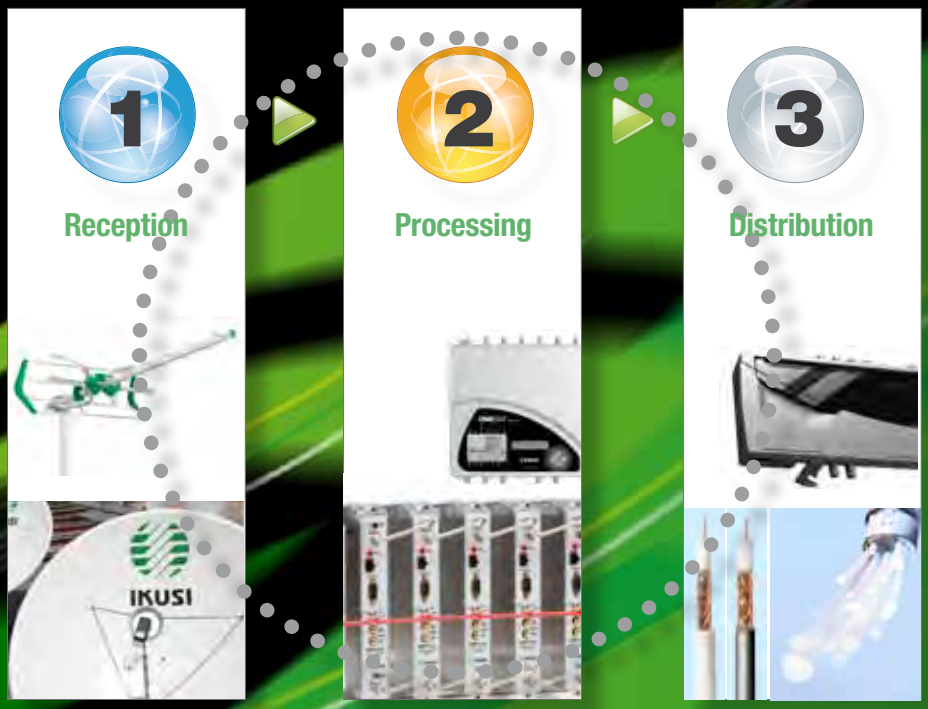
Broadband Catalogue
2011

www.ikusi.com

This catalogue describes the IKUSI products for reception, processing and distribution of terrestrial, satellite and cable signals in individual and collective installations.



GENERAL CHARACTERISTICS

- The nominal RF impedance of all electronic products is 75Ω. Return losses at the RF input and output ports are ≥10 dB unless other value is specified.
- Unless notified, the operative ambient temperature range for these products is -10° to +55° C.
- The TV frequency bands designated as BI, BIII and UHF (BIV-BV) are those of the B-G Europe system. The FM Radio band (BII) comprises the frequencies between 87.5 and 108 MHz, and the DAB band thoses comprises between 174 and 240 MHz (unless other frequency interval is specified).
- Specifications in this catalogue are typical and they are subject to change without notice.

CE AND DVB MARKINGS

- With the reproduction of the CE mark, IKUSI guarantees the compliance of the products with the appropriate EN 50083-1, EN 50083-2 and EN 60065 european standards of the European Committee for Electrotechnical Standardization (CENELEC).
- Likewise, with the reproduction of the DVB mark IKUSI guarantees the compliance of the products with the DVB standards. DVB is a registered trademark of the DVB Project.

ENGINEERING CHANGES

- IKUSI, in order to provide its customers with products embodying the latest technological advances, reserves the right to make revisions in current production models. New specifications affected by such changes may not appear in this catalogue.

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Antennas Reception

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Multichannel Headends

Multiband Headends

ClassA Headends

TV on IP networks

Fibre Optics

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DTT Receiver

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RS-A516	1148	99
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TAE-323	3964	101
TAE-326	3966	101
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TAE-588	3208	100
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TAE-733AR	3976	100
TAE-736	3192	101
TAE-736AR	3210	100
TAE-923	3181	101
TAE-925	3182	101
TAE-933	3183	101
TAE-935	3184	101
TAL-883	3948	109
TAL-886	3950	109
TAL-893	3975	109
TAL-896	3974	109
TBA-120	4277	54
TBF-101	2364	119
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TPC-010 DIG	3842	55
TPC-110	3843	55
TRF-011	4085	56
TRF-112	4420	56
TSI-500	2179	107
TTF-090	2517	119
UCF-013	1735	19
UCF-170	1847	119
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UDL-115	3227	112
UDL-120	3228	112
UDL-210	3244	112
UDL-215	3245	112
UDL-220	3232	112
UDL-410	3235	112
UDL-415	3236	112
UDL-420	3237	112
UDL-816	3366	113
UDL-820	3367	113
UDU-205	5350	110
UDU-307	5351	110
UDU-408	5352	110
UDU-612	5353	110
UDU-813	5354	110
UEU-121K	1113	23
UEU-124K	1114	23
UEU-221K	3083	23
V-2T	1408	122
VRT-602	3645	121
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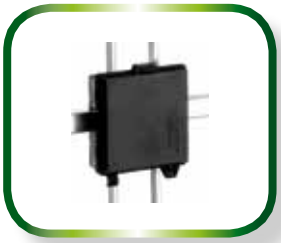
TV and Radio Antennas - VHF Band

- Elements and support square-bars made of aluminium.
- Pre-assembled. Clamping system for masts of Ø25 to 50 mm.
- Terminal clamp connection. Impedance: 75Ω.

Radio antenna - FM (BII)

MODEL		IKS-1E/FM
REF.		1725
Frequency range	MHz	87.5 - 108
Type		Circular
Gain	dB	0
Front to back ratio	dB	0
Windload (for velocities 130/150 km/h)	N	28/38



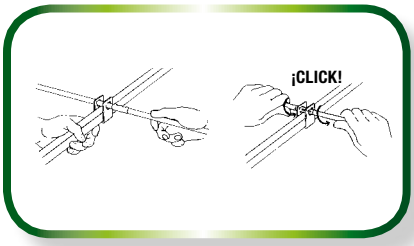
Waterproof box
IP55 Protection

Wingnuts and screw fixations

TV antenna - BIII

MODEL		INT-070
REF.		1715
Channels		E5 - E12
Type		YAGI (7 elements)
Gain	dB	8.5
Front to back ratio	dB	≥15
Beamwidth	H° V°	45 70
Windload (for velocities 130/150 km/h)	N	31/42

Elements made of aluminium

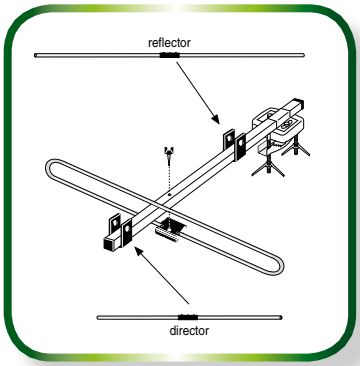


Quick assembly without tools

TV and Radio Antennas - VHF Band

DAB antenna

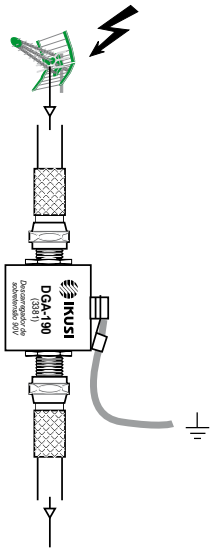
MODEL		DAB-030
REF.		1730
Frequency range	MHz	174 - 240
Type		YAGI (3 elements)
Gain	dB	5
Front to back ratio	dB	10
Beamwidth	H° V°	150 65
Windload (for velocities 130/150 km/h)	N	15/20



Quick assembly without tools

Gas Discharge Suppressor

MODEL		DGA-190
REF.		3381
Cutting nominal voltage		90V ±20%
Maximum peak power	W	40
Impedance	Ω	75
Frequency range	GHz	0-3
Insetion loss	dB	< 0,4
Return loss	dB	> 20
Nominal discharge current (8/20µs)	kA	10
Max discharge current (8/20µs)	kA	20
Residual voltage (1kA/µs)		< 600
Isolation	GΩ	> 10
Weight	gr	85
Operating temperature	ºC	-40 ... +80
Connectors		F female/female



NEW!

FLASHD COMPACT

UHF BAND RECEPTION ANTENNA

Antenna that are especially designed for terrestrial digital TV reception

- Pre-mounted antennas for easy installation.
- Reception of channels from 21 to 69.
- Gain 13 dB.
- Dipole antenna in the box as a whole, being able to attach to the antenna after it is installed on the mast.
- Minimum packaging volume for transport.

F Connector

TV Antenna - UHF Band

- Compact type antenna for reception of TV signals in the UHF band, formed by a dihedral reflector made up of four aluminium tubes, one boom with 7 directors and one "W" dipole.
- For vertical and horizontal polarization, allowing variation of elevation angle.

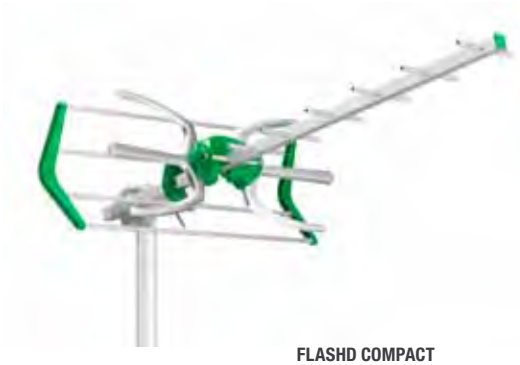
DVB T TERRESTRIAL

DVB-T ATSC

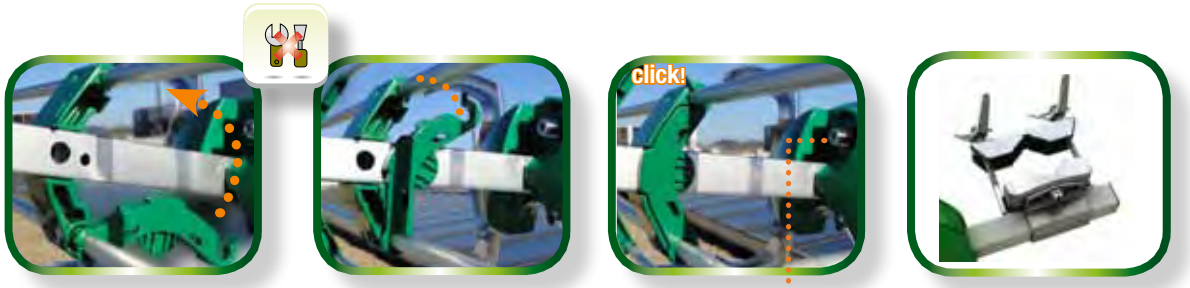
FULL HD Digital Quality

FLASHD COMPACT

MODEL			FLASHD COMPACT
REF.			1803
Channels			21 - 69 (470-862 MHz)
Gain		dB	13
Front-to-Back ratio		dB	≥16
Beamwidth	H V		60º 80º
Windload			130 Km/h : 18 N 150 Km/h : 23 N
Dimensions		cm	53 x 80 x 20
Packed weight (10 U.)		kg	8
Connection			F
Quantity boxed			10



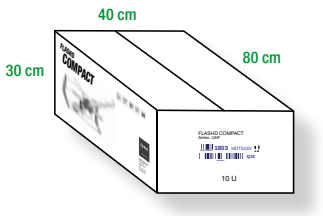
FLASHD COMPACT



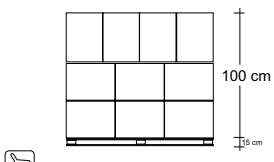
A simple mechanism to set the reflector assembly

F

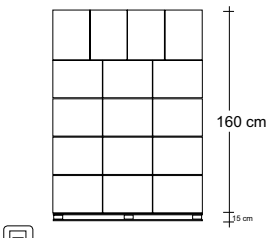
Robust and functional clamping with captive thumbscrew



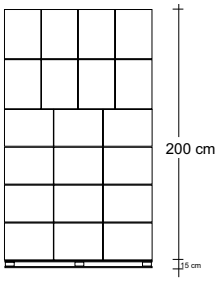
multiple packaging for 10 units



100 u ; H total < 120 cm



160 u ; H total < 180 cm



200 u ; H total < 220 cm

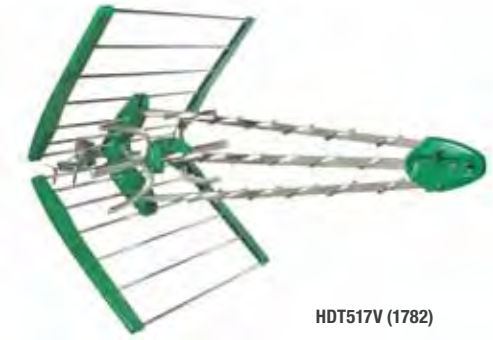
Versatility in the pallet from 30cm to the desired height, in increments of 10cm.

