

**GENERAL
CATALOGUE**

2008

**DIGITAL TECHNOLOGY
FOR THE NEW TELEVISION**



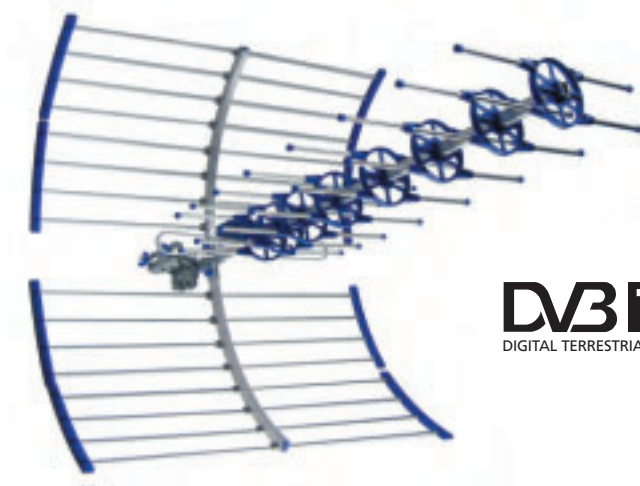
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TERRESTRIAL - TV ANTENNAS

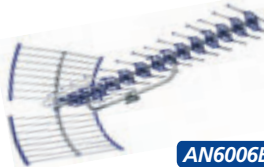
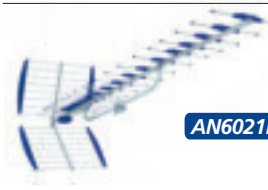


- Professional antennas with high gain and directivity
- Produced in aluminium extrusion and anticorrosion treatment
- Robust subjection clamp, 2 mm aluminium thickness
- Several connection types and packaging formats available
- DIGIPOLE (AM8000) low noise figure and high output level



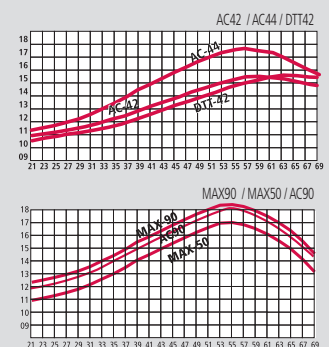
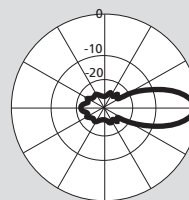
DTV
DIGITAL TERRESTRIAL TV

UHF Antennas

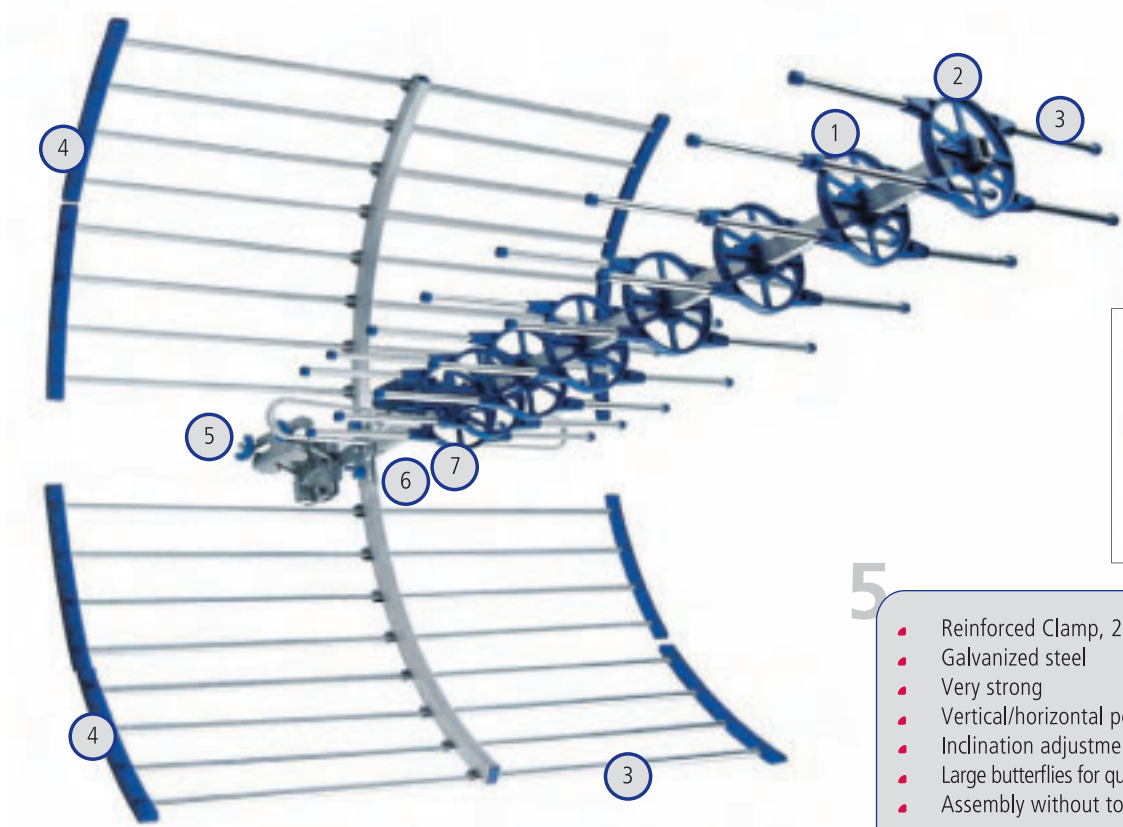
CODE	DESCRIPTION	PACK/PALLET	CODE	DESCRIPTION	PACK/PALLET
 AN6003	Antenna DTT-42 C21/69 13dB	10/80	 AN0530B	Ant. UHF- 30 Elem -14dB	4/72
 AN6000B	Antenna AC42 C21/69 14dB F Connector	10/80	 AN0530Bi	Ant. UHF- 30 Elem -14dB - Indiv Box	1/45
 AN6000Bi	Antenna AC42 C21/69 14dB individual carton Box	1/60	 AN6002B	Ant. MAX50 C21/69 17,5dB F Connect.	2/24
 AN6001B	Ant. AC44 C21/69 15,5dB F Connector	10/50	 AN6006B	Ant. MAX90 C21/69 19dB F Connect.	2/16
 AN6001Bi	Ant. AC44 C21/69 15,5dB individual carton Box	1/32	 AM8000	Optional pre-amplifier low noise figure and high output 6=18 dB, F=2,4 dB, Vo=105 dBμV, 5-24 Vdc/35 mA	1
 AN6021B	Ant. AC90 C21/69 18,5dB F Connect.	1/22			

TECHNICAL CHARACTERISTICS

Code	AN6003	AN6000B	AN6001B	AN6002B	AN6006B	AN6021B
Model	DTT-42	AC-42	AC-44	MAX-50	MAX-90	AC-90
Band	UHF	UHF	UHF	UHF	UHF	UHF
Channels	E21-69*	E21-69	E21-69	E21-69	E21-69	E21-69
Director Elements	17	17	25	34	62	35
Gain	13	14	15,5	17,5	19	18,5
Beamwidth H/V	38°/43°	38°/43°	35°/42°	32°/38°	26°/31°	29°/34°
Front/back ratio	25	25	28	27	35	30
Windload(150Km/h)	7,9Kp	7,9Kp	11Kp	13,4Kp	15Kp	15Kp
Length (mm)	1015	1015	1090	990	1760	1940



HIGH QUALITY ANTENNAS





1

- Quadruple element directors at different antenna wavelength to obtain the maximum gain

2

- Easy assembly and replacement of elements
- Long durability plastic

3

- Extruded aluminium tube, very robust
- Anti corrosion treatment for all kind of enviroments

4

- Double reflection of large dimensions to obtain the maximum front/back ration
- Reflection elements very strong due to plastic subjection

6



- UHF Dipole
- F Connector
- Removable cover for an easy cable connection
- Isolated box, water proof
- Protected against short-circuits, dust and rain

Removable cover with simetrized balun C21/69 for coaxial cable connection

7

AM8000/DIGIPOLE (Optional accessory)

- Easy to replace the original dipole
- High output level
- Low noise figure
- Ideal for Digital-TV reception, even with low signal coverage



TERRESTRIAL - TV ANTENNAS



DVB T
DIGITAL TERRESTRIAL TV

Digi MAX 120



Directional logarithmic dipole with low noise amplifier incorporated

- Special for areas of low DTT coverage
- F connector
- 1,2 m parabolic reflector
- Active (35 dB) gain antenna
- Very low noise figure 1 dB
- Power supply 5-24V/100mA

Digi MAX 120

CODE	DESCRIPTION	PACK/PALLET
AN6111	Parabolic antenna, active dipole 35 dB (24Vdc)	1/12
AN6111K	KIT individual box, active antenna, power supply	1/3
AL6121	Power supply 24 V / 100 mA	1/N.A

Logarithmic Antennas



H/V POLARISATION

F CONNECTOR



INTEGRATED ELEMENTS



CODE	DESCRIPTION	PACK/PALLET
AN6008	Logarithmic UHF antenna, F connector 14dB	10/100
AN6009	Logarithmic UHF antenna, F connector 10dB	10/350
AN6011	Logarithmic 32 elem. BdIII/UHF antenna, F connector 12 / 14dB	10/50
AN6012	Logarithmic 16 elem. BdIII/UHF, F connector 8 / 10dB	10/50

Panel Antenna



4 DIPOLES
SELFPOWERED

CODE	DESCRIPTION	PACK/PALLET
AN6007	Panel UHF antenna, C21-69, 14dB	2/18

Band III Antenna



CODE	DESCRIPTION	PACK/PALLET
AN6004B	Band III antenna, 7 elements, 9 dB F Connector	1/84

DAB Antenna



NEW

CODE	DESCRIPTION	PACK/PALLET
AN6027	Band III DAB antenna, 3 elements	1/24

FM Antenna



CODE	DESCRIPTION	PACK/PALLET
AN6005	FM Circular antenna	1/90

Indoor / Outdoor Antenna



DVB T

- High sensitivity
- Indoor / Outdoor use
- Filter GSM signals
- 5 Vdc connector for direct feed from receiver

CODE	DESCRIPTION	PACK
AN0256E	Indoor Antenna UHF/VHF	1/6
AN0263G	DTT UHF-VHF Indoor active antenna	1/6
AN0264G	DTT UHF-VHF Outdoor/indoor active antenna	1/6

MAST AMPLIFIERS

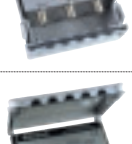


- Complete mast amplification range ideal for digital TV
- Models adaptable to every need (110 and 100dBμV)
- Band-adjustable gain
- Very low noise factor



- Interference-free, thanks to electromagnetic shielding
- Very easy assembly and hook-up (F connectors included)
- Water- and dust-proof box made from durable, corrosion-proof material
- IF mixing available

Mast Amplifier 40dB-110dBμV (shielded)

CODE	DESCRIPTION	PACK
 AM6112	Mast amplifier 2 inputs UHF (40dBreg)-VHF (0dBreg)	1/35
 AM6212	Mast amplifier 2 inputs UHF (40dBreg)-VHF (25dBreg)	1/35
 AM6113	Mast amplifier 3 inputs: UHF (40dB) - UHF (40dBreg) VHF (0dBreg)	1/35
 AM6213	Mast amplifier 3 inputs UHF (40dBreg)-UHF (40dBreg) VHF (25dBreg)	1/35
 AM6114	Mast amplifier 4 inputs IV Band (40dB) V(40dB)-I/III (30dB)-FM (20dB)	1/35
 AM6115	Mast amplifier 4 inputs UHF (40dB) UHF (40dB)-I/III (30dB)-FM (20)	1/35

Mast Amplifier 30dB-100dBμV (shielded)

CODE	DESCRIPTION	PACK
 AM6105	Mast amplifier 1 input UHF+BdI/BdIII (30dBreg)	1/35
 AM6106	Mast amplifier 1 input 24 dB SPECIAL 4 OUTPUTS	1/35
 AM6110	Mast amplifier 2 inputs UHF(30dBreg)-VHF (0dBreg)	1/35
 AM6210	Mast amplifier 2 inputs UHF(30dBreg)-VHF (25dBreg)	1/35
 AM6111	Mast amplifier 3 inputs UHF (30dBreg) UHF (30dBreg)-VHF (0dBreg)	1/35
 AM6211	Mast amplifier 3 inputs UHF (30dBreg) UHF (30dBreg)-VHF (25dBreg)	1/35

Power supplies for mast amplifiers

 AL6121	Power supply for 40dB mast amplifiers 24V/120 mA-(2 RF outputs) F Connector	1/35
 AL6120	Power supply for 30 dB mast amplifiers 24 V-75mA (2 RF outputs)	1/35
 AL6126	Power supply for mast amplifiers with IF mixing 13V/280mA 2Out(RF,FI), PASO 13/18V/22KHz	1/35

Mast Mixers

CODE	DESCRIPTION	PACK
 MP6100	Mast mixer 3 inputs VHF-UHF-UHF (DC pass through)	1/35
MP6101	2 inputs VHF-UHF, F Connect.	1/35
MP6102	3 inputs VHF-UHF-UHF, F Connector	1/35

Mast Amplifiers 30 dB-100dBuV with IF mixing



 AM6302	Mast amplifier UHF(30dB + I/III/DAB(20dB)+IF(mix)	1/35
 AM6304	Mast amplifier UHF+UHF (30dB+ I/III/DAB(20dB)+IF(mix)	1/35

Indoor Amplifiers

CODE	DESCRIPTION	PACK
 AM6140	Indoor amplifier-2 RF outputs UHF (25dB reg), VHF (15 dB reg)	1/35
AM6142	Indoor amplifier-4 output 14dB (VHF) 23dB (UHF) 90 dBμV, F 5,5dB	1/35
AM6141	Indoor amplifier-2 RF outputs	1/40

TECHNICAL CHARACTERISTICS

Code	AM6112	AM6212	AM6113	AM6213	AM6114	AM6115	AM6105	AM6110	AM6210	AM6111	AM6211	MP6100
Inputs n°	2	2	3	3	4	4	1	2	2	3	3	3
UHF1 input gain (dB)	40 reg	40 reg	40 reg	40 reg	40 (IV)	40	-	30 reg	30 reg	30 reg	30 reg	-4
UHF2 input gain (dB)	-	-	40 reg	40	40 (V)	40	-	-	-	30 reg	30 reg	-4
VHF input gain (dB)	0 reg	25 reg	0 reg	25 reg	30 (I/III)	30 (I/III)	-	0 reg	25 reg	0 reg	25 reg	-1,5
FM input gain (dB)	-	-	-	-	20	20	-	-	-	-	-	-
47-860MHz input gain (dB)	-	-	-	-	-	-	30 reg	-	-	-	-	-
Output level (dBμV)*	110	110	110	110	110	110	100	100	100	100	100	-
Typ noise factor (dB)	3	3	3	3	3	3	3	3	3	3	3	-
24Vdc consumption (mA)	110	110	110	110	110	110	70	70	70	70	70	-

*60dB- IM3 (45004B)

MECHANICAL ACCESSORIES



Standard Towers-200 series (up to 15m high)

SECTIONS	CODE	DESCRIPTION	PACK
	AC6010	Top section 1 m	1
	AC6011	Top section 2,5 m	1
	AC6012	Intermediate section 2,5 m	1
BASE PLATES	CODE	DESCRIPTION	PACK
	AC6015	Fixed base plate 200 mm	1
	AC6016	Tiltable base plate 200 mm	1
	AC6017	Embedded base plate 200 mm	1

Reinforced Towers-200R (up to 25m high)

SECTIONS	CODE	DESCRIPTION	PACK
	AC6010R	Reinforced top section 1,5 m	1
	AC6011R	Reinforced top section 3 m	1
	AC6012R	Reinforced intermediate section 3 m	1
BASE PLATES	CODE	DESCRIPTION	PACK
	AC6015R	Reinforced fixed 200 mm	1
	AC6016R	Reinforced tiltable 200 mm	1
	AC6017R	Reinforced embedded 200 mm	1

NOTE: Available model 400R for towers up to 51 m high.

