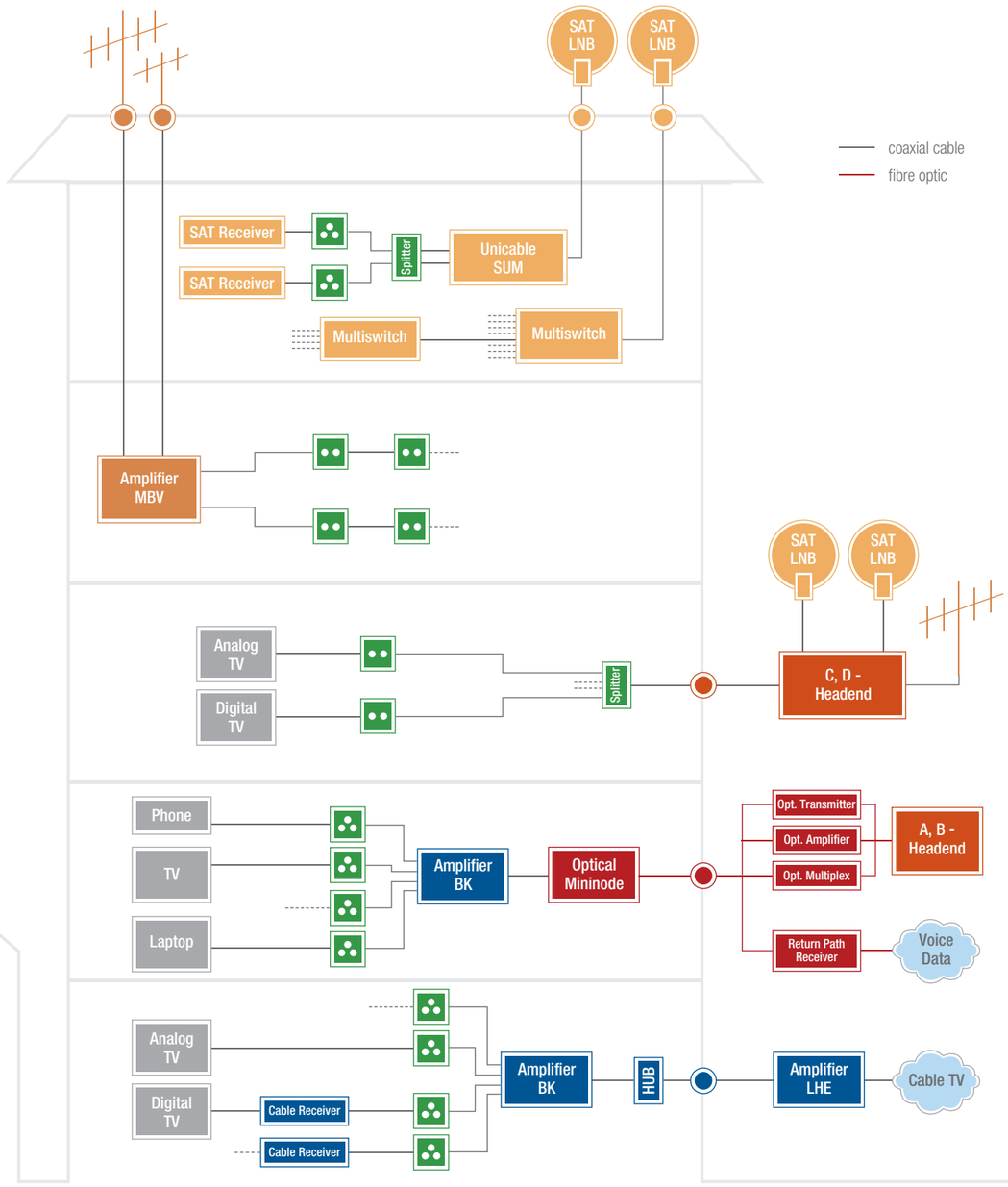
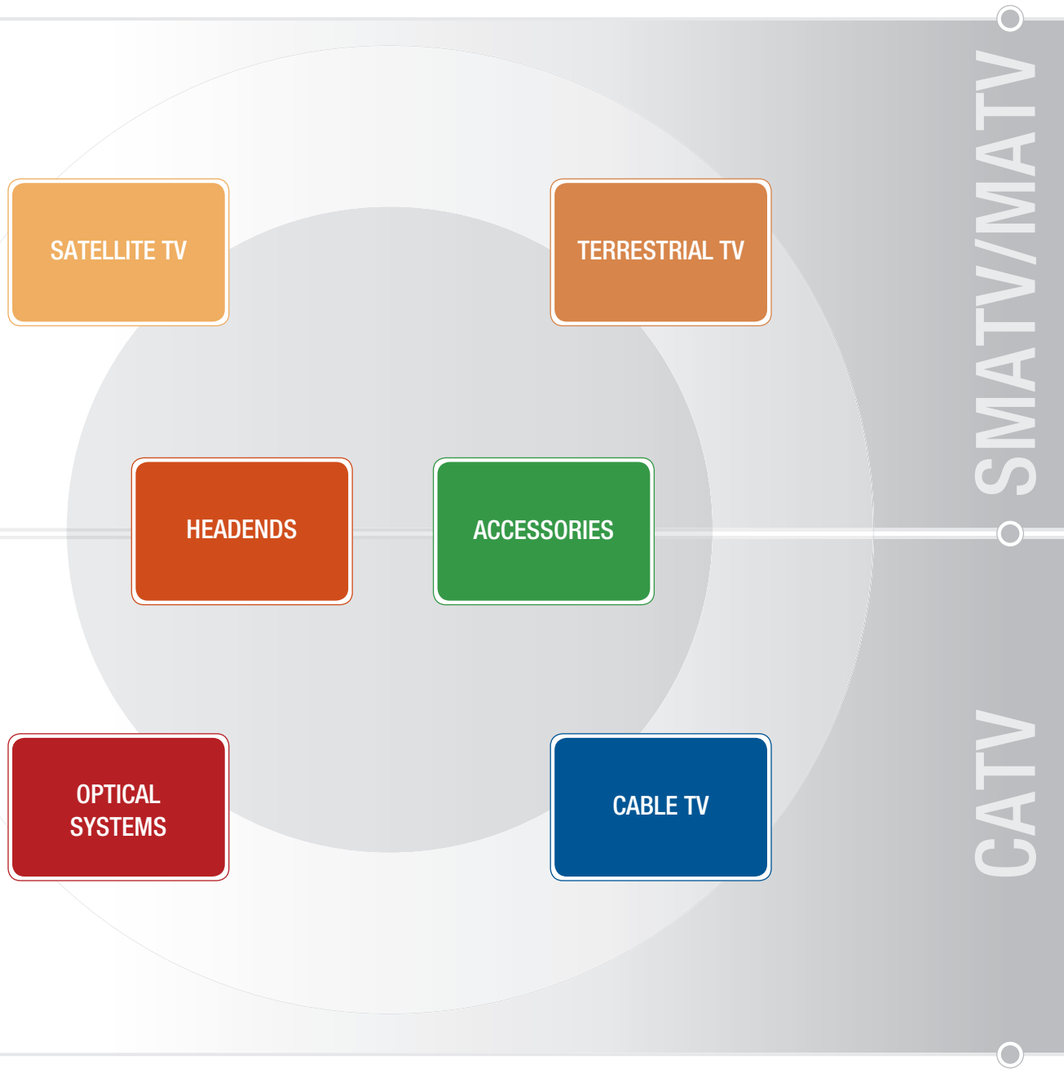
DELTA Electronics

MAINCATALOGUE

EDITION 5

DCT DELTA – FIELD OF SYSTEM EXPERTISE





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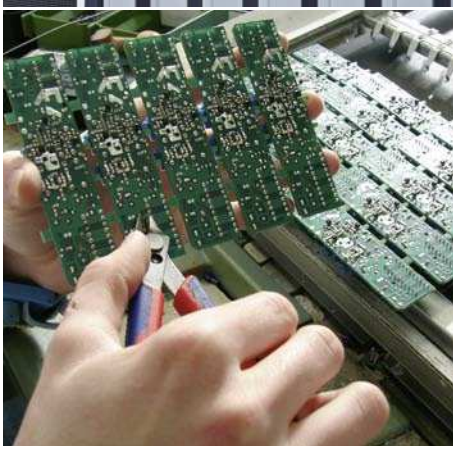


Dear Customer, dear Business Partner

In our last catalogue we presented our range in SMATV, CATV and optical product lines. So we give you an initial impression of the development of our corporate group and our portfolios. We oriented our further development to you, our customers, and our markets.

With our new catalogue we invite you to discover and revisit this evolution, whereby the following is important to us:

Customised solution expertise

This catalogue demonstrates that we develop a range of products into solutions and make a broad portfolio of services available to have exactly the right response to your requirement . From the CLASS A headend through the in-house network to the wall socket we offer copper and fibre optic infrastructure for signal transmission with the SMATV and CATV range.

Guaranteed Quality

We guarantee uncompromising quality in signal transmission, perfect handling and excellent cost effectiveness. Delta will also be your German manufacturer in the future and a national and international solution provider in the field of grid-bound broadband transmission for cable, satellite and glass-fibre infrastructures. All „Made in Germany“, of course. With this commitment to quality we’re aiming at achieving a leading position internationally.

Custom development

This catalogue is also a warm invitation to you, our business partners, to speak with us about your own developments for the future. Via custom design-in in existing or new infrastructures, we can offer network operators-tailored products and solutions, which we specially develop and manufacture ourselves for your specific requirements.

Experience the difference

We offer you a dynamic partnership through our trained specialists in sales, development and manufacturing, from planning to implementation. Delta’s promise to you can be summarised as follows:

We listen, understand, consult and execute.

We would be happy to answer your enquiries and to assist with your individual solution needs at any time. We are your specialist for complex applications in SMATV and CATV.

With kindest regards,
Your Delta team

WE LISTEN, UNDERSTAND, CONSULT AND EXECUTE.

Right from the start, DCT Delta Electronics GmbH has gone from strength to strength. For the past 20 years, our medium-sized company has been specialising in the supply of complex applications and tailor-made solutions. Our products are developed through a combination of state-of-the-art technical equipment, highly qualified employees and continuous quality checks at every level of the development and production processes.

DCT DELTA DELIVERS FLEXIBLE, FAST AND CONVINCING SOLUTIONS.

Our high level of technical, development and production skills gained through specialisation enables DCT Delta to deliver flexible, fast and convincing solutions to meet your needs. In doing so, we set standards for quality, innovation, reliability and customer satisfaction, while reducing investment risks at the same time.

Our commitment to the continuous enhancement of the product families and the development of new technologies and applications ensures that DCT Delta will in the future remain a sought-after supplier to and partner of the leading network operators. In Germany and across Europe.

Ecology

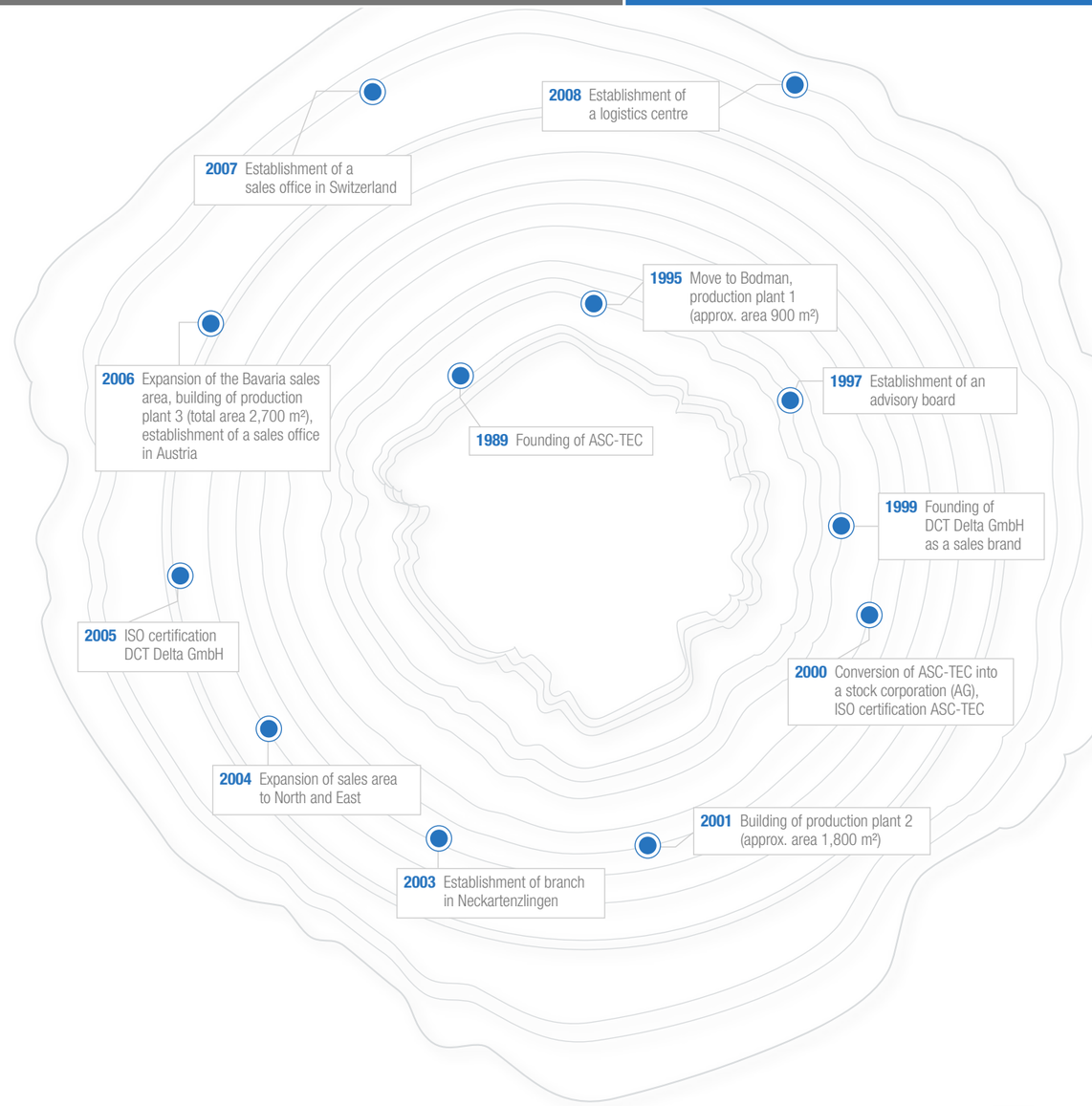
DCT Delta not only looks after the interests of its customers, but is also committed to protecting the environment.

Hence environmental policy is an essential part of our corporate policy. In practical terms, this means that the entire energy consumption at our Bodman location is covered by solar energy (photovoltaic power system) and a combined heat and power plant.

Social responsibility

The fundamental social orientation of the entire company is not only wholeheartedly practised and supported by the owner, the managing directors and the employees, it is also an essential part of DCT Delta's corporate philosophy.

This means that we naturally also integrate people with disabilities into our work processes and that we support regional establishments, e.g. in regard to procurement purposes.



STAYING AHEAD THROUGH KNOW-HOW

SATELLITE TV

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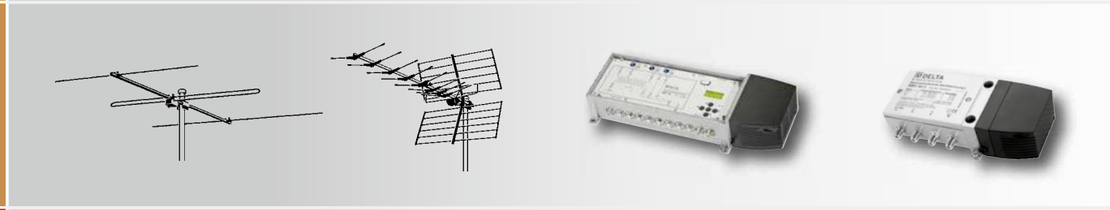
Parabolic Offset Reflectors, LNB-Mount, SAT-Amplifier, Optical LNB,
Multiswitches, Unicable Switches, Sat*LAN*, SatTransSelect



TERRESTRIAL TV

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Terrestrial Antennas, Terrestrial Multiband Amplifier, Splitband Amplifier

HEADENDS

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Headends, Modular Channel Processing Unit,
IP Professional Channel Processing Unit

OPTICAL SYSTEMS

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Optical Transmitter, EDFAS, Fibre Nodes HFC/FTTX,
Passive Fibre Optic Distributor Material

CABLE TV

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House-Amplifier, Line Extender- and Distribution-Amplifier,
Network Management Systems, Network Termination Point, Apartment-Amplifier

ACCESSORIES

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Tabs, Splitter, Wall Outlets, Cable, Connectors, Tools, Fixing Accessories

READY TO RECEIVE





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UC	LNB's with Coaxial Outputs	11
NV	SAT-ZF Inline Amplifier	12
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PARABOLIC OFFSET REFLECTORS

- For reception of satellite signals in the frequency range 10,7–12,75 GHz
- Simple setup on site – only 2 completely pre-assembled parts
- High stability – 40 mm die-cast feed mount (part of shipment) and solid screw connection of reflector with mounting bracket
- Corrosion-resistant – Aluminium reflector, hot-dip galvanized mast bracket
- Esthetically pleasing – available in three colors, integrated cable duct
- Available colors: white, graphite, brick red

Highlight SAT 2/2008

DIGITAL fernsehen 8.2010 sehr gut DELTA SAT 85 www.digitalfernsehen.de

Type		SAT 75	SAT 85	SAT 100	SAT 120
Color / Article-No.	white	5700 1277	5700 1280	5700 1283	5700 0877
	graphite	5700 1278	5700 1281	5700 1284	5700 1050
	brick red	5700 1279	5700 1282	5700 1285	–
Reflector-Ø	m	0,75	0,85	1,0	1,2
Gain	dB	37,3	38,3	40	41,0 ... 42,5
Half-value aperture	°	2,4	2,1	1,8	1,37
Mount for mast Ø	mm	40 - 80	40 - 80	40 - 80	55 - 100
Adjustment range, elevation	°	10 - 40	10 - 40	10 - 40	20 - 50
Wind load	N	480	600	800	1250
Width x height	cm	75 x 80	85 x 90	94 x 101	124 x 133
Packing dimensions	cm	78 x 94 x 14	93 x 94 x 25	115 x 102 x 35	140 x 130 x 15
Weight	kg	7,0	11,0	11,5	14,5

Coherent appearance

- Finishing of reflector, support arm and bracket in same color

Multi-feed-compatible

- Flexible rail system for up to 4 LNBs
- Slip safe construction of support arm and LNB mount

High stability

- Generous material profiles and hexagonal clamping nuts
- One-piece construction of support arm and LNB mount

Protected cable duct

- Secure and orderly cabling on support arm

SPECIAL LNB-MOUNT

- Rail system with additional feed adaptors Ø 40 mm for simultaneous reception of up to 4 satellites:
  Min. angle distances:
  SAT 75 / SAT 85: 6º; (with FH 40 HS: 3°)
  SAT 100: 4º; (with FH 40 HS: 3°)
  SAT 120: 3º
- Easy mounting to all DELTA Electronics reflectors
- Special Mount for replacement: FH 40 HS with elevation adjustment and small dimemsion for 3°


MFH 2


FH 40 HS

Type		MFH 2	MFH 3	MFH 4	FH 40 HS
Description		Multifeed mount	Multifeed mount	Multifeed mount	Special mount elevation adjustment+small dimension
Article-No.		5700 1191	5700 1192	5700 1193	5700 1562
LNB fittings		2	3	4	–
Provided LNB fittings		1	2	3	1
Shift range	º	6	25	25	–
Weight	kg	0,2	0,4	0,5	–

LNB'S WITH COAXIAL OUTPUTS

- Low Noise Block Converter for conversion of TV SAT transponders into the SAT-IF range (L-Band)
- Watertight die-cast housing and additional protection by means of plastic outer housing
- Suitable for all standard feed mounts of 40 mm Ø
- Low power consumption
- Low noise and low distortion

Type		UC 21	UC 22	UC 44	UC 44 S
Description		Single-LNB	Twin-LNB	Quattro-LNB	Quattro-Switch-LNB
Article-No.		5700 0881	5700 0883	5700 0885	5700 0886
Frequency range low-band	GHz	10,70 - 11,70	10,70 - 11,70	10,70 - 11,70	10,70 - 11,70
high-band	GHz	11,70 - 12,75	11,70 - 12,75	11,70 - 12,75	11,70 - 12,75
Gain	dB	> 50	> 50	> 50	> 50
Oscillator frequency	GHz	9,75 low 10,60 high	9,75 low 10,60 high	9,75 low 10,60 high	9,75 low 10,60 high
Polarization decoupling	dB	25	25	25	25
Switching voltage (H/V)	VDC	14/18	2 x 14/18	12...18	4 x 14/18
Band switching signals	kHz	0/22	2 x 0/22	–	4 x 0/22
Current consumption	mA	130	235	280	280
Feed fitting	mm	40	40	40	40
Operating temperature	ºC	-40...+60	-40...+60	-40...+60	-40...+60
Weight	kg	0,38	0,45	0,47	0,47

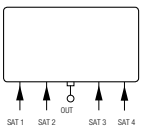
SAT-ZF INLINE AMPLIFIER

- Super wideband amplifier for terrestrial and SAT range
- Frequency range 47 up to 2300 MHz
- Remote feeding via coaxial RF connector
- DC-pass for LNB remote feeding
- Die-cast enclosure Class A

Type		NV 1624 D
Article-No.		5700 2025
Frequency range	MHz	47 - 2300
Inputs		1 (F)
Outputs		1 (F)
Gain 40 MHz	dB	16
Gain 950 / 1750 / 2300 MHz	dB	18 / 20 / 24
Output level: SAT 35 dB IMA_3	dBµV	110
TERR 60 dB IMA_3	dBµV	105
Remote feeding voltage	V	11 ... 20 (bi-directional)
Remote feeding current	A	max. 0,5
Power consumption	mA	60
Dimensions	mm	45 x 24 x 24
Weight	kg	0,04

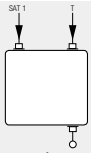
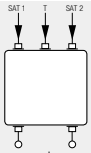
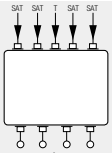
DiSEqC-SWITCH

- SAT-IF switch, controlled by DiSEqC / Toneburst
- Short-circuit protected
- Connectors F female
- Weather proved enclosure for outside applications (please order separately)

Type		SUS 41	SUWP 41
Description		DiSEqC-Switch	Weather protection cap
Article-No.		1016 1596	5700 2022
			
Frequency range	MHz	950 - 2150	–
Inputs		4	–
Outputs		1	–
Switching modes		DiSEqC A/B, Toneburst	–
Through loss	dB	4	–
Isolation SAT/SAT	dB	> 28	–
Power supply		Remote feeding via output, DC- pass for LNB- remote feeding, max. 500 mA	
Power consumption	mA	18	–
Connectors		F female	–
Dimensions / Weight	mm/kg	80 x 110 x 30 / 0,2	130 x 130 x 50 / 0,1

SAT-IF INSERTION DIPLEXER

- To combine or separate terrestrial/CATV- and SAT-IF signals
- Metal housing with plastic side brackets
- **ESW 54:** For Quattro-Switch-LNB
- Active combiner with low through loss
- Terrestrial active/passive switchable
- Passive return path from 5 MHz
- Socket jack for optional continuous feeding with power supply NG 1880-2 (please order separately)

Type		SW 02		SW 22		ESW 54	
Article-No.		1016 1033		1016 1041		1016 1169	
							
Frequency range	MHz	47-862	950-2150	47-862	950-2150	47-862	950-2150
Inputs		1	1	1	2	1	4
Outputs		1		2		4	
Insertion loss (Ter active)	dB					4 ... 6	4 ... 6
Insertiion loss (Ter passive)	dB	1 ... 3		2 ... 4		12 ... 14	4 ... 6
Output level 60 dB IMA$_3$	dBµV					88	
Isolation SAT/TER	dB	> 30		> 30			
Power supply		by Receiver		by Receiver		by Receiver or through external power supply	
Remote feeding LNB		max. 500		max. 500		–	max. 500
Power consumption	mA					< 60 (12...18 V=)	
Connectors		F female		F female		F female	
Dimensions	mm	90 x 70 x 27		115 x 90 x 40		110 x 90 x 35	
Weight	kg	0,1		0,2		0,3	

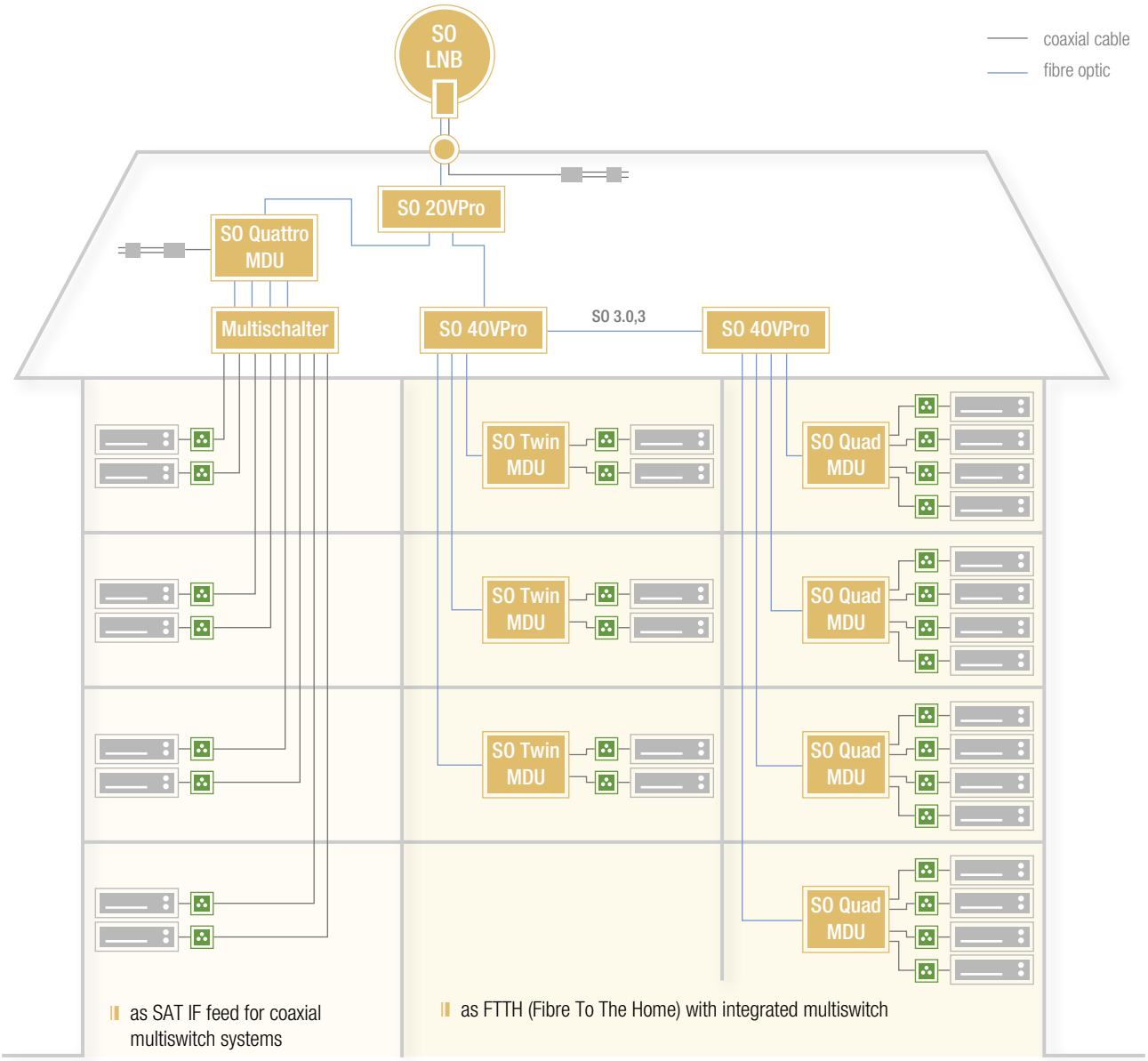
UNIVERSAL PLUG-IN POWER SUPPLY

NG 1880-2:
- Power efficiant plug-in power supply 18 V/0,8 A
- For amplifier NVS 510, Unicable SUM 514 K, SUM 516 K, SUM 518 K, SUM 524 K and SAT-IF combiner ESW 54

NG 1520 S:
- Powerful mains adapter 15 V/2,4 A
- For amplifier NVS 917, NVS 1717 and Multiswitch MS 17xx N, MS 17xx K

Type		NG 1880-2	NG 1520 S
Article-No.		5700 1822	5700 1292
Operating voltage 50/60 Hz	V~	230 / flange mounted Euro plug	100 … 240 / Euro plug
Output voltage	V	18 / stabilized	15 / stabilized
Output current max	mA	800	2.400
Connectors		3,5 mm jack	F female + patch cable
Dimensions	mm	70 x 30 x 50	120 x 60 x 35
Weight	kg	0,16	0,4

OPTICAL LNB-SYSTEM



The System

All four SAT-IF ranges of a satellite position are converted to a frequency multiplex in the SO LNB and transmitted over a monomode glass fibre (optical fibre) using a 1310nm laser signal. On the subscriber page the back conversion to the normal SAT-IF position is made by a converter MDU with optical input. Preconfigured fibre optic cables and connector-compatible optical splitter complete the „Plug & Play“ system. The maximum bridgeable optical budget of 19 dB enables optical distribution on up to 32 optical converters.

Adequate planning is recommended prior to installation e.g. by the DELTA planning office.

The advantages at a glance

- Large transmission lengths as well as high splitting factors possible
- Cost effective, as only one fibre and only one splitter is required for all four SAT-IF ranges of a satellite position
- Space-saving installation
- The galvanic separation due to the fibre optic wiring avoids potential losses and EMV problems
- As a SAT-IF feed recommended for:
  - Multiswitches of the MS/MSE series (p. 19-23)
  - Uni*Comb* Multiswitch MSU (p. 25)
  - Unicable SAT Channel Router SUM (p. 29-30)
- Further fibre optic network components for the construction of larger systems can be found in the optical systems section starting on page 78.

OPTICAL LNB

- Convert the 4 SAT-IF levels of a satellite position to one single frequency-multiplex (stacking)
- Convert the electrical multiplex signal into optical output signal for fibre optical transmission

Type		SO LNB
Description		LNB with optical output
Article-No.		5700 1824
L.O. frequency vertical	GHz	9,75
L.O. frequency horizontal	GHz	7,30
Noise figure	dB	0,5
Input frequency	GHz	10,70-12,75
Frequency range VL	GHz	0,95-1,95
Frequency range VH	GHz	1,95-3,00
Frequency range HL	GHz	3,40-4,40
Frequency range HH	GHz	4,40-5,45
Optical wavelength	nm	1310
Optical output	dBm	7,0
Fibre connector		FC/PC
Operating voltage		12 V via F connector (plug-in PSU is part of shipment)
Feed fitting	mm	40

OPTICAL BACK CONVERTER

- The back converter (De-Stacker) changes the optical signal from the SO LNB first as an electrical frequency multiplex signal and then sets it back into four original separate SAT-IF ranges
- With twin and quad converters a multi-switch is already integrated. The receivers can be directly connected via the antenna outlet sockets. The operating voltage for the MDU is provided via the receiver
- In the case of Quattro converters, which are used for downstream control for coaxial multi-switches, in addition the power supplier is required to be connected (included in the scope of delivery)

Type		SO Twin MDU	SO Quad MDU	SO Quattro MDU
Description		Optical Twin Converter*	Optical Quad Converter	Optical Quattro Converter
Article-No.		5700 1829	5700 1830	5700 1831
Input frequency	GHz	0,95-5,45		
Min. optical input level	dBm	-12		
Max. optical input level	dBm	0		
Optical input		FC/PC		
RF output frequency range	MHz	950-2150		
RF output level**	dBµV	80	80	80
RF connectors		2 x F-Type	4 x F-Type	4 x F-Type
Dimensions	mm	165 x 155 x 30		

* Discontinuation
** Diameter of parabol aerial 85

FIBRE CABLE

- Monomode fibreglass cable, metal reinforced and PVC coated, in various lengths, Ø 3.0 mm
- The cables are already prefconfigured on both ends with FC/PC connectors
- LSHZ (smoke resistant and halogen-free)

Type	SO 3.0,1	SO 3.0,3	SO 3.0,10	SO 3.0,20	SO 3.0,30	SO 3.0,50	SO 3.0,75	SO 3.0,100	SO 3.0,200
Article-No.	5700 2023	5700 1838	5700 1839	5700 1840	5700 2024	5700 1841	5700 1842	5700 1843	5700 1844
Length m	1	3	10	20	30	50	75	100	200

OPTICAL SPLITTERS

- The optical splitter distributes the optical signal proportionally to 2, 3, 4 or 8 outputs
- Planar-Splitter 1-16 and 1-32 outputs (see p. 100)

Type		SO 20VPro	SO 30VPro	SO 40VPro	SO 80VPro
Description		opt. two way distributor	opt. three way distributor	opt. four way distributor	opt. eight way distributor
Article-No.		5700 1825	5700 1826	5700 1827	5700 1828
Outputs		2	3	4	8
Optical wavelength	nm	1310/1550	1310/1550	1310/1550	1310/1550
Through loss	dB	3,8	5,5	6,8	8,5
Optical Input/Output		FC/PC	FC/PC	FC/PC	FC/PC

OPTICAL ACCESSORIES

- **Optical attenuator:** For optical attenuation ensure that attenuation from the output of the LNB to the input of the converter 15 is maintained below 15 dB
- **Optical cable connector:** FC/PC socket on both sides
- **Fibreglass rod** as insertion tool for fibre optic cables in empty tubes

Type	SO OA 5	SO OA 10	SO OA 15	SO FC/PC BC	SO EZH
Description	Optical attenuator 5 dB	Optical attenuator 10 dB	Optical attenuator 15 dB	Adapter FC/PC – FC/PC	Fibreglass rod (insertion tool)
Article-No.	5700 1833	5700 1834	5700 1835	5700 1832	5700 1836

SAT-IF DISTRIBUTION SYSTEMS

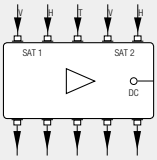
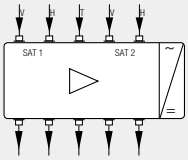
The crucial advantage of the satellite direct reception is the almost unlimited programme variety, which is made available to the user over various satellite positions. Via a single coaxial cable, however, only a fraction of over 30 transponders are transmittable directly to the Sat Receiver in the SAT-IF range of 950-2150 MHz. In order to nevertheless allow each receiver in SAT multi-subscriber systems access to the multitude of programmes and thus the SAT-IF levels and transponders, in the main terminal-controlled matrix switches are used, which are also known as multi-switches. For systems in which the use of multi-switches is not possible due to wiring technology Delta Electronics has developed the programmable SAT-IF conversion SatTransSelect.

This active SAT-IF distribution system is offered by Delta Electronics in differentiated product families:

Product line	Type line	Trunk lines / inputs	Switch control	Cableing structur
Multiswitches Ecoline – matrix switches DiSEqC-controlled				
	MS/MSE	5, 9, 17	13/18 V; 0/22 kHz; DiSEqC	Full star network
Uni*Comb* Multiswitches – a combination of DiSEqC matrix switch and Unicable SAT channel router				
	MSU	5, 9, 17	Unicable; 13/18 V; 0/22 kHz; DiSEqC	Floor star network; single branch line in flat (tree network)
Unicable Switches – Unicable SAT channel router confirm to EN 50494				
	SUM	9 5	Unicable	Tree network until 8 subcribers/Sat tuners on one single cable trunk line
SatTransSelect Single Cable Converter – programmable selective SAT-IF into SAT-IF Conversion				
	STS 10 SatTransSelect	no limitation, max. 30 transponders	needless	Tree network without any limitations
Sat*LAN* – Ethernet LAN via coaxial cableing of a SAT multiswitch network				
	MS-LAN	9 5, 9, 17 (Insertion diplexer)	13/18 V; 0/22 kHz; DiSEqC; Ethernet 150 MB/s	Full star network

AMPLIFIER 5-CABLE SYSTEM

- **NVS 510:** Head- or backbone line amplifier for 5-cable systems, terrestrial path active
- Power supply unit NG 1880-2 optionally connectable (please order separately)
- **SV 528:** Head amplifier for 5-cable systems
- Terrestrial active/passive switchable
- Attenuator, 22 kHz generator

Type		NVS 510			SV 528		
Article-No.		1016 1200			1016 1201		
							
Description		head or backbone amplifier			head amplifier		
Frequency range	MHz	5 - 30	47 - 862	950 - 2150	5 - 30	47 - 862	950 - 2150
Inputs		1		4	1		4
Outputs			5			5	
Gain: active-mode	dB	-1 ... -3	7 ... 10	7 ... 12	-1 ... -3	26 ... 28	21 ... 28
passive-mode	dB	-	-	-	-1 ... -3	-1 ... -3	21 ... 28
Attenuator	dB	-	-	-	1 x 0...15		4 x 0...15
Noise figure	dB	-	5	9	-	8	
Output level							9
SAT 35 dB IMA_3	dBµV			112			116
TERR 60 dB IMA_3 / IMA_2	dBµV	112 / 95			114 / 95		
Isolation inputs	dB	> 25			> 25		
22 kHz tone		-			selectable		
Operating voltage for LNB and NVS 510		connector 3,5mm for plug-in power supply (NG 1880-2), max. 800 mA			185 - 265 V~ flanch mouted power supply unit		
Remote feeding LNB		13/18 VDC 300 mA,			13/18 VDC 500 mA,		
Remot feeding NVS 510 via trunk lines (no pass to LNB feeding)		selectable: 12 VDC, 250 mA for remote feeding of cascade devices			selectable: 12 VDC, 250 mA for remote feeding of cascade devices		
Power consump. without LNB remote feeding		< 200 mA			11,7 W		
Connectors		F female			F female		
Dimensions	mm	125 x 90 x 35			210 x 125 x 73		
Weight	kg	0,3			1,2		

QUICK GROUNDING BLOCKS

- Easy connection of the multi-switch with the subscriber lines
- Ensures the permanent equipotential bonding in according to the safety standard EN 60728-11
- High quality F-Quick connector
- Grid 25 mm

Type	MSEB 08 (1x8)	MSEB 12 (1x12)
Article-No.	5700 0927	5700 0928
MS-Type	MSE 58 N, 98 N, 9016 N, 5016 N, 5032 N (with overlap: MS 54 N, MSE 56 N, 94 N, 96 N)	MSE 5012 N, 9012 N, 5048 N

MULTISWITCH 5-CABLE SYSTEM

Stand alone switch with power supply

- For selection of 4 satellite polarities from all of the connected SAT receivers
- Input switching via control with 13/18 V, 0/22 kHz from the receiver
- 22 kHz and 13/18V - Overlay with connection for Quad Switch LNB
- Input for terrestrial and CATV signals, available as a return path in passive operation
- Active switch for terrestrial range with low tap loss
- Connectors: F female
- Metal housing with plastic side brackets
- Switch mode power supply with LED-control
- Temperature range -20°C...55°C

Type				MSE 56 N		MSE 58 N		MSE 5012 N	
Article-No.				5700 1788		5700 1789		5700 1790	
Frequency range	TER passive/active		MHz	5/47-862	950-2150	5/47-862	950-2150	5/47-862	950-2150
Inputs				1	4	1	4	1	4
Outputs Receiver				6		8		12	
Gain	TER passive/active		dB	-22/1	-7	-23/1	-7	-27/2	-8
Isolation:	TER/SAT		dB	25		25		22	
	SAT/TER		dB	28		28		22	
	Rec/Rec		dB	28	30	28	30	28	30
Output level:	35 dB IMA$_3$		dBµV		101		101		100
	60 dB IMA$_3$		dBµV	85		85		85	
Operating volatage			V~	230		230		230	
Remote feeding LNB			mA	max. 600		max. 600		max. 600	
Power consumption*	TER passive/active		W	4,0/5,0		4,0/5,0		4,0/7,0	
Dimensions			mm	345 x 120 x 80		345 x 120 x 80		440 x 120 x 80	
Weight			kg	1,3		1,3		1,4	

*without LNB remote feeding

Type				MSE 5016 N		MSE 5024 N		MSE 5032 N		MSE 5048 N	
Article-No.				5700 1791		5700 1792		5700 1793		5700 1794	
Frequency range	TER passive/active		MHz	5/47-862	950-2150	5/47-862	950-2150	5/47-862	950-2150	5/47-862	950-2150
Inputs				1	4	1	4	1	4	1	4
Outputs Receiver				16		24		32		48	
Gain	TER passive/active		dB	-29/2	-4	-33/0	-2	-33/-1	-1	-37/-3	-2
Isolation:	TER/SAT		dB	22		25		25		25	
	SAT/TER		dB	25		25		25		25	
	Rec/Rec		dB	28	30	28	30	28	30	28	30
Output level:	35 dB IMA$_3$		dBµV		100		95		95		95
	60 dB IMA$_3$		dBµV	85		86		86		86	
Operating volatage			V~	230		230		185 - 265		185 - 265	
Remote feeding LNB			mA	max. 600		max. 600		max. 600		max. 600	
Power consumption*	TER passive/active		W	4,0/7,0		4,0/7,0		2,0/5,0		2,0/5,0	
Dimensions			mm	530 x 120 x 80		440 x 120 x 80		384 x 120 x 71		484 x 120 x 71	
Weight			kg	1,6		1,6		1,4		1,7	

*without LNB remote feeding

AMPLIFIER 9-CABLE CASCADABLE SYSTEM

- Useful as head- or cascade amplifier. Powering via a plug-in power supply, contained in the scope of supply
- Attenuator per input, fixed slope in SAT range
- High degree of controllability

Type			NVS 917	
Article-No.			1016 1638	
Frequency range		MHz	47-862	950-2150
Inputs			1	8
Outputs trunkline			1	8
Gain		dB	17	14 ... 24
Attenuator		dB	0 ... 20	0 ... 20
Equalizer		dB	2 ... 15	10
Noise figure		dB	7	9
Isolation:	SAT/SAT	dB		> 30
	SAT/TER	dB	> 20	
Output level:	35 dB IMA_3	dBµV		110
	60 dB IMA_3	dBµV	105	
Plug-in power supply			230 V~ / 18 V, 1200 mA (Cinch connector), Type NG 1520 S	
Power consumption		mA	max. 400 (without LNB remote feeding)	
Dimensions		mm	287 x 124 x 51	
Weight		kg	1,1	

MULTISWITCH 9-CABLE CASCADABLE SYSTEM

- For selection of 8 satellite polarities signals
- Switching mode 13/18 V, 0/22 kHz, DiSEqC 2.0
- Terrestrial/CATV path passive and available as return path
- Connectors F female
- Metal housing with plastic side brackets
- Remote feed from the connected receivers
- Temperature range -20°C...55°C

Type			MSE 94 K		MSE 98 K		MSE 9016 K	
Article-No.			5700 1800		5700 1801		5700 1802	
Frequency range		MHz	5-862	950-2150	5-862	950-2150	5-862	950-2150
Inputs			1	8	1	8	1	8
Outputs receiver			4		8		16	
Outputs trunkline			1	8	1	8	1	8
Gain output subscriber*		dB	-25	-2 ... +4	-26	-2,5...+4	-30	-3... +3
Through loss trunkline		dB	5	2	5	3	6	6
Isolation:	SAT/SAT	dB		35		35		35
	SAT/TER	dB	28		28		28	
	Rec/Rec	dB	28	30	28	30	28	30
Output level:	35 dB IMA_3	dBµV		100		100		100
Remote feeding SAT trunkline		mA	max. 800		max. 800		max. 800	
Power consumption receiver		mA	< 65		< 65		< 65	
Dimensions		mm	287 x 125 x 51		287 x 153 x 51		250 x 210 x 51	
Weight		kg	0,66		0,76		1,0	

*6 dB Slope

MULTISWITCH 9-CABLE SYSTEM

Stand alone switch with power supply

- For selection of 9 satellite polarities from all of the connected SAT receivers
- Input switching via the receiver with 13/18 V, 0/22 kHz; DiSEqC 2.0
- 22 kHz and 13/18V - Overlay with connection for Quad Switch LNB
- Input for terrestrial and CATV signals, available as a return path in passive operation
- Active switch for terrestrial range with minimal tap loss
- Connectors F female
- Metal housing with plastic side brackets
- Switch mode power supply with LED-control
- Temperature range -20°C...55°C

Type				MSE 94 N		MSE 96 N		MSE 98 N	
Article-No.				5700 1795		5700 1796		5700 1797	
Frequency range	TER passive/active		MHz	5/47-862	950-2150	5/47-862	950-2150	5/47-862	950-2150
Inputs				1	8	1	8	1	8
Outputs Receiver				4		6		8	
Gain	TER passive/active		dB	-26/0	0	-27/-1	0	-28/-2	0
Isolation:	TER/SAT		dB	30		30		30	
	SAT/TER		dB	28		28		28	
	Rec/Rec		dB	30	30	30	30	30	30
Output level:	35 dB IMA$_3$		dBµV		100		100		100
	60 dB IMA$_3$		dBµV	82		82		82	
Operating volatage			V~	230		230		230	
Remote feeding LNB			mA	max. 800		max. 800		max. 800	
Power consumption*	TER passive/active		W	7,5/8,5		7,5/8,5		7,5/8,5	
Dimensions			mm	345 x 120 x 80		345 x 120 x 80		345 x 120 x 80	
Weight			kg	1,6		1,6		1,6	

*without LNB remote feeding

Type				MSE 9012 N		MSE 9016 N	
Article-No.				5700 1798		5700 1799	
Frequency range	TER passive/active		MHz	5/47-862	950-2150	5/47-862	950-2150
Inputs				1	8	1	8
Outputs Receiver				12		16	
Gain	TER passive/active		dB	-32/2	0	-33/0	0
Isolation:	TER/SAT		dB	30		30	
	SAT/TER		dB	28		28	
	Rec/Rec		dB	30	30	30	30
Output level:	35 dB IMA$_3$		dBµV		100		100
	60 dB IMA$_3$		dBµV	82		82	
Operating volatage			V~	230		230	
Remote feeding LNB			mA	max. 800		max. 800	
Power consumption*	TER passive/active		W	7,5/10,5		7,5/10,5	
Dimensions			mm	440 x 120 x 80		550 x 120 x 80	
Weight			kg	1,8		2,1	

*without LNB remote feeding

AMPLIFIER 17-CABLE CASCADABLE SYSTEM

- Useful as head- or cascade amplifier. Powering via a plug-in power supply, contained in the scope of supply
- Attenuator per input, fixed slope in SAT range
- High degree of controllability

Type			NVS 1717		
Article-No.			5700 1262		
Frequency range		MHz	5-65	88-862	950-2150
Inputs			1		16
Outputs subscriber			1		16
Gain		dB	4	16	14 ... 20
Attenuator		dB	0 ... 10		0 ... 10
Equalizer		dB	0 ... 10		6
Noise figure		dB	7		9
Isolation:	SAT/SAT	dB			> 25
	SAT/TER	dB	> 30		
Output level:	35 dB IMA$_3$	dBµV			110
	60 dB IMA$_3$	dBµV	105		
Plug-in power supply with F connector		V~	230 V~ / 15 V, 2 A (Remote feeding LNB max. 1,2 A), Type NG 1520 S		
Remote feeding		W	12 (without LNB remote feeding)		
Dimensions / Weight		mm/kg	370 x 105 x 55 / 2,8		

MULTISWITCH 17-CABLE CASCADABLE SYSTEM

- For selection of 16 satellite polarities + terrestrial signals
- Switching mode 13/18 V, 0/22 kHz, DiSEqC-signals and toneburst
- LED for signalisation of power supply
- Metal housing with plastic side brackets, connectors F female
- Remote feed from the connected receivers

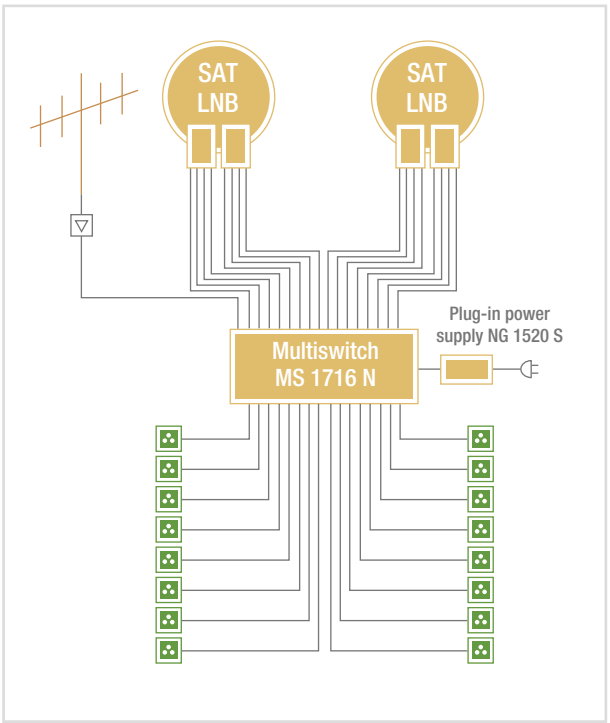
Type			MS 1704 K		MS 1708 K		MS 1716 K	
Article-No.			5700 1261		5700 1259		5700 1260	
Frequency range		MHz	5-862	950-2150	5-862	950-2150	5-862	950-2150
Inputs			1	16	1	16	1	16
Outputs subscriber			4		8		16	
Outputs trunkline			17		17		17	
Gain		dB	-22	0	-24	0	-27	2
Through loss trunkline		dB	4	3,5	4	3,5	4	5
Isolation:	SAT/SAT	dB		> 30		> 30		> 30
	SAT/TER	dB	> 30		> 30		> 30	
	Subscriber	dB	> 25	> 30	> 25	> 30	> 25	> 30
Output level:	35 dB IMA$_3$	dBµV		100		100		100
Remote feeding		mA	max. 1300		max. 1300		max. 1300	
Power consumption max. (by receiver)		mA	< 50		< 50		< 50	
Dimensions		mm	370 x 105 x 55		370 x 105 x 55		370 x 205 x 55	
Weight		kg	1,8		1,8		2,8	

MULTISWITCH 17-CABLE SYSTEM

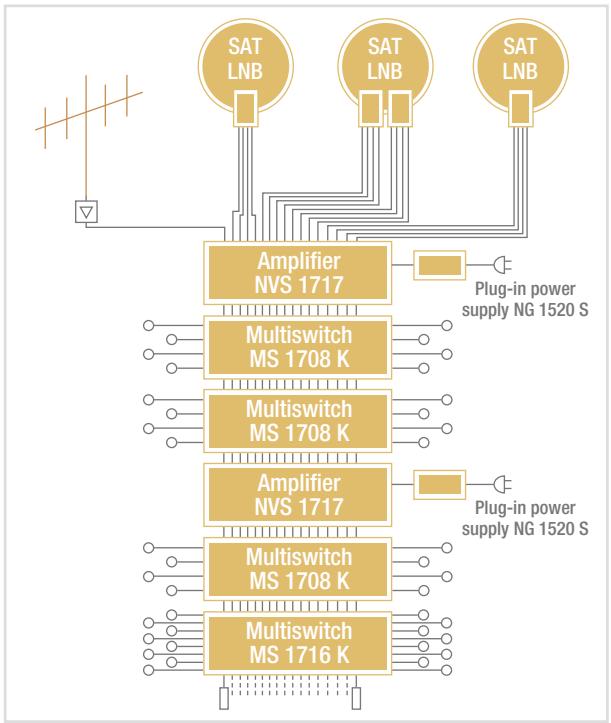
Stand alone switch with power supply

- For selection of 9 satellite polarities from all of the connected SAT receivers
- Switching mode 13/18 V, 0/22 kHz, DiSEqC 2.0
- Input for terrestrial or CATV signals, passive and return path compatible
- Metal housing with plastic side brackets, connectors F female
- Energy-saving remote feed via the SAT receiver, plug-in power supply NG 1520 S with F connector for LNB-remote feeding, included in the scope of delivery

Type			MS 1704 N		MS 1708 N		MS 1716 N	
Article-No.			5700 1265		5700 1257		5700 1258	
Frequency range		MHz	5-862	950-2150	5-862	950-2150	5-862	950-2150
Inputs			1	16	1	16	1	16
Outputs subscriber			4		8		16	
Gain		dB	-18	0	-22	0	-24	0
Isolation:	SAT/SAT	dB		> 30		> 30		> 30
	SAT/TER	dB	> 30		> 30		> 30	
	Subscriber	dB	> 25	> 30	> 25	> 30	> 25	> 30
Output level:	35 dB IMA$_3$	dBµV		100		100		100
Plug-in power supply with F connector		V~	230 / 15 V, 2 A		230 / 15 V, 2 A		230 / 15 V, 2 A	
Remote feeding LNB			max. 1,3 A via external power adapter		max. 1,3 A via external power adapter		max. 1,3 A via external power adapter	
Power consumption max. (by receiver)		mA	< 50		< 50		< 50	
Dimensions / Weight		mm/kg	370 x 105 x 55 / 1,8		370 x 105 x 55 / 1,8		360 x 205 x 55 / 2,8	



Distribution network for 16 subscribers with a stand alone switch

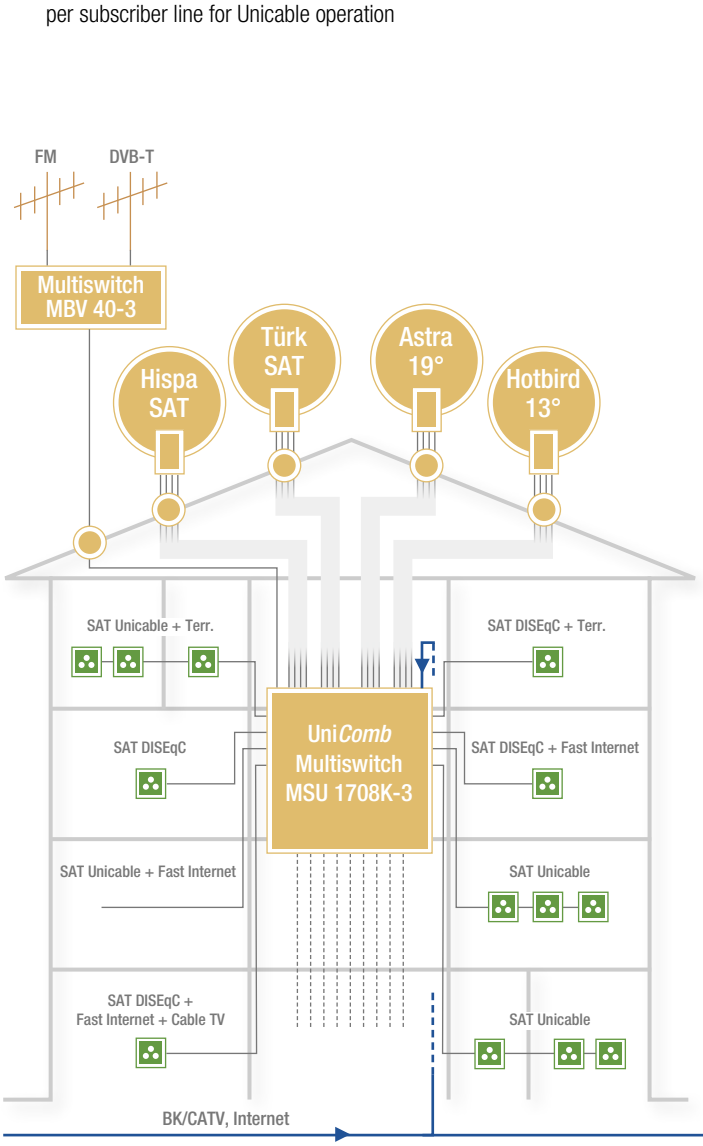


Cascade system for up to 40 subscribers

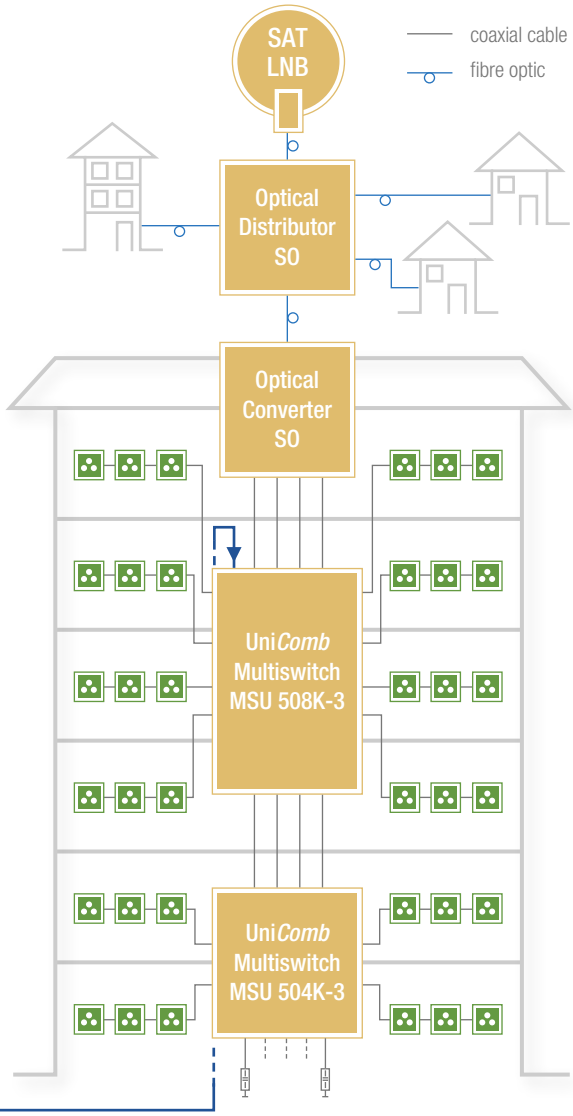
Uni*Comb* MULTISWITCH-SYSTEMS

The most flexible solution for the conversion of multi-subscriber systems to SAT direct reception

