trunk and distribution amplifiers

DKT DANLAB

about dktcomega and dktdanlab

DKTCOMEGA develops coaxial and optical products for professional broadband operators and solution providers. The company was founded in 1977, and with thirty years of experience in coaxial broadband networks, DKTCOMEGA offers a comprehensive product portfolio, making it a strong partner for broadband operators.

In April 2007 DKTCOMEGA took over DANLAB Electronics A/S forming a product range called DKTDANLAB. DANLAB had since 1986 been developing and producing high performance amplifiers for small, medium and large HFC networks.

The solid experience gained by DKTCOMEGA and DKTDANLAB is reflected in its products; they being characterised by high quality, top performance and easy installation. As a result, customers turn to DKTCOMEGA for products and advice, when it comes to optical, coaxial and HFC broadband networks.

DKTCOMEGA's headquarters are in Denmark, and it has subsidiaries in Sweden and Finland. As a dynamic and innovative company, its ambition is to deliver the best and broadest selection of quality products for signal distribution in broadband networks.

DKTCOMEGA's mission
DKTCOMEGA's mission is to be a strong partner in network products for European broadband operators and solution providers. Based on know-how and natural enthusiasm, good ideas are developed into successful products. This is done together with the customer, who furthermore can appreciate the broad product range, the attractive quality/price level and the unique customized products. DKTCOMEGA's flexibility and proactive attitude assists in optimizing broadband networks. For requests , please contact us: sales@dktcomega.com.

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product introduction

Introduction

For the past 20 years the former DANLAB Electronics A/S has been developing and manufacturing trunk and distribution amplifiers for small, medium and large HFC broadband networks, which have been used throughout Europe. Three years ago the innovative and cost optimized MIDI-series was launched with a unique cooling system and reduced number of standardised plug-in modules.

Overview

This product group covers advanced amplifiers for both trunk and distribution network with focus on high technical standards. Many thoughts were put into the development of a robust design with a unique cooling system, as it was a priority to our customers to ensure an exceptional long lifetime, and thereby keeping the installation (CAPEX) and operation (OPEX) costs at a minimum.

Furthermore, the modular and step-by-step design of the MIDI platform makes all amplifiers and optical nodes within the MIDI series extremely flexible in the configuration of the networks. All share common plug-in accessories, giving a reduction in costs of spare parts and at the same time resulting in convenient maintenance as well as reduction in operation costs. The amplifiers enable operators to deliver a secure and manageable last-mile network at a competitive price/performance.

The nodes are all with the special DKTDANLAB cooling fins optimized for best possible air circulation, where the fins release the heat with high efficiency. The nodes can be installed both indoor and outdoor due to its robust design. The series have a product design with the lid hinged to the box ensuring easy mounting.

Standard features	Trunk & Distribution amplifiers AB 801 Series	Distribution & Mini-Trunk amplifiers AA 801 Series	Distribution & End Amplifiers AE 801 Series
High Output Level 108.5/111 dBµV	✓	✓	✓
Very High Output Level 110.5/113 dBµV	✓	✓	✓
Input Splitter Module	✓	✓	
Output Splitter Module Dual Output (Splitter) Optional	✓	✓	✓
Gain Switch	✓	✓	
System Equaliser Module Bump/Vally	✓		
Cable Simulator Function	✓	✓	✓
Fixed Return Path Amplifier Active or Passive	✓	✓	✓
Return Path Input Test Point	✓	✓	✓
5 A AC Pass (or 10 A optional)	✓	✓	
Options (see page 10/11)			
DIB™	✓	✓	
AGC	✓		
HMS	✓		
MA 6510	✓	✓	

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Advantages

- Very high system performance - high level/low noise
- Modular universal plug-ins - high flexibility
- High and low gain (gain switch easily switches the gain)
- Meets the needs of current and future HFC networks
- Competitive price/performance
- Input splitter
- DIB™ and HMS (management) upgrade modules

ab 801 series - trunk and distribution amplifier

Product information

The AB 801 series is an advanced series of Trunk & Distribution in-one Amplifiers, which meets the need of current and future HFC networks. The amplifiers have an interstage gain switch, which does not affect CTB/CSO and NF (noise figure). These active elements can be used for upgrading or establishing new bi-directional broadband HFC networks that offer interactive services. Their full feature set enables operators to economically serve low density suburban areas and medium to high-density buildings.