Supports

CODE	DESCRIPTION	PACK
AC6030	Horizontal aerial support L 500 mm - Ø 35 mm	1/10
AC6031	Double horizontal aerial support L 1000 mm - Ø 35 mm	1/10

Masts

FIXED (Galvanized)	DESCRIPTION	PACK
AC6020	Mast 2500 x 35 x 1.2 mm	6
AC6021	Mast 1500 x 35 x 1.5 mm	6
TELESCOPIC	DESCRIPTION	PACK
AC6022	Mast 3000 x 25 x 2 mm	1
AC6023	Mast 3000 x 32 x 2 mm	1
AC6024	Mast 3000 x 38 x 2 mm	1
AC6025	Mast 3000 x 45 x 2 mm	1
AC6026	Mast 3000 x 50 x 1,5 mm	1

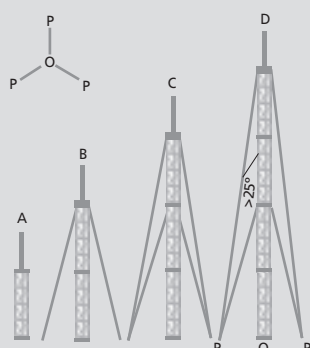
Wall Clamps

CODE	DESCRIPTION	PACK
AC6032	250 mm wall clamp	1/20
AC6033	500 mm wall clamp	1/20
AC6034	200 mm plate clamp	1/20
AC6035	400 mm plate clamp	1/20
AC6034R	300 reinforced plate clamp	1/20
AC6042	Square support	1/40
AC6036	Metallic lag screw M-8	100
AC6045M	Reinforced chimney clamp	1/5
AC6046M	Double reinforced chimney clamp	1/5

Accessories

CODE	DESCRIPTION	PACK
AC6041	Tiltable base for root-top	1/6
AC6043	Chimney clamp	1/10
AC6044	Tightener 1/4"	1/50
AC6055	Cable clamp	1/100
AC6056	Bar clamp M8	1/100
AC6057	Double reinforced bar clamp M8	1/75
AC6058	35 mm ring and clamp for steel cables support	1
AC6060	Steel cable 2 mm	100 m
AC6061	Steel cable 3 mm	100 m
AC6062	Steel cable 4 mm	100 m

MULTI-TOWERS ASSEMBLY



KITS (Towers + Mast)	4,5m	5m	7m	8m	9,5m	11m	14m
Figure	A	A	B	B	C	C	D
Tower series 200	200R	200	200R	200	200R	200R	
Mast code (2,5m)	6020	6020	6020	6020	6020	6020	6020
Top tower code (2,5-3m)	6011	6011R	6011	6011R	6011	6011R	6011R
Interm tower code (2,5-3m)	-	-	1x6012	1x6012R	2x6012	2x6012R	3x6012R
Bse code	6015/6/7	6017R	6015/6/7	6017R	6015/6/7	6017R	6017R
«OP» distance (3x120°)	-	-	2,1m	2,6m	3,3m	4,0m	5,4m
VH charge in «O» (Kp)	154-84	154-84	807-31	807-31	980-20	980-20	1105-28
Moment in «O» (Kgxm)	240	240	-	-	-	-	-
V/H effort in «P» (Kp)	-	-	255-118	255-118	318-188	318-188	363-228
Support cables diam (mm)	-	-	4	4	4 - 3	4 - 3	4 - 3
Support cables effort (Kp)	-	-	147	147	126-60	126-60	133-85
Antenna max charge (Kp)	56	56	56	56	52	52	52

SATELLITE DISHES

- Fixed-offset satellite dishes, ideal for DIGITAL TV reception
- High gain and performance (12GHz) with 45 to 160-cm models
- Easy to assembly, adaptable to any location
- Materials designed for durability in extreme weather conditions and temperatures (electrozinc-coated steel disk with polyester paint)
- Standard polypropylene or metal support, both very sturdy with clips in galvanized plate
- Adaptable to polar mountings and different supports



Standard Plastic Support

CODE	DESCRIPTION			
	AN7001	Offset satellite dish 60 cm		
				
	35,3	62 x 55	2,5	45 mm
	Gain 11,7 GHz	Dimensions VxH in cm	Weight in Kg	Diameter max mast
	AN7016	Offset satellite dish 60 cm, Logo ENGEL		
				
	35,8	59 x 63	2,9	50 mm
	Gain 11,7 GHz	Dimensions VxH in cm	Weight in Kg	Diameter max mast
	AN7008	Offset satellite dish 80 cm		
				
	38	82 x 73	4,8	60 mm
	Gain 11,7 GHz	Dimensions VxH in cm	Weight in Kg	Diameter max mast
	AN7023	Offset satellite dish 80 cm, Logo ENGEL		
				
	38'5dB	80 x 85	4,2	60 mm
	Gain 11,7 GHz	Dimensions VxH in cm	Weight in Kg	Diameter max mast

CODE	DESCRIPTION			
	AN7004	Offset satellite dish 85 cm		
				
	38,5	85 x 85	5,1	70 mm
	Gain 11,7 GHz	Dimensions VxH in cm	Weight in Kg	Diameter max mast
	AN7005	Offset satellite dish 105 cm		
				
	40,3	106 x 96	8,6	75 mm
	Gain 11,7 GHz	Dimensions VxH in cm	Weight in Kg	Diameter max mast
				
Standard plastic support				
				
Compatible with any standard LNB of d=40 mm				
				
Indication of the antenna elevation				

PACKAGING OPTIONS

Model	AN7001	AN7016	AN7002	AN7021	AN7008	AN7023	AN7010	AN7022	AN7004	AN7005	AN7003	AN7024	AN7006	AN7009
ANxxxxi	1pcs	1pcs	1pcs	-	1pcs	1pcs	1pcs	-	1pcs	1pcs	1pcs	1pcs	1pcs	-
ANxxxxF	5pcs	5pcs	5pcs	-	5pcs	5pcs	5pcs	-	5pcs	5pcs	5pcs	-	-	-
ANxxxxG	30pcs	30pcs	30pcs	-	30pcs	30pcs	30pcs	-	30pcs	30pcs	30pcs	-	-	-
ANxxxxH	100pcs	100pcs	100pcs	-	140pcs	100pcs	100pcs	-	100pcs	100pcs	100pcs	-	-	-
ANxxxxK	250pcs	400pcs	300pcs	250pcs	140pcs	250pcs	250pcs	250pcs	-	-	-	50pcs	-	-
ANxxxxKL	250pcs+LNB	400pcs+LNB	300pcs+LNB	250pcs+LNB	140pcs+LNB	250pcs+LNB	250pcs+LNB	250pcs+LNB	-	-	-	-	-	-
ANxxxxP	-	-	-	-	-	-	-	-	-	-	-	-	50pcs	3pcs

SATELLITE DISHES



Metal Support

CODE	DESCRIPTION			
	AN7002	Offset satellite dish 65 cm		
	 36,2 Gain 11,7 GHz	 66 x 62 Dimensions VxH in cm	 4,5 Weight in Kg	 45 mm Diameter max mast
	AN7010	Offset satellite dish 80 cm		
	 38 Gain 11,7 GHz	 85 x 73 Dimensions VxH in cm	 6,9 Weight in Kg	 55 mm Diameter max mast

	AN7021	Click-Click Offset satellite dish 65 cm		
	 36,2 Gain 11,7 GHz	 66 x 62 Dimensions VxH in cm	 4,9 Weight in Kg	 45 mm Diameter max mast
	AN7022	Click-Click Offset satellite dish 80 cm		
	 38dB Gain 11,7 GHz	 85 x 73 Dimensions VxH in cm	 6,9 Weight in Kg	 55 mm Diameter max mast

CODE	DESCRIPTION			
	AN7003	Offset satellite dish 100 cm		
	 39,9 Gain 11,7 GHz	 100 x 92 Dimensions VxH in cm	 9,9 Weight in Kg	 60 mm Diameter max mast
	AN7024	Offset satellite dish 120 cm TRX		
	 41,3 Gain 11,7 GHz	 120 x 110 Dimensions VxH in cm	 12,5 Weight in Kg	 60 mm Diameter max mast

	AN7006	Offset satellite dish 130 cm (aluminium dish)		
	 41,5 Gain 11,7 GHz	 130 x 122 Dimensions VxH in cm	 15 Weight in Kg	 75 mm Diameter max mast
	AN7009	Offset satellite dish 160 cm (aluminium dish)		
	 41,5dB Gain 11,7 GHz	 130 x 122 Dimensions VxH in cm	 15 Weight in Kg	 75 mm Diameter max mast



Metallic mount very robust, with galvanized clamp



Compatible with any standard LNB of d=40 mm



Indication of the antenna elevation



Metallic mount very robust, with galvanized clamp



Compatible with any standard LNB of d=40 mm



Indication of the antenna elevation

TECHNICAL CHARACTERISTICS

Code	AN7016	AN7019	AN7023	AN7004	AN7005	AN7002	AN7010	AN7021	AN7022	AN7003	AN7006	AN7009
Support	Standard	Standard	Standard	Standard	Standard	Metallic	Metallic	Metallic	Metallic	Metallic	Metallic	Metallic
Ef. diameter	60cm	65cm	80cm	85cm	105cm	65cm	80cm	60cm	80cm	100cm	125cm	150cm
Type:	Offset	Offset	Offset	Offset	Offset	Offset	Offset	Offset	Offset	Offset	Offset	Offset
Efficiency	65-75%	65-75%	65-75%	65-75%	65-75%	65-75%	65-75%	65-75%	65-75%	65-75%	65-75%	65-75%
Gain	35,1dB	35,4 dB	37,6 dB	38,1 dB	39,9 dB	35,8 dB	37,6 dB	35,1dB	37,6dB	39,5 dB	41,1 dB	43 dB
Gain	35,8dB	36,1dB	38,3dB	38,8dB	40,7dB	36,5 dB	38,3 dB	35,8 dB	38,3 dB	40,3 dB	41,8 dB	43,7 dB
Beamwidth	<3	<2,9	<2,2	<2,1	<1,7	<2,7	<2,2	<2,7	<2,2	<1,8	<1,5	<1,2
Cross polar	<-27dB	<-27dB	<-27dB	<-26dB	<-26dB	<-28dB	<-28dB	<-27dB	<-27dB	<-27 dB	<-27dB	<-27 dB
F/D ratio	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64
LNB diameter	40	40	40	40	40	40	40	40	40	40	40	40
Mast clamp:	32-50mm	32-50mm	32-60mm	32-70mm	32-75 mm	32-50 mm	32-60 mm	32-50mm	32-60mm	32-60mm	55-80mm	55-80 mm
Weight	2,5Kg	2,9Kg	4,8Kg	5,1Kg	8,6Kg	4,9Kg	6,9Kg	2,5Kg	4,8Kg	9,9Kg	15kg	22kg
Max wind speed	150Km/h	150Km/h	150Km/h	140Km/h	150Km/h	150Km/h	150Km/h	150Km/h	150Km/h	150Km/h	150Km/h	150Km/h
Windloading-130Km/h	28 Kg	33 Kg	50 Kg	56 Kg	85 Kg	33 Kg	50 Kg	-	-	78 Kg	145 Kg	235 Kg
Base effort H-V (150Km/h)	-	-	-	-	105-60Kp	-	-	-	-	100-57	145-82	238-158
Base moment (150Km/h)	-	-	-	-	103Kp-m	-	-	-	-	97	140	345

LNB CONVERTERS

- Universal LNBs with 1,2 or 4 outputs
- For individual, multiuser or collective set-ups
- Adaptable to offset or Prime Focus parabolic dishes
- Monoblock model for 2 simultaneous satellites
- Very effective, high performance
- Universal band (switching by 0/22KHz, 13/18 V)
- Very low noise factor and phase noise (special digital TV)
- Perfect polarity discrimination



Protection of the F connectors by a waterproof cap or sliding cover.

Universal LNB's (1 output)

	CODE	DESCRIPTION	PACK
	AN7123	Single Offset LNB, F=0.3dB	1
	AN7125	Single-Mix Offset LNB (Universal + Terrestrial)	1
	AN7124	Prime focus LNB, F=0,7dB	1
	AN7108	Monoblock, double satellite LNB Astra/Eutelsat	1

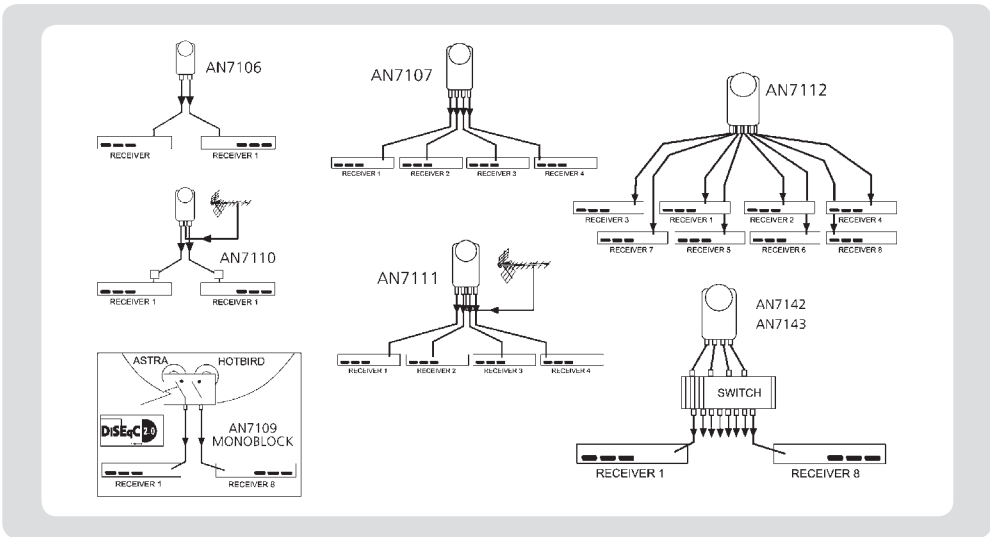
LNB Mounting Supports

	AC7095M	2 LNB support (AN7023, 7002, 7010, 7003)	1
	AC7097	2 LNB support (AN7006, 7009)	1
	AC7094	2 LNB support (AN7018, 7024)	1
	AC7098	2 LNB univ. support (23/40 mm)	1
	AC7099	3 LNB univ. support (23/40 mm)	1

Universal LNB's (several users)

	CODE	DESCRIPTION	PACK
	AN7106	2 Users, Twin LNB	1
	AN7110	2 Users, Twin Mix LNB (Twin+Terrestrial)	1
	AN7109	Twin LNB Monoblock (2 satellites, 2 users)	1
	AN7107	Quad-Twin LNB, F=0.7dB independent universal outputs	1
	AN7111	Quad-Mix LNB, F=0.7dB independent universal outputs	1
	AN7112	Octo LNB, F=0.7dB	1
	AN7142	Quatro LNB offset dish (F=0.7dB)	1
	AN7143	Quatro LNB prime focus dish (F=0.7dB)	1

INSTALLATION DIAGRAMS:



SATELLITE ACCESSORIES



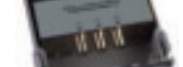
Polar Mounting DiSEqC 1.2

CODE	DESCRIPTION	PACK
 AC7209	Engel polar mounting with DiSEqC positioner	1/112
 AC7215	Engel DigiTracker for 120 cm dishes GOTOX	1/180
 AC7214	Rotor SAT HH120 USALS	1/96
 AC7216	Rotor SAT HH90 USALS	1/114
 AC7213	Minipositioner DiSEqC 1.2	1

TECHNICAL CHARACTERISTICS

Code	AC7209	AN7214/AC7216	AC7215
Type	Standard	Metallic	Metallic
Compatible	DiSEqC1.2, 1.1, 1.0	DiSEqC1.2, Usals	DiSEqC1.2/GOTOX
Hor/Vert Turn	70°, +/- 45°	+/- 65°	+/-75° 10/75°
Dish Max Diameter	80 cm	120/90 cm	120 cm
N° Max of Satellites	50	49	60
Dish max Weight	8	17/10	17
Lenght Ø	120/40	180-54/125-54	200-50
Turn Speed	2°/s(18V)-1,4°/s(14s)	0,7°/s -0,4°/s	1,9°/s -2,5°/s
Voltage	13/18V	13/18V	13/18V
Consumption	95-150mA	30-90mA	50-200-350mA
Wind Speed	100 Km/h	100 Km/h	100 Km/h
Temperature	-35+70	-40+80	-30+70
Weight	3,3	3,2 / 2,9	3,5

Switches

CODE	DESCRIPTION	PACK
 SW0210	DiSEqC 2 in / 1 out, mast switch (shielded)	1/25
 SW0211	DiSEqC 4 in / 1 out, mast switch (shielded)	1/25
 SW0212	DiSEqC 2 in / 1 out, Terr. mast switch (shielded)	1/35
 SW0213	DiSEqC 4 in / 1 out, Terr. mast switch (shielded)	1/35
 SW7602	2 in / 1 out 0/22KHz (without 22KHz pass through) for low band LNBs	1/35

Supports

CODE	DESCRIPTION	PACK
 AC7025	Wall support - 65mm for 130-160cm dishes	1
 AC7029	Floor support - 40 mm for 60-105 cm dishes	1
 AC7026	Floor support - 60mm for 130-160 cm dishes	1

Supports

CODE	DESCRIPTION	PACK
 AC7032	Multifunctional wall "U" supp. for 60-80 dishes	1/20
 AC7039	Wall support - 35mm for 60-80cm dishes	1/25
 AC7040	Wall support - 40mm for 60-80 cm dishes	1
 AC7027	Set of short clamps M8	1/25
 AC7031	Wall/floor support - 50 mm for 85-105 cm dishes	1/25
 AC7033	Wall/floor support - 40 mm for 60-85 dishes	1/25

Diplexers

CODE	DESCRIPTION	PACK
 MP7630V	Terrestrial-satellite diplexer	1/100
 MP7631	Terrestrial-satellite mast diplexer	1/35

Amplifiers

 AM7530	Line IF amplifier 20dB (950-2400MHz)	1/100
 MP7662V	IF reg. attenuator-20dB	1/35
 AM6151	Indoor amplifier TV/SAT - 2 outputs	1/35
 AM6152	Indoor amplifier TV/SAT - 4 outputs	1/35

DIGICOMPACT 8, DIGITAL COMPACT HEADEND SYSTEM

DigiCOMPACT8

DIGITAL-TV CABINET

- Common Interface included in each receiver board (possibility to distribute encrypted channels)
- Possibility to combine up to 8 receiver/transmodulator boards.
- Full band PLL modulator in each board (VSB/DSB and/or Mono/stereo)
- Modulator available to distribute video signals from any external video source
- Full band amplifier optional with each cabinet
- Robust aluminum cabinet with power supply, cooling fan system and remote command.
- Compatible with existing systems and possibility to cascade more than one cabinet
- Easy programming with On Screen Display menus, touch keys and remote command
- Easy to install (just two screws with each board) and to maintain (each board is independent from the other).



CONTROL FROM THE EVERY HOTEL ROOM (SUITE).

- Each room of the hotel has assigned an individual receiver, and thus it does not need for an additional IF distribution.
- More than 1000 channels available
- Channel lists grouped by language
- The TV on the room will only need to be tuned to the appropriate V/UHF channel



HOTEL-USER System

CONTROL FROM HOTEL RECEPTION

- Ability to adapt the channel's offer to the clients preferences.
- Easy modification of channel and satellite from the reception
- Channel lists grouped by language
- The TV on the room will only need to be tuned to the appropriate V/UHF channel



HOTEL-LINK System



CONTROL FROM HEADEND



- Normal system used in hotels or community buildings.
- You should mount as many receiver as channels you wish to distribute
- Programming done at headend via comprehensive On Screen Display or remote command

SMATV System

CONTROL FROM COMMUNITY BUILDINGS



- Each house has its own receiver assigned from the headend.
- Each user has availability of thousands of digital satellite channels
- The User has access to the typical menus of any digital receiver (Favorites, Info, EPG, DiSEqC, etc...)