- **Largest programme variety up to four satellite positions with 16 SAT-IF levels able to be fed in, suitable for DVB-S/S2 (SD, HD, Pay-TV)**
- **Lowest installation cost, extremely compact and able to connect up to three subscriber connections in feed-through technology on one user line.**
- **Independent operating conditions for subscribers**
  - Operation of up to three SAT receivers in Unicable mode or
  - one SAT receiver in DiSEqC mode (legacy) per line
  - In a 17-cable system: two of four SAT positions are connectable per subscriber line for Unicable operation
- Additional feed of DVB-T, cable fast internet and/or cable TV supply via passive input/return path
- Excellent "Made in Germany" product quality, suitable also for large SAT-IF systems with cascading
- Energy efficient due to receiver remote feed and LNB standby switching
- A power pack is required for the LNB-remote feeding only in cascading switches without trunkline amplifiers. Recommended: MSNT 19-2, 19V/2A with F connector. Can be connected at any MSU switch in the cascading switch



Example: four satellite receiver systems with MSU 1708K-3

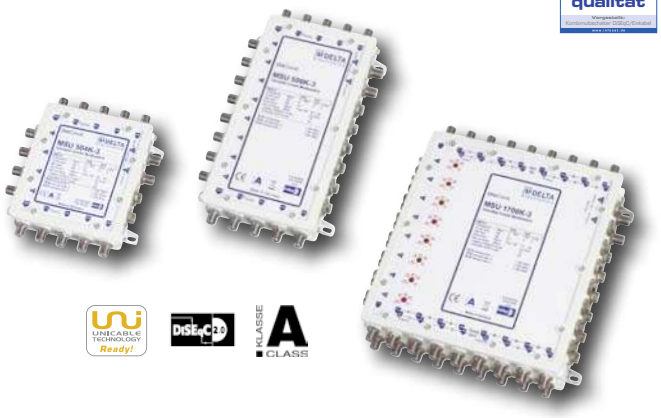


Example: SAT receiver system with glass fibre access distribution for multiple buildings or block of flats

Uni*Comb* MULTISWITCH FOR 5, 9- AND 17-CABLE SYSTEMS

The ideal combination of Unicable Sat Channel Router and DiSEqC Multiswitch

- Each subscriber output level is separately maintained constant (AGC)
- Each subscriber output occupies three SCR transport frequencies for independent Unicable operation of three SAT receivers at one user line (Unicable mode in accordance with EN 50494).
- Each subscriber output can alternatively be controlled also from a standard DiSEqC receiver. The switching of the subscriber output in DiSEqC mode occur automatically.
- Highly decoupled passive input/return path (5-862 MHz) in accordance with EN 60728-1 and -3 for terrestrial or CATV
- Open trunkline outputs has to be closed with capacitively separated terminal resistor FR 75 DC
- Prepared for extended Unicable standard with more than two satellite positions
- For LNB-remote feeding connect an external power supply MSNT 19-2 (please order separately)



Type	Article-No.	SAT-IF inputs	Selectable SAT positions	Subscriber lines	max. number of SAT rec.*	SAT input level	SAT output level Unicable* (AGC controlled)	SAT output level legacy (AGC controlled)	Insertion loss branch ines TER/BK 5-862 MHz	insertion loss trunk TER/SAT	Dimensions
						dBµV	dBµV	dBµV	dB	dB	mm
5-Cable system											
MSU 504K-3	5700 1876	4	1	4	12	60-90	82	75	23	3/2	130 x 145 x 35
MSU 506K-3	5700 1877	4	1	6	18	60-90	82	75	22	4/3	130 x 185 x 35
MSU 508K-3	5700 1877	4	1	8	24	60-90	82	75	22	5/3	130 x 225 x 35
9-Cable system											
MSU 904K-3	5700 1879	8	2	4	12	70-95	85	75	20	3/3	210 x 145 x 35
MSU 906K-3	5700 1880	8	2	6	18	70-95	85	75	21	5/4	210 x 225 x 35
MSU 908K-3	5700 1881	8	2	8	24	70-95	85	75	23	6/4	210 x 225 x 35
17-Cable system											
MSU 1704K-3	5700 1882	16	4/2*	4	12	70-95	85	75	20	3/3	210 x 145 x 55
MSU 1706K-3	5700 1883	16	4/2*	6	18	70-95	85	75	21	5/4	210 x 225 x 55
MSU 1708K-3	5700 1884	16	4/2*	8	24	70-95	85	75	22	6/4	210 x 225 x 55

* Unicable operation in accordance with EN 50494
Unicable SCR frequency 1: 1,280 MHz, -frequency 2: 1,382 MHz, -frequency 3: 1,484 MHz

Uni*Comb* AMPLIFIER FOR 5, 9- AND 17-CABLE SYSTEMS

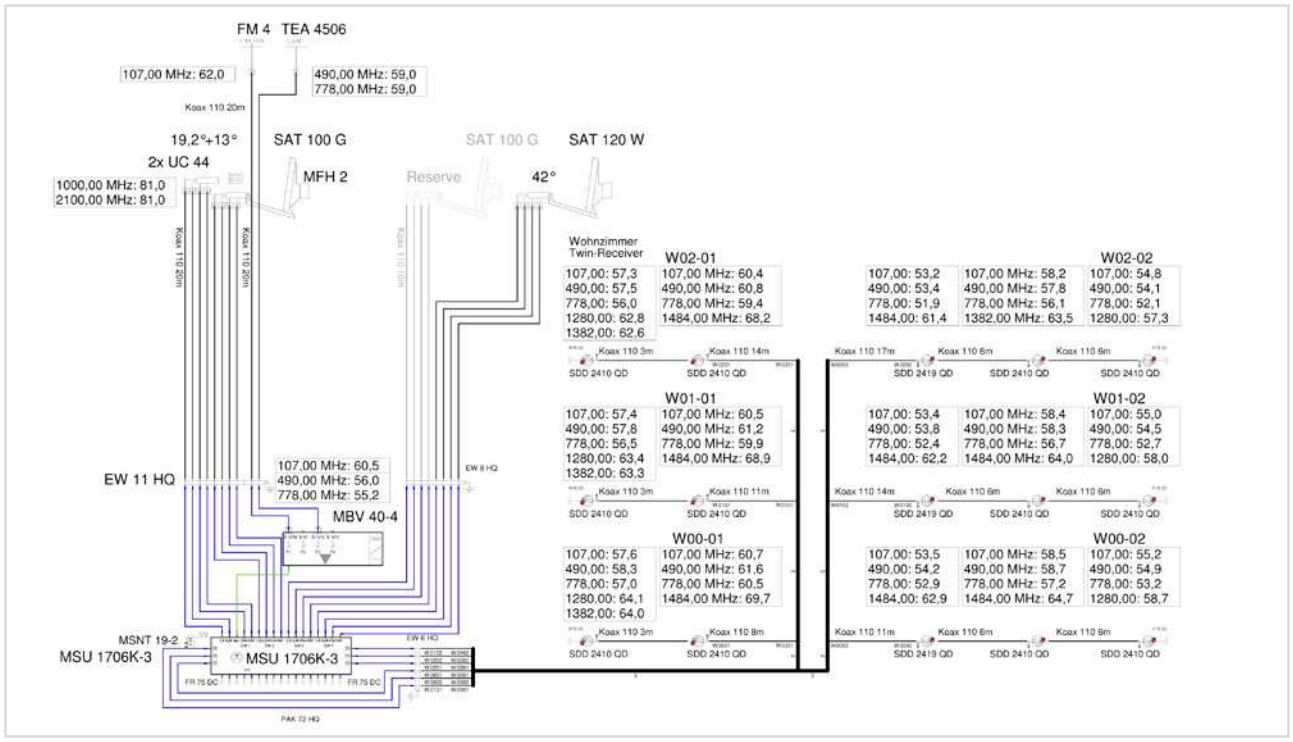
- Base amplifier for Uni*Comb* systems
- High degree of controllability
- Attenuator for each SAT input
- Fixed slope
- Network adapter for the power supply to the device and LNB-remote feeding included in parts supplied

Type	Article-No.	SAT-IF trunk lines	Gain SAT dB	Gain Terr.CATV	Attenuator SAT dB	max. Output level dBµV	Dimensions
MSA 525N	5700 1886	4	20 … 25 (5 dB Slope)	0 … -2,5	0 … 10	116 (IMA$_3$) 104 (DVB-S/S2-full channel load)	130 x 145 x 35
MSA 925N	5700 1887	8					
MSA 1725N	5700 1888	16					

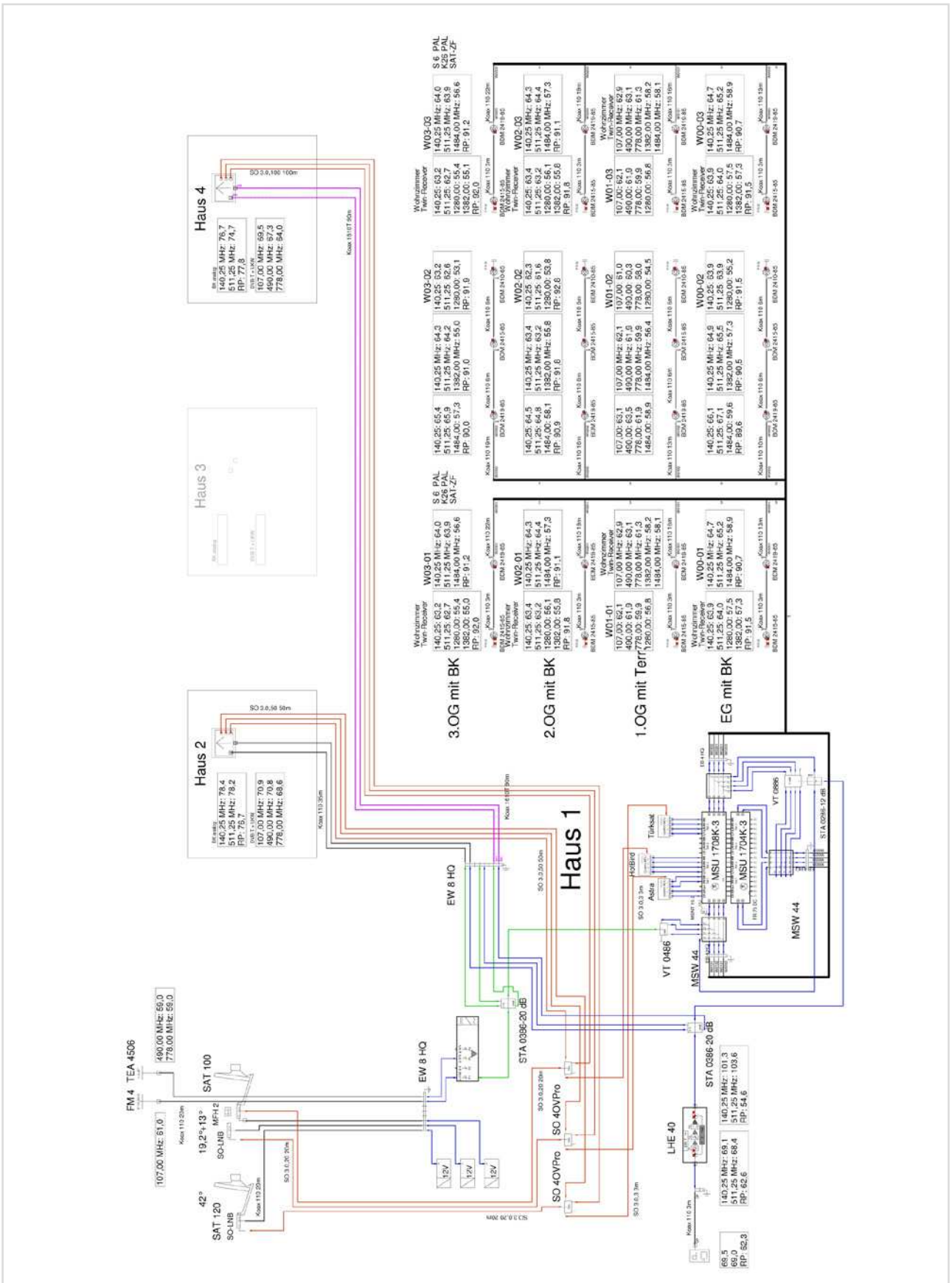
Uni*Comb* MAINS ADAPTER

- Longlife mains adapter 19V/2 A für Uni*Comb* components like MSA and MSU

Type		MSNT 19-2 pro
Article-No.		5700 1885
Operating voltage 50/60 Hz	V~	230 / Euros plug
Output voltage	VDC	19 / stabilized
Output current max	mA	2.000
Connectors		F female
Dimensions	mm	120 x 80 x 50
Weight	kg	0,3



- System design: 4 satellite positions with FM radio and DVB-T feed for 6 apartments each with 2 or 3 SAT multimedia junction boxes

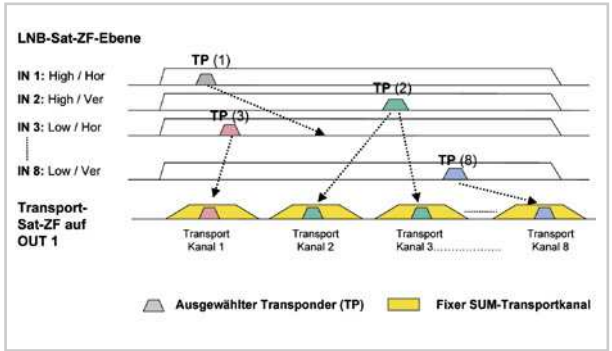


System design: 4 satellite positions with alternative terrestrial or CATV feed for 4 buildings with 12 apartments, each with 2 or 3 SAT multimedia junction boxes, supp lied with SAT Opto LNB system, 17 Cable UniComb switches

UNICABLE – INTELLIGENT UNICABLE-DISTRIBUTION SYSTEMS

Structure of the digital single-cable solution in Unicable technology

The pure Unicable Sat Channel Routers of the SUM family operate in digital technology and provide full access to four or eight SAT-IF levels for up to 16 subscribers per device. Tree networks can be easily fed, without the need of installing a complex star distribution to each subscriber. The converters are controlled via the Unicable protocol in accordance with EN 50494. In addition all of the attached SAT receivers must be operated in the Unicable mode. Please note: the operation of a receiver in the standard DiSEqC mode leads to the disturbance of all subscribers present in the line. With multi-dwelling cable installations it is strongly recommended to use the programmable Unicable sockets (page 159) in order to exclude mutual disturbances.



The advantages at a glance

- Unlimited digital program diversity via just one cable
- Ideal for the expansion or alteration of SAT-IF and CATV systems, in feed through technology (tree distribution)
- Low installation effort, as no star distribution necessary
- Future-safe, even in case of satellite or transponder change
- Compact unit for up to 2 x 8 subscribers
- Expandable by input side SAT-IF distribution to multiple SUM devices or cascading of the SUM xx K switch

Principle of function

The intelligent single cable solution operates according to the channel-router principle. Here, a single satellite transponder is transferred to a specific receiver. The satellite transponder is also routed to the receiver. A specific transponder frequency, with all comprising programs is filtered out and converted to the SCR-transponder frequency. This signal is then allocated uniquely to a respective receiver.
Each subscriber decides independently which satellite transponder must be converted to his own transponder frequency. The receiver selects and decodes the selected TV programme from the transport stream of the transponder.

UNICABLE SINGLE SWITCH

- SAT-IF converter with flanged on power supply for a single-cable solutions
- Providing of up to 8 or 2 x 8 subscribers
- Safe when changing satellites or transponders
- Converters are controlled by the Unicable protocol from the attached SAT receivers
- Active input for terrestrial, switchable to passive for CATV with return path
- HD capable due to minimal phase noise during SAT-IF conversion
- LED-indication
- Connectors F female

Product range / Type	SUM 918	SUM 928
Article-No.	5700 1380	1016 1676
SAT-IF inputs	8	8
Input terrestrial/CATV	1	1
Outputs trunkline	1	2
No. of connectable receivers	8	2 x 8

Technical data			SUM 918, SUM 928	
Frequency range	MHz	5 - 30	47 - 862	950 - 2150
Gain SUM 918	dB	-4*	-3* / 19 ... 23 (slope)	21 ... 25 (slope)
Gain SUM 928	dB	-7*	-6* / 19 ... 23 (slope)	21 ... 25 (slope)
Linearity	dB	± 1,0	± 1,0	± 2,5
Attenuator	dB		0 ... 20	0 ... 20
Phase noise	dBc/Hz			-85 (at 10 kHz)
Switching mode		DiSEqC 1.1 Unicable Technology Ready (EN 50494)		
SAT-channel subscriber	Ch. 1			1284 MHz
	Ch. 2			1400 MHz
	Ch. 3			1516 MHz
	Ch. 4			1632 MHz
	Ch. 5			1748 MHz
	Ch. 6			1864 MHz
	Ch. 7			1980 MHz
	Ch. 8			2096 MHz
Output level				
2nd order DIN 45004A1	dBµV	110		
3rd order DIN 45004B	dBµV	113		114
Isolation: SAT/SAT	dB			> 26
SAT/TERR	dB		> 40	> 35
Output 1/Output 2	dB		> 26	> 26
Operating voltage	V~	185 - 265		
Remote feeding LNB		13/18 V, 250 mA per LNB / 22 kHz selectable		
Power consumption	W	12 (SUM 918) / 18 (SUM 928)		
Operating temperature	°C	-20 ... +55		
Dimensions / Weight	mm/kg	370 x 150 x 70 / 2,9		

* switched to passive

UNICABLE CASCADING SWITCH

- Cascade-capable SAT-IF converters for single-cable solutions
- For the reception of 1 SAT orbit position
- Safe when changing satellites or transponders
- Control of the converters is achieved via Unicable protocol from the attached SAT receivers
- Terrestrial path with separate input
- HD capable due to minimal phase noise
- Stand-alone operation with terminal resistor FR 75 DC
- Receiver supplied, optional power supply NG 1880-2 connectable via socket jack, ordered separately

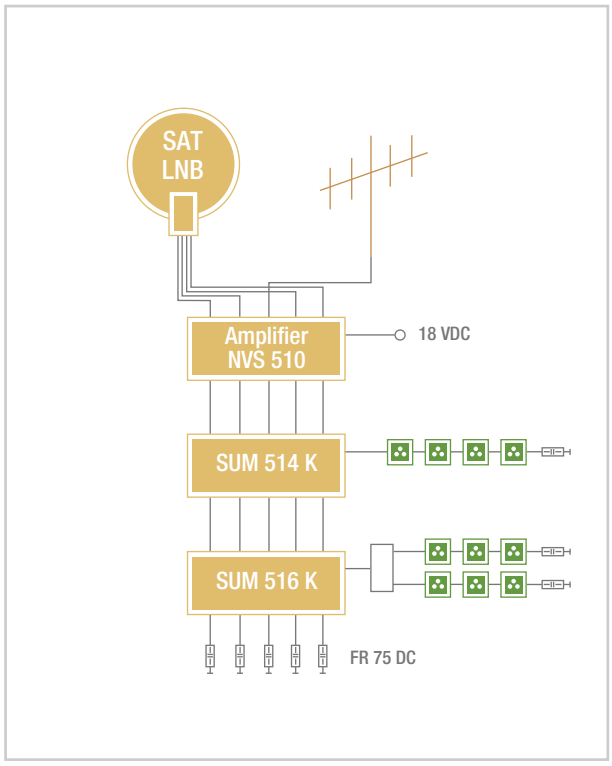
SUM 524 K Double Unicable switch:

- Predestined for floor star distribution

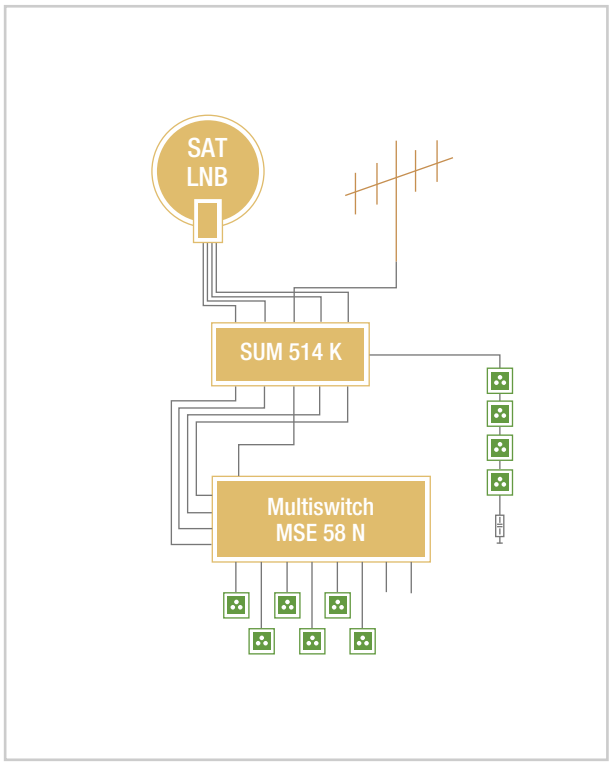
Product range / Type		SUM 514 K	SUM 516 K	SUM 518 K	SUM 524 K
Article No.		5700 1379	1016 1380	5700 1617	5700 1518
SAT-IF inputs		4	4	4	4
Input terrestrial/CATV		1	1	1	1
Outputs trunkline		5	5	5	5
Outputs subscriber		1	1	1	2
No. of connectable receivers		4	6	1 x 8	2 x 4
SAT-channel subscriber	Ch. 1	1284 MHz	1284 MHz	1284 MHz	1284 MHz
	Ch. 2	1400 MHz	1400 MHz	1400 MHz	1400 MHz
	Ch. 3	1516 MHz	1516 MHz	1516 MHz	1516 MHz
	Ch. 4	1632 MHz	1632 MHz	1632 MHz	1632 MHz
	Ch. 5		1748 MHz	1748 MHz	
	Ch. 6		1864 MHz	1864 MHz	
	Ch. 7			1980 MHz	
	Ch. 8			2096 MHz	

Technical data		SUM 514 K, SUM 516 K, SUM 518 K, SUM 524 K	
Frequency range	MHz	5 - 862	950 - 2200
Tap loss subscriber	dB	-5	+1 ... -3
Trough loss trunkline	dB	4,5	1,5
Linearity	dB	± 1,0	± 2,5
Phase noise	dBc/Hz		-85 (at 10 kHz)
Switching mode		DiSEqC 1.1 Unicable Technology Ready (EN 50494)	
Input level each SAT-IF input	dBµV		max. 95
Isolation:			
SAT/SAT (trunk line)	dB		> 30
SAT/TV (trunk line)	dB	> 35	> 35
Polarisation	dB		> 28
Operating voltage	V~	18 V=, 800 mA, via plug-in power supply NG 1880-2 (only for stand-alone operation)	
Remote current each trunk line	A	1	
Power consumption each subscriber	mA	< 180 (at remote feeding from the connected receiver)	
Operating temperature	ºC	-20 ... +55	
Connectors		F female	
Dimensions	mm	125 x 90 x 35	
Weight	kg	0,3	

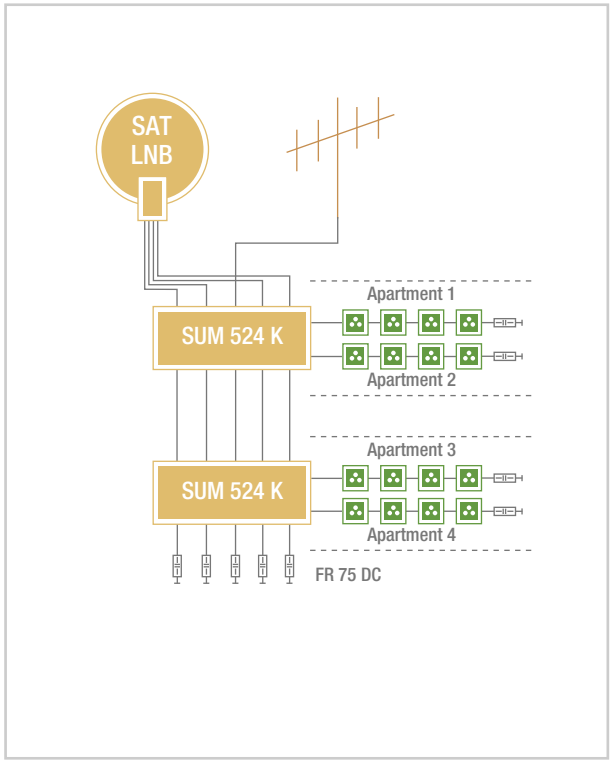
Applications with Unicable cascading switches



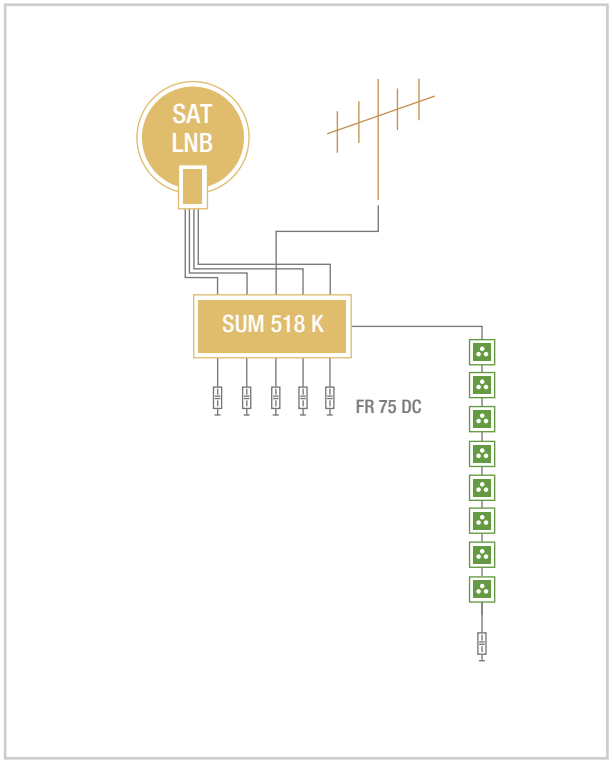
Floor star distribution with intermediary cascade units



Expansion of multiswitch with a cascade, e.g. for re-fitting of a Twin-PVR receiver



Floor star distribution for apartments



Single switch for SAT tree distribution

Sat*LAN* – THE POWERCOMBI FOR SAT-TV AND INTERNET

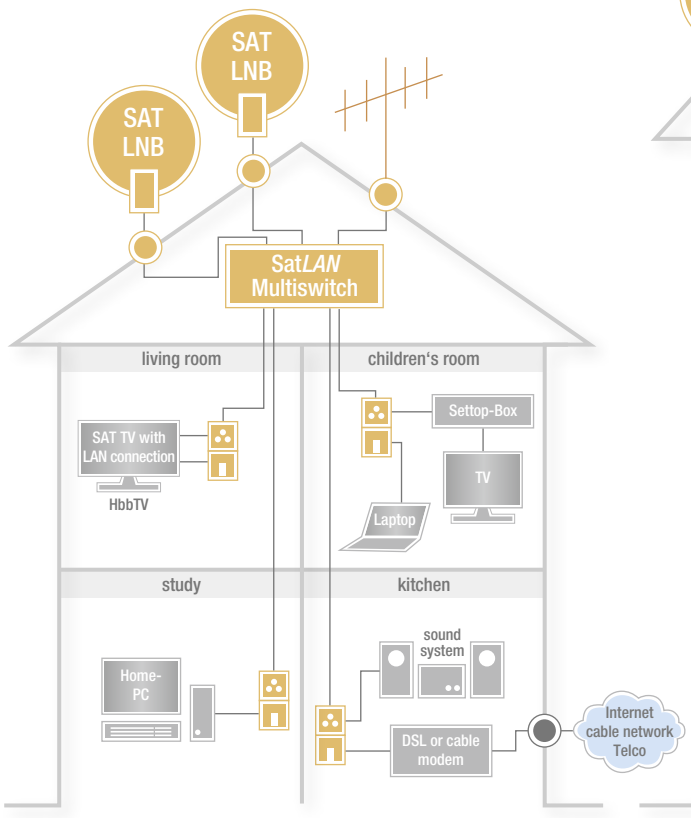
The quickest and simplest route to the Internet – without additional cabling expense

Broadcast and telecommunication services as well as entertainment electronics enable many new multimedia applications like fast Internet, HbbTV, video and audio streaming, voice over IP or IP-TV. As a result it is desirable that television, Internet and efficient data lines for the networking of the terminals are available in different rooms. Sat*LAN* uses the star cabling, already required for the unlimited satellite reception, simultaneously as Ethernet-LAN to connect IT devices such as cable modems, PCs, servers, printers and other IP end-devices to each other.

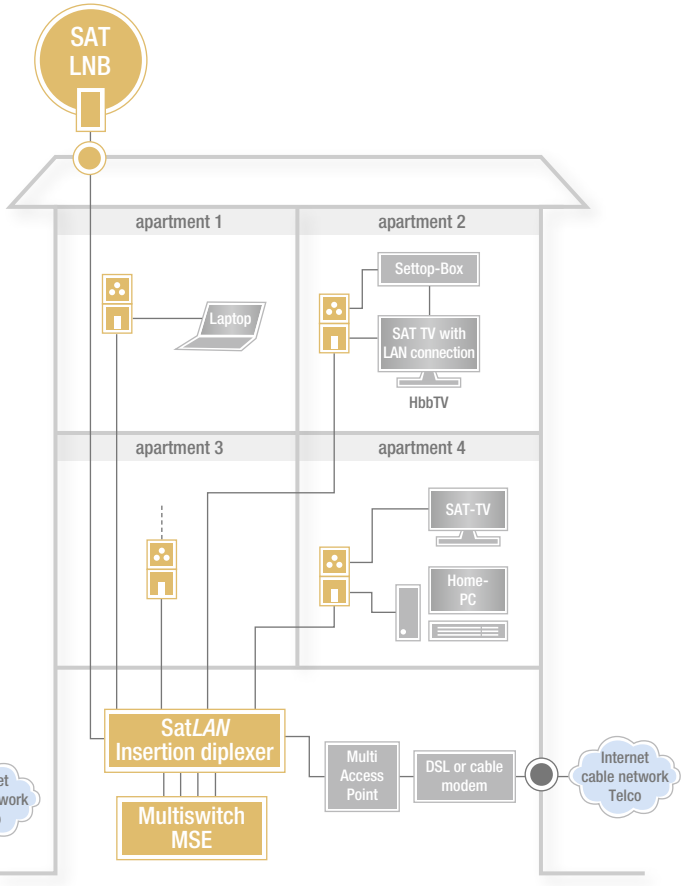
The „peer-to-peer“ operation (as supplied) enables all RJ 45 interfaces of the Sat*LAN* boxes to be equally connected in a closed dwelling and thus intercommunication between connected devices. The „master-slave“ operation is selected to address multiple Internet accounts in a multiple-family dwelling independently from each other (Operating software for „master-slave“ operation in preparation).

The advantages at a glance

- Home LAN with highest bit rate of 200 MBit/s over the SAT multi-switch system, net bit rate typically 75 MBit/s
- In contrast to Powerline (PLC) or WLAN, coaxial cabling prevents system-impairing disturbances as well as constant radiation in the residential environment
- Ideal for TV systems with LAN (RJ45) connection for Internet
- Plug & Play via self-configuration of the LAN interface with RJ 45 connection.
- Internet access by means of cable or DSL modem connected to any Sat*LAN* interface possible
- **New systems:** Sat*LAN* Multiswitch MS-LAN 98 N
  Post-installations: Sat*LAN* Transferring switch MS-LAN 54 EWN



Apartments and single-family dwellings: „Peer-to-peer“ operation



Multiple-family dwellings: “master slave” operation (in preparation)

Sat*LAN* COMPONENTS

Sat*LAN* Multiswitch 9 in 8 with external power supply unit

Type		MS-LAN 98 N		
Article-No.		5700 1920		
		LAN	**TER**	**SAT**
Frequency range	MHz	2 – 30	30 – 862	950 – 2150
Attenuation	dB		16 … 20	6 … 2
Max. output level	dBµV		91 @ 60 dBc	94 @ 35 dBc

Sat*LAN* insertion diplexer 5 in 4 with external power supply unit

Type		MS-LAN 54 EWN		
Article-No.		5700 1921		
		LAN	**TER**	**SAT**
Frequency range	MHz	2 – 30	30 – 862	950 – 2150
Attenuation	dB		14 … 16	6 … 4
Max. output level	dBµV		91 @ 60 dBc	94 @ 35 dBc

Sat*LAN* double-frame single boxes SAT/TV/FM + RJ45

Type		MS-LED 14			
Article-No.		5700 1922			
Output		**LAN**	**FM**	**TV**	**SAT**
Frequency range	MHz	200 Mbit/s	87 – 862	5 – 862	950 – 2150 + DC
Attenuation	dB		7	3	2
Connector *		RJ 45	IEC female	IEC male	F female

* for installation in 55 series junction boxes

Sat*LAN* power supply unit (Included in the Sat*LAN* components as supplied)

Mains	VAC	230
Output	V	12 V/max. 3A
DC connector		Cinch

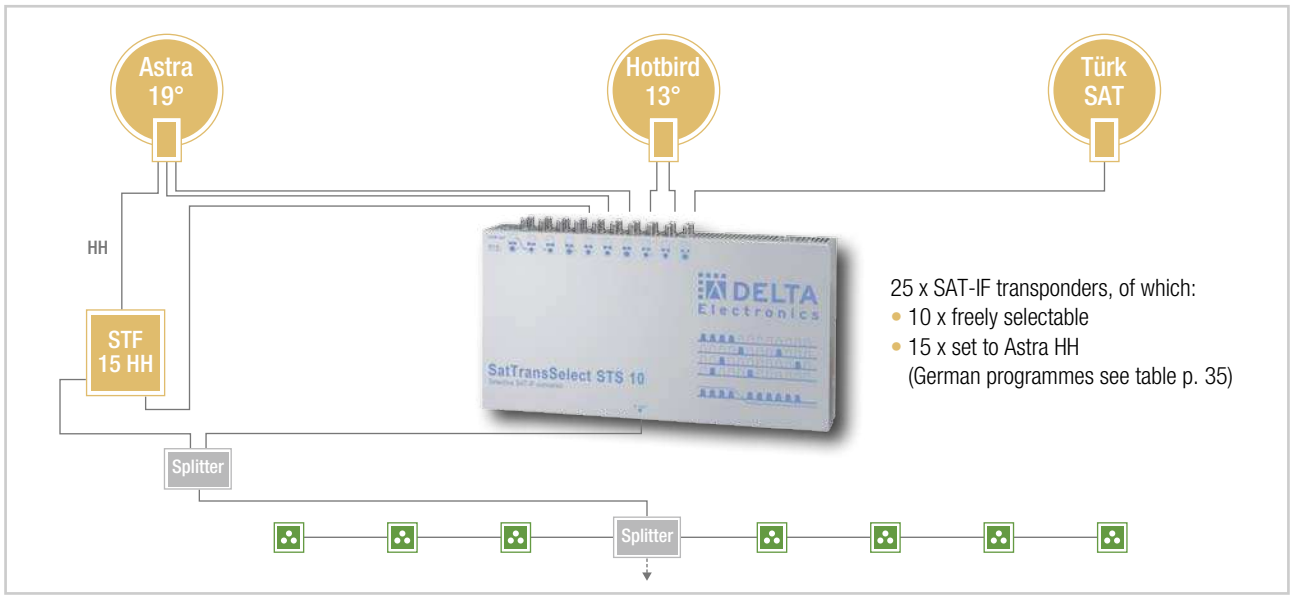
SatTransSelect STS 10 – THE SELECTIVE SAT-IF IN SAT-IF CONVERTER

SAT retrofit and upgrade - simple, cost-effective and flexible

With the SatTransSelect solution you can select up to 30 digital SAT-IF transponders and assign them selectively to an adjacent SAT-IF channel by means of a transponder conversion. It enables you to distribute a customised programme selection, according to the occupant's requirements, of up to 150-250 digital programmes via the existing cabling. Only splitters, distributors and antenna sockets have to be replaced by SAT-IF-suited types. For reception simple SAT receivers or TV receivers with DVB-S tuner are sufficient (no Unicable mode necessary!). The connection of second and third receivers in the dwelling is realisable trouble-free as far as possible.

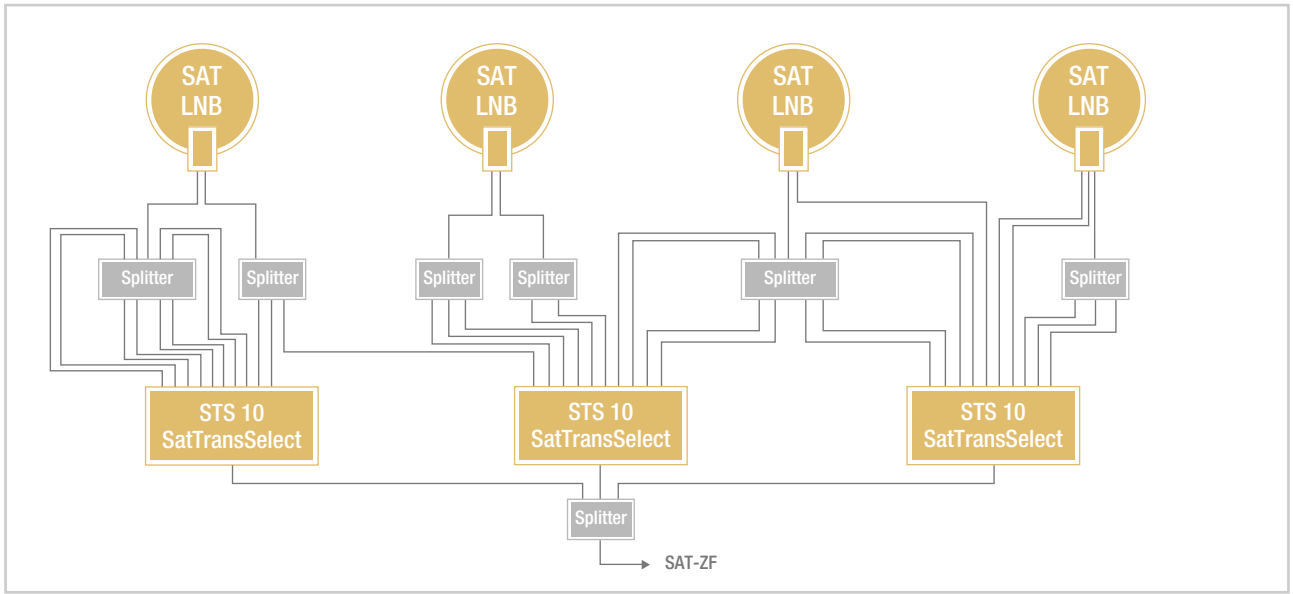
Selective SAT-IF in SAT-IF conversion for ten independent SAT transponders:

- 10 transponder input signals freely selectable
- 10 transponder output signals freely selectable
- Adjustable output levels for each transponder
- Automatic stability of the output levels via AGC
- LNB remote feeding implemented



25 x SAT-IF transponders, of which:
- 10 x freely selectable
- 15 x set to Astra HH
(German programmes see table p. 35)

STS 10 + STF 15 HH – the „Germany Saver“
STF 15 HH: By-Pass Bandfilter <5349/>1100-1690 MHz in the tap, 950-2150 MHz in the trunk



30 transponders from 4 satellites

Type		STS 10
Article-No.		5700 1624
Input frequency range	MHz	950 - 2150 (fine tuning 1 MHz steps)
Input level	dBµV	52 - 75
Pass throug output	MHz	950 - 2150
Path trough less	dB	max. 3
Symbol rate QPSK	MS/s	5 - 40
Output frequency range	MHz	1015 - 2150
Sporius noise	dB	> 26
Linearity	dB	± 3
Level attenuator	dB	0 … 10
Output level	dBµV	88
Operating voltage	V~	190 - 250 / 50 - 60 Hz
Remote feeding LNB	mA	12 V / 250 mA via input 1, 4, 8, max. 500 mA
Operating temperature	°C	0 … +50
Dimensions / Weight	mm/kg	380 x 195 x 80 / 3,6

SatTransFilter STF 15 HH

- For the 15 most popular German language transponders on ASTRA 19.2° East, horizontal High-Band (see table below)
- Sky-capable for transponders which are situated in the transmis-

Type	STF 15 HH
Article-No.	5700 1679
Pass thrugh range / loss	950 … 2150 MHz / 5 dB
filtering path / gain	1100 … 1690 MHz / 2 - 12 dB adjustable
Remote feeding	12 V / 70 mA via F output connector

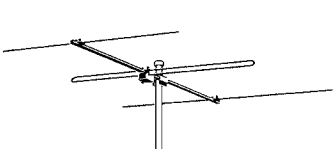
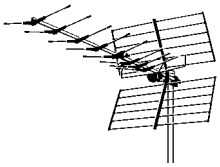
fix

Fixed configuration „Germany Package“ with SatTransFilter STF 15HH *					
Transponder			SAT level	Input	Output
65	SKY	D	Astra high horz.	1120	1120
67	SKY	D	Astra high horz.	1159	1159
69	SKY	D	Astra high horz.	1198	1198
71	ARD Digital	D	Astra high horz.	1237	1237
73	SKY	D	Astra high horz.	1276	1276
75	SKY HDTV	D	Astra high horz.	1315	1315
77	ZDF Vision	D	Astra high horz.	1354	1354
79	SKY HDTV	D	Astra high horz.	1393	1393
81	SKY	D	Astra high horz.	1432	1432
83	SKY	D	Astra high horz.	1471	1471
85	ARD Digital	D	Astra high horz.	1510	1510
87	SKY	D	Astra high horz.	1549	1549
89	RTL World	D	Astra high horz.	1588	1588
91	Deutsche Diverse	D	Astra high horz.	1626	1626
93	ARD Radio	D	Astra high horz.	1666	1666
not usable 1690 – 1780 MHz					

freely selectable

Example of free transponder selection with SatTransSelect STS 10					
Transponder			SAT level	Input	Output
101	ARD Digital	D	Astra high horz.	1822	1802
107	Pro 7 / SAT 1	D	Astra high horz.	1945	1920
78	VIVA	D	Astra high vert.	1373	1841
104	APS (Sport1)	D	Astra high vert.	1880	1880
51	ARD Digital	D	Astra low horz.	993	2034
42	Music Box Russia	R	Hotbird low horz.	1892	1958
90	ORT Int.	R	Hotbird high vert.	1997	1996
11	TRT	T	Türksat 2A high vert.	1318	2072
14	Show Türk	T	Türksat 3A high horz.	2056	2110
16	ATV	T	Türksat 3A high horz.	2015	2148

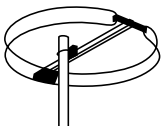
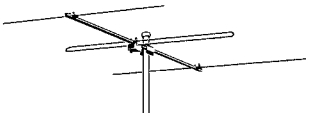
* Transponder configuration at time of printing

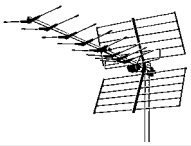
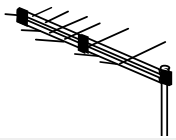
TYPE	DESCRIPTION	PAGE
FM/TEA	Terrestrial Antennas	38
MBC	Terrestrial Multiband Amplifier, programmable	39
MBV	Terrestrial Multiband Amplifier	40
SVD/SVD-E	Splitband Amplifier Terrestrial + SAT-ZF	42
KBD/KBD-E	Splitband Amplifier Terrestrial + 2 x SAT-ZF	43
LVD/LVD-RP	Splitband Amplifier BK + SAT-ZF	44

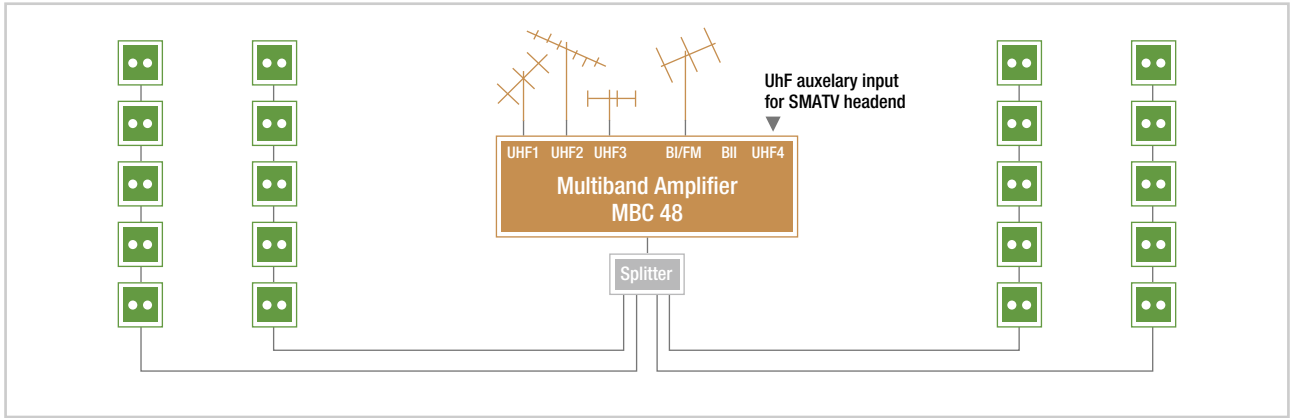
TERRESTRIAL ANTENNAS

FM antennas

Type		FM 1	FM 3
			
Article-No.		5700 2020	5700 0837
Description		omnidirectional antenna with F connector	directional antenna
Frequency range	MHz	87,5 - 108	87,5 - 108
Gain	dB	-2	5
Angle of aperture	°	360	70
Wind load	N	45	49
Mast Ø	mm	60	60
Front to back ratio	dB	0	14
Dimensions / Weight	mm / kg	Ø 540 / 1,1	1200 / 1,0

DVB-T antennas for the UHF range

Type		TEA 413	TEA 4506
			
Article-No.		5700 0842	5700 1891
Description		directional Yagi abtenna	fishbone antenna with F connector
Frequency range	MHz	470 – 862 (K21-69)	470 – 862 (K21-69)
Gain	dB	13	6
Angle of aperture	°	40	65 / 100
Wind load	N	85	30
Mast Ø	mm	60	60
Front to back ratio	dB	25	20
Dimensions / Weight	mm / kg	1260 / 1,2	450 / 0,5



TERRESTRIAL MULTIBAND AMPLIFIER, PROGRAMMABLE

- Anennat inputs: BI-FM, BIII-DAB, 3 x UHF, UHFaux
  8 selective UHF amplifier paths, programmable:
  - Channel frequency
  - Bandwith of the amplifier path 1…6 UHF channles
  - Attenuaton of the signal level
  - Fine-tuning of the channel frequency
- Combining of the UHF inputs to the selctive amplfifier paths by menu-driven soft switches
- µC-dirven controlled measurment of the signal levels and AGC
- Switchable remote feeding for external UHF pre-amplifier, selectable 12 VDC or 24 VDC
- Back lighted LCD display
- Operational controls:
  - Menu-driven by soft navigation buttons
  - Duplicating of setups on a SD card by usung the card reader MBCR 16
- Die-cast encosure with protection class IP 50
- **MBCR 16:** SD-Card Reader included SD card in format FAT 16

MBC 48

MBCR 16

Type		MBC 48						MBCR 16
Article-No.		5700 0919						5700 1607
Inputs		**BI-FM**	**BIII-DAB**	**UHF 1**	**UHF 2**	**UHF 3**	**UHF 4**	
Bandwidth	MHz	47-108	174-230	470-862	470-862	470-862	470-862	
Combinations of UHF filter paths		–	–	2	3	3	–	
		–	–	2	5	1	–	
		–	–	2	6	–	–	
		–	–	5	–	3	–	
		–	–	7	–	1	–	
		–	–	8	–	–	–	
Gain	dB	26 ±2	45 ±2	44 ±3			33 ±3	
Level control range	dB	20 ±2	20 ±2	20 ±2 (on all filter paths)			20 ±2	
Level control UHF sum signal	dB	–	–	20 ±2			–	
Eingangsrauschmaß	dB	9	7	9			–	
Inputlevel max.	dBµV	90	80	80			80	
Outputlevel max.	dBµV	114 @-60 dBc (IMA 3)						
Selection (f=fp±16 MHz)		–	–	> 14 dB			–	
Return loss	dB	10	10	8			8	
Remote feeding on UHF 1...3, switchable		–	–	0 V / 12 V / 24 V[1] max. 50 mA			–	
Programmable bandwidth		–	–	1…6 x TV-Ch. á 8 MHz			–	
Linearity 1 Ch @ 8 MHz	dB	–	–	max. 3			–	
Linearity 2…6 channels	dB	–	–	typ. 6			–	
Measurment range output level	dBµV	95-115						
Test point output	dB	-20 ±2						
Power supply	V~	230 VAC / 20 VA						
Operation temperature	°C	-5 … +50						
Dimensions B x H x T	mm	370 x 150 x 70						
Weight	kg	2,9						

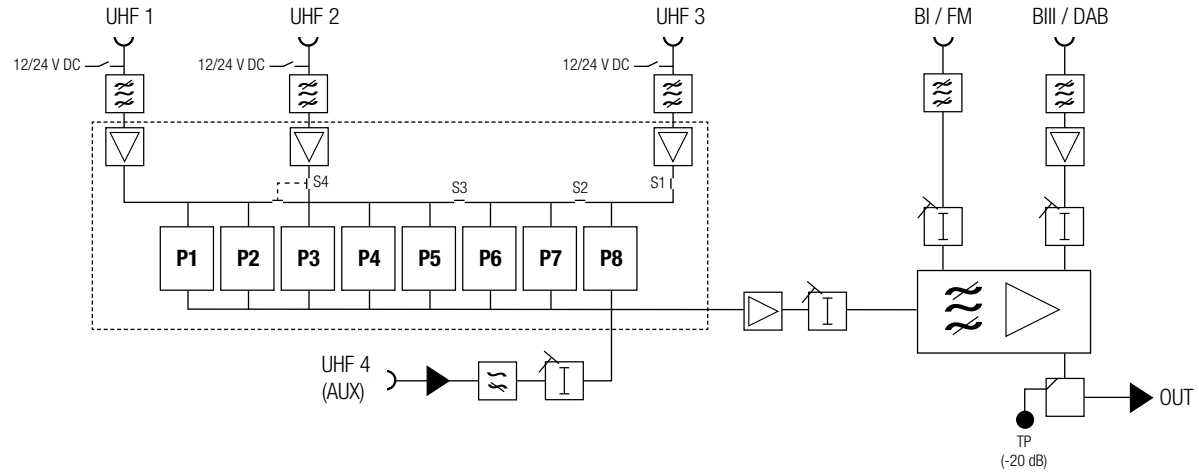
[1] Remote feeding voltage selectable menu-driven; disconnecting of remote feeding by removing of the jumpers

TERRESTRIAL MULTIBAND AMPLIFIER

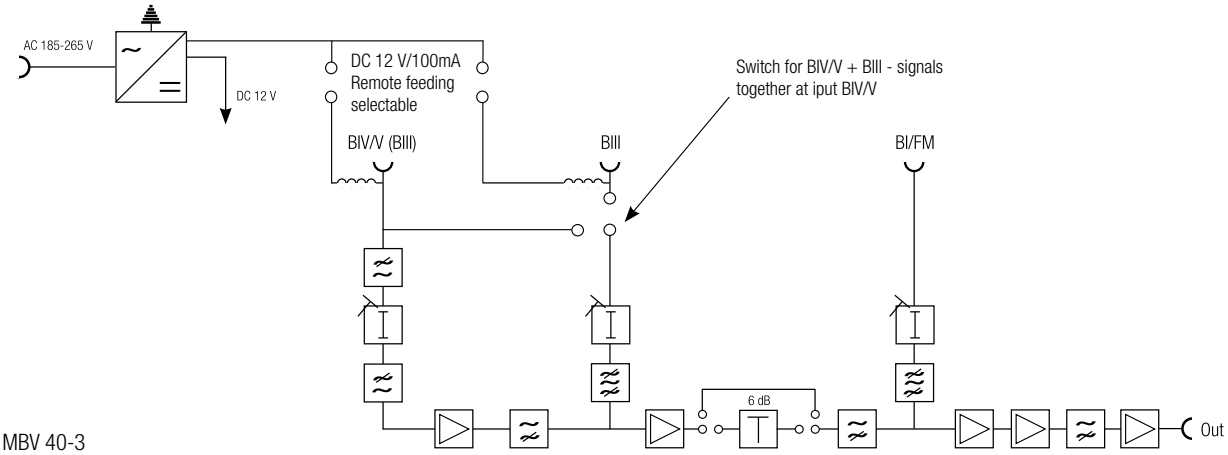
- Die cast housing
- RF connectors: F sockets
- High output level
- DVB-T low noise input
- Excellent linearity
- Attenuators 0...20 dB at all inputs
- Switch mode power supply
- Remote feeding 12 V/100 mA via all TV- inputs selectable
- **MBV 40-3:** Inputs UHF+BIII switchable for wideband DVB-T operation

Type		MBV 40-3	MBV 40-4
Article-No.		1016 1671	1016 1397
No. of inputs		3	4
Frequency range/inputs	MHz		
Bd. I/FM		47-108	47-68 / 87,5 - 108
Bd. III		174-230	174-230
Bd. IV/V		–	470-862
Bd. IV/V		–	470-862
Bd. IV/V (DVB-T)		470-862 [1]	–
Gain	dB		
Bd. I/FM		24	34
Bd. III		28/34, selectable	34
Bd. IV/V		–	34/40, selectable
Bd. IV/V (DVB-T)		36/42, selectable	34/40, selectable
SAT-ZF		–	–
Attenuators at all inputs	dB	0 ... 20	0 ... 20
Noise figure	dB		
Bd. I/FM		7	5
Bd. III		5,5	5
Bd. IV/V		–	8
Bd. IV/V (DVB-T)		4,5	8
Linearity	dB	± 2,0	± 2,0
Output level			
60 dB IMA 3	dBµV	117	117
60 dB IMA 2	dBµV	109	109
Operating voltage	V~	185-265	185-265
Power consumption	W	7	7
Dimensions	mm	188 x 85 x 50 (IP 20)	210 x 122 x 70 (IP 50)
Weight	kg	0,66	1,4