TV Antennas - UHF Band

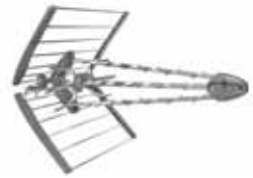
- Supplied completely assembled.
- Convergent triple-boom, with 23 directors. W-Dipole. Dihedral reflector. All elements made of aluminium.
- Two 'vertical plane' radiation patterns available.
- Clamping system for masts of Ø25 to 50 mm. Variable clamp tilt: ±40°. Horizontal or vertical polarization.
- Cable connection: F type connector. 1 screw-on plug and 1 rubber protection cap are supplied.Polystyrene connecting-box with weatherproofing IP55 grade. The box is easily detachable for an easier coaxial cable connection. Impedance: 75 Ω. Two colors: Green and Grey.

FLASHD

MODEL			FLASHD (HDT517V)		FLASHD with active dipole (HDT534V)
REF.			1782		1787
Channels			21 - 69 (470-862 MHz)		
Gain		dB	17.5		34.5
Front-to-Back ratio		dB	≥20		
Beamwidth	90° Dihedral Mode		470 MHz (H) 55° / (V) 65°	670 MHz (H) 40° / (V) 50°	860 MHz (H) 25° / (V) 30°
	120° Dihedral Mode		(H) 55° / (V) 55°	(H) 40° / (V) 40°	(H) 25° / (V) 23°
Windload		N	130 Km/h : 105 150 Km/h : 150		
Length		cm	105		
Packed weight		kg	3		
Quantity boxed			1		



HDT517V (1782)



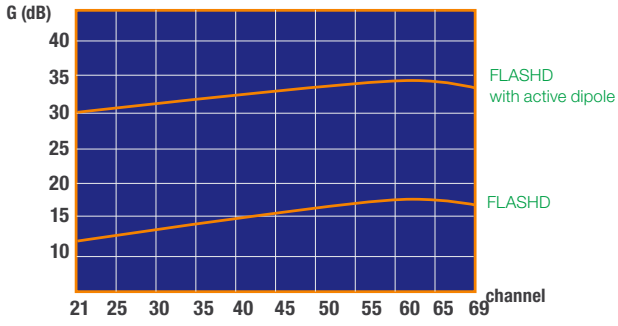
HDT517G (1783)

F Connector

Robust and functional clamping

Adjustable tilt angle

Gain Graphs



TV Antennas - UHF Band

- The smallest antenna range FLASHD for reception of TV signals in the UHF band, formed by a dihedral reflector made up of four aluminium tubes and a dipole (the same as the one in the FLASHD antenna).
- For vertical and horizontal polarization, allowing variation of elevation angle.
- Minimum packaging volume for transport and easy assembly without tools.

DVB T TERRESTRIAL

DVB-T ATSC

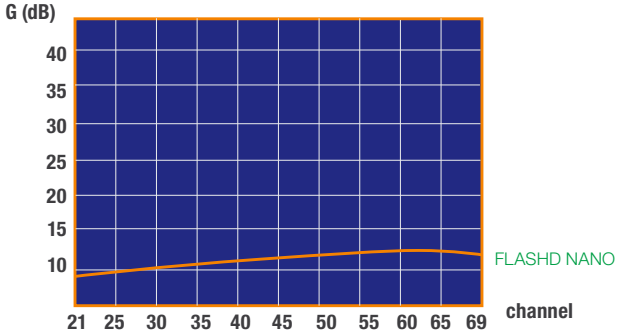
FULL HD Digital Quality

FLASHD NANO

MODEL			FLASHD NANO (HDT510V)
REF.			1791
Channels			21 - 69 (470-862 MHz)
Gain		dB	12
Front-to-Back ratio		dB	≥16
Beamwidth	H V		60º 80º
Windload		N	130 Km/h : 15 150 Km/h : 20
Dimensions		cm	30 x 53 x 20
Packed weight		kg	0,825
Connection			F
Quantity boxed			1/5

FLASHD NANO

Gain Graphs



- 3 seconds
- 2 positions
- 1 cleaner signal

Unfolding the antenna

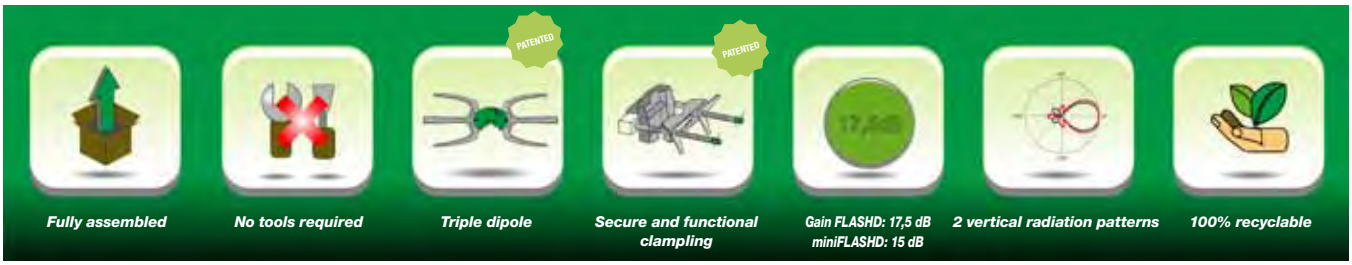
ultra-rapid installation!

The antenna is unfolded by simply pressing a button

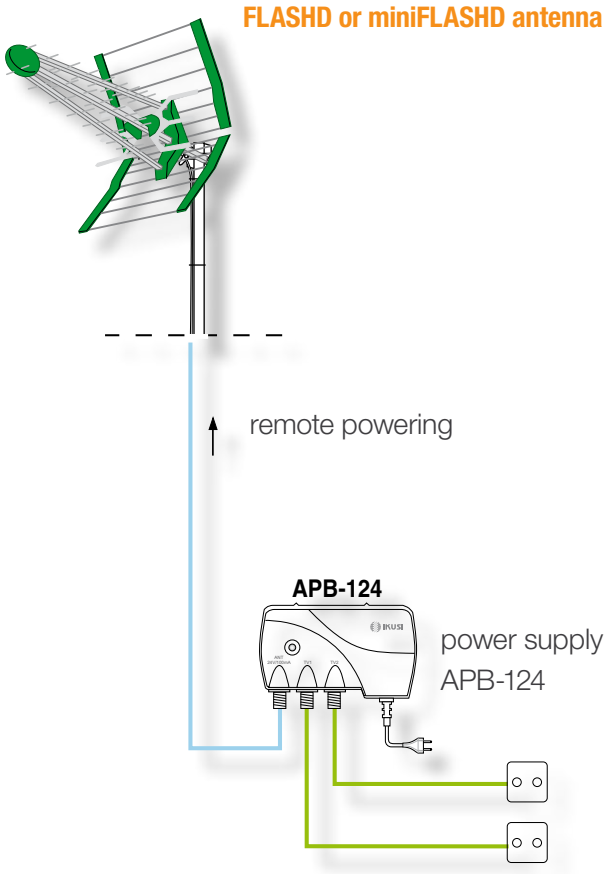
2 MODES

Le mode Dièdre 90°
This unfolding (90°DIHEDRAL Mode) provides the best general performance of the antenna.

Le mode Dièdre120°
The 120°DIHEDRAL mode provides a 'vertical plane' radiation pattern different to the one of the 90° DIHEDRAL mode. It can be tried out when existing echoes that with the 90° mode produce visible interferences.



Application example



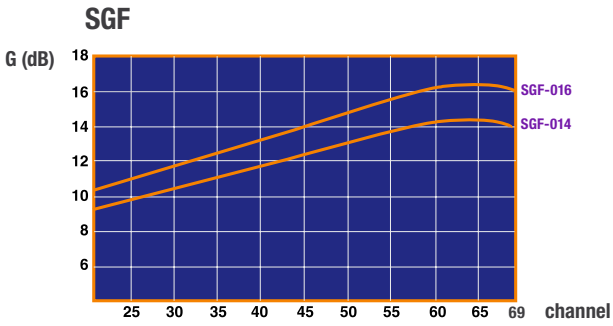
Dipole disassembly for easy connection

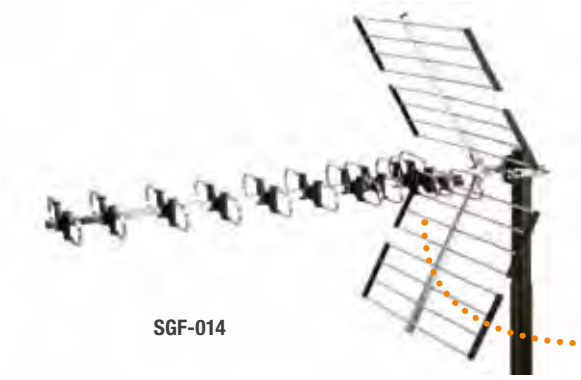
TV Antennas - UHF Band

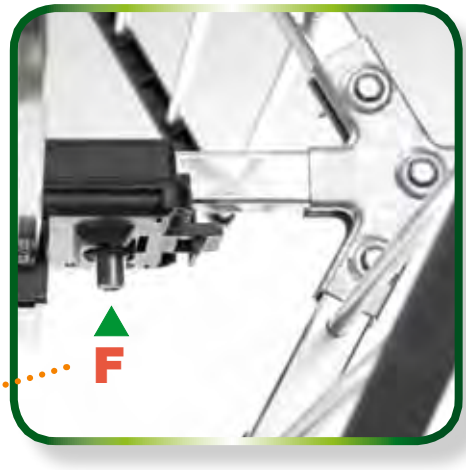
- Elements and support square-bars made of aluminium.
- Pre-assembled (except KSG models). Clamping system for masts of Ø25 to 50 mm.
- Polypropylene connecting-box. Impedance: 75Ω.
- Cable connection: F connector (SGF, UCF, INU-F) or terminal-clamp (INU-B09, INU-B11).

SGF Series

MODEL		SGF-014	SGF-016
REF.		1732	1734
Channels		21 - 69	21 - 69
Nominal gain	dB	14	16
Front to back ratio	dB	≥25	≥25
Beamwidth	H° V°	30 29	23 22
Windload (for velocities 130/150 km/h)	N	85/116	133/182







F Connection

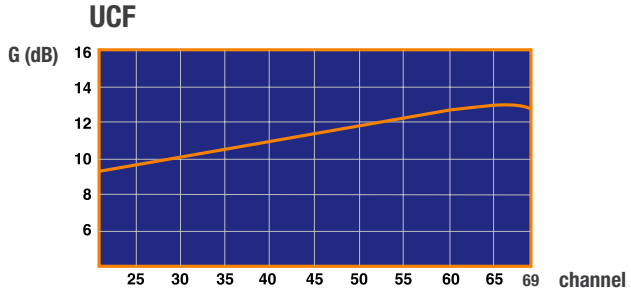
The box is detachable for easy connection of the coaxial cable

Safe and functional fixstion system

TV Antennas - UHF Band

UCF

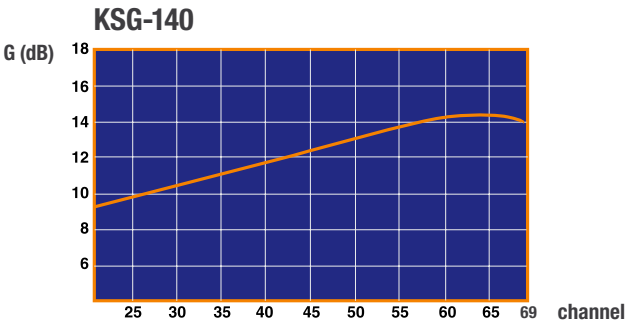
MODEL		UCF-013
REF.		1735
Channels		21 - 69
Nominal gain	dB	13
Front to back ratio	dB	≥25
Beamwidth	H° V°	38 43
Windload (for velocities 130/150 km/h)	N	56/77

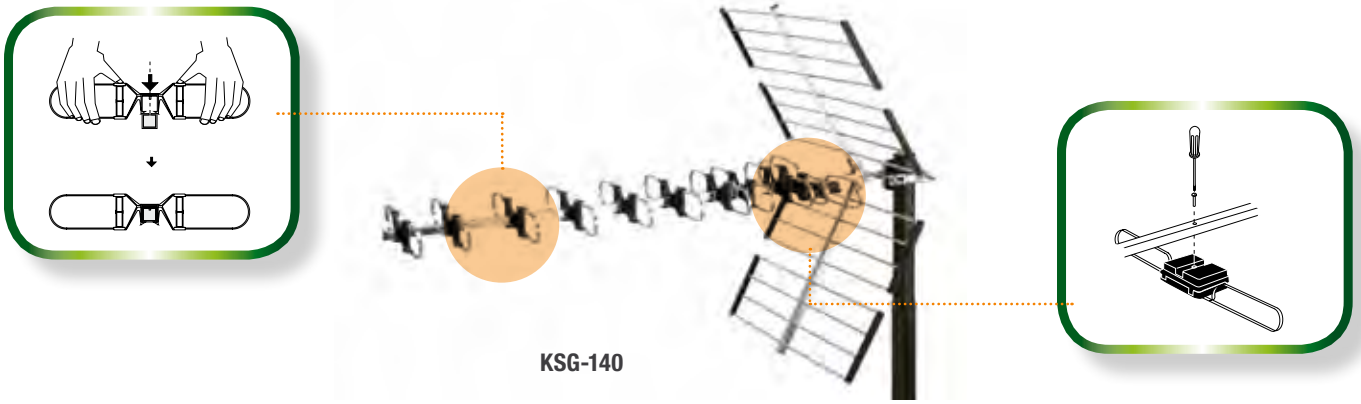


TV-UHF Antenna Kit

- Economical. The antenna are supplied wholly disassembled.
- Elements and support square-bars made of aluminium.
- Clamping system for masts of Ø25 to 50 mm.
- Polypropylene connecting-box. Impedance: 75Ω.
- Cable connection: Terminal-clamp