See block diagram on page 13

AB 801 series comes in different versions - a line powered and a mains powered. The amplifier can be set to high or very high output with a gain switch easily switching the gain. The series has, with multiple hot pluggable upgrade modules and modular universal plug-ins, provided flexibility. The amplifiers come in two different versions - one with a Standard Attenuator Pads for gain & tilt adjustment as well as interstage attenuation & tilt functions and one with Adjustable Attenuators for gain & tilt adjustment. The interstage attenuation & tilt function is combined in one compact MEX module.

Forward path, bandwidth (depending on diplexer modules)		**AB 801H1 & H2**	**AB 801V1 & V2**
Gain (8 dB gain switch)	47/862 MHz	30/30 or 38/38 dB	30/30 or 38/38 dB
CTB (42 ch CENELEC)	flat/8 dB tilt	108.5/111 dBµV	110.5/113 dBµV
CSO (42 ch CENELEC)		112 dBµV	112 dBµV
Noise Figure	47/862 MHz	5/6.5 5/6.5	5/6.5 5/6.5
Return Path, bandwidth (depending on diplexer modules)			
Gain		23 dB	23 dB
Noise Figure		6 dB	6 dB
General			
Line power, Voltage		24-65 VAC	24-65 VAC
Line power, Current		820-360 mA	900-390 mA
Main power, Voltage		175-260 VAC	175-260 VAC
Power consumption (incl. return path)		14.5 W	16.5 W
Physical Characteristics			
Dimensions		200 x 180 x 82 mm	200 x 180 x 82 mm
Weight		2 kg	2 kg

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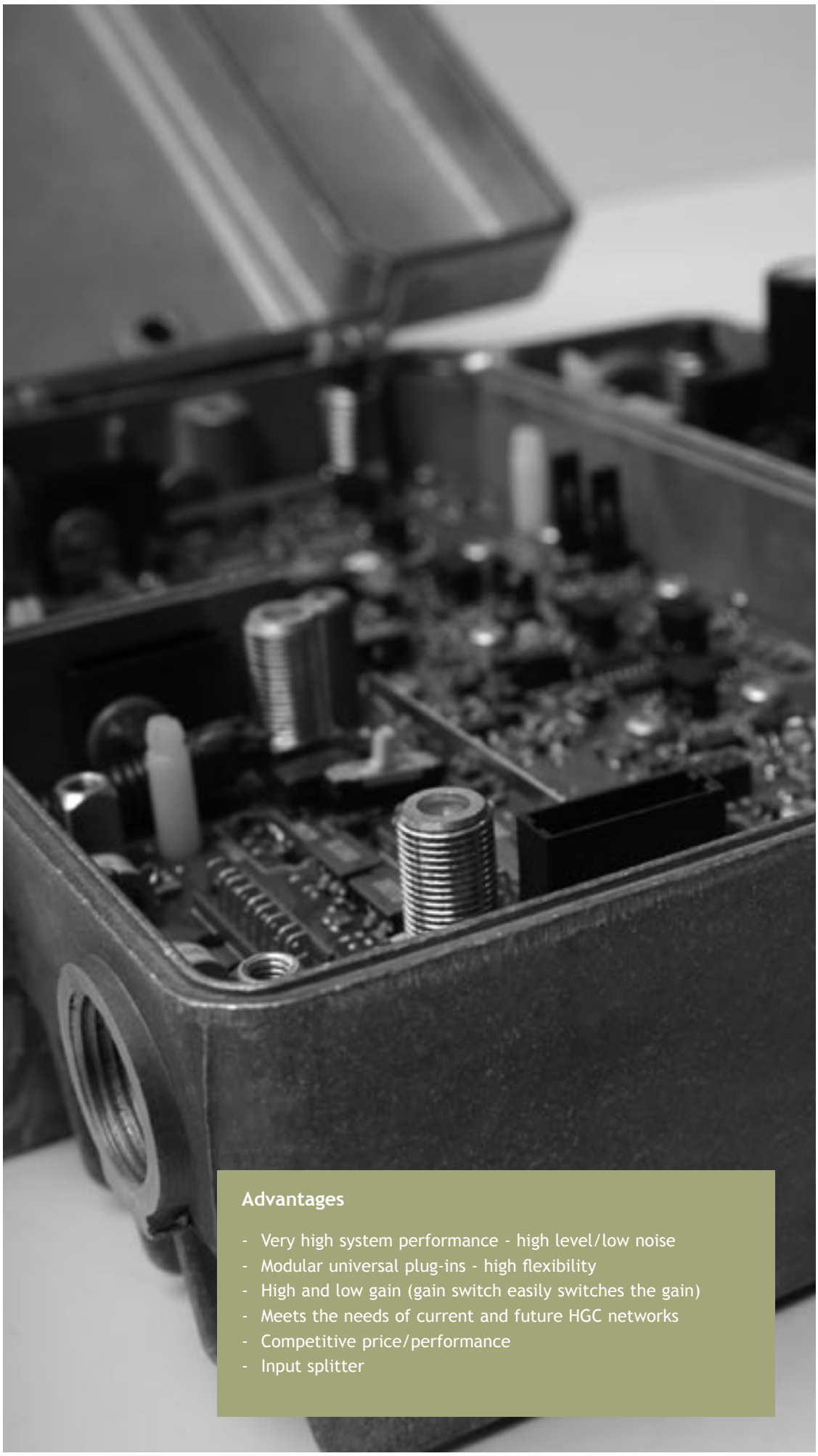