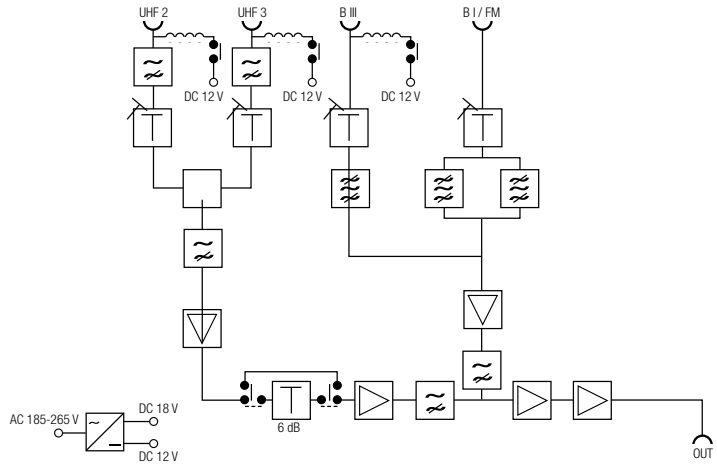
[1] UHF-input switchable tof B IV/V + B III, thus a DVB-T broadband antenna (B III+B IV/V) is directly connectable



MBC 48



MBV 40-3



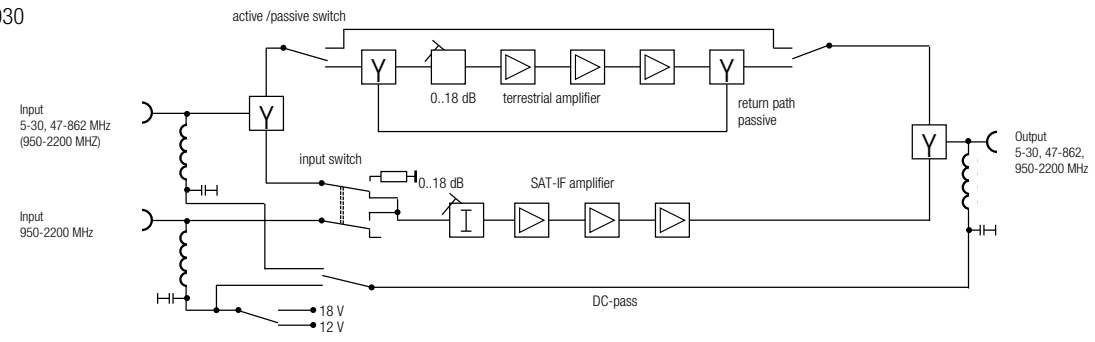
MBV 40-4

SPLITBAND AMPLIFIER TERRESTRIAL + SAT-ZF

- Insertion-/splitband post amplifier, 1-cable-system
- Through a modern switching technology useful as insertion- or splitband post amplifier
- Frequency range 47-862/950-2200 MHz
- Return path 5-30 MHz, passive
- With attenuator for SAT/TER
- Terrestrial active/passive switchable
- Fix slope at SAT-IF
- Highly efficient switch mode power supply, LED indication
- High power for remote feeding of LNB
- LNB- voltage 13/18 V selectable
- Die-cast housing IP 50, Class A (EN 50083-2)

Type		SVD 3030			SVD 3834 E		
Article-No.		1016 1601			5700 1365		
Frequency range	MHz	5 - 30	47 - 862	950 - 2200	5 - 30	47 - 862	950 - 2200
Inputs		1		1	1		1
Outputs			1			1	
Gain: active	dB	- 2	30	21 ... 30	- 2	34	32 ... 39
passive	dB	-2	- 2		-2	- 2	
Attenuator	dB		0 ... 20	0 ... 20		0 ... 20	0 ... 20
Equalizer	dB					0 ... 18	
Noise figure / Linearity	dB		7 / ± 1,0	7 / ± 1,0		7 / ± 1,0	7 / ± 1,5
Output level							
SAT 35 dB IMA_3	dBµV			116			121
TERR 60 dB IMA_3	dBµV		112			117	
Isolation							
SAT V / SAT H	dB			> 35			> 35
SAT / TERR	dB		> 35			> 35	
Operating voltage	V~	185 - 265			185 - 265		
Remote feeding LNB		400 mA/12V, 350 mA/18 V with jumper selectable			300 mA/12V, 250 mA/18 V with jumper selectable		
DC-pass		max. 400 mA			max. 400 mA		
Power consumption	W	9,5			10,5		
Connectors		F female			F female		
Dimensions	mm	210 x 122 x 70			210 x 122 x 70		
Weight	kg	1,2			1,2		

SVD 3030

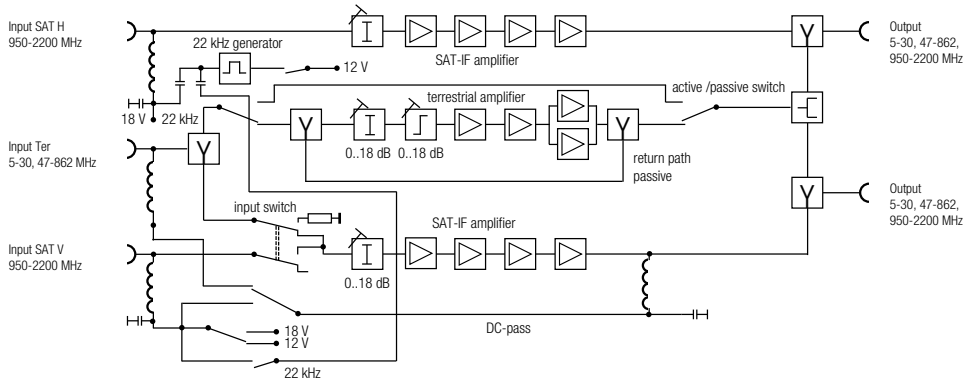


SPLITBAND AMPLIFIER TERRESTRIAL + 2 x SAT-ZF

- Insertion-/splitband post amplifier, 2-cable system
- Through a modern switching technology useful as insertion- or splitband post amplifier for 2 polarisations
- Frequency range 47-862/950-2200 MHz
- Return path 5-30 MHz, passive
- With attenuator for SAT/TER
- Terrestrial active/passive switchable
- Fix slope at SAT-IF
- Highly efficient switch mode power supply, LED indication
- High power for remote feeding of LNB
- LNB-voltage 13/18 V selectable
- Die-cast housing IP 50, Class A (EN 50083-2)

Type		KBD 2826			KBD 3830 E		
Article-No.		1016 1581			5700 1364		
Frequency range	MHz	5 - 30	47 - 862	950 - 2200	5 - 30	47 - 862	950 - 2200
Inputs		1		2	1		2
Outputs			2			2	
Gain: active	dB	- 3	26	21 ... 29	- 3	31	32 ... 39
passive	dB	-3	- 3		-3	- 3	
Attenuator	dB		0 ... 20	2 x 0 ... 20		0 ... 20	2 x 0 ... 20
Equalizer	dB					0 ... 18	
Noise figure / Linearity	dB		7 / ± 1,0	7 / ± 1,0		7 / ± 1,0	7 / ± 1,5
Output level							
SAT 35 dB IMA_3	dBµV			116			121
TERR 60 dB IMA_3	dBµV		112			114	
Isolation							
SAT V / SAT H	dB			> 35			> 35
SAT / TERR	dB		> 35			> 35	
Operating voltage	V~	185 - 265			185 - 265		
Remote feeding LNB		2 x 250 mA			2 x 250 mA		
		with jumper selectable			with jumper selectable		
DC-pass		max. 400 mA			max. 400 mA		
Power consumption	W	10,5			11,5		
Connectors		F female			F female		
Dimensions	mm	210 x 122 x 70			210 x 122 x 70		
Weight	kg	1,2			1,2		

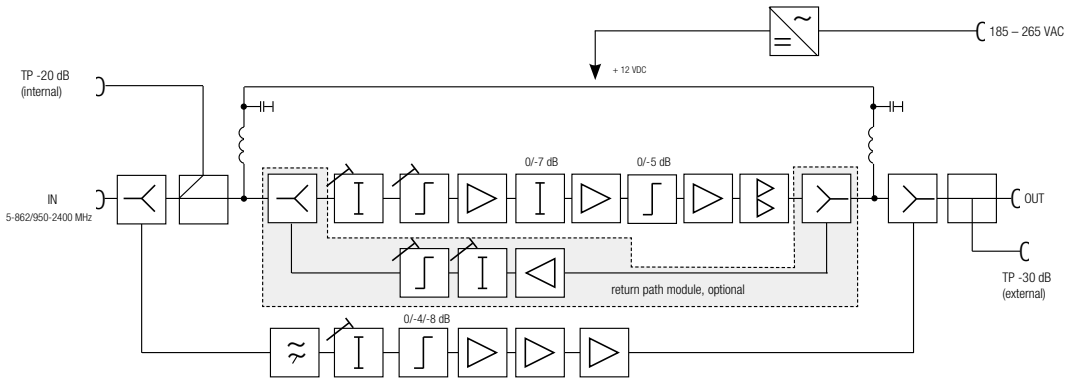
KBD 2826



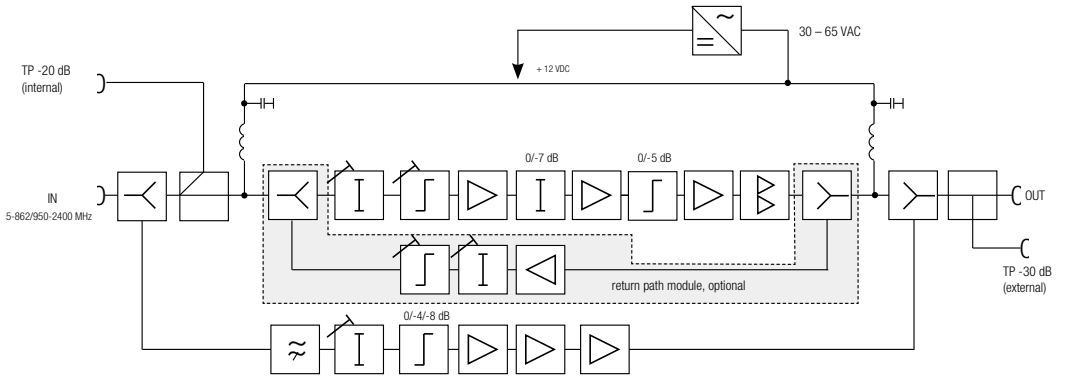
SPLITBAND AMPLIFIER BK + SAT-ZF

- Die cast housing, IP 50
- Splitband technology, 5-862/950-2400 MHz
- Useable as broadband post amplifier
- GaAs-FET push-pull stages
- Flexible return path modules, active or passive
- Excellent linearity
- For local and remote feeding
- Remote current 2,7 A
- Input and output test points
- Highly efficient switch mode power supply
- F-Connectors or 5/8”

Local feeding LVD 3440



Remote feeding LVD 3440



Plug-in slots for optional return path modules

SPLITBAND AMPLIFIER BK + SAT-ZF

- Broadband post amplifier in splitband technology
- Die-cast housing IP 50, Class A (EN 50083-2)
- Frequency range 5-862/950-2400 MHz
- High gain 34/41dB
- GaAS-FET push-pull stages for high output level
- Plug-in slot for active or passive return path modules (page 134)
- Slope frequency point selectable, 606/862/2400 MHz
- Excellent linearity up to 2400 MHz
- Testpoint at input and output
- Highly efficient switch mode power supply
- Remote current 2,7 A, integrated surge protection

Type		LVD 3440		LVD 3440 RP	
Article-No.		1016 1389		1016 1390	
Frequency range	MHz	47 - 862	950 - 2400	47 - 862	950 - 2400
Slope frequency point	MHz	606 / 862	2400	606 / 862	2400
Slots for return path		1	1	1	1
Gain	dB	34 ± 1,0	40 ± 1,0	34 ± 1,0	40 ± 1,0
Interstage attenuation		5 dB selectable	–	5 dB selectable	–
Interstage equalization		7 dB selectable	4 dB selectable	7 dB selectable	4 dB selectable
Noise figure	dB	7	8	7	8
Linearity	dB	± 0,8	± 1,5	± 0,8	± 1,5
Attenuator	dB	0 ... 20	0 ... 20	0 ... 20	0 ... 20
Equalizer	dB	0 ... 18	0/4	0 ... 18	0/4
Output level					
IMA_3	dBµV	122 (60 dB)	120 (35 dB)	122 (60 dB)	120 (35 dB)
IMA_2 > 60 dB	dBµV	116	–	116	–
CSO > 60 dB/42 Ch.	dBµV	104	–	104	–
CTB > 60 dB/42 Ch.	dBµV	104	–	104	–
Return loss	dB	18 dB ≥ 47 MHz	10 dB	18 dB ≥ 47 MHz	10 dB
Input / output		-1,5 dB/Octave		-1,5 dB/Octave	
Isolation SAT-UHF/VHF	dB	> 35		> 35	
Test point input		-20 dB (F-connector, internal)		-20 dB (F-connector, internal)	
Test point output		-30 dB (F-connector, external)		-30 dB (F-connector, external)	
Connectors		F-connector or 5/8"		F-connector or 5/8"	
Operating voltage	V~	185 - 265		30 - 65	
Remote current max	A	2,7		2,7	
Power consumption	W	13,2		13,2	
Dimensions	mm	210 x 122 x 70		210 x 122 x 70	
Weight	kg	1,2		1,2	





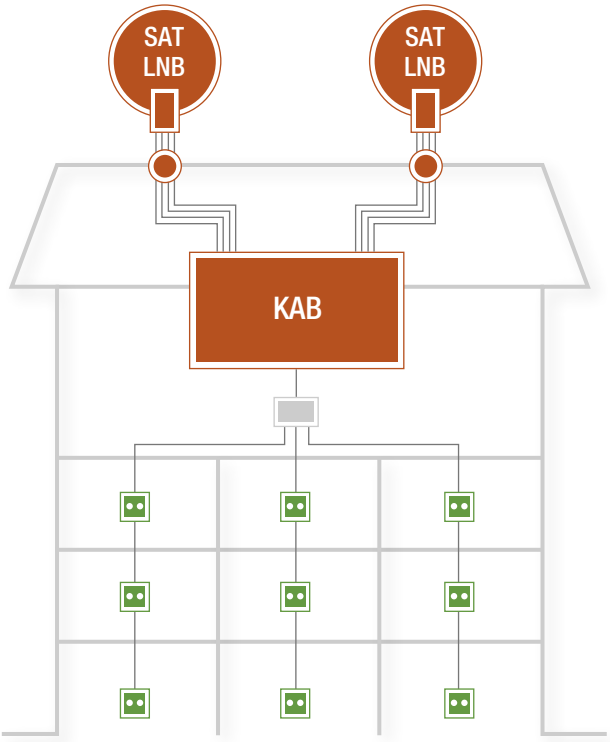
HEADENDS FOR TV SIGNAL PROCESSING

General system description

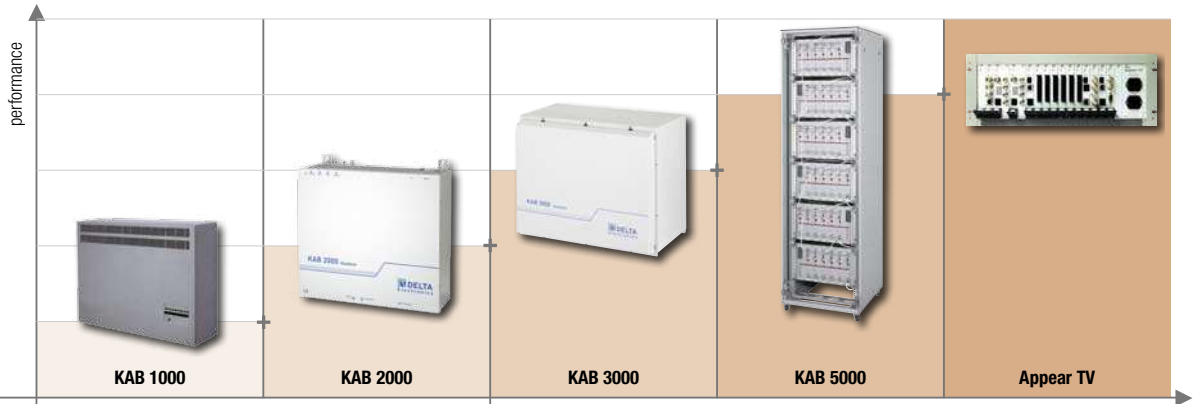
Signal processing is to be done when the transmission format of a medium such as satellite or terrestrial is to be converted for distribution via another medium, such as coaxial cable. As a result it is possible to adapt the broadcasting signals from satellites (DVB-S/S2), terrestrial transmitters (DVB-T) or line network transmissions (IP) to a customised programme package for cable TV system users. This programme mix is provided at the output of a headend in a format optimised for cable transmission (e.g. DVB-C, B/G-PAL analogue, DVB-T, IP).

The advantage of the community antenna system with headend lies, among other things, in that in the corresponding version modern digital televisions as well as existing analogue TV systems can be connected directly to the distribution network (i.e. without an additional set top box). As a result the network itself can be accomplished cost effectively in the often already existing tree structure. Trouble-free upgrades of the system, no additional feed-in costs and simple use for the user are further arguments for an closed SMATV system with headend.

In addition to the KAB 1000 and KAB 2000 permanently pre-configured compact headends, DCT Delta offers modular systems that are individually configurable. The planning and configuration of a headend requires special knowledge. The DCT Delta planning department, with their wide-ranging specialist knowledge, are available for planning and configuration of a headend designed according to the customer's needs.



KAB - THE IDEAL SMATV-HEADEND FOR EVERY PURPOSE



Configuration	Compact		Modular		
Input signal format	DVB-S	DVB-S/S2	DVB-S/S2 DVB-T DVB-C AV	DVB-S/S2 DVB-T AV	IP, ASI, DVB-S/S2, DVB-T/T2, DVB-C, SDI, HD-SDI
Output signal format	PAL Stereo UHF Double side band	DVB-C	PAL Stereo/Mono DVB-T DVB-C	PAL Stereo/Mono DVB-T DVB-C IP-Streamer	IP, ASI, DVB-S/S2, DVB-T/T2, DVC-C, PAL, FM, SDI, HD-SDI Composite PAL Video output Balanced Stereo output
CA-Slot transport stream-operation DVB re-multiplexing	– – –	– – –	■ ■ –	■ – –	■ ■ ■

HEADEND KAB 1000

10 x converter QPSK - > PAL Stereo - compact in one box

The KAB 1000 headend is a preconfigured unit to convert digital TV satellite programmes in DVB-S format from the SAT IF ranges into UHF PAL channels. They are recommended for smaller SAT GA systems (SMATV) so that analogue TV devices can receive digitally broadcast satellite programmes.

- The device is pre-programmed to the ten most viewed German programmes and is delivered "Plug & Play" ready for operation.
- Individual programming can be conveniently performed using a remote control similar to the "on-screen" operation of a satellite receiver.
- The integrated intelligent input splitter enables flexible allocation to one of the four SAT IF ranges on the respective converter tuner by software control.
- The output allocation of the PAL channels is freely selectable within the UHF area in the adjacent channel spacing.
- Via an auxiliary input the local DVB-T and UKW programmes of a terrestrial receiver can e.g. be fed in with the programmable MBC 48 DELTA multiband amplifier.

Given its compactness, simple set-up and in particular its favourable price, the KAB 1000 is destined for the quick and very inexpensive reanalogisation in SAT antenna systems of hostels, guesthouses and residential buildings

Type	KAB 1000
Article-No.	5700 1700
SAT IF levels	4 (F-connector 75 Ω)
Frequency range input	950 - 2150 MHz (DVB-S/QPSK)
Input level	60 … 90 dBµV
Input symbole rate	1 … 45 Msymb/s
Remote feeding LNB	13/18 V / max. 400 mA (selectable 22 kHz)
Cinch test output Video signal	1 Vss FBAS (channel selection by buttons on front)
Output level sum-signal	98 dBµV ± 2 dB (F-connector 75 Ω)
Output TV channels	10 PAL Stereo
Selectable output channels	K21 … K69 (471 … 862 MHz), adjacent channel not useable
Terrestrial auxiliary input/output	-20 dB, 47 … 862 MHz (F-connector 75 Ω)
Power supply	230 VAC (180 … 264 V / 47 … 63 Hz) / < 80 VA, Euro-Plug
Weight	11,2 kg
Dimensions (B x H x T)	495 x 365 x 155 mm
Operating voltage	0 … 45° C

* via a video monitor connected on the test output

HEADEND KAB 2000

12 x Transmodulator DVB-S/S2 -> QAM in one box – HD-capable for the future

The KAB 2000 headend is a preconfigured unit to convert digital TV satellite transponders in DVB-S/S2 format from the SAT IF ranges into common cable QAM channels in the VHF or UHF ranges. It is recommended for easily converting SAT GA systems to complete digital TV reception. That means that all TV devices operated on the system need a DVB-C (QAM) tuner for reception. Older, analogue TV devices can continue to be operated by connecting a QAM set top box.

- The device is preprogrammed to the ten most viewed German programmes and is delivered "Plug & Play" ready for operation.
- Individual programming can be conveniently performed using a laptop or PC via the USB interface
- The integrated intelligent input distribution field enables flexible allocation to one of the four SAT IF ranges on the respective converter tuner by software control. Further SAT IF ranges can be directly fed into the device using patch cables.
- The output frequencies are freely selectable as QAM single channels and are suitable for adjacent channel processing.
- The conversion of QPSK/8PSK into QAM (SD or HD) takes place transparently and without transport stream processing and CI slot.

Given its compactness, simple set-up and most of all its favourable price, the KAB 2000 is destined especially for smaller SAT antenna systems in hostels, guesthouses and larger residential buildings. In most cases the existing wiring can continue to be used, which helps keep the installation costs down.

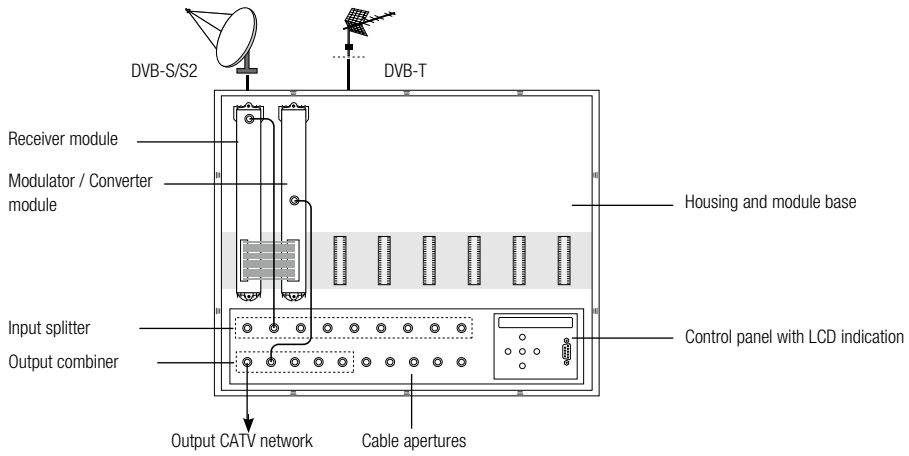
Type	KAB 2000
Article-No.	5700 1699
Input switch matrix for Sat levels	4 (F-connector 75 Ω)
Input frequency range	950 - 2150 MHz (DVB-S/S2)
Input level	50 … 80 dBµV (operating by AGC)
Input symbol rate QPSK/8PSK	1 … 45/37 MSymb/s
Remote feeding LNB	12 V / 2 x max. 250 mA (via F inputs of the input switch matrix)
Number of transponders	12
Sinal modulations	QPSK, 8PSK –> QAM 16, 32, 128, 256, selectable
Coding rates DVB-S DVB-S2	1/2, 2/3, 3/4, 5/6, 7/8 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10
Roll off	35, 25, 20 %
Output symbol rates QAM Standard	1,0 … 7,2 MS/s
Bandwidth QAM channel	7/8 MHz (addicted from symbol rate, adjacent channel usable)
Output data rate max. (QAM)	53 Mbit/s
Output frequency range	114 … 862 MHz, S02 … C69 F-connector 75 Ω)
Adjustment grid	250 kHz
Output level	90 dBµV, 0 … 12 dB attenuator
MER/Spurious	> 40 dB / > 50 dB
Power supply	230 VAC / max. 60 Watt, incl. 500 mA LNB feeding
Weight	7,1 kg
Dimensions (B x H x T)	360 x 125 x 380 mm
Operating voltage	0 … 45° C

HEADEND KAB 3000

General system description

With its extremely high component density and optimised construction in terms of cost-benefit ratio, the KAB 3000 is destined for mid-sized systems such as found in hotels, hostels, blocks of flats or housing developments.
The KAB 3000 is predestined for small to middle-sized systems (e.g. hotels, residential accommodation, apartments or housing estates) due to its extremely high packing density and, in regard to the cost-benefit aspect, its optimized technical setup. It is also ideal for the insertion (feed-in) of additional foreign-language programs into an existing CATV system. The KAB 3000 is a modular channel processing unit which decodes digital TV programs from DVB-S/S2 or DVB-T transponders. The decoded digital TV programs are modulated to a suitable format for cable distribution.
The high output level of >100 dBµV allows a direct insertion into a distribution network without the need for post-amplifiers. More programs can be processed by interconnecting several KAB 3000 in a star-layout.

The system comprises of a base unit KAB 3000 as module base with a power supply, a return wiring board and a control panel, as well as a multitude of signal processing modules and expansion components which can be equipped. Its high configurability enables the system to be easily adapted to the functional circumstances and requirements on site. The in- and output configuration of the modules results is done via a permanently installed control panel and can thus be adjusted on site at any time. The settings are saved in non-volatile memories and thus persist even after a power failure. Software updates of the control panel and modules can be carried out via the built-in RS 232 interface. In addition, the set-up is savable downloadable and can be copied to another KAB 3000 device using the PC interface. There is also the option to make changes in the NIT (Network Information Table), to increase the data rate via "stuffing" or to reduce the transmission bandwidth by deleting individual programmes from the transport stream.



Product overview KAB 3000

Type	Description	Input	Output	Tuner	CI	Twin	Quad	Page
KAB 3000	Base unit							52
KQR 342	Receiver module	QPSK	AV	2	1		■	53
KQR 344	Receiver module	QPSK	AV	4	4		■	53
KCR 341	Receiver module	COFDM	AV	1			■	53
KCR 342	Receiver module	COFDM	AV	2			■	53
KMM 342	Modulator module	AV	PAL/mono				■	54
KMS 343	Modulator module	AV	PAL/stereo				■	54
KQC 322	Transmodulator module	QPSK	COFDM	2	1	■		54
KQQ 323	Transmodulator module	QPSK	QAM	2	1	■		55
KQQ 324	Transmodulator module	Q/8PSK	QAM/HDTV	2	1	■		55
KTQ 322	Transmodulator module	COFDM	QAM	2	1			55
KCC 321	Converter module	COFDM	COFDM/VHF	2	1	■		56
KCC 322	Converter module	COFDM	COFDM/UHF	2	1	■		56
KUB 325	FM-Amplifier module	FM	FM					56
KAD 340	AV-Adapter	AV	9				■	57
KSI 319	Input splitter	1	6 + 4					57
KSI 320	Input splitter	1 + 1	1					57
KSO 381	Output combiner	8						57

QPSK = DVB-S (SAT); 8PSK = DVB-S2 (SAT-HD); COFDM = DVB-T (Terrestrial); QAM = DVB-C (Cable TV)

HEADEND KAB 3000

KAB 3000 – Base unit

High packing density, low costs

Up to 16 PAL programs or QAM transponders can be processed per base unit. Alternatively, the program contents of up to 32 external sources can be modulated to standard PAL B/G channels (standard I on request) via the AV internfaces.

Stable, flexible and secure

The base unit acts as a module mounting base and offers protection through its housing.

- 8 long module slots, 8 short module slots
- Return wiring board for power supply of modules
- Power supply for modules and LNB
- Output combiner, 4 inputs, 1 output
- Control panel with LCD display, cursor keys and RS 232 interface
- Mountable angle brackets for wall, shelf or 19" rack assembly
- Housing with many prefabricated mounting apertures for:
  > Input splitters, output combiners
  > Fans
  > F-connectors for RF cabling
- Screwable housing lid ensures EMC safety and protects from unauthorized access

Compact, accessible design

- Closed, powder-coated steel plate housing
- Low cost, sophisticated screening concept
- Simple, flexible RF cabling, per hand

Easy to control and reliable

- Settings can be made at any time via menu driven, permantly installed control panel
- Additional cooling possible by implanting of fans
- Energy efficient, reliable switch-mode power supply

Headend with 4x4 QPSK-PAL modules and 4x4 modulator modules for processing of up to 16 programs

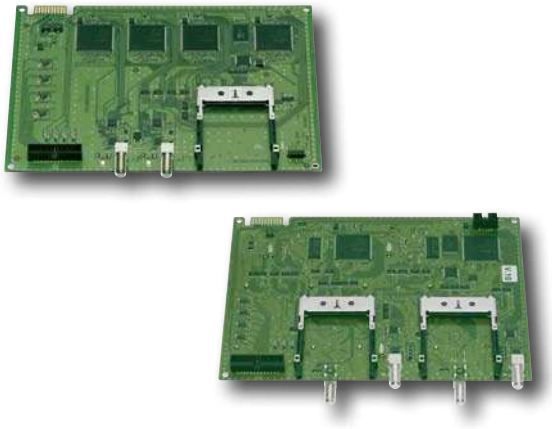
DVB Digital Video Broadcasting

Type	KAB 3000
Article-No.	5700 1400
Processing options	• QPSK -> PAL/BG: up to 16 PAL channels
	• COFDM -> COFDM: up to 16 DVB-T multiplexes
	• QPSK/8 PSK -> QAM: up to 16 DVB-S transport streams
	• AV -> PAL/BG: up to 32 PAL channels
Input / output impedance	75 Ω
Programming	via integrated control unit
Software update	via RS 232 interface
Frequency range input (SAT)	950-2150 MHz
LNC voltage / max. current	12 V / 350 mA
Output channel range	C 02 - C 69 (incl. S 03 - S 41)
Selection of channels	suitable for adjacent channels
Output level	> 102 dBµV
Operating voltage	180 - 265 V AC
Power consumption (fully loaded)	70 … 110 VA
Weight (fully loaded)	approx. 15 Kg
Dimensions (W x H x D)	44,3 (19") x 35,5 (8 RU) x 22,8 cm

HEADEND KAB 3000

Quad QPSK-AV Receiver for DVB-S

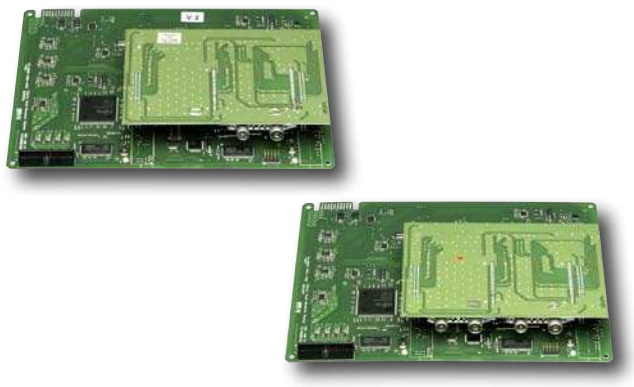
- The IRD modules select the transponders and programmes via the KAB 3000 local control unit, and decode these in FBAS video and audio R/L signals
- Via the CI slot, encoded programs can be decoded by means of the CA module
- **KQR 342 with two tuners:** Tuner "A" with CI slot decodes 2…3 unencrypted or encrypted programmes; Tuner "B" decodes 1…2 exclusively unencrypted programmes
- **KQR 344 with four tuners and four CI slots:** From four transponders, four unencrypted or encoded programs are independently decodable



Type	KQR 342	KQR 344
Article-No.	5700 1402	5700 1623
Input tuners	2	4
AV outputs	4	4
Input frequency range	950 - 2150 MHz	950 - 2150 MHz
Symbol rate	1 - 45 Msymb/s	1 - 45 Msymb/s
Common Interface	for up to 4 channels via Tuner 1	4, separated for all 4 tuners
Video S/N	58 dB	54 dB
LNB supply	12 V / 350 mA	12 V / max. 350 mA

Quad COFDM-AV Receiver for DVB-T

- The IRD modules selects a COFDM transponder and decodes from it 4 programs as FABS and R/L audio signals. Progam selection is possible via the control panel.
- Status signalisation via coloured LEDs
- **KCR 341:** with tuner, decodes 4 programs from one tranpsonder
- **KCR 342:** with two tuners, receives two independent tranpsonders. The following selections are possible:
  3 programs from tuner 1 + 1 program from tuner 2 or
  2 programs from tuner 1 + 2 programs from tuner 2



Type	KCR 341	KCR 342
Article-No.	5700 1403	5700 1404
Input tuners	1	2
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)
Carriers	2 k and 8 k	2 k and 8 k
Symbol rate	2 - 40 Msymb/s	2 - 40 Msymb/s
Converted TV channels	4	4

HEADEND KAB 3000

Quad AV Modulator

- The KAB 3000 modulator modules are designed in single side-band technology and are thus suitable for neighbour-channel operation
- Each module is equipped with 4 independent modulators that can be tuned to any channel within the channel range C 02 - 69 (incl. S 03 - S 41)
- A forced neighbour channel allocation is not required, allowing maximum flexibility regarding network planning
- Up to 4 AV signals can be inserted via the input
- Status signalisation via coloured LEDs
- The AV adapter KAD 340 enables the insertion of external AV source

Type	KMM 342	KMS 343
Article-No.	5700 1632	5700 2006
Input signals	4 x AV	4 x AV
Channel grid	suitable for neighbour channels	suitable for neighbour channels
Sound output	Mono	Stereo (R/L), dual tone, mono
Standard	B/G/I, PAL	B/G, PAL
Output channels	C 02 - C 69 incl. S 03 - S 14 and. S 16 - S 41	C 02 - C 69 incl. S 03 - S 14 and. S 16 - S 41
Video-signal to noise ratio (typ.)	55 dB	55 dB

Twin QPSK-COFDM Transmodulator

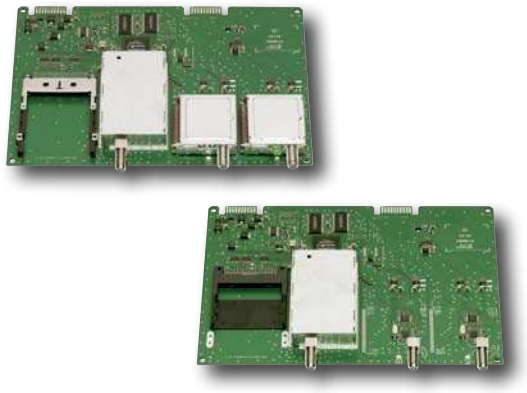
- Conversation of two different QPSK transponder (DVB-S) into two COFDM transponders (DVB-S)
- Opration of SCPC- und MCPC
- Integrated TPS module (Transport-Stream-Processing). The TPS module processes the data of the demodulated transport stream. This allows service information to be changed (NIT Network Information Table), data rates to be increased (stuffing) and individual channels to be deleted from the transport streams. Hereby, the remaining channels can be transmitted with bandwith optimization. Additionally, the operator ID can be set.
- With common interface (CI) plug-in slot for transponder from Tuner “A”

Type	KQC 322
Article-No.	5700 1561
Number of DVB-S tuners on inputs	2 (F-Connector 75 Ω)
Input frequency range DVB-S	950 - 2150 MHz
Input level	60 … 80 dBµV
Input symbol rate	1 - 45 Msymb/s
Remote feeding LNB	12 V / max. 350 mA, via F inputs
Number of transponders	2, DVB-S –> DVB-T
Signal maodulations	QPSK, 16 QAM, 64 QAM, selectable
Tansmission modes	2k, 4k, 8k, COFDM:EN 300744
Transport stream	MPEG 2
Coding rate	1/2, 1/4, 5/6, 7/8
Prtection modes	1/4, 1/8, 1/16, 1/32
RF output	1 (F-Connector 75 Ω)
Output frquency range	45 … 862 MHz
Output channles VHF / UHF	C5 … 12 / C21 … C69

HEADEND KAB 3000

Twin QPSK-QAM Transmodulator

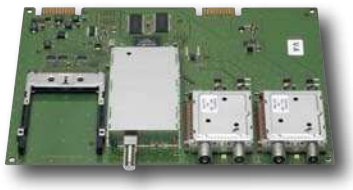
- Transmodulation of two different QPSK-modulated data streams (SCPC or MCPC) into two QAM-modulated data streams
- Integrated TPS module (Transport-Stream-Processing).
  The TPS module processes the data of the demodulated transport stream. This allows service information to be changed (NIT Network Information Table), data rates to be increased (stuffing) and individual channels to be deleted from the transport streams. Hereby, the remaining channels can be transmitted with bandwith optimization. Additionally, the operator ID can be set.
- With common interface (CI) plug-in slot for transponder from Tuner “A”
- **KQQ 324:** High-End transmodulator for HDTV, DVB-S2 standard



Type	KQQ 323	KQQ 324
Article-No.	5700 1411	5700 1412
Input tuners	2	2
Converted transponders	2	2
Common Interface	1 (for converter A)	1 (for converter A)
Input frequency range	950 - 2150 MHz	950 - 2150 MHz
Symbol rate input QPSK	1 - 45 Msymb/s	2 - 45 Msymb/s
Symbol rate input DVB-S2	–	QPSK: 10 ... 30 Msymb/s
	–	8PSK: 10 ... 31 Msymb/s
Symbol rate output	1 - 7 Msymb/s	1 - 7 Msymb/s
Modulation scheme	QAM 4, 16, 32, 64, 128, 256	QAM 4, 16, 32, 64, 128, 256
Frequency range output	45 - 862 MHz	45 - 862 MHz

Twin CODFM-QAM Transmodulator

- Module converts two separate CODFM transponders (DVB-T) into two QAM transponders (DVB-C)
- In channel A the scrambled programmes of the transport stream can be encrypted with a corresponding CA Module
- Integrated TPS module (Transport-Stream-Processing).
  The TPS module processes the data 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 streams. Hereby, the remaining channels can be transmitted with bandwith optimization. Additionally, the operator ID can be set.
- With common interface (CI) plug-in slot for transponder from Tuner “A”



Type	KTQ 322
Article-No.	5700 2005
Input tuners	2
Converted transponders	2
Input frequency range	146 … 862 MHz
Carriers	2k and 8k
Input symbol rate	1-30 MSymb/s
Output symbol rate	1-7 MSymb/s
Modulationsart	QAM 4, 16, 32, 64, 128, 256
CI on conversion path A	■
Output frequency range	45 … 862 MHz

HEADEND KAB 3000

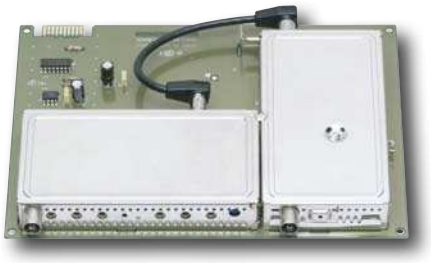
Twin COFDM-COFDM Converter

- Terrestrial modules for conversion of two terrestrial signals into two freely selectable channels in the VHF/UHF band

Type	KCC 321	KCC 322
Article-No.	5700 1407	5700 1408
Input tuners	2	2
Loop-through outputs	2	2
Converted channels	2	2
Input frequency range	47 - 862 MHz	47 - 862 MHz
Output channels	VHF: S 03 - S 24 incl. C 05 - C 12	UHF: C 21 - C 69
Output channel bandwidth	7/8 MHz, selectable	7/8 MHz, selectable
RF output level	90 dBµV	90 dBµV

FM Amplifier

- For selection and amplification of the FM-radio range
- To eliminate interference, up to 6 different input frequencies can be attenuated with tuneable traps



Type	KUB 325
Article-No.	5700 1417
Frequency range	87,5 - 108 MHz
Input level	45 ... 65 dBµV
FM selection	> 60 dB
Gain	17 ... 37 dB
Noise figure	6 ... 9 dB
Traps	6 (tuning range 87,5 - 108 MHz)
Attenuation	10 dB
Output level	max. 100 dBµV

HEADEND KAB 3000

Quad AV-Adapter

- The quadruple AV-adapter is necessary for feeding in of external AV-signals via cinch connectors with the quadruple modulators KMM 342 and KMS 343

Type	KAD 340
Article-No.	5700 1416

Input Splitter with integrated LNB supply

- The SAT-IF signal is divided via the input splitter and passed along to the inputs of the signal processing modules
- 8 RF cables included in the scope of delivery

Type	KSI 319	KSI 320
Article-No.	5700 1413	5700 1414
Frequency range	950 - 2400 MHz	950 - 2400 MHz
Inputs / outputs	1 / 9	1/6 + 1/4
Attenuation	–	5 dB
Through loss	typ. 16 dB	9-14 dB + 9-12 dB
LNB supply	12 V / < 800 mA	12 V / < 800 mA

Output Combiner 8 to 1

- This active output collector gathers the output signals of the modulator modules and provides them via the output socket for the cable network
- For housing assembly with 5...8 QAM modules “KQQ” or COFDM converter ”KCC”/„KTQ“

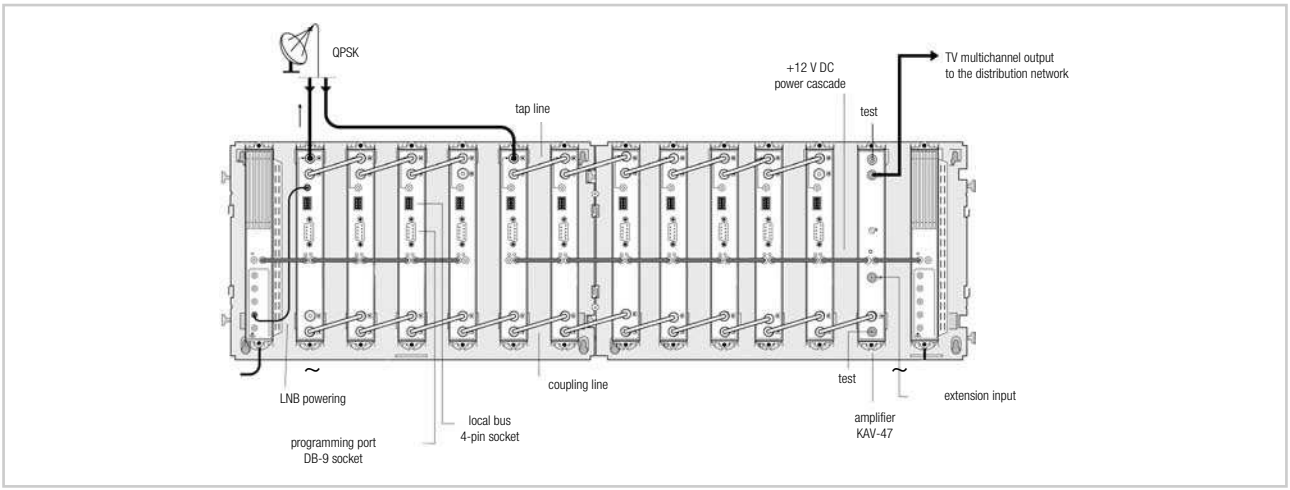
Type	KSO 381
Article-No.	5700 1415
Frequency range	47 - 862 MHz
Gain	18 dB
Electronic attenuator	0 ... -31 dB
Output level	> 102 dBµV
Inputs	8
Outputs	1
Test point	1 / -20 dB

HEADEND KAB 5000

General system description

KAB 5000 is a complete range of programmable, signal processing modules for terrestrial, satellite and cable TV headends.
All modules have an identical format and are simple to place on a wall-fixing base plate or in a 6U rack frame. RF and DC connections are carried out on the front panel using plug bridges supplied.
KAB modules feature frequency agility handled by a high-performance PLL heterodyne double conversion. The broadband noise floor generated is exceptionally low, so multiple modules can be installed in the headend with very little deterioration of the CNR. The use of SAW filters provides, on the other hand, a true vestigial sideband response that enables frequency planning using adjacent channels.

These characteristics mean the installations are highly flexible and the maintenance problems are simplified.
The KAB modules are programmed and adjusted either with the PRG-5000 programming unit or with a PC with PRG-300 software installed. Programming process offers information about input BER and general operating status of the connected module. The parameter values are controlled in each module by a built-in, powerful microprocessor and remain unalterable unless they are modified with the PRG or PC.
When using a PC, programming and setting can also be done remotely via modem.
Firmwares of the modules and programming unit can be updated.



Product overview KAB 5000

Type	Description	Input	Output	Tuner	CI	Twin	Quad	Page
QPS	Receiver module	QPSK	PAL	1			■	60
QPSC	Receiver module	QPSK	PAL	1	■		■	60
QQ	Transmodulator module	QPSK	QAM	1			■	61
QQ-HD	Transmodulator module	QPSK	QAM	1				61
QPI	Transmodulator module	QPSK	IP (LAN)	1				62
QPIC	Transmodulator module	QPSK	IP (LAN)	1	■			62
TT	Converter module	TER / COFDM	TER / COFDM	1				63
QPDT	Converter module	QPSK	COFDM	1			■	64
DTP	Converter module	COFDM	PAL/UHF	1			■	65
DTQ	Transmodulator module	COFDM	QAM	1				66
MM	Modulator module	AV	PAL	1		■		67
MS	Modulator module	AV	PAL	1			■	67
HMS 120	Headend-Monitor-Server							68
KAV 47	Power amplifier	47-862	47-862					69
NT-5000	Power supply	100-240 V	12/13/18/24 V					69

QPSK = DVB-S (SAT); COFDM = DVB-T (Terrestrial); QAM = DVB-C (Cable TV); IP = Internet protocol

HEADEND KAB 5000

Description of modules and programming

A receiving module carries out the complete channel processing from the input to the output:

- tunes a QPSK Sat-IF digital channel in the 950-2150 MHz band,
- selects a TV station from the multiplex received, and
- directs it to a conventional TV channel which is selectable throughout the 45-862 MHz band

Programming of each module involves the following selections and settings

- Central Input Frequency (1 MHz increments)
- Input Data Rate (0.001 MSym/s increments)
- TV Station and Audio Service (or a Radio Station. Image will be black)
- Parameters of the output TV channel (video carrier frequency, TV system, colour system,video modulation depth, audio modulation index, carrier level ratio, output level)
- Image Format. Possible conversions are 16:9 to 4:3 Pan&Scan and 16:9 to 4:3 Letter-Box.

CE

Models featuring VSB output are utilizable for adjacent channel operation. If this operation is not required, existing model featuring DSB output may be used without problems.
The first ones present, on the other hand, a very low broadband noise floor (< -75 dBc) that permit to use multiple modules in the headend with very little deterioration of the CNR.
The receiving modules feature two directionally coupled input and output ports. Sat-IF signal can therefore be directly fed into the input port of the first module, which in turn passes it through the coupler to the next and so forth.

On the output side, the same procedure is repeated which forms the channel coupling. The sum of the combined channels is in turn connected in the same way to the drive amplifier - the KAV-47 module or an external wideband amplifier - which then feeds the distribution network. For power connection, each module has two DC banana sockets that allow to build a +12 VDC cascade. A third banana socket is available to connect the power for the attached LNB.
Programming connection using the PRG-5000 is individual - module by module. When using a PC, programming may be local or remote

Mounting description

- Mounting on a wall-fixing base plate (RW 6)
- If required the housing (GHA) may be used

- Mounting in a 19” rack frame
- If required the housing (GHA) may be used

HEADEND KAB 5000

QPSK-PAL Receiver for DVB-S

- Satellite receivers for free-to-air reception standard DVB-S / MPEG2
- QPSC: for Common-Interface (CI)
- Vestigal side band modulators
- Frequency agility, any selectable TV channel within the 45-862 MHz band
- IF modulation and SAW filtering for maximum harmonic reduction and true VSB response
- PLL frequency synthesized
- Programmed by central headend controller PRG-5000 or PC, interface RS 232 / DB-9

Type			QPS	QPSC
	Article-No.		5700 1206	5700 1208
	Output channel TV system		B/G *	B/G *
	Audio operation mode		Stereo/Dual	Stereo/Dual
	Common-Interface		–	■
	Frequency range output	MHz	45 - 862 (PAL, SECAM, NTSC)	
Input QPSK	Input frequency	MHz	950 - 2150	
	Input level	dBm	-65 ... -25	
	Input loop-through loss	dB	1 ... 5 (950-2150 MHz)	
	AFC pull-in range	MHz	± 5	
	Input data rate	MSym/s	2 ... 45	
Decoding	Standard		MPEG-2	
	Video processing		Main Profile @ Main Level	
	Audio processing		Layer II	
	Teletext-subtitles insertion		yes	
	Image format conversation		16:9 to 4:3 Pan&Scan and 16:9 to 4:3 Letter-Box	
Video/Auido	Video & Audio remodulation		RSB	
	Video modulation depth	%	80 ... 90	
	Audio peak deviation	kHz	10 ... 50	
	Audio modulation depth	%	10 ... 80	
Modulation	Output level, adjustable	dBµV	65 ... 80	
	Output loop-through loss	dB	1,1	
	Carrier level ratio, adjustable	dB	10 ... 20	
	Weighted SNR	dB	> 60	
	Spurious in band	dBc	< -58	
	Broadband noise (ΔB = 5 MHz)	dBc	< -75	
General	Operating voltage	V=	+ 12	+ 12
	Consumption	mA	770	720
	Operating temperature	°C	0 ... +45	
	Connectors input / output		2 x F-connector, female	
	DC connector type		banana socket	
	Dimensions	mm	230 x 195 x 32	
	Weigth	kg	1,03	

* Receivers for other TV systems available

HEADEND KAB 5000

QPSK-QAM Transmodulator

- Satellite transmodulator QPSK to QAM, standard DVB-S / MPEG2
- Transparent digital transmodulation process
  The 33/26 MHz wide QPSK channels located in the Sat-IF band are transformed to 5,5 to 9 MHz wide QAM channels located in the 47-862 MHz band
- Programmed by central headend controller PRG-5000 or PC, interface RS 232 / DB-9
- NIT, TS monitoring

Type			QQ	QQ-HD
Article-No.			5700 1207	5700 0934*
Input QPSK	Standard		EN 300 421	
	Input frequency	MHz	950 - 2150	
	Input level	dBm	-65 ... -25	
	Input loop-through loss	dB	1 ... 5 (950-2150 MHz)	
	AFC pull-in range	MHz	±5	
	Input data rate	MSym/s	6 ... 45	
QAM	Standard		EN 300 429	
	Modulation scheme ouput		16 QAM / 32 QAM / 64 QAM / 128 QAM / 256 QAM (selectable)	
	Modulation Error Ratio, MER	dB	38 (typ) / 36 (min)	
	Output data rate	MSym/s	3 ... 8	
	Roll-Off factor	%	12 / 13 / 15	
RF-Output	Frequency range output	MHz	47 - 862	
	Output level, adjustable	dBµV	65 ... 80	
	Output loop-through loss	dB	1,1	
	Spurious in band	dBc	< -55	
	Broadband noise (ΔB = 8 MHz)	dBc	< -75	
General	Operating voltage	V=	+ 12	
	Consumption	mA	620	
	Operating temperature	°C	0 ... +45	
	Connectors Input / Output		2 x F-connector, female	
	DC connector type		banana socket	
	Programming interface		RS 232 / DB-9	
	PC-programming local bus connector		4-pin socket	
	Dimensions	mm	230 x 195 x 32	
	Weigth	kg	1,03	

* Equivalent to MDI-910, Article-No. 5700 1680

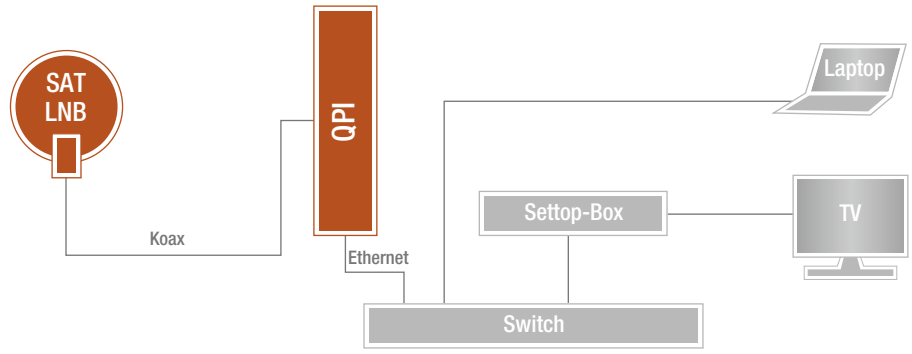
HEADEND KAB 5000

QPSK-IP Streamer

- Digital receiving module for transmodulation of digital satellite programs according to IP (LAN) streaming
- DVB-S / MPEG2
- With slot for a CI module (QPIC)
- From a DVB-S transponder in up to 8 simultaneous transmitted IPTV programs in a multi-cast IP network
- Signal transmission with LAN, (no coax cable necessary), interesting for Hospitals, Hotel industry and businesses
- The IP program is present with an IPTV set-top box (e.g. AmiNet100) or with a media player (e.g. VLC)

Type			QPI	QPIC
Article-No.			5700 1432	5700 1433
Common-Interface			–	■
Input QPSK	Frequency range input	MHz	950 - 2150	
	Frequency selection step	MHz	1	
	Input level	dBm	-65 ... -25	
	Input loop-through loss	dB	0 (± 3)	
	Symbol rate	MSym/s	2 ... 45	
Output IP	Standard		IEEE 802.3 10/100 Base T	
	Bit rate	Mbps	up to 100	
	Transmission protocols		UPD / RTP	
	No. of simultaneous streams		up to 8	
	Multicast		yes	
Connectors	RF input (loop-through)		2 x F-connector, female	
	DC connection		banana socket	
	Configuration		RS 232 / DB-9	
	Ethernet output		RJ-45	
General	Operating voltage	V=	+ 12	+ 12
	Consumption	mA	260	400 (CAM active)
	LED indication		AN - STATUS - LINK - ACT	
	Operating temperature	°C	0 ... +45	
	Dimensions	mm	230 x 195 x 32	
	Weigth	kg	1,03	

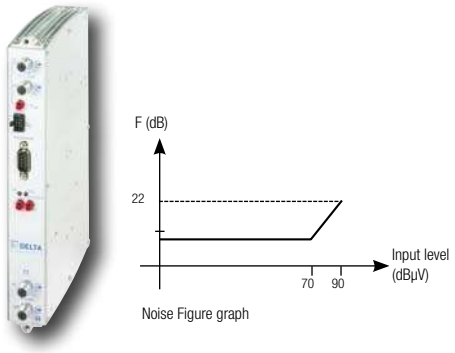
QPI and AmiNET 110



HEADEND KAB 5000

Terrestrial Converter

- For analogue or digital signals
- Agile processing modules, usable either as channel converters (output channel is different to input channel) or as channel processor (output channel is the same as input channel)
- Double heterodyne conversion in the 45-862 MHz frequency range
- IF SAW filtering
- Adjacent channel operation at input and output