USER-LINK System

CONTROL FROM MOBILE, ETHERNET \ INTERNET



- Instalation complementary to the SMATV system
- Possibility to fully diagnose or program the headend remotely
- Ability to request the state of the headend, reset, turn off/on, retune, etc... from your mobile phone

GSM / ETHERNET System

QPSK/OFDM TRANSMODULATORS WITH COMMON INTERFACE

DigiCOMPACT8
QPSK-OFDM DIGITAL RECEIVER SYSTEM

QPSK/OFDM to OFDM QPSK/OFDM to PAL/SECAM QPSK/OFDM to IP



QPSK/OFDM to PAL/SECAM Transmodulation

- Ideal for satellite & terrestrial digital TV distribution in community buildings and hotels
- No necessary to change analog tvsets
- Control of the headend via GSM and ethernet from all tvsets of the building (see pages 16-17)
- Decryption of encrypted channels at head-end and sharing of the rights to 4/6 modules (depending on C.A. System)

QPSK/OFDM to OFDM Transmodulation

- Ideal for satellite & terrestrial digital TV distribution in community buildings and hotels
- Preserves the digital quality of the incoming signal until tvset
- Possibility to distribute up to four services per channel
- Decryption of encrypted channels at head-end (4 programs distribution depending on C.A. System)

QPSK/OFDM to IP Transmodulation

- IP encapsulation of full QPSK/OFDM incoming transponder
- Distribution of IP signal through the Ethernet network
- Ideal for delivery of Video of demand services
- Decryption of encrypted channels at head-end (4 programs distribution depending on C.A. System)

DigiCompact 8 System

CODE	DESCRIPTION	PACK
 MS8600	Aluminium cabinet + power supply + fan system + IR remote control	1

DVB-S to PAL/SECAM Transmodulation with C.I.

CODE	DESCRIPTION	PACK
 MS8710	QPSK to PAL/SECAM+C.I. receiver (VSB-V/U-stereo modulator)	1
MS8711	QPSK to PAL/SECAM+C.I. receiver (VSB-V/U-mono modulator)	1
 MS8712	QPSK to PAL/SECAM+C.I. receiver (DSB-V/U-mono modulator)	1
MS8713	QPSK to PAL/SECAM+C.I. receiver (DSB-U-mono modulator)	1

DVB-T to PAL/SECAM Transmodulation with C.I.

CODE	DESCRIPTION	PACK
 MS8720	OFDM to PAL/SECAM+C.I. receiver (VSB-V/U-stereo modulator)	1
MS8721	OFDM to PAL/SECAM+C.I. receiver (VSB-V/U-mono modulator)	1
 MS8722	OFDM to PAL/SECAM+C.I. receiver (DSB-V/U-mono modulator)	1
MS8723	OFDM to PAL/SECAM+C.I. receiver (DSB-U-mono modulator)	1

QPSK/OFDM to OFDM Transmodulation with C.I.

CODE	DESCRIPTION	PACK
 MS8810	QPSK to OFDM + C.I. transmodulator	1
MS8820	OFDM to OFDM + C.I. transmodulator	1

QPSK/OFDM to IP Transmodulation with C.I.

 MS8910	QPSK to IP + C.I. transmodulator	1
MS8920	OFDM to P + C.I. transmodulator	1

QPSK/OFDM TO IP TRANSMODULATORS

Code	MS8910	MS8920
Transmodulation	QPSK - IP	OFDM - IP
Input frequency	950-2150 MHz	45-862 MHz
Input Level	-25/-65 dBm	35/85 dBuV
LNB Supply	13V/18V & 0/22 KHz DiSEqC	-
Decoding Options	FTA/Encrypted (C.I. Module)	FTA/Encrypted (C.I. Module)
Max. Decrypt services	8 PIDs (depend. on card)	8 PIDs (depend. on card)
BW	Auto	6/7/8 MHz
Output	IP	IP
Standard	IEE 802.3 10/100 BaseT	IEE 802.3 10/100 BaseT
Transmission protocol	UDP (Broadcast)	UDP (Broadcast)

Accessories

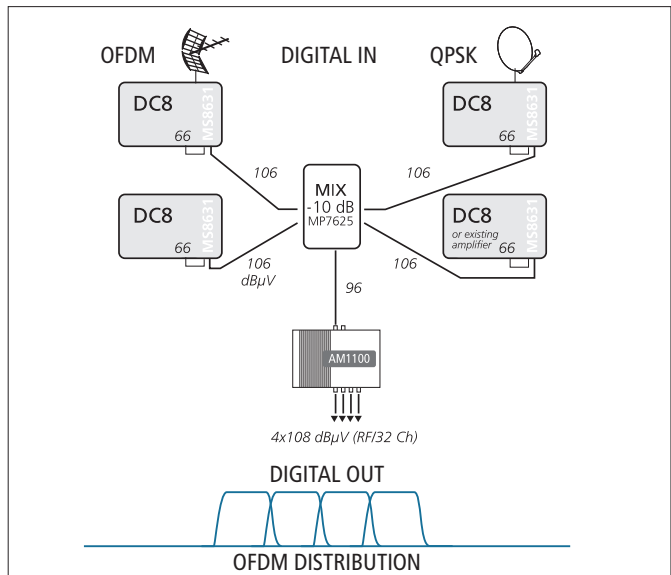
	CODE	DESCRIPTION	PACK
	MS1695	RS232 programmer	1
	MS1697	IR remote control	1
	MS1699	MultiLink Telecontrol Kit	1
	MS8670	GSM module	1
	MS8601	19" rack adaptor	1
	MS2689	RF output Bridge (F) 48 mm	1
	MS2788	QPSK input bridge (F)	1
	MS2787	OFDM input bridge (IEC)	1
	RS7100	PCMCIA IRDETO	1
	RS7101	PCMCIA CRYPTOWORKS	1
	RS7102	PCMCIA CONAX	1
	RS7103	PCMCIA VIACCESS 3.0	1
	RS7104	PCMCIA POWERCAM	1
	RS71XX	Compunicate, DVN, Sumavision Novel-Tongfang, ABV available	1

	CODE	DESCRIPTION	PACK
	MS8750	Stereo VSB modulator (UHF, VHF, S band)	1
	MS8751	Mono VSB modulator (UHF, VHF, S band)	1

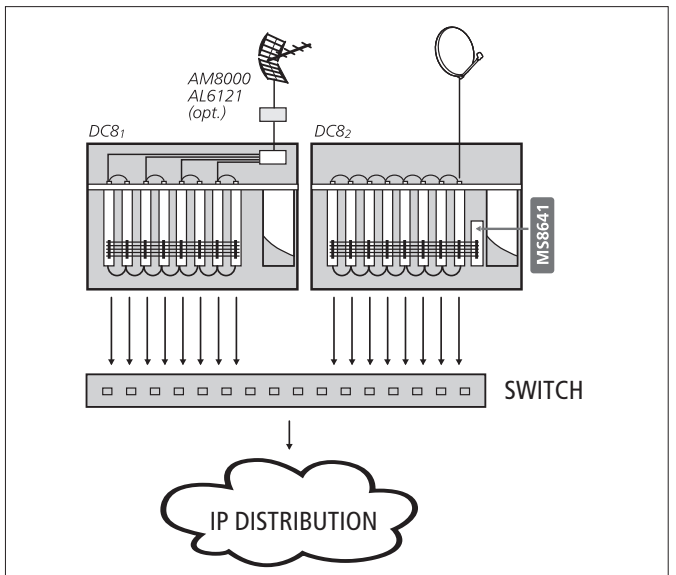
Amplification options

	MS8640	RF+IF wideband amplifier 110 dBμV output (+ RF mixer)	1
	MS8641	RF wideband amplifier 110 dBμV output (+ RF mixer)	1
	MS8631	RF wideband amplifier 122 dBμV output (DIN45004B)	1
	MS8170	Mixer + amplifier (for 8 x MS8713/23)	1
	AM1100	Line amplifier with 4 outputs of 122 dBμV each (see page 22)	1
	AM1060	IF amplifier 40dB/120dBμV (see page 22)	1
	AM1090	IF/RF wide band amplifier 40dB/122dBμV (see page 22)	1

QPSK/OFDM to OFDM Transmodulation



QPSK/OFDM to IP Transmodulation



QPSK/OFDM TO PAL/SECAM TRANSMODULATION			
Code	MS8710 /11 /12 /13	MS8720 /21 /22 /23	
Transmodulation	QPSK - PAL/SECAM	QPSK - PAL/SECAM	
Input frequency	950-2150 MHz	170-862 MHz	
Input Level	-25/-65 dBm	35/85 dBμV	
LNB Supply	13V/18V/ 0/22 KHz DiSeqC	-	
Decoder	MPEG2	MPEG2	
Decoding Options	FTA/Encrypted (C.I. Module)	FTA/Encrypted (C.I. Module)	
Max. Decrypt/Modules	4/6 modules (depend. on C.A.)	4/6 modules (depend. on C.A.)	
BW	Auto	6/7/8 MHz	
AV Output	RCA (V) -Jack (L/R)	RCA (V) -Jack (L/R)	
Output modulator	VSB Stereo (MS8710) VSB Mono (MS8711) DSB Mono (MS8712) DSB Mono-UHF (MS8713)	VSB-Stereo (MS8720) VSB Mono (MS8721) DSB Mono (MS8722) DSB Mono-UHF (MS8723)	
Output frequency	120 - 862 MHz (MS8710 /11 /12) 470-862MHz (MS8713)	120 - 862 MHz (MS8720 /21 /22) 470-862MHz (MS8723)	
Color standard	PAL - SECAM	PAL - SECAM	
Standard	B, G, I, D, K, BB, L	B, G, I, D, K, BB, L	
Output Level	90 dBμV (0-20dB)	90 dBμV (0-20dB)	
Spurious	> 60 dB's (Vo<90dBμV)	> 60 dB's (Vo<90dBμV)	

QPSK/OFDM TO OFDM TRANSMODULATION			
Code	MS8810*	MS8820*	
Transmodulation	QPSK - COFDM	OFDM - COFDM	
Input frequency	950-2150 MHz	45-862 MHz	
Input Level	-25/-65 dBm	35/85 dBμV	
LNB Supply	13V/18V & 0/22 KHz DiSeqC	-	
Decoding Options	FTA/Encrypted (C.I. Module)	FTA/Encrypted (C.I. Module)	
Max. Decrypt services	8 PIDs (depend. on card)	8 PIDs (depend. on card)	
BW	Auto	6/7/8 MHz	
Output	DVB-T	DVB-T	
Modulation	COFDM (2K & 8k)	COFDM (2K & 8k)	
MER output	> 35 dB's	> 35 dB's	
IFFT Mode	2k & 8k	2k & 8k	
Guard Interval	1/4, 1/8, 1/16, & 1/32 selectable	1/4, 1/8, 1/16, & 1/32 selectable	
Code Rate	1/2, 2/3, 3/4, 5/6 & 7/8 selectable	1/2, 2/3, 3/4, 5/6 & 7/8 selectable	
Constellation	QPSK, 16 QAM & 64 QAM	QPSK, 16 QAM & 64 QAM	
B.W.	6, 7 & 8MHz selectable	6, 7 & 8MHz selectable	
Output frequency	45-862 MHz	45-862 MHz	
Output Level	90 dBμV (0-20dB)	90 dBμV (0-20dB)	
Spurious	> 60 dB's	> 60 dB's	

SMATV HEAD-ENDS



QPSK-2000

SATELLITE
DIGITAL
RECEIVER

- Transmodulator to convert digital QPSK into PAL signals
- Easy installation, wall cabinet or DIN rail, input-output mix
- Easy programming, OSD menus fast scanner, watch dog for automatic reset
- Volume adjustment and TEST function for BER/SNR
- Allows broadband amplification



OFDM-2000

TERRESTRIAL
DIGITAL
RECEIVER

- Digital receiver which converts OFDM into PAL signals, intended for collective systems distribution
- High sensitivity, ideal even in areas with low reception (included adjacent channel filters)
- Subtitles, teletext and TEST function BER/SNR
- Broadband or single channel amplification



QPSK 2000 Digital SAT Receivers

	CODE	DESCRIPTION	PACK
	MS2610	QPSK Receiver (PAL-SECAM) with DSB modulator (UHF+VHF)	1
	MS2610T	QPSK Receiver (PAL/SECAM) with VSB modulator (UHF+VHF)	1

OFDM Receivers & MPEG Streamers

	CODE	DESCRIPTION	PACK
	MS2620	OFDM Receiver with DSB modulator (UHF+VHF)	1
	MS2620T	OFDM Receiver with VSB modulator (UHF+VHF)	1

TECHNICAL CHARACTERISTICS

Model	OFDM-2000	OFDM-2000	QPSK-2000	QPSK-2000
Code	MS2620	MS2620T	MS2610	MS2610T
Input modulation	OFDM	OFDM	QPSK	QPSK
Input band (MHz)	470-862	470-862	950-2150	950-2150
Input level	40-80dBµV	40-80dBµV	-25 / -65 dBm	-25/-65 dBm
LNB supply	-	-	13-18V - 0/22KHz	13-18V - 0/22KHz
Noise factor	8dB	8dB	-	-
Mode	2K/8K	2K/8K	-	-
BW	6/7/8 MHz	6/7/8 MHz	27/36 MHz	27/36 MHz
AV decod.	MPEG2	MPEG2	MPEG2	MPEG2
MPEG Output	Yes	Yes	Yes	Yes
Audio-Video ST	Yes	Yes	Yes	Yes
Output	DSB	VSB	DSB	VSB
Out modul-Side bd.	PAL/SECAM	PAL/SECAM	PAL/SECAM	PAL/SECAM
TV Standards	BG DK L I BB	BG DK L I BB	BG DK L I BB	BG DK L I BB
Channels	E5/12 E21/69 S3/41	E5/12 E21/69 S3/41	E5/12 E21/69 S3/41	E5/12 E21/69 S3/41
Frequency	120-860 MHz	120-860 MHz	120-860 MHz	120-860MHz
DK L I BB Channels	4,5 5,5 6 6,5 MHz	4,5 5,5 6 6,5 MHz	4,5 5,5 6 6,5 MHz	4,5 5,5 6 6,5 MHz
Reg output level	80(-0-20)	80(-0-20)	80(-0-20)	80(-0-20)
Size (mm)	47x200x115	47x200x115	47x200x115	47x200x115
24V consumption	460 mA	475 mA	400 mA	425 mA

*Recommended maximum temperature: 50°C (at this temperature, decrease in 1 module the capacity of the power supply).
For higher temperatures use draughty cupboards (cod.AC1530).

NEW FEATURES

- OSD graphics
- Easy and fast programming through screen menus
- New VSB modulator
- Coverage of UHF, VHF and full S Band
- Useful for adjacent channel applications



MULTI-SMATV

Multi-Smatv Accessories

Common family of accessories for the MULTI-SMATV range:

	CODE	DESCRIPTION	PACK
	MS2692	Power supply 24V / 3A	1
	MS2690	Power supply 24V / 2,1A	1
	MS2691	Power supply 24V / 1,6 A	1
	MS1695	Multi-Smatv programmer	1
	AC1520	DIN rail for wall subsection 500 mm	1
	AC1521	Reinforced DIN rail for wall subsection 500 mm	1
	MS2698	RF Bridge (56 mm)	1
	MS2699	DC Bridge (76 mm)	1
	VR7832	75Ω insulated load	1
	VR7543	75Ω Non insulated load	1

Metallic Rack Cabinets



- Cabinets for lead-end distribution on collective systems
- Made of galvanized steel, robust and compact
- Easy installation of Multi-Smatv modules

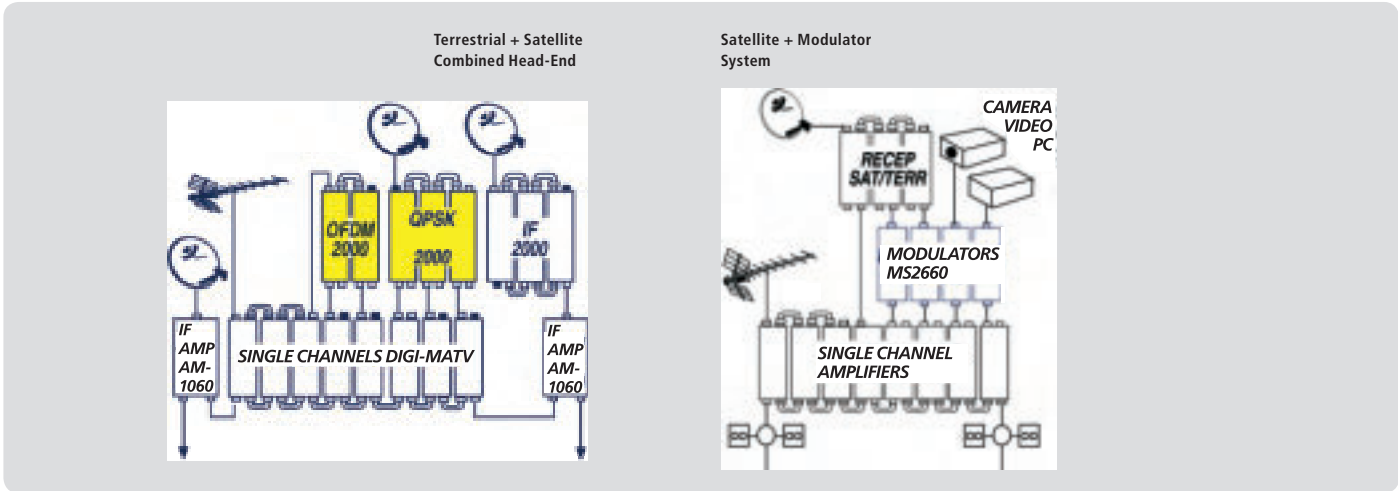
	CODE	DESCRIPTION	PACK
	AC1532	Metallic cabinet with 1 DIN rail (recommended for Multi-Smatv or amplifiers)	1
	AC1533	Metallic cabinet with 2 DIN rail (recommended for Multi-Smatv and amplifiers)	1
	AC1534	For system 80x80 cm, 230 Vac	1
	AC1535	DC-8 cabinet with DIN rail	1
	AC1536	DIN-rail cabinet for 10 modules	1
	AC1537	DIN-rail cabinet for 14 modules	1
	AC1538	DIN-rail cabinet for 22 modules	1



MULTI-SMATV KITS

	Code	Description	Number of channels					
			4	5	6	7	8	
QPSK or OFDM	MS2610/MS2620	QPSK/OFDM Receiver	4	5	6	7	8	
	MS2692	Power supply 3A	0	1	1	0	1	
	MS2690	Power supply 2,1A	1	0	0	2	1	
	AC1520	DIN rail	1	1	1	2	2	

MULTI-SMATV Installation Diagrams



HIGH OUTPUT WIDEBAND AMPLIFICATION

AM1060 SAT AMPLIFIER WITH RF MIX



- Compact system for IF satellite amplification
- Intended for distributing satellite channels in collective systems
- Mix with existing terrestrial channels
- Switchable LNB power

AM1100 4 OUTPUTS (122 dBμV) RF REAMPLIFIER



- 4 outputs of 122 dBμV
- Ideal for collective systems with several cable drops
- Substitute the passive splitter after the Head-End in order to introduce signal level in every riser
- 4 independent high output transistors
- Amplification of VHF+UHF+S bands

AM1090/91 RF+IF REAMPLIFIER



- Multiband amplifier system UHF+VHF/IF for medium and small system
- Intended for reamplification inside the building distribution
- High gain and very low output distortion level
- Amplifier covering the return band (5-35 MHz)
- Gain and tilt regulation independent for each band

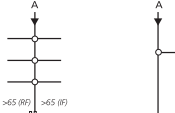
SAT Amplifier

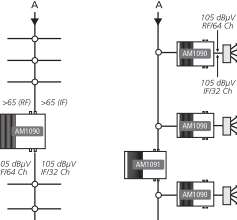
CODE	DESCRIPTION	PACK
 AM1060	IF Amplifier 230 Vac 40dB / 120 dBμV	1

RF Reamplifier

 AM1100	RF Amplifier 4x122 dBμV (47-862 MHz) Gain 12dB	1
---	--	---

RF + IF Amplifier

CODE	DESCRIPTION	PACK
 AM1090	IF/RF Wideband amplifier 40dB/122dBμV (47-862MHz) 40dB/120dBμV (950-2150MHz)	1
 AM1091	IF/RF Wideband re-amplif. 38dB/117dBμV (47-862MHz) 40dB/120dBμV (950-2150MHz)	1



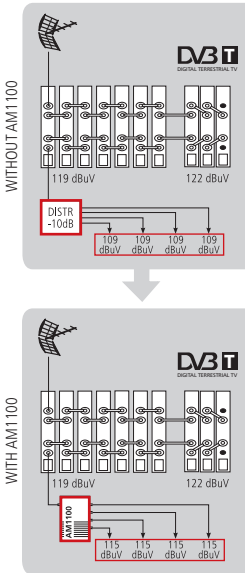
Application Note of AM1100

YES, ENGEL OFFERS YOU AN EASY AND LOW COST SOLUTION FOR REPLACE THE EXISTING SPLITTER AFTER THE HEAD-END TO ENCREASE THE OUTPUT LEVEL.