Advantages

- Very high system performance - high level/low noise
- Modular universal plug-ins - high flexibility
- High and low gain (gain switch easily switches the gain)
- Meets the needs of current and future HGC networks
- Competitive price/performance
- Input splitter

AA 801 series
- distribution and mini trunk amplifier

Product information

The AA 801 series is a mid-range series of Distribution & Mini-Trunk Amplifiers with a very high system performance (high levels/low noise) that do not affect CTB/CSO and NF (noise figure), and are ideal for upgrading or establishing new bi-directional broadband HFC networks. These amplifiers enable more subscribers to be connected to existing equipment and reduce network expansion costs.

See block diagram on page 14

AA 801 series comes in different versions - a line powered and a mains powered. The amplifier can be set to high or very high output with a gain switch easily switching the gain. The series has, with multiple hot pluggable upgrade modules and modular universal plug-ins provided flexibility. The amplifiers come in two different versions - one with a Standard Attenuator Pads for gain & tilt adjustment as well as interstage attenuation & tilt functions and one with Adjustable Attenuators for gain & tilt adjustment. The interstage attenuation & tilt function is combined in one compact MEX module.

Forward path, bandwidth (depending on diplexer modules)		**AA 801H1 & H2**	**AA 801V1 & V2**
Gain (8 db gain switch)	47/862 MHz	30/30 or 38/38 dB	30/30 or 38/38 dB
CTB (42 ch CENELEC)	flat/8 dB tilt	108.5/111 dBµV	110.5/113 dBµV
CSO (42 ch CENELEC)		110 dBµV	112 dBµV
Noise Figure	47/862 MHz	5/6.5 5/6.5	5/6.5 5/6.5
Return Path, bandwidth (depending on diplexer modules)			
Gain		23 dB	23 dB
Noise Figure		6 dB	6 dB
General			
Line power, Voltage		24-65 VAC	24-65 VAC
Line power, Current		820-360 mA	900-390 mA
Main power, Voltage		175-260 VAC	175-260 VAC
Power consumption (incl. return path)		14 W	16 W
Physical Characteristics			
Dimensions		200 x 180 x 82 mm	200 x 180 x 82 mm
Weight		2 kg	2 kg