Noise Figure graph

Type		TT
Article-No.		5700 1244
TV System		B/G, D/K, I, L, DVB-T, DVB-C
Selectable input channel	MHz	45 - 862
Selectable output channel	MHz	45 - 862
Frequency selection steps	MHz	0,125
Input level Analogue Digital	 dBµV dBµV	 50 - 90 40 - 80 AGC: 40 dB; manual adjustment for L-system channels
Input loop-through gain	dB	1 (± 3)
Noise figure	dB	< 9 (input level: < 70 dBµV)
Input loop's noise figure	dB	6
Bandwidth of SAW filtering For 7 MHz channels For 8 MHz channels	 MHz MHz	3 6,875 7,850
Selectivity for 7 MHz channels Selectivity for 8 MHz channels	dB dB	> 9 (fc ± 3,75 MHz) / > 70 (fc ± 4,75 MHz) > 18 (fc ± 4,25 MHz) / > 70 (fc ± 5,25 MHz)
Image rejection	dB	> 70
Output level, adjustable	dBµV	65 ... 80 (analogue) / 55 ... 70 (digital)
Output loop-through loss	dB	1,1 (typ.) / 1,4 (max.)
Group delay	ns	< ± 40
Spurious in band	dBc	< - 58
Broadband noise (ΔB = 5 MHz)	dBc	< - 75
Operating voltage Consumption	V= mA	+ 12 780
Operating temperature	ºC	0 ... +45
Connector types DC connector type		F-connector female banana socket
Programming interface		RS 232 / DB-9
Dimensions Weight	mm kg	230 x 195 x 32 1,03

HEADEND KAB 5000

QPSK-COFDM Transmodulator

- Reception module for transmodulation of digital satellite programs to DVB-T
- Ideal for expansion of existing systems with established basic DVB-T provision
- TV sets with built-in DVB-T tuner do not require an additional receiver
- With slot for a CI module
- Transport stream processing enables the transmodulation of 4 freely selectable TV programs of a DVB-S transponder to DVB-T
- Adaption of NIT table possible

Type			QPDT
	Article-No.		5700 1463
	Common-Interface		1
	Transport-Stream (TS) Processing		yes
Input QPSK	Standard		EN 300421
	Input frequency	MHz	950 - 2150
	Input level	dBm	-65 ... -25
	Input loop-through loss	dB	0 (± 3)
	AFC pull-in range	MHz	± 5
	Symbol rate	MSym/s	2 ... 45
Re-Modulation COFDM	Data processing		EN 300744
	Operation modes		2K / 8K (automatic detection))
	Constellation		QPSK, 16 QAM, 64 QAM
	Code rate		1/2, 2/3, 3/4, 5/6, 7/8
	Guard interval		1/4, 1/8, 1/16, 1/32
	Modulation error ratio (MER)	dB	> 36
Output COFDM	Frequency range output	MHz	47 - 862
	Bandwidth	MHz	6, 7, 8
	Output level, adjustable	dBµV	65 ... 80
	Frequency stability	ppm	< ± 10
	Output loop-through loss	dB	1,1
	Spurious in band	dBc	< -50
	Broadband noise (ΔB = 8 MHz)	dBc	< -75
General	Operating voltage	V=	+ 12
	Consumption	mA	350
	Operating temperature	°C	0 ... +45
	Connector types		2 x F-connector, female
	DC connector type		banana socket
	Programming interface		RS 232 / DB-9
	PC programming bus connector		4-pin socket
	Dimensions	mm	230 x 195 x 32
	Weight	kg	1,03

HEADEND KAB 5000

DVB-T PAL Converter

- Digital terrestrial receiver DVB-T to PAL, standard DVB-T / MPEG2
- Digital-to-analogue transmodulation process
- The 7/8 MHz wide COFDM channels located in the 47-862 MHz band are transformed to conventional VHF/UHF channels
- Vestigal side band modulators
- Programmed by central headend controller PRG-5000 or PC, interface RS 232 / DB-9

Type			DTP
Article-No.			5700 1209
Output channel TV system			B/G
Audio operation mode			Stereo/Dual
Output channel colour system			PAL, SECAM, NTSC
Input (COFDM)	Standard		EN 300 744
	Input frequency	MHz	174 - 230 / 470 - 862
	Bandwidth	MHz	7 / 8
	Mode		2K / 8K (automatic detection)
	Constellation		QPSK / 16 QAM / 64 QAM (automatic detection)
	Hierarchy		High Priority / Low Priority
	Input level	dBµV	35 ... 100
	Input loop-through gain	dB	0,5 (±1)
	Guard interval		1/4 , 1/8 , 1/16 , 1/32 (automatic detection)
Decoding	Standard		MPEG-2
	Video processing		Main Profile @ Main Level
	Audio processing		Layer II
	Teletext - subtitles insertion		yes
	Image fromat conversation		16:9 to 4:3 Pan&Scan and 16:9 to 4:3 Letter-Box
Video/Auido	Video & Audio remodulation		RSB
	Video modulation depth	%	80 ... 90
	Audio peak deviation	kHz	±10 ... ±50
	Audio modulation depth	%	10 ... 80
Output	Frequency range output	MHz	45 - 862
	Output level, adjustable	dBµV	65 ... 80
	Output loop-through loss	dB	1,1
	Carrier level ratio, adjustable	dB	10 ... 20
	Weighted SNR	dB	> 60
	Spurious in band	dBc	< -60
	Broadband noise (ΔB = 8 MHz)	dBc	< -75
General	Operating voltage	V=	+12
	Consumption	mA	770
	Operating temperature	ºC	0 ... + 45
	Connectors input / output		2 x F-connector, female
	DC connector type		banana socket
	Dimensions	mm	230 x 195 x 32
	Weight	kg	1,03

HEADEND KAB 5000

DVB-T-QAM Transmodulator

- Digital terrestrial transmodulator DVB-T to QAM, standard DVB-T / MPEG2
- Transparent digital transmodulation process
- The 7/8 MHz wide COFDM channels located in the 47-862 MHz band are transformed to 5,5 to 9 MHz wide QAM channels located in the same band
- Programmed by central headend controller PRG-5000 or PC, interface RS 232 / DB-9

Type			DTQ
Article-No.			5700 1210
Input (COFDM)	Standard		EN 300 744
	Input frequency	MHz	47 - 862
	Bandwidth	MHz	7 / 8
	Mode		2K / 8K (automatic detection)
	Constellation		QPSK / 16 QAM / 64 QAM (automatic detection)
	Hierarchy		High Priority / Low Priority
	Input level	dBµV	35 ... 100
	Input loop-through gain	dB	2 (±2)
	Guard interval		1/4 , 1/8 , 1/16 , 1/32 (automatic detection)
QAM	Standard		EN 300 429
	Modulation scheme ouput		16QAM / 32QAM / 64QAM / 128QAM / 256 QAM (selectable)
	Modulation error ratio (MER)	dB	38 (typ) / 36 (min)
	Output symbol rate	MSym/s	3 ... 8
	Roll-Off factor, selectable	%	12 / 13 / 15
RF-Output	Frequency range output	MHz	47 - 862
	Output level, adjustable	dBµV	65 ... 80
	Output loop-through loss	dB	1,1
	Spurious in band	dBc	< -55
	Broadband noise (ΔB = 8 MHz)	dBc	< -75
General	Operating voltage	V=	+ 12
	Consumption	mA	630
	Operating temperature	ºC	0 ... +45
	Connectors input / output		2 x F-connector, female
	DC connector type		banana socket
	Video-loop connector type		2 x RCA female
	Programming interface		RS 232 / DB-9
	PC-programming local bus connector		4-pin socket
	Dimensions	mm	230 x 195 x 32
	Weigth	kg	1,03

HEADEND KAB 5000

Audio/Video Modulator

- Vestigal side band modulator for adjacent channel operation
- IF modulation and SAW filtering for maximum harmonic reduction and true VSB response
- Frequency agility, any selectable TV channel within the 45-862 MHz band
- PLL frequency synthesized
- Bulit-in test pattern generator
- Programmed by central headend controller PRG-5000, interface RS 232 / DB-9

Type		MM	MS
Article-No.		5700 1212	5700 1211
TV System		B / G *	B / G *
Audio System		Mono	Stereo
Frequency range	MHz	45 - 862	45 - 862
Output level, adjustable	dBµV	70 ... 80	70 ... 80
Intercarrier frequency			
Sound 1	MHz	5,5	5,5
Sound 2	MHz	–	5,742
Carrier level ratio, adjustable	dB	10 ... 20	
Video input level	V_{pp}	0,7 ... 1,4	
Video input impedance	Ω	75	
Video modulation depth	%	80 ... 90	
Audio input level	V_{pp}	0,5 ... 4,0	
Audio input impedance	Ω	> 600	
Audio peak deviation	kHz	± 40 ... ± 50, adjustable	
Audio modulation depth	%	60 ... 80, adjustable	
Audio pre-emphasis	µs	50	
Group delay precorrection		yes	yes
Weighted SNR	dB	> 60	
Differential gain	%	< 3	
Differential phase	°	< 2	
K-factor (2T pulse)	%	< 2	
Spurious in band	dBc	< - 60	
Broadband noise		< - 77 (ΔB = 5 MHz)	
Output loop-through loss	dB	0,7	
Operating voltage	V=	+ 12	+ 12
Consumption	mA	360	420
Operating temperature	°C	-10...+55	
Connector types		Video 1 x RCA, Audio 2 x RCA, Output RF 2 x F connector	
DC connector type		banana socket	
Programming interface		RS-232 / DB-9	
Dimensions	mm	230 x 195 x 32	
Weigth	kg	<1,03	

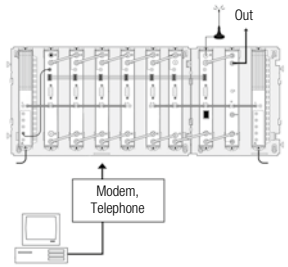
* Modulators for other TV systems available

HEADEND KAB 5000

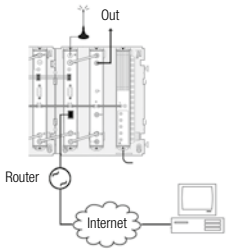
Headend-Monitor-Server

- For comfortable remote control of headends via a GSM/GPRS- or Ethernet interface
- Functions: Identification of the headend and dates of interventions, reading of the RF level outgoing from each signal module, and multichannel signal outgoing from the headend.
  Automatic alarm advertisements via SMS, equalization of the RF multichannel signal outgoing from the headend. Scheduling of parameter settings, OSD messages and firmware updates.
- With embedded Web server, enables the control over a local or remote computer via a standard browser

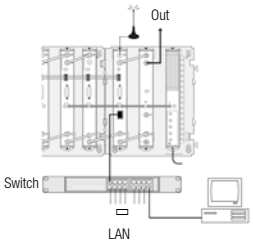
Type			HMS 120
Article-No.			5700 1335
Software	Software		Operation software embedded, Web server, internal GSM/GPRS modem, HTTP and support for SNMP v2, access password
RF	Frequency range	MHz	45 - 862
	Output level	dBµV	55 ... 90
	Accuracy of the reading	dBµV	± 1,5
GSM/GPRS	Frequency range	MHz	GSM900: Tx 880-915, Rx 925-960 / GSM 1800: Tx 1710-1785, Rx 1805-1880
	Threshold	dBm	< 102
	RF output power	W	GSM900 = 2 W / GSM1800 = 1 W
Connectors	GSM antenna		FME
	GSM modem card		SIM socket
	Monitoring ethernet port		Bit rate up to 100 Mbps, transmission protocol TCP/IP
	RF input		F female
	Local bus		RS-485, 2x4 pin socket
	Monitoring		RJ-45
	Terminal port		Electrical interface: V28/RS-232 / Terminal DB-9
	DC		banana socket
General	Operating voltage	V=	12
	Consumption	mA	600
	Operating temperature	ºC	0 ... +45
	Dimensions	mm	230 x 195 x 32
	Weigth	kg	1,03



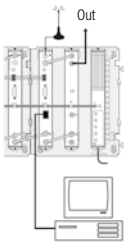
Remote access via GSM/GPRS



Remote access via Internet



Headend integrated into a LAN network. Control from any PC of the LAN.



Control in local mode with a PC

HEADEND KAB 5000

RF-Power amplifier

- Push-Pull amplifier for high output level
- Low noise figure
- Variable interstage attenuation
- Input and output test points

Type		KAV 47
Article-No.		5700 1215
Frequency range	MHz	47 - 862
Gain	dB	47
Interstage attenuator	dB	0 ... 20
Noise figure	dB	< 6
Output level (DIN 45004 B/60dB IMA)	dBµV	> 120
Output level (DIN 45004A1/60dB IMA)	dBµV	> 115
Testpoint input	dB	-20 ± 1,5
Testpoint output	dB	-30 ± 1
Extension input		
Frequency range	MHz	47 - 862
Gain	dB	6
Operating voltage	V=	+ 12
Consumption	mA	600
RF and test connector types		F connector, female
DC connector type		banana socket

Power supply

- High effiency switch mode power supply
- Electrical safety protection level: Class II
- Efficiency 75%
- For powering of max. 6 headend modules

Type		NT-5000
Article-No.		5700 1217
Operating voltage	V~	100 - 240
Outputs		
Headend modules		+12 V (5A) for max. 6 modules
Mast-head preamplifier		+24 V (60 mA)
LNB remote powering		+18 V (300 mA)
		+18 V / 22 kHz (300 mA)
		+13 V (300 mA)
		+13 V / 22 kHz (300 mA)
Max. total current for 24V, 18V, 13V	mA	700
Power consumption	W	max. 80

HEADEND KAB 5000

Complete Headends

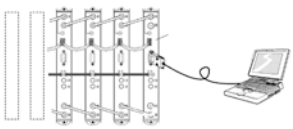
- Pre-configured with housing
- QPS-6: QPSK/PAL, 6 modules
- QQ-6: QPSK/QAM, 6 modules

Type		KAB 5000 - QPS/6	KAB 5000 - QQ/6
Article-No.		5700 1205	5700 1224
Description		Complete Headend with 6 modules “QPS” QPSK/PAL,VSB, Stereo, power supply “NT-5000”, power cord, base plate, housing with lock key	Complete Headend with 6 modules “QQ” QPSK/QAM, power supply “NT-5000”, power cord, base plate, housing with lock key
Dimensions	mm	430 x 341 x 258	430 x 341 x 258
Weight	kg	15	15

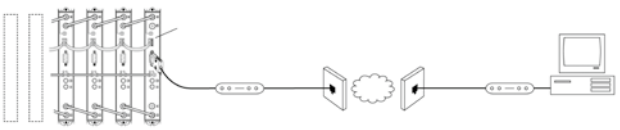
Programming Unit PRG-5000

- For programming the KAB modules. Cable connection to the DB-9 front panel socket
- 20x4 character alphanumerical display. Numerical and function keys
- Microprocessor controlled
- User friendly software (selectable language: English, Spanish, French)
- Built-in diagnostic and error identification
- Module firmware update. Firmware of the PRG-5000 can also be updated through a PC
- Capacity of 80 preset memory allocations for repetitive KAB assemblies
- No battery required. Powered through the interface lead (max consumption: 150 mA)

Type	PRG-5000
Article-No.	5700 1216



Local Programming with PC



Remote Programming with PC

HEADEND KAB 5000

Accessories

Type	RW-6	GHA-6
		
Article-No.	5700 1219	5700 1218
Description	Base plate, capacity: 7 modules	Indoor housing for 1 base plate RW-6 lock/key closing system
Dimensions	441 x 257 x 24	430 x 341 x 258

Type	GH-19Z2	OMR-600
		
Article-No.	5700 0944	5700 1225
Description	Rack frame 19”, 6U height capacity: 7 modules with 7 fixing plates to fasten the KAB modules	Blank panel for 19” rack GH-19Z2

Type	BUS 013
	
Article-No.	5700 1226
Description	Kit of jumpers for communication bus between KAB modules (PC programming application) packing unit 11 pcs.

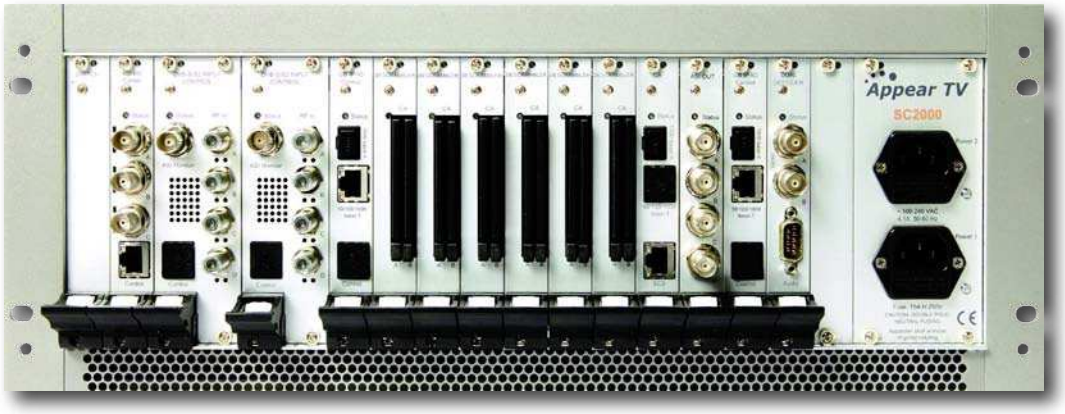
Appear TV

General system description

Built around a modular platform hosting a wide selection of modules, Appear TV's SC2000/SC2100 can be configured as a turn-key head-end or as a standalone solution designated for intensive service processing applications. The SC2000/SC2100's integrated architecture offers superior reliability, while its single web-based management interface simplifies deployment and reduces maintenance routines. A user friendly GUI offers intuitive selection of services, and comprehensive management facilities featuring automatic and manual configuration possibilities.

Content Aggregation: The SC2000/SC2100's high density and selection of multiple source inputs makes it the most effective content aggregation solution. Configured as a high density receiver, services from sources including IP, DVB-S/S2, DVB-C and DVB-T/T2 networks as well as ASI feeds, can be obtained and output via ASI, IP, QAM and COFDM.

Descrambling: Appear TV's high performance multi-service descramblers maximize receiver utilization and simplify system design and deployment. Appear TV provides two types of descramblers: one that is CAM-based (DVB-Common Interface) and another for bulk descrambling. The DVB-CI based descramblers are capable of descrambling up to 10 DVB scrambled services per CAM. The bulk descrambler is capable of descrambling up to 250 DVB or AES scrambled services. With support for various CA systems, be it hardware-based or software-based, Appear TV's descramblers are an efficient, space and energy saving solution. Compatible with major CA systems, Appear TV supports AES and DVB CSA algorithms and offers a number of throughput options.



SC2000 Chassis with DVB-S2 receiption modules and descrambling

Processing: The SC2000/2100 can carry out EPG regeneration to regenerate schedule information using channel bouquets received from multiple sources. Via the GUI, operators can configure the number of days the schedule information should be played out, the data rate, etc. It is also possible to prioritize a higher repetition for events that are nearer in time. Digital audio leveling for both radio and TV channels from different studios, processed with different encoder settings, is possible with the SC2000/2100. The audio leveling solution enables operators to individually adjust the audio level of up to 250 channels within the MPEG domain. Resilience is built into the Appear TV architecture. SC2000 modules are hotswappable, including power supplies and fans, and along with Pro MPEG FEC, Appear TV's redundancy solution offers full or partial redundancy for a variety of failure scenarios.

The SC2000/SC2100 is ideal for digital TV broadcast over FTTH, ADSL2+/VDSL and for Cable Operators moving towards IP distribution. The SC2000/SC2100 is also suitable for smaller digital broadcast networks; in the Hospitality Industry and in Corporate or Governmental Offices where Streaming Broadcast TV to PCs is valued for informational and monitoring purposes.

Appear TV's DC1000/DC1100 enables cable operators to use a common hardware platform to deliver high quality analog and digital TV services. By integrating all functions into a single chassis, Appear TV is able to offer a high density solution boasting high performance outputs with exceptional reliability. The most manageable solution on the market, the DC1000/DC1100 offers an intuitive user interface as well as remote configuration of all modules, simplifying system deployment and reducing operational routines. The DC1000/DC1100 includes a comprehensive alarm system along with facility for integration with 3rd party management systems, enabling fully automatic alarm capture and fault rectification.

Simulcast for Cable Operators: The DC1000/DC1100 eliminates the need to distribute analog channels over the core network; ensuring optimal bandwidth utilization whilst maintaining complete flexibility of local programming. The high performance RF module supports A2, NICAM stereo.

Cable FM Radio System

Appear TV FM radio decoders offer cable operators a compact solution for the delivery of radio services. Decoding and FM modulating up to 8 radio services per module makes it possible to provide all required FM channels in a single chassis. This solution is easy to deploy and operate, and supports RDS data insertion. In addition, these FM radio decoders can be combined with decoders having built-in RF modulation and digital QAM modulator, making them a complete remote head-end for cable operators.Digital Cable Modulation

The DC1000/DC1100 can also be equipped with digital QAM output or COFDM output modules to deliver the digital subscriber package, enabling operators to manage both analog and digital services within a common platform, through a single user interface.

Appear TV

The advantages at a glance

- 1RU and 4RU chassis
- GB IP (electrical or optical), ASI, DVB-S/S2, DVB-T und DVB-C inputs
- Any combination of inputs in the same chassis. Maximum:
  - 45 ASI
  - 28 DVB-S/S2, DVB-T, DVB-C
- GB IP (electrical or optical) and ASI output MPTS or SPTS. Supports multiple of output modules.
- Multiplexing
- PSI/SI regeneration
- Up to 28 DVB common interface slots for DVB descrambling
- Support for AES SW descrambling
- Support DVB and AES scrambling, simulcrypt Interface based
- Up to 40 PAL channels in one 4 RU chassis
- Up to 48 FM channels in one 1 RU chassis.
- MPEG-2/4 4:2:0 MP@ML decoding
- Composite PAL and analogue stereo audio output
- Video and audio modulated directly to a configurable VHF/UHF frequency
- NICAM or A2 stereo (4RU only)
- VBI reinsertion
- EBU/DVB subtitling support
- FM radio with RDS insertion
- „Hot-swappable" module
- Support for AES descrambling (option)
- Support for DVB Common Interface
- IP (electrical or optical), ASI, DVB-S/S2, DVB-T and DVB-C inputs
- ASI output with multiplexing and PSI/SI regeneration
- ntuitive web-based user control
- Dual redundant hot-swappable power supplies (option, 4RU only)
- Monitoring of power and fans (4 RU only)
- SNMP Alarm MIB
- SOAP/XML Interface for external control

Product overview Appear TV

Type	Description	Input	Output	Function	Page
SC/CAB4PS-03	1RU Chassis with switch and power supply			Base unit	74
SC/CAB4PS-04	Chassis with dual power 230V AC			Base unit	74
SC/SWM	Switch			Switch	74
SC/GBIPIN-MMI	GB IP Input + Control	IP			74
SC/SWIP1IN1OUTRJ45-MMI	Switch + Control with 1xIP In and 1xIP out, RJ45	IP	IP	Switch	74
SC/3ASI-MMI	3 ASI input + Control	ASI			74
SC/4DVBSS2-MMI	4 DVB-S/S2 input + Control	QPSK/8 PSK			74
SC/4QAM-MMI	4 DVB-C input + Control	QAM			74
SC/4COFDM-MMI	4 DVB-T input + Control	COFDM			74
SC/2CI	Descrambler			2 x CI	75
SC/DVBSCS75	DVB Scrambler with SCS. Number of channels:			CA	75
DC/TRA2HDCH	Transcoder MPEG-4 auf MPEG-2/4 - 2 x channel			Transcoder	75
DC/GBIPOUT	GB IP Output		IP	MUX	75
DC/4ASIOUTMX	4 ASI Out with multiplexing		ASI	MUX	75
DC/16QAMOUTMX	16 QAM Out with multiplexing		QAM	MUX	75
DC/HPDDMRFA2	HP DDM card with RF modulation and A2 stereo		2 x PAL		75
DC/8FMR	8 x FM Radio channels with RDS Insertion		8 x UKW		76
DC/2QDECST+TVMOD8	8 x MPEG-2/4 decoding with RF modulation		8 x PAL		76

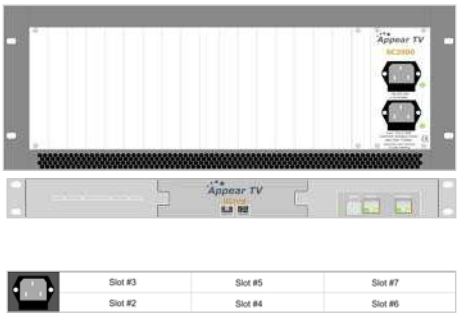
Appear TV

Chassis

Chassis SC and DC / Switch module

Chassis SC and DC:

- Modular configuration with up to 16+2 board positions
- WEB based configuration, SNMP Alarms, SOAP/XML interface
- Gesteuerte Luftkühlung
- Forced air-cooling (through back of 4RU)
- Dual redundant hot-swappable power supply
- 4 individually monitored hot-swappable fans



Switch Modul:

- Gbit/s routing between modules in a chassis
- 1 slot wide

Input modules

Ethernet Input – SC/GBIPIN-MMI

- 10/100/1000BaseT input card (RJ45)
- Mini-GBIC interface (SFP) for optical input
- Supports UDP/RTP Multicast/Unicast reception
- Supports reception of MPTS and SPTS
- Service filtering
- PCR regeneration
- 10/100/1000BaseT management port (RJ45)
- Enables WEB management
- Supports FEC (SMPTE 2022)
- 1 slot wide

Switch module with Management 2x10/100/1000 Base-T input – SC/SWIP1IN1OUTRJ45-MMI

- 2xGbit input or output port for data
- Up to 850 Mbit/s per data port TS
- Supports UDP/RTP Multicast/Unicast
- Supports reception and streaming of MPTS and SPTS
- Multiplexing on output with PSI/SI regeneration
- Service filtering & PCR regeneration
- FEC encoding and decoding (optional)
- Enables WEB management
- 10/100/1000BaseT management port (RJ45)
- 1 slot wide

DVB-S/S2 Input – SC/4DVBSS2-MMI

- 4xDVB-S/S2 inputs
- F connectors
- DVB-S, DVB-S2 QPSK and 8PSK modes
- 950 – 2150 MHz Frequency Range
- 1-45 MSym/s (mode dependent)
- 1/2, 2/3, 3/4, 5/6, 7/8, 8/9, 9/10 FEC (mode dependent)
- Supports reception of MPTS and SPTS
- Service filtering
- ASI monitoring port
- 10/100/1000BaseT management port (RJ45)
- Enables WEB management
- 2 slots wide

DVB-C Input w/Management – SC/4QAM-MMI

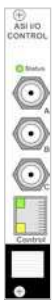
- 4xQAM inputs
- F connector
- 0.87-6.9 Ms/s
- Supports reception of MPTS and SPTS
- Service filtering
- ASI monitoring port
- 10/100/1000BaseT management port (RJ45)
- Enables WEB management
- 2 slots wide

DVB-T Input w/Management – SC/4COFDM-MMI

- 4xCOFDM inputs
- F connector
- 1/2, 2/3, 3/4, 5/6, 7/8 FEC
- 2k and 8k carrier mode
- QPSK, 16QAM, 64QAM modulation
- Supports reception of MPTS and SPTS
- Service filtering
- ASI monitoring port
- 10/100/1000BaseT management port (RJ45)
- Enables WEB management
- 2 slots wide

ASI Input w/Management – SC/3ASI-MMI

- 3xASI input
- BNC connectors
- 213 Mbit/s per input
- Supports reception of MPTS and SPTS
- Service filtering
- 10/100/1000BaseT management port (RJ45)
- Enables WEB management
- 1 slot wide



Appear TV

Processing modules

Descrambling – SC/2CI

- 2xDVB Common interface
- Descrambling of 10 services per CAM (depends on common interface)
- Support for all major CA systems and CAMS
- 1 slot wide

Scrambling - SC/DVBSCS75

- DVB CA compliant scrambling (CSA) and AES compliant scrambling
- Scrambles up to 250 services, maximum 850 Mbit/s
- Support scrambling of MPEG-2 and H264 in SD &HD
- DVB Simulcrypt compliant
- 10/100/1000BaseT IP interface towards CA system (RJ45)
- Handles up to 250 ECM's
- 1 slots wide

Transcoder MPEG-2/4 - DC/TRA2HDCH

- Transcodes up to 2 HD or 4 SD channels
- Full decode and re-encode
- Operates in three different Encoder Rate Contol modes:
- Constant Bit Rate (CBR)
- Capped Variable Bit Rate (CVBR)
- Statistical Multiplexing (in future release)
- 1 Einschub breit

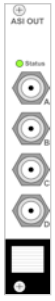
Output modules

Ethernet Output - DC/GBIPOUT

- 10/100/1000BaseT output card (RJ45)
- Mini-GBIC interface (SFP) for optical output
- Supports UDP/RTP Multicast/Unicast transmission
- Supports multiple of output cards
- Streaming of up to 850 Mbit/s & Maximum 250 services
- Supports streaming of SPTS
- Support streaming of MPTS with Multiplexing (optional)
- PSI/SI regeneration & PCR regeneration
- Supports FEC (SMPTE 2022)
- 1 slot wide

ASI output - DC/4ASIOUTMX

- 4xASI outputs
- BNC connectors
- 213 Mbit/s per output
- 4 different multiplexed outputs
- PSI/SI regeneration
- 1 slot wide



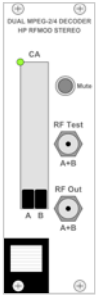
QAM Output – DC/16QAMOUTMX

- 16 QAM modulators, 4 and 4 paired
- Full digital modulation and up-conversion
- DOCSIS 3.0 RF compliant
- 32 / 64 / 128 / 256 QAM modulation
- Frequency range of 47 – 862 MHz
- Supports multiplexing and transparent pass through
- PSI/SI/PSIP regeneration
- 2 x 75 ohm RF output (EN/IEC 60728-5) - F connector
- ITU-TJ83. Annex A/B/C

HP Dual Decoder w/RF output A2 - DC/HPDDMRFA2

- 2 outputs per decoder
- MPEG-2/4 (H264) SD and HD
- VBI re-insertion (WSS, WST/EBU Teletext, VPS, VITS)
- DVB and EBU subtitling
- High performance RF modulation and up-conversion
- 47 - 862 MHz frequency range
- F connector output with both channels combined
- 2 DVB Common Interfaces. One per channel
- Dual stereo to mono conversion
- NICAM or A2 stereo audio (option)
- HD downconversion to SD

For Quad decoder product code please contact Delta Electronic



Please note that card ejector will not be mounted for modules installed in 1RU chassis. Modules mounted in front of 1 RU chassis are not hot-swappable.

Appear TV

Output modules

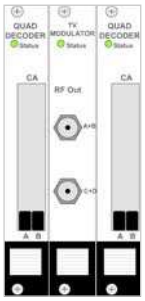
FM Radio with RDS – DC/8FMR

- 8 independent radio channels per module
- Decoding of MPEG-1,2 audio
- FM modulation and up-conversion to FM band
- Fully agile independent frequency setting for each channel
- RDS insertion - UECP SPB490 or static
- One RF output connector, F-type, with all 8 channels
- MPX test output
- 1 slots wide

2xQUAD Decoder w/RF output and A2 – DC/2QDECST+TVMOD8

- 4 or 8 channels
- MPEG-2/4 decoding
- VBI re-insertion (WSS, WST/EBU Teletext, VPS, VITS)
- DVB and EBU subtitling
- RF modulation and up-conversion
- 47-862 MHz frequency range
- 2 F connector output ports, up to 4 channels per port
- 2 DVB Common Interfaces per decoder module
- 2 or 3 slots wide

For Quad decoder product code please contact Delta Electronic



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TYPE	DESCRIPTION	PAGE
OT-E	Optical External Modulated Transmitter 1550nm	78
OT/OTM	Optical Direct Modulated Transmitter 1310nm	79
OA	Erbium-Doped Fibre Amplifier 1550nm	80
OA-W	Erbium-Doped Fibre Amplifier 1550nm	82
OR	Optical Forward Path Receiver	84
OR/ORM	Optical Return Path Receiver	85
OR-L	Optical Return Path Receiver RFoG	86
ONH/ONH-B	RFoG Micro Node - Plus	88
ONB/ONB-B	Mini Fibre Node	90
ONC	Medium Fibre Node for HFC/FTTX	92
ONS	Segmentable Fibre Node 2x2 for HFC	94
OTC	Optical CATV/SAT-ZF Transmitter	96
ORC	Optical CATV/SAT-ZF Receiver	98
OPC-SC	Optical PLC Splitter	100
OWDM-SC	Optical Wavelength Division Multiplexer	101
OTB-SC	Optical Termination Box	102
OMPC	Optical Fibre Patch Cord	102
OATN	Optical Attenuator	103
OPM	Optical Power Meter	103
OLS	Optical Light Source	104
OCT	Optical Cleaning Kit	104

OPTICAL EXTERNAL MODULATED TRANSMITTER 1550NM

External modulated 1550nm DFB-Laser transmitter for electrical to optical conversion of multi-channel broadcast signals like AM, FM and QAM signals

- Enables the usage of optical amplifier (EDFA) as booster or repeater in order to realize large FTTX networks
- Available in a standard 19",1 rack unit chassis
- Output power: 2 x 5 dBm or 2 x 11 dBm (other's on request)
- Dual optical output
- Broadcast or narrowcast transmission at long or extended distances
- For Video overlays in FTTx Networks
- External modulated technology, 2 optical outputs
- 47…1006 MHz bandwidth
- SBS suppression: 13, 16 and 18dBm
- Low dispersion distortion (DFB continuous wave laser)
- Low noise DFB Laser
- Automatic Gain Control (AGC) or Manual Gain Control (MGC)
- Adjustable optical modulation index (OMI)
- Advanced SNMP network management function
- Front panel LCD display and LED status indication
- Redundant dual power supply

Type	OT 1155-2-05 E	OT 1155-2-11 E
Article-No.	5700 1600	5700 1871
Description	External modulated optical Transmitter 1550nm, 2 Outputs, +5 dBm, SC/APC	External modulated optical Transmitter 1550nm, 2 Outputs, +11 dBm, SC/APC

Type		OT 1155-2-xx E
Operation wavelength (λ)	nm	1543,5 ~ 1556,5
Output power	dBm	2 x 5 or 2 x 11 ± 0,5 (other optical output power on request)
Equivalent noise intensity	dB/Hz	< -160
Side mode suppression ratio	dB	> 45, SMSR
Return loss	dB	> 50
Optical fiber connector		SC/APC
RF bandwidth	MHz	47…1006
Input level	dBµV	78…88 (AGC)
Flatness	dB	< ± 0,75, 47…1000 MHz
Return loss	dB	>16
Input impedance	Ω	75
CNR	dB	53 @ 4% OMI
CTB	dB	< -63, CENELEC 42
CSO	dB	< -65, CENELEC 42
SBS- Suppression	dBm	13, 16 and 18 adjustable
SNMP network management		RJ45
Communication interface		RS232
Power Supply (1+1 Backup)	V~	90 ... 265, 50/60Hz
Power consume	W	< 50++
Operation temp.	°C	0 … +50, Temp. control on board
Storage temp.	°C	-10 … +85
Size (W x D x H)	mm	482 x 368 x 44
Laser class		1M, DIN EN 60825-1 (2008)

OPTICAL DIRECT MODULATED TRANSMITTER 1310NM

- Modular optical Transmitter for Cable TV signals (CATV)
- Transparent conversion of electrical signals (AM-TV, QAM, FM) to amplitude modulated optical fiber signals
- Cooled 1310nm DFB Laser with electronic multi-point-pre-distortion- keeps intermodulation interference (CTB,CSO) low
- Microprocessor controlled level control (ALC) for uncomplicated electric
  operation with constant transmission parameters
- Recommended for “Deep Fiber” applications, e.g HFC Access networks with small coax clusters and FTTx
- Flexible and services-friendly through modular construction, module slot on rear chassis
- 19” Base unit, 1RU with control and power supply and 2 slots for transmitter modules OTM 813-xx
- User-friendly and tidy: Signal connectors on rear chassis, displays and test points on front chassis
- Microprocessor controlled and display functions with alpha-numeric LCD-Display
- Addressable network management interface for remote control of modules and base unit
- Alarm signalisation with LEDs

Type	OT 813	OTM 813-08	OTM 813-10	OTM 813-12	OTM 813-13.5
Article-No.	5700 1321	5700 1322	5700 1323	5700 1324	5700 1325
Description	base unit with 2 transmitter slots	Optical transmitter module 1310nm, output power 8 dBm (6mW)	Optical transmitter module 1310nm, output power 10 dBm (10mW)	Optical transmitter module 1310nm, output power 12 dBm (16mW)	Optical transmitter module 1310nm, output power 13,5 dBm (22mW)

Type		OT 813 / OTM 813-xx
Optical output power	dBm	8 / 10 / 12 / 13,5, direct modulated DFB-Laser
Optical wavelength	nm	1310 ± 20
RF frequency range	MHz	47 - 870
RF input level	dBµV	80 ± 3 (Multiple channel load > 20AM/TV chanal)
C/N	dB	52 (10 km fiber distance, receiver input 0 dBm)
CTB	dB	-67
CSO	dB	-62
RF flatness	dB	± 0,75
RF impedance	Ω	75
RF input return loss	dB	> 16 / 47-550 MHz, > 14 / 550-870 MHz
Operating temperature	°C	+ 5 ... + 40
Overall relative humidity	%	40 - 70
Fibre connector		SC/APC
RF connector		F- connectors
NMS-Interface		RS 232/485, Base unit
Operating voltage	V~	230 (86 - 264), Switch mode power supply in base unit
Power consume	W	50 (Base unit with 2 modules)
Laser class		1M, DIN EN 60825-1 (2008)

ERBIUM-DOPED FIBRE AMPLIFIER 1550NM

DELTA Erbium doped fibre amplifier is designed for amplification of 1550nm optical wave lenght on single mode fibres

- To use with DELTA optical transmitter 1550nm to realize large FTTX networks
- 1 optical output
- For large distribution network
- For Video overlays in FTTx networks and xPON-application
- Low noise figure
- 980nm / 1480nm pump-laser diodes
- High saturated output power +18, 21
- Input and output optical power control
- Parameter-Indication: Input/Output-power, PUMP-Bias, PUMP-Temp, Voltage.
- SNMP Interface
- Available in a standard 19",1 rack unit chassis
- Redundant dual power supply

Type	OA 1155-1-18	OA 1155-1-21
Article-No.	5700 1613	5700 1813
Description	Optical 1550nm Amplifier EDFA, 1 Output, +18 dBm, SC/APC	Optical 1550nm Amplifier EDFA, 1 Output, +21 dBm, SC/APC

Type		OA 1155-1-xx
Operation wavelength (λ)	nm	1530 ~ 1570
Input power range	dBm	-5 ... +10
Total output power	dBm	18 (OA 1155-1-18) 21 (OA 1155-1-21)
Number of output port		1
Noise figure	dB	< 5,5
Maximal Gain	dB	27
Polarization dependent loss	dB	0,1
Polarization dependent gain	dB	0,5
Pump power leakage	dBm	-30
SNMP network management		RJ45
Power supply	V~	90 ... 265 (48 VDC on request)
Power consume	W	< 50
Operation temp.	°C	0 - 50
Storage temp.	°C	-40 ... +85
Operating relative humidity	%	5 - 95
Size (W x D x H)	mm	482 x 360 x 44
Laser class		1M, DIN EN 60825-1 (2008)

ERBIUM-DOPED FIBRE AMPLIFIER 1550NM

DELTA Erbium doped fibre amplifier is designed for amplification of 1550nm optical wave lenght on single mode fibres

- To use with DELTA optical transmitter 1550nm to realize large FTTX networks
- 4 optical outputs
- For large distribution network
- For Video overlays in FTTx networks and xPON-application
- Low noise figure
- 980nm / 1480nm pump-laser diodes
- High saturated output power at each output +18 or +21dBm
- Input and output optical power control
- Parameter-Indication: Input/Output-power, PUMP-Bias, PUMP-Temp, Voltage.
- SNMP Interface
- Available in a standard 19",1 rack unit chassis
- Redundant dual power supply

Type	OA 1155-4-18	OA 1155-4-21
Article-No.	5700 1810	5700 1821
Description	Optical 1550nm Amplifier EDFA, 4 Outputs, +18 dBm, SC/APC	Optical 1550nm Amplifier EDFA, 4 Outputs, +21 dBm, SC/APC

Type		OA 1155-4-xx
Operation wavelength (λ)	nm	1540 ~ 1560
Input power range	dBm	-5 ... +10
Total output power	dBm	18 (OA 1155-4-18) 21 (OA 1155-4-21)
Number of output port		4
Noise figure	dB	< 6,5
Maximal Gain	dB	27
Polarization dependent loss	dB	0,1
Polarization dependent gain	dB	0,5
Pump power leakage	dBm	-30
SNMP network management		RJ45
Power supply	V~	90 ... 265 (48 VDC on request)
Power consume	W	< 70
Operation temp.	°C	0 - 50
Storage temp.	°C	-40 ... +85
Operating relative humidity	%	5 - 95
Size (W x D x H)	mm	482 x 360 x 44
Laser class		1M, DIN EN 60825-1 (2008)

ERBIUM-DOPED FIBRE AMPLIFIER 1550NM

DELTA Erbium doped fibre amplifier is designed for amplification of 1550nm optical wave lenght on single mode fibres

- To use with DELTA optical transmitter 1550nm to realize large FTTX networks
- 8 optical outputs
- With integrated wavelength division multiplexer (WDM) to realize GPON solution with RF Video Overlay
- Low noise figure
- 980nm / 1480nm pump-laser diodes
- With integrated WDM for 1550 / 1310 and 1490nm wavelengths to realize GPON solution with RF Video Overlay
- WDM isolation between RF Overlay and GPON ports > 40 dB
- WDM insertion loss of WDM for GPON (1310/1490nm) and RF Video Overlay (1550nm) channels < 0.8 dB
- High saturated output power at each output +18, +21 dBm
- Input and output optical power control
- Parameter-Indication: Input/Output-power, PUMP-Bias, PUMP-Temp, Voltage…
- SNMP Interface
- Available in a standard 19", 2 rack unit chassis
- Redundant dual power supply

Type	OA 1155-8-18 W	OA 1155-8-21 W
Article-No.	on request	5700 2010
Description	Optical 1550nm Amplifier EDFA with integrated WDM 1550/1310 and 1490nm, 8 Outputs, +18 dBm, SC/APC	Optical 1550nm Amplifier EDFA with integrated WDM 1550/1310 and 1490nm, 8 Outputs, +21 dBm, SC/APC

Type		OA 1155-8-xx W
Operation wavelength (λ)	nm	1540 ~ 1560
Input power range	dBm	-5... +10
Total output power	dBm	18 (OA 1155-8-18 W) 21 (OA 1155-8-21 W)
Number of output port		8
Noise figure	dB	< 6,5
Maximal Gain	dB	27
Polarization dependent loss	dB	0,1
Polarization dependent gain	dB	0,5
Pump power leakage	dBm	-30
Insertion loss of WDM	dB	0,8
Isolation of WDM between GPON and RF Overlay ports		40
SNMP network management		RJ45
Power supply	V~	230
Power consume	W	< 70
Operation temp.	°C	0 - 50
Storage temp.	°C	-40 - 85
Operating relative humidity	%	5 - 95
Size (W x D x H)	mm	482 x 360 x 44
Laser class		1M, DIN EN 60825-1 (2008)

ERBIUM-DOPED FIBRE AMPLIFIER 1550NM

DELTA Erbium doped fibre amplifier is designed for amplification of 1550nm optical wave lenght on single mode fibres

- To use with DELTA optical transmitter 1550nm to realize large FTTX networks
- 16 optical outputs
- With integrated wavelength division multiplexer (WDM) to realize GPON solution with RF Video Overlay
- Low noise figure
- 980nm / 1480nm pump-laser diodes
- With integrated WDM for 1550 / 1310 and 1490nm wavelengths to realize GPON solution with RF Video Overlay
- WDM isolation between RF Overlay and GPON ports > 40 dB
- WDM insertion loss of for GPON (1310/1490nm) and RF Video Overlay (1550nm) channels < 0.8 dB
- High saturated output power at each output +18, +21 dBm
- Input and output optical power control
- Parameter-Indication: Input/Output-power, PUMP-Bias, PUMP-Temp, Voltage…
- SNMP Interface
- Available in a standard 19", 2 rack unit chassis
- Redundant dual power supply

Type	OA 1155-16-18 W	OA 1155-16-21 W
Article-No.	on request	5700 2009
Description	Optical 1550nm Amplifier EDFA with integrated WDM 1550/1310 and 1490nm, 16 Outputs, +18 dBm, SC/APC	Optical 1550nm Amplifier EDFA with integrated WDM 1550/1310 and 1490nm, 16 Outputs, +21 dBm, SC/APC

Type		OA 1155-16-xx W
Operation wavelength (λ)	nm	1540 ~ 1560
Input power range	dBm	-5 ... +10
Total output power	dBm	18 (OA 1155-16-18 W) 21 (OA 1155-16-21 W)
Number of output port		16
Noise figure	dB	< 6,5
Maximal Gain	dB	27
Polarization dependent loss	dB	0,1
Polarization dependent gain	dB	0,5
Pump power leakage	dBm	-30
Insertion loss of WDM	dB	0,8
Isolation of WDM between GPON and RF Overlay ports		40
SNMP network management		RJ45
Power supply	V~	230
Power consume	W	< 70
Operation temp.	°C	0 - 50
Storage temp.	°C	-40 - 85
Operating relative humidity	%	5 - 95
Size (W x D x H)	mm	482 x 360 x 44
Laser class		1M, DIN EN 60825-1 (2008)

OPTICAL FORWARD PATH RECEIVER

- Full optical HFC receiver in 19” single rack unit housing
- With optical-electrical converter module with low noise pre-Amplifier
- High output level with low, non-linear distortions (CTB, CSO) through power doubling output stage
- Connections for fibre (SC/APC) und RF socket for signal output on rear chassis
- Modular construction, consisting of base unit with power supply and receiver Slot
- User-friendly and tidy: Signal connectors on rear chassis, displays and test points on front chassis
- DC test point, optical input level (5V/mW) and level signalization with LED
- Simple Plug & Play operation
- Efficient, energy-saving switch-mode power supply

Type	OR 801
Article-No.	5700 1328
Description	19” Optical receiver, 1 rack unit, 47 – 862 MHz, -6…+3dBm

Type		OR 801
Operation wavelength (λ)	nm	1000 - 1600
Optical return loss	dB	> 45
Optical input power	dBm	-6 ... +3
RF frequency range	MHz	47 - 862
RF output Level	dBµV	> 100 (@ 0dBm optical input power, OMI = 4%)
C/N	dB	51
CTB	dB	< -65
CSO	dB	< -62
Test point optical input	V/mW	5
RF impedance	Ω	75
Test point RF output	dB	-20
Operating temperature	°C	+ 5 ... + 40
Overall relative humidity	%	40 - 70
MTBF	h	> 40.000
Fiber connector		SC/APC
RF connector		F-connectors
Operating voltage	V~	230 (180-244), Switch mode power supply
Power consumption	W	20 (Base unit with receiver module)

OPTICAL RETURN PATH RECEIVER

DELTA Optical return path receiver is designed for converting upstream optical signal into RF signals at the head-end or remote hubs

- Modular return path receiver for optical fibre hubs in HFC and FTTx access networks
- Optical-electrical converter module and with low noise pre-amplifier
- 19" Base unit, 1 rack unit (RU) for 3 receiver modules ORM 200
- High output ability through power doubling output stage
- Contacting of display and test signals via SUB-D Plug to front panel of base unit
- Configurable as "Point-to-point" and "point-to-multi-point" links
- User-friendly and tidy: Signal connectors on rear chassis, displays and test points on front chassis
- For each module slot: Test point for optical input signal and level signal with LED, as well as test point for RF-output level
- Efficient, energy-saving switch-mode power supply

Type	OR 203	ORM 200
Article-No.	5700 1326	5700 1327
Description	Base unit for 3 return path receiver modules	Optical return path receiver module, 5 - 200 MHz, SC/APC

Type		OR 203 + ORM 200
Optical wavelength	nm	1000 - 1600
Optical return loss	dB	> 45
Optical input power	dBm	-6 ... +3
RF frequency range	MHz	5 - 200
RF output Level	dBµV	100 (@ 0dBm optical input power, OMI = 4%)
C/N	dB	51
CTB	dB	< -65
CSO	dB	< -62
Test point optical input	V/mW	5
RF impedance	Ω	75
Test point RF output	dB	-20
Operation temperature	ºC	+ 5 ... + 40
Overall relative humidity	%	40 - 70
Fibre connector		SC/APC
RF connector		F-connectors
Operating voltage	V~	230 (180-244)
Power consumption	W	46 (Base unit with receiver module)

OPTICAL RETURN PATH RECEIVER RFoG

DELTA Optical return way receiver is designed for converting upstream optical signal into RF signals at the head-end or remote hubs, typically used for RFoG deployments

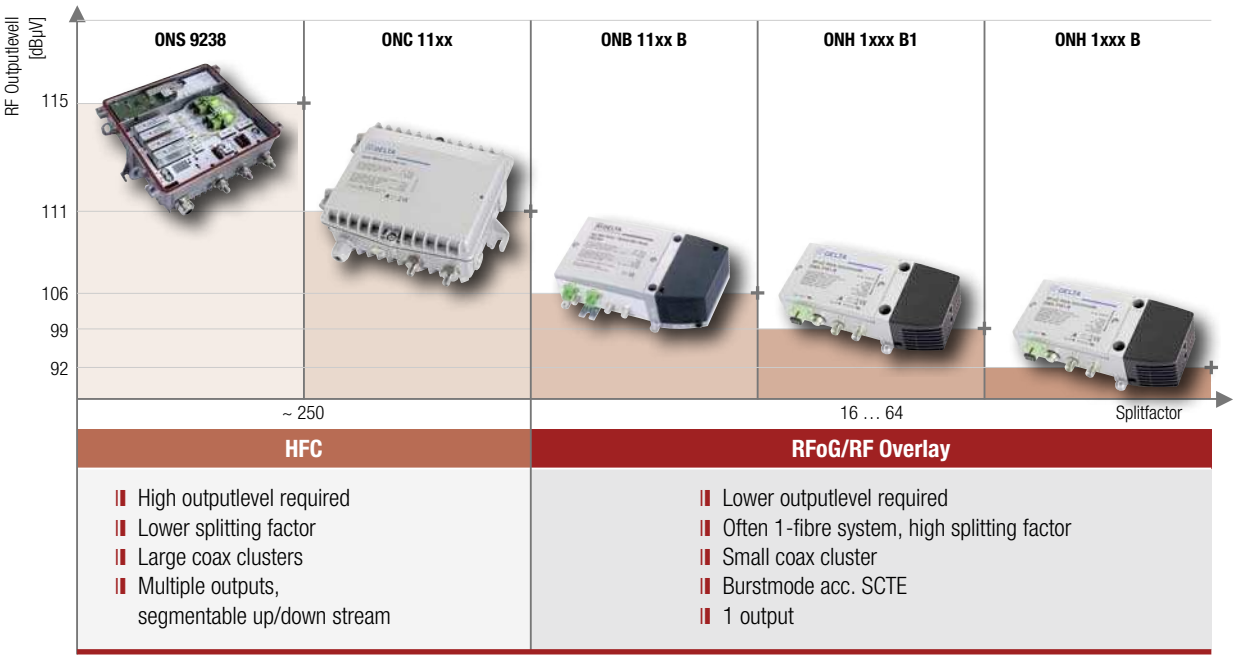
- 4-Port receiver supports up to 256 mini node transceiver
- Four independent receiver are packed in a standard 19",1 RU
- Wideband receiver 1260nm – 1620nm
- Optical input power range -26 dBm to -12 dBm
- RF output power adjustable from 75 to 95 dBµV
- Low noise enables DOCSIS 3.0 upstream bonding
- Supports DOCSIS 3.0 upstream bonding on PON architectures, typically designed for RFoG
- Test / Monitor points for each RF output
- Front mounted SC/APC connectors
- Temperature-hardened: 0°C to +50°C
- Redundant power supply

Type	OR 204 L
Article-No.	5700 1601
Description	Optical return path receiver 1260..1620nm, 4 optical inputs, -26…-12 dBm, 4 RF-Outputs, SC/APC

Type		OR 20x L
Operation wavelength (λ)	nm	1260 - 1620
Receiving Power	dBm	-26 … -12
Optical fibre connector		SC/APC
RF bandwidth	MHz	5 - 85
RF output power	dBµV	75 - 95
Flatness	dB	≤ ± 0,75
Return loss	dB	16
RF test point/Monitor	dB	-20 ± 0,5
RF connector	dB	F-female
Equivalent input noise	pA/√Hz	1,0
Power supply	V~	230
Power consume	W	<50, 12W @ 1 Receiver module
Operation temp.	°C	0 - +50
Size (W x D x H)	mm	482 x 310 x 44

PRODUCT OVERVIEW OPTICAL NODES

For an easear selection of our node portfolio please refer to the table below



- High outputlevel required
- Lower splitting factor
- Large coax clusters
- Multiple outputs, segmentable up/down stream

- Lower outputlevel required
- Often 1-fibre system, high splitting factor
- Small coax cluster
- Burstmode acc. SCTE
- 1 output

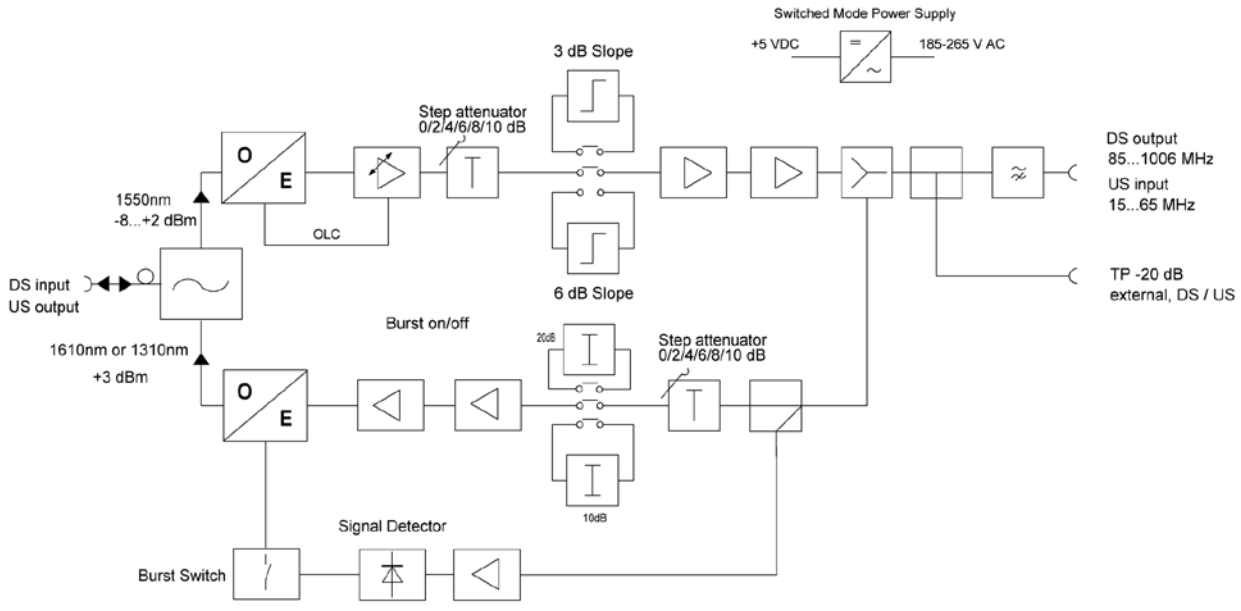
RFoG MICRO NODE - PLUS

The Micro Node ONH 1161 B is a compact FTTB and FTTH node and designed for bidirectional DOCSIS-PON / RF over Glass (RFoG) networks.