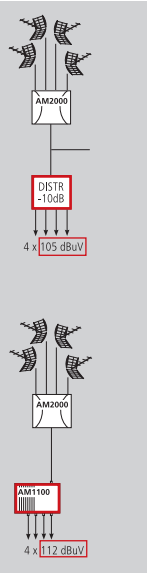


- The AM1100 will avoid replacing old cables because it gives additional gain to compensate the added channels losses.
- The AM1100 will allow using programmable amplifiers because it will give high output level.
- The AM1100 will allow designing large installations with many channels (see page 15).

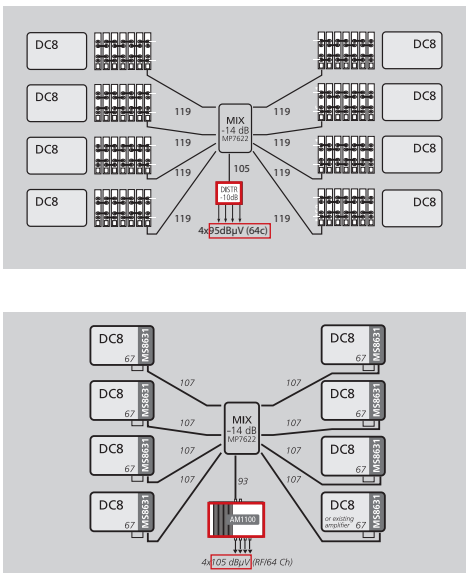
DTT upgrade on existing installations



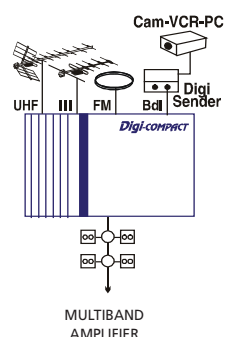
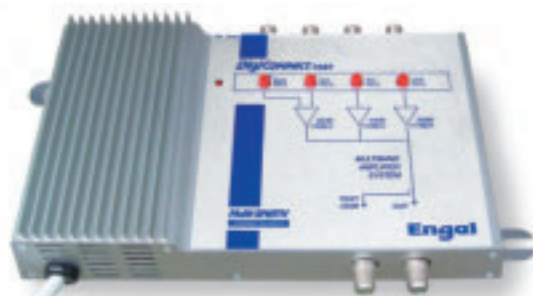
Improve output level of programmable amplifiers



Improve output level on large installations (more than 40 channels)

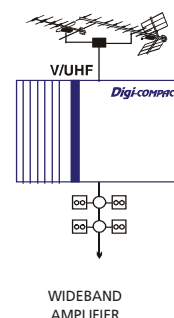
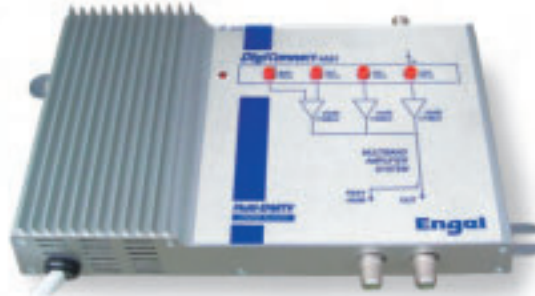


MULTIBAND RF AMPLIFICATION



- ▲ Compact exchanges for multiband amplification (VHF-UHF) for small and medium collectives
- ▲ Ideal for amplifying terrestrial and digital satellite TV signals on head station
- ▲ High gain and output level with very low degree of distortion
- ▲ Separate FM-VHF-UHF amplification with independent regulation for each sub-band. Feed: 230Vac network

WIDEBAND RF AMPLIFICATION



RF Multiband Amplifier System

CODE	DESCRIPTION	PACK
AM1023	Multiband amplifier system 33/40 dB Bdi-FM-III-U, Vo=117dBμV	1
AM1034	Multiband amplifier system 33/40/50 dB Bdi/III/FM/UHF/UHF, Vo=122dBμV	1

RF Wideband Amplifier System

CODE	DESCRIPTION	PACK
AM1021	Wideband amplifier syst. V/U 25/33dB - 117dBμV	1
AM1022	Wideband amplifier syst. V/U 33/40dB - 117dBμV	1
AM1032	Wideband amplifier syst. V/U 40/50dB - 122dBμV	1

TECHNICAL CHARACTERISTICS

Code	AM1021	AM1022	AM1023	AM1032	AM1034	AM1090	AM1091	AM1100	AM1060
Inputs number	1	1	4	1	4	1	1	1	1
Adjustable bands	FM-I-III-U	FM-I-III-U	FM-I-III-U	FM-I-III-U	FM-I-III-U	R/UHF/SAT	R/UHF/SAT	UHF	SAT
Gain - FM/III/U band (dB)	33/25/25/25	33/40/40/40	33/40/40/40	30/40/40/54	33/40/50/50	10/40/42	10/38/42	12 dB	44
Gain Regulation	0/-20dB	0/-20dB	0/-20dB	0/-20dB	0/-20dB	0-20 dB / 0-15 dB	0-20 dB / 0-15 dB	0-20 dB	0-20 dB
Out level (dBμV-DIN45004B)	115V-117/U	115V-117/U	115V-117/U	116V-122/U	116V-122/U	110/122/120	110/117/120	4x122	122
Noise factor (V-U)	7-6dB	7-6dB	7-6dB	7-6dB	7-6dB	7 / <10	7 / <10	7	<10
Supply voltage	230Vac	230Vac	230Vac	230Vac	230Vac	230 Vac	230 Vac	230 Vac	230 Vac
Size (mm)	200x115x40	200x115x40	200x115x40	200x115x40	200x115x40	200x115x40	200x115x40	200x115x40	200x115x40

WIDE BAND AMPLIFIER COMPARATION TABLE

	MS8640 (DC8)		MS8641 (DC8)		MS8631 (DC8)		AM1100		AM1060		AM1090		AM1091	
BAND	RF	IF	RF	IF	RF	IF	RF	IF	RF	IF	RF	IF	RF	IF
Max Gain (dB)	38	40	38	40	48	40	13	40	40	40	40	40	40	40
Min Gain (dB)	18	20	18	20	28	20	-6	20	20	20	20	20	20	20
Tilt (dB)	-	0/18	-	0/18	-	0/15	-	0/15	0/15	0/15	0/15	0/15	0/15	0/15
RF Mix	Yes		Yes		No		No		Yes		No		No	
Output level- 2ch (dBuV*)	110,0	118,0	110,0	118,0	122,0	119,7	4 x 122,0	120,0	122,0	120,0	117,0	120,0	117,0	120,0
Output level- 3ch (dBuV*)	107,7	115,7	107,7	115,7	119,7	117,5	4 x 119,7	117,7	119,7	117,7	114,7	117,7	114,7	117,7
Output level- 5ch (dBuV*)	105,5	113,5	105,5	113,5	117,5	115,5	4 x 117,5	115,5	117,5	115,5	112,5	115,5	112,5	115,5
Output level- 9ch (dBuV*)	103,2	111,2	103,2	111,2	115,2	113,2	4 x 115,2	113,2	115,2	113,2	110,2	113,2	110,2	113,2
Output level- 17ch (dBuV*)	101,0	109,0	101,0	109,0	113,0	111,0	4 x 113,0	111,0	113,0	111,0	108,0	111,0	108,0	111,0
Output level- 33ch (dBuV*)	98,7	106,7	98,7	106,7	110,7	108,7	4 x 110,7	108,7	110,7	108,7	105,7	108,7	105,7	108,7
Output level- 65ch (dBuV*)	96,5	104,5	96,5	104,5	108,5	106,5	4 x 108,5	106,5	108,5	106,5	103,5	106,5	103,5	106,5

*DIN45004B

Vo (n amplif) = -10log(n)

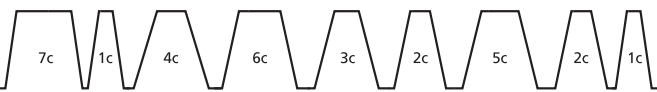
Vo (2amplif) = -3/-3dB, -6/-1,3dB, -9/-0,5dB

PROGRAMMABLE HEAD-END AMPLIFIER

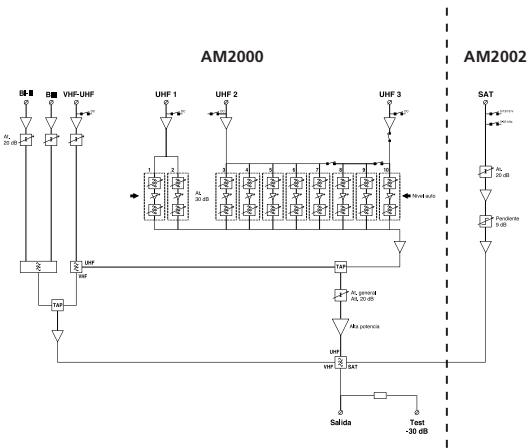
AM2000/AM2002



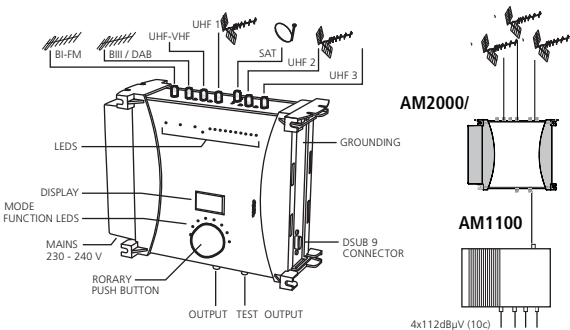
- Available in 2 versions: AM2000 only RF, and AM2002 including RF+IF
- Compact amplification stations, very easy to be programmed.
- Offers 6 inputs in BI-FM / BIII / VHF-UHF / 3 x UHF.
- Allows to program up to 10 clusters in UHF, with bandwidth from 1 to 7 channels.
- High gain, and output level: UHF: 55 dB / 123 dBμV BIII: 40 dB / 118 dBμV BI-FM: 35 dB / 118 dBμV.
- Separated amplification for UHF and VHF, with intermediate attenuation adjustment
- Test output of -30dB
- The AM2002 gives on the satellite range 40dB / 120 dBμV



10 clusters programmable from 1 to 7 channels



CODE	DESCRIPTION	PACK
AM2000	Programmable Head-End Multichannel Amplifier, 6 terrestrial inputs	1
AM2002	Programmable Head-End Multichannel Amplifier, 6 terrestrial inputs + 1 satellite input	1



TECHNICAL CHARACTERISTICS

	AM2000						AM2002
Inputs	BI-FM	BIII	VHF-UHF	UHF 1	UHF 2	UHF 3	SAT
Freq. Margin	47-108	174-240	47-240 + 470-862	470-862	470-862	470-862	950-2300
Clusters configuration	-	-	-	8-56 (1 a 7 channels / cluster)			-
				2	8	0	
				2	7	1	
				2	5	3	
Gain	35	40	40	55			40
Attenuator	20	20	20	30			20
TILT adjustment	-	-	-	-	-	-	9
UHF general adjustment level	-	-	-	+10 dB a -9 dB			-
Noise factor	5	5	5	6			9
Max. input level	80	80	80	80			90
Max. output level	118	118	VHF:118 / UHF:123	123			116
Selectivity	-	-	-	10 dB / 10 MHz			SAT / TERR. > 30 dB TERR. / SAT > 25 dB
Return losses	> 10	> 10	> 10	> 10	> 10	> 10	>10
Input/output							
Current pass through	-	-	24 V	24 V	24 V	24 V	0-13-18 V / 300 mA y 0-22 kHz
Output test	-30						
Data transfer	Connector DSUB9						
Power supply	230 V~ / 15 V DC / 45 VA						
Working temperature	-5 a +50						
Dimensions	265 x 220 x 95						

* TERR.: -54 dB / IM3 SAT: -35 dB / IM3

SINGLE CHANNEL AMPLIFIERS



AM6000



Manufactured in high quality shielded zamac casing, with latest generation transistors and with the most strict quality controls, Engel incorporates intelligent features to this new design in order to supply as many advantages as possible to the user:

- High gain (55dB) with a maximum regulation (30dB) and flatness, in order to be suitable for all types of antenna signals, analogues as well as digitals.
- 6 cavities ultra-selective to obtain an excellent filtering of adjacent channels without affecting the signal quality.
- High output level so it can be used in medium and large community installations.
- Fulfilling all requirements from the ICT norm.
- Compatibility (mechanical and electrical) with most of the existing amplifier brands in the market, so they can be used for upgrading existing installations.
- Exclusive system "EASY SETTING" for a simple and quick switch on of the different amplifiers present in the Head-End.
- Intelligent system "TEST LINK" which informs about the signal levels present in the most restrictive outlets for an easy adjustment and equalization of the amplifiers, without requiring any test equipment. System patented by ENGEL.
- AM1100 Unique accessory for re-amplification of 4 x 122dBμV outputs. Very useful for old installations as well as large buildings like hotels, hospitals, ...
- AM8000, antenna pre-amplifier for areas of low signal reception. Offering high output level, and extremely low noise figure.

VHF / UHF Models

CODE	DESCRIPTION	PACK
AM6005...AM6012	Single Channel Ampl. Band III	1
AM6003S...AM6041S	Single Channel Ampl. Bd S (S3 - S41)	1
AM6020	Single Channel Ampl. FM	1
AM6508	Single Channel Ampl. DAB 195-232 MHz	1
AM6021...AM6069	Multichannel Ampl. UHF c21 a69, 55dB, 125dBμV	1
AM6221...AM6269	Ampl. Bichannel UHF	1

IF Models

	AM6960	IF Amplifier with terrestrial Mix 40dB, 120dBμV, 24Vdc	1
	AM1060	IF Amplifier with terrestrial Mix 40dB, 120dBμV, 230Vac	1

Professional Pre-Set Kits for DTT

	KM6XXX	Configurable KIT for DTT reception	1
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Accessories Series AM6000

CODE	DESCRIPTION	PACK
AL6020	Power supply (24V-2,1A)	1
AL1668P	Power supply Plug in 24V/625mA	1
AC1520	DIN rail (500 mm)	1
AC1520B	DIN rail (250 mm)	1
MS2689	Bridge RF out L=48,25mm F/rap (DC8)	1
VR7832	75Ω insulated load	1
VR7543	75Ω non insulated load	1
MS2699	DC Bridge (76 mm)	1
MS2684	DC Bridge (4 Pins-4 Pins)	1
MS2685	DC Bridge (4 Pins-Banana)	1
MS2686	DC Bridge (4 Pins-Faston)	1

TECHNICAL CHARACTERISTICS

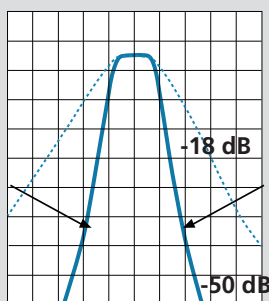
	UHF				RADIO		VHF			
	MULTICHANNEL	MULTI 66-69	MULTI 65-69	BICHANNEL	FM (ICTs)	DAB (ICTs)	BdS low	Bd III	BdS high	Hyperband-S
Code	AM6021...69	AM6466	AM6565	AM6221...69	AM6020	AM6508	AM6003S...105	AM6005...12	AM6011S...205	AM6021S...415
Bandwidth (MHz)	8	32	40	16	20,5	37	7	7	7	8
Frequ. Range (MHz)	470-862	830-862	822-862	470-862	87,5-108	195-232	104-174	174-230	230-300	302-470
Max. Gain (dB)	55	57	57	50	35	45	58	50	58	58
Output Level (dBμV EN50083-5)	125A/118D	108	108	111/109/108/108	114	114 (2c/4M/50dB)	125	123	124	125
Noise Factor (dB)	<10,5	<10,5	<10,5	<10,5	<9	<9	<9	<9	<9	<9
Gain Regulation (dB)	32	32	32	32	35	35	35	35	35	35
Rejection betw. channels (dB)	18/50(+/-1/2c)	22(Pv/c65)	22(Pv/c64)	14(±1c)	30(77/120MHz)	20(n+2)	30(n+2)	30(n+2)	30(n+2)	30(n+2)
Flatness (dB)	<3	<3	<3	<3	<3	<3	<1	<1	<1	<1
Consumption 24Vdc (mA)	90	90	90	70	65	90	90	65	90	90
Max. current Preamp. (24V)	150	150	150	150	150	150	150	150	150	150

AM6000 - ULTRASELECTIVE SINGLE CHANNEL AMPLIFIERS

An entire world of advantages thanks to the new concept of an intelligent amplifier

HIGH SELECTIVITY

- Incorporates 6 zamak aluminium cavities with very low losses and ultraselective filters based in inductive bars and trimmers of high Q.
- Ideal for adjacent channels due to high rejection of the neighbour channels. (-18/50dB on the video carriers on the next upper channel and alternate +2c).