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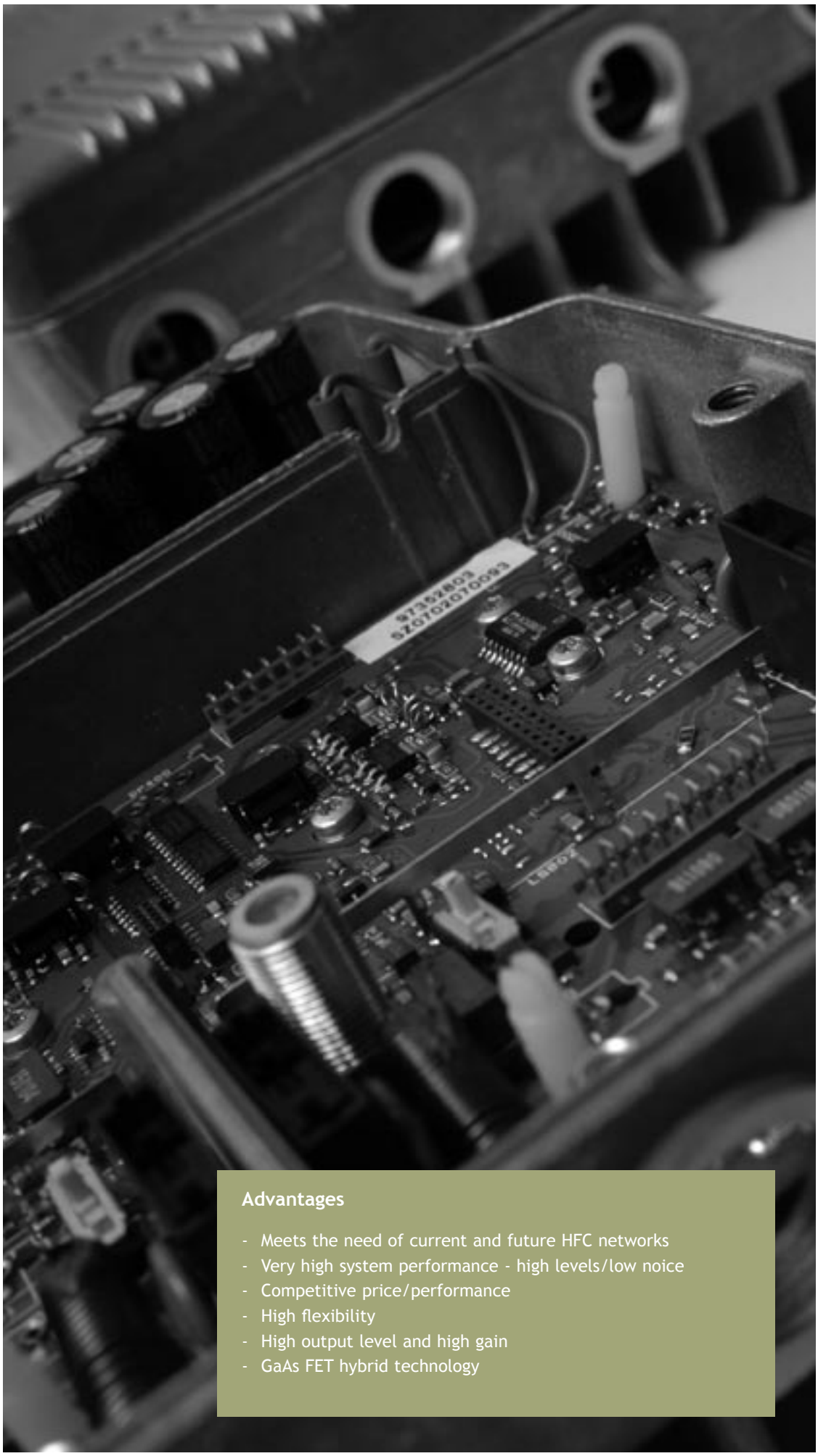

Advantages

- Meets the need of current and future HFC networks
- Very high system performance - high levels/low noice
- Competitive price/performance
- High flexibility
- High output level and high gain
- GaAs FET hybrid technology

ae 801 series
- distribution and end amplifier

Product information

The AE-series are high quality, economical amplifiers with a minimized set of features. The distribution and end amplifier used in bi-directional broadband HFC networks deliver excellent system performance and are designed to be used as low-cost, last distribution installations. They are suitable for rapidly increasing the number of household connections to an existing medium to large networks or to establish new networks and thereby reducing network expansion costs.

See block diagram on page 15

AA 801 series comes in different versions - a line powered and a mains powered with a switch mode power supply. The amplifiers have a very high performance with a high output level and high gain as well as a low noise figure and low power consumption, which leads to a very competitive price / performance ratio. The series provides with the modular universal plug-ins flexibility.