- Very low noise optical receiver
- Constant RF output level at wide optical input power range
- Optical AGC function based on optical input power
- Interstage Attenuator and Slope - Step spin control
- Optical Input power indicator and monitoring LEDs
- RF input and output test point
- Ultra Low noise DFB- laser with isolator in burst mode operation

Type	ONH 1000	ONH 1161 B	ONH 1161 B1
Article-No.	5700 1708	5700 1688	5700 1957
Description	Optical Micro-Receiver, 1550nm, 40-1006 MHz, 92 dBµV RF-output level	Optical Micro-Node, 1550nm/1610nm, 15-65/85-1006 MHz, 92 dBµV RF-output level	Optical Micro-Node, 1550nm/1610nm, 15-65/85-1006 MHz, 99 dBµV RF-output level

ONH 11xx B



Type			ONH 1161 B	ONH 1161 B
Applications			FTTH, FTTB, DOCSIS-PON/RFoG	
Compact die-cast housing			188 x 85 x 50 / IP 20, In-door	
Weight		kg	0,8	
Fiber connectors			SC/APC	
RF connectors			F-female	
Mains feeding		V~/W	230 / < 6	
Operation temperature		°C	-20…+55, Free convection	
Adjustment elements			Step Spin Attenuator and Jumper	
Internal WDM (Tx / Rx)		nm	1550 / 1610 (Tx. 1310 or 1590nm on request)	
Downstream	Optical wavelength	nm	1550 ± 10	
	Optical input power	dBm	-8…+2, max. +2 dBm optical input power	
	Frequency range	MHz	85…1006	
	Frequency response	dB	± 0,7	
	Optical level control (OLC)	dBm	-7…+1 (RF-output level ± 1 dB)	
	RF output level	dBµV	92 ± 1 @ -7…+1 dBm, OMI = 4 %, CTB,CSO > 60 dBc	99 ± 1 @ -7…+1 dBm, OMI = 4 %, CTB,CSO > 60 dBc
	C/N		50 dBc @ -3 dBm, OMI 4%	
	RF level attenuator	dB	0 / 2 / 4 6 / 8 / 10 (Step Spin Attenuator)	
	RF slope	dB	0 / 3 / 6 (Switchable by jumper)	
	Test point RF output	dB	-20 (F-female, external)	
	Monitoring optical input	dBm	Green LED on: input > -10	
	Test point optical input	V/mW	2 (Inside housing)	
Upstream	DFB Laser / optical power	dBm	1610 nm / +3 (With isolator)	
	Laser operation		Burst Mode (Laser “Delay-Time” ≤ 0,8 µsec) SCTE compliant	
	RF input dynamic range	dBµV	76…100 (“Laser ON”@ Min. input RF-Level 76 dBµV)	
	Frequency range	MHz	15…65	
	RF input level	dBµV	OMI 10% @ 70 (Att. = 0 dB)	
	RF input level attenuator	dB	0 / 2 / 4 6 / 8 / 10 (Step Attenuator 2 dB steps), 0 / 10 / 20 dB Jumper Att.	

MINI FIBRE NODE

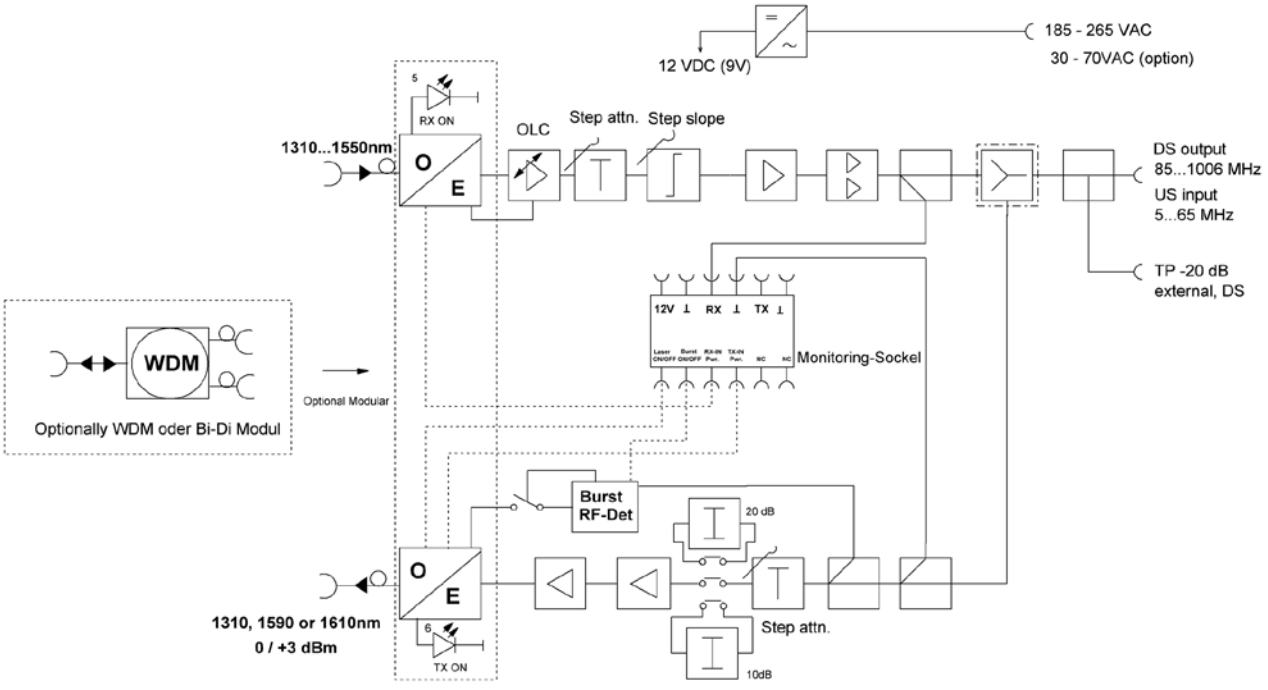
Smart fibre node for FTTH and PON- networks

The Burst Mode mini node ONB 11xx B is part of the Opto*Link* 1000 platform, which is special designed for DOCSIS-PON/RF over Glass (RFoG) applications

- Compact optical receiver with modular return way Burst Mode laser
- High RF output level and dynamic range
- Low noise impedance receiver
- Low noise DFB- laser in burst or CW mode operation
- Optical AGC built in
- Internal WDM-filter 1550/1310, 1550/1610 nm (others optional) for 1 fibre system, 2 fibre system on request
- Return way via Diplexer-module selectable
- Prepared for NMS monitoring module

Type	ONB 1000	ONB 1131 B	ONB 11xx	ONB 1161 B
Article-No.	5700 1958	5700 1637	5700 xxx	5700 1599
Description	Optical Mini receiver 5…1006 MHz	Optical Mini Node, Burst Mode DFB Laser 1310nm, +3 dBm, Internal WDM 1550 / 1310 nm	Optical Mini Node, DFB Laser CWDM xx nm, +3 dBm 2x SC/APC	Optical Mini Node, Burst Mode DFB Laser 1610nm, +3 dBm, WDM 1550/1610nm

ONB 11xx B



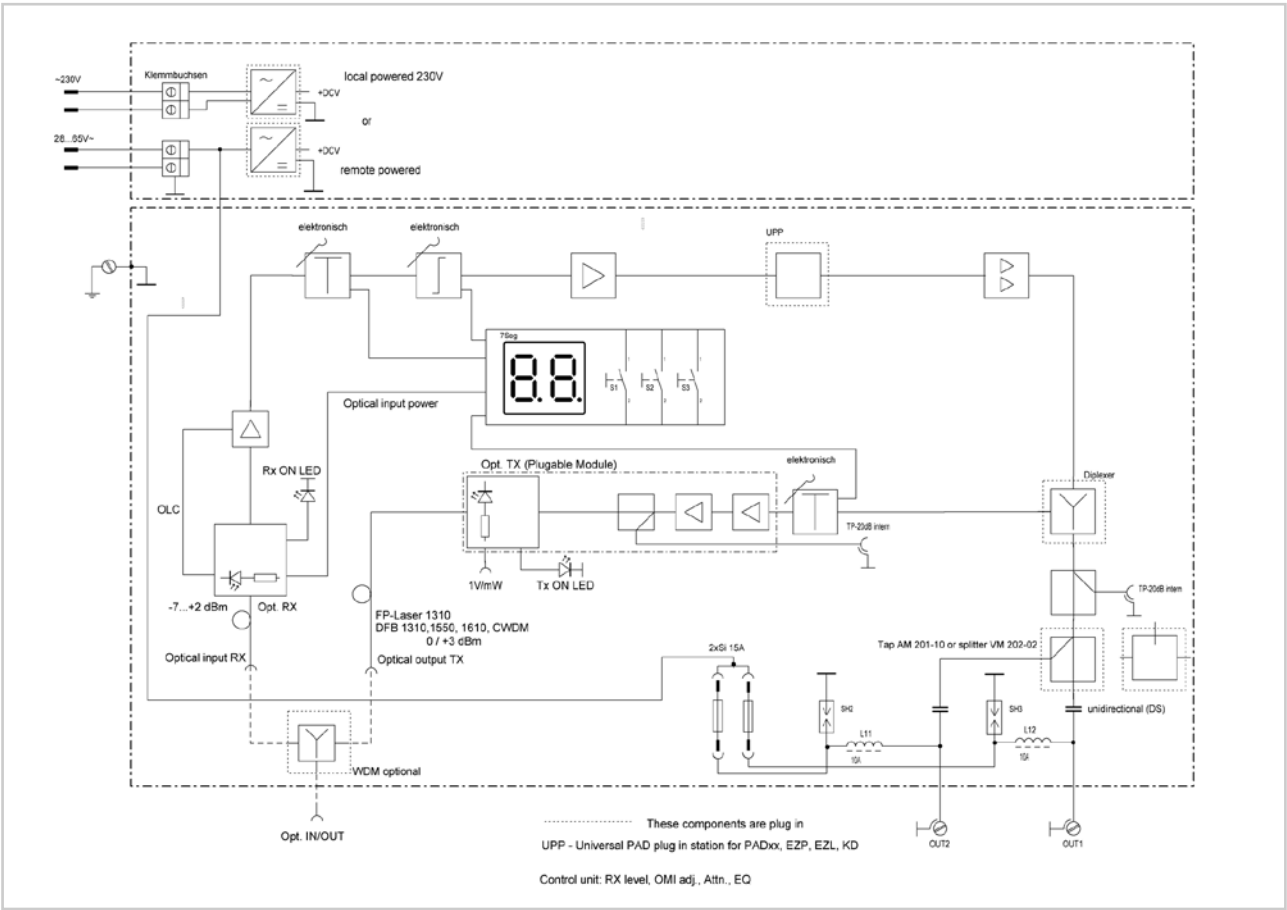
Type			ONB 11xx B*
Applications			HFC, FTTC, DOCSIS-PON/RfoG
Compact die-cast housing		mm	210 x 123 x 70 / IP 50, In-door
Weight		kg	1,3
Fiber connectors			SC/APC, 2 Pcs (without internal WDM), 1 Pc (with internal WDM)
RF connectors			F-female
Mains feeding		V~/W	185…265 / 13,5
Operation temperature		°C	-20…+55, Free convection
Adjustment elements			Step Spin 2 dB steps for level and slope control
Internal WDM			1550/1310 or 1550/1610nm (CWDM on request)
Downstream	Optical wavelength	nm	1260 …1620
	Optical input power	dBm	-8…+2
	Optical level control	dBm	-7…+1 (RF-output level ± 1 dB)
	Frequency range	MHz	47/85…1006 (Diplexer RLK 30 / 65)
	Frequency response	dB	± 0,7
	RF output level	dBµV	106 @ -7...+1 dBm, OMI = 4% (CTB,CSO > 60 dBc, 41Ch. PAL, 54 Ch.QAM, Flat)
	C/N		53 @ -3 dBm, OMI 4%
	RF slope	dB	0 / 2 / 4 6 / 8 / 10 Step Spin
	RF level attenuators	dB	0 / 2 / 4 6 / 8 / 10 Step Spin
	Monitoring optical input	dBm	Green LED on: input > -10
	Test point optical input	V/mW	2 (Inside enclosure)
Upstream	DFB Laser / optical power	dBm	+3 (1310, 1590, 1610 nm, other on request)
	Laser operation		Burst Mode, Laser „Delay-Time“ < 1 µSec
	RF input dynamic range	dBµV	74 … 100 („Laser ON“ @ 70 dBµV)
	Frequency range	MHz	5…30/65 (Diplexer RLK 30 / 65)
	RF input level	dBµV	OMI 15% @ 76 (Att. = 0 dB)
	RF input level attenuator	dB	0 / 2 / 4 6 / 8 / 10 Step Spin, 0/10/20dB Jumper Attn.
	Monitoring optical output		Green LED on: output power available

MEDIUM FIBRE NODE FOR HFC / FTTX

A deep Fibre Node for Hybrid Fibre Coaxial Networks
The node ONC 1000 is part of the OptoLink 1000 platform, which is designed for deep fibre deployments in 1 GHz HFC networks with small coaxial clusters or FTTX.

- Compact optical receiver with modular return way laser
- High RF output level and dynamic range , 2 outputs
- Low noise impedance receiver
- Low noise DFB- laser in burst or CW mode operation
- Optical level control (OLC) based on optical input power
- 7-Segment display for various monitoring options and easy control
- Mains or remote feeded types available
- Internal fibre splice management

Type	ONC 1000	ONC 1000 R	ONC 1131 F	ONC 1131 FR	ONC 1131	ONC 1131 R
Article-No.	5700 1625	5700 1709	5700 1710	5700 1711	5700 1706	5700 1707
Description	Optical Receiver, RX 1260…1620nm, 40-1006 MHz, mains feeding 185…265 V~	Optical Receiver, RX 1260…1620nm, 40-1006 MHz, remote feeding 28…70 V~	Optical Node, RX 1260…1620nm, 47/85-1006 MHz, TX FP 1310nm, 0 dBm, 185…265 V~	Optical Node, RX 1260…1620nm, 47/85-1006 MHz, TX FP 1310nm, 0 dBm, 28…70 V~	Optical Node, RX1260...1620nm, 47/85-1006 MHz, TX DFB 1310nm, 3 dBm, 185…265 V~	Optical Node, RX 1260…1620nm, 47/85-1006 MHz, TX DFB 1310nm, 3 dBm, 28…70 V~



Type			ONC 1000 (R), ONC 1000, ONC 11xx
	Applications		HFC, FTTC/FTTB
	Compact die-cast housing	mm	225 x 190 x 86 / IP 65, Out-door
	Fiber connectors (internal)		SC/APC (internal fibre slice management)
	Connectors		PG 11-RF out , PG 13,5 (Optical fibre cable input)
	Mains feeding	V~/W	185…265 / 20 (ONC 1000)
	Remote feeding	V~	28…70 / 0,67 A @ 30 VAC, 10 A (ONC 1000 R)
	Operation temperature	°C	-20…+55, Free convection
	OLC	dBm	-7…+1 (RF output ±1dB, optical level control)
	Adjustment elements	dB	0…15 (adjustable by electronic step attenuators in 1dB steps, 7-segm. Display+micro)
	Return laser module		various available (0, 3 dBm DFB, FP, CWDM)
	RF outputs		1 or 2 (Selectable with splitter module 1:2 or taps modules : 10 or 20 dB)
Downstream	Optical wavelength	nm	1290 …1620
	Optical input power	dBm	-8…+2 (1310nm)
	Optical return loss	dB	> 40
	Frequency range	MHz	47/85…1006 (Diplex filter RLK 30 / 65)
	Frequency response	dB	± 0,7
	OLC limited RF output power	dBµV	113 @ -6…+1 dBm, OMI= 4,4%, CTB,CSO>60 dBc, 41Ch PAL + 54 Ch QAM, with Tx.1550nm Slope = 9 dB, One output
	MGC limited RF-output power (Without OLC)	dBµV	121 @ 0 dBm, OMI = 4,4% one output, Jumper + µC
	C/N	dBc	53 @ -3 dBm, OMI 4%
	RF slope	dB	0…15 dB (adjustable by electronic step attenuators in 1 dB steps), 1 dB step attn.
	RF level adjustment	dB	0…15 dB (adjustable by electronic step attenuators in 1 dB steps), 1 dB step attn.
	RF test point	dB	-20 (internal)
	Monitoring optical input	dBm	Green LED on: input > -10
	Optical input power		7-segment display, Power meter function
Upstream	Laser / optical power Continous Burst Mode		1310 nm: FP-DFB-Laser / 0 dBm (ONC 1131 F) CWDM 1470…1610 nm: DFB-Laser / 0 dBm (ONC 11xx) 1610, 1590, 1310nm / +3 dBm (ONC 11xx B for RFoG networks)
	Frequency range	MHz	5…30/65 (Diplexer RLK 30 / 65)
	RF input level (CWDM)	dBµV	OMI 10 % @ 70, 0 dB attn, DFB- Tx. 1550nm, 0 dBm
	RF input level attenuator	dB	0…15 (adjustable by electronic step attenuators in 1 dB steps), 1 dB step attn.
	RF test point	dB	-20 (internal)
	Monitoring optical output		Green LED on: output power available

SEGMENTABLE FIBRE NODE 2X2 FOR HFC

ONS 9238 is one of the most advanced optical nodes and uses microprocessor technology to enable an uninterrupted control and complete remote monitoring of the device operation.
ONS 9238 is dedicated to traditional HFC and FTTB networks. Thanks to the use of advanced hybrids, it can achieve the highest levels of output signals while simultaneously reducing power consumption. The main advantages of the device include the following modes:

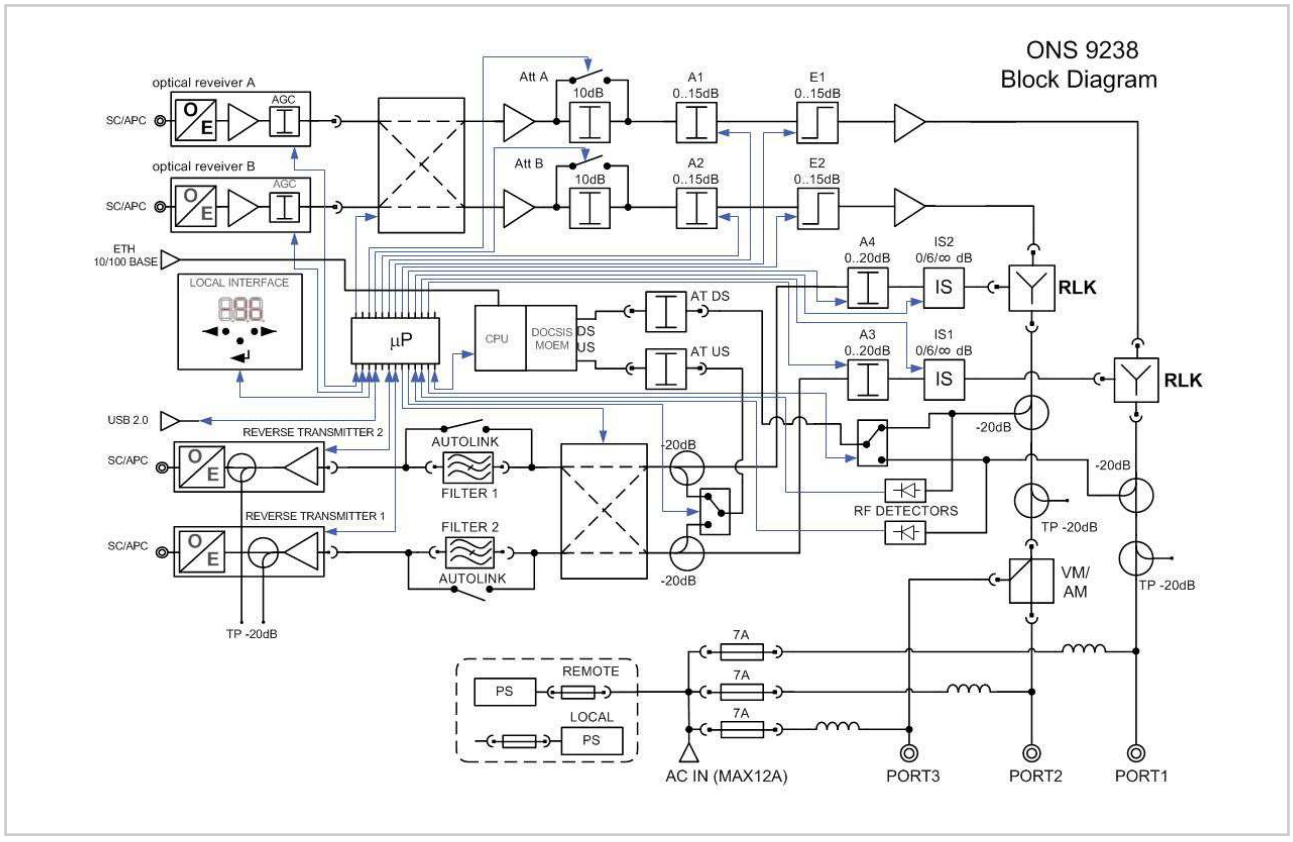
- „AUTOALIGNMENT“, depending on the given input parameters of optical signal and the parameters of RF output signal, it enables automatic internal control, which ensures that the programmed parameters are obtained.

The device can be equipped with monitoring module including RJ45 or SFP interface.
Depending on the need, there is a possibility of remote monitoring using fibre optic or copper medium. Total independence from DOCSIS infrastructure and RF parameter measurement system allows the operator to consciously control and change the quality of received signals. ONS 9238 can cooperate with an optical switch, forming an independent monitoring infrastructure or optional with DOCSIS or HMS monitoring system.

- 1 GHz frequency range
- Designed to work in HFC and FTTB networks

- Easy configuration – electronic adjustment and universal plug-in modules.
- Built-in AGC (Automatic Gain Control)
- 3-DIGIT LED display
- 2x2 full redundancy and segmentation in forward and reverse
- Local or remote powering
- Monitoring via SNMP v2c and WWW

Type	ONS 9238
Article-No.	5700 1938
Description	Segmentable Fibre Node 2x2



Type			ONS 9238
Applications			HFC, FTTC/FTTB
Compact die-cast housing		mm	245 x 207 x 125 / IP 65, Out-door
Fiber connectors (internal)			SC/APC
Connectors			PG 11 or 5/8" RF out, PG 13,5 (Optical fibre cable input)
Mains feeding		V~/W	185…265 / < 35 (ONS 9238)
Remote feeding		V~	28…70 / 0,67 A @ 30 VAC, 10 A (ONS 9238 R, 57001939)
Operation temperature		°C	-20…+55, Free convection
Testpoint A1, A2		dB	-20 (internal)
Return laser module			various available (DFB, FP, CWDM)
RF outputs			2 x 2 (redundant)
Downstream RX	Optical wavelength	nm	1100 …1650 (ORS 98 module)
	Optical input power	dBm	-7…+2 (1310nm)
	OLC		Yes (-6 … +0 dBm, optical level control)
	Optical return loss	dB	> 45
	Frequency range	MHz	85…1006 (Diplex filter RLK 465)
	Frequency response	dB	± 0,75
	Output level 1310nm @ -3 dBm		
	E1 and E2 = 6 dB slope, 3,5% OMI		2 x 114 dBµV (acc. CENELEC 42 CTB/CSO > 60 dBc)
	E1 and E2 = 6 dB slope, 4,0% OMI		2 x 116 dBµV (acc. CENELEC 42 CTB/CSO > 58 dBc)
	C/N	dBc	52 @ -3 dBm, OMI 4%
	Interstage Att. A1, A2	dB	0…15 dB (adjustable by electronic step attenuators in 0,5 dB steps)
	Interstage slope E1, E2	dB	0…15 dB (adjustable by electronic step attenuators in 0,5 dB steps)
	RF test point	dB	-20 (internal)
Upstream TX	Laser / optical power (e.g. OTS 1610 D, 1610 nm DFB + 3 dBm)		1310/1610 nm: FP or DFB-Laser / 0 or 3 dBm CWDM 1470…1610 nm: DFB-Laser / 3 dBm
	Frequency range	MHz	5…65 (other on request)
	RF input level (CWDM)	dBµV	OMI 10 % @ 70, 0 dB attn
	RF level attenuator A3, 4	dB	0…20 (1 dB step attn.)
	RF test point	dB	-20 (internal)
	Monitoring optical output		Green LED on: output power available

Modules for ONS 9238

Type	Article-No.	Description
ORS 98	57001940	RX-Module 1260 -1620nm, -7…2 dBm
OTS 1310 D	57001941	TX-Module, DFB 1610nm, +3 dBm
OTS 1610 D	57001942	TX-Module, DFB 1310nm, +3 dBm
OTS 1xxx CWDM	On request	TX-Module, CWDM 1xxxnm, +3 dBm
RLK 465	57001945	Diplexers 5 - 65/85-1000 MHz
NHP 915	57001946	Rev path filter FPA 15 - 65 MHz
VM 902	57001947	Output splitter VM 2-way 3,5 dB
AM 9-01-10	57001948	Output RF tap AM 10 dB
FOSTRA D	On request	DOCSIS Transponder
FOSTRA H	On request	HMS Transponder

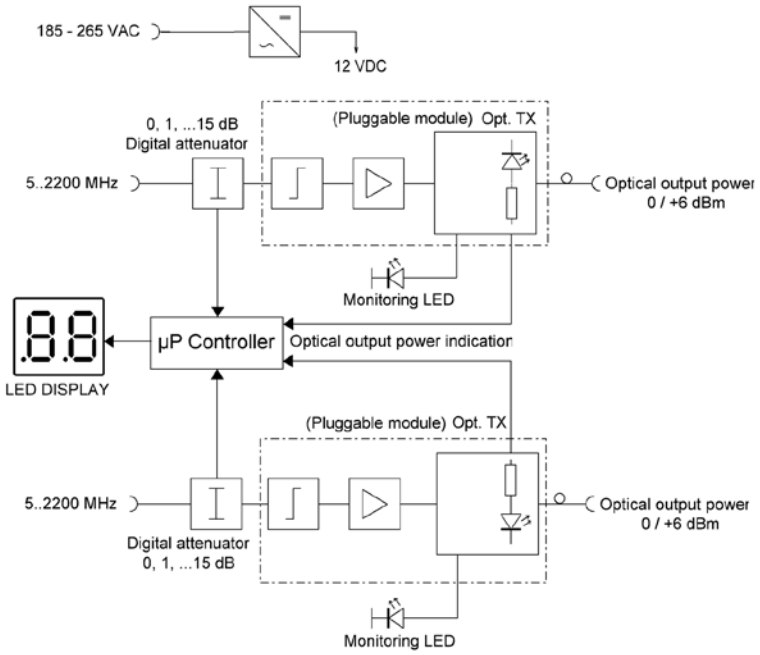
OPTICAL CATV / SAT-IF TRANSMITTER

Optical compact twin transmitter for RF and IF over fibre
The compact optical transmitter 5-2250 MHz is part of the Opto*Link* 2000 platform

- Compact optical transmitter with 1 or 2 pluggable modules
- Compatible with the compact twin receiver ORC 2200
- Bandwidth 47...2250 MHz
- Ready for analogue PAL TV channels, SAT QPSK distribution High linearity, DFB Laser with internal optical isolator
- Electronic control of RF input level attenuation for each module on the LED display
- Measurement of the optical output power for each module on the LED display
- Monitoring LEDs

Type	OTC 2113-6	OTC 2213-6	OTC 2113-0	OTC 2213-0
Article-No.	5700 1532	5700 1534	5700 1578	5700 1579
Description	Optical compact transmitter, single version with 1 transmitter module 6 dBm	Optical compact transmitter, twin version with 2 transmitter module 6 dBm	Optical compact transmitter, single version with 1 transmitter module 0 dBm	Optical compact transmitter, twin version with 2 transmitter module 0 dBm

OTC 2213-0



Type		OTC 2213-x
Applications		CATV and SAT over fibre
Operation wavelength (λ)	nm	1310 ± 10
Optical output power	dBm	+6 / 0 (Indication on LED display)
Laser class		3M, DIN EN 60825-1 (2008)
RF bandwidth	MHz	5 … 2250
Frequency flatness	dB	± 0,5, 5 … 2250 MHz
RF input level PAL	dBµV	76…91, ATT = 0…15 dB @ OMI 4% (OTC 2213-6) 69…84, ATT = 0…15 dB @ OMI 4% (OTC 2213-0)
Maximum input Level	dBµV	93
Laser type		Un-cooled DFB, with internal optical isolator
RF return loss	dB	> 14, up to 2200 MHz
Optical return loss	dB	> 55
RF Input level attenuator	dB	0…15 (Indication and Setting on LED display,1 dB steps)
Monitoring optical output		Green LED on (Output power available)
Optical Link SAT-IF		with ORC 2200
Optical budget OTC2213-6 QPSK	dB	> 15 dB (BER degradation factor ~ 10)
Optical budget OTC2213-0 QPSK	dB	> 8 dB (BER degradation factor ~ 10)
Fiber connectors		SC/APC
RF connectors		F female
LNB-power supply	V/mA	12,8 / max. 500
Compact die-cast housing	mm	225 x 190 x 86
Operation voltage	V~	185…265
Operation temperature	°C	0…+55
Weight	kg	2

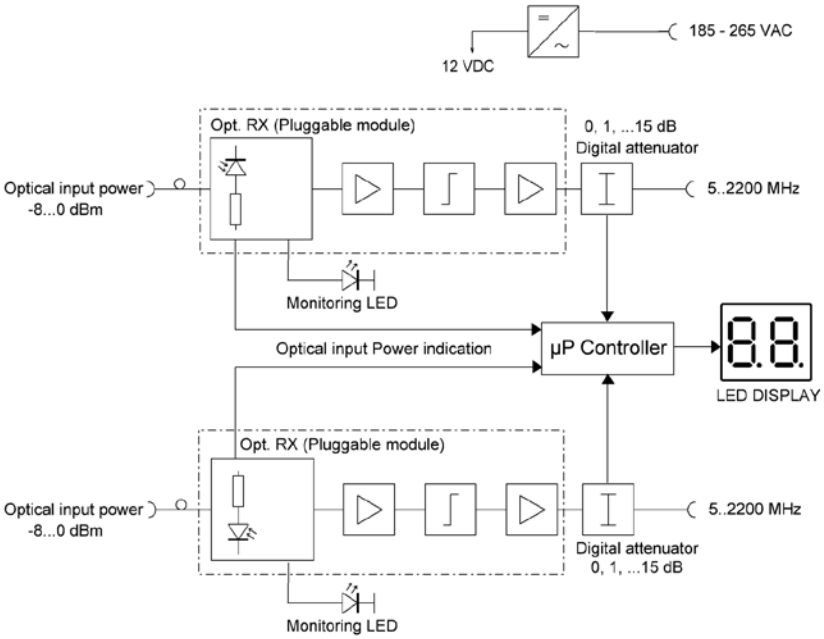
OPTICAL CATV / SAT-IF RECEIVER

Optical twin compact receiver for RF and IF over fiber
The compact optical Receiver 5-2250 MHz is part of the Opto- 2000 platform

- Compact optical receiver with 1 or 2 pluggable modules
- Compatible with the compact twin transmitter OTC 2213
- Bandwidth 47...2250 MHz
- Ready for analogue PAL TV channels, SAT QPSK distribution
- Low noise impedance receiver
- Electronic control of RF output level attenuation for each module on the LED display
- Measurement of the optical input power for each module on the LED display
- Monitoring LEDs

Type	ORC 2100	ORC 2200
Article-No.	5700 1533	5700 1535
Description	Optical compact receiver, Single version with 1 Receiver-Module 5 … 2250 MHz	Optical compact receiver, Dual version with 2 Receiver-Module 5 … 2250 MHz

ORC 2200



Type		ORC 2200
Applications		CATV and SAT over fibre
Operation wavelength (λ)	nm	1290 … 1600
Optical input power	dBm	-8 … 0 (+2 dBm, absolute Max.)
RF bandwidth	MHz	5 … 2250 (Max. 2400 MHz)
Frequency flatness	dB	± 0,75 (5 – 2200 MHz, measured with OTC 2213)
RF output level	dBµV	89 ± 1 @ 0dBm, OMI = 4% (measured with OTC 2213)
RF return loss	dB	> 14, up to 2200 MHz
Optical return loss	dB	> 55
RF output level attenuator	dB	Electronic control, 1 dB steps, 0..15dB (Indication and Setting on LED display)
Optical input power indication (digital)	dBm	-8,5 … 0 (Indication on LED display)
Monitoring optical input		Green LED on: input power > -8 dBm
Fiber connectors		SC/APC
RF connectors		F-female
Compact die-cast housing	mm	225 x 190 x 86 / IP 54
Mains feeding	V~	185…265
Operation temperature	°C	0…+55
Weight	kg	2

OPTICAL PLC SPLITTER 1260…1620NM

- Wide operation wavelength 1260…1620nm
- Good uniformity and low insertion loss
- Low polarization dependent loss
- 1 x 2, 1 x 4, 1 x 8, 1 x 16, 1 x 32 and 1 x 64 type splitters with SC/APC connectors (optional LC/APC)
- 1 x 2, 1 x 4, 1 x 8 type splitters in Optical Termination Box (OTB), for wall and mast mount
- 1 x 16, 1 x 32, 1 x 64 type splitters in 19" 1U chassis

Type	OCP 1-2 SC	OCP 1-4 SC	OCP 1-8 SC	OCP 1-16 SC	OCP 1-32 SC	OCP 1-64 SC
Article-No.	5700 1925	5700 1926	5700 1927	5700 1576	5700 1577	5700 1900
Description	Optical PLC Splitter 1200..1620nm, 1 Input, 2 Outputs, SC/APC, OTB 215 x 200 x 55 mm	Optical PLC Splitter 1200..1620nm, 1 Input, 4 Outputs, SC/APC, OTB 215 x 200 x 55 mm	Optical PLC Splitter 1200..1620nm, 1 Input, 8 Outputs, SC/APC, OTB 215 x 200 x 55 mm	Optical PLC Splitter 1200..1620nm, 1 Input, 16 Outputs, SC/APC 19" 1RU	Optical PLC Splitter 1200..1620nm, 1 Input, 32 Outputs, SC/APC 19" 1RU	Optical PLC Splitter 1200..1620nm, 1 Input, 64 Outputs, SC/APC 19" 1RU

Type		OCP 1-xx SC
Operation wavelength (λ)	nm	1260…1620
Insertion loss		
1 x 2 Splitter	dB	3,7
1 x 4 Splitter	dB	7,2
1 x 8 Splitter	dB	10,5
1 x 16 Splitter	dB	13,8
1 x 32 Splitter	dB	17,2
1 x 64 Splitter	dB	20,5
Polarization dependent loss	dB	< 0,3
Uniformity		
1 x 2 Splitter	dB	< 0,6
1 x 4 Splitter	dB	< 0,8
1 x 8 Splitter	dB	< 1,0
1 x 16 Splitter	dB	< 1,5
1 x 32 Splitter	dB	< 2
1 x 64 Splitter	dB	< 2,5
Return loss	dB	≥ 55
Optical fibre connector		SC/APC
Fibre type		SMF-28e
Operation temperature	°C	-40 ~ +85
Storage temperature	°C	-40 ~ +85
Max. input power	dBm	24,5
Package		
1 x 2, 1 x 4, 1 x 8 Splitter	mm	215 x 200 x 55 (OTB)
1 x 16, 1 x 32, 1 x 64 Splitter	mm	482 x 225 x 44 (19" 1RU)

OPTICAL WAVELENGTH DIVISION MULTIPLEXER

Optical wavelength- division multiplexer multiple optical carrier signals on a single optical fibre by using different wavelength to carry different signals.

- CWDM- channels available
- Low insertion Loss
- Wide pass band
- High channel isolation
- High Stability and Reliability
- Compatible with any FTTX PON technology

Type	OWDM 1-02 SC	OWDM 1-03 SC	OWDM 1-04 SC	OWDM 1-08 SC
Article-No.	5700 1629	5700 1854	5700 1611	5700 1630
Description	Optical Wavelength Division multiplexer, developed especially for RFoG system, 1550 / 1610nm, SC/APC, 19" 1RU or ABS	Optical Wavelength Division multiplexer, developed especially for GPON solution with RF Overlay or GPON + RFoG system, 1550 / 1610 / 1310 and 1490nm, SC/APC, 19" 1RU	Optical Wavelength Division multiplexer, 1470 / 1550 / 1590 / 1610nm, SC/APC, 19" 1RU	Optical Wavelength Division multiplexer, 1470 / 1490 / 1510….1610nm, SC/APC, 19" 1RU

Type		OWDM 1-xx SC
Operation wavelength (λ)	nm	1470 …1610, CWDM- channels (ITU-T G.694.2)
Center Wavelength	nm	± 0,5
Channel Spacing	nm	20 (CWDM- Network)
Insertion Loss		
1 x 2	dB	< 0,7
1 x 3	dB	< 1,4
1 x 4	dB	< 1,5
1 x 8	dB	< 3
Channel ripple	dB	≤ 0,3
Isolation	dB	≥ 40
Return Loss	dB	≥ 45
Max. input power	dBm	24,5
Operation Temperature	°C	0 ~ +70
Storage Temperature	°C	-40 ~ +85
Dimensions (W x D x H)	mm	482 x 225 x 44

OPTICAL TERMINATION BOX

- Wall and mast mountable fibre termination box
- Durable plastic box for indoor and outdoor applications IP 65
- Simply and clearly arranged incoming and outgoing fibre management
- Up to 2 and 11 splicing patching capacity (OTB 2-08 SC and OTB 2-16 SC)
- Up to 9 and 17 connector patching capacity (OTB 2-08 SC and OTB 2-16 SC)
- 1 x 2, 1 x 4 and 1 x 8 optical PLC splitter mountable (OTB 2-08 SC)
- 1 x 2, 1 x 4, 1 x 8 and 1 x 16 optical PLC splitter or WDM's mountable (OTB 2-16 SC)

OTB 2-08 SC

OTB 2-16 SC

Type	OTB 2-08 SC	OTB 2-16 SC
Article-No.	5700 1928	5700 1929
Description	Optical Termination Box, 2 Inputs, 8 Outputs, 9 SC adaptors, 2 splicing, 215 x 200 x 55 mm	Optical Termination Box, 2 Inputs, 16 Outputs, 17 SC adaptors, 11 splicing, 300 x 250 x 80 mm

OPTICAL FIBRE PATCH CORD

- Excellence mechanical endurance and Low insertion loss
- Standard exact plastic material, good exchangeability
- Cable diameter: Ø 3mm
- Single mode cable type SC, FC, LC, E2000/APC
- FTTx, Optical fibre CATV and Test equipments

Type	OMPC 02 E2-FC	OMPC 02 E2-SC	OMPC 02 FC-FC	OMPC 02 SC-FC	OMPC 02 SC-SC
Article-No.	5700 0920	5700 0921	5700 0924	5700 0922	5700 0923
Description	Optical fiber patch cord, Single mode, E2000 - FC/APC, 2 Meter	Optical fiber patch cord, Single mode, E2000 - SC/APC, 2 Meter	Optical fiber patch cord, Single mode, FC - FC/APC, 2 Meter	Optical fiber patch cord, Single mode, SC - FC/APC, 2 Meter	Optical fiber patch cord, Single mode, SC - SC/APC, 2 Meter

Type		OMPC 02 xx-yy
Insertion Loss	dB	< 0,2
Return Loss	dB	≥ 45
Mode-Operation		Single Mode, 9 / 125 µm
Type		8 ° APC (PC on request)
Operation Temperature	°C	-40 - +75
Storage Temperature	°C	-40 - +85
Length	m	2 (Other on request)

OPTICAL ATTENUATOR

Fibre optical attenuator reduces optical signal
in fixed attenuation values

- Low insertion loss
- High stability
- Connector type attenuator SC, FC/APC
- Use in optical fibre networks and test equipments

Type	OATN 03 FC	OATN 03 SC	OATN 06 FC	OATN 06 SC	OATN 10 FC	OATN 10 SC
Article-No.	5700 0907	5700 0910	5700 0908	5700 0911	5700 0909	5700 0912
Description	Optical attenuator, -3 dB, FC/APC	Optical attenuator, -3 dB, SC/APC	Optical attenuator, -6 dB, FC/APC	Optical attenuator, -6 dB, SC/APC	Optical attenuator, -10 dB, FC/APC	Optical attenuator, -10 dB, SC/APC

Type		OATN xx-yy
Attenuation value	dB	1,2,…10 ± 0,5 (Others on request)
Operation wavelength (λ)	nm	1200 - 1600
Return Loss	dB	≥ 60 APC ≥ 55 PC
Max. Optical input power	dBm	26,5
Fiber type		SC, FC/APC (Others on request)
Operation Temperature	°C	-30 - +75
Storage Temperature	°C	-40 - +85

OPTICAL POWER METER

Fibre optical power meter for accurate measure
of optical signal levels in FTTX deployments

- Hand held
- Auto power off
- Backlight LCD display
- Self calibration
- Power measurements in dBm or mw, insertion loss in dB

Type	OPM 200
Article-No.	5700 1862
Description	Optical power meter, -50…+26 dBm

Type		OPM 200
Measurement range	dBm	-50…+26
Operation wavelength (λ)	nm	800 - 1700 (850,1310,1490,1550,1590,1610 calibrated)
Accuracy/Resolution		± 5% , 0.01
Connector		FC (Interchangeable to SC, ST, 2.5mm universal)
Power supply		Battery 1.5 V AA (Operation app. 140h)
Operation Temperature	°C	-10 - +60
Dimension	mm	190 x 100 x 50

OPTICAL LIGHT SOURCE

Fibre optical light source / transmitter for easy testing of optical network structures

- Hand held
- Auto power off
- Backlight LCD display
- Self calibration
- Tone generator 270Hz, 1kHz, 2kHz

Type	OLS 103
Article-No.	5700 1863
Description	Optical light source, 1310, 1550, 1610nm

Type		OLS 103
Light power	dBm	-0…-5, adjustable
Transmitted wavelengths (λ)	nm	1310,1550,1610 (Other wavelengths on request)
Spectrum wide	nm	< 5,5
Connector		FC (Interchangeable to SC, ST, 2.5 mm universal)
Power supply		Battery 1.5 V AA (Operation app. 140 h)
Operation Temperature	°C	-10 - +50
Dimension	mm	190 x 100 x 50

OPTICAL CLEANING KIT

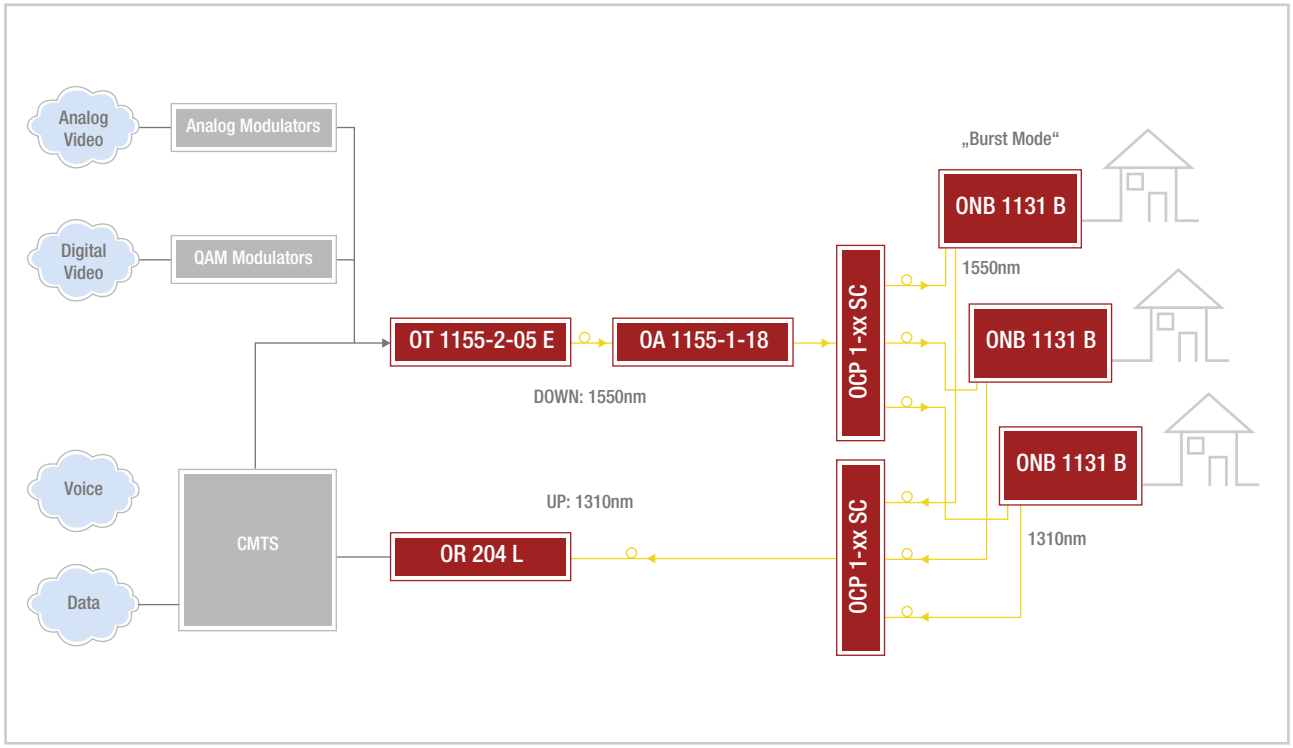
Careful cleaning of fibre optic connectors

- Easy to clean
- Up to 50 times cleaning

Type	OCT 1	OCT 2
Article-No.	5700 1864	5700 1865
Description	Cleaning tool 1,25 mm, LC/APC	Cleaning tool 2,25 mm, FC/APC, LC/APC

FTTX-APPLICATIONS – RFoG NETWORK SYSTEM

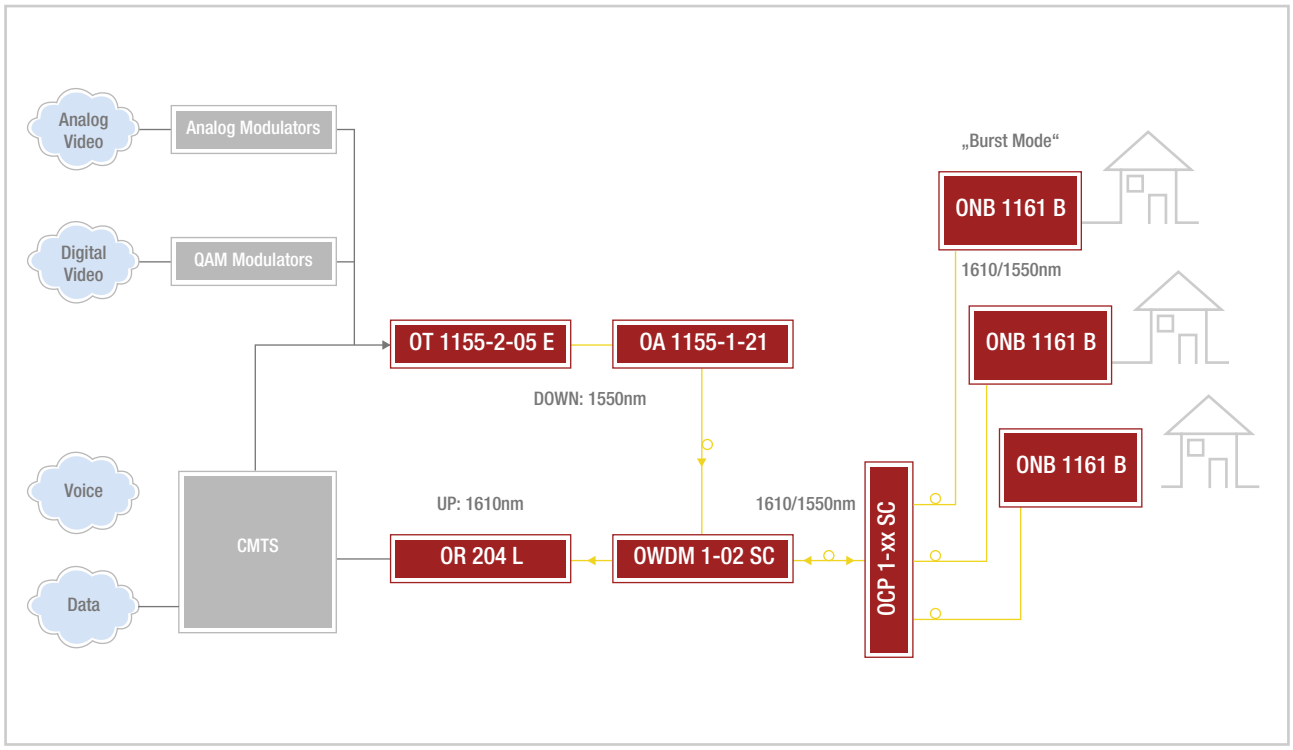
2 fibre-system application “Burst operation”



Splitter	Description
1 x 16	• Distance 1 + 2 up to 28 km available, Return laser power +3 dBm • Mini node C/N = 52 @ 0 dBm, OMI = 4 % • Pin = -20 dBm @ Return path receiver OR 204 L
1 x 32	• Distance 1 + 2 up to 19 km available, Return laser power +3 dBm • Mini node C/N = 52 @ 0 dBm, OMI = 4 % • Pin = -20 dBm @ Return path receiver OR 204 L
1 x 64	• Distance 1 + 2 up to 10 km available, Return laser power +3 dBm • Mini node C/N = 52 @ 0 dBm, OMI = 4 % • Pin = -20 dBm @ Return path receiver OR 204 L

FTTX-APPLICATION – RFoG NETWORK SYSTEM

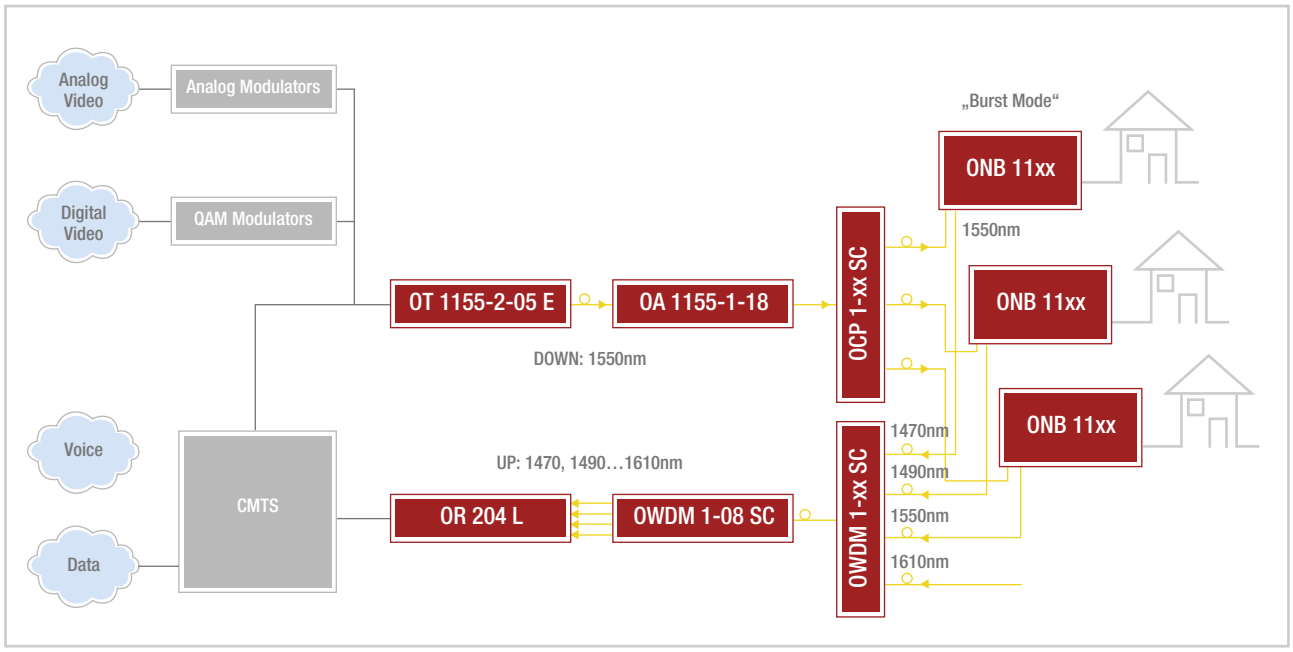
1 fibre-systems application "Burst operation"



Splitter	Description
1 x 16	• Distance 1 + 2 up to 25 km available, Return laser power +3 dBm • Mini node C/N = 52 @ 0 dBm, OMI = 4 % • Pin = -20 dBm @ Return path receiver OR 204 L
1 x 32	• Distance 1 + 2 up to 15 km available, Return laser power +3 dBm • Mini node C/N = 52 @ 0 dBm, OMI = 4 % • Pin = -20 dBm @ Return path receiver OR 204 L
1 x 64	• Distance 1 + 2 up to 8 km available, Return laser power +3 dBm • Mini node C/N = 52 @ 0 dBm, OMI = 4 % • Pin = -20 dBm @ Return path receiver OR 204 L

FTTX-APPLICATION – RFoG NETWORK SYSTEM

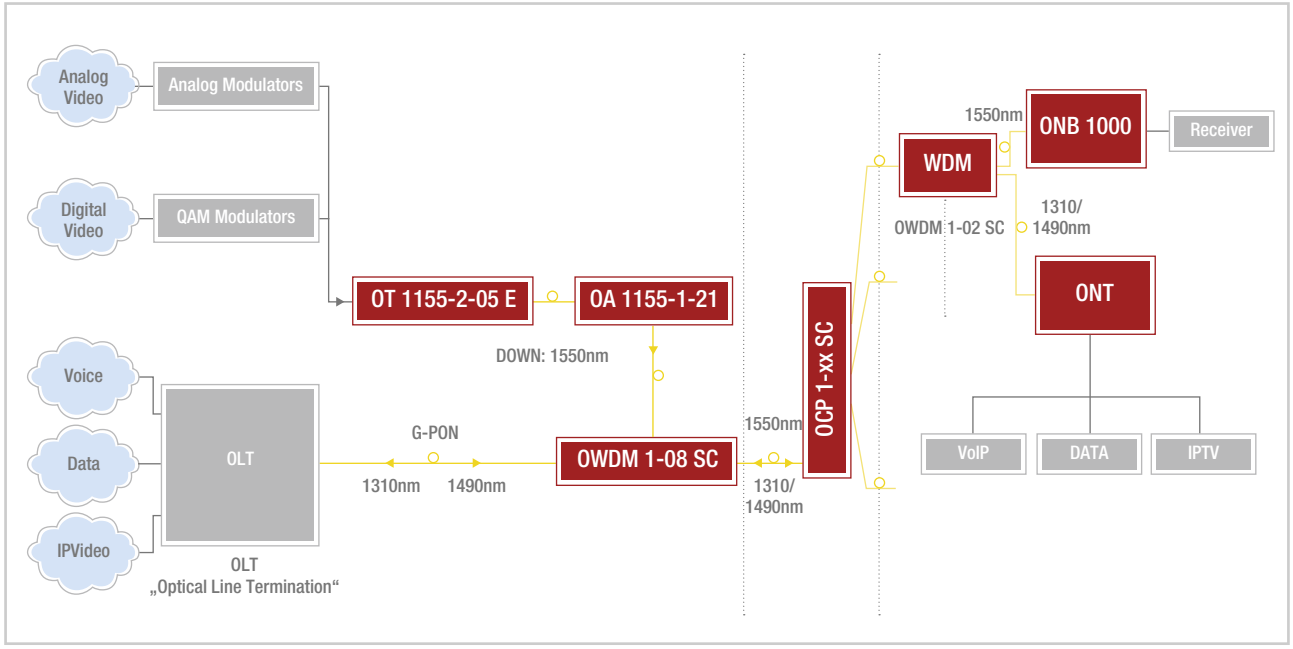
2 fibre-systems application "CWDM operation, return way"