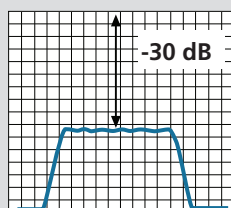
HIGH GAIN

- Amplifier with latest generation transistors to obtain a gain of 55dB on the whole band with minimum consumption.
- Ideal to make it compatible with any existing installation and all types of antenna signal.



VERY STABLE FLATNESS AND GAIN REG

- The cavities design and the input transistor allows a regulation up to 30dB with an optimal spectrum of flatness.
- This frequency response, together with the high selectivity of the amplifier, allows using antenna levels very different from one channel to the other, without any problem.

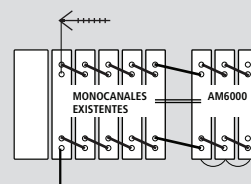
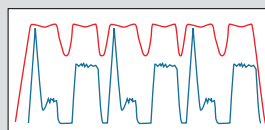


PERFECT MIX / DEMIX

- Additionally to the steep selectivity, the 6 cavities also offer very low attenuation on the mix/ demix system in Z.
- This allows increasing the number of adjacent single channel amplifiers, maintaining similar output level.

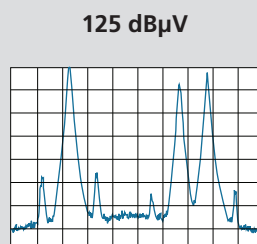
UNIVERSAL COMPATIBILITY

- The community installations are not always brand new. In many cases, it's necessary to reuse the existing amplifiers.
- The AM6000 allows perfect compatibility with the most relevant brands available in the market. In terms of mechanical fixation (rail / screws), electrical connection (jacks / pins / fastons) and RF connection (F / IEC).



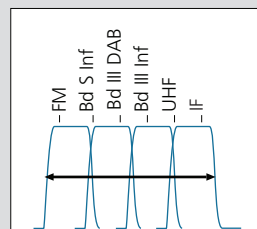
HIGH OUTPUT LEVEL

- Amplifier with high power transistors to get an optimal output level.
- Three output cavities of low losses, to get a perfect obligation between output level and selectivity.



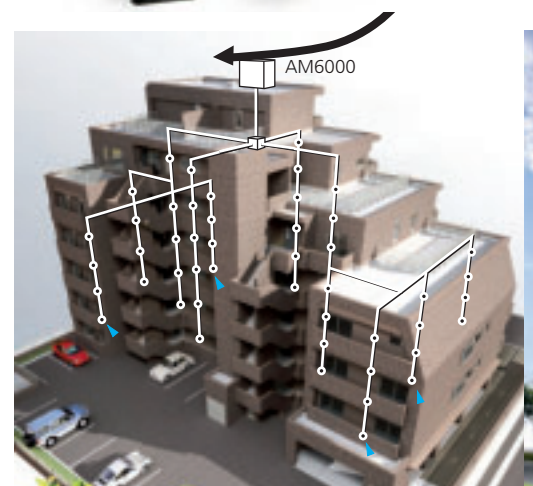
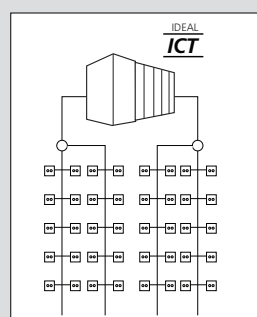
WIDE RANGE

- The amplifiers range is covering from the S-low band up to the IF satellite band, including the hyperband, VHF and UHF.
- Its characteristics offer the maximum efficiency for each installation type, thanks to the wide range of single channel, bi-channel and multichannel configuration.



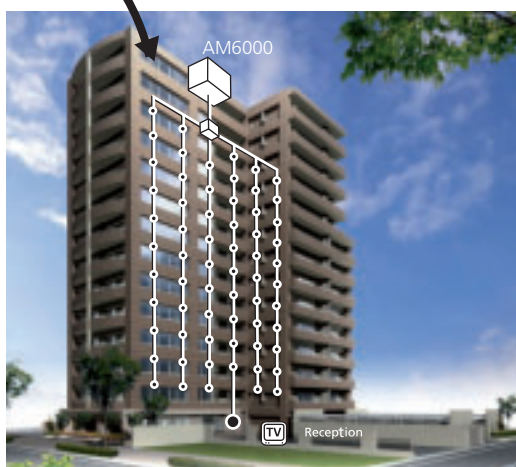
IDEAL FOR MEDIUM AND LARGE COLLECTIVE INSTALLATIONS

- Ideal for medium and large installations, because of its specifications of output level, gain and selectivity. Its design and production protocol fulfills the quality parameters required by the european standards.



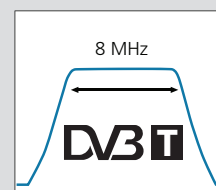
NEW SYSTEM OF SWITCH ON AND EASY SETTING

- The amplifiers AM6000 incorporate a unique system for setup with two features, MUTE (maintains power, disconnects signal) and POWER OFF (disconnects power supply).
 - You can switch on, one by one, every amplifier and easily isolate every module in order to make diagnosis and detect any possible incidence during the setup process.
- Always without having to remove bridges, or unplug modules.



IDEAL FOR DTT SIGNALS

- The cavities have been designed to give steep selectivity and low attenuation. Maintaining always the channel bandwidth. This characteristic, together with its low intermodulation, offers an optimum compatibility with the new DTT channels.



PREPARED FOR AREAS WITH LOW COVERAGE

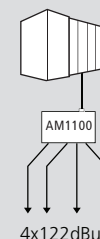
- This amplifier has a low noise figure due to the cavities accurate design and the low noise of the input transistor. In areas where the signal reception is very weak, we offer you two interesting solutions, the active antenna DIGIMAX-120 or the preamplifier AM8000 (low noise figure, and high output level), which can be used with our AC and MAX antenna range.

F NOISE= 2dB



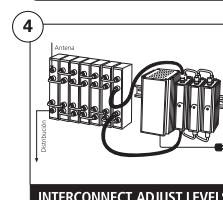
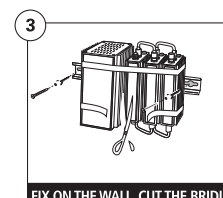
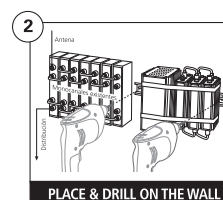
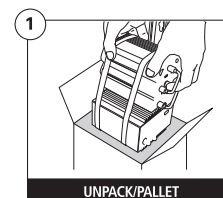
RE-AMPLIFIER 4 OUTPUTS

- The high output level of the AM6000 allows to be used in installations with large number of TV outlets. For those installations, like hotels, we also recommend to incorporate the AM1100, with 4 outputs of 122dBμV each. Very convenient to increase the total output level of the system, once you have added new channels (see page 20).



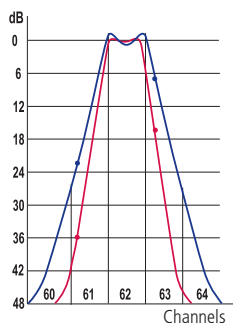
FAST AND EFFICIENT DTT INSTALLATIONS

- A lot of analogue transmitters are being switched off everyday. Installers in the same region of operation must go installation by installation to upgrade the Head-Ends so to be able to receive the new digital channels. Such installations usually take a maximum of 2 to 3 new multiplexers. The channel amplifiers that must be installed are common through the same region of influence of a given transmitter. Being able to supply such channels in a pack, will provide the installer with great advantages:



SINGLE CHANNEL AMPLIFIERS

AM5000



Blue Line = standard Single Channels
Red Line = adjacent Single Channels

- Complete range of monochannel VHF/UHF amplifiers, specially designed for analog and digital television reception throughout the building
- Very high selectivity, ideal for terrestrial digital television (Standard model for alternate channels and model "50xx" for adjacent channels)
- High output level (117, 122dBμV) with adjustable gain and Z system
- Low-consumption SMD technology, ultra-compact size and absolute reliability
- Attractive aluminum design
- Low-consumption, "cold" system (feed: 15V)

Single Channel Amplifiers (50dB, 122dBμV)

	CODE	DESCRIPTION	PACK
	AM5021...AM5069	UHF Single Channel Ampl. for adjacent channels 50dB, 122dBμV (Silver)	1
	AM5121...AM5169	UHF Single Channel Ampl. for adjacent channels 50dB, 122dBμV (Black)	1
	AM5021K...AM5069K	UHF Amplifier KIT + wall support+Plug-in power supply (Silver)	1
	AM5121K...AM5169K	UHF Amplifier KIT + wall support+Plug-in power supply (Black)	1

Power Supplies & Accessories Series AM5000

	CODE	DESCRIPTION	PACK
	AL1569	Power supply 15V/2A (230Vac) (Silver)	1
	AL1579	Power supply 15V/2A (230Vac) (Black)	1
	AL1568P	Plug-in power supply 15V/400 mA	1
	AC1520	DIN rail (500 mm)	1
	AC1528	Mechanical adapter KIT for other brands	1
	VR1653	RF Bridge (F connector, 40 mm)	1
	VR1651	DC Bridge (35 mm)	1

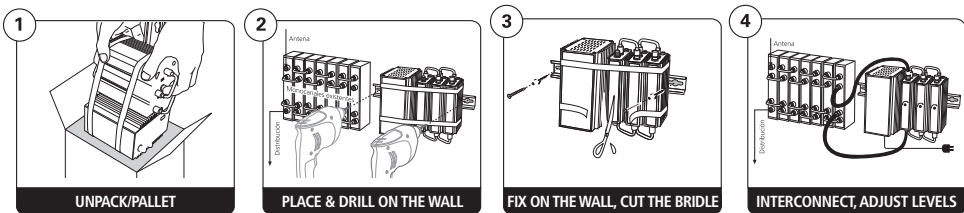
Pre-Set KITS for DTT



- Pre-assembled KIT with all accessories (rail, power supply, bridges, ...)
- Simple and fast installation in only 4 steps
- Adaptable to existing Head-Ends (any brand)
- Optional re-amplifier AM1100 to avoid changing cables, passive components, outlets, ...

CODE	DESCRIPTION	PACK
KM5xxx	Configurable KIT for DTT reception	1

INSTALLATION IN ONLY 4 STEPS





SPECIAL
ADJACENT
CHANNELS

AM-1670

RF-RF CHANNEL CONVERTER

- Agile converter of any channel into the UHF/S/VHF bands
- Ideal for applications with adjacent channels
- High selectivity due to the saw filter
- Output to single channel amplifier
- Channel selection by means of rotary switches on the front panel

MS-2660

STEREO VESTIGIAL MODULATOR

- Smooth modulation of video and audio signals on the entire V/UHF band
- Very useful for multichannel stereo satellite reception and for telesecurity, PCs or building-wide VCRs.
- High image and stereo sound quality 2-carrier system
- Vestigial modulation for adjacent channels
- Channel adjustment by means of rotary switches



RF - RF Channel Converters

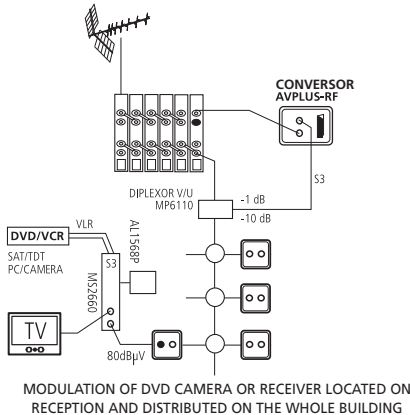
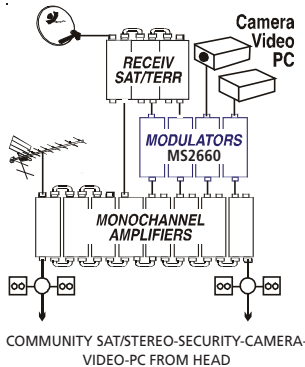
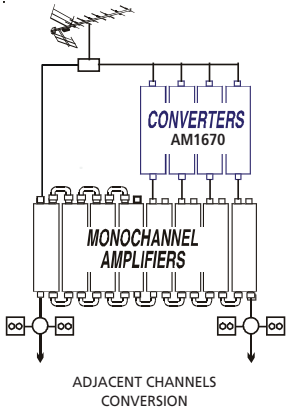
	CODE	DESCRIPTION	PACK
	AM1670	RF Channel Converter V/UHF to 120-862 MHz Loop input	1
	AM1670M	RF Channel Converter single input-Multistandard	1

	CODE	DESCRIPTION	PACK
	MS2660	Vestigial Stereo Modulator (15Vdc)	1
	MS2660M	Vestigial Mono Modulator (15Vdc)	1

TECHNICAL CHARACTERISTICS

AM 1670 CONVERTERS		
	AM1670	AM1670M
Converters /module	1	1
Input frequency	47-862MHz	47-862MHz
Noise factor	<9dB	<9dB
Internal IF	38,9MHz	38,9MHzBW
BW (MHz)	8	8
Standard	BG	Multistandard
Output frequency	120-862	120-862
Output level	80dBμV	80dBμV
Regulation	0/-15dB	0/-15 dB
Inputs-outputs	2-1	1-1
15V consumption	200mA	240mA
Size (mm)	34x135x75	34x135x77

AV-1000 MODULATORS	
	MS2660
Modulators/module	1
Input signal	Video-AudL/R
Input level	1Vpp-0dBm
Output modulation	Pal/Sec-VSB
Audio modulation	Stereo Dual
Output channels	s3/40-L5/10-e5/69
Output level	80dBμV
Regulation	0/-20dB
Outputs	loop
24V consumption	15dc/100mA
Size (mm)	34x135x75



IMPORTANT NOTE: It is recommended to use converters with monochannel amplifiers in the output.

SATELLITE MULTISWITCHES

STAR Multi-Subscriber IF Distribution

	CODE	DESCRIPTION	PACK/PALLET		CODE	DESCRIPTION	PACK/PALLET
	SW0540	IF switch 5 in - 4 out	1		SW1760	IF switch 17 in - 6 out	1
	SW0560	IF switch 5 in - 6 out	1		SW1780	IF switch 17 in - 8 out	1
	SW0580	IF switch 5 in - 8 out	1				
	SW0590	IF switch 5 in - 12 out	1				
	SW0940	IF switch 9 in - 4 out	1				
	SW0960	IF switch 9 in - 6 out	1				
	SW0980	IF switch 9 in - 8 out	1				
	SW0990	IF switch 9 in - 12 out	1				

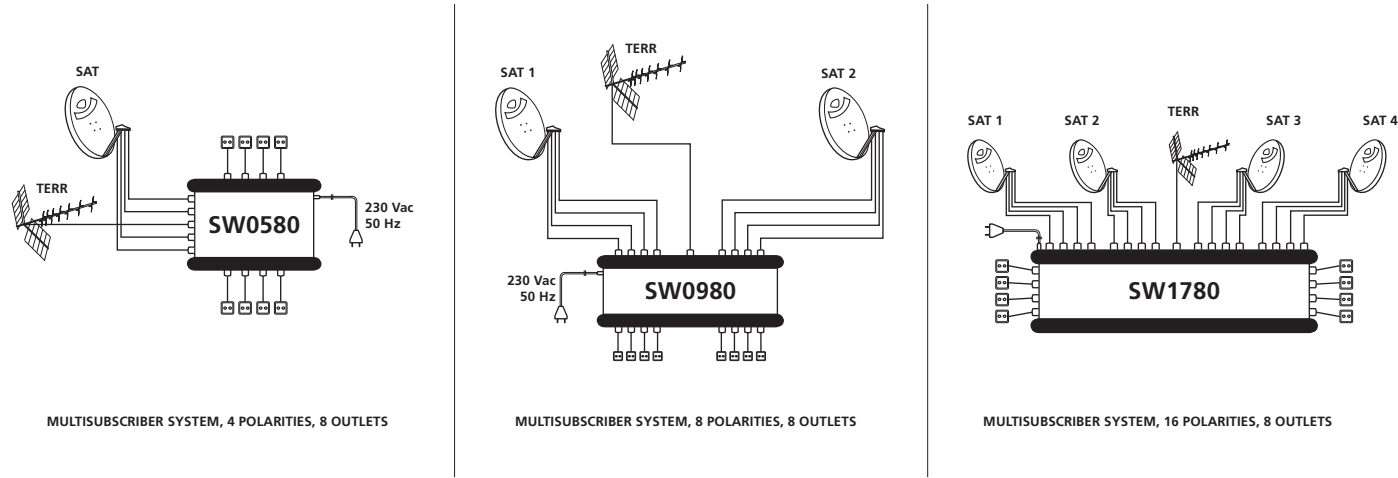
LNB Mounting Supports Accessories

	CODE	DESCRIPTION	PACK/PALLET
	AL1569P	External power supply	1
	VR7832	75 Ω load	1