Forward path, bandwidth (depending on diplexer modules)		**AA 801H1 & H2**	**AA 801V1 & V2**
Gain (8 db gain switch)	47/862 MHz	38/38 dB	38/38 dB
CTB (42 ch CENELEC)	flat/8 dB tilt	108.5/111 dBµV	110.5/113 dBµV
CSO (42 ch CENELEC)		112 dBµV	112 dBµV
Noise Figure	47/862 MHz	5/6.5 5/6.5	5/6.5 5/6.5
Return Path, bandwidth (depending on diplexer modules)			
Gain		23 dB	23 dB
Noise Figure		6 dB	6 dB
General			
Line power, Voltage		24-65 VAC	24-65 VAC
Line power, Current		790-340 mA	870-380 mA
Main power, Voltage		175-260 VAC	175-260 VAC
Power consumption (incl. return path)		14 W	16 W
Physical Characteristics			
Dimensions		200 x 180 x 82 mm	200 x 180 x 82 mm
Weight		2 kg	2 kg

midi platform upgrade modules

Automatic Gain Control

AGC (Automatic Gain Control) is designed to maintain some measure of performance by compensating for the drift that would otherwise occur after a cascade of amplifiers.

- Requires only one pilot frequency
- Any tone or signal can be used as pilot
- Very easy alignment procedure
- Allows for compensation for seasonal temp. prior to adjustment
- Automatic “shift to manual” function

Dynamic Ingress Blocker (DIB)

A tool for upgrading cable networks for interactive services, DIB™ is transparent to radio, TV and communication signals. It provides a solution for ingress blocking and return path management, giving operators a faster and less costly option for bi-directional upgrades as opposed to existing technologies.

- Ingress noice reduction through blocking of non-communication disturbances
- More efficient and reliable network upgrades
- Increased traffic capacity with improved QoS
- Scalable from small to nation-wide networks
- Hot pluggable module

Technical specifications: AA & AB series amplifiers		Withouy DIB	With DIB
Return path, bandwidth (depending on diplexer modules)	MHz	5 - 65	15-65
Gain	dB	23	23
Attenuation by pads	dB	0 - 18	0 - 18
Equaliser by pads	dB	0 - 8	0 - 8
Linearity	dBµV	±1	±1
3rd order (DIN 45004B)	dBµV	119	110
2nd order (DIN 45004 A1)	dBµV	104	86
3rd order @ 40dB IMA	dBµV	N/A	113
2nd order @ 40dB IMA	dBµV	N/A	106
Docsis level at return path input (minimum required)	dBµV	N/A	73
Noise Figure	dB	6	7
Power consumption (DIB module alone)	W	-	1.4

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midi platform upgrade modules

Network Management Transponder

With an HMS-based (Hybrid Management Sub-Layer) transponder solution from the recognised supplier AM, monitoring and management of services critical to the HFC network are simplified. This way it is possible to monitor status of amplifier output level and temperature. Furthermore, the built-in reverse path switch can be controlled. Full HMS compatability and centralised management allows for suveillance, status monitoring, and element management of mission-critical HFC network services. Works together with numerous third party management software solutions.

Return Path Amplifier

The return path amplifier (MA 6510 Module) is an upgrade module, which can be used for installation in all AB and AA series amplifiers to raise the gain in the return path by 10 dB. Besides its high gain, it is characterised by having a low noise and a high output capability with extra loop attenuation to secure a reliable return path operation. The correction of linearity is 65 MHz. It is a hot pluggable module with a very easy and time-saving installation procedure.

Technical specifications		MA 6510
Bandwidth	MHz	5 - 65
Linearity*	dB	< ±0.5
Gain*	dB	33
3rd order (DIN 45004B)*	dBµV	118
2nd order (DIN 45004B)*	dBµV	105
Noise figure*	dB	< 6
Power consumption	W	1.5

* Figures for a MIDI-amplifier with the MA 6510 installed.

MDA module, Diplex filter

The MDA xxxx Diplex Filters are for installation in all DKTDANLAB MIDI platform AB- and AA-Series amplifiers and AO-Series optical nodes.