Splitter	Description
1 x 16	• Distance 1 + 2 up to 7 km available, Return path Laser power 0dBm with ONB 11xx (1470,..,1610nm) • Mini node C/N = 52 @ 0 dBm, OMI = 4 %

FTTX-APPLICATION – GPON + RF OVERLAY

1 fibre-system







AMPLIFIER OVERVIEW

House-Amplifier

Type	BK	BKE-S	BKE-P	BKD-S	BVD/LVD-ED	LVD	LHD	LHE-P
								
Outputlevel dBuV (CTB/CSO > 60 dB) 110/113					BVD/LVD DOCSIS	LVD 35P, 40P	LHD 35-4P, 40-4P	LHE 41 P
108		BKE 40 S	BKE 41 P	BKD 40 S				
106								
104		BKE 35 S	BKE 39 P BKE 36 P BKE 33 P	BKD 35 S				
98	BK 22, 30 BK 306	BKE 30 S		BKD 30 S				
Usage	GA/MATV/SMATV	HFC	HFC	HFC	Multimedia	BK	BK	BK
Return way	– / passive	active, fix	active, modular	active, fix	active, modular	active, modular	active, modular	active, fix
Adjustments	Variable attn.	Step Spin	Pads	Step Spin	Electronic	Variable attn.	Variable attn.	PAD
RF-ports	F-Connector	F-Connector	F-Connector	F-Connector	F-Connector	F-Connector	F-Connector	F-Connector
Power supply	fix	fix	modular	modular	fix	fix	fix	fix
Local / Remote power	■ / –	■ / –	■ / –	■ / –	■ / –	■ / –	■ / ■	■ / –

Trunk- and Distribution-Amplifier

Type	LHE	NVE	NVD
			
Outputlevel dBuV (CTB/CSO > 60 dB) 110/113	LHE 40-1	NVE 9130 R, 9136 R	NVD 8128 ED, 8138 ED
Usage	Trunk- and Distribution-Amplifier	Trunk- and Distribution-Amplifier	Trunk- and Distribution-Amplifier manageable
No. of outputs	1 / 2	1 / 2	1 / 2
Adjustments	electronic	PAD's interrupt free	electronic
Return way	active, fix	active, modular	active, modular
RF-connection	PG 11 or 5/8"	PG 11 or 5/8"	PG 11 or 5/8"
Local / Remote power	■ / ■	■ / ■	■ / ■

HOUSE-AMPLIFIER ECO-LINE BK

- Alu-die cast IP 20
- Very good EMC distortion
- Easy to install - compact design
- Frequency range to 862 MHz
- F-connector
- **BK 306:** passive return way 5-65 MHz

Type		BK 306	BK 30	BK 22
Article-No.		5700 1429	5700 1294	5700 1293
Frequency range	MHz	85 - 862	5 - 862	5 - 862
Gain	dB	28 ... 30 ± 1	28 ... 30 ± 1	19 ... 22 ± 1
Noise	dB	7	5	7
Linearity	dB	± 0,5	± 0,5	± 0,5
Attenuation / Slope	dB	0...20 / 0...18	0...20 / 0...18	0...20 / –
Outputlevel max.				
CSO / CTB > 60 dB, 42 Ch. flat	dBµV	96 / 99	96 / 99	96 / 99
IMA_2 / IMA_3 > 60 dB, DIN-level	dBµV	104 / 115	104 / 115	100 / 115
Return way, passive	MHz	5 - 65	–	–
Powersupply	V~	230	230	230
Power consumption	W	6,0	6,0	6,0
Burstprotection	kV	2,0	2,0	2,0
Dimension B x H x T / Weight	mm / kg	105 x 150 x 40 / 0,8	105 x 150 x 40 / 0,8	105 x 150 x 40 / 0,8

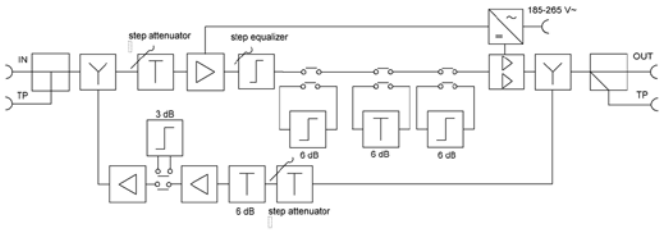
HOUSE-AMPLIFIER PROFI-LINE BKE

- Compact class amplifier
- Integrated return way
- Unique Step Spin technology
- Step Spin adjust - allows readable values
- No accessories necessary for operation
- Excellent performance price relation

STEP SPIN TECHNOLOGY

Type			BKE 30 S	BKE 302 S	BKE 35 S	BKE 40 S
Article-No.			5700 1640	5700 1677	5700 1641	5700 1604
Downstream	Frequency range	MHz	85 - 862	85 - 862	85 - 862	85 - 862
	Gain	dB	32 ± 1	2x28 od 1x32	36 ± 1	41 ± 1
	Noise	dB	5	5	5	5
	Attenuator input/interstage	dB	0-2-4-6-8-10 / 6 dB, Step Spin+double jumper			
	Slope/Interstage Slope	dB	0-2-4-6-8-10 / 6 dB / 3 dB, Step Spin+double jumper			
	Linearity	dB	± 0,5	± 0,5	± 0,5	± 0,5
	Outputlevel max. CSO / CTB > 60 dB, 41 Ch CENELEC, 3 dB Slope	dBµV	99 / 101	99 / 101	104 / 104	109 / 109
Upstream	Frequency range	MHz	5 - 65	5 - 65	5 - 65	5 - 65
	Gain	dB	28	2x24 or 1x28	28	30
	Noise	dB	5	5	5	5
	Attenuator input/Interstage	dB	0-2-4-6-8-10 / 6 dB, Step Spin+double jumper			
	Slope	dB	0 / 3 dB, double jumper, delivery with 3 dB fix slope			
	BER @ Ua= 120	dBµV	< $1*10^{-6}$ KDG mid channel load			
Power supply		V~	230 / 7,5 W	230 / 7,5 W	185 … 265 / 8 W	185 … 265 / 12 W
Testpoint OUT			–	–	–	- 20 dB (F-Conn.)
Burst- and Surgeprotection		kV	2,0	2,0	2,0	2,0
Connector			F-Connector	F-Connector	F-Connector	F-Connector
Dimension B x H x T		mm	175 x 85 x 50	175 x 85 x 50	188 x 85 x 50	188 x 85 x 50
Weight		kg	0,8	0,8	0,7	0,7

BKE 40 S

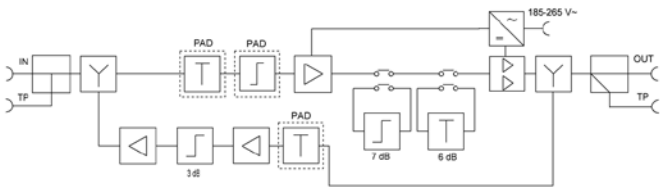


HOUSE-AMPLIFIER PROFI-LINE BKE

- Integrated return way
- Frequency range to 1006 MHz
- Very high return way outputlevel, low noise
- Adjustable by PAD's
- Alu-die cast housing IP 20, low temperature raise, long life
- Easy to install
- LED indicator for operation control
- Various gain values

Type			BKE 2220-1	BKE 33 P	BKE 36 P	BKE 39 P	BKE 41 P
Article-No.			5700 1823	5700 1931	5700 1932	5700 1933	5700 1934
Downstream	Frequency range	MHz	85 - 1006	85 - 1006	85 - 1006	85 - 1006	85 - 1006
	Gain	dB	23 ± 1	33 ± 1	35 ± 1	39 ± 1	41 ± 1
	Noise	dB	5	5	5	5	5
	Linearity	dB	± 0,5	± 0,5	± 0,5	± 0,5	± 0,7
	Attenuation (PAD's)	dB	–	0 ,1,2... 20	0 ,1,2... 20	0 ,1,2... 20	0 ,1,2... 20
	Loss Interstage switchable	dB	–	–	–	6	6
	Slope (PAD's)	dB	–	0 ,1,2... 20	0 ,1,2... 20	0 ,1,2... 20	0 ,1,2... 20
	Slope interstage switchable	dB		7	7	7	7
	Outputlevel max.						
	CSO / CTB >60 dB, 42 Ch flat	dBµV	102	98	100	103	106
	95K acc. UM grid 7dB slope	dBµV	104	99	101	105	108
Upstream	Frequency range	MHz	5 - 65	5 - 65	5 - 65	5 - 65	5 - 65
	Gain	dB	22 ± 1	23 ± 1	25 ± 1	29 ± 1	32 ± 1
	Noise	dB	5	5	5	5	5
	Attenuation (PAD's)	dB	-	0 ,1,2... 20	0 ,1,2... 20	0 ,1,2... 20	0 ,1,2... 20
	64QAM, 3 carrier,120 dBµV, UM		$< 1*10^{-8}$	$< 1*10^{-8}$	$< 1*10^{-8}$	$< 1*10^{-8}$	$< 1*10^{-8}$
Power supply		V~	185-265	230	230	185-265	185-265
Power consumption		W	4,5	8,0	8,0	5,0	7,0
Testpoint IN			- 20 dB (F-Conn.)	-	-	- 20 dB (F-Conn.)	- 20 dB (F-Conn.)
Testpoint OUT			- 20 dB (F-Conn.)	- 20 dB (F-Conn.)	- 20 dB (F-Conn.)	- 20 dB (F-Conn.)	- 20 dB (F-Conn.)
Burstprotection		kV	4,5	2,0	2,0	2,0	2,0
Connector			F-Connector	F-Connector	F-Connector	F-Connector	F-Connector
Dimension B x H x T		mm	188 x 85 x 50	188 x 85 x 50	188 x 85 x 50	188 x 85 x 50	188 x 85 x 50
Weight		kg	0,7	0,8	0,8	0,7	0,7

BKE 41 P



HOUSE-AMPLIFIER PROFI-LINE BKD

- Alu-die cast housing IP 20, low temperature raise, long life
- 1 GHz bandwidth, modular return way (page 135)
- Unique Step Spin technology
- Step Spin adjust - allows readable values and fast adjust
- No accessories necessary for operation
- Low noise by GaAs-FET IC's
- Cable equivalent 0/5/10dB on input selectable
- Modular power supply allows an easy in field replacement or up grade - less service interruption, no new adjustment needed

BKD xx S:

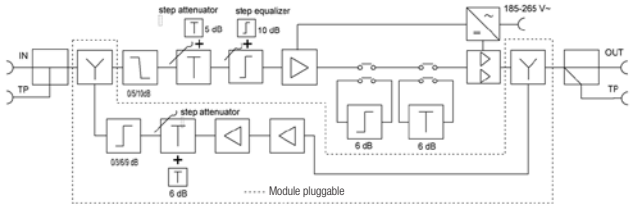
- Push-Pull ampliifer with high outputlevel (BKD 40S)
- MultiGainTech: gain switchable

STEP SPIN TECHNOLOGY

Type		BKD 40 S	BKD 35 S	BKD 30 S
Article-No.		5700 1270	5700 1451	5700 0879
Frequency range		5-1006	5 - 1006	5 - 1006
Plug-in slot		1	1	1
Gain	dB	34/40 ± 1 switchable	29/35 ± 1 switchable	25/31 ± 1 switchable
Noise[1]	dB	6	6	6
Linearity[1]	dB	± 0,7	± 0,7	± 0,7
Slope Step Spin			Step Spin 0...10 dB / + 10dB 2 dB steps	
Attenuation Step Spin			Step Spin 0...10 dB / + 5dB 2 dB steps	
Interstage-slope		7 dB switchable	7 dB switchable	7 dB switchable
Interstage attenuation		6 dB switchable	6 dB switchable	6 dB switchable
Cable equivalent		5/10 dB switchable	5/10 dB switchable	5/10 dB switchable
Outputlevel[1]				
CSO / CTB > 60 dB, 42 Ch flat	dBµV	106 / 106	101 / 102	98 / 99
95 K Unity Media grid 7dB slope	dBµV	108	101	101
Power supply	V~	185-265	185-265	230
Power consumption	W	6,0	4,0	7,0
Testpoint IN		- 20 dB (F-Connector)	- 20 dB (F-Connector)	- 20 dB (F-Connector)
Testpoint OUT		- 20 dB (F-Connector)	- 20 dB (F-Connector)	- 20 dB (F-Connector)
Burstprotection	kV	2,0	2,0	2,0
Connector		F-Connector	F-Connector	F-Connector
Dimension B x H x T	mm	188 x 85 x 50	188 x 85 x 50	175 x 85 x 50
Weight	kg	1,1	1,1	1,2

[1] without return way

BKD 40 S

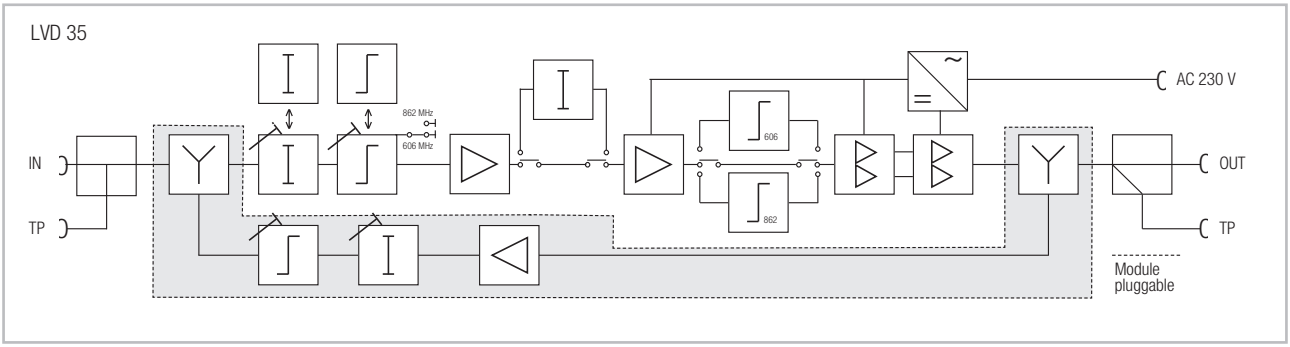


HOUSE-AMPLIFIER PROFI-LINE LVD

- For local power supply
- Solid Alu-die cast housing IP 50
- Plug-in slot for return way modules (page 135)
- Push-Pull GaAs-FET technology for high output level
- Excellent linearity
- Attenuation and slope by variable attenuators (delivery) or alternatively by Pads in 1 dB steps
- Interstage-slope -5dB by jumper
- Test point IN/OUT
- High efficiency power supply 185- 265 V~

Type		LVD 35 P	LVD 40 P
Article-No.		5700 1236	5700 1238
Frequency range	MHz	5 - 862	5 - 862
Plug-in slot		1	1
Gain		29/35 ± 1 (switchable)	35/41 ± 1 (switchable)
Interstage-slope	dB	5 (switchable)	5 (switchable)
Noise[1]	dB	5	5
Linearity[1]	dB	± 0,7	± 0,8
Slope		variable attenuator 0...18 dB (delivery) alternatively by Pads in 1 dB	
Attenuation		variable attenuator 0...18 dB (delivery) alternatively by Pads in 1 dB	
Outputlevel max.[1]			
CSO / CTB >60 dB, 42 CH flat	dBµV	112 / 107	112 / 107
IMA_2 / IMA_3 >60 dB, DIN-level	dBµV	122 / 123	122 / 123
Power supply	V~	185-265	185-265
Power consumption	W	12,5	12,5
Testpoint input		-20 dB (F-Connecor, internal) bidirectional	
Testpoint output		-20 dB (F-Connector, external) unidirectional	
Burst- / Surgeprotection	kV	4,5 / 4,5	4,5 / 4,5
Connector		F-Connector	F-Connector
Dimension B x H x T	mm	210 x 122 x 70	210 x 122 x 70
Weight	kg	1,2	1,2

[1] without return way module at 35/41 dB gain

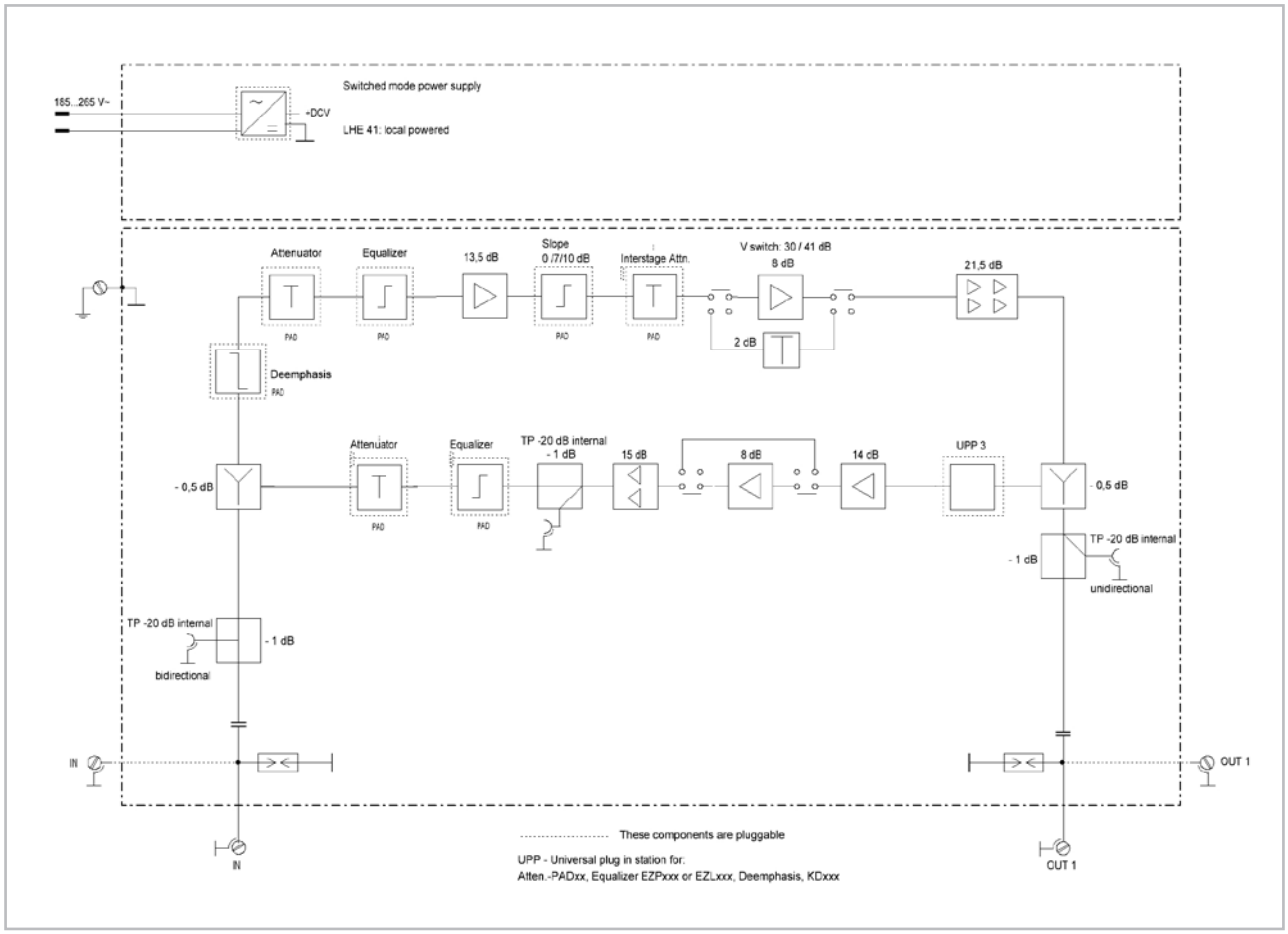


HOUSE-AMPLIFIER LHE-P

- 1 GHz bandwidth
- MultiGainTech 40/32 dB
- By PAD's in 1dB steps adjustable
- Relaiable, long life adjustment
- Cable simulator at input
- Extreme high return way outputlevel and low noise
- IN/OUT connectors in vertical or horizontal position
- Very low ripple up to 1 GHz
- Compact alu-die cast housing acc. IP 65, strand mountable

Type			LHE 41 P
Article-No.			5700 1936
Downstream	Frequency range	MHz	85-1006 (fix diplexer)
	Gain at 1006 MHz	dB	32/40, switch able
	Linearity	dB	± 0,5
	Cable simulator	dB	0,1,2,3…10, PAD's attenuator
	Input attenuator	dB	0,1,2,3…20, PAD's attenuator
	Input equalizer at 47 MHz	dB	0,1,2,3…20, PAD's attenuator
	0 point loss	dB	± 0,5, @ 1 GHz
	Interstage attenuation	dB	0,1,2,3…10, with PAD's
	Interstage equalizer	dB	0/7/10 with PAD's
	Return loss input and output	dB	18 -1,5 dB, Octave min. 12, reference 47 MHz
	Noise figure	dB	< 6, Ta ≤ 40° C
	Output level 41 Ch, CENELEC, CSO/CTB > 60 dB	dBµV	113/112, without K2
	Output level 95 K, UM-Raster, 7 dB slope	dBµV	110, CTB/CSO > 60 dB; BER < $1*10^{-9}$
	Operation output level 95 K, UM grid, 7 dB slope	dBµV	108
Upstream	Frequency range	MHz	5-65
	Gain	dB	22/32, switch able
	Ripple	dB	± 0,8
	Input attenuator	dB	0,1,2,3…15, PAD's attenuator
	Output equalizer	dB	0,1,2,3…12, PAD's attenuator
	Output attenuator	dB	0,1,2,3…20, PAD's attenuator
	Return loss input and output	dB	18, 5-65 MHz
	Noise figure		5, Ta ≤ 40° C
	Output-BER @ 120 dBµV (64 QAM, 3 carrier,120 dBµV, UM)	dBµV	< $1*10^{-8}$
Power supply		V~	185 - 265
Power consumtion		W	14, @ 230 V active return way
Dimension B x H x T		mm	225 x 180 x 95
Connectors			PG 11 / F-connector

HOUSE-AMPLIFIER LHE-P



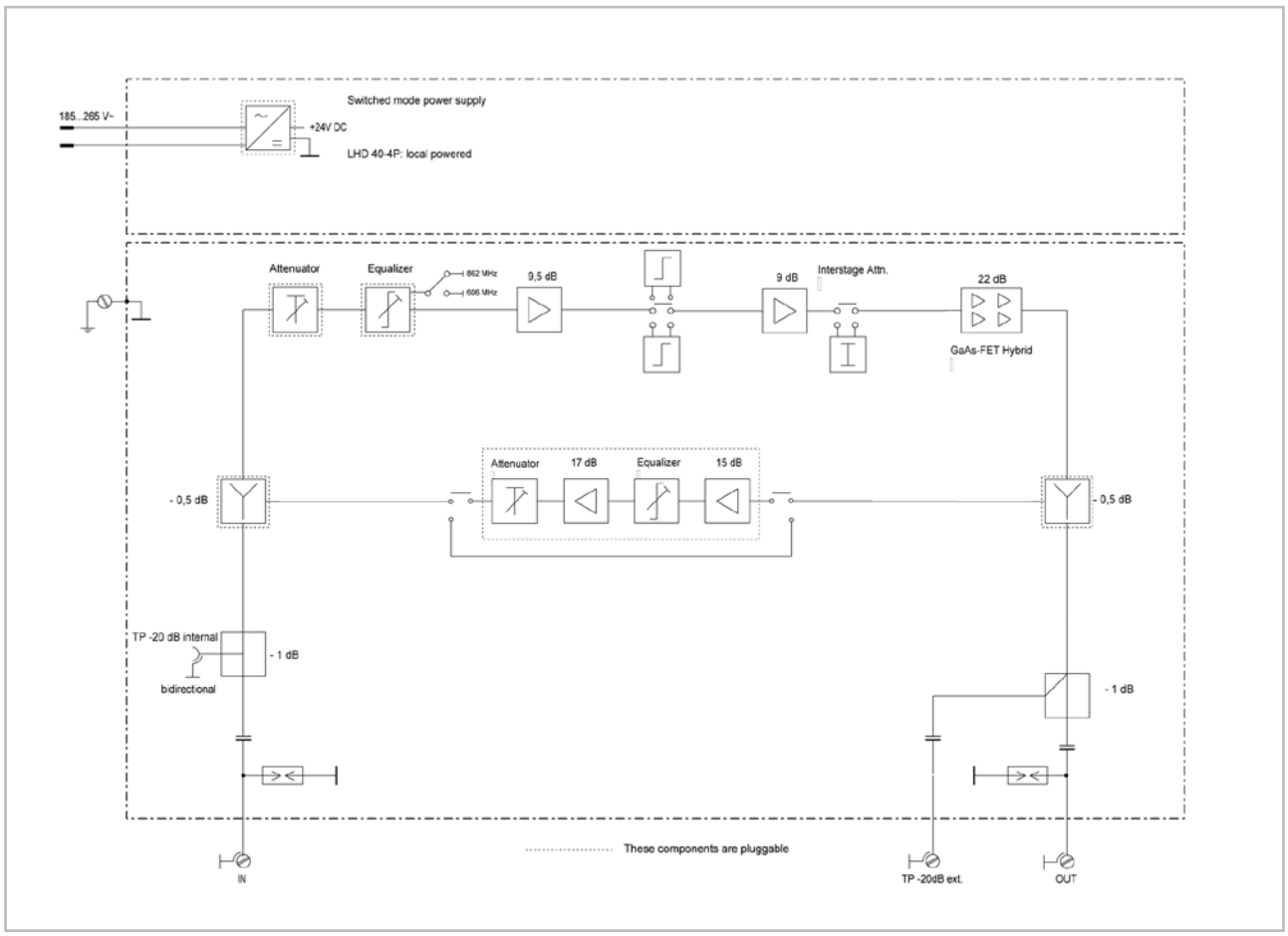
HOUSE-AMPLIFIER PROFI-LINE LHD

- Hlgh-Power Doubler GaAs-FET amplifier
- Compliant to class D(3.4) and D(4.4) acc. KDG 1TS140
- LHD 35-4P = 35 dB DS-Gain
- LHD 40-4P = 40 dB DS-Gain
- Modular assembly, return way amplifier, diplexer
- Return way gain 28 or 32 dB available, modular diplexer (page 135)
- Excellent linearity
- No accessories necessary for adjustments of level and slope
- Testpoints for in- and output
- High efficiency power supply 185- 265 V~
- Burst- and Surgeprotection to 4,5 kV
- Relaiable technique Made in Germany
- Solid Alu-die cast housing IP 54

Type		LHD 35-4P	LHD 40-4P
Article-No.		5700 1906	5700 1907
Final stage		GaAs-Fet Hybrid	GaAs-Fet Hybrid
Frequency range	MHz	40 - 862 (without diplexer)	40 - 862 (without diplexer)
Return way plug-in slot		1	1
Gain	dB	28/35, switchable	33/40, switchable
Noise	dB	7, Tu ≤ 40° C	7, Tu ≤ 40° C
Linearity	dB	± 0,7	± 0,7
Attenuation Solpe	dB dB	20, continuouse adjust 18, continuouse adjust	20, continuouse adjust 18, continuouse adjust
Interstage attenuation Interstage slope	dB dB	0/7, by jumper 0/6, by jumper, 606/862 MHz	0/7, by jumper 0/6, by jumper, 606/862 MHz
Testpoint input Testpoit output		- 20 dB (F-Connector, internal) - 20 dB (F-Connector, external)	- 20 dB (F-Connector, internal) - 20 dB (F-Connector, external)
Returnloss IN/OUT		> 18 dB (-1,5 dB/Octave)	> 18 dB (-1,5 dB/Oktave)
Outputlevel 42 Ch, CENELEC, flat	dBµV	113/112, CSO/CTB > 60 dB	113/112, CSO/CTB > 60 dB
Power supply	V~	185 -265	185 -265
Power consumtion	W	14, max. incl. act. return way	14, max. incl. act. return way
Connector		F-Connector	F-Connector
Burst- / Surgeprotection	kV	4,5 / 4,5	4,5 / 4,5
Dimension B x H x T	mm	225 x 190 x 86	225 x 190 x 86
Weight	kg	2	2

HOUSE-AMPLIFIER PROFI-LINE LHD

Modern house amplifier with very high return way outputlevel class D acc. KGD 1TS140 for installation within DOCSIS 3.0 deployments - returnway modular

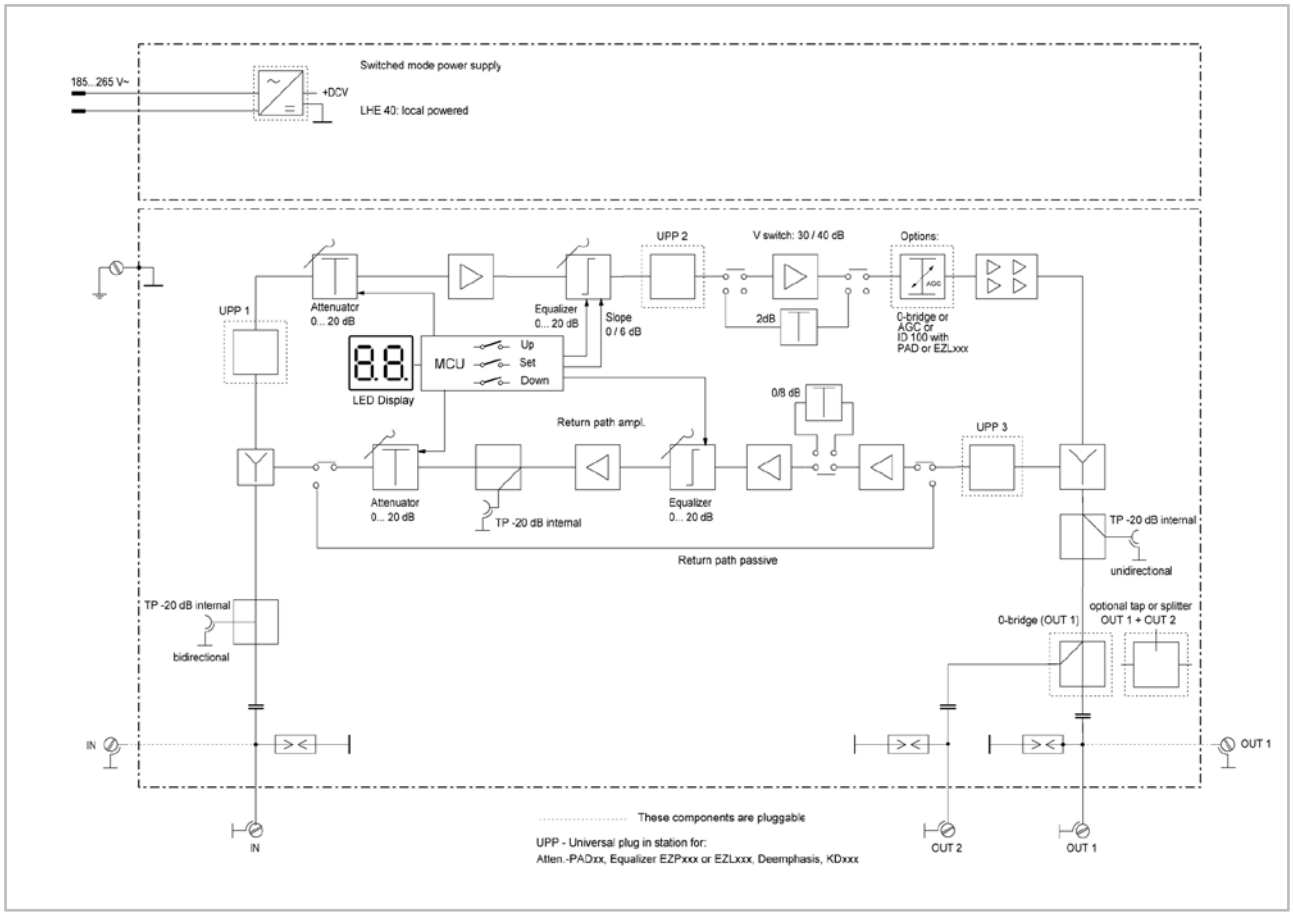


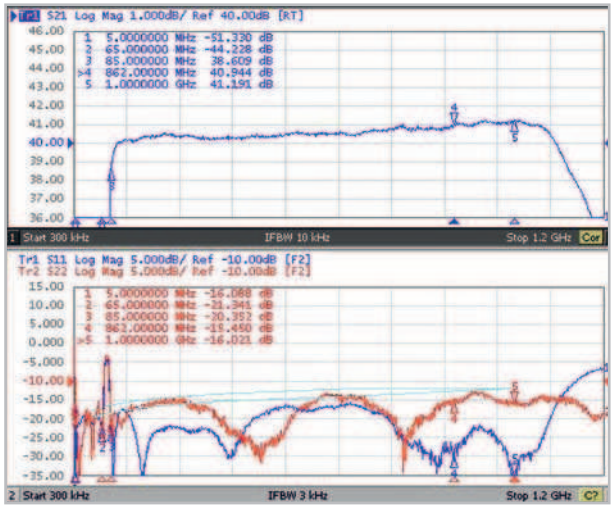
LINE EXTENDER-/ DISTRIBUTION-AMPLIFIER LHE

- 1 GHz Bandwidth
- Interrupt free electronic adjustment, get it operable without additional accessories
- 7-Segment display, simply to adjust
- MultiGainTech 41/30 dB
- New: Ingress control switch (ICS) on request, FSK managed
- AGC module available
- High output level - GaAs-FET technology
- 2 outputs, IN/OUT connectors in vertical or horizontal position
- Very low ripple up to 1 GHz
- Compact alu-die cast housing acc. IP 65, strand mountable

Type			LHE 40-1	LHE 40-1R
Article-No.			5700 1626 (local powered)	5700 1627 (remote powered)
Downstream	Frequency range	MHz	85-1006 (diplexer on board)	
	Gain	dB	41 / 30 dB switchable	
	Linearity	dB	± 0,5	
	Entzerrer	dB	0 ... 20, 1 dB steps adjustment, electronical	
	0 point loss	dB	± 0,5, @ 1 GHz	
	Interstage slope	dB	0/6, electronic switchable	
	Attenuation	dB	0 ... 20, in 1 dB steps adjustment, electronical	
	Interstage attn., slot UPP1/UPP2	dB	0,1,2, ... 20 with Pads in 1 dB steps	
	Interstage slope, slot UPP1/UPP2	dB	3,6,9,12 with EZL/EZP	
	Testpoint input	dB	-20 ± 1,5 dB, F-connector, internal	
	Testpoint output	dB	-20 ± 0,75 dB, F-connector, internal	
	Return loss In/Out	dB	-20 ± 1,5 dB/Octave, min. -12 dB @ 1 GHz	
	Noise	dB	5, Tu ≤ 40° C	
	Outputlevel 42 Ch, CENELEC, flat	dBµV	113, CSO > 60 dB	
	Outputlevel 42 Ch, CENELEC, flat	dBµV	112, CTB > 60 dB	
Upstream	Frequency range	MHz	5-65 (Diplexer on board)	
	Gain passive /active	dB	-4 / 24 / 32	
	Linearity	dB	± 0,5	
	Slope (Output)	dB	0 ... 20, in 1 dB steps adjustment, electronical	
	Attenuator (Output)	dB	0 ... 20, in 1 dB steps adjustment, electronical	
	Input slot UPP3	dB	0,1,2, ... 20 with Pads in 1 dB steps	
	Interstage attenuation	dB	0 / 8, by jumper	
	Testpoint 5 - 65 MHz	dB	-20 ± 0,75 dB, F-connector, 2x internal	
	Noise	dB	6, Tu ≤ 40° C	
	Outputlevel 2nd order, -60 dB	dBµV	108, DIN 45004A1	
	Outputlevel 3rd order, -60 dB	dBµV	116, DIN 45004B	
	OUT-BER @ 120 dBµV middle load 3 carrier 16 QAM	BER	$1*10^{-6}$ (KDG 1TS140)	
Power supply		V~	185 - 265 local powered or 28-70 remote powered with 10 A power pass	
Power consumtion		W	14, max. with active return way	
Dimension B x H x T		mm	225 x 180 x 95	
Connectors			PG 11 (delivery without connectors)	

LINE EXTENDER-/ DISTRIBUTION-AMPLIFIER LHE



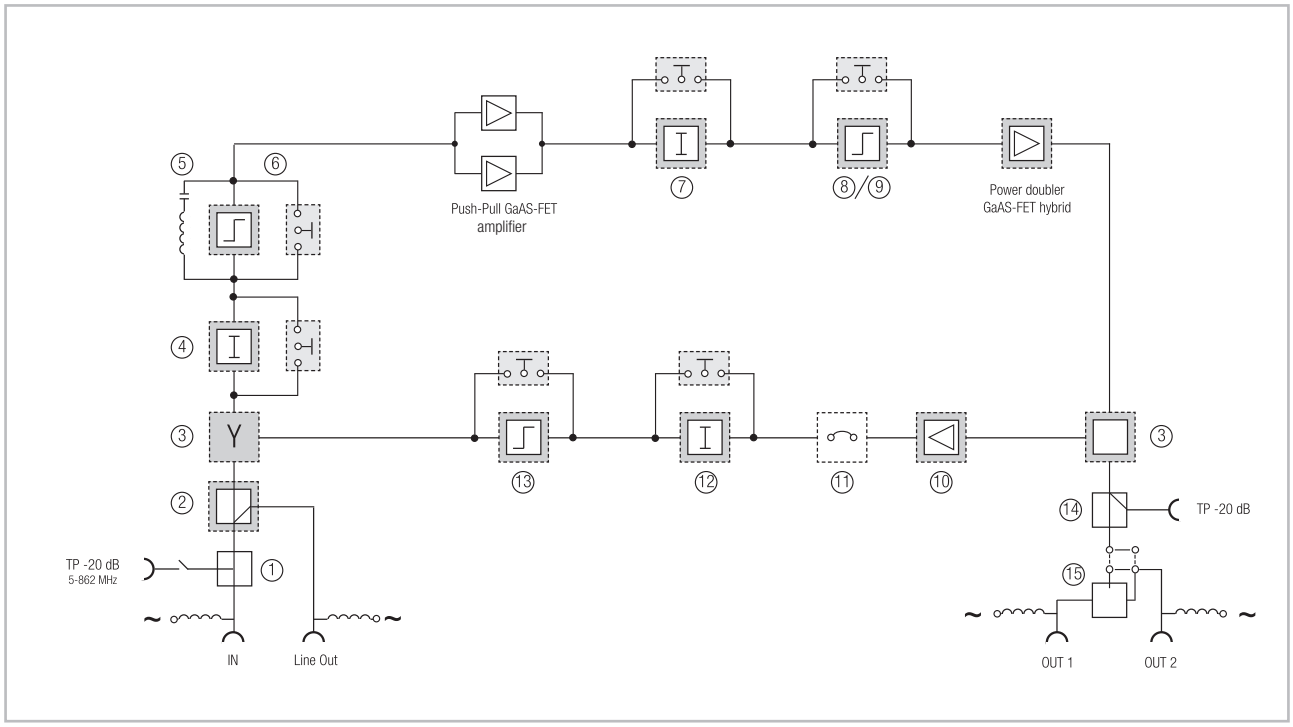


LINE EXTENDER-/ DISTRIBUTION-AMPLIFIER PROFI-LINE NVE

- 1 GHz Bandwidth
- Return way modular
- Very high outputlevel on return way
- GaAs-FET Hybrid Power Doubler Stage
- Low noise by GaAs-FET pre-amplifier stage
- Interrupt free adjustment by Pads
- AGC-Module available
- Line-Out input, by splitter or tap module, second output by jumper shiftable
- Compact Alu-die cast housing acc. IP 65, best temperature sink
- High efficiency german power supply

Type			NVE 9130	NVE 9130 R	NVE 9136	NVE 9136 R
Article-No.			5700 2033	5700 2034	5700 2035	5700 2036
Downstream	Final stage		Power Doubler GaAs-FET-Hybrid		Power Doubler GaAs-FET-Hybrid	
	Frequency range	MHz	47/85 - 1006		47/85 - 1006	
	Gain	dB	30 ± 1 by Pads in 1 dB steps		36 ± 1 by Pads in 1 dB steps	
	Noise	dB	< 5		< 5	± 0,7
	Linearity	dB	± 0,5	± 0,5	± 0,6	
	Attenuation input	dB	0 ... 20 by Pads in 1 dB steps		0 ... 20 by Pads in 1 dB steps	
	Slope input	dB	plug-in slot for slope-modules “EZP / EZL”			
	Interstage-attenuation	dB	0 ... 20 by Pads in 1 dB steps		0 ... 20 by Pads in 1 dB steps	
	Interstage-slope		0 ... 20 by Pads in 1 dB steps		0 ... 20 by Pads in 1 dB steps	
	Outputlevel max.					
	CSO / CTB > 60 dB, 42 CH flat	dBµV	113 / 112		113 / 112	
	IMA_2 / IMA_3 > 60 dB, DIN level	dBµV	124 / 125		124 / 125	
	Return loss		20 dB at 40 MHz / -1,5 dB / Octave		20 dB at 40 MHz / -1,5 dB / Octave	
Upstream	Frequency range	MHz	5 - 30/65		5 - 30/65	
	Gain	dB	24 ± 1		24 ± 1	
	Noise	dB	< 7		< 7	
	Loss	dB	0 ... 20 dB, by Pads in 1 dB steps			
	Slope	dB	0 ... 20 dB, by Pads in 1dB steps			
	Outputlevel max.					
	1 TS 140 / IMA_3 > 60 dB	dBµV	120 / 116		120 / 116	30-70
Power supply		V~	185-265	30-70	185-265	10,0
Power pass		A	—	10,0	—	1,0...0,4 A~ (30...70 V)
Power consumption		A~	24 W	1,0...0,4 A~ (30...70 V)	24 W	
Testpoint input			-20 dB (F-connector, external) bidirectional			
Testpoint output			-20 dB (F-connector, external) unidirectional			
Burst- / Surgeprotection		kV	4,5 / 4,5		4,5 / 4,5	
Connector			PG 11 or 5/8”		PG 11 or 5/8”	
Dimension B x H x T		mm	225 x 190 x 86		225 x 190 x 86	
Number of RF In / Out			2		2	

LINE EXTENDER-/ DISTRIBUTION-AMPLIFIER PROFI-LINE NVE



Plug-in slots for modules (delivery includes return way amplifier)

Description NVE 9128 / NVE 9136

(1) Testpoint - 20 dB, F-connector external, bi-directional

(2) Input split, IN/Line-Out, plug-in slot for splitter
Types: VM 02 or tap Typ AM 201 (page 137)

(3) Plug-in slot for diplexer for 30/65 MHz
Type: RLK 265 (page 135)

(4) Attenuation input, plug-in slot Pads, interrupt free
1 dB-steps

(5) Cable equivalent 606 or 1006 MHz, plug-in slot
(6) for modules EZP, EZL (page 138).
Alternatively useable for AGC-module type AGC 203 (page 137)

(7) Interstage-attenuation, plug-in slot for Pads, interrupt free
1 dB-steps

(8) Plug-in slot for interstage-slope, slope by Pads in
(9) 1 dB steps

(10) Return way-Hybrid, plug-able, within the delivery

(11) Plug-in slot for ingress filter, NHP 15 (page 135)

(12) Attenuation return way, plug-in slot for Pads, interrupt free
1 dB-steps

(13) Slope return way, plug-in slot for Pads, interrupt free
slope in 1 dB steps

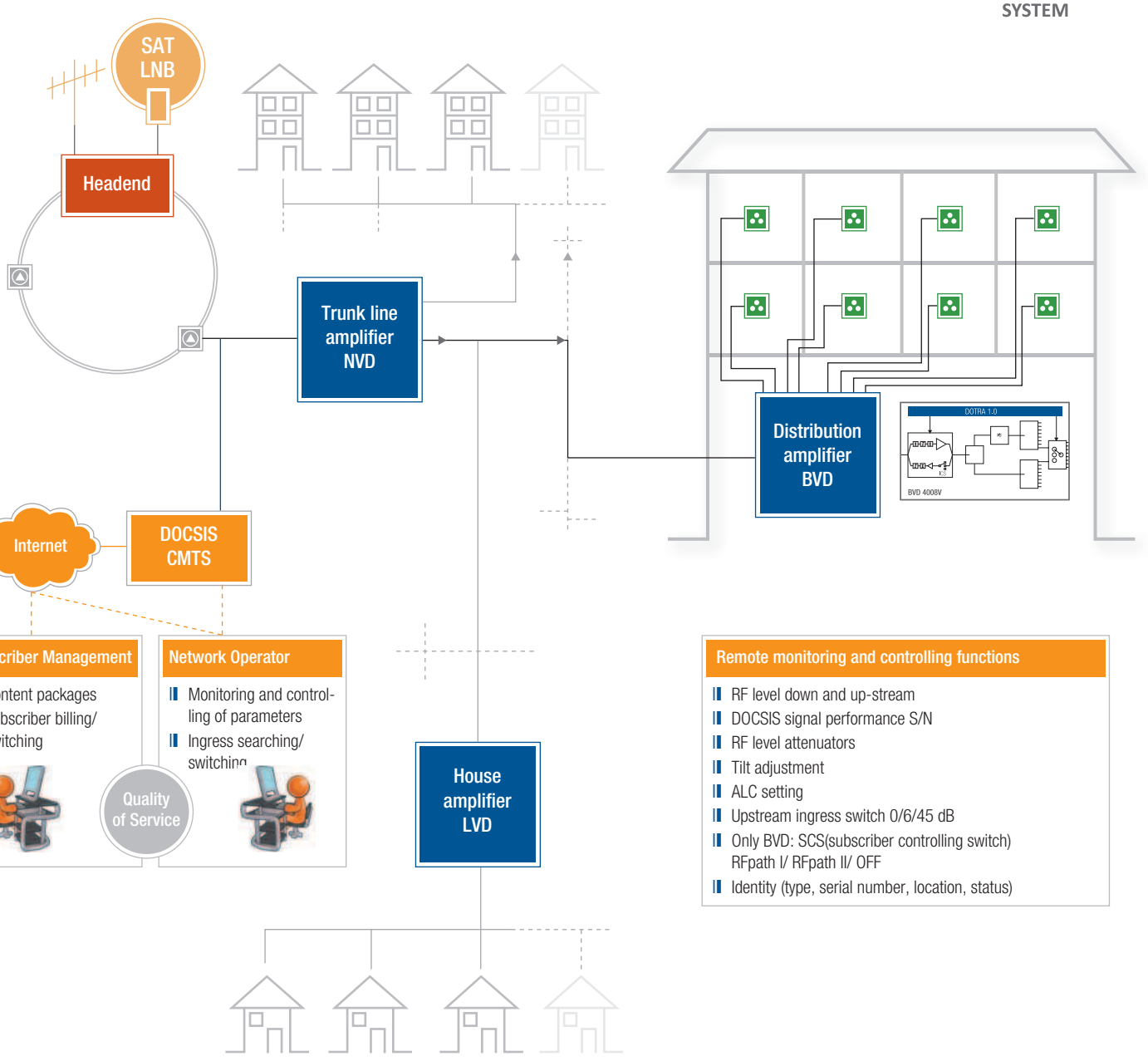
(14) Test point -20 dB, F-connector external, uni-directional

(15) Output splitter by jumper shiftable

THE WWW GENERATION – REDUCE YOUR NETWORK OPERATION COSTS BY USING DOCSIS MANAGED AMPLIFIER

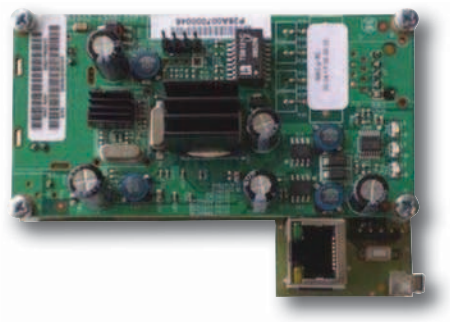
- Comfortable operation by WebGui, HTML based
- Remote operation, adjustments
- Easy ingress tracking in your network
- ICS = Ingress Control Switch 0/8/40 dB
- SCS = Subscriber Control Switch - ON/OFF, signal way 1 or 2 for each connected subscriber (BVD-Types)
- ALC = Automatic Level Control (NVD-Typen)
- Displaying of various QoS information
- SNMP get and set

WEB CONNECT NETWORK MANAGEMENT SYSTEM



DOCSIS® Transponder DOTRA 1.0

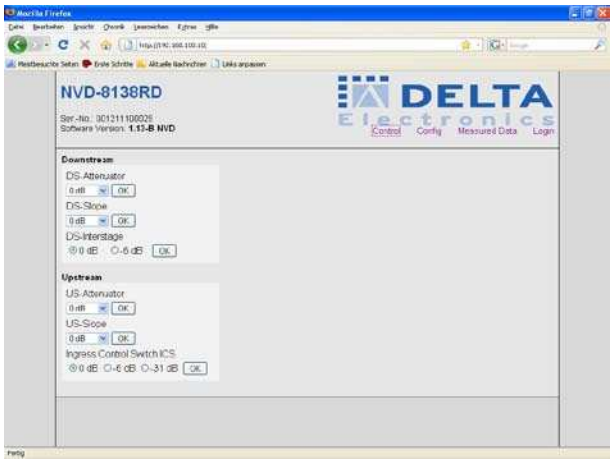
- Eurodocsis Transponder for LVD-ED, BVD-ED and NVD-ED
- SNMP client, WebGUI Web server, MIB's available
- Ethernet RJ 45 connection
- Modular plug-able
- The transponder is within the delivery



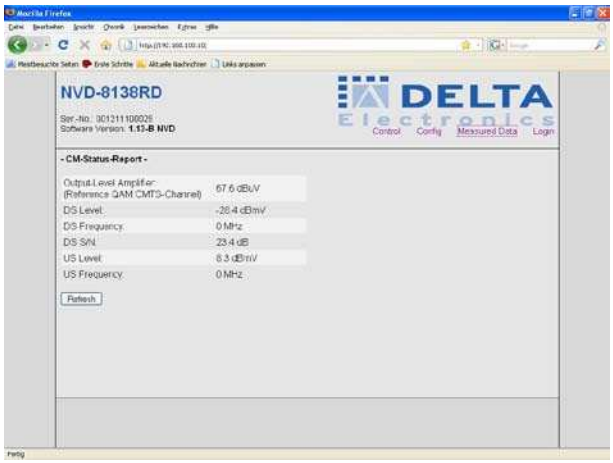
WEB CONNECT
NETWORK MANAGEMENT SYSTEM

Type		DOTRA 1.0
Standard		EURODOCSIS 2.0 compliant, DOCSIS 1.x on request
Common MAC-Address header		00-24-1F
MAC-Addressrange CM		08-00-00...FF-FF-FF *
MAC-Addressrange CPE (LAN-PIC)		08-00-00...FF-FF-FF *
Dynamicrange DS	dBm	-15 ... +15
Output level US	dBmV	+8 to +55 (16 QAM)
Connection		DHCP IP allocation
Ethernet		10 Base-T
Connector		RJ-45
Power supply	V	5
Power consumption	W	3,5
WebGUI		http, web server
Dimension	mm	100 x 70 x 15

* corresponding ca. 8,3 Mio. reserved MAC addresses

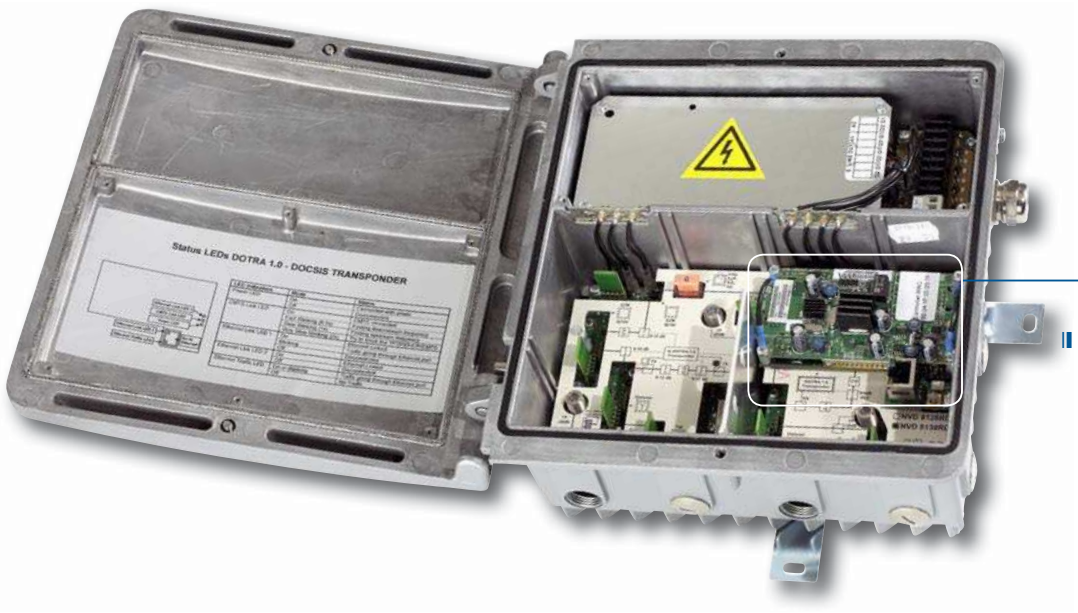


WebGUI RF adjustments



WebGUI „Measured date" - displaying of QoS information

TRUNK- AND LINE-EXTENDER EXPERT-LINE NVD



NEW

- DOCSIS-Transponder

Key benefits

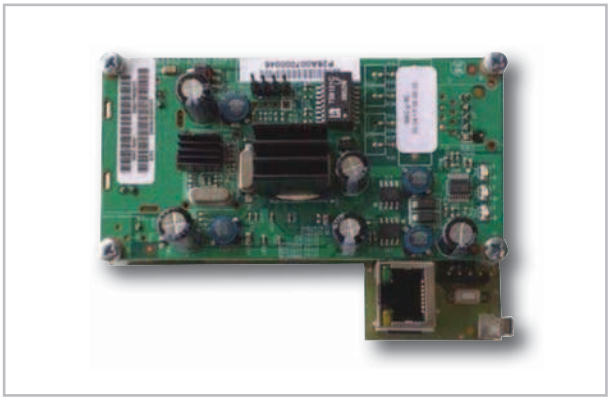
- Manageable 1GHz Trunk and Lineextender for modern HFC-architectures
- Comfortable operation by WebGui, HTML based
- Built in return amplifier (modular), including Ingress-Control-Switch 0/6-8 > 40 dB.
- State of the art GaAs-FET-IC pre-stages and GaAs-FET Hybrid final stage for excellent linearity, low noise and high outputlevel
- All adjustments by www possible - low installation and service effort
- Interstage-slope or loss with PAD's or electronic
- ALC - automatic level control included (QAM ch. analysis)
- Complete equippment and testpoints
- Solid Alu-die cast housing, protection class IP 65

Remark: Fittings are not included pls. refer to page 140.