TECHNICAL CHARACTERISTICS

Code	SW0540	SW0560	SW0580	SW0590	SW0940	SW0960	SW0980	SW0990	SW1760	SW1780
N° Inputs	4+1	4+1	4+1	4+1	8+1	8+1	8+1	8+1	16+1	16+1
N° Outputs	4	6	8	12	4	6	8	12	6	8
Frequency SAT	950-2150	950-2150	950-2150	950-2150	950-2150	950-2150	950-2150	950-2150	950-2150	950-2150
Frequency TER	47-862	47-862	47-862	47-862	47-862	47-862	47-862	47-862	5-862	5-862
Gain SAT	0	0	0	0	12	12	12	6	2	2
Insertion loss TER	2	2	0	2	3	3	3	0	22	22
Attenuation Reg.	10	10	10	10	15	15	15	15	-	-
Isolation	25	25	25	25	30	30	30	30	30	30
Rejection	30	30	30	30	25	25	25	25	26	26
Return loss	10	10	10	10	10	10	10	10	10	10
Output SAT	95	95	100	95	100	100	100	100	100	100
Output TER	85	85	85	85	85	85	85	85	-	-
Voltage	built-in 230V	built-in 230V	built-in 230V	built-in 230V	built-in 230V	built-in 230V	built-in 230V	built-in 230V	external power	external power
Dimensions	265x125x70	265x125x70	355x125x70	265x125x70	353x125x70	353x125x70	353x125x70	455x125x70	356x125x53	356x125x53

APPLICATION NOTE



SATELLITE MULTISWITCHES



CASCADE IF Distribution

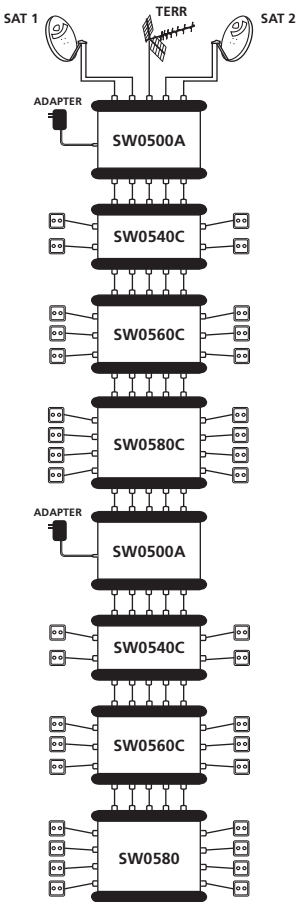
	CODE	DESCRIPTION	PACK/PALLET
	SW0540C	Cascade IF 5 in - 4 out	1
	SW0560C	Cascade IF 5 in - 6 out	1
	SW0580C	Cascade IF 5 in - 8 out	1
	SW0940C	Cascade IF 9 in - 4 out	1
	SW0960C	Cascade IF 9 in - 6 out	1
	SW0980C	Cascade IF 9 in - 8 out	1

	CODE	DESCRIPTION	PACK/PALLET
	SW1760C	Cascade IF 17 in - 6 out	1
	SW1780C	Cascade IF 17 in - 8 out	1

Cascade Amplifiers

	CODE	DESCRIPTION	PACK/PALLET
	SW0500A	Amplifier 5 inputs, level adjustment for every input	1
	SW0900A	Amplifier 9 inputs, level adjustment for every input	1
	SW1700A	Amplifier 17 inputs, level adjustment for every input	1

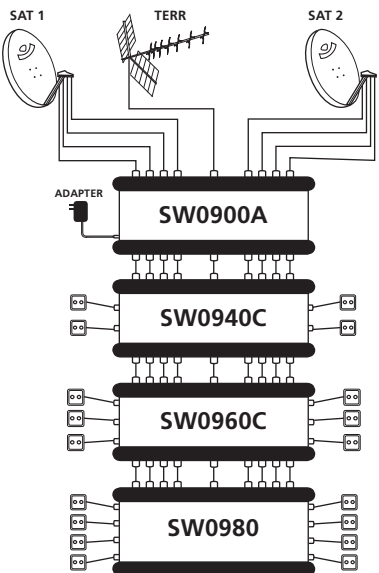
APPLICATION NOTE



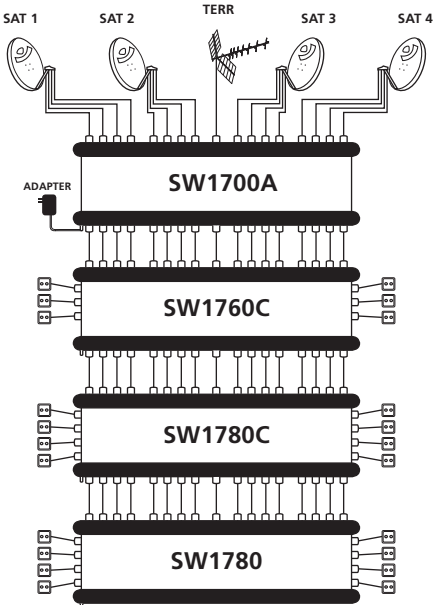
CASCADE SYSTEM 4 POLARITIES, 36 OUTLETS

TECHNICAL CHARACTERISTICS

Code	SW0540C	SW0560C	SW0580C	SW0940C	SW0960C	SW0980C	SW1760C	SW1780C
N° Inputs	4+1	4+1	4+1	8+1	8+1	8+1	16+1	16+1
N° Outputs	4	6	8	4	6	8	6	8
Frequency SAT	950-2150	950-2150	950-2150	950-2150	950-2150	950-2150	950-2150	950-2150
Frequency TER	5-862	5-862	5-862	5-862	5-862	5-862	5-862	5-862
Gain SAT	4	5	6	3	4	5	3	3
Insertion loss TER	2	3	4	5	5	6	4	4
Attenuation Reg.	16	18	19	20	20	20	2	2
Isolation	18	20	22	22	22	6	25	25
Rejection	35	35	35	30	30	30	30	30
Return loss	30	30	30	30	30	30	30	30
Output SAT	10	10	10	12	12	12	10	10
Output TER	8	8	8	8	8	8	8	8
Voltage	External	External	External	External	External	External	External	External
Dimensions	96x86x36	96x149x36	96x149x36	254x128x49	254x128x49	254x157x49	356x125x53	356x125x53



CASCADE SYSTEM 8 POLARITIES, 18 OUTLETS



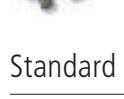
CASCADE SYSTEM 16 POLARITIES, 22 OUTLETS

DISTRIBUTION PASSIVE COMPONENTS

- Complete distribution range, ideal for digital TV
- Models adaptable to every need (standard range with F connectors and Master range with direct cable connection)
- Taps and splitters with high shielding, very low attenuation, bandwidth and very easy to assembly
- DC pass on all outputs, for feading amplifiers or LNBs



Standard Series - Splitter (5-2400MHz)

	CODE	DESCRIPTION	PACK
	MP7620	2 outputs DC (4,5-6 dB)	1/100
	MP7623	3 outputs DC (6-8,5 dB)	1/100
	MP7621	4 outputs DC (8,5-11 dB)	1/100
	MP7626	6 outputs DC (10-13 dB)	1/50
	MP7622	8 outputs DC (12-15 dB)	1/50

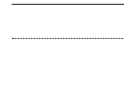
Standard Series - Taps (5-2400MHz)

	CODE	DESCRIPTION	PACK
	MP6110/15/20	1 output (10/15/20 dB)	1/100
	MP6210/15/20/25	2 outputs (10/15/20/25 dB)	1/100
	MP6410/15/20/25	4 outputs (10/15/20/25 dB)	1/100
	MP6515/20/25	6 outputs (15/20/25 dB)	1/50
	MP6815/20/25	8 outputs (15/20/25 dB)	1/50

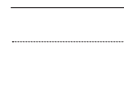
User Access Point

	CODE	DESCRIPTION	PACK
	MP7550	RT user access point with 75 ohm load	1/10

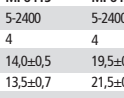
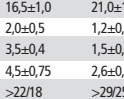
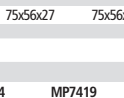
Master Series - Splitter (5-2400MHz)

	CODE	DESCRIPTION	PACK
	MP7624	2 outs 4,5 dB-DC pass	1/100
	MP7625	4 outs 8,5 dB-DC pass	1/100
	AM7625	5 outputs active splitter	1/100

Master Series - Directive Taps

	CODE	DESCRIPTION	PACK
	MP7211	2 outputs - 11 dB	1/100
	MP7214	2 outputs - 14 dB	1/100
	MP7219	2 outputs - 19 dB	1/100
	MP7224	2 outputs - 24 dB	1/100
	MP7414	4 outputs - 14 dB	1/100
	MP7419	4 outputs - 19 dB	1/100
	MP7424	4 outputs - 24 dB	1/100
		Directivity > 10 dB	

Master Series - Equalized Taps

	CODE	DESCRIPTION	PACK
	MP8211	2 out -26/11 dB	1/100
	MP8214	2 out -27/14 dB	1/100
	MP8219	2 out -31/19 dB	1/100
	MP8224	2 out -34/24 dB	1/100
	MP8414	4 out -26/11 dB	1/100
	MP8419	4 out -31/19 dB	1/100
	MP8424	4 out -34/24 dB	1/100

TECHNICAL CHARACTERISTICS

STANDARD TAPS											STANDARD SPLITTERS				
Code	MP6110	MS6115	MP6120	MP6210	MP6215	MP6220	MP6225	MP6415	MP6420	MP6425	MP7620	MP7623	MP7621	MP7626	MP7622
Freq. range	5-2400	5-2400	5-2400	5-2400	5-2400	5-2400	5-2400	5-2400	5-2400	5-2400	5-2400	5-2400	5-2400	5-2400	5-2400
Outputs n°	1	1	1	2	2	2	2	4	4	4	2	3	4	6	8
Tap loss 47	10,5±0,5	14,5±0,5	20,5±0,5	10,0±0,5	15,5±0,5	18,5±0,5	23,5±0,5	14,0±0,5	19,5±0,5	23±0,5	-	-	-	-	-
Tap loss 900	10,5±0,5	14,5±0,5	20,0±0,5	9,25±0,5	16,5±0,7	19,0±0,7	24,0±0,5	13,5±0,7	21,5±0,7	23,5±0,7	-	-	-	-	-
Tap loss 2150	10,0±1	14,0±1	20,0±0,5	12,7±0,7	17,5±0,7	20,0±1	27,0±1,0	16,5±1,0	21,0±1,0	25±1,0	-	-	-	-	-
Throu. loss 47	2,0±0,25	1,5±0,25	1,0±0,25	2,5±0,5	1,2±0,5	1,2±0,5	1,7±0,5	2,0±0,5	1,2±0,25	1,2±0,25	4,5±0,5	6±0,5	8,5±0,5	10,5±0,5	13,2±0,7
Throu. loss 900	2,0±0,4	1,7±0,35	1,5±0,35	3,0±0,4	1,7±0,5	1,5±0,35	2,0±0,25	3,5±0,4	1,5±0,35	1,7±0,35	5,1±0,7	7,1±0,7	9,5±0,7	11,5±0,7	13,2±0,7
Throu. loss 2150	3,0±0,4	3,0±0,5	3,0±0,7	3,5±0,7	3,0±0,7	3,0±0,5	3,5±0,5	4,5±0,75	2,6±0,5	2,6±0,5	6±0,9	8,5±0,9	11±0,9	13±0,9	15±0,9
RF/IF isolation	>20/18	>25/18	>28/22	>22/17	>29/25	>30/26	>30/26	>22/18	>29/25	>30/26	>16	>16	>16	>16	>16
Size	53x60x24	53x60x24	53x60x24	53x60x24	53x60x24	53x60x24	53x60x24	75x56x27	75x56x27	75x56x27	53x60x24	53x60x24	75x60x24	120x60x25	120x60x25

MASTER SPLITTERS		MASTER TAPS								MASTER EQUALIZED TAPS			
Code	MP7624	MP7625	MP7211	MP7214	MP7219	MP7224	MP7414	MP7419	MP7424	MP8211	MP8214	MP8219	MP8224
Freq. range	5-2400	5-2400	5-2400	5-2400	5-2400	5-2400	5-2400	5-2400	5-2400	5-2400	5-2400	5-2400	5-2400
Outputs n°	2	4	2	2	2	2	4	4	4	2	2	2	2
Tap loss 47	-	-	11±0,5	14±0,5	18,5±0,5	24,5±0,5	14±0,5	18,5±0,5	23,5±0,5	26±0,5	26±0,5	30±0,5	34±0,5
Tap loss 900	-	-	11,5±0,5	14,5±0,5	18,5±0,5	24±0,5	14±0,5	19±0,5	24±0,5	16±0,5	18±0,5	24±0,5	29±0,5
Tap loss 2150	-	-	12,0±0,7	15±0,7	19,5±0,7	24±0,7	14,5±0,7	19±0,7	24±0,7	10,5±0,7	14±0,7	19±0,7	25±0,7
Through loss 47	4±0,3	7±0,3	3,6±0,25	2,5±0,25	2,5±0,25	2,4±0,25	4±0,35	3,7±0,35	2,5±0,25	0,8±0,25	0,7±0,25	0,6±0,2	0,5±0,2
Through loss 900	4,5±0,5	8±0,5	3,5±0,35	2,4±0,35	2,4±0,35	2,3±0,25	3,9±0,35	3,5±0,35	2,7±0,3	1±0,25	0,9±0,25	0,8±0,25	0,7±0,25
Through loss 2150	5,4±0,5	9,8±0,5	3,6±0,35	2,5±0,35	2,5±0,35	2,4±0,25	3,7±0,35	3,0±0,35	3±0,35	1,8±0,3	1,5±0,3	1,1±0,3	1,0±0,3
RF/IF isolation	>18/16	>18/16	>43/36	>48/41	>55/45	>59/44	>50/41	>55/46	>58/44	>40/27	>45/29	>55/45	>55/50
Size	78x33x25	78x33x25	78x33x25	78x33x25	78x33x25	78x33x25	78x33x25	78x33x25	78x33x25	78x33x25	78x33x25	78x33x25	78x33x25

NOTE: Attenuations in dB / Standard series: F connector / Master series: direct cable connection

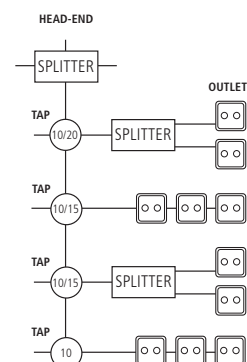
TV-OUTLETS



- ▲ Specially designed outlets for digital TV
- ▲ Complies with new regulation ICT standards
- ▲ Very low passing attenuation and high directionality
- ▲ Fast, safe assembly (screw in)
- ▲ Standard range with removable upper lid and Master range with side aperture
- ▲ Very high shielding and absolutely reliable SMD technology
- ▲ Response in ample and level frequency (2400MHz)
- ▲ Adapted to new and renovated building (very narrow, 54 mm between clip ends), 65 mm reduction over current market offer
- ▲ Special triple connector models with separate outputs for TV, radio and IF for end lines or in cascade



STANDARD Series



Standard Series - Double Connector

CODE	DESCRIPTION	PACK
MP6620	Cascade-intermediate 20dB-DC pass through	1/100
MP6615	Cascade-intermediate 15dB-DC pass through	1/100
MP6610	Cascade-intermediate 10dB-DC pass through	1/100
MP6605	Cascade-final 5dB DC pass through	1/100
MP6648	Single outlet socket -1dB DC pass through	1/100
MP6638	Single outlet socket -1dB DC pass through (Low Cost)	1/100

Triple Connector

CODE	DESCRIPTION	PACK
MP7650M	Triple outlet socket - Final TV-FM-SAT, without cover	1/100
MP7652M	Triple outlet socket - Final TV-FM-SAT, with white cover	1/100
MP7651M	Triple outlet socket-cascade 13/1,5 dB, with white cover	1/100
MP7653	4 outlet socket, TV-FM-SAT-SAT with white plastic cover	1/100

Accessories

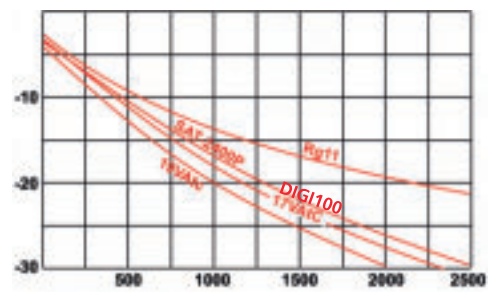
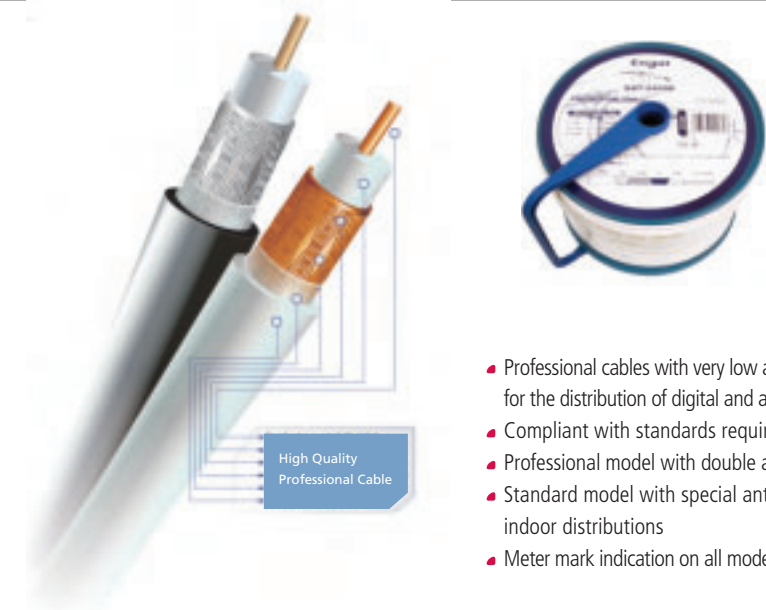
CODE	DESCRIPTION	PACK
MP7645	White wall plastic support	1
MP7645i	Ivory wall plastic support	1
MP7646	White outlet plastic cover	1
MP7646i	Ivory outlet plastic cover	1
MP7647M	White Triple outlet plastic cover	1
MP7647i	Ivory triple outlet plastic cover	1
MP6650	75 ohms load for TV-outlet	1/100
MP0138	Surface outlet F connector	1/10
MP0545	Surface outlet (1 output)	1/10

NOTE: Available all models with ivory color plastic cover (reference with "i" at the end)