- Same plug-in modules for all amplifiers and splitter housings
- Low insertion loss and high return loss
- Available in numerous frequency combinations

Technical specifications		MDA 3047	MDA 4254	MDA 5573
Frequency range forward path	MHz	47 - 862	54 - 862	73 - 862
Frequency range reverse path	MHz	5 - 30	5 - 42	5 - 55
Insertion loss reverse path	dB	0.6 at 30MHz	0.7 at 40MHz	0.7 at 55MHz
	dB		1.0 at 42MHz	
Insertion loss forward path	dB			1.0 at 73MHz
	dB	0.6 at 47MHz	0.7 at 54MHz	0.7 at 75MHz
	W	0.3 at 862MHz	0.3 at 862MHz	0.3 at 862MHz

midi platform upgrade modules

MEX module, interstage

The MEX Interstage Modules are designed to provide attenuation and slope between the two forward amplifier stages in all DKTDANLAB amplifiers, thus optimizing the technical performance of the amplifiers.
Depending on insertion in function “A” or “B”, flat or sloped output is chosen.

- Same plug-in modules for all series of amplifiers
- Two functions in the same module

For technical specifications, please see seperate data sheet.

MS module, splitter

The MS Splitter Modules are designed to be installed in all DKTDANLAB Amplifiers and Splitter Housings.

- Same plug-in modules for all amplifiers and splitter housings
- Very high return loss and superb linearity
- Numerous value combinations

For technical specifications, please see seperate data sheet.

JXP Orange - 75 Ohm - 1200 MHz

The JPX Orange pads are for installation in all DKTDANLAB MIDI platform AB- and AA-Series amplifiers and AO-Series optical nodes.

- Can be used in two different positions in the MIDID platforms providing either attenuation or tilt.
- Inserted in two ways (by rotating 180˚), providing the same performance
- Offered in 1 dB steps, in a range of 1-26 dB

Type	Attenuation position (dB)	Tilt position (dB)
JXP-OT200	0	0
JXP-OT201	1	1
JXP-OT202	2	2
JXP-OT203	3	3
JXP-OT204	4	4
JXP-OT205	5	5
JXP-OT206	6	6
JXP-OT207	7	7
JXP-OT208	8	8
JXP-OT209	9	9
JXP-OT210	10	10
JXP-OT211	11	
JXP-OT212	12	11.5
JXP-OT213	13	

Type	Attenuation position (dB)	Tilt position (dB)
JXP-OT214	14	13
JXP-OT215	15	
JXP-OT216	16	14.5
JXP-OT217	17	
JXP-OT218	18	16
JXP-OT219	19	
JXP-OT220	20	17
JXP-OT221	21	
JXP-OT222	22	18.5
JXP-OT223	23	
JXP-OT224	24	20
JXP-OT225	25	
JXP-OT226	26	