MODEL		KSG-140
REF.		1695
Channels		21 - 69
Nominal gain	dB	14
Front to back ratio	dB	≥25
Beamwidth H° V°		30 29
Windload (for velocities 130/150 km/h)	N	85/116

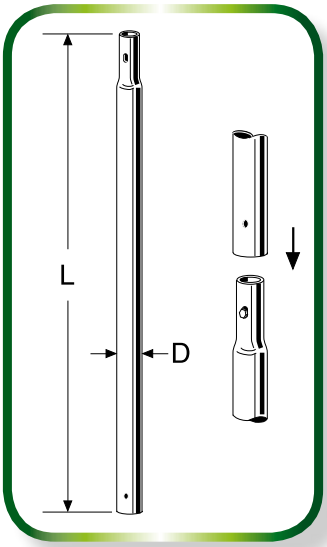




Plug-in Masts

- Pluggable for double configurations.
- Material: zinced, quality S235JR (EN 10025) steel.
- For anchorage on Ø30 and 35 mm use the rope-bracing Ref. 1916

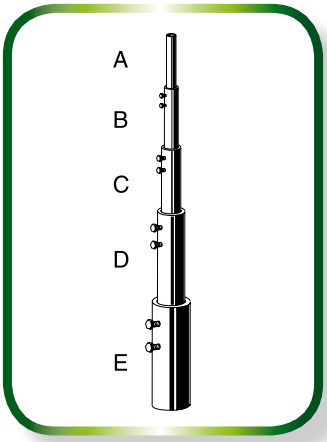
REF.	Length m	Diameter mm	Thickness mm
1941	3	40	1.5
1880	2.5	35	1.5
1881	1.5	35	1.5
1885	2.5	30	1

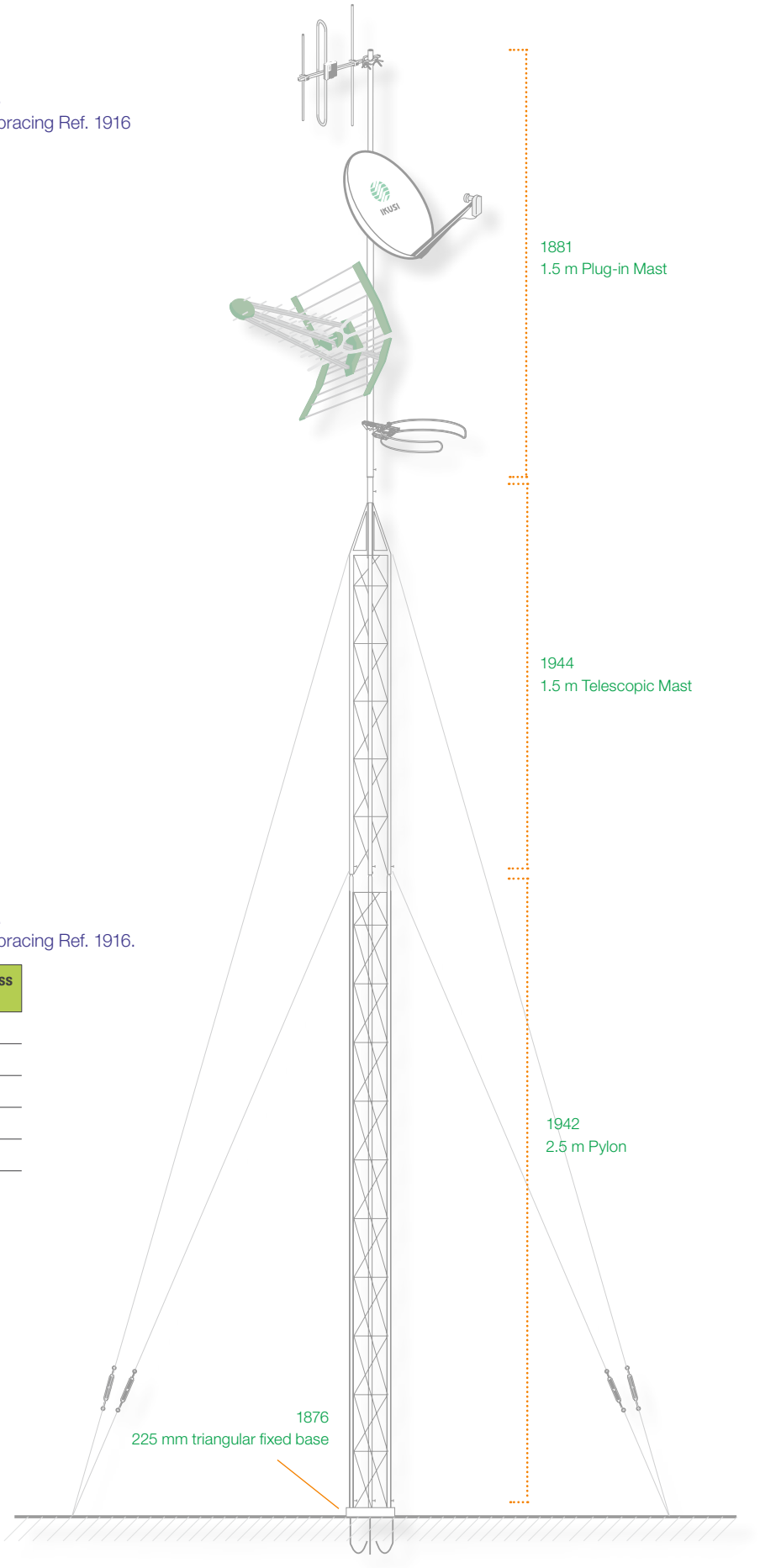


Telescopic Masts

- Easy mounting. Heights of up to 14.2 m.
- Material: zinced, quality S235JR (EN 10025) steel.
- For anchorage on Ø30 and 35 mm use the rope-bracing Ref. 1916.

REF.	Section	Length m	Diameter mm	Thickness mm
1934	A	3	25	1.5
1935	B	3	30	1.5
1936	C	3	35	1.5
1937	D	3	40	1.5
1938	E	3	45	1.5

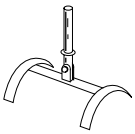


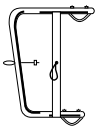


Supports

- General material: zinced, quality S235JR (EN 10025) steel.

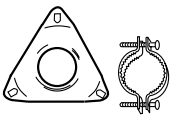
REF.	DESCRIPTION
1913	Tiltable ridge-tale base for Ø30 to 35 mm masts.
1915	Chimney support for Ø≤45 mm masts.
2878	Bracket set for distant wall-mounting of Ø≤45 mm masts.
1921	Window angled bracket. Length: 85 cm; Ø25 mm.
1874	Off-centre single-angled bracket for Ø≤45 mm masts. Pipe: Ø25/22mm. Hor. length: 80cm; Vert. length: 25cm
1875	Off-centre double-angled bracket for Ø≤45 mm masts. Pipe: Ø25/22mm. Hor. length: 120cm; Vert. length: 25cm
1912	Off-centre straigh angled bracket for Ø≤45 mm masts. Pipe: Ø25/22mm. Hor. length: 50cm
1916	Rope-bracing set for Ø30 to 35 mm masts.
1918	Rail clamp for Ø≤45 mm masts.
1917	Double rail clamp for Ø≤45 mm masts.
1919	Wall reinforced clamp, length 40 cm. For Ø≤45 mm masts.
1940	Wall 26P clamp, length 25 cm. For Ø≤45 mm masts.
1911	GMA-400. Wall-screwing clamp, length 40 cm. For Ø≤45 mm masts.
1920	Tensioner 1/4". Adjustable length: 16 to 22 cm.
1923	Enclosed cable clip.

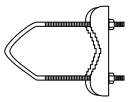

1913


1915

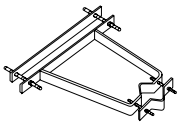

1921

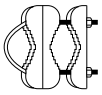

1874

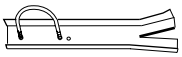

1916

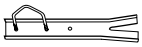

1918

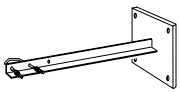

1875


2878


1917


1919


1940


1911

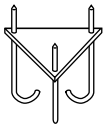
1920

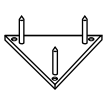

1923

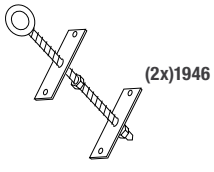
Pylons

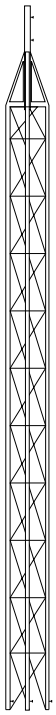
- Made from Ø20 mm pipe and Ø6 mm lattice-road. Three available sections with joining ends to facilitate coupling when building high towers.
- Material for pylons and accessories: zinced, quality S235JR (EN 10025) steel.

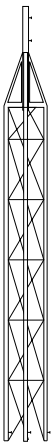
REF.	DESCRIPTION
1942	Trestle-power or upper section, 2.5m. Top end adapted for housing the Ref. 1941 point mast.
1944	Trestle-power or upper section, 1.5m. Top end adapted for housing the Ref. 1941 point mast.
1943	Lower section, 2.5 m. To be coupled to an upper section or to be used as intermediate section. Resulting trestle-tower requires rope-bracing.
1876	Hooked, triangular fixed base, side 225 mm. Three bolts for securing the trestle-tower.
1950	BTA-225. Screwed, triangular fixed base, side 225 mm. Three bolts for securing the trestle-tower.
1945	AMA-112. M14 rod for rope-brace anchoring. Length: 380 mm. Ring: Ø48 mm.
1946	AMA-111. Plate 200 x 50 mm for rope-brace anchoring.
1948	Steel wire Ø3 mm for rope-bracing use.


1876


1950




1942


1944


1943

RPA. Satellite Dishes-Offset type

- Dish made of powder-coated steel, LNB arm made of aluminium, LNB holder made of polypropylene and fibre glass,Az-El holder made of galvanized steel, with 2 U-bolts and 2 mast clamps.
- Precision mechanical construction.
- Supplied in individual box or industrial packings of 30 units.

MODEL Supplied in individual box			**RPA-060** (3065)	**RPA-080** (3067)	**RPA-100** (3069)
MODEL Supplied in 30 unit packings			**RPA-060T** (3066)	**RPA-080T** (3068)	**RPA-100T** (3070)
Diameter / Colour		cm	60 / light grey	80 / light grey	100 / light grey
Gain	10.75 GHz	dBi	34.7	36.8	39.8
	11.75 GHz		35.2	37.8	40.5
	12.75 GHz		36.1	38.5	40,9
Offset angle		°	25	25	25
Beamwidth (at 12.75 GHz)		°	< 3.1	< 2.2	< 1.8
Cross-polar discrimination		dB	> 27	> 27	> 27
Pointing range	Elevation	°	15 - 48	10 - 56	5 - 90
	Azimut	°	0 - 360	0 - 360	0 - 360
Feed bracket diameter		mm	23 / 40	23 / 40	23 / 40
Dish dimension (external)		mm	574 x 644	745 x 845	991 x 1090
Mast clamp for		mm	32 - 60	32 - 76	32 - 76
Windload (130/150 km/h)		N	320 / 435	520 / 710	800 / 1095

RPA-100

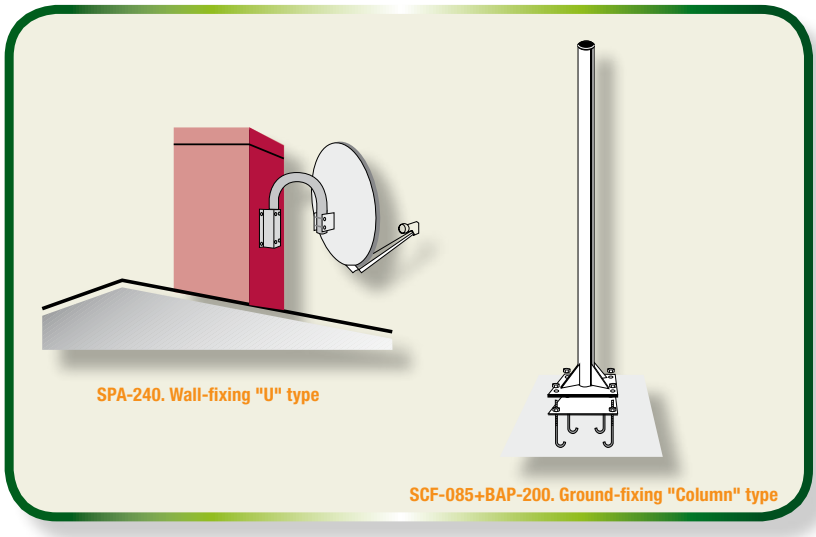
Supports for Satellite Dishes

MODEL	REF.	DESCRIPTION
SCF-085	**1067**	Ground-fixing. "Column" type. Heigh: 90cm. For antennas RPA-080 and RPA-100. Pipe of Ø50 mm and quadrangular base of 200x200 mm, all made of zinced steel.
BAP-200	**1949**	Hooked-support for SCF-085. Plate 200x200x2 mm and four M12 threaded hooks.
SPA-240	**3071**	Wall-fixing. "U" type. Width of the arm: 24cm. For antennas RPA-060 and RPA-080. Pipe of Ø40mm made of galvanized steel.