Transponder acc. DOCSIS-Standard 2.0 included

The following parameters and functions can be monitorred by the DOCSIS transponder:

- QoS information's C/N, BER , MHz, RF-level etc.
- All electronic adjustments
- Return way Ingress-Control-Switch
- Temperature
- Identification of product type and location
- Variouse control- and monitoring functions



- DOCSIS-Transponder

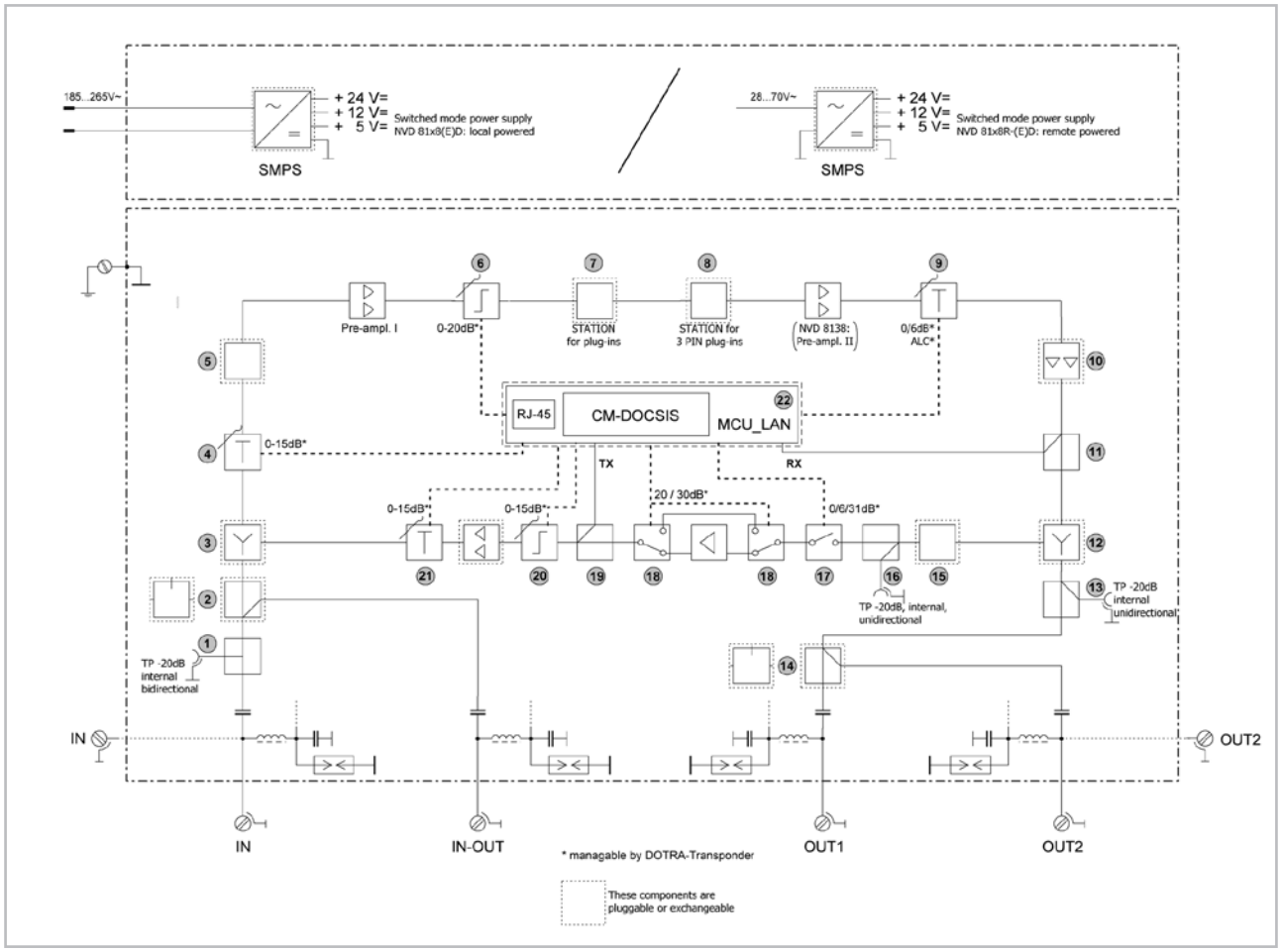
TRUNK- AND LINE-EXTENDER EXPERT-LINE NVD

- Manageable 1GHz Trunk and Lineextender for modern HFC-architectures
- For local - or remote power supply
- DOCSIS 2.0 transponder with WebGui included
- Elektronic attentuation and interstage-slope by www adjustable
- Flexible and future proofed returnway, with built in return way amplifer (replaceable), inluding Ingress-Control-Switch
- Low noise
- High outputlevel by Power-Doubler GaAs-FET technology
- AGC ± 3,5 dB - CMTS QAM channel analysis
- Power pass 10 A, with overvoltage protection
- Compact Alu-die cast housing IP 65

WEB CONNECT NETWORK MANAGEMENT SYSTEM

Type			NVD 8128 ED	NVD 8138 ED
Article-No.			5700 1590	5700 1594
Final stage			1 x Power Doubler GaAs-FET	1 x Power Doubler GaAs-FET
Downstream	Frequency range	MHz	47/85 - 1006	47/85 - 1006
	Gain	dB	28 ± 1	38 ± 1
	Noise	dB	< 5	< 5
	Linearity	dB	± 0,5	± 0,7
	Attenuation input	dB	0...15,5	0...15,5
	Interstage-slope	dB	0 ... 20	0 ... 20
	Interstage addtional		Slope or loss with Pads in 1dB steps	
	Outputlevel max.			
	CSO / CTB > 60 dB, 42 Ch flat	dBµV	113 / 112	113 / 112
	IMA_2 / IMA_3 > 60 dB, DIN-level	dBµV	124 / 125	124 / 125
	Return loss	dB	20 dB @ 40 MHz (-1,5 dB/Octave)	
Upstream	Frequency range	MHz	5 - 30/65	5 - 30/65
	Gain	dB	20/28 ± 1	22/30 ± 1
	Noise	dB	7	7
	Attenuation	dB	0...18	0...18
	Slope	dB	0...10	0...10
	Outputlevel			
	IMA_3 > 60 dB	dBµV	119	119
	IMA_2 > 60 dB	dBµV	114	114
	BER @ 115 dBµV (4 carrier QAM 64; 5,12 Msym/s)	BER	< $1*10^{-8}$	< $1*10^{-8}$
Power supply		V~	185-265	185-265
Power pass		A	10	10
Hum-isolation		dB	> 60	> 60
Power consumption			24 W	22 W
Testpoint input			-20 dB (F-Connector, internal) bidirectional,	
Testpoint output			-20 dB (F-Connector, external) unidirectional	
Burst- / Surgeprotection		kV	4,5 / 4,5	4,5 / 4,5
Connector			PG 11 or 5/8"	PG 11 or 5/8"
Dimension B x H x T		mm	319 x 246 x 119	319 x 246 x 119
RF-IN/OUT connection			2	2

TRUNK- AND LINE-EXTENDER EXPERT-LINE NVD



(1) Testpoint - 20 dB, F-Connector internal, bi-directional

(2) Plug-in slot for splitter type VM 202 or tap type AM 201 (page 137), Line-Out

(3) Plug-in slot for return-diplexer for 30/65 MHz Types: RLK 265 (page 135)

(4) Attenuator electronic 0...15,5 dB in 0,5 dB steps

(5) Plug-in slot for cableequivalent 862 or 1006 MHz slope in 1 dB steps by Pads Types: EZP, EZL, or ID 100 (page 137)

(6) Interstage slope electronic 1006 MHz, 0...20 dB, in 1 dB steps

(7) Plug-in slot for AGC-module, Type: AGC 203 (page 137) For automatic gain control over temperature deviation. Alternatively shoud be used for interstage-loss PAD's or EZM plug-in module

(8) Plug-in slot for interstage-loss by PAD's, Type: ID 100+PAD (page 137/138) or for interstage-slope by EZL, EZP

(9) Interstage loss 0/6dB, alternatively AGC (by DOCSIS QAM chanel analysis)

(10) GaAs-FET Power-Doubler Hybrid

(11) Transponder RX

(12) Plug-in slot for diplexer, e.g. type RLK 265 (page 135)

(13) Test point output -20dB unidirectional, internal

(14) Outputsplitter/tap module VM / AM

(15) Plug-in slot for ingress filter NHP 15

(16) Test point return way -20 dB, internal unidirectional

(17) Return way Ingress-Control-Switch 0/6/31 dB

(18) Gain switch 22/30 dB

(19) Transponder TX

(20) Slope return way 65 MHz, 0...15,5 dB

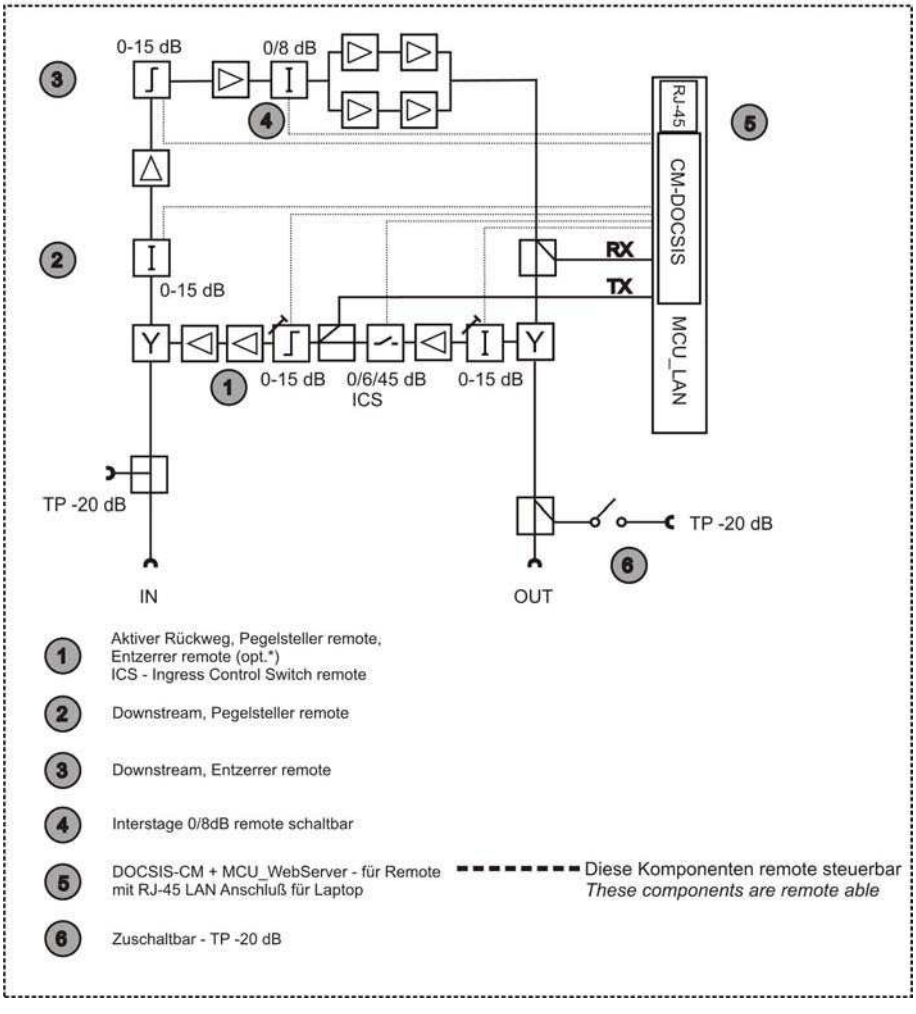
(21) Attenuation return way 0...15,5 dB

(21) DOCSIS Transponder DOTRA 1.0

MULTIMEDIA-HOUSE-AMPLIFIER LVD

- Remote managable by EURO-DOCSIS-Transponder DOTRA 1.0
- Web-Server with Ethernet-RJ 45 for offline/online control
- All adjustments by www possible - low installation and service effort
- Comfortable remote maintenance and failure analysis
- Return way plug-able
- Ingress Control Switch for an easy ingress tracking
- Low noise GaAs-FET-pre-amplifier
- Push-Pull GaAs final stage
- Test point IN/OUT
- Solid Alu-die cast housing

WEB CONNECT
NETWORK MANAGEMENT SYSTEM



Type			LVD 40 ED
	Article-No.		5700 1588
	Ingress-Control-Switch	dB	0/8/45
	Local connection		RJ 45-Jack
	Remote control		EURO-DOCSIS
Downstream	Frequency range	MHz	85 - 1006
	Gain	dB	41
	Linearity	dB	± 1
	Attenuation adjust	dB	0…15,5
	Slope adjust @ 47 MHz 0 point-loss	 dB dB	 0...15,5 (@ 1006 MHz) ± 1 (@ 1006 MHz)
	Interstage attenuation	dB	8
	Test point input	dB	-20, F-Connector, external
	Test point output	dB	-20, F-Connector, external
	Return loss input	dB	-18 + 1,5 / Oct., min -12
	Return loss output	dB	-18 + 1,5 / Oct., min -12
	Noise	dB	5
	Output level DIN 45004A1 (IMA 2. Order, - 60 dB)	 dBµV	 122
	Output level DIN 45004B (IMA 3. Order, - 60 dB)	 dBµV	 124
	Output level 41channel grid CENELEC, flat, CSO > 60 dB	 dBµV	 112
	Output level 41 channel grid CENELEC, flat, CTB > 60 dB	 dBµV	 107
Upstream	Frequency range	MHz	5-65
	Gain	dB	30
	Linearity	dB	± 1
	Isolation	dB	> 40
	Attenuation adjust	dB	0…15,5
	Slope adjust @ 5 MHz	dB	0...15,5 * (65 MHz)
	Ingress control switch	dB	0/6/40
	Return loss input	dB	15 (5-65 MHz)
	Return loss output	dB	15 (5-65 MHz)
	Noise	dB	8
	Output level DIN 45004A1 (IMA 2. Order, - 60 dB)	 dBµV	 104
	Output level DIN 45004B (IMA 3. Order, - 60 dB)	 dBµV	 114
	Through loss passive isolation 5-65 MHz	dB dB	2,5 (to 65 MHz) > 35 (from 85 MHz)
	Isolation Through loss 85-1006 MHz	dB dB	> 40 (to 65 MHz) 1,0 (from 85 MHz)
	Power supply	V~	230
	Power consumption	W	13,5
	Connector		2-pin Europlug
	Dimension (B x H x T) / Weight	mm / kg	210 x 122 x 70 / 1,4

* Optional with slope adjust

MULTIMEDIA-DISTRIBUTION-AMPLIFIER BVD

- Connection of up to 8 subscriber including management option
- Remote access by EURO-DOCSIS-Transponder DOTRA 1.0
- Web-Server with Ethernet-RJ 45 for offline/online control
- Comfortable remote maintenance and failure analysis
- Return way plug-able
- Ingress Control Switch for an easy ingress tracking
- Internal 2,4 or 8 way splitter, depends on the model
- Second signal way selectable per subscriber, plug-in filter section
- Low noise GaAs-FET-pre-amplifier
- Push-Pull GaAs final stage
- Test point IN/OUT
- Solid Alu-die cast housing

WEB CONNECT
NETWORK MANAGEMENT SYSTEM

Type	Output-No.	Downstream 85-1006 MHz		Upstream 5-65 MHz	
		Gain Stream 1	Gain Stream 2	Gain Stream 1	Gain Stream 2
BVD 4002 V*	1	30,0		24,0	
	2	30,0		24,0	
BVD 4004 V*	1	27,0	21,0	21,0	16,0
	2	27,0	21,0	21,0	16,0
	3	27,0	21,0	21,0	16,0
	4	27,0	21,0	21,0	16,0
BVD 4008 V*	1	23,5	17,5	18,0	13,0
	2	23,5	17,5	18,0	13,0
	3	23,5	17,5	18,0	13,0
	4	23,5	17,5	18,0	13,0
	5	23,5	17,5	18,0	13,0
	6	23,5	17,5	18,0	13,0
	7	23,5	17,5	18,0	13,0
	8	23,5	17,5	18,0	13,0

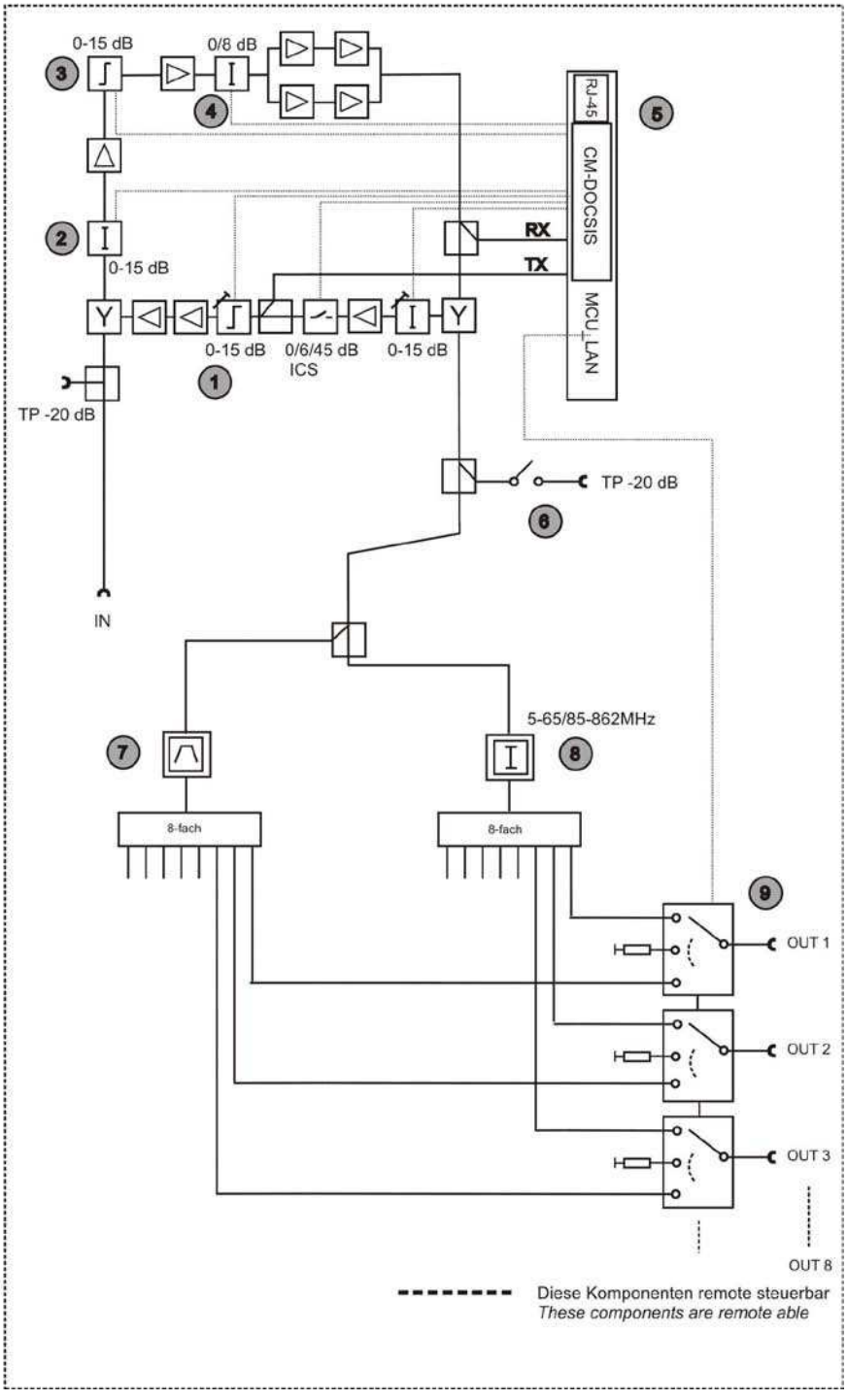
* Splitter technology, all outputs equal

MULTIMEDIA-DISTRIBUTION-AMPLIFIER BVD

Type			BVD 4002 V-ED	BVD 4004 V-ED	BVD 4008 V-ED
Article-No.			5700 1524	5700 1588	5700 1500
Ingress-Control-Switch		dB	0/8/45		
Local connection			RJ 45-Jack		
Remote control			EURO-DOCSIS		
Downstream	Frequency range	MHz	85 - 1006		
	Gain	dB	39		
	Linearity	dB	± 1		
	Attenuation adjust	dB	0…15,5		
	Slope adjust @ 47 MHz 0 point-loss	 dB dB	 0...15,5 (@ 1006 MHz) ± 1 (@ 1006 MHz)		
	Interstage attenuation	dB	8		
	Test point input	dB	-20, F-Connector, external		
	Test point ouput	dB	-20, F-Connector, external		
	Return loss input	dB	-18 + 1,5 / Oct., min -12		
	Return loss output	dB	-18 + 1,5 / Oct., min -12		
	Noise	dB	5		
	Outputlevel DIN 45004A1 (IMA 2. Order, - 60 dB)	dBµV	122		
	Outputlevel DIN 45004B (IMA 3. Order, - 60 dB)	dBµV	124		
	Isolation between outputs	dB	> 36		
Upstream	Frequency range	MHz	5-65		
	Gain	dB	30		
	Linearity	dB	± 1		
	Isolation	dB	> 40		
	Attenuation adjust	dB	0…15,5		
	Slope adjust @ 5 MHz	dB	0...15,5 * (@ 65 MHz)		
	Return loss input	dB	15 (5-65 MHz)		
	Return loss output	dB	15 (5-65 MHz)		
	Noise	dB	6		
	Outputlevel DIN 45004A1 (IMA 2. Order, - 60 dB)	dBµV	104		
	Outputlevel DIN 45004B (IMA 3. Order, - 60 dB)	dBµV	114		
	Through loss passive isolation 5-65 MHz	dB dB	2,5 (to 65 MHz) > 35 (from 85 MHz)		
	Through loss passive isolation 85-862 MHz	dB dB	> 40 (to 65 MHz) 1,0 (from 85 MHz)		
Power supply		V~	230		
Power consumption		W	13,5		
Connector			2-pin Europlug		
Dimension (B x H x T) / Weight		mm / kg	210 x 122 x 70 / 1,4		

* Optional with slope adjust

MULTIMEDIA-DISTRIBUTION-AMPLIFIER BVD



1. Aktiver Rückweg, Pegelsteller remote, Entzerrer remote (opt.*) ICS - Ingress Control Switch remote
2. Downstream, Pegelsteller remote
3. Downstream, Entzerrer remote
4. Interstage 0/8dB remote schaltbar
5. DOCSIS-CM + MCU_WebServer - für Remote mit RJ-45 LAN Anschluß für Laptop
6. Zuschaltbar - TP -20 dB
7. Gefilteres Frequenzspektrum, Weg II
8. komplettes Frequenzband
9. Geschaltete Teilnehmerausgänge (Ein, Aus, Weg II)

RETURN WAY PLUG-IN OVERVIEW

Amplifier types BKD, LVD

Type		RV 65-25 F2	RV 65-28 F2	RV 65-32 F3	RV 65-32 D
Article-No.		1016 1623	5700 1448	5700 1955	5700 1955
Frequency range	MHz	5-65	5-65	5-65	5-65
Gain	dB	25	28	32	32
Attenuation	dB	0...20	0...20	0,2,4...16 dB	0,2,4...16 dB
Slope	dB	–	0...10	0/3/6/9	0/3/6/9
Outputlevel					
1TS 140 / DIN IMA_3	dBµV	115	115	115	120
BKD 30 S		■	■	■	
BKD 35 S		■	■	■	
BKD 40 S		■	■	■	■
LVD 35 P		■	■	■	
LVD 40 P		■	■	■	

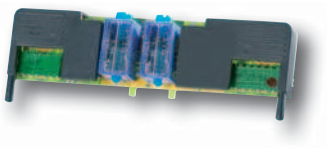
Amplifier types LHD, LHE, NVD, NVE

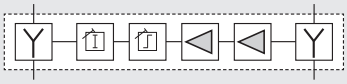
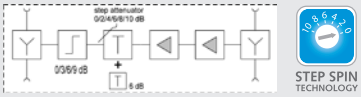
Type		RLK 265	RLK 365	RLV 65-28 D	RLV 65-32 D	AGC 203	ID 100	NHP 15
Article-No.		1016 1313	5700 1903	5700 1905	5700 1904	1016 1355	1016 1588	5700 1255
Description		Diplexer	Diplexer	Amplifier	Amplifier	AGC	Adapter	Ingress-Filter
Frequency range	MHz	5-65/85-1006	5-65/85-1006	5-65	5-65	5-862	5-1006	15-65
Gain	dB			28	32			
Attenuation	dB	1,0	1,0	20	20	< 5	Pads	
Slope	dB			10	10		Pads	
Outputlevel								
1TS 140 / DIN IMA_3	dBµV			120	120			
LHD			■	■	■			
NVD		■				■	■	■
NVE		■				■	■	■
LHE						■		

Type		EZP ...	EZL ...	VM 202	VM 02	AM 201-10	AM 201-20
Article-No.				5700 1674	1016 1357	5700 1656	5700 1639
Description		Equalizer	Equalizer	Splitter	Splitter	Tap	Tap
Frequency range	MHz	85-862	85-862	5-1006	5-862	5-1006	5-1006
Attenuation	dB	1	1	4,0	4,0	1,3 / 10	0,9 / 20
Slope		6, 9, 12, 15	6, 9, 12, 15				
NVD		■	■	■		■	■
NVE		■	■		■		
LHE		■	■	■			

PLUG-IN MODULES FOR HOUSE-AMPLIFIER

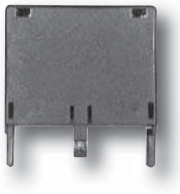
- For BKD- and LVD-amplifier
- Pls. also refer to the table at page 134
- High linearity
- Plastic cover for solid protection



Type		RV 65-25 F2	RV 65-28 E2	RV 65-32 F3	RV 65-32 D
Article-No.		5700 1469	5700 1448	5700 1955	5700 1956
					
Frequency range	MHz	5-65	5-65	5-65	5-65
Gain	dB	25	28	32	32
Attenuation		0...20	0...20	0,2,4...16 dB	0,2,4...16 dB
Entzerrung		–	0...10	0/3/6/9	0/3/6/9
Linearity	dB	± 0,5	± 0,5	± 0,5	± 0,5
Noise	dB	7	7	7	7
Output level max.					
KBW mid channel load	dBµV	115	115	115	120
4 carrier QAM 64	BER	< $1*10^{-8}$	< $1*10^{-8}$	< $1*10^{-8}$	< $1*10^{-6}$ (KDG 1TS140 Class D)
Downstreamrange	MHz	85-862	85-862	85-1006	85-1006
Loss	dB	- 1,0	- 1,0	- 1,0	- 1,0

PLUG-IN MODULES FOR TRUNK- AND DISTRIBUTION-AMPLIFIER

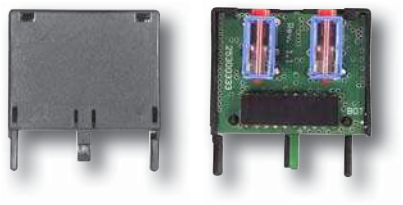
- Diplex-Module
- For LHD, NVE as well as NVD amplifier
- Return loss 18 dB at 47 MHz, 1,5 dB per octave
- Plastic cover for solid protection
- Remark: 2 pieces per amplifier needed

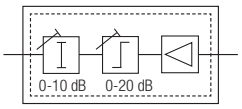
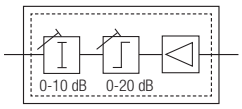


Type		RLK 265	RLK 365
Article-No.		1016 1313	5700 1903
Usage		NVE, NVD	LHD
Frequency range upstream	MHz	5-65	5-65
Frequency range downstream	MHz	85-1006	85-1006
Loss	dB	1,0	1,0
Isolation Up-/Downstream	dB	> 45 per diplexer	> 50 per diplexer

PLUG-IN MODULES FOR TRUNK- AND DISTRIBUTION-AMPLIFIER

- Return way amplifier module
- For LHD 35-4 and LHD40-4 amplifier
- RLV: with variable attenuation and slope adjustment
- Extreme high outputlevel acc. KDG class D



Type		RLV 65-28 D	RLV 65-32 D
Article-No.		5700 1905	5700 1904
Usage		LHD xx-4D	LHD xx-4D
			
Frequency range	MHz	5-65 (with 2x RLK 365)	5-65 (with 2x RLK 365)
Gain	dB	28	32
Slope (interstage)	dB	10, variable adjustment	10, variable adjustment
Attenuation (output)	dB	20, variable adjustment	20, variable adjustment
Linearity	dB	± 1,0	± 1,0
Noise	dB	5, Tu ≤ 40° C	5, Tu ≤ 40° C
Output-BER @ 120 dBµV full channel load 5 carrier 16 QAM 8 MHz & 1 carrier 16 QAM 3,2 MHz	BER	< $1*10^{-6}$ (KDG 1TS140 class D)	< $1*10^{-6}$ (KDG 1TS140 class D)

RETURN PATH INGRESS

- Return path ingress filter
- For distribution and line amplifiers series NVE and NVD
- For suppression of return path ingress
- High rejection loss

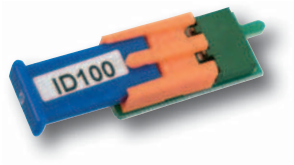
Type		NHP 15
Article-No.		5700 1255
Transit range	MHz	15-65 (862)
Through loss	dB	< 1,5
Rejection range	MHz	0-10
Rejection loss	dB	> 40

SYSTEM MODULES FOR TRUNK- AND DISTRIBUTION-AMPLIFIER

- AGC-automatic gain control module
- For LHE, NVE as well as NVD amplifier
- Temperature caused gain deviations will be stabilized
- No pilot tone required due to sum grid detection

Type		AGC 203
Article-No.		1016 1355
Usage		LHE, NVE, NVD
Frequency range	MHz	5-862
Loss	dB	< 5
Level control	dB	± 3,0
Remark		Pls. notice if using the AGC module you will loose 5dB gain in average.

- Adapter for interstage plug-in slot's
- For trunk and distribution amplifier like NVE and NVD
- EZP or EZL can be used

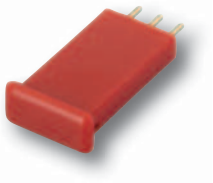


Type		ID 100
Article-No.		1016 1637
Usage		NVE, NVD
Frequency range	MHz	5-1006
Loss	dB	1...20

Type		VM 202	VM 02	AM 201-10	AM 201-20
Article-No.		57001674	10161357	57001656	57001639
Description		splitter	splitter	tap	tap
Usage		LHE, ONC, NVD	NVE	NVD	NVD
					
Frequency range	MHz	5-1006	5-862	5-1006	5-1006
Loss out 1	dB	4,0	4,0	1,3	0,9
Loss out 2	dB	4,0	4,0	10,0	20,0

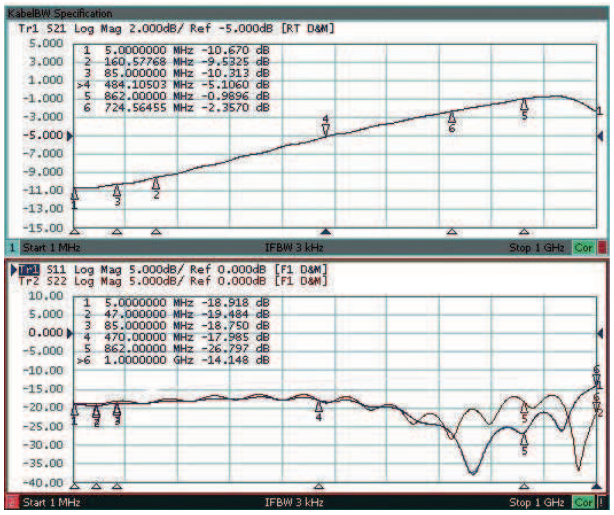
EQUALIZER PAD'S FOR TRUNK- AND DISTRIBUTION-AMPLIFIER

- For trunk, distribution and line extender amplifier LHE, NVE and NVD
- Return loss 18 dB @ 47 MHz, 1,5 dB per Octave
- Plastic cover for solid protection

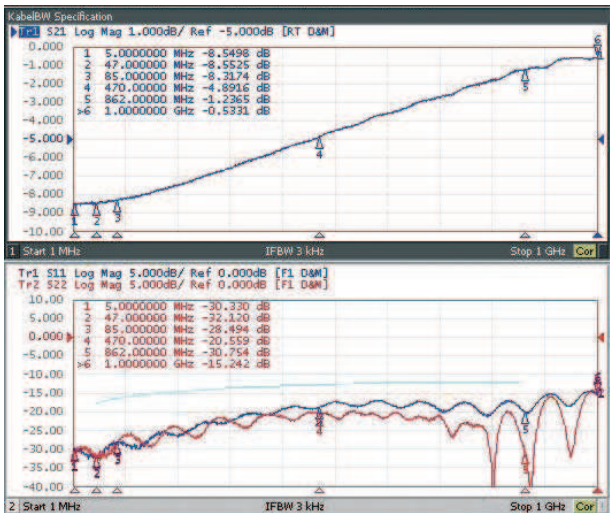


Type		EZP 806	EZP 809	EZP 812	EZP 815
Article-No.		5700 1366	5700 1367	5700 1368	5700 1369
Frequency range	MHz	5-862	5-862	5-862	5-862
Slope	dB	6	9	12	15
Loss	dB	0,8	1,0	0,9	0,9
Linearity	dB	± 0,2	± 0,2	± 0,2	± 0,2

Type		EZL 803	EZL 806	EZL 809	EZL 812
Article-No.		5700 1421	5700 1422	5700 1423	5700 1424
Frequency range	MHz	5-862	5-862	5-862	5-862
Slope	dB	3	6	9	12
Loss	dB	0,9	1,1	1,2	1,0
Linearity	dB	± 0,2	± 0,2	± 0,2	± 0,2



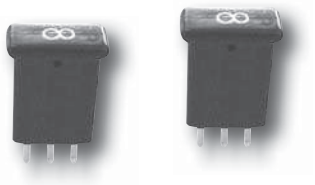
- Slope of EZP 809 at 85-862 MHz



- Slope of EZL 809 at 85-862 MHz

ATTENUATION-PAD'S

- Fix attenuation-PAD's
- For loss or slope adjustments
- Step size in 1 dB
- Length available in 0,45" and 1"



Type		PAD 0	PAD 1	PAD 2	PAD 3	PAD 4	PAD 5	PAD 6
Article-No.	1016	1016 0358	1016 0359	1016 0360	1016 0361	1016 0362	1016 0363	1016 0364
Attenuation	dB	0	1	2	3	4	5	6
Type		**PAD 7**	**PAD 8**	**PAD 9**	**PAD 10**	**PAD 11**	**PAD 12**	**PAD 13**
Article-No.	1016	1016 0365	1016 0366	1016 0367	1016 0368	1016 0369	1016 0370	1016 0371
Attenuation	dB	7	8	9	10	11	12	13
Type		**PAD 14**	**PAD 15**	**PAD 16**	**PAD 17**	**PAD 18**	**PAD 19**	**PAD 20**
Article-No.	1016	1016 0372	1016 0373	1016 0374	1016 0375	1016 0376	1016 0377	1016 0378
Attenuation	dB	14	15	16	17	18	19	20

Length 11,4 mm (0,45")

Type		PAD 0 L	PAD 1 L	PAD 2 L	PAD 3 L	PAD 4 L	PAD 5 L	PAD 6 L
Article-No.	1016	1016 0523	1016 0524	1016 0525	1016 0526	1016 0527	1016 0528	1016 0529
Attenuation	dB	0	1	2	3	4	5	6
Type		**PAD 7 L**	**PAD 8 L**	**PAD 9 L**	**PAD 10 L**	**PAD 11 L**	**PAD 12 L**	**PAD 13 L**
Article-No.	1016	1016 0530	1016 0531	1016 0532	1016 0533	1016 0534	1016 0535	1016 0536
Attenuation	dB	7	8	9	10	11	12	13
Type		**PAD 14 L**	**PAD 15 L**	**PAD 16 L**	**PAD 17 L**	**PAD 18 L**	**PAD 19 L**	**PAD 20 L**
Article-No.	1016	1016 0537	1016 0538	1016 0539	1016 0540	1016 0541	1016 0542	1016 0543
Attenuation	dB	14	15	16	17	18	19	20

Length 25,4 mm (1")

FITTINGS PG 11

Type		PG11m-Ff	PG11m-IECf	PG11m-3,5/12f	PG11m 3,5/12f
					
Article-No.		5700 1082	1016 1203	5700 1141	5700 1291
Description		PG 11 - Adapter PG 11 / F-female	PG 11 - Adapter PG 11 / IEC-female	PG 11 - Adapter PG 11 / 3,5/12 female	PG 11 - Adapter PG 11 / 3,5/12 female
Inner conductor length		47 mm	17 mm	47 mm	17 mm

Type		PG 11m-5/8f	PG 11 PC
			
Article-No.		1016 1204	1016 1205
Description		PG 11 - reduction ring PG 11 / 5/8”	PG 11 Blind cap

Type		A025-PG11m	B004-PG11m	B004-Fm	B004-SPL
					
Article-No.		5700 1019	5700 1023	5700 1011	5700 1016
Description		PG 11 - fitting	PG 11 - fitting	5/8” fitting	cable connector
Fits for		7,0 mm	RG 11	1,6 / 10,0 / 10,1 mm	1,6 / 10,0 / 10,1 mm
Frequency range	MHz	5 - 2200	5 - 2200	5 - 2200	5 - 2200
Screening factor	dB	> 110	> 110	> 110	> 110

Type		A025-5/8m	D015-5/8m	B071-5/8m	G003-5/8m	B004-5/8m
						
Article-No.		5700 1024	5700 1025	5700 1026	5700 1027	5700 1028
Description		5/8” fitting	5/8” fitting	5/8” fitting	5/8” fitting	5/8” fitting
Fits for		7,0 mm	nkx	ikx	qkx	RG 11
Frequency range	MHz	5 - 2200	5 - 2200	5 - 2200	5 - 2200	5 - 2200
Screening factor	dB	> 110	> 110	> 110	> 110	> 110

SURGE- AND BURSTPROTECTOR

- For Surge- and Burstprotection
- Direct connection to an in- or output of the protectable device

Type		ÜSA 45
Article-No.		5700 1221
Frequency range	MHz	1006
Through loss	dB	0,7
Voltage protection	V	max. 4.500
max. output level		126 dBµV / IMA_2 (DIN 45004A1)
(60 dB IMA)		125 dBµV / IMA_3 (DIN 45004AB)
Dimension B x H x T	mm	44 x 48 x 24

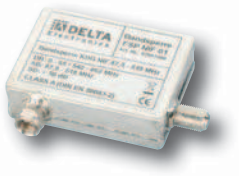
GALVANIC ISOLATOR

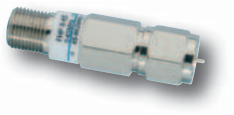
- To avoid offset current between different electrical potential's
- Capacitors for galvanic isolation of IN- and outputs
- Surge- and Burstprotection to 2 kV

Type		GTR 02-1
Article-No.		1016 1670
Frequency range	MHz	5-1000
Through loss	dB	0,5 ... 1,0
Linearity	dB	± 0,5
Voltage protection	kV	2 (zwischen Ein- und Ausgangspotentialen)
Dimension B x H x T	mm	60 x 30 x 38

RETURN WAY FILTER

- FSP NIF 01: band pass filter for tv channel grid "Internet & Phone Only"
- FHP 8-65: High pass filter for return channel or ingress blocking



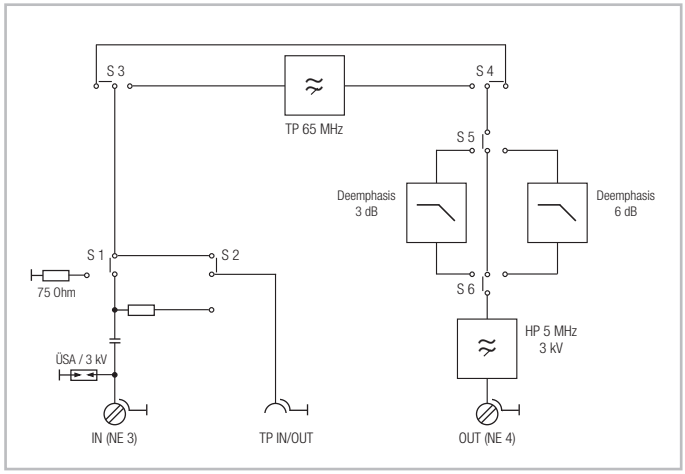


Type		FSP NIF 01	FHP 8-65
Article-No.		5700 1349	5700 0989
Pass band	MHz	0-65, 542-862 (return way, K 30 - K 69)	86-862 (FM - K 69)
Through loss	dB	0,5	< 1
Cut off band	MHz	87,5-518 (FM - K 26)	0-65 (return way)
Isolation	dB	> 50	> 50
Dimension	mm	67 x 20 x 49 (B x H x T)	42,4 x 12,5 (L x Ø)

NETWORK TERMINATION POINT PROFI-LINE

- For broadband network termination between level 3 (street installation) and level 4 (house installation)
- Alu diecast housing, IP 54
- Frequency range 5 to 1006 MHz
- Switchable return way cut off filter built-in
- Galvanic isolated inner conductor
- Deemphasis slope adjustable
- Surge- and Burstprotection
- Testpoint - IN/OUT shiftable
- Plastic cover for solid protection
- Secured against unauthorized opening

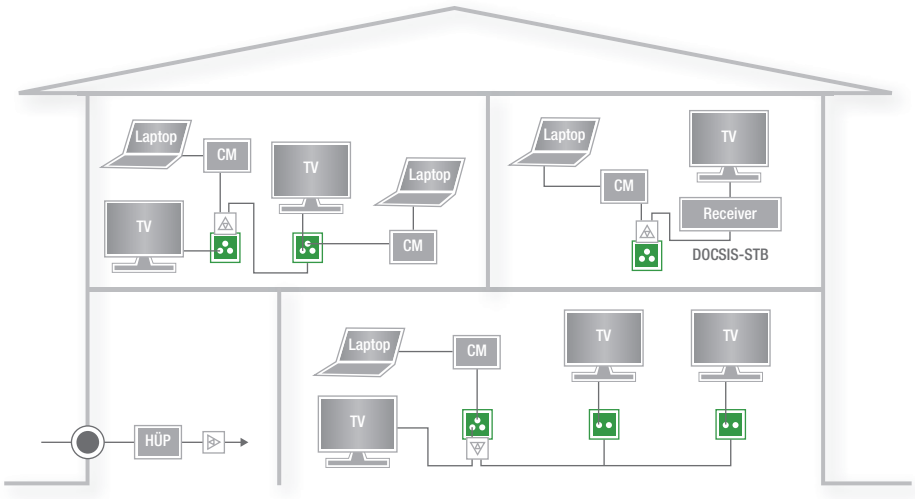
Type		HÜP 862 D	
Article-No.		5700 1434	
Frequency range	MHz	5-1006 without retrun way cut off filter	85-1006 with retrun way cut off filter
Cut off loss 5-65 MHz	dB	–	40
Through loss	dB	0,8	
Linearity	dB	± 0,5	
Isolation E/A to S1 at 75 Ω	dB	50	
Deemphase slope 470-1006 MHz	dB	0 / 3 / 6 switchable	
Surge- and Burstprotection	kV	3	
Testpoint		1 F-female (between in- and output switchable)	
Dimension B x H x T	mm	100 x 90 x 45	
Weight	kg	0,3	
Termination NE3		75 Ohm (switchable)	
Returnloss	dB	-20 dB at 40 MHz / -1,5 dB/Octave	



2-WAY APARTMENT-AMPLIFIER

- 2-way apartment-amplifier with active return way
- Perfect for Multimedia-or DOCSIS-application, for Modem-, TV- or STB extension
- For push-on to antenna wall outlets
- Active 2-way split to connect a cablemodem and one more multimedia walloutlet
- Connection: F-female, F-male
- Including power adapter

Type			ZGV 12-65 A
Article-No.			5700 1631
Input			1
Outputs			2
Downstream	Frequency range	MHz	85 - 1006
	Gain	dB	2x10
	Noise	dB	4,5
	Linearity	dB	± 0,5
	Outputlevel		
	CSO / CTB > 60 dB, 42 Ch. flat	dBµV	98
	IMA_2 / IMA_3 > 60 dB, DIN-level	dBµV	112/113
Upstream	Frequency range	MHz	5 - 65
	Gain	dB	2x10
	Linearity	dB	± 0,7
Powersupply		V~	230
Powerconsumption		W	0,5
Connection			2 x F-female, 1 x F-male
Dimension B x H x T / Weight		mm/kg	44 x 48 x 24 / 0,6



- Perfect to extend multimedia wall outlets in case of to high loss or for connection of a second cable modem or set top box with integrated cable modem. Ideal to connect another appartment wall outlet.





TAPS F-CONNECTION 1000 MHz FOR CATV

- For indoor usage
- Connection: F-female
- Frequency range 5-1000 MHz
- Die cast-housing with earth bonding
- Screnning factor > 100 dB, CLASS A
- Hum-suppression

KLASSE A CLASS

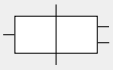
Type		STA 0186-6	STA 0186-8	STA 0186-12	STA 0186-16	STA 0186-20
Article-No.		1016 1259	1016 1260	1016 1261	1016 1262	1016 1263
						
Frequency range	MHz	5 - 1000	5 - 1000	5 - 1000	5 - 1000	5 - 1000
Tap's		1	1	1	1	1
Tap loss	± 1,0 dB	6	8	12	16	20
Through loss						
5-470 MHz	dB	2,8	2,0	0,8	0,8	0,8
470-1000 MHz	dB	3,0	2,0	1,0	1,0	1,0
Directional isolation	dB	> 23	> 25	> 26	> 28	> 32
Return loss	dB	> 18	> 20	> 20	> 20	> 20
Dimension B x H x T	mm	52 x 51 x 17	52 x 51 x 17	52 x 51 x 17	52 x 51 x 17	52 x 51 x 17
Weight	kg	0,05	0,05	0,05	0,05	0,05

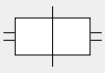
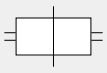
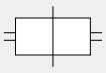
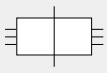
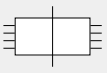
Type		STA 0286-8	STA 0286-12	STA 0286-16	STA 0286-20
Article-No.		1016 1264	1016 1266	1016 1267	1016 1268
					
Frequency range	MHz	5 - 1000	5 - 1000	5 - 1000	5 - 1000
Tap's		2	2	2	2
Tap loss	± 1,0 dB	8	12	16	20
Through loss					
5-470 MHz	dB	3,8	1,8	0,8	0,8
470-1000 MHz	dB	4,2	2,0	1,5	1,0
Directional isolation	dB	> 28	> 25	> 28	> 32
Port isolation	dB	> 28	> 27	> 30	> 30
Return loss	dB	> 20	> 20	> 20	> 20
Dimension B x H x T	mm	52 x 51 x 17	52 x 51 x 17	52 x 51 x 17	52 x 51 x 17
Weight	kg	0,05	0,05	0,05	0,05

TAPS F-CONNECTION 1000 MHz FOR CATV

- For indoor usage
- Connection: F-female
- Frequency range 5-1000 MHz
- Die cast-housing with earth bonding
- Screnning factor > 100 dB, CLASS A
- Hum-suppression

KLASSE A CLASS

Type		STA 0386-10	STA 0386-12	STA 0386-16	STA 0386-20
Article-No.		1016 1558	1016 1559	1016 1560	1016 1561
					
Frequency range	MHz	5 - 1000	5 - 1000	5 - 1000	5 - 1000
Taps		3	3	3	3
Tap loss	± 1,0 dB	10	12	16	20
Through loss					
5-470 MHz	dB	3,2	3,2	1,8	1,0
470-1000 MHz	dB	4,2	4,0	2,5	1,5
Directional isolation	dB	> 25	> 25	> 30	> 30
Port isolation	dB	> 25	> 25	> 25	> 25
Return loss	dB	> 20	> 20	> 20	> 20
Dimension B x H x T	mm	52 x 51 x 17	52 x 51 x 17	52 x 51 x 17	52 x 51 x 17
Weight	kg	0,09	0,09	0,09	0,09

Type		STA 0486-12	STA 0486-16	STA 0486-20	STA 0686-16	STA 0886-16
Article-No.		1016 1273	1016 1274	1016 1275	1016 1276	1016 1277
						
Frequency range	MHz	5 - 1000	5 - 1000	5 - 1000	5 - 1000	5 - 1000
Taps		4	4	4	6	8
Tap loss	± 1,0 dB	12	16	20	16	16
Through loss						
5-470 MHz	dB	3,5	2,0	1,0	2,8	3,5
470-1000 MHz	dB	4,0	2,5	1,5	3,0	4,2
Directional isolation	dB	> 23	> 28	> 28	> 25	> 24
Port isolation	dB	> 23	> 28	> 28	> 25	> 25
Return loss	dB	> 20	> 20	> 20	> 18	> 18
Dimension B x H x T	mm	74 x 60 x 17	74 x 60 x 17	74 x 60 x 17	118 x 60 x 17	118 x 60 x 17
Weight	kg	0,09	0,09	0,09	0,12	0,13

SPLITTER F-CONNECTION 1000 MHZ FOR CATV

- For indoor usage
- Connection: F-female
- Die cast-housing with earth bonding
- Screnning factor > 100 dB, CLASS A
- Frequency range 5-1000 MHz
- Hum-suppression

KLASSE A CLASS

Type		VT 0286	VT 0386	VT 0486	VT 0686	VT 0886
Article-No.		1016 1289	1016 1290	1016 1291	1016 1352	1016 1292
						
Frequency range	MHz	5 - 1000	5 - 1000	5 - 1000	5 - 1000	5 - 1000
Outputs		2	3	4	6	8
Through loss						
5-470 MHz	dB	3,7	5,8	7,0	9,0	11,2
470-1000 MHz	dB	3,8	6,3	7,8	10,5	11,5
Isolation	dB	> 25	> 25	> 25	> 25	> 25
Return loss	dB	> 20	> 18	> 18	> 18	> 18
Dimension B x H x T	mm	22 x 51 x 17	74 x 51 x 17	74 x 51 x 17	118 x 60 x 17	118 x 60 x 17
Weight	kg	0,05	0,06	0,07	0,11	0,13

SPLITTER F-CONNECTION 2150 MHz FOR SAT-IF

- Frequency range 5-2150 MHz
- Power pass all outlets, diode isolated

Type		VT 0224	VT 0324	VT 0424	VT 0624	VT 0824
Article-No.		1016 1293	1016 1294	1016 1295	1016 1356	1016 1297
						
Frequency range	MHz	5 - 2150	5 - 2150	5 - 2150	5 - 2150	5 - 2150
Outputs		2	3	4	6	8
Through loss						
5-470 MHz	dB	5,0	8,0	9,0	11,0	13,0
470-1000 MHz	dB	6,0	10,0	11,0	14,0	16,0
Isolation	dB	> 20	> 20	> 20	> 20	> 20
Return loss	dB	> 10	> 10	> 10	> 10	> 10
Dimension B x H x T	mm	52 x 51 x 17	74 x 51 x 17	74 x 51 x 17	118 x 60 x 17	118 x 60 x 17
Weight	kg	0,05	0,06	0,07	0,11	0,13

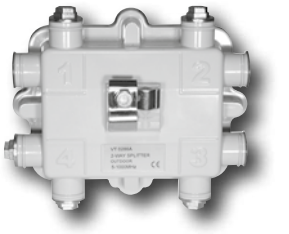
TAPS F-CONNECTION 2150 MHz FOR SAT-IF

- For indoor usage
- Connection: F-female
- Frequency range 5-2400 MHz
- Die cast-housing with earth bonding
- Screnning factor > 100 dB, CLASS A
- Hum-suppression
- DC-power pass at trunk line max. 1 A

Type		STA 0124-10	STA 0224-10	STA 0424-10
Article-No.		5700 0995	5700 0996	5700 0997
				
Frequency range	MHz	5 – 2150	5 – 2150	5 – 2150
Taps		1	2	4
Tap loss	± 1,0 dB	10	10	10
Through loss				
5 – 862 MHz	dB	2,5	4,2	5,5
950 – 2400 MHz	dB	3,5	5,0	6,6
Directional isolation	dB	> 23	> 25	> 23
Port isolation	dB	> 20	> 20	> 20
Connector		F-female	F-female	F-Buchsen
Dimension B x H x T	mm	74 x 16 x 17	74 x 16 x 17	74 x 16 x 17
Weight	kg	0,05	0,06	0,09

POWER INSERTER OUTDOOR

- Frequency range to 1000 MHz
- For outdoor usage
- Water proofed Alu-diecast housing, IP 65
- Screening factor > 100 dB, CLASS A
- Remote supply current 10 A / 60 V AC, between IN and OUT
- In- and Outputs fuse protected
- Connecotor: 5/8" thread



Type		PI 0186-A
Article-No.		1016 1298
Frequency range	MHz	5 – 1000
Through loss	dB	1,0
Isolation	dB	> 50 (AC/RF)
Remote current / 60 V AC	A	10
Hum suppression		> 66 dB / 10 A
Dimension B x H x T	mm	150 x 125 x 79
Weight	kg	0,58

MULTITAPS F-CONNECTION 1000 MHz FOR CATV

- For indoor usage
- Connection: F-female
- Frequency range 5-1000 MHz
- Die cast-housing with earth bonding
- Screnning factor > 100 dB, CLASS A
- Hum-suppression

KLASSE A CLASS

Type		MTF 0486	MTF 0686	MTF 0886	MTF 1286	MTF 1686
Article-No.		1016 1331	1016 1332	1016 1333	1016 1329	1016 1330
						
Taps		4	6	8	12	16
Frequency range	MHz	5 - 1000	5 - 1000	5 - 1000	5 - 1000	5 - 1000
Tap loss	dB	13,0 13,5 14,5 15,5	13,0 13,5 14,5 15,5 16,5 17,5	13,0 14,0 15,0 16,0 17,0 18,0 19,0 20,0	13,0 13,5 15,0 15,5 16,0 16,5 18,0 19,0 19,5 20,0 21,5 22,0	13,0 13,5 15,0 15,5 16,0 16,5 18,0 19,0 19,5 20,0 21,5 22,5 23,5 24,0 25,0 25,5
Tolerance tap loss						
5-470 MHz	dB	± 1,0	± 1,0	± 1,0	± 1,5	± 1,5
470-1000 MHz	dB	± 1,0	± 1,0	± 1,0	± 1,5	± 1,5
Directional loss	dB0	> 30	> 30	> 30	> 30	> 30
Port isolation	dB	> 36	> 36	> 36	> 36	> 36
Return loss	dB	> 16	> 16	> 16	> 16	> 16
Dimension B x H x T	mm	96 x 55 x 44	96 x 55 x 44	120 x 55 x 44	241 x 79 x 44	241 x 79 x 44
Weight	kg	0,18	0,19	0,20	0,55	0,57

ANTENNA WALL OUTLETS HIGH-Q

The best solution for television, radio as well as internet- and phone accsess

Antenna sockets in the dwelling build the network connection of the coaxial house distribution system for television, radio and interactive services. They supply connection possibilities for terminals like television, SAT receiver, FM stereo system or cable modem within the residence.

The most suitable socket types can be simply chosen according to the planned reception types and services of the antenna system:

- **Universal broadband sockets** are suitable for terrestrial reception, for the CATV transmission in community antenna systems and for SAT-IF signals. They are mostly independent from the type of broadcast and enable universal connection possibilities. Universal broadband sockets are recommended for house distribution systems, in which the expansion of both transmission technologies (CATV or SAT) is generally possible, but no special requirements are to be expected.
- **CATV sockets** are suitable for terrestrial, i.e. cable frequency ranges up to 862 MHz. Special versions like the **multimedia sockets** avail of an additional cable modem connection (DATA) with extremely high isolation of the return path. Interferences of the TV reception from the cable modem are thus effectively suppressed.
- **SAT sockets** are optimized for the transmission of SAT-IF signals in antenna systems with direct satellite reception. In single SAT systems and community systems with multi-switches (star distribution) DC feedable tap sockets are required. The use of DC-free SAT loop-through antenna sockets is recommended in DC free single cable solutions (tree networks). For intelligent single cable solutions, e.g. with the DELTA SAT converter SUM, a special D version with DC capability and diode decoupled F-connector is available. Here, the last socket must be terminated with a capacitive separated resistor R 75 DC (accessories).