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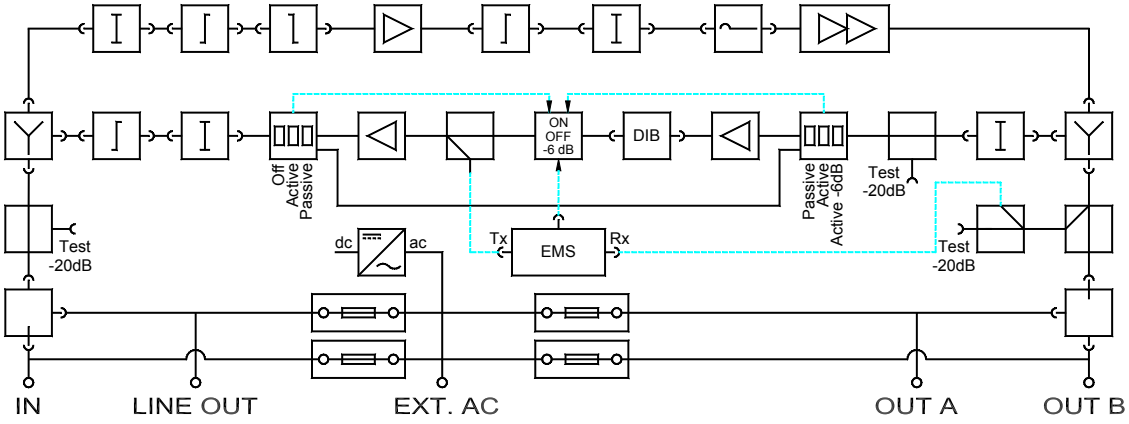
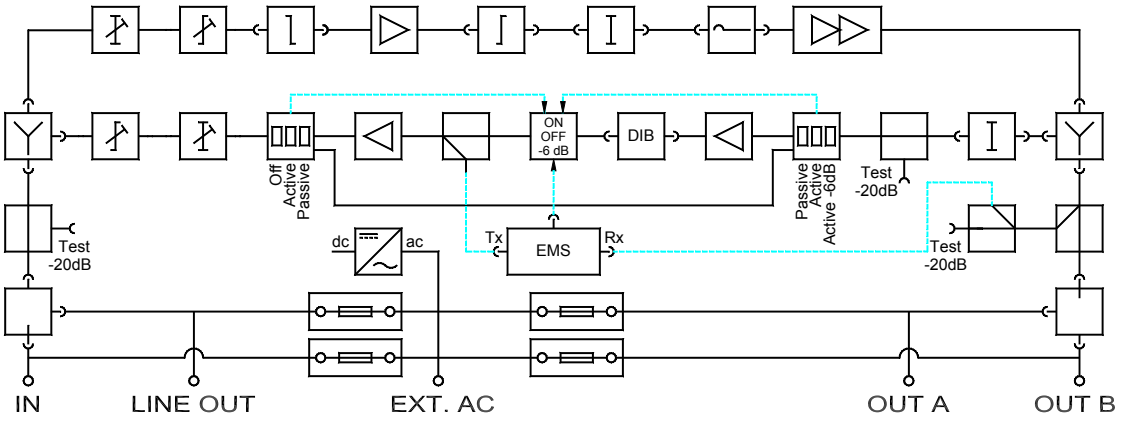
block diagrams - ab 801 series