TECHNICAL CHARACTERISTICS

	STANDARD						
DOUBLE CONNECTOR	Code	MP6620	MP6615	MP6610	MP6605	MP6648	
	Position	Casc Interm	Casc Interm	Casc Interm	Casc final	Single	MP7652
	IEC-h output (47 MHz)	19,3±0,4dB	15,0±0,4dB	10,1±0,4dB	5,1±0,25dB	0,5±0,25dB	Position
	IEC-h output (862 MHz)	20,5±0,6dB	15,5±0,6dB	10,5±0,6dB	6,0±0,5dB	2,0±0,5dB	Single
	IEC-h output (950 MHz)	20,0±0,7dB	14,5±0,7dB	10,5±0,7dB	6,2±0,5dB	3,0±0,5dB	IEC-h output (47 MHz)
	IEC-h output (2150 MHz)	19,0±0,7dB	14,0±0,7dB	10,8±0,7dB	6,8±0,5dB	3,0±0,5dB	0,5±0,5dB
	Through loss 47MHz	0,7±0,25dB	0,7±0,25dB	1,4±0,25dB	-	0,7±0,25dB	IEC-h output (862 MHz)
	Through loss 900MHz	1,5±0,5dB	1,4±0,5dB	1,7±0,5dB	-	1,4±0,5dB	1,5±0,5dB
THROUGH LOSS	Through loss 2150MHz	2,2±0,7dB	2,5±0,7dB	2,9±0,7dB	-	2,5±0,5dB	IEC-m output (FM)
							2±0,5 dB
F OUTPUT							F output (950 MHz)
							1±0,5dB
							F output (2150 MHz)
							0,5±0,5dB

PROFESSIONAL COAXIAL CABLES



- Professional cables with very low attenuation, specially made for installations in compliance with the standard for the distribution of digital and analog TV signals in RF and IF
- Compliant with standards required on new building constructions
- Professional model with double antioxidant copper-mesh, ideal for major installations
- Standard model with special antioxidant copper-tin mesh, specially made for small, medium-sized and indoor distributions
- Meter mark indication on all models

Professional Coaxial Cables

CA1110			CA7400R		
PVC	Pet	Cux96	Cu	PE-Ph	Cu-1,63
CODE	DESCRIPTION	PACK	CODE	DESCRIPTION	PACK
	DIGI-100		CA7100R	Reel 100m DIGI-100LC white	5/175
	DIGI-100LC		CA7100G	Reel 250m DIGI-100LC white	2/72
	DIGI-100CCS		CA7100H	Reel 500m DIGI-100LC white	1/30
	RG-11		CA7110R	Reel 100m DIGI-100LC black	5/175
CA7400R	Reel 100m DIGI-100 white	5/175	CA7110G	Reel 250m DIGI-100LC black	2/72
CA7400G	Reel 250m DIGI-100 white	2/72	CA7000R	Reel 100m DIGI-100CCS white	5/175
CA7400H	Reel 500m DIGI-100 white	1/30	CA7000G	Reel 250m DIGI-100CCS white	2/72
CA7410R	Reel 100m DIGI-100 black	5/175	CA7000H	Reel 500m DIGI-100CCS white	1/30
CA7410G	Reel 250m DIGI-100 black	2/72	CA7010R	Reel 100m DIGI-100CCS black	5/175
			CA7010G	Reel 250m DIGI-100CCS black	2/72
			CA1110	RG11-PRtC , 500m Coax. Cable black	1

Coaxial Cables 17 VAtC / 19 VAtC

CA1700			CA1900		
PVC	Pet	CuSnx62	Al/P	PE-Ph	CU-1,13
CODE	DESCRIPTION	PACK	CODE	DESCRIPTION	PACK
	17 VAtC		CA1710	17 VAtC 100m Coax. Cable black	5/175
	19 VAtC		CA1710G	17 VAtC 250m Coax. Cable black	2/72
			CA1710H	17 VAtC 500m Coax. Cable black	1/30
			CA1900	19 VAtC 100m Coax. Cable white	5/175
CA1700	17 VAtC 100m Coax. Cable white	5/175	CA1900B	19 VAtC 50m Coax. Cable white	18
CA1700G	17 VAtC 250m Coax. Cable white	2/72	CA1900C	19 VAtC 25m Coax. Cable white	36
CA1700H	17 VAtC 500m Coax. Cable white	1/30	CA1910	19 VAtC 100m Coax. Cable black	5/175
			CA1940R	19 VAtC 100m Coax. Cable black (Low Cost)	5/175



COAXIAL CABLE FOR ENVIRONMENTAL PRESERVATION (LSZH)



- Professional cables with very low attenuation, specially made for installations in compliance with the standard for the distribution of digital and analog TV signals in RF and IF
- Halogen free cables
- Flame retardant
- Low levels of smoke emission

CODE	DESCRIPTION	PACK
CA7420	Reel 100m Coaxial Cable Digi-100LSZH ECO-white	1
CA1720	Reel 100m Coaxial Cable 17VatC/LSZH ECO-white	1

TECHNICAL CHARACTERISTICS

Professional code	CA1100	CA7400	CA7100	CA7000	CA1700-1710	CA1900-1910
ECO Cable code	CA7420			CA1720		
Model	RG11	DIGI-100 (SAT2400P)	DIGI-100LC	DIGI-100CCS	17VatC/PatC	19VatC/PatC
Internal conductor	Cu 1.63mm	Cu 1.13mm	Cu 1 mm	CCS 1mm	Cu 1.13mm	CCS 1.02mm
Dielectric	Polietilene 7,25mm	Polietilene 4,8mm	PEE 4,8 mm	PEE 4,8 mm	Polietilene Physic	Polietilene
1st ext. cond.	Cu	Cu	Cu	Cu	Aluminium	Aluminium
2nd ext. cond.	Cu	Cu	Cu	Cu	Cu	CuSn
Coverage	80%	80%	60%	60%	60%	60%
Film protection	Polyester 20x0.015	Polyester Pet	Polyester Pet	Polyester Pet	Poliester Pet	Poliester Pet
Outer Sheath	PVC 10,3mm	PVC 6.60mm	PVC 6.60mm	PVC 6.60mm	PVC 6.80mm	PVC 6.80mm
Colour	Black	White	Black/White	Black/White	Black/White	Black/White
Total Weight		40.3Kg/Km	41.3Kg/Km		42 Kg/Km	42 Kg/Km
Bending radius		35/70mm (int/ext)	35/70mm (int/ext)	35/70mm (int/ext)	35/70mm (int/ext)	35/70mm (int/ext)
Imped. Cap-Veloc	75 ohm - 53pF/m-82%	75 ohm - 52pF/m-85%	75 ohm - 52pF/m-85%	75 ohm - 52pF/m-85%	75 ohm	75 ohm
Shielding efficiency	85 dB (100-900 MHz)	75 dB (100-900 MHz)	75 dB (100-900 MHz)	75 dB (100-900 MHz)	75 dB (100-900 MHz)	70 dB (100-900 MHz)
Freq. Range	0-2500 MHz	0-2400 MHz	0-2400 MHz	0-2400 MHz	0-2400 MHz	0-2400 MHz
47 MHz attenuation	2,5 dB/100m	3 dB/100m	3,2 dB/100m	3,2 dB/100m	3,5 dB/100m	4,2 dB/100m
200 MHz attenuation	5,4 dB/100m	7,3 dB/100m	7,8 dB/100m	7,8 dB/100m	7,5 dB/100m	8,6 dB/100m
900 MHz attenuation	13,0 dB/100m	16,2 dB/100m	17,5 dB/100m	17,5 dB/100m	17,0 dB/100m	19,3 dB/100m
2150 MHz attenuation	19,8 dB/100m	27,9 dB/100m	29,9 dB/100m	29,9 dB/100m	28,5 dB/100m	32,0 dB/100m

ACCESSORIES FOR COAXIAL CABLES



CODE	DESCRIPTION	PACK
VR0026	Cable Reel Holder	1
MP0197	Flexible Cable, F Connector - for crossing frames, doors,...	1
CA1901C	Coaxial Cable 25m CONEX F white	30
CA1901D	Coaxial Cable 20m CONEX F white	36/720
VR0039	Cable Peeler	1

AV TRANSMITTERS - MULTIVISION

Telerouter

- 5 simultaneous scart inputs and 3 independent outputs (audiovisual switch)
- 2,4 GHz wireless audio/video sender incorporated for transmitting to any room
- Unique coding technology to avoid interferences from other video senders
- A full solution for connecting to TVs, VCR, DVD, receivers, HiFi, game stations, cameras...
- Maintains 4:3, 16:9 formats from the input source like DVD
- High quality RGB switching on the TV, SAT and DVD connectors
- Digital audio outputs for a direct connection to home-cinema

Allows to choose:

- Which channel we want to record on the VCR
- Which signal we want to view on the main TV
- Which signal we want to transmit to 2nd TV
- Control equipment from 2nd TV



CODE	DESCRIPTION	PACK
 MV7290	Engel Telerouter 2,4 GHz multiscart wireless audio-video sender	1/4

TECHNICAL CHARACTERISTICS

Tx frequency	2,411-2,773 GHz
Audio/Video channels	4
Antenna	circular
Video Modulator	FM-PLL
Audio Modulator	FM stereo
Coverage range	100 m open air
Infrared coding	4 bits
Tc scart connector	SAT, DVD, AV, TV, VCR
Ex scart connector	TV, VCR

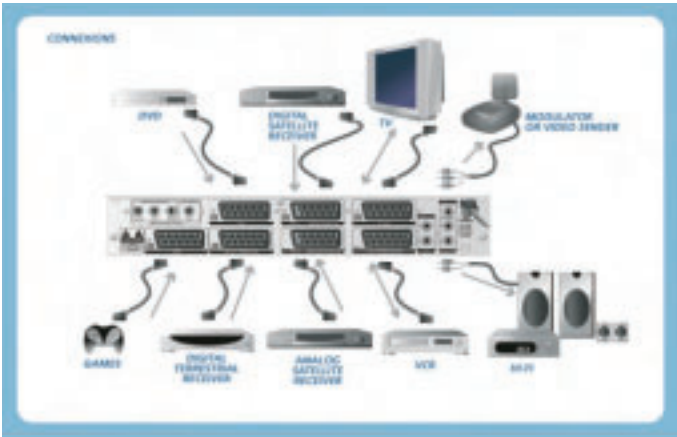
AV-Router

- Audiovisual automatic multi-switch
- Choose which input signal you want to view on TV set, record in the VCR or listen to the HiFi equipment
- 7 scart connector inputs to be selected
- Easy configuration and modern design
- Control of all equipments with remote control or from the front panel



CODE	DESCRIPTION	PACK
 MV7294	Engel AV-Router multiscart audio-video switch	1/5

TABLE OF CONNECTIONS



AUDIO / VIDEO SENDERS

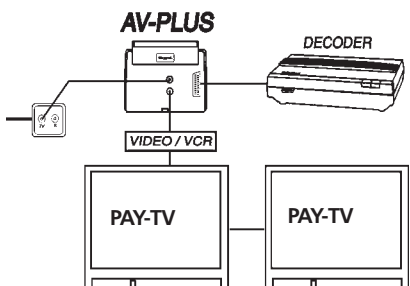


WIRELESS AUDIOVISUAL TRANSMITTER

AV-PLUS

2.4GHz

- AV-PLUS 2,4 GHz is ideal for controlling and distributing any audiovisual equipment to and from any television
- No need of cable or antenna installation
- Wire-free, passing through walls and ceilings
- High precision and stability (PLL systems) from an optimal picture and audio quality



AV-PLUS

RF

PAY-TV ADAPTER, CHANNEL CONVERTER & RF MODULATOR

- AV-PLUS RF replaces pay-TV adapters, improving audiovisual quality and making reception possible on all television sets in the household
- Its PLL function enables the user to convert broadcast channels with the intermediary audiovisual multiscart modulator (see page 27)

Wireless AV-Sender

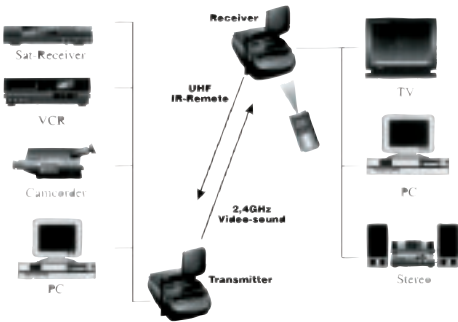
AV-PLUS RF

CODE	DESCRIPTION	PACK
 MV7297	AV-PLUS 2.4 GHz Audiovisual transmitter (Emitter+receiver with modulator)	1/6
 MV7220	Engel DUO AV-PLUS 2 inputs, remotely controlable	1/10
 MV7191	TBoston 2,4 GHz Large coverage range	1/10

CODE	DESCRIPTION	PACK
 MV7148	AV-PLUS - RF Bd III/PAL input: E2-E69, S3-40 out: S3-S10, E5-E12 (75 dBμV)	1/30
 MV7149	AV-PLUS - RF UHF/PAL input: E2-E69, S3-40 out: E21-E69 (75dBμV)	1/30
MV7149M	AV-PLUS - RF UHF (PAL/SECAM) input: E2-E69, S3-40 out: E21-E69 (75dBμV)	1/30

TECHNICAL CHARACTERISTICS

AV-PLUS-2.4GHz	
TRANSMITTER:	
Output level:	90dBμV (3m)
Frequency band:	2.4-2.4835 GHz
Modulation	FM (video & audio)
Video input level	1Vpp-75ohm
Audio input level	1Vpp - 600 ohm
RECEIVER:	
Output level	1Vpp (video-audio)
RF output channel	E36 (cod. MV7197)
Noise factor	3.5 dB
Rem.control extender freq:	433.92 MHz



AV-PLUS RF	
PLL RECEIVER:	
Input channels	E2-E69, S3-S40
Input level	50-90dBμV
Aud-Vid output (Scart)	1Vpp/-600mV rms
PLL MODULATOR:	
Type	PAL-G (c.MV7148/7149)
	PAL-G / Secam-L (c.MV7149M)
Output channels:	E5-E12, S03-S10 (c. MV7148)
	E21-E69

MULTI-ROOM TELECONTROL

POWER-LINK

REMOTE CONTROL EXTENDER
(BY COAXIAL)



- Enables the user to control the satellite receiver, VCR and any other audiovisual equipment from any room in the house
- VERY EASY ASSEMBLY (direct set-up in TV sockets with Led transmission and reception signals)
- High reliability and very wide range (special 11MHz system with very low attenuation, ultra-sensitive adjustable sensors)

POWER-NET

REMOTE CONTROL EXTENDER (BY
ELECTRICS)



- Enables the user to control the satellite receiver, VCR and any other audiovisual equipment from any room in the house
- VERY EASY ASSEMBLY (direct set-up in electric power supply sockets with Led transmission and reception signals)
- High reliability and wide range

POWER-PLUS

WIRELESS REMOTE
CONTROL EXTENDER



- Enables the user to control the satellite receiver, VCR and any other audiovisual equipment from any room in the house
- VERY EASY ASSEMBLY (WIRELESS set-up with Led transmission and reception signals)
- High reliability and wide range

Extenders by Coaxial

	CODE	DESCRIPTION	PACK
	MV7320	POWER LINK Infrared extender by coaxial (receiver and reemitter)	1/30
	MV7321	POWER LINK Infrared receiver (by coaxial)	1/30
	MV7322	POWER LINK Infrared receiver (by coaxial)	1/30
	MV7306	By-pass 11MHz	1/15

Extenders by Electrics

	CODE	DESCRIPTION	PACK
	MV7330	POWER NET Infrared extender by electrics (receiver and transmitter)	1/30
	MV7331	POWER NET Infrared receiver (by electrics)	1/30
	MV7332	POWER NET Infrared reemitter (by electrics)	1/30

TECHNICAL CHARACTERISTICS

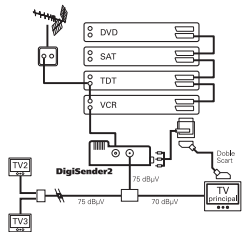
	POWER-LINK	POWER-NET	POWER-PLUS
RECEIVER	IR Frequency	35-41 KHz	36-40KHz
	Transmission freq:	11MHz-ASK	100-150KHz/FSK
	Output level	110dBµV (coax)	2Vpp (red)
	Transmission range	50m tip	50m tip
REEMITTER	VHF/UHF pass	-0,5dB	-
	Sensibility	<50dBµV	<50mVpp
	IR output	37±1KH	38±1KHz
	Supply voltage	230Vac, 50Hz	230Vac, 50Hz

Wireless Extenders

	CODE	DESCRIPTION	PACK
	MV7310	POWER LINK Infrared extender by coaxial (receiver and reemitter)	1/20
	MV7311	POWER PLUS Wireless infrared receiver	1/20
	MV7312	POWER PLUS Wireless infrared reemitter	1/20

PLL Modulator with Display (DIGI-SENDER 2)

- PLL modulator for distributing TV signal coming from any audiovisual source to the entire house network
- Channel programming by means of push-buttons and display
- Allows connention / disconnection of 75 Ω load to obtain the optimum signal quality
- Compatible with our remote control extenders (Power-Plus / Link)



MV7125	DigiSender 2 (VHF / S3-E12)	1/5
MV7126	DigiSender 2 (UHF / E21-E69)	1/5

Code	MV7125	MV7126
Type	Modulador PLL	Modulador PLL
Video input	1 Vpp / 75 ohm	1 Vpp / 75 ohm
Audio input	1,5 V / 10Kohm	1,5 V / 10Kohm
Output Channels	E5-E12, S3-S10	E21-E69
Output Level	75dBuV	75dBuV
Test Signal	Yes	Yes
Gain (Pass. freq.)	5 dB (40-860MHz)	5 dB (40-860MHz)
Power supply	230 Vac	230 Vac

PROFESSIONAL SIGNAL LEVEL METERS



- ▲ 4,5" B/W monitor
- ▲ BER measurement for QPSK signals and S/N measurement
- ▲ Fast spectrum analyzer for an easy dish pointing
- ▲ Small dimensions and low weight

CODE	DESCRIPTION	PACK
ME7716	SAT-LOOK digital	1



- ▲ Ideal for dish alignment, very sensible to signal variations
- ▲ NIT information for automatic satellite identification
- ▲ BER for QPSK signals and constellation diagram
- ▲ 99 memories

CODE	DESCRIPTION	PACK
ME7714	SAT-LOOK digital "Micro"	1



- ▲ Signal control of DiSEqC, 22 KHz and LNB voltage
- ▲ Indication by leds or beep audio signal

CODE	DESCRIPTION	PACK
ME7723	DIGISAT + meter	1



- ▲ Satellite beeper
- ▲ Very small and easy to use

CODE	DESCRIPTION	PACK
ME7711	Satfinder	1



- ▲ Satellite finder, ideal for dish installation
- ▲ Acoustic tone of signal strength
- ▲ Indication on signal level

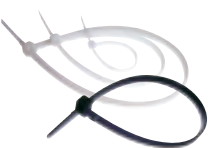
CODE	DESCRIPTION	PACK
ME7712	Satfinder	1

CONNECTION AND CABLE ACCESSORIES

Audio / Video Connections

	AV0920	Shielded scart cable 1,5m	10
	AV0921	Standard scart cable 1,5m	10
	AV0960	Scart cable 3m	10
	AV0924	Scart to 4 RCA	10
	AV0915	2 connect. RCA(M)-RCA(m) 1,2m	10
	AV0916	2 connect. RCA(m)-RCA(m) 1,2m	10
	AV0918	2 connect. RCA(m)-RCA(m) 5m	10
	AV0941	Triple scart base	5
	AV0968	5 scart base	5
	AV0951	Adapter scart-RCA	8

Cable Clamps / Bridles

	AC0741	Cable Clamp (100pcs)	1
	AC0611	Cable Clamp 2 mm, white (50pcs)	1
	AC0616	Cable Clamp 4 mm, white (50pcs)	1
	AC0621	Cable Clamp 5 mm, white (50pcs)	1
	AC0631	Cable Clamp 7 mm, white (35pcs)	1
	AC0636	Cable Clamp 8 mm, white (25pcs)	1
	AC0475	Bridle 2,5 x 100, white (200pcs)	1
	AC0491	Bridle 2,5 x 150, white (50pcs)	1
	AC0482	Bridle 5 x 200, white (50pcs)	1
	AC0488	Bridle 5 x 275, white (100pcs)	1
	AC0471	Bridle wads (10pcs)	1

NOTE: Clamps in grey color and bridles in black color available.