SPA-240


BAP-200


SCF-085



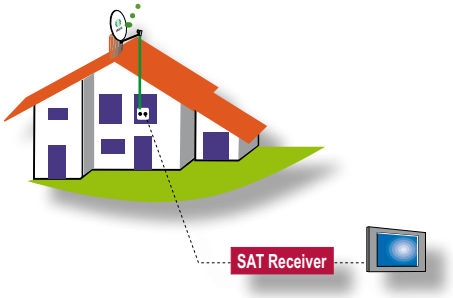
UEU. LNB Quattro and Universal

• Use with offset antennas. F connector.

MODEL			UEU-121K	UEU-221K	UEU-124K
REF.			1113	3083	1114
Type		GHz	UNIVERSAL	TWIN UNIVERSAL	QUATTRO
Input frequency			10.70 - 12.75		
IF outputs			1 (VL or VH or HL or HH)	2 (VL or VH or HL or HH)	4 (VL) (VH) (HL) (HH)
LO frequency	10.70 to 11.70 GHz band 11.70 to 12.75 GHz band	GHz	9.75 10.60		
Output frequency		MHz	950 - 2150		
Phase noise at 10 kHz (typ.)		dBc/Hz	-85		
Gain		dB	58 (±2)		
Noise figure (typ.)		dB	0.2		
Operating voltage		VDC	Vert. : 11 - 14 Hor: 16 - 20		9 - 20
Control tone			22 kHz for high band 11.70 to 12.75 GHz		—
Max consumption		mA	90	190	
Cross polarization isolation		dB	40		

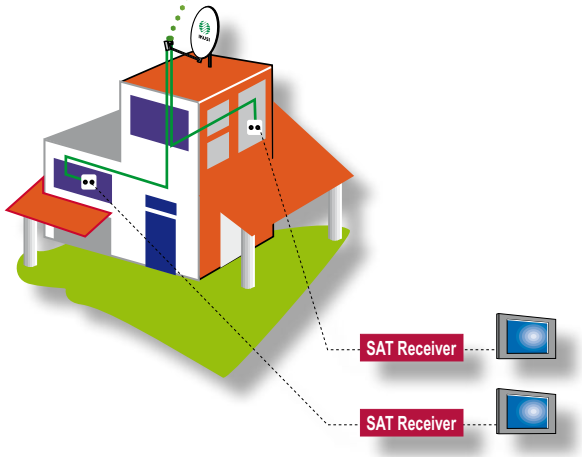
for 1 user

UEU-121K



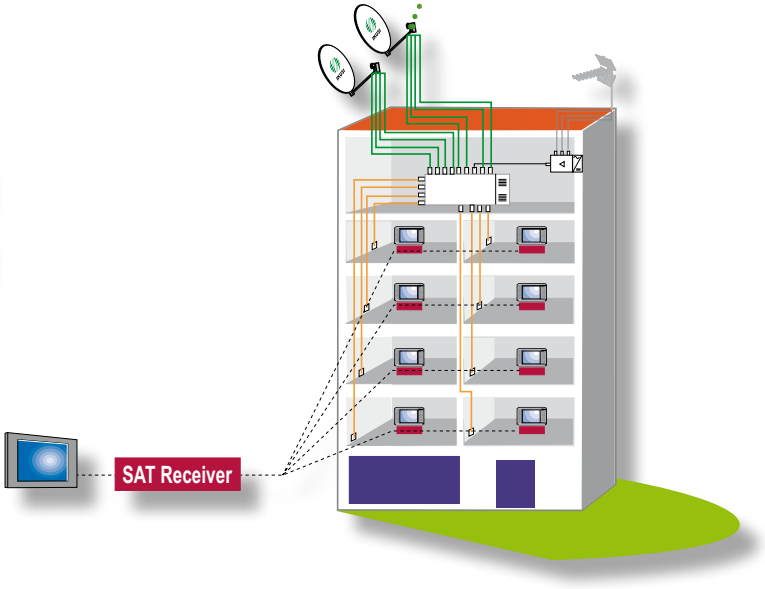
for 2 users

UEU-221K



for communities

UEU-124K



SBA Series. Shielded Multiband Preamplifiers

NEW! SBA-202

- Very high UHF gain.
- Interstage variable attenuators. Optimum design for very low operative noise figure.
- External polystyrene box, with fixing plastic camp. IP55 weatherproofing grade. Protection against lightning.

MODEL		SBA-120	SBA-100	SBA-202	SBA-290	SBA-220	SBA-353	SBA-373
REF.		3390	3398	3385	1213	3394	1218	1219
RF Inputs		1	1	2	2	2	3	3
Frequency range		UHF	UHF	VHF UHF	UHF SAT	FM UHF	(BI/DAB/BIII) UHF1 UHF2	(BI/DAB/BIII) BIV BV
Nominal gain	dB	UHF: 35	UHF: 40	VHF: -1 UHF: 25	UHF: 35 SAT:-2	FM: 22 UHF: 40	BI/DAB/BIII: 30 UHF1: 35 UHF2: 35	BI/DAB/BIII: 30 BIV: 36 BV: 36
Gain adjustment	dB	0 - 15	0 - 15	0 - 15	0 - 15	0 - 15	0 - 15	0 - 15
Noise figure	dB	≤ 3	≤ 2	VHF: — UHF: ≤ 2	≤ 3	FM: ≤ 5 UHF: ≤ 2	BI/DAB/BIII: ≤ 3 UHF: ≤ 5	BI/DAB/BIII: ≤ 3 BIV, V: ≤ 4
Output level	dBµV	114 *	105	103 / 106 **	105	105	103	103
Rejection to BII (FM)	dB	—	—	—	—	—	≥ 30	≥ 30
Input isolation	dB	—	—	—	—	≥ 26	≥ 18	≥ 18
Operation voltage	VDC	+24	+24	+12 to +24	+12 to +24	+24	+24	+24
Consumption	mA	50	30	40	50 (12V) , 70 (24V)	30	80	80

GSM frequency rejection filter in SBA-202 model.
** 103 dBµV to +12VDC ; 106 dBµV to +24VDC

*** The high signal capacity of the SBA-120 is reinforced with two built-in notch filters for selective attenuation of 1 or 2 very strong channels.**
Adjustment range extends to GSM 900 mobile telephony frequencies.

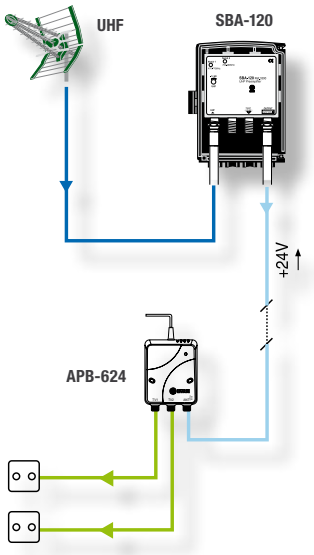

SBA-120

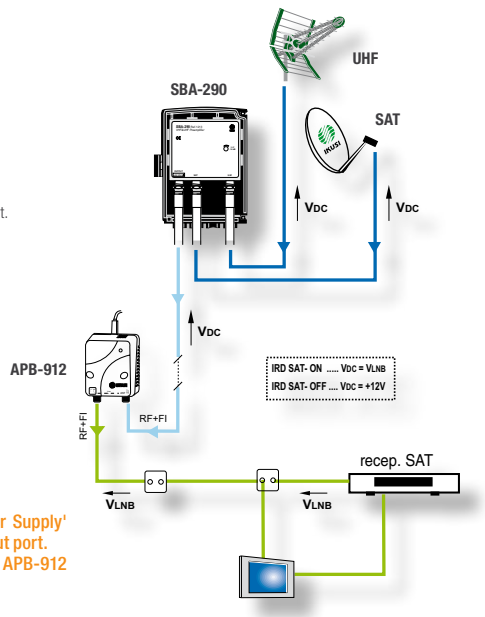

SBA-290

		Notch-filter 1	Notch-filter 2
Adjustable frequency	MHz	470 ... 770	760 ... 960
Notch depth	dB	5 (470 MHz) “ 18 (770 MHz)	8 (760 MHz) “ 18 (860 MHz) “ 25 (960 MHz)

To facilitate the adjustment of the notch-filters, the SBA-120 has a -20dB test port.

Application example





Line powering via down-lead coax cable:
a) From a 'Satellite Receiver + APB-912 Power Supply' assembly. Passing of voltage/tone to SAT input port.
b) In the case of not using the SAT input, from an APB-912 or APB-624 power supply.

SBA-201. Switchable 1/2 inputs

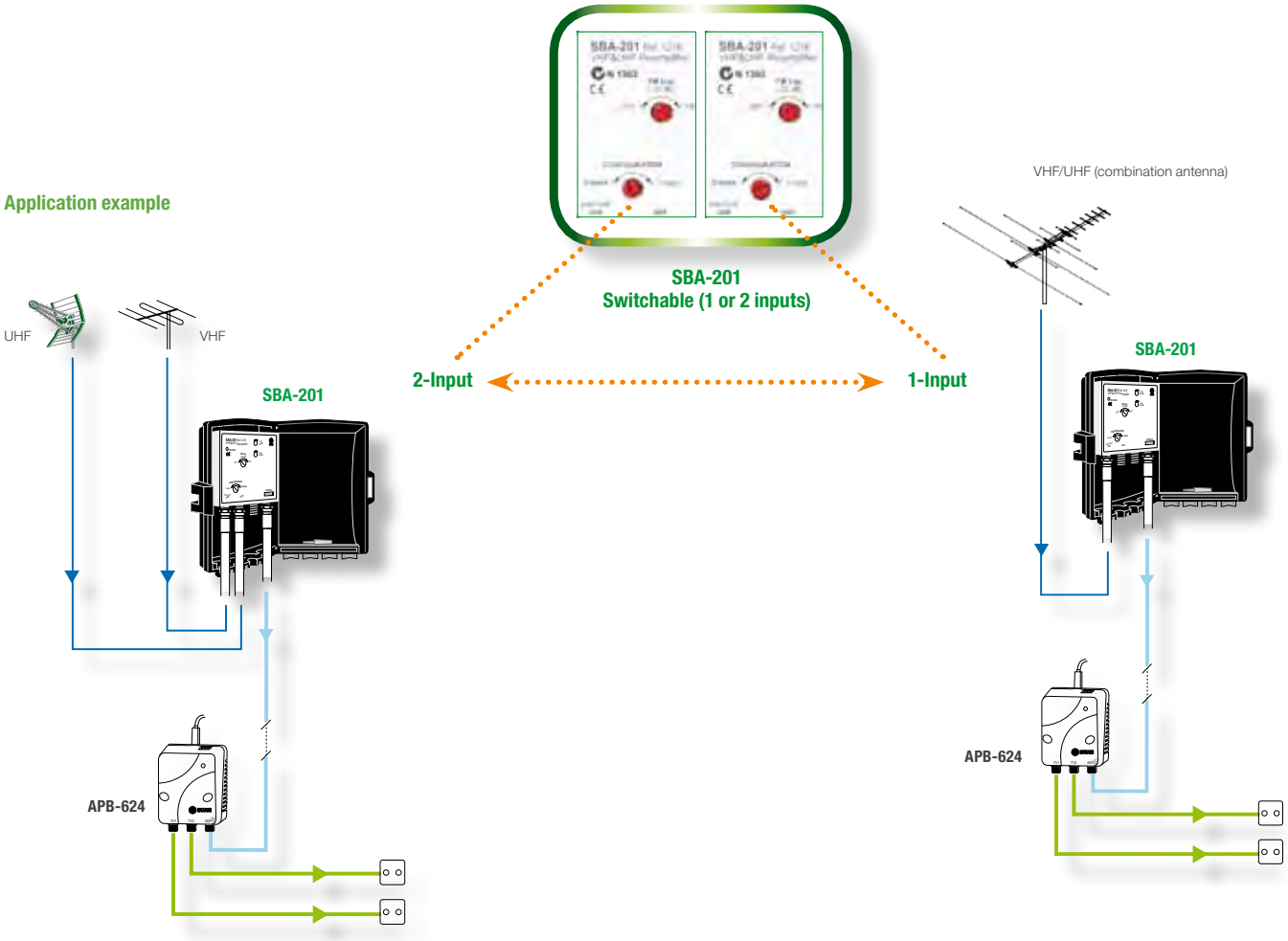
- One input (VHF/UHF) or two separate inputs (VHF - UHF).
- Switchable FM trap in SBA-201.
- Interstage variable attenuators. Optimum design for very low operative noise figure.
- Internal injection-moulded zinc alloy housing with F type ports.
- External HIPS housing, with fixing plastic clamp for 20-50mm diameter masts.
- IP55 weatherproofing grade.