Key features

- Easy to install, solid mechanical construction
- Reliable inner conductor cable clamp
- Multimedia-wall outlets with excellent return loss
- Types with return way blocking filter available
- Optimized according logistics, usage and handling aspects

- Packing: Single packed or 10 pcs packed
  Single packing includes cover plate and frame

HIGH-Q WALL OUTLETS UNIVERSAL SUPER-BROADBAND

- Super-Broaband-walloutlet for CATV and SAT-IF
- Wide band frequency transmission at both outputs
- For variouse applications suitable
- Packing: 10 pcs package

Type		Frequency range	BE 0424	BD 1024	BD 1524	BD 2024
Article-No.	10pcs-package		1016 1242	1016 1241	1016 1240	in progress
						
Description			terminal	loop through	loop through	loop through
Attenuation						
TV OUT (IEC-male)	dB	5-2200 MHz	4,0 - 5,5	10 - 12	15 - 16	20
FM OUT (IEC-female)	dB	5-2200 MHz	4,0 - 5,5	10 - 12	15 - 16	20
Trunkline OUT	dB	5-2200 MHz	–	2,2 - 4,0	1,0 - 2,0	1,0 - 2,0
Isolation		5-862 MHz				
between the connector	dB	OUT <–> TV	–	22	24	24
between the connector	dB	OUT <–> RF	–	22	24	24
DC pass at TV port		TV (SAT)	13/18 V, 22 kHz	–	–	–
Weight	kg		0,1	0,1	0,1	0,1

Frequency-grid RK | VHF I | FM | S2/3 | VHF III | UHF | SAT

IEC-male „TV”

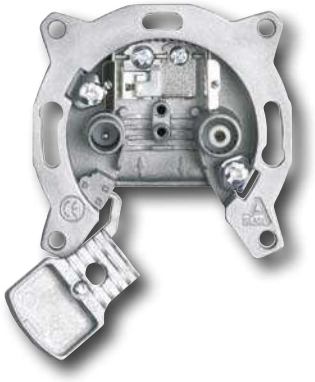
IEC-female „RF”

Trunkline OUT*

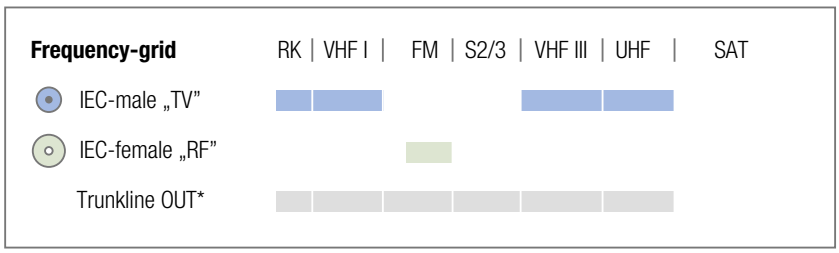
*only BD xxxx

HIGH-Q ANTENNA OUTLET SOCKETS CATV/TERRESTRIAL

- Subscriber outlet for community systems with headend (SMATV) as well as terrestrial reception systems (MATV)
- Filter sockets with selective isolation of outputs
- Very low insertion loss



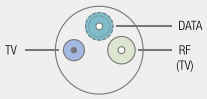
Type			Frequency range	BE 8601	BD 8607	BD 8610	BD 8615	BD 8619
Article-No.	10pcs-package			1016 1247	1016 1246	1016 1245	1016 1244	1016 1243
								
Description				individual	loop-through	loop-through	loop-through	loop-through
Attenuation								
Output TV (IEC male)		dB	4-68/125-862 MHz	1,0 - 2,0	7,0	10	15	19
Output RF (IEC female)		dB	87,5-108 MHz	1,0	7,0	10	15	19
Loop-through OUT		dB	4-862 MHz	–	3,5	2,0	1,0	0,8
Isolation			5-862 MHz					
between outputs		dB	TV <–> RF	22	32	35	45	45
between outputs		dB	OUT <–> TV	–	21	23	27	27
between outputs		dB	OUT <–> RF	–	21	23	27	27
Weight		kg		0,1	0,1	0,1	0,1	0,1

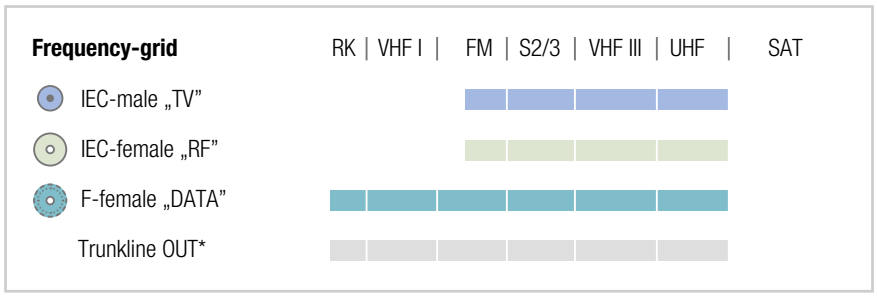


*only BD 86xx

HIGH-Q WALL OUTLETS CATV-MULTIMEDIA

- Multimedia-wall outlet for interactive CATV networks (Triple Play)
- High isolation between return way and downstream ensures a perfect TV transmission during the cable modem operation
- Wide frequency range at TV port allows the receive of QAM-channels S2 and S3
- Packing: Single package incl. cover plate and frame or 10 pcs package

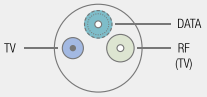
Type		Frequency range	BEM 8604-85 Q	BDM 8610-85 Q	BDM 8612-85 Q	BDM 8615-85 Q	BDM 8619-85 Q
Article-No.	1pcs-package		5700 1536	5700 1537	5700 1678	5700 1538	5700 1539
	10pcs-package		5700 1540	5700 1541	5700 1661	5700 1542	5700 1543
							
Description			terminal	loop through	loop through	loop through	loop through
Attenuation							
TV OUT (IEC-male)	dB	85-1000 MHz	4,0	10	12	14,5	19
FM OUT (IEC-female)	dB	87,5-1000 MHz	9,0	10	12	14,5	19
Auslass DATA (F-female)	dB	5-1000 MHz	8,0	10	12	14,5	19
Trunk line OUT	dB	5-1000 MHz	–	4,3	2,0	2,5	2,0
Isolation		5-65/85-862 MHz					
between the connector	dB	DATA <–> TV	75/30	75/40	75/35	70/35	72/40
between the connector	dB	OUT <–> TV	–	45/30	45/30	45/30	45/30
between the connector	dB	OUT <–> RF	–	45/22	45/22	45/22	45/22
Weight	kg		0,1	0,1	0,1	0,1	0,1

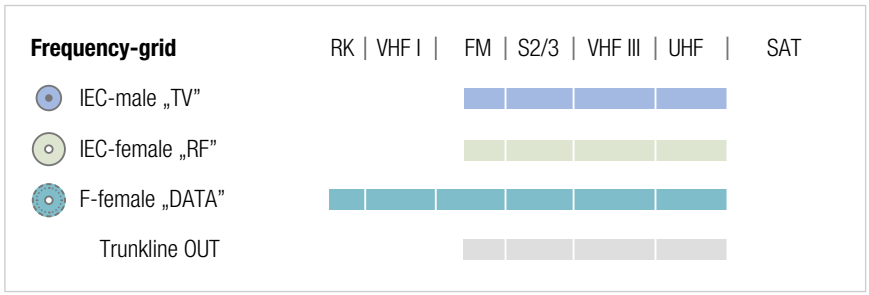


*only BDM 86xx-85Q

HIGH-Q WALL OUTLETS CATV-MULTIMEDIA-RETURN FILTER

- Multimedia-wall outlet with highpass filter at trunkline for blocking return signal to the next wall outlets
- High isolation between return way and downstream ensures a perfect TV transmission during the cable modem operation
- Wide frequency range at TV port allows the receive of QAM-channels S2 and S3
- Packing: Single package incl. cover plate and frame

Type		Frequency range	BDM 8610-85 QHP	BDM 8615-85 QHP
Article-No. 1pcs-package			5700 1298	5700 1545
				
Description			loop through	loop through
Attenuation				
TV OUT (IEC-male)	dB	85-1000 MHz	10,5	14,5
FM OUT (IEC-female)	dB	87,5-1000 MHz	10,5	14,0
DATA OUT (F-male)	dB	5-1000 MHz	10,5	15,0
Trunk line OUT	dB	5-65/85-1000 MHz	45/4,0	45/2,5
Isolation		5-65/85-1000 MHz		
between the connector	dB	DATA <–> TV	70/30	70/30
between the connector	dB	OUT <–> TV	45/30	45/30
between the connector	dB	OUT <–> RF	45/22	45/22
Weight	kg		0,1	0,1

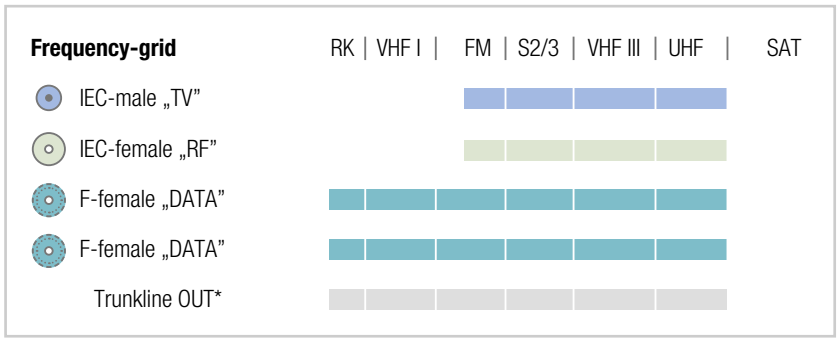


HIGH-Q WALL OUTLET CATV-MULTIMEDIA TWIN-DATA

2 x Internet access and cable tv receive – from one wall outlet!

- Universal single- and loop through wall outlet
- Multimedia-wall outlet for interactive CATV networks (Triple Play)
- Outlets for 2x DATA, TV, FM for an easy connection of 2x cable modems or 1 cable modem + Hybrid STB, TV-Sets and Radio
- High isolation between DATA, DATA and TV
- Unity Media approved
- Including cover plate, without frame, 10 pcs package

Type		Frequency range	BEM 1012-QT	BDM 1012-QT	BDM 1015-QT
Article-No.	10pcs-package		5700 1874	5700 1873	5700 1572
					
Description			terminal	loop through	loop through
Attenuation					
FM OUT (IEC-female)		85-1000 MHz	12 dB	10 - 12	15 - 16
TV OUT (IEC-male)	dB	85-1000 MHz	12 dB	10 - 12	15 - 16
DATA I OUT (F-male)	dB	5-1000 MHz	12 dB	10 - 12	15 - 16
DATA II OUT (F-male)	dB	5-1000 MHz	12 dB	10 - 12	15 - 16
Trunk line OUT	dB	5-1000 MHz		2,2 - 4,0	1,0 - 2,0
Isolation					
DATA <–> DATA	dB	40-1000 MHz	35 -1.5 / Oct.	22	24
DATA <–> TV/FM	dB	5-65/85-1000 MHz	> 62/32	22	24
OUT <–> FM/TV	dB	5-65/85-1000 MHz	-	–	–
Return Loss TV	dB	40-1000 MHz	-14 - 1.5 / Oct.	0,1	0,1

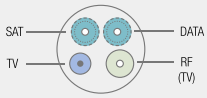


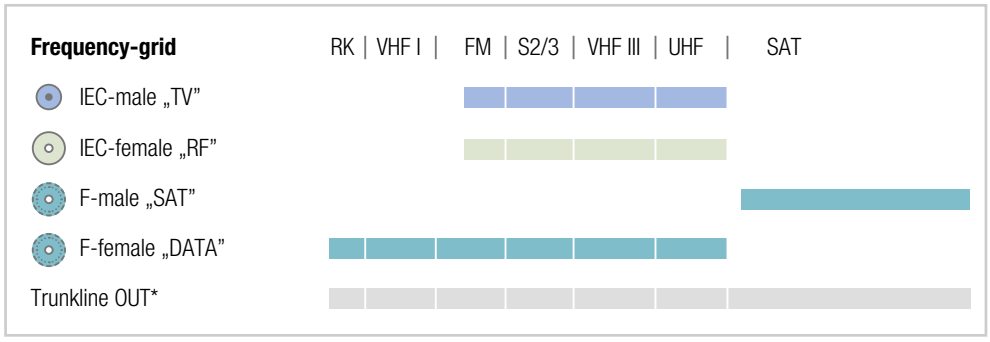
*only BDM 10xx-OT

SAT-DATA MULTIMEDIA WALL OUTLETS

Universal single- and loop through wall outlets
Applicable in SAT-IF- and HFC-hybrid networks.

- Outlets for SAT, DATA, FM, TV to connect a cable modem, SAT-STB, TV-Sets and Radio
- High isolation between DATA, SAT and TV
- DC-Pass for LNB power supply or multiswitch control
- Including cover plate and frame

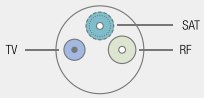
Type		Frequency range	BEM 2404-85	BDM 2410-85	BDM 2415-85	BDM 2419-85
Article-No.	1pcs-package		5700 0951	5700 0947	5700 0948	5700 0949
						
Description			terminal	loop through	loop through	loop through
Attenuation			8			
FM OUT	dB	85-862 MHz	4	10	14	119
TV OUT	dB	85-2200 MHz	9	10	14	19
DATA OUT	dB	5-862 MHz	3	10	14	19
SAT OUT	dB	950-2200 MHz	–	10	14	19
Trunkline OUT	dB	5-1750 MHz	–	6,5	5,0	6,0
Trunkline OUT	dB	1750-2400MHz		8,0	7,0	6,5
Isolation			18			
SAT <-> TV/RF	dB	950-2400/85-862 MHz	65/22	20	20	20
DATA <-> TV/FM	dB	5-65/85-862 MHz	–	65/22	65/22	65/22
OUT <-> SAT/TV	dB		13/18V, 22 kHz	22	22	22
DC pass		SAT DC Pass (18V/1A)		13/18V, 22kHz	13/18V,22kHz	13/18V,22kHz

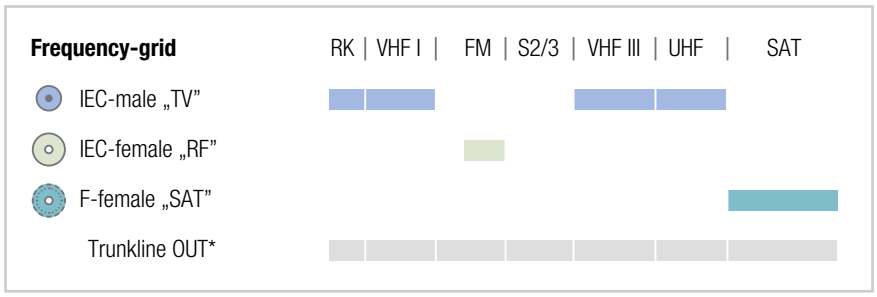


* only BDM 24xx-85

HIGH-Q WALL OUTLET SAT-IF

- Applicable for SAT-IF and terrestrial transmission
- Band filter for FM with low loss and high output isolation
- Loop through models: **SDD....QD** with DC-pass and diode isolated, e. g. for digital unicable solution with SUM or MSU UNICABLE READY

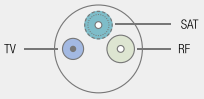
Type		Frequency range	SEA 2400 Q	SDD 2410 QD	SDD 2419 QD	SDD 2424 QD
Article-No.	1pcs-package		1016 1442	5700 1527	5700 1442	5700 1443
	10pcs-package		1016 1399	–	–	–
						
Description			terminal	loop through	loop through	loop through
Attenuation						
TV OUT (IEC-male)	dB	4-68/125-862 MHz	1,0 - 2,0	12,0	19,0	24,0
FM OUT (IEC-female)	dB	87,5-108 MHz	1,0	11,0	19,0	24,0
SAT OUT (F-female)	dB	950-2200 MHz	1,5	13,0	19,0	24,0
Trunkline OUT	dB	5-862/950-2200 MHz	–	2,0/4,5	1,9/4,0	1,7/3,5
Isolation		5-65/85-862 MHz				
between the connector	dB	SAT <–> TV/RF	30	25	25	25
between the connector	dB	TV <–> RF	25	24	24	24
between the connector	dB	OUT <–> SAT/TV	–	22	22	22
DC pass		SAT	13/18 V / 22 kHz	13/18 V / 22 kHz	13/18 V / 22 kHz	13/18 V / 22 kHz
Weight	kg		0,1	0,1	0,1	0,1

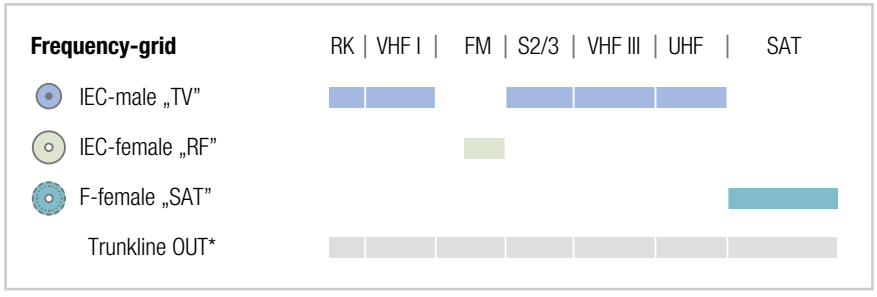


*only SDD 24xx QD

SAT-UNICABLE WALL OUTLET PROGRAMMABLE

- Special antenna outlet socket for multi-apartment Unicable multi-switches according to EN 50494, prepared for the extended standard (JESS)
- Blocks 18V and 22 kHz-continuous signal, in order to prevent malfunctioning of the Unicable switch, if the receiver is operated in Standard (legacy) mode. (as supplied)
- Up to 16 SCR transport frequencies (user bands) of the socket are assignable via programming. Only receivers with identical SCR frequency to the socket have access to the Unicable switch. Ensures conflict-free operation of the Unicable receiver at one line.
- Easy programming of the sockets with SPU 01 programming adapter via PC/laptop.
- Attention: not recommended for Uni*Comb* switches; locks the Legacy function

Type		Frequency range	SEU 07	SDU 10	SDU 14	SDU 18
Article-No.	10pcs-package		5700 2027	5700 2028	5700 2029	5700 2030
						
Description			terminal	loop through	loop through	loop through
Attenuation						
TV OUT (IEC-male)	dB	5-65/109-862 MHz	7,0	12,0	16,0	20,0
FM OUT (IEC-female)	dB	87,5-108 MHz	7,0 - 4,5	12,0	16,0	20,0
SAT OUT (F-female)	dB	950-2200 MHz	7,0	10,0	14,0	18,0
Trunkline OUT	dB	5-862/950-2200 MHz	–	3,0	1,3/2,5	1,7/3,5
Isolation		5-65/85-862 MHz				
between the connector	dB	SAT <–> TV/RF	30	25	25	25
between the connector	dB	TV <–> RF	25	24	24	24
between the connector	dB	OUT <–> SAT/TV	–	22	22	22
DC pass		SAT/trunkline	13/18 V / 22 kHz	13/18 V / 22 kHz	13/18 V / 22 kHz	13/18 V / 22 kHz
Weight	kg		0,1	0,1	0,1	0,1



*only SDU xx

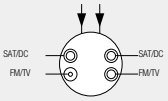
Programming adapter for Unicable antenna outlet sockets

- Adaptation of Unicable sockets SEU/SDU with PC
- Free programming software available by download from www.dct-delta.de

Type	SPU 01
Article-No.	5700 2031
Connectors	F female, USB mini

TWIN-WALL OUTLET SAT-ZF

- Twin-wall outlet for 2-wire-SAT-IF application
- With DC pass
- Including cover plate and frame

Type		Frequency range	STD 2400
Article-No.			1016 1174
			
Description			terminal-twin wall outlet
Attenuation			
TV OUT (IEC-male)	dB	85-862 MHz	1,0 - 2,0
RF OUT (IEC-female)	dB	87,5-862 MHz	1,0 - 2,0
2x SAT OUT (F-female)	dB	950-2200 MHz	4,0 - 6,5
DC pass			12 V =, max. 500 mA (over SAT-IF-connector)

ACCESSORIES FOR ANTENNA WALL OUTLETS

Type		AD 1	AD 3	AP 1	SD 1
					
Article-No.		5700 1580	5700 1452	1016 1348	5700 1581
Description		special cover KBW 1-hole, incl. security screw	Set with cover plate and frame for 3-hole outlets	frame	special tooling for AD1
Dimension	mm	55 x 55 x 3	76 x 76 x 8 / 76 x 76x 32	76 x 76x 32	
					sechskant

Type		R 75	R 75 DC
			
Article-No.		5700 0813	5700 0990
Description		terminal resistor	terminal resistor DC isolated
Frequency range	MHz	0 – 2200	10 – 2200
Load		75 Ohm	75 Ohm
Usage		for DC isolated walloutlets	for SAT-wall outlets with DC pass

COAXIAL CABLES

Most modern cable technology

Cables are like the nerve cords of a TV distribution network. DELTA, in cooperation with qualified suppliers, has put a lot of effort in developing optimal coaxial cable for different applications. For this, sensitive coherences between material usage, constructive cable design, the process parameters of manufacturing and lastly, the resulting mechanical and electrical cable characteristics needed to be reliably controlled. Multiple extruders for the purpose of physically cubicalising dielectrics, special machines for the braiding of the finely wired multi-wire shielding or electronically controlled extruders, which are sprayed under very high pressure onto the cable coating, are just some examples for this state-of-the-art manufacturing technology.

The advantages at a glance

KOAX 0645 T
- HQ - Mini coaxial cable for space saving installation, especially in houses and living areas
- Threefold shielding, class A, suitable for return path capable cable TV networks (Triple Play)
- Recommended by leading cable TV operators

KOAX 80
- Low cost RG6 cable for community and SMATV systems
- Compact aluminium braiding with 60% coverage ensures good screening (class B) and comfortable handling
- CCS inner core with high copper ratio. If used with DC feed through, e.g. in case of LNB feeding, please note the increased DC resistance!

KOAX 100
- The universal house installation cable for SAT-IF, community systems and CATV
- Special shielding construction ensures excellent and low coupling resistance in the return path range, as well as good screening resistance in CATV and SAT-IF frequency range (class A according to EN 50117-2-4)
- Solid-core inner conductor ensures corrosion free F-plug connections and low DC resistance in case of 13/18V remote feeding in SAT systems
- Compact multi-wire braiding, made from 128 single wires with isolation foil for comfortable installation
- Alloy mesh is much cheaper than copper. For house cable installation and the use of DELTA compression plugs a similarly high reliability can be expected

KOAX 110
- HQ house installation cable optimised for return path capable TV distribution networks (Triple Play). Effective suppression of interference in CATV systems (ingress) and SAT-IF distributions (GSM interference). Complies fully to the compulsory EMC network limits
- Special 3 tier shielding construction ensures low coupling resistance in return path range (class A according to EN 50117-2-4), as well as excellent screening attenuation in CATV and SAT-IF frequency range (class A++ according to EN 50117-2-4)
- Solid-core inner conductor and tinned copper braiding as outer conductor for corrosion free F-plug connections, even in damp environments
- Physically highly celled threefold PE as a dielectric ensure low attenuation and long life
- Outer shielding foil glued to jacket for comfortable cable stripping
- Inner screening foil with dielectric glued for easy installation and secure mounting of compression and crimp plugs as well as excellent screening, even after bending
- Recommended by leading cable TV operators

KOAX 1610 T
- HQ coaxial cable for low resistance trunk and feed lines for inside and outside installation
- Threefold shielding, class A, especially suitable for return-path capable cable TV networks (Triple Play)
- Premium solid-copper inner conductor for corrosion free connections
- Recommended by leading cable TV operators

COAXIAL CABELS

- Highly celled gas injection dielectric (FPE) for low attenuation
- Length printed on jacket, beginning with 1m
- High reliability and durability
- Conforms to RoHS
- Orientated on standard EN 50117 ff

Type		KOAX 0645 T	KOAX 58 Midi	KOAX 80	KOAX 100	KOAX 110	KOAX 1610 T
Article-No.	100 m / plastic spool	–	5700 1875	5700 1382	5700 1383	5700 1386	–
	250 m / plastic spool	–	–	–	5700 1384	5700 1387	–
	305 m / wooden barrel	5700 0850	–	–	–	–	–
	500 m / wooden barrel	–	–	5700 1381	5700 1385	5700 1388	5700 0861
	FRNC* 500 m /wooden barrel	–	–	–	–	5700 1389	–
US classification			RG 58	RG 6	RG 6	RG 6	RG 11
Screening		triple layer	double layer	double layer	double layer	triple layer	triple layer
Inner conductor	Ø mm	0,61 Cu	0,8 Cu	1,02 CCS	1,02 Cu	1,02 Cu	1,6 Cu
Dielectric	Ø mm	2,72 FPE	3,5 FPE	4,6 FPE	4,6 FPE	4,6 FPE	7,11 FPE
Jacket	Ø mm	4,5 PVC (white)	5,0 PVC (white)	6,8 PVC (white)	6,8 PVC (white)	6,8 PVC (white)	10,0 PE (black)
Screening material		Al	CuSn	Al	Al	CuSn	Al
Attenuation	dB/100 m						
5 MHz	dB	2,8	1,8	1,7	1,8	1,6	1,2
50 MHz	dB	7,8	5,5	4,9	4,8	4,8	2,9
100 MHz	dB	10,6	7,8	6,6	6,5	6,5	4,1
200 MHz	dB	14,6	11,1	9,4	9,0	9,0	6,0
400 MHz	dB	20,8	15,9	13,4	13,0	13,0	8,1
800 MHz	dB	29,9	22,8	19,3	18,5	18,5	11,8
1600 MHz	dB	44,5	32,8	28,5	27,5	27,1	18,2
2150 MHz	dB	48,8	38,6	33,5	32,5	31,8	22,1
Loop resistance	Ω	75 ± 3,0	75 ± 3,0	75 ± 3,0	75 ± 3,0	75 ± 3,0	75 ± 3,0
Propagation velocity		82 %	82 %	82 %	82 %	82 %	84 %
DC resistance (loop)	Ω/m	0,08	0,052	0,124	0,05	0,037	0,022
Bending radius	cm		2,5	3,5	3,5	3,5	10
Return loss ratio							
5 – 450 MHz	dB	> 26	> 26	> 26	> 26	> 30	> 30
450 – 1000 MHz	dB	> 24	> 26	> 23	> 23	> 25	> 25
1000 – 2150 MHz	dB	> 18	> 20	> 20	> 20	> 20	> 20
Coupling resistance							
5 – 30 MHz	mΩ/m	< 4	< 5	< 15	< 5	< 4	–
Screening							
30 – 1000 MHz	dB	100	110	80	100	100 ... 120	110 ... 120
1000 – 2150 MHz	dB	90	100	85	90	100	110
Classification to EN 50117		A	A	B	A	A	A
F connector screw-in type		FC 43	–	FC 70	FC 70	FC 70	–
F connector crimp type		CMP MC 30 (yellow)	CMP MC 37 (orange)	EX 6-49, CMP 6-49 (blue)	EX 6-49, CMP 6...	EX 6-49, CMP 6...	EX 11

*on request

CONNECTING CABLE HIGH-Q

- High quality type
- Compression connectors
- Screening factor > 90 dB CLASS A, EN 50117

Type	FAK 250 HQ	MAK 250 HQ	MAK 500 HQ	MAK 750 HQ	PAK 35 HQ	PAK 42 HQ
Article-No.	5700 0988	5700 1174	5700 1169	5700 1190	5700 1172	5700 1173
Lenght	2,5 m	2,5 m	5,0 m	7,5 m	0,35 m	0,42 m
Connector	IEC-90° female, IEC-male	2 x F-male (compression)	2 x F-male (compression)	2 x F-male (compression)	2 x F-male (compression)	2 x F-male (compression)
Applicable	TV connection cable	Modem-STB-connection cable	Modem-STB-connection cable	Modem-STB-connection cable	Patch-Kabel	Patch-Kabel
Package	10 pcs	50 pcs	30 pcs	30 pcs	10 pcs	10 pcs

LEVELATTENUATOR

- For variable attenuation adjust
- Connection: F-male, F-female
- CLASS A

Type		DR 8620 FF	DR 2018 F
Article-No.		5700 1231	10161 038
Frequency range	MHz	5 – 1000	5 – 2200
Attenuation	dB	1 ... 20	1 ... 18
Max. DC pass		–	500 mA / 24 V, DC
Connector		F-female	F-female
Dimension B x H x T	mm	24 x 44 x 24	24 x 44 x 24

FIX-ATTENUATOR

- Small housing, 40 x Ø 11 mm
- Connector: F-female and F-male
- CLASS A

Type		FR 3-3	FR 3-6	FR 3-10
Article-No.		5700 1154	5700 1155	5700 1156
Frequency range	MHz	5 - 1000	5 - 1000	5 - 1000
Attenuation	dB	3	6	10

CABLE-SIMULATOR

- Small housing, 42 x Ø 13mm
- Connector: F-female and F-male
- CLASS A
- DC – Pass 50V / 500mA
- Frequency range DC ... 862MHz
- Return loss 18dB (Typ)

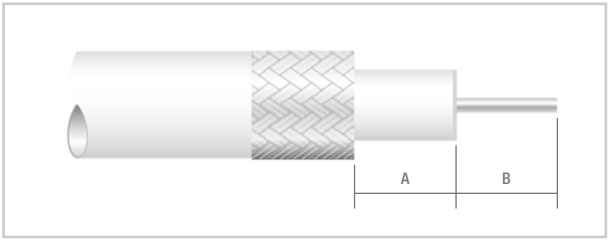
KLASSE A CLASS

Type	BEQ5-450/862075W	BEQ5-450/86210W	BEQ5-450/86213W	BEQ5-450/86216W
Article-No.	5700 1849	5700 1850	5700 1851	5700 1852
Description	Cable simulator 450 - 862 MHz, 7 dB	Cable simulator 450 - 862 MHz, 10 dB	Cable simulator 450 - 862 MHz, 13 dB	Cable simulator 450 - 862 MHz, 16 dB

ACCESSORIES COMPRESSION-F-CONNECTOR

- Frequency range 0 – 2400 MHz
- CLASS A
- Screening factor > 90 dB

Type		CMP MC 30	CMP MC 37	CMP 6-49	CMP 6-51
Article-No.		5700 0769	5700 1497	5700 1158	5700 1159
Description		F-male	F-male	F-male	F-male
Coloure code		yellow	orange	blue	green
Applicable cable type		KOAX 0645 T	KOAX 58 MIDI	KOAX 80, 100, 110	KOAX 1170 T
Jacket Ø	mm	4,5	5,3	6,8	6,6
Dielectricum Ø	mm	2,8-2,9	3,7	4,6	4,8
Stripping A	mm	6,8	6,8	6,8	6,8
Stripping B	mm	6,8	6,8	6,8	6,8
Stripping tool		FACW 70 uni	FACW 70 uni	FACW 70 uni	FACW 70 uni
Compression tool		VT 300	VT 300	VT 200	VT 200



- Cable stripping dimensions

HQ-F-COMPRESSION CONNECTORS

Type		EX 11	EX 6-49	EX 6-51
				
Article-No.		5700 0768	5700 0771	5700 0772
Description		F-male	F-male	F-male
Cable type		KOAX 1610 T	KOAX 80, 100, 110	KOAX 1170 T
Cleading Ø	mm	10,0	6,8	6,6
Dielectrium Ø	mm	7,1	4,6	4,8
Stripping A		6,8	6,8	6,8
Stripping B		6,8	6,8	6,8
Stripping tool		UDT	FACW 70 uni	FACW 70 uni
Compression tool		VT 300	VT 300	VT 300

INSTALLATION-TOOLS

Type	VT 200	VT 300
		
Article-No.	5700 1199	5700 1200
Description	Compression tool (blue)	Compression tool (green)
Applicable for	CMP 6-49, CMP 6-51, CMP 6 IEC, EX 6	EX 6-49, EX 6-51, EX 11 CMP MC 30, MC 37

Type	TW 307 AH
	
Article-No.	5700 0839
Description	Torque wrench
	for F-compression connectors EX torque 3,4 Nm

Type	UDT	FCAW 70 uni	ABI 70
			
Article-No.	5700 0833	5700 0802	5700 0804
Description	Cable stripper	Cable stripper, 2-steps	Cable stripper universal
	universal, KOAX 1610 T	KOAX 58, 80, 100, 110	KOAX, all

F-CONNECTING ACCESSORIES

Type	FC 43	FC 70	FCB 1 HQ	FCS 1	FC U 1
					
Article-No.	5700 0757	5700 0760	5700 1456	5700 0783	5700 0785
Description	F-connector for cable-Ø 4,0	F-connector für cable-Ø 7,0	F-connector HQ female - female	F-connector male - male	F-connector in-wall

Type	FC-KK 1	FC-KS 1	FB-KK 1	FB-KS 1	FCW 1
					
Article-No.	5700 0773	5700 0774	5700 0775	5700 0776	5700 0784
Description	F-Adapter F-male/IEC-female	F-Adapter F-male/IEC-male	F-Adapter F-female/IEC-female	F-Adapter F-female/IEC-male	F-90° adapter F-female/F-male

Type	FCQ 1	FCQ 2	FR 75	FR 75 DC
				
Article-No.	5700 0777	5700 0778	5700 0779	5700 0780
Description	F-Quick-adapter F-male/F-female	F-Quick-adapter F-male/F-male	F-terminal-resistor High-Q	F-terminal-resistor DC-isolated

Type	EB 1 HQ	EB 2 HQ	EB 4 HQ	POT 1
				
Article-No.	5700 0808	5700 0809	5700 0878	5700 1178
Description	F-earth grounding block 1-time	F-earth grounding block 2-times	F-earth grounding block4-times	Potential mounting rail, 25 V

Type	EW 6 HQ	EW 7 HQ	EW 8 HQ	EW 9 HQ	EW 11 HQ	EW 13 HQ
						
Article-No.	5700 0807	5700 1663	5700 0811	5700 1662	5700 0814	5700 0818
Description	earth grounding	earth grounding	earth grounding	earth grounding	earth grounding	earth grounding
No. of F-ports	6-times	7-times	8-times	9-times	11-times	13-times

FIXING ACCESSORIES

ANTENNA MASTS

- For attaching parabolic antennas
- Hot dip galvanized
- Mast cap included
- **AMS:** Antenna mast plugable
- Protected by bead against rotating

Type		MR 48/200	MR 60/200	MR 60/300	AMS 50/200
Article-No.		5700 0710	5700 0712	5700 0713	5700 0708
Length	m	2	2	3	2
Tube Ø	mm	48	60	60	48
Wall thickness	mm	2,0	2,0	2,0	2,0
Weight	kg	5,0	6,0	7,5	4,8
Permissible bending moment	(max.) Nm	1100 (1170)	1650 (1750)	1570 (1750)	975 (1040)

WALL MOUNTS

- For attaching parabolic antennas

Type		WH 25 AL	WH 35 AL	WH 44	WH 60
Article-No.		5700 0700	5700 0701	5700 0704	5700 0705
Material		aluminium	aluminium	steel, hot dip galvanized	steel, hot dip galvanized
Distance from wall	mm	250	350	440	600
Tube length	mm	250	250	280	280
Tube Ø	mm	50	50	48	48
Weight	kg	1,0	1,5	2,7	3,7

FIXING ACCESSORIES

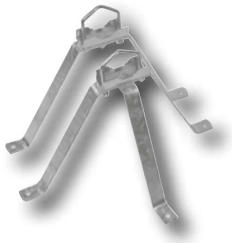
ROOF BRACKETS

- For attaching antennas up to Ø 1,0 m
- Material: steel, hot dip galvanized
- High stability
- Flexible setting

Type		DSP 90	DSP 130
Article-No.		5700 0751	5700 0752
Rafter distance up to	m	0,9	0,9
Lenght	m	0,9	1,3
Tube Ø	mm	48	48
Weight	kg	ca. 5,4	ca. 6,5
For antennas up to Ø	m	1,0	1,0

WALL MOUNTS

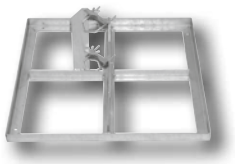
- For attaching antenna masts



Type		MH 60/250	MH 60/450
Article-No.		5700 0724	5700 0725
Material		Steel, hot dip galvanized	Steel, hot dip galvanized
Distance from wall	mm	250	450
Tube Ø	mm	48 – 60	48 – 60
Weight	kg	2,5	6,0
Packaging unit		2 pcs.	2 pcs.

TERRACE RACKS

- For attaching antenna masts
- Material: steel, hot dip galvanized



Type		BST 43
Article-No.		5700 0748
For tubes up to	mm	60
For antennas up to Ø	m	1,0
Weight		11
Fixing		4 stone stabs 30 x 30 cm

MECHANICAL ACCESSORIES

Type		BZ 60	MK 60
			
Article-No.		5700 0741	5700 0730
Description		Mast roof entry plate 400x400 mm	Mast cap
For tube Ø	mm	48 – 60	48 – 60
Weight	kg	1,0	0,02

Type		BS 50 G	BS 60 G
			
Article-No.		5700 0736	5700 0737
Description		Mast clamp	Mast clamp
For tube Ø	mm	48 – 50	60
Weight	kg	0,2	0,2

Type		DM 50	DM 60
			
Article-No.		5700 0728	5700 0729
Description		Tightening sleeve	Tightening sleeve
For tube Ø	mm	48 – 57	57 – 65
Weight	kg	0,2	0,2

Type		MZ 50	MZ 60	DZ 50
				
Article-No.		5700 0733	5700 0734	5700 0753
Description		Mast accessories set	Mast accessories set	Mast accessories set for roof brackets DSP
For tube Ø	mm	50	60	48 – 60
Weight	kg	1,0	1,0	0,8
Packaging unit		Mast roof, mast clamps, sealing cuff and mast cap		Roof entry plate, Tightenig sleeve

TECHNICAL ANNEX

Frequently needed conversions

mV on 75 Ohm	dBµV	mV on 75 Ohm	dBµV	mV on 75 Ohm	dBµV	mV on 75 Ohm	dBµV	mV on 75 Ohm	dBµV
0,100	40	0,80	58	6,30	76	50	94	400	112
0,112	41	0,90	59	7,00	77	56	95	450	113
0,125	42	1,00	60	8,00	78	63	96	500	114
0,140	43	1,12	61	9,00	79	70	97	560	115
0,160	44	1,25	62	10,00	80	80	98	630	116
0,180	45	1,40	63	11,20	81	90	99	700	117
0,200	46	1,60	64	12,50	82	100	100	800	118
0,225	47	1,80	65	14,00	83	112	101	900	119
0,250	48	2,00	66	16,00	84	125	102	1000	120
0,280	49	2,25	67	18,00	85	140	103	1120	121
0,315	50	2,50	68	20,00	86	160	104	1250	122
0,355	51	2,80	69	22,50	87	180	105	1400	123
0,400	52	3,15	70	25,00	88	200	106	1600	124
0,450	53	3,55	71	28,00	89	225	107	1800	125
0,500	54	4,00	72	31,50	90	250	108	2000	126
0,560	55	4,50	73	35,50	91	280	109	2250	127
0,630	56	5,00	74	40,00	92	315	110	2500	128
0,700	57	5,60	75	45,00	93	355	111	2800	129

dB/voltage ratio

Faktor with - dB	dB	Faktor with + dB	Faktor with + dB	dB	Faktor with - dB	Faktor with + dB	dB	Faktor with - dB
1,00	0,0	1,00	0,33	9,5	3,00	0,040	28	25,0
0,94	0,5	1,06	0,32	10,0	3,16	0,035	29	28,2
0,89	1,0	1,12	0,28	11,0	3,55	0,032	30	31,6
0,84	1,5	1,19	0,25	12,0	4,00	0,028	31	35,5
0,80	2,0	1,25	0,22	13,0	4,50	0,025	32	40,0
0,75	2,5	1,33	0,20	14,0	5,00	0,022	33	45,0
0,71	3,0	1,41	0,18	15,0	5,62	0,020	34	50,0
0,67	3,5	1,50	0,16	16,0	6,30	0,018	35	56,0
0,63	4,0	1,60	0,14	17,0	7,10	0,016	36	63,0
0,60	4,5	1,67	0,125	18,0	8,00	0,014	37	71,0
0,56	5,0	1,78	0,11	19,0	8,90	0,0125	38	80,0
0,53	5,5	1,88	0,10	20,0	10,00	0,011	39	89,0
0,50	6,0	2,00	0,089	21,0	11,20	0,010	40	100,0
0,47	6,5	2,12	0,080	22,0	12,50	0,0056	45	178,0
0,45	7,0	2,24	0,071	23,0	14,10	0,0032	50	316,0
0,42	7,5	2,37	0,063	24,0	16,00	0,0018	55	562,0
0,40	8,0	2,50	0,056	25,0	17,80	0,0010	60	1000,0
0,38	8,5	2,66	0,050	26,0	20,00			
0,35	9,0	2,82	0,045	27,0	22,40			

The following correlations apply to the conversions of dBpW level indications into dBµV-values and vice-versa:

Nominal impedance 50 Ohm	Nominal impedance 75 Ohm	dBW <—> dBm	Nominal impedance 50 Ohm	Nominal impedance 75 Ohm
1 pW = 7,07 µV = 17 dBµV	1 pW = 8,66 µV = 18,75 dBµV	dBW + 30 = dBm		
dBpW + 17 = dBµV	dBpW + 18,75 = dBµV	dBW - 30 = dBW	dBm + 107 = dBµV	dBm + 108,75 = dBµV
dBµV - 17 = dBµW	dBµV - 18,75 = dBpW		dBµV - 107 = dBm	dBµV - 108,75 = dBm

Subject to technical changes!

TECHNICAL ANNEX

Limits for interference radiation and interfering immu-

Screening an maximum permissible interfering radiation level

Minimum screening values according to EN 50083-2

MHZ	Class A	Class B
30 - 300	> 85 dB	> 75 dB
300 - 470	> 80 dB	> 75 dB
470 - 1000	> 75 dB	> 65 dB
1000 - 3000	> 55 dB	> 55 dB

The maximum permissible operating level is calculated as follows:
Operating level (dBµV) = max. interfering radiation (dBµV) + screening (dB)

Limits for out-of-band and in-band interfering immunity according to EN 50083-2

In the event of line trouble, an interfering distance of 60 dB must be proved in the concerned channel with the following field strengths:

a) Out-of-band interfering immunity to a modulated interfering signal

0,15 ... 100 MHz (AM): 125 dB(µV/m)
950 ... 3000 MHz (FM): 125 dB(µV/m)

b) In-band interfering immunity to an unmodulated interfering signal

0,15 ... 1000 MHz (AM): 106 dB(µV/m)
950 ... 3000 MHz (FM): 106 dB(µV/m)

The interfering immunity of an EVA to external continuous interfering signal can be calculated as follows:

Out-of-system interference level (dBµV/m) - screening (dB) = in-system interference level (dBµV) + 60 dB interfering distance = minimum effective level in the system (dBµV)

The maximum permissible effective interference radiation to be emitted by an EVA has been determined as follows (NB 30)

Frequency MHZ	Limit of interfering field strength at 3m dist.
0,009 - 1	40 - 20 x log10 (f/MHz)
> 1 - 30	40 - 8,8 x log10 (f/MHz)
> 30 - 1000	27[1]
> 1000 - 3000	40[2]

[1] equivalent to a radiating power of 20 dBpW.
[2] equivalent to a radiating power of 33 dBpW.

Channel allocation ranges / B I, USB, B II, OSB, ESB, B IV, BV (Standard CCIR)

Abbreviation	Channels	Channel band width	Frequencies	Wave lenghts
LW GO	-	9 kHz	150 - 285 kHz	2000 - 1050 m
MW MO	-	9 kHz	510 - 1605 kHz	590 - 187 m
KW SW OC	-	9 kHz	3,95 - 26,1 MHz	76 - 11,5 m
B I	2 - 4	7 MHz	47 - 68 MHz	6,35 - 4,4 m
UKW (B II) FM	2 - 56	300 kHz	87,5 - 108 MHz	3,4 - 2,9 m
USB	S 2 - S 10	7 MHz	111 - 174 MHz	2,9 - 1,7 m
B III	5 - 12	7 MHz	174 - 230 MHz	1,7 - 1,3 m
OSB	S 11 - S 20	7 MHz	230 - 300 MHz	1,3 - 1,0 m
ESB	S 21 - S 38	8 MHz	302 - 446 MHz	99,3 - 67 cm
B IV	21 - 37	8 MHz	470 - 606 MHz	64 - 49,5 cm
B V	38 - 69	8 MHz	606 - 862 MHz	49,5 - 35 cm

Subject to technical changes!

TECHNICAL ANNEX

Channel allocation (Standard B + G Europe)

Bands	Channel	Bandwidth MHz	Picture carrier MHz	Sound carrier MHz	CENELEC + (42 Channels)	FTZ 156/1 (36 Channels)
I	2	47 - 54	48,25	53,75	+	■
	3	54 - 61	55,25	60,75		
	4	61 - 68	62,25	67,75		■
	S 2	111 - 118	112,25	117,75		
	S 3	118 - 125	119,25	124,74	+	
	S 4	125 - 132	126,25	131,75		
	S 5	132 - 139	133,25	138,75		■
	S 6	139 - 146	140,25	145,75		■
	S 7	146 - 153	147,25	152,75		■
	S 8	153 - 160	154,25	159,75		■
	S 9	160 - 167	161,25	166,75		■
	S 10	167 - 174	168,25	173,75		
III	5	174 - 181	175,25	180,75	+	■
	6	181 - 188	182,25	187,75		
	7	188 - 195	189,25	194,75		■
			(207,25)		+	
	8	195 - 202	196,25	201,75		
	9	202 - 209	203,25	208,75		■
			(197,25)		+	
	10	209 - 216	210,25	215,75		
	11	216 - 223	217,25	222,75		■
			(223,25)		+	
	12	223 - 230	224,25	229,75		
	S 11	230 - 237	231,25	236,75	+	■
	S 12	237 - 244	238,25	243,75		■
	S 13	244 - 251	245,25	250,75		■
			(247,25)		+	
	S 14	251 - 258	252,25	257,75		■
	S 15	258 - 265	259,25	264,75		■
			(263,25)		+	
	S 16	265 - 272	266,25	271,75		■
	S 17	272 - 279	273,25	278,75		■
	S 18	279 - 286	280,25	285,75		■
	S 19	286 - 293	287,25	292,75	+	■
	S 20	293 - 300	294,25	299,75		■
	S 21	302 - 310	303,25	308,75		■
	S 22	310 - 318	311,25	316,75	+	■
	S 23	318 - 326	319,25	324,75		■
	D 330/S 24	326 - 334	327,25	332,75	+	■
	D 338/S 25	334 - 342	335,25	340,75		■
	D 346/S 26	342 - 350	343,25	348,75	+	
	D 354/S 27	350 - 358	351,25	356,75		■
	D 362/S 28	358 - 366	359,25	364,75	+	■
	D 370/S 29	366 - 374	367,25	372,75		■
	D 378/S 30	374 - 382	375,25	380,75	+	■
	D 386/S 31	382 - 390	383,25	388,75		■
	D 394/S 32	390 - 398	391,25	396,75	+	■
	D 402/S 33	398 - 406	399,25	404,75		
	D 410/S 34	406 - 414	407,25	412,75	+	■
	D 418/S 35	414 - 422	415,25	420,75		■
	D 426/S 36	422 - 430	423,25	428,75	+	■
	D 434/S 37	430 - 438	431,25	436,75		■
	D 442/S 38	438 - 446	439,25	444,75	+	
	D 450/S 39	446 - 454	(447,25)		+	
	D 458/S 40	454 - 462	(455,25)			
	D 466/S 41	462 - 470	(463,25)		+	

Bands	Channel	Bandwidth MHz	Picture carrier MHz	Sound carrier MHz	CENELEC + (42 Channels) FTZ 156/1 (36 Channels)
IV	21	470 - 478	471,25	476,75	
	22	478 - 486	479,25	484,75	+
	23	486 - 494	487,25	492,75	
	24	494 - 502	495,25	500,75	+
	25	502 - 510	503,25	508,75	
	26	510 - 518	511,25	516,75	+
	27	518 - 526	519,25	524,75	
	28	526 - 534	527,25	532,75	+
	29	534 - 542	535,25	540,75	
	30	542 - 550	543,25	548,75	+
	31	550 - 558	551,25	556,75	
	32	558 - 566	559,25	564,75	
	33	566 - 574	567,25	572,75	+
	34	574 - 582	575,25	580,75	
	35	582 - 590	583,25	588,75	+
	36	590 - 598	591,25	596,75	
	37	598 - 606	599,25	604,75	+
V	38	606 - 614	607,25	612,75	
	39	614 - 622	615,25	620,75	
	40	622 - 630	623,25	628,75	
	41	630 - 638	631,25	636,75	
	42	638 - 646	639,25	644,75	
	43	646 - 654	647,25	652,75	
	44	654 - 662	655,25	660,75	
	45	662 - 670	663,25	668,75	+
	46	670 - 678	671,25	676,75	
	47	678 - 686	679,25	684,75	+
	48	686 - 694	687,25	692,75	
	49	694 - 702	695,25	700,75	+
	50	702 - 710	703,25	708,75	
	51	710 - 718	711,25	716,75	+
	52	718 - 726	719,25	724,75	
	53	726 - 734	727,25	732,75	+
	54	734 - 742	735,25	740,75	
	55	742 - 750	743,25	748,75	+
	56	750 - 758	751,25	756,75	
	57	758 - 766	759,25	764,75	+
	58	766 - 774	767,25	772,75	
	59	774 - 782	775,25	780,75	+
	60	782 - 790	783,25	788,75	
	61	790 - 798	791,25	796,75	+
	62	798 - 806	799,25	804,75	
	63	806 - 814	807,25	812,75	+
	64	814 - 822	815,25	820,75	
	65	822 - 830	823,25	828,75	+
	66	830 - 838	831,25	836,75	
	67	838 - 846	839,25	844,75	+
	68	846 - 854	847,25	852,75	
	69	854 - 862	855,25	860,75	+

S 2, S 3 und S 24 - S 41:
digital channels possible (D xxx)

Subject to technical changes!

TECHNICAL ANNEX

Channel allocation international

Bands	Channel	Bandwidth	Picture carrier	Sound carrier
		MHz	MHz	MHz
Standard A	Great Britain			
I	B 1	41,25 - 46,25	45,00	41,50
	B 2	48 - 53	51,75	48,25
	B 3	53 - 58	56,75	53,25
	B 4	58 - 63	61,75	58,25
	B 5	63 - 68	66,75	63,25
II	B 6	176 - 181	179,75	176,25
	B 7	181 - 186	184,75	181,25
	B 8	186 - 191	189,75	186,25
	B 9	191 - 196	194,75	191,25
	B 10	196 - 201	199,75	196,25
	B 11	201 - 206	204,75	201,25
	B 12	206 - 211	209,75	206,25
	B 13	211 - 216	214,75	211,25
	B 14	216 - 221	219,75	216,25
Standard B	Italy			
I	A	52,5 - 56,5	53,75	59,25
	B	61- 68	62,25	67,75
(II)	C	81 - 88	82,25	87,75
(III)	D	174 - 181	175,25	180,75
	E	182,5 - 189,5	183,75	189,25
	F	191 - 198	192,25	197,75
	G	200 - 207	201,25	206,75
	H	209 - 216	210,25	215,75
	H 1	216 - 223	217,25	222,75
	H 2	223 - 230	224,25	229,75
Standard D	OIRT			
I	R I	48,5 - 56,5	49,75	56,25
	R II	58 - 66	59,25	65,75
	R III	76 - 84	77,25	83,75
(II)	R IV	84 - 92	85,25	91,75
	R V	92 - 100	93,25	99,75
	S 1	110 - 118	111,25	117,75
	S 2	118 - 126	119,25	125,75
	S 3	126 - 134	127,25	133,75
	S 4	134 - 142	135,25	141,75
	S 5	142 - 150	143,25	149,75
	S 6	150 - 158	151,25	157,75
	S 7	158 - 166	159,25	165,75
	S 8	166 - 174	167,25	173,75
(III)	R VI	174 - 182	175,25	181,75
	R VII	182 - 190	183,25	189,75
	RVIII	190 - 198	191,25	197,75
	RIX	198 - 206	199,25	205,75
	R X	206 - 214	207,25	213,75
	R XI	214 - 222	215,25	221,75
	R XII	222 - 230	223,25	229,75
	S 9	230 - 238	231,25	237,75
	...	...	...	...
	...	...	...	...
	...	...	...	...
	...	...	...	...
	S 38	462 - 470	463,25	469,75

Bands	Channel	Bandwidth	Picture carrier	Sound carrier
		MHz	MHz	MHz
Standard I	Ireland			
I	A	44,5 - 52,5	45,75	51,75
	B	52,5 - 60,5	53,75	59,75
	C	60,5 - 68,5	61,75	67,75
III	D	174 - 182	175,25	181,25
	E	182 - 190	183,25	189,25
	F	190 - 198	191,25	197,25
	G	198 - 206	199,25	205,25
	H	206 - 214	207,25	213,25
	I	214 - 222	215,25	221,25
	J	222 - 230	223,25	229,25
Standard L	France			
I	L 2	49,00 - 57,00	55,75	49,25
	L 3	53,75 - 61,75	60,50	54,00
	L 4	57,00 - 65,00	63,75	57,25
III	L 5	174,75 - 182,75	176,00	182,50
	L 6	182,75 - 190,75	184,00	190,50
	L 7	190,75 - 198,75	192,00	198,50
	L 8	198,75 - 206,75	200,00	206,50
	L 9	206,75 - 214,75	208,00	214,50
	L 10	214,75 - 222,75	216,00	222,50
	B	115,5 - 123,5	116,75	123,25
	C	127,5 - 135,5	128,75	135,25
	D	139,5 - 147,5	140,75	147,25
	E	151,5 - 159,5	152,75	159,25
	F	163,5 - 171,5	164,75	171,25
	G	175,5 - 183,5	176,75	183,25
	H	187,5 - 195,5	188,75	195,25
	I	199,5 - 207,5	200,75	207,25
	J	211,5 - 219,5	212,75	219,25
	K	223,5 - 231,5	224,75	231,25
	L	235,5 - 243,5	236,75	243,25
	M	247,5 - 255,5	248,75	255,25
	N	259,5 - 267,5	260,75	267,25
	O	271,5 - 279,5	272,75	279,25
	P	283,5 - 291,5	284,75	291,25
	Q	295,5 - 303,5	296,75	303,25
IV/V	- Channels, channel bandwidth and picture carrier frequencies see standard G Europe - Sound carrier frequencies = standard G Europe + 1MHz			

Subject to technical changes!

TECHNICAL ANNEX

Channel allocation international

Bands	Channel	Bandwidth	Picture carrier	Sound carrier
		MHz	MHz	MHz
Standard M	USA			
I	A 2	54 - 60	55,25	59,75
	A 3	60 - 66	61,25	65,75
	A 4	66 - 72	67,25	71,75
	A 5	76 - 82	77,25	81,75
	A 6	82 - 88	83,25	87,75
III	A 7	174 - 180	175,25	179,75
	A 8	180 - 186	181,25	185,75
	A 9	186 - 192	187,25	191,75
	A 10	192 - 198	193,25	197,75
	A 11	198 - 204	199,25	203,75
	A 12	204 - 210	205,25	209,75
	A 13	210 - 216	211,25	215,75

Bands	Channel	Bandwidth	Picture carrier	Sound carrier
		MHz	MHz	MHz
IV	A 14	470 - 476	471,25	475,75
	A 15	476 - 482	477,25	481,75
	A 16	482 - 488	483,25	487,75
	...	...	...	...
	A 40	626 - 632	627,25	631,75
	A 41	632 - 638	633,25	637,75
	A 42	638 - 644	639,25	643,75
V	A 43	644 - 650	645,25	649,75
	A 44	650 - 656	651,25	655,75
	A 45	656 - 662	657,25	661,75
	...	...	...	...
	A 81	872 - 878	873,25	877,75
	A 82	878 - 884	879,25	883,75
	A 83	884 - 890	885,25	889,75

Subject to technical changes!

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