AB 801 H1 & V1

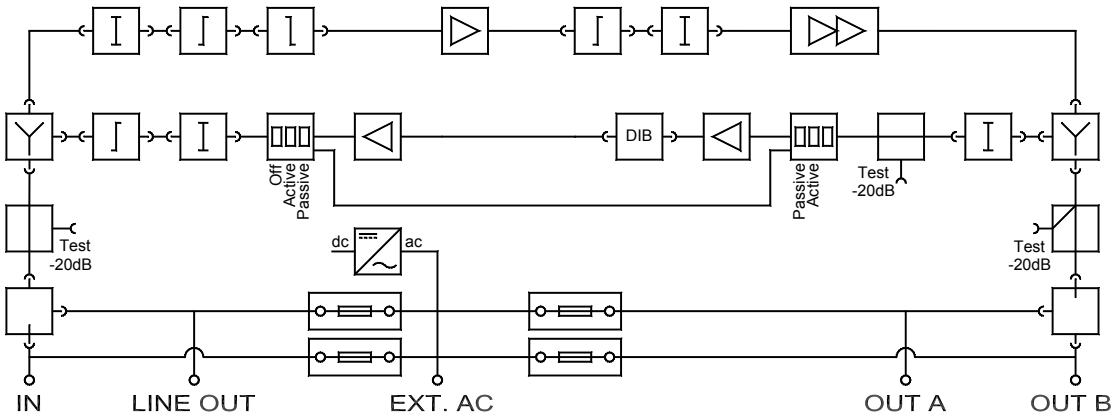


AB 801 H2 & V2

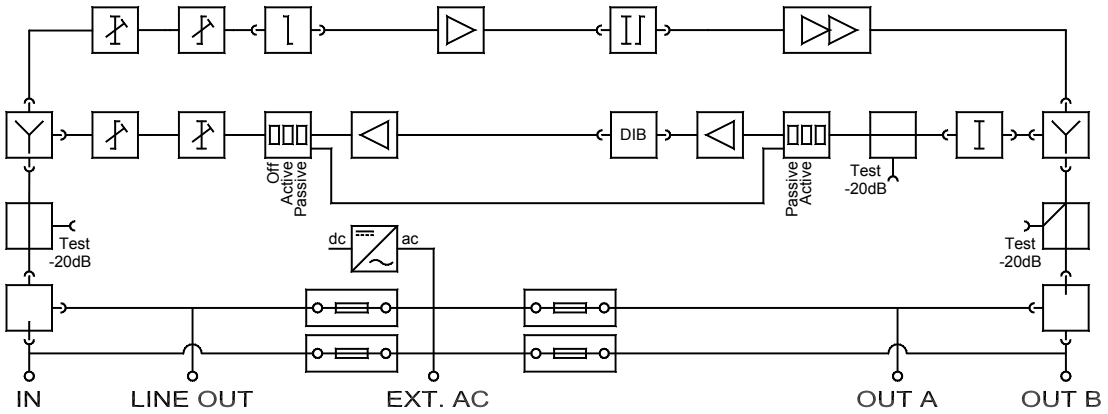


block diagrams - aa 801 series

AA 801 H1



AA 801 H2



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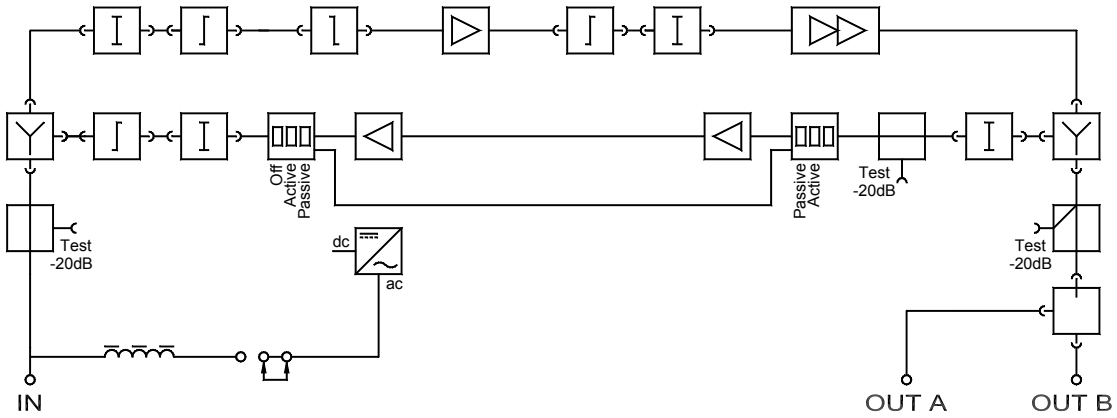
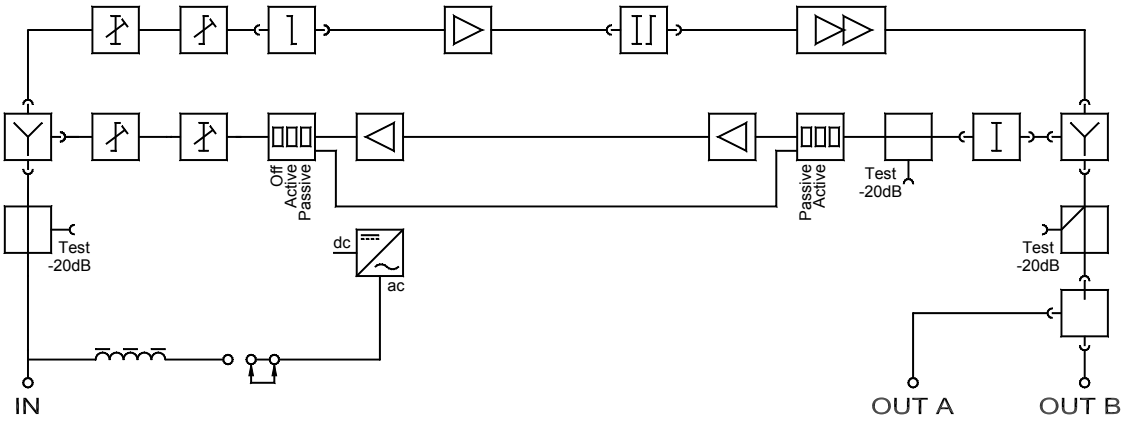
block diagrams - ae 801 series

AE 801 H1 & V1



AE 801 H2 & V2



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