SBA-201

MODEL		SBA-201
REF.		1216
RF inputs- switchable Frequency range		1 / 2 (VHF/UHF) / VHF UHF VHF : 45-108 MHz and 174-240 MHz UHF : 520-820 MHZ
Nominal gain	dB	VHF: 16 UHF: 23
Attenuation adjustment [1]	dB	0 - 10
FM rejection	dB	0 / 20 (switchable)
Noise figure	dB	VHF: ≤ 5 UHF: ≤ 3
Output level (DIN-B, -60 dB)	dBµV	105
Operation voltage [2]	VDC	+24
Consumption	mA	50

1 Two interstage variable attenuators, one for VHF and other for UHF. Maintenance of low noise figure
2 Line powering via down-lead coax cable, from the APB-124/624 power supply

Application example



MBS Series. Shielded Multiband Preamplifiers

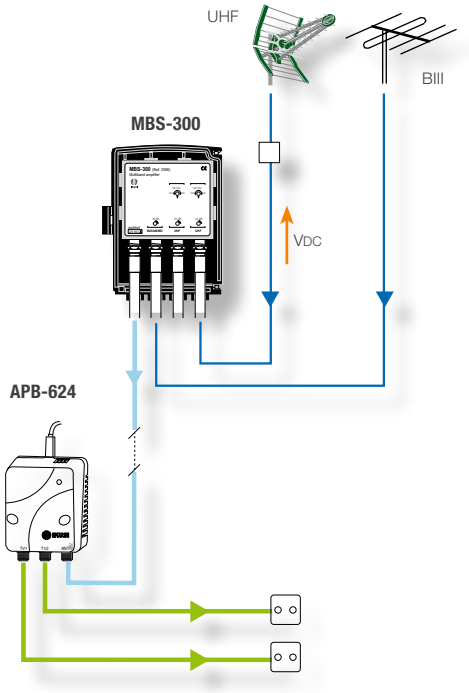
- Variable input attenuators and DC feed-through switches.
- Internal zinc alloy housing with integral F type ports.
- External uv stabilised ABS box with fixing plastic clamp for 20-50mm diameter masts.
- IP55 weatherproofing grade.
- Protection against lightning. F connection. Dimensions: 112x112x48 mm.

MODEL		MBS-200	MBS-300
REF.		3397	3396
RF inputs		2	3
Frequency range		VHF UHF +	BI/DAB/BIII UHF + UHF +
Nominal gain	dB	VHF: -1 UHF: 30	BI/DAB/BIII: 30 UHF1: 26 UHF2: 26
Gain adjustment	dB	0 ... 15	0 ... 15
Noise figure	dB	≤ 4	BI/DAB/BIII: ≤ 5 UHF: ≤ 9
Output level (DIN-B, -60 dB)	dBµV	106	106
Rejection to BII (FM)	dB	—	≥ 25
Input isolation	dB	≥ 26	≥ 18
Operating voltage	VDC	+24	+24
Consumption	mA	40	40

Input with + sign have an ON/OFF switch for +24 VDC passing.

MBS-300

Application example



ON/OFF switchs
for +24 VDC passing
(UHF inputs)

removal of masthead amplifier module
maintaing the housing in place

variable input attenuators

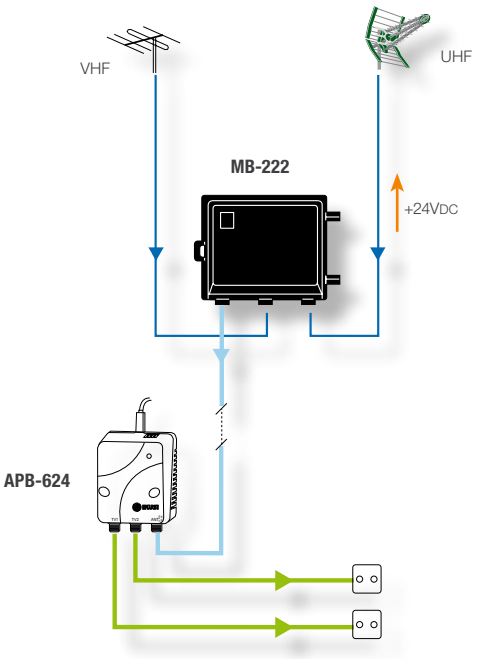
MB Series. 1 and 2 Inputs

- Variable input attenuators and DC feed-through switches.
- Polystyrene box with fixing plastic clamp for 20-50 mm diameter masts. Dimensions: 109x84x57 mm. IP55 weatherproofing grade.
- Protection against lightning. Terminal-clamp connection.

MODEL		MB-01	MB-222	MB-322	MB-255
REF.		2180	2185	3407	2186
RF inputs		1	2	2	2
Frequency range		BI/DAB/BIII/UHF +	BI/DAB/BIII UHF +	FM UHF +	UHF1 + UHF2 +
Nominal gain	dB	26	BI/DAB/BIII: 32 UHF: 32	FM: 32 UHF: 32	UHF1: 26 UHF2: 26
Gain adjustment	dB	—	0 ... 15	0 ... 15	0 ... 15
Noise figure	dB	≤ 3	≤ 3	≤ 3	≤ 7
Output level (DIN-B, -60 dB)	dBµV	106	106	106	106
Rejection to BII (FM)	dB	≥ 30	≥ 30	—	—
Input isolation	dB	—	≥ 26	≥ 26	≥ 18
Operating voltage	VDC	+24	+24	+24	+24
Consumption	mA	45	45	45	45

Input with + sign have an ON/OFF switch for +24 VDC passing.

Application example



MB-222

ON/OFF switchs for +24 VDC passing (UHF inputs)

UHF Selective Preamplifier

- Amplification of 1 UHf channel.
- Polystyrene box with fixing plastic clamp for 20-50 mm diameter masts. Dimensions: 150x112x68 mm. IP55 weatherproofing grade.
- On request, DC passing to power antenna connecting-box preamplifiers. Protection against lightning.
- Terminal-clamp connection.

MODEL		MMS-UHF
REF.		1429
Bandwidth		**1 UHF channel**
Nominal gain	dB	21
Selectivity	dB	>20 (±12 MHz) >30 (±20 MHz)
Noise figure	dB	5
Output level	dBµV	105 (analog) 100 (digital)
Operating voltage	VDC	+24
Consumption	mA	20

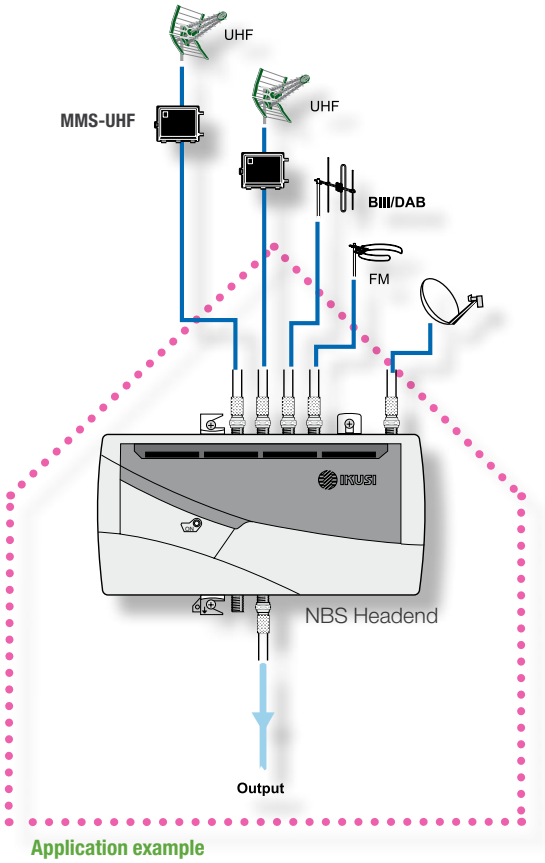
MMS-UHF

Ordering instructions

Specify channel or channel group. If DC passing is desired, include Ref. 1287.

Example:

- 1 MMS-UHF (Ref. 1429) channel 61
  1 DC Passing (Ref. 1287)



Application example

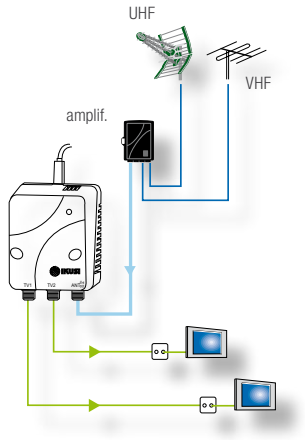
Power Supply +24 VDC

- 1 «RF input + DC output» port — 2 «RF output» ports.
- Electrical safety protection level: Class II. Mains lead with bipolar plug. LED indicator.
- External plastic box. Wall fixing by 2 screws supplied.

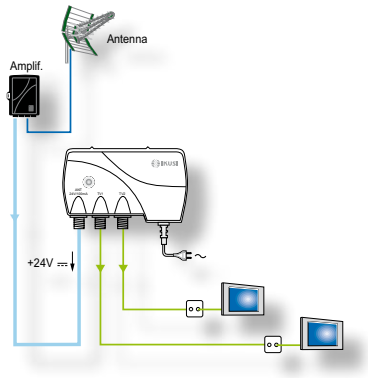
MODEL		APB-624	APB-124
REF.		3435	3432
Regulation type		linear	switch mode
Mains voltage (50 Hz)	VAC	230-240	
Output voltage	VDC	+24 (±5%)	
Max output current	mA	100	
Frequency range	MHz	40 - 862	
Number de RF outputs		2	
RF insertion loss	dB	≤ 5	≤ 4
Max consumption	W	5.5	3.5
Dimensions	mm	65x90x45	58x90x20

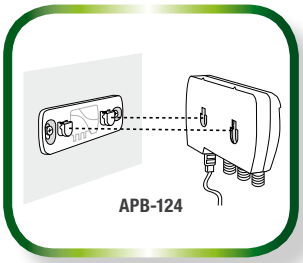
APB-624

Application example



APB-124





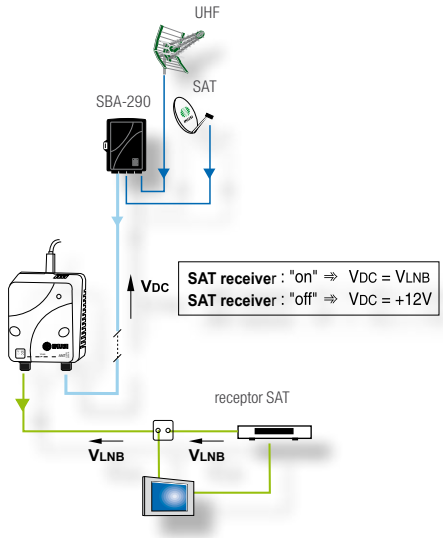
Quick fixing system

Power Supply +12 VDC

- Designed to be used with mast-head preamplifiers featuring Sat-IF coupling, such as the IKUSI's SBA-290 model.
- When the user's SAT receiver is OFF or stand-by, the APB-912 power supply operates normally, providing +12 VDC voltage for the mast-head preamplifier (and also, attention, for the attached LNB). When the SAT receiver is switched ON, the APB-912 comes automatically to stand-by and let pass the voltage/tone signals coming from the receiver, so that the LNB as well the SBA-290 preamplifier are powered by the SAT receiver.
- 1 «RF input + DC output» port — 1 «RF output» port.
- Electrical safety protection level: Class II. Mains lead with bipolar plug. LED indicator.
- External plastic box. Wall fixing by 2 screws supplied.

MODEL		APB-912
REF.		3433
Regulation type		linear
Mains voltage (50 Hz)	VAC	230 - 240
Output voltage	VDC	+12 (±5%)
Max output current	mA	200
Frequency range	MHz	45 - 2300
Number de RF outputs		1
RF insertion loss	dB	≤ 1.5
Max consumption	W	5.5
Dimensions	mm	65x90x45

Application example



Preamplifier + Power Supply KITS

MODEL	REF.	Contents
JSBA100	1208	Preamplifier SBA-100 + Power Supply APB-624
JSBA202	3384	Preamplifier SBA-202 + Power Supply APB-624
JSBA210	1210	Preamplifier SBA-210 + Power Supply APB-624
JMBS210	1212	Preamplifier MBS-210 + Power Supply APB-624

JSBA202

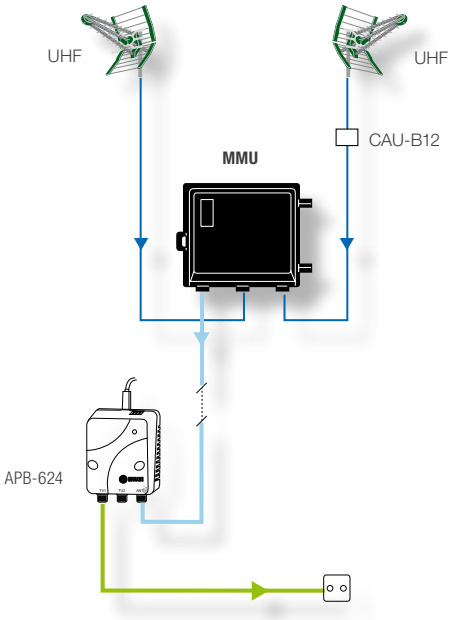
2-input Band Multiplexers

• Uv stabilised ABS box with zip tie fixing for 20-50 mm diameter masts.

MODEL		MMU	MM V-U
REF.		1270	1276
RF inputs		2	2
Frequency range		40-862 MHz 40-862 MHz	VHF UHF
DC passing		YES	NO
Insertion loss	dB	in VHF: 3.5 in UHF: 5	VHF: 0.5 UHF: 1
Input isolation	dB	≥18	≥26

MMU

Application example



SZB. Amplification Equipment

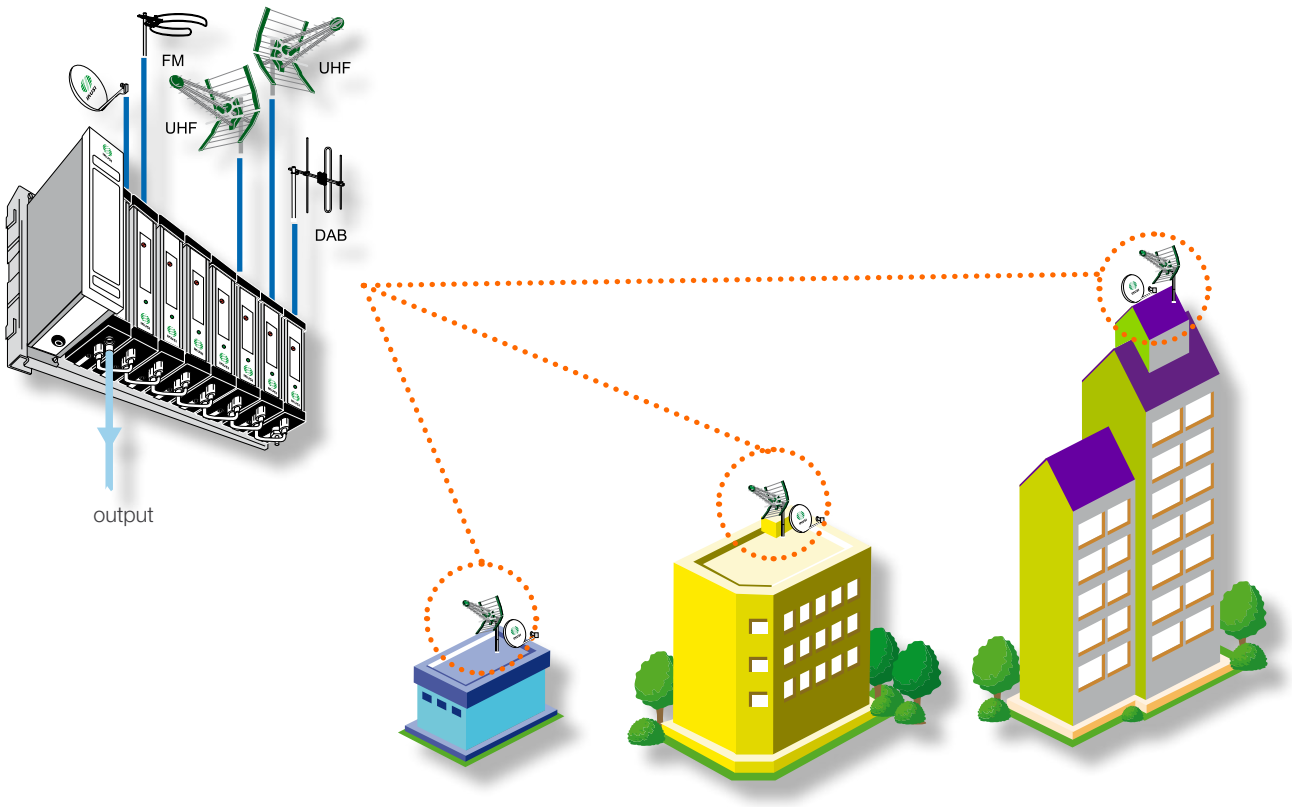
- Amplification, Conversion and Modulation modules, dimensions: 190x38x87 mm. F connection. Easy to assemble onto the wall mounting base plates, without the need of any tools.
- TV single-channel and multichannel amplifiers, the last ones especially created for amplification of combined analog and digital channels. Z input de-multiplexing and Z output multiplexing. Adjacent channel operation allowed in UHF band.
- FM Radio and DAB Amplifiers.
- PLL-controlled converters. Z input demultiplexing. Within a headend, each converter module must be complemented with an amplifier module.
- Sat-IF Combiner/Amplifier.
- Double Side Band programmable TV modulators.
- Power Supply modules, dimensions: 215x35x140 mm. Output voltage +24 VDC is automatically connected to the RF modules through a connecting bar at the base-plate.
- It is advisable to place the amplifiers on the base-plate following an increasing order of number of channel (frequency). The RF output of the headend will be taken from the last one of the modules ordered in this way.

SZB Headend

TV Single-channel, FM Radio and DAB Amplifiers

MODEL		SZB-119	SZB-129	SZB-128	SZB-168	SZB-139	SZB-148 *
REF.		3151	2294	2293	3160	3152	2246
Bandwidth		**1 channel BI**	**FM**	**FM**	**DAB** 195-223 MHz	**1 channel BIII**	**1 channel UHF** analog or digital
Gain	dB	57	57	30	53	56	52
Gain adjustment (interstage attenuator)	dB	20	20	20	20	20	30
Noise figure	dB	4		7,5	8	7	9
Output level	dBµV	(2x) 126 analog (2x) 121 digital	(2x) 113	(2x) 113	(2x) 113	(2x) 126 analog (2x) 121 digital	(2x) 126 analog (2x) 121 digital
Z output return loss	dB	≥ 6	≥ 6	≥ 6	≥ 6	≥ 6	≥ 6
Consumption	mA	100	100	80	100	100	100

* SZB-148 high selectivity. Amplification of one analog or digital UHF channel, either non-adjacente or adjacent.
Each amplifier is packed with 1 Z bridge Ref. 2247



SZB. Multichannel UHF Amplifiers

MODEL		SZB-182	SZB-184	SZB-185
REF.		2242	2240	2241
Bandwidth		2 channels UHF (analog. and digital)	4 channels UHF (analog. and digital)	Channels 65 to 69 (65: analog. or dig. / 66-69: dig.)
Gain	dB	59	60	
Noise figure	dB	5		
Output level	dBµV	(2x)111 (2 analog.) (2x)118 (2 digital) (2x) 123/113 (1 analog. / 1digital)	(2x) 115 (4 digital) (2x) 121/111 (1 analog. 3 digital) (2x) 111/101 (1 analog. / 2 digital)	(2x) 120 (C 65 analog.) (2x) 110 (C 66-69 digital) (2x) 114 (C 65-69 digital)
Z output return loss	dB	≥ 6		
Consumption	mA	100		

Each amplifier is packed with 1 Z bridge Ref. 2247

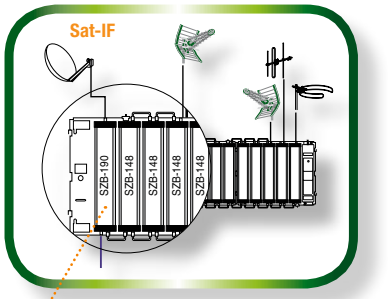
SZB-182

SZB. Sat-IF Combiner/Amplifier

- 1 satellite input 950-2150 MHz with adjustable gain and sloped response to compensate for cable loss; 1 terrestrial coupling input 5-862 MHz; 1 satellite+terrestrial output.
- Automatic power connection, either via contact terminal (SZB application) or via terrestrial coupling input port (MZB applications).
- LNB coax line powering.

MODEL		SZB-190
REF.		1346
Sat-IF Band	MHz	950 - 2150
Gain (7 dB fixed slope)	dB	33 (950 MHz) 40 (2150 MHz)
Gain adjustment	dB	18
Output level	dBµV	120
Noise figure	dB	< 8
Terrestrial band	MHz	5 - 862
Terrestrial coupling loss	dB	< 1
Operating voltage	VDC	+ 24
Consumption	mA	120
Insertable voltage/tone to Sat-IF input port		+13 / +18 VDC 0 / 22 kHz
Max LNB power current	mA	350 (at +18 VDC) / 250 (at +13 VDC)

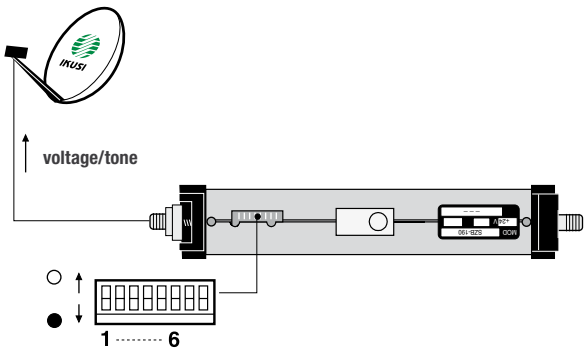
Each amplifier is packed with 1 Z bridge Ref. 2247



SZB-190

The SZB-190 may be used with anuniversal 1 output LNB. Power andvoltage/tone signals for polarity/ bandselection are provided by the modulefrom its IF-Sat input port.Using a small screwdriver, place properlyeach microswitch 1 to 6 as indicated inthe table below :

Voltage / Tone	Microswitch					
	1	2	3	4	5	6
+13 VDC / 0 kHz	○	○	●	●	○	○
+13 VDC / 22 kHz	○	○	●	●	●	●
+18 VDC / 0 kHz	●	●	○	○	○	○
+18 VDC / 22 kHz	●	●	○	○	●	●



SZB. Programmable TV Modulators

- Double Side Band. Mono Audio.
- Built-in test pattern generator.
- Designed to deliver a very low broadband noise floor so several SZB-400's can be simply combined together through the two directional RF output ports provided, then fed into a broadband amplifier as the final driver. Only 1 channel gap required.
- One single channel RF output from each modulator, or one multichannel RF output by installing the concentration line. The free output ports need to be terminated using a 75Ω terminator. F female video connector; RCA female audio connector.

SZB-440

MODEL		SZB-410	SZB-430	SZB-440
REF.		2237	2238	2239
Selectable TV channel located between:	**MHz**	**45 - 146**	**146 - 470**	**470 - 890**
Selectable TV system (DSB)		B, G, D, K, I, L, M, N		
Audio mode		MONO		
Output level (adjustment potentiometer)	dBµV	65 to 75		
Adjustable carrier level ratio	dB	10 to 18		
Video input level	Vpp	0.7 ... 1.4		
Video input impedance	Ω	75		
Adjustable video modulation depth	%	75 to 85		
Audio input level	Vpp	0.4 ... 4		
Audio input impedance	Ω	600		
Adjustable audio peak deviation	kHz	±10 to ±50 (except system L)		
Adjustable audio modulation depth	%	10 to 80 (System L)		
Broadband noise (ΔB = 5 MHz)	dBc	< -60		
Output loop-through loss	dB	≤ 0.8		
Consumption at +24 VDC	mA	110		
Programming-Unit connector		USB type		

Each module is packed with:
- 1 plug-bridge Ref. 2247, for output concentration line between modules.
- 1 RCA plug, for audio input connection.

Microprocessor controlled. Access to adjustments and programming can be easily achieved through the SPI-300 programming-unit.

2.18 firmware version SPI-300

Programming Unit

MODEL	SPI-300
REF.	4070

- For setting the TV channel parameters of the "SZB-400" modulators: video carrier frequency, TV system, video modulation depth, carrier level ratio and audio modulatin index. Cable connection to the USB front panel socket
- LCD display. Microprocessor controlled. Simple and easy to use software. Firmware of the SPI-300 can be updated.
- Capacity of 20 pre-set memory allocations for repetitive "SZB-400" installations.
- No battery required. Powered through the interface lead (max consumption: 150 mA). DC jack to connect a +15 VDC voltage from an auxiliary power supply when updating the internal firmware through a PC.
- Dimensions: 160x75x40 mm.

Power Supplies

- Electrical safety protection level: Class II. Mains lead with bipolar plug.

MODEL		SZB-212	SZB-211
REF.		2228	1423
Regulation type		switch mode	
Mains supply voltage (50/60 Hz)	VAC	185 - 264	
Output voltage	VDC	+24 (±5%)	
Max output current	A	2	1

Each amplifier is packed with 1 Z bridge Ref. 2247

SZB-212

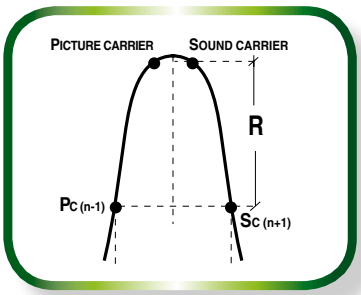
MZB. Amplification Equipment

- Single- and multi-channel amplifiers. Adjacent channel operation allowed in UHF band. Also FM Radio and DAB amplifiers.
- Dimensions: 140x37x70 mm. F connection. Easy to assemble onto the wall mounting base plates, without the need of any tools. Z input demultiplexing and Z output multiplexing.
- Power supply module, dimensions: 140x37x70 mm. Output voltage +24 VDC is automatically connected to the amplifiers through the Z concentration line.
- The RF output of the headend is taken from the last amplifier module, through a plug-in DC blocker supplied. In MZB headends with many amplifier modules it is advisable to install two Z lines.
- Easy incorporation —to a new or existing «MZB» headend— of the SZB-190 Sat IF Combiner/Amplifier.

TV Single-channel, FM Radio and DAB Amplifiers

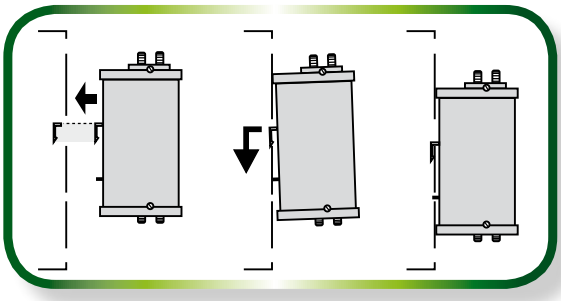
MODEL		MZB-129	MZB-168	MZB-139	MZB-141 *
REF.		3253	3261	3254	3260
Bandwidth		**FM**	**DAB**	**1 channel BIII**	**1 channel UHF** analog or digital
Gain	dB	42	44	43	40/36
Noise figure	dB	7.5	8	7	11
Output level (Analog: DIN-K, -54 dB) (Digital: EN 50083-3, -35 dB)	dBµV	(2x) 104		(2x) 117 analoge (2x) 112 digital	
Z output return loss	dB	≥ 6	≥ 6	≥ 6	≥ 6
Consumption	mA	30	35	30	35

* MZB-141 is a high-selectivity amplifier especially created to ampliify one adjacent channel (analog or digital).
Each amplifier is packed with 1 Z bridge Ref. 1579



Amplitude vs. Frequency response of MZB-141 Amplifier

MZB Headend



Mounting the amplifier modules, without the need of any tools

MZB. Multichannel UHF Amplifiers

MODEL		MZB-182	MZB-184
REF.		3259	3257
Bandwidth		**2 channels UHF** (analg and digital)	**Channels 66 to 69** (all digital)
Gain	dB	44	
Noise figure	dB	7	
Output level	dBµV	(2x) 102 (2x) 109 2digital 2analog. (2x) 114/104 1analog. / 1dig.	(2x) 106
Z output return loss	dB	≥ 6	
Consumption	mA	35	

Each amplifier is packed with 1 Z bridge Ref. 1579.

MZB-182

Power supply

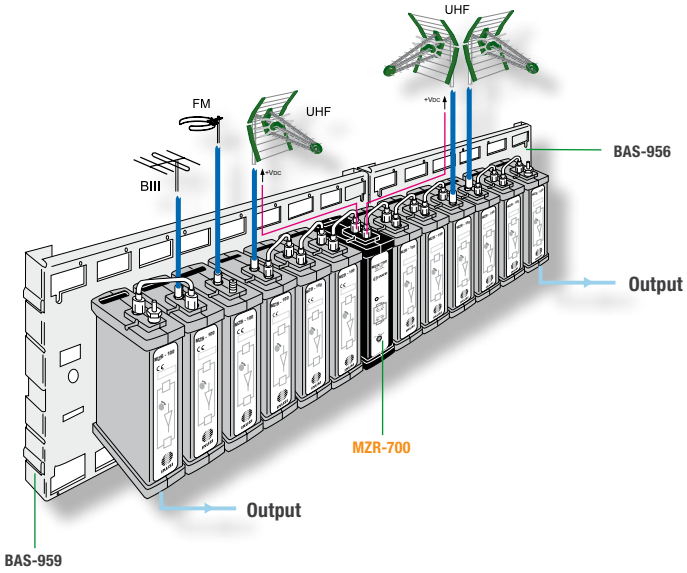
MODEL		MZR-700
REF.		1607
Regulation type		switch mode
Mains supply voltage (50/60 Hz)	VAC	230 - 240
Output [1]		+24V (700mA) (for the amplifier modules of the MZB headend) +24V/+12V (80mA) (for mast-head preamplifiers)

1 Two +24V output ports at the lower side, for the amplifier modules, and other two +24V/+12V (switchable) ones at the upper side, for mast-head preamplifiers. All of them behave as Z line end, and, as that, they are loaded internally with 75Ω.

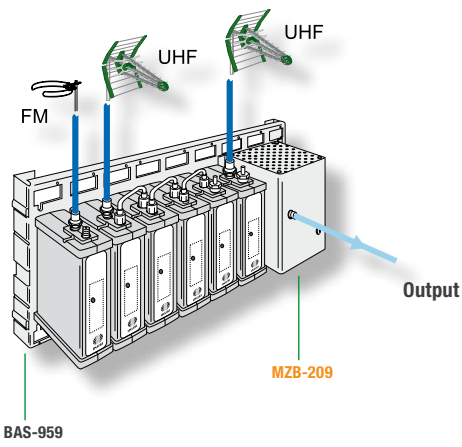
The module is packed with 1 AC/DC blocker (BCF-060, Ref. 2379).

MZR-700

Application example



with MZR-700 power supply



with MZB-209 power supply

MZ6. Amplification Equipment

- Single-channel and multichannel active Filter Modules. The multichannel ones have been especially created for amplification of combined analog and digital channels. Adjacent channel operation allowed in UHF band. Also FM Radio and DAB active filters. Dimensions: 140x42x73 mm. F connection. Simply to place, without any tool, onto wall-fixing base-plates. Z input demultiplexing and Z output multiplexing.
- Wideband RF power amplification and DC powering functions on two separate modules (MZR-123 and MZR-700). The filters' Z concentration line is used as RF signal source for the power amplifier and as +24 VDC power voltage connecting way.
- Easy incorporation —to a new or existing «MZ6» headend— of the SZB-190 Sat IF Combiner/Amplifier.

TV Sigle-channel, FM Radio and DAB Active and Passive Filters

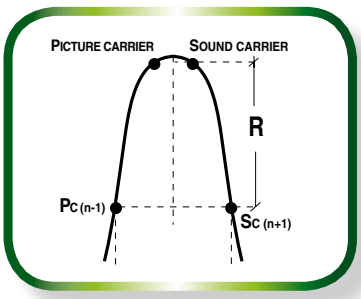
MODEL		MZ6-129	MZ6-168	MZ6-139	MZ6-148 *
REF.		1597	1590	1598	1592
Bandwidth		FM	DAB	1 channel BIII	1 channel UHF analog. or dig
Gain	dB	13	15		12
Gain adjustment	dB	-23	-30		-23
Noise figure	dB	6	7		11
Consumption	mA	25	30	25	

* High-selectivity. It can be used for adjacent channels

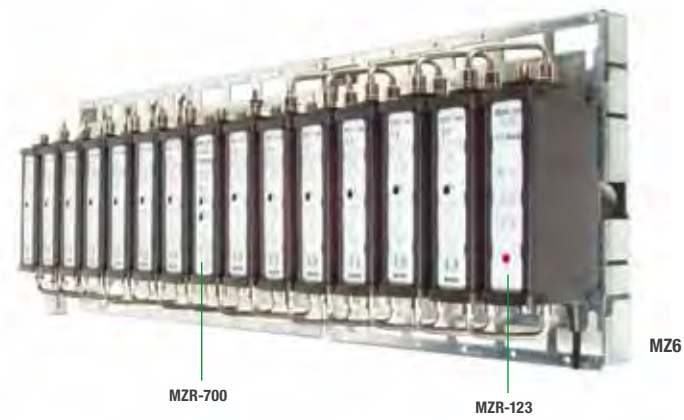
MZ6-100

Multichannel UHF Active Filters

MODEL		MZ6-182	MZ6-184	MZ6-185
REF.		1605	1603	1604
Bandwidth		2 channels UHF analog and digital	4 channels UHF analog and digital	5 channels UHF analog and digital
Gain	dB	12		
Gain adjustment	dB	-23		
Noise figure	dB	7		
Consumption	mA	25		



Amplitude vs. Frequency response of MZ6-148 Active Filter



MZ6 Headend

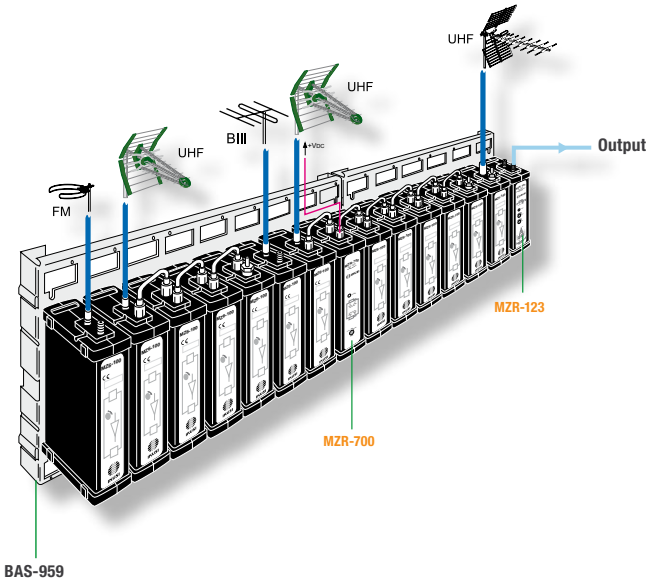
RF Power Amplification and Power Supply Modules

MODEL		MZR-123	MZR-700
REF.		1608	1607
Function		Amplifier	Power Supply
No of RF inputs Frequency range		2 45 - 862 MHz	—
Gain	dB	(2x) 38	—
RF output level	dBµV	123	—
Mains supply voltage (50/60 Hz)	VAC	—	230 - 240
Output voltage/current		—	+24V / +12V , 700mA
Regulation type		—	switch mode
Consumption for +24V	mA	200	—

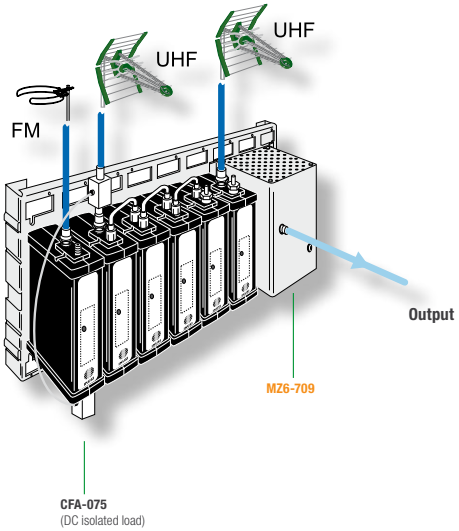
MZR-123

MZR-700

Application example



with MZR-123 power amplifier and MZR-700 power supply



with MZ6-709 amplifier/power supply

Accessories

MODEL	REF.	DESCRIPTION
BAS-916	2229	Base plate with power connecting bar. Capacity: 1p. supply+5 RF modules SZB; or 6 RF modules.
BAS-919	2225	Base plate with power connecting bar. Capacity: 1p. supply+8 RF modules SZB; or 9 RF modules.
BAS-956	1601	Base plate. Capacity: 1 amplifier/power supply+3 filters MZB/MZ6, or 6 filters.
BAS-959	1602	Base plate. Capacity: 1 amplifier/power supply+6 filters MZB/MZ6, or 9 filters.
COF-806	2231	Housing for 1 BAS-916. Dimensions: 294x346x180 mm.
COF-809	2224	Housing for 1 BAS-919. Dimensions: 420x346x180 mm.
COF-812	2233	Housing for 2 BAS-916. Dimensions: 546x346x180 mm.
COF-818	2226	Housing for 2 BAS-919. Dimensions: 798x346x180 mm.
PZB-453	2247	Z plug bridge, F connectors. Length: 45.3 mm.
PZB-465	1579	Z plug bridge, F connectors. Length: 46.5 mm.
CTF-175	1519	Shielded load.
BCF-060	2379	Plug-in 60V AC/DC blocker. F connectors.

BAS-919

BAS-959

COF-806

COF-809

COF-812

PZB-453

CTF-175

BCF-060

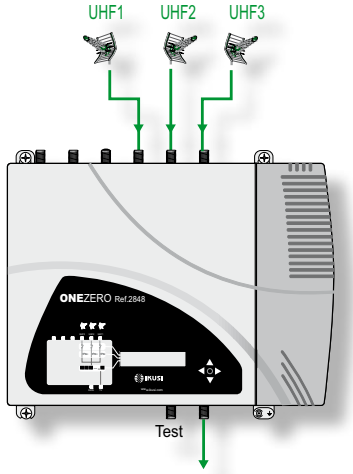
ONEZERO. Programmable Terrestrial Filtering Header

The ONE ZERO model is a programmable terrestrial filtering header, designed to selectively filter analogue and digital UHF channels. It is suitable for individual and collective dwellings and it is the ideal solution to correctly equalise television channels that come through the aerial with different frequencies and amplitudes.

- Self-installation function.
- All settings are automatically memorized.
- Reprogrammable as many times as required. Programmed without the need for external control.
- 10 tuneable UHF filters with the variable band width of 1 to 5 channels.
- Automatic gain control.
- 3 terrestrial inputs with power connection for mast-head amplifiers.
- Internal configuration cloning with transferral to another equipment.
- Unit locking by security code.

MODEL		ONE ZERO		
REF.		2848		
Inputs		**UHF 1**	**UHF 2**	**UHF 3**
Output		**1 (TV)**		
Bandwidth	**MHz**	**470 - 862**		
Number of filters		10		
Number of channels per filter		5		
Input configuration Number of programmable UHF filters per input		10 7 9 2 2	0 0 0 5 7	0 3 1 3 1
Gain	dB	0		
Gain adjustment	dB	30 adjustable +20 step		
Noise figure	dB	< 6		
Optimum input margin	dBµV	50-80 / 70-100		
Return losses input/output	dB	> 10		
AGC precision	dB	± 1		
Selectivity (±10 MHz of channel ends)	dB	10		
Uncoupling between inputs	dB	> 20		
Switchable preamp voltage	V	12-24		
Maximum preamp current	mA	100		
Mains voltage	VAC	230-240		
Consumption	W	12		
Operating temperature	ºC	-5 ... 50		
Mains connector		CEI C8		
Dimensions	mm	300 x 250 x 41		
Packed weight	kg	2.5		

Application example



TV multichannel output to the widebande amplifier

No external programmer required, programmed directly from the headend. programming of the filters through the button and the LCD display

¡extra slim!

NEW!

IKUSI

ONE Series. Programmable Multichannel Amplifiers

CONFIGURABLE output with higer power (123 dBµV)

ONESAT (**Inputs**: 6 TV + 2 Sat ; **Outputs Configuration** : a) TV1 118 dBµV + Sat 1 (116 dBµV)
TV2 118 dBµV + Sat 2 (116 dBµV)
b) TV1 123 dBµV + Sat (116 dBµV)

ONE118 (**Inputs**: 5 TV ; **Outputs**: 1 TV)

- Self-installation function.
- All settings are automatically memorised.
- Reprogrammable as many times as required. Programmed without the need for external control.
- 10 tuneable UHF filters with the variable band width of 1 to 5 channels.
- Terrestrial inputs (BI-FM, BIII-DAB, UHF and EXT) and satellite input with low noise figure.
- Equalisation and automatic gain control.
- Internal configuration cloning with transferral to another equipment.
- Equipment locking by security code.

MODEL			ONESAT (AFP-292)							
REF.			2844							
Inputs			1 BI/FM	1 DAB/BIII	1 EXT (VHF/UHF)	3 UHF 3	3 UHF 2	3 UHF1	1 FI-SAT	1 FI-SAT (passive)
Frequency range		MHz	47 - 108	174 - 240	47 - 240 / 470 - 862	470 - 862			950-2150	
Input configuration Number of programmable UHF filters per input			—			0 1 3 3 1	0 0 0 5 7	10 9 7 2 2	—	
Gain	config TV2 & TV1	dB	30	35	35	35/55 switchable			40	-1,5
	config TV1		35	40	40	40/60 switchable			40	
Gain adjustment		dB	25	20		30			20	
Noise figure		dB	< 6						< 9	
Optimum input margin		dBµV	60-85	60-80		50-100			68-88	
Return losses		dB	> 10							
Selectivity (±10MHz of channels ends)		dB	—			10			—	
Uncoupling between inputs		dB	—			> 20			—	
Output level [1]	config TV2 & TV1	dBµV	**113**	**113**	VHF: **113** UHF: **118**	**118**			**116**	
	config TV1		**118**	**118**	VHF: **113** UHF: **123**	**123**			**116**	
Output level adjustment		dB	20							
AGC tolerance		dB	—			± 1			—	
Switchable preamp voltage		V	—			12-24			0	
Maximum preamp current		mA	—			100			300	
Preamp tones (only SAT)		kHz	—						0-22	
Slope adjustment (sólo SAT)		dB	—						0-9	
Test output		dB	-30							
Mains voltage		VAC	230 - 240							
Consumption			25 W / 0.25 A							
Operating temperature		ºC	-5 ... +50							

[1] TERR: IMD3-60dB, DIN 45004B ; SAT: IMD3 -35dB, EN50083-3. (See channel Reduction Table in Technical Annex)

programming of the filters through the button and the LCD display

Two configurable output modes in ONE SAT:

One output: TV 123 dBµV + Sat (116 dBµV)

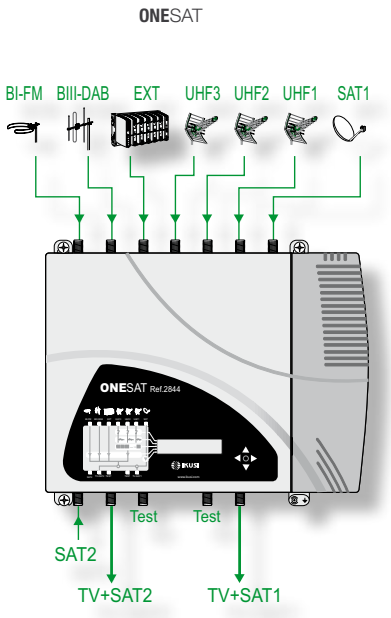
Two outputs: TV 118 dBµV + Sat 1 (116 dBµV)
TV 118 dBµV + Sat 2

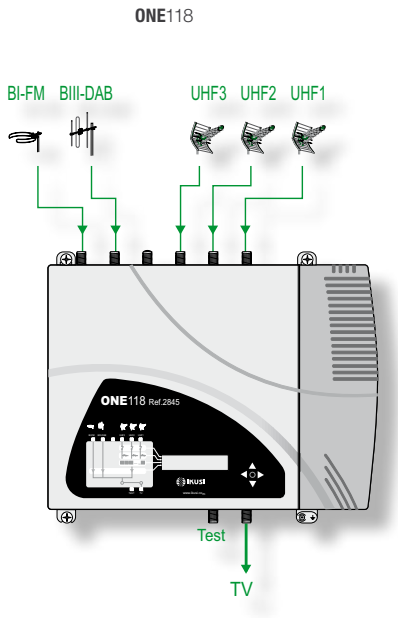
ONE Series. Programmable Multichannel Amplifiers

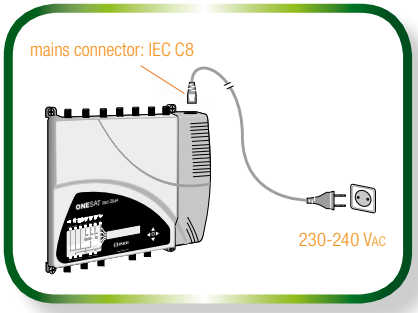
MODEL		ONE118 (AFP-201)				
REF.		2845				
Inputs		BI / FM 1	DAB/BIII 1	UHF 3	UHF 2 3	UHF 1
Frequency range	MHz	47 - 108	174 - 240	470 - 862		
Input configuration Number of programmable UHF filters per input		—	—	0 1 3 3 1	0 0 0 5 7	10 9 7 2 2
Gain	dB	35	40	55		
Gain adjustment	dB	25	20	30		
Noise figure	dB	< 6				
Optimum input margin	dBµV	60-85	60-80	50-100		
Return losses	dB	> 10				
Selectivity (a ±10 MHz of channels ends)	dB	—		10		
Uncoupling between inputs	dB	—		> 20		
Output level [1]	dBµV	118	118	118		
Output level adjustment	dB	20				
AGC tolerance	dB	—		± 1		
Switchable preamp voltage	V	—		12-24		
Maximun preamp current	mA	—		100		
Test outputs	dB	-30				
Mains voltage	VAC	230 - 240				
Consumption		25 W / 0.25 A				
Operating temperature	°C	-5 ... +50				

[1] TERR: IMD3-60dB, DIN 45004B (See channel Reduction Table in Technical Annex).

Application example







NBS SERIES

NEW!

TERRESTRIAL AND SATELLITE AMPLIFICATION HEADENDS

Switchable between 862 MHz and 790 MHz

- *NBS-800*
- *NBS-600*
- *NBS-200*

NBS Series. Terrestrial and Satellite amplification Headend

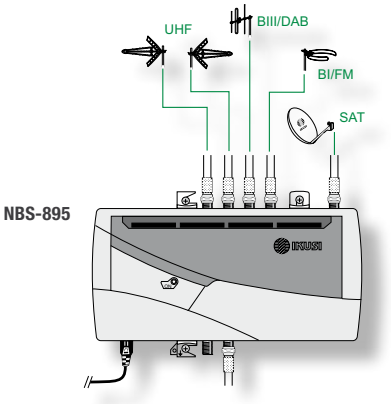
NBS-800

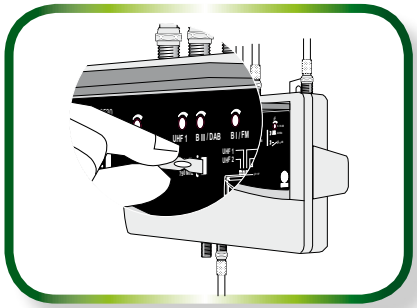
- High-power broadband amplifiers, for terrestrial and satellite signals in small installations.
- Four models: **NBS-801** (1 broadband input ; 1 output),
  NBS-804 (4 inputs BI/FM-BIII/DAB-2xUHF ; 1 output)
  NBS-824 (4 inputs BI/FM-BIII/DAB-UHF1-UHF2 ; 1 output)
  NBS-895 (5 inputs BI/FM-BIII/DAB-2xUHF-IF SAT ; 1 output)
- Input attenuators interstage.
- Powered by switching power supply, in removable box.
- By inserting a bridge, you can select the cutoff frequency low-pass filter in the upper UHF, switchable between 862 MHz and 790 MHz.
- Power passing to input.
- Zamak housing with protective cover for adjustment potentiometers.
- F Connectors. Wall fixing and indoor mounting. Grounding terminal.

Model		NBS-801	NBS-804	NBS-824	NBS-895
Ref.		3531	3532	3533	3534
Inputs		**1**	**4** BI/FM - BIII/DAB - 2xUHF	**4** BI/FM - BIII/DAB - UHF1 - UHF2	**5** BI/FM - BIII/DAB - 2xUHF - IF SAT
Frequency range	MHz	45-862 / 45-790 *	BI/FM: 45-112 BIII/DAB: 174-240 2xUHF: 470-862 / 470-790 *	BI/FM: 45-112 BIII/DAB: 174-240 UHF1: 470-606 ** UHF2: 606-862 * ** 606-790 *	BI/FM: 45-112 BIII/DAB: 174-240 2xUHF: 470-862 / 470-790 * IF SAT: 950-2150
Gain	dB	42	BI/FM: 42 BIII/DAB: 42 2xUHF: 45	BI/FM: 42 BIII/DAB: 42 UHF1: 45 UHF2: 45	BI/FM: 42 BIII/DAB: 42 2xUHF: 45 IF SAT: 40
Gain adjustment	dB	0 - 18	0 - 18	0 - 18	0 - 18
Slope control range	dB	0 - 12	—	—	IF SAT : 0 / 6
Response flatness	dB	±2	BI/FM: ±2 BIII/DAB: ±2 2xUHF: ±1,5	BI/FM: ±2 BIII/DAB: ±2 UHF1: ±1,5 UHF2: ±1,5	BI/FM: ±2 BIII/DAB: ±2 2xUHF: ±1,5 IF SAT: ±2
Output		1	1	1	1
Output test	dB	-30	-30	-30	-30
RF output level	dBµV	TV: 118 (DIN-45004B IMD -60 dB)	TV: 118 (DIN-45004B IMD -60 dB)	TV: 118 (DIN-45004B IMD -60 dB)	TV: 118 IF SAT: 120 (EN 50083-3 IMD -35 dB)
Noise figure	dB	6	BI/FM: 7 BIII/DAB: 7 2xUHF: 8	BI/FM: 7 BIII/DAB: 7 UHF1: 8 UHF2: 8	BI/FM: 7 BIII/DAB: 7 2xUHF: 8 IF SAT: 9
Input/output return loss	dB	10	10	10	TV: 10 FI-SAT: 6
Voltage/current preamplifier mast		12-24V / 100mA	UHF2: 12-24 V / 100 mA	UHF1,2: 12-24V / 100mA	UHF2: 12-24 V / 100 mA IF SAT: 13-18V / 100 mA LNB: 0/22 kHz
Mains supply voltage	VAC	240 (+10% -15%)	240 (+10% -15%)	240 (+10% -15%)	240 (+10% -15%)
Consumption	W	11	11	11	16
Dimensions	mm	230 x 145 x 45	230 x 145 x 45	230 x 145 x 45	230 x 145 x 45

* Switchable frequency range by inserting a plug-in bridge supplied.
** Other crossover channels on request.

1. Compatible with UNICABLE TM





Switchable frequency range by inserting a plug-in bridge supplied

NEW!

NBS Series. Terrestrial and Satellite amplification Headend

NBS-600

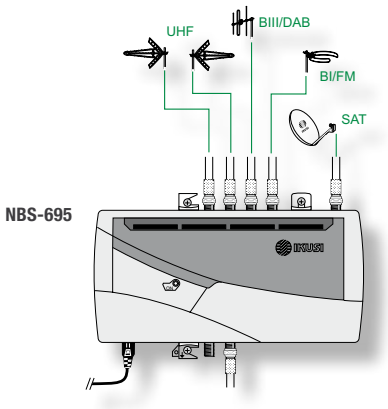
- Mid-power broadband amplifiers, for terrestrial and satellite signals in small installations.
- Two models : NBS-604 (4 inputs BI