Antenna Connections

	MP0578	Antenna extender, white (1,5 m)	10
	MP0584	Antenna extender, black (1,5 m)	10
	MP0574	Antenna extender, white (2 m)	10
	MP0575	Antenna extender, black (2 m)	10
	MP0587	Antenna extender, white (5 m)	10
	MP0588	Antenna extender, black (5 m)	10
	MP0577E	Antenna cable extender, (10 m)	1
	MP0605	Triple antenna connector, (1 male, 2 female)	25
	MP0606	Triple antenna connector, (2 male, 1 female)	25

Shielded Connections

	MP0561	Coded ant. connector IEC (male)	100
	MP0563	Coded ant. connector IEC (female)	100
	MP0595	Adapter IEC, female-male	100
	MP0622	Shielded ant. connector, 9,5 mm (male)	100
	MP0623	Shielded ant. connector, 9,5 mm (female)	100

Other Accessories

	AV0758E	RS232 null modem serial cable	1
	AV0759E	RS232 direct serial cable	1
	AC0201	Metal tubes and wires detector	1

TV NORMS - RADIO FREQUENCY STANDARDS

VHF	UHF	NORM	
Algeria	B	H	PAL
Argentina	N	N	PAL
Australia	B	H	PAL
Austria	B	G	PAL
Bahrain	B	G	PAL
Belgium	B	H	PAL
Bulgaria	D	K	SECAM
China	D	K	PAL
Cyprus	B	G	PAL
Croatia	B	G	PAL
Czechoslov.	D	K	SECAM
Denmark	B	G	PAL
Egypt	B	G, H	SECAM
Finland	B	G	PAL
France	EIL	L	SECAM
Germany	B	G	PAL
Gibraltar	B	H	PAL
Great Britain	I	I	PAL
Greece	B	G	SECAM
Holland	B	G	PAL
Hong Kong (A)	I	I	PAL
Hungary	D	K	SECAM
Iceland	B	G	PAL
India	B		PAL
Indonesia	B		PAL
Iran	B	G	SECAM
Iraq	B		SECAM
Ireland	I	I	PAL
Israel	B	G	PAL
Italy	B	G	PAL
Japan	M	M	NTSC
Jordan	B	G	PAL
Korea (Rep.)	M		NTSC
Kuwait	B	G	PAL
Lebanon	B	G	SECAM
Libya	B	H	PAL
Luxembourg	C	L	PAL/SECAM
Malta	B	H	PAL
Malaysia	B	G	PAL
Mexico	M	M	NTSC
Monaco	E	L	SECAM
Morocco	B	H	SECAM
Nigeria	B	G	PAL
Norway	B	G	PAL
Oman Sultan.	B	G	PAL
Pakistan	B	-	PAL
Philippines	M	M	NTSC
Poland	D	K	SECAM
Portugal	B	G	PAL
Qatar	B	-	PAL
Romania	D	K	PAL
Russia	D	K	SECAM
Saudi Arabia	B	G	PAL/SECAM
Singapore	B	G	PAL
Slovenia	B	G	PAL
Spain	B	G	PAL
Sri Lanka	B/H	-	PAL
South Africa	I	I	PAL
Sweden	B	G	PAL
Switzerland	B	G	PAL
Syrian Ar. Rep.	B	H	SECAM
Thailand	B	R	PAL
Tunisia	B	G	SECAM
Turkey	B	G	PAL
U.A.E.	B	G	PAL
U.S.A.	M	M	NTSC
Yemen P.D.R.	B	-	PAL
Yugoslavia	B	G	PAL

CCIR NORM (B+G EUROPE STANDARD)				
Bands	Channels	Frequency	Video carr.	Audio carr.
Bd.I	2	47...54	48,25	53,75
	3	54...61	55,25	60,75
	4	61...68	62,25	67,75
			62,25	67,75

Sub.Band	L1	68...75	69,25	74,75
	L2	75...82	76,25	81,75
	L3	82...89	83,25	88,75

Bd.II	FM	88...108
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Low S Band	S1	104...111	105,25	110,75
	S2	111...118	112,25	117,75
	S3	118...125	119,25	124,75
	S4	125...132	126,25	131,75
	S5	132...139	133,25	138,75
	S6	139...146	140,25	145,75
	S7	146...153	147,25	152,75
	S8	153...160	154,25	159,75
	S9	160...167	161,25	166,75
	S10	167...174	168,25	173,75

BdIII	5	174...181	175,25	180,75
	6	181...188	182,25	187,75
	7	188...195	189,25	194,75
	8	195...202	196,25	201,75
	9	202...209	203,25	208,75

	10	209...216	210,25	215,75
	11	216...223	217,25	222,75
	12	223...230	224,25	229,75

High S Band	S11	230...237	231,25	236,75
	S12	237...244	238,25	243,75
	S13	244...251	245,25	250,75
	S14	251...258	252,25	257,75
	S15	258...265	259,25	264,75
	S16	265...272	266,25	271,75
	S17	272...279	273,25	278,75
	S18	279...286	280,25	285,75
	S19	286...293	287,25	292,75
	S20	293...300	294,25	299,75

Hyperband	S21	302...310	303,25	308,75
	S22	310...318	311,25	316,75
	S23	318...326	319,25	324,75
	S24	326...334	327,25	332,75
	S25	334...342	335,25	340,75
	S26	342...350	343,25	348,75
	S27	350...358	351,25	356,75
	S28	358...366	359,25	364,75
	S29	366...374	367,25	372,75
	S30	374...382	375,25	380,75
	S31	382...390	383,25	388,75
	S32	390...398	391,25	396,75
	S33	398...406	399,25	404,75
	S34	406...414	407,25	412,75
	S35	414...422	415,25	420,75
	S36	422...430	423,25	428,75
	S37	430...438	431,25	436,75
	S38	438...446	439,25	444,75

Bd.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
	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

L STANDARD (FRANCE)				
Bands	Channels	Frequency	Video carr.	Audio carr.
BdIII	L05	174,75...182,75	176	182,5
	L06	182,75...190,75	184	190,5
	L07	190,75...198,75	192	198,5
	L08	198,75...206,75	200	206,5
	L09	206,75...214,75	208	214,5
	L10	214,75...222,75	216	222,5

I STANDARD (GREAT BRITAIN-SOUTH AFRICA)				
Bands	Channels	Frequency	Video carr.	Audio carr.
BdIII	I4	174...182	175,25	181,75
	I5	182...190	183,25	189,75
	I6	190...198	191,25	197,75
	I7	198...206	199,25	205,75
	I8	206...214	207,25	213,75

	I9	214...222	215,25	221,75
	I10	222...230	223,25	229,75
	I11	230...238	231,25	237,75
	I12	238...246	239,25	245,75
	I13	246...254	247,25	253,75

K STANDARD (Great Britain-South Africa)				
Bands	Channels	Frequency	Video carr.	Audio carr.
BdIII	K4	174...182	175,25	181,75
	K5	182...190	183,25	189,75
	K6	190...198	191,25	197,75
	K7	198...206	199,25	205,75
	K8	206...214	207,25	213,75
	K9	214...222	215,25	221,75

H STANDARD (AUSTRALIA)				
Bands	Channels	Frequency	Video carr.	Audio carr.
BdIV	H28	526...533	527,25	532,75
	H29	533...540	534,25	539,75
	H30	540...547	541,25	546,75
	H31	547...554	548,25	553,75
	H32	554...561	555,25	560,75
	H33	561...568	562,25	567,75
	H34	568...575	569,25	574,75
	H35	575...582	576,25	581,75
	H36	582...589	583,25	588,75
	H37	589...596	590,25	595,75
	H38	596...603	597,25	602,75

BdV	H39	603...610	604,25	609,75
	H40	610...617	611,25	616,75
	H41	617...624	618,25	623,75
	H42	624...631	625,25	630,75
	H43	631...638	632,25	637,75
	H44	638...645	639,25	644,75
	H45	645...652	646,25	651,75
	H46	652...659	653,25	658,75
	H47	659...666	660,25	665,75
	H48	666...673	667,25	672,75
	H49	673...680	674,25	679,75
	H50	680...687	681,25	686,75
	H51	687...694	688,25	693,75
	H52	694...701	695,25	700,75
	H53	701...708	702,25	707,75
	H54	708...715	709,25	714,75
	H55	715...722	716,25	721,75
	H56	722...729	723,25	728,75
	H57	729...736	730,25	735,75
	H58	736...743	737,25	742,75
	H59	743...750	744,25	749,75
	H60	750...757	751,25	756,75
	H61	757...764	758,25	763,75
	H62	764...771	765,25	770,75
	H63	771...778	772,25	777,75
	H64	778...785	779,25	784,75
	H65	785...792	786,25	791,75
	H66	792...799	793,25	798,75
	H67	799...806	800,25	805,75
	H68	806...813	807,25	812,75
	H69	813...820	814,25	819,75

B STANDARD (ITALY)				
Bands	Channels	Frequency	Video carr.	Audio carr.
Bd.I	A	52,5...59,5	53,75	59,25
	B	61...68	62,25	67,75
Bd.II	C	81...88	82,25	87,75
Bd.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
	H1	216...223	217,25	222,75
	H2	223...230	224,25	229,75

D STANDARD (RUSSIA)-OIRT				
Bands	Channels	Frequency	Video carr.	Audio carr.
Bd.I	R1	48,5...56,5	49,75	56,25
	R2	58...66	59,25	65,75
	R3	76...84	77,25	83,75

Bd.II	R4	84...92	85,25	91,75
	R5	92...100	93,25	99,75

Bd.III	R6	174...182	175,25	181,75
	R7	182...190	183,25	189,75
	R8	190...198	191,25	197,75
	R9	198...206	199,25	205,75
	R10	206...214	207,25	213,75
	R11	214...222	215,25	221,75

TECHNICAL INFORMATION

Conversions

dBμV	mV	dBm
125	1778	16,3
124	1585	15,3
123	1413	14,3
122	1259	13,3
121	1122	12,3
120	1000	11,3
119	891	10,3
118	794	9,3
117	708	8,3
116	631	7,3
115	562	6,3
114	501	5,3
113	447	4,3
112	398	3,3
111	355	2,3
110	316	1,3
109	282	0,3
108	251	-0,7
107	224	-1,7
106	200	-2,7
105	178	-3,7
104	158	-4,7
103	141	-5,7
102	126	-6,7
101	112	-7,7
100	100	-8,7
99	89,1	-9,7
98	79,4	-10,7
97	70,8	-11,7
96	63,1	-12,7
95	56,2	-13,7
94	50,1	-14,7
93	44,7	-15,7
92	39,8	-16,7
91	35,5	-17,7
90	31,6	-18,7
89	28,2	-19,7
88	25,1	-20,7
87	22,4	-21,7
86	20,0	-22,7
85	17,8	-23,7
84	15,8	-24,7
83	14,1	-25,7
82	12,6	-26,7
81	11,2	-27,7
80	10,0	-28,7
79	8,91	-29,7
78	7,94	-30,7
77	7,08	-31,7
76	6,31	-32,7
75	5,62	-33,7
74	5,01	-34,7
73	4,47	-35,7
72	3,98	-36,7
71	3,55	-37,7
70	3,16	-38,7
69	2,82	-39,7
68	2,51	-40,7
67	2,24	-41,7
66	2,00	-42,7
65	1,78	-43,7
64	1,58	-44,7
63	1,41	-45,7
62	1,26	-46,7
61	1,12	-47,7
60	1,00	-48,7
59	0,89	-49,7
58	0,79	-50,7
57	0,71	-51,7
56	0,63	-52,7
55	0,56	-53,7
54	0,50	-54,7
53	0,45	-55,7
52	0,40	-56,7
51	0,35	-57,7
50	0,32	-58,7
49	0,28	-59,7
48	0,25	-60,7
47	0,22	-61,7
46	0,20	-62,7
45	0,18	-63,7
44	0,16	-64,7
43	0,14	-65,7
42	0,13	-66,7
41	0,11	-67,7
40	0,10	-68,7

TV / Radio Quality for Collective Installations

Parameter	Signal type	Bd. 47-862MHz	Bd. 950-2150MHz
Signal level	TV-AM	57-80dBμV	57-80dBμV
	TV-64QAM	45-70dBμV	45-70dBμV
	TV-FM	47-77dBμV	47-77dBμV
	TV-QPSK	45-70dBμV	45-70dBμV
	RADIO-FM	40-70dBμV	40-70dBμV
Ampl/frequ.			
Resp.(Bd)	All	12dB	25dB
BER	QAM	9 x 10-5	9 x 10-5
	QPSK	9 x 10-5	9 x 10-5

Parameter	Signal type	Bd. 47-862MHz	Bd. 950-2150MHz
Carrier/noise			
Ratio	TV-AM	>=43dB	>=43dB
	TV-64QAM	>=28dB	>=28dB
	TV-FM	>=15dB	>=15dB
	TV-QPSK	>=11dB	>=11dB
	RADIO-FM	<=38dB	<=38dB
Inter-mod.			
TV-AM	TV-AM	>=54dB	>=54dB
	TV-64QAM	>=35dB	>=35dB
	TV-FM	>=27dB	>=27dB
	TV-QPSK	>=18dB	>=18dB

Output Level Reduction in Wideband Amplifiers

In general, output voltage for wideband amplifiers indicates the maximum level for two TV channels (according to UNE 20523 norm, referred to a cross-modulation of 60 dB).
When amplifying more than two channels, the output voltage must be attenuated according to the following table (AM for terrestrial and FM for IF satellite signals).
In case of several wideband cascade amplifiers it must be applied an additional attenuation.

Nr. Of channels	Reduction Vo (AM)	Reduction Vo (FM)
2	0	0
3	-2,1	-3
4	-3,3	-4,8
5	-4,2	-6
6	-4,9	-7
7	-5,4	-7,8
8	-5,9	-8,5
9	-6,3	-9
10	-6,7	-9,5
N	-7 x LOG (N-1)	-10 x LOG (N-1)

Nr. Cascade ampl.	Reduction Vo
1	0
2	-3
3	-4,8
4	-6
5	-7
6	-7,8
7	-8,5
8	-9
9	-9,5
N	-10 x LOG (N-1)

TUCad 1.16



ENGEL TVCAD Program for Design and Calculation of SMATV Installations

- The Engel TVCAD allows to design any SMATV or CATV project and to calculate the basic parameters of attenuation, signal level, C/N ratio and intermodulation in any frequency and TV outlet of the installation.
- The diagram can be drawn manually with the mouse, and by means of any easy wizard which will project the installation based on the given number of floors, drops, flats and TV outlets of the building.
- The elements and its parameters belong to an Engel data base which can be updated from our web site.
- The result can be printed as a list or as a diagram. It can also be obtained a budget of the total cost of implementing the desired system, and export the diagrams (WWF format) the list (TXT format) so the installer can prepare a detailed project of the installation.

GENERAL CONDITIONS & INDEX BY CODES



SALES CONDITIONS

- **Inquiries & Orders:**
All inquiries and orders to be placed directly to:
ENGEL AXIL, S.L.
Puig dels Tudons, 6
Pol. Industrial Santiga 08210
Barberà del Vallès (Barcelona)
Catalonia – Spain
Tel +34 93 719 18 11
Fax +34 93 729 25 11
Email export@engel.es
- **Price List:**
Professional distributor discounts available.
- **Delivery time:**
To be confirmed after reception of order.
- **Shipment terms:**
EXW BARCELONA (Exists the possibility to invoice transport cost but always using our own transport company).
- **Sample orders:**
All samples will be invoiced before delivery with the possibility to accept its return if not interested.
- No merchandise will be accepted for return without the prior authorization.
- Credits will not be issued until goods are received, inspected and counted.
- ENGEL will repair or replace, at its option, any item exhibiting a manufacturing defect. No other warranty is expressed or implied.
- All products have 1 year warranty.
- If the product is under warranty, ENGEL will repair/replace and return the product free of charge. (The customer only have to pay transport costs to our installations in Barberà).
- If the product is NOT under warranty, the customer will have to pay the transport cost to our installation and repairing / replacing costs. ENGEL will send back the goods without any transport cost.
- The customers accept the above terms of sales and delivery when ordering.
- ENGEL reserves the right to change or obsolete any items, programs, prices and policies that are deemed necessary without notice. All orders are subject to approval by ENGELS' sales & credit departments.
- Some listed products are exclusivity for domestic sales and, in some countries, as agreed with suppliers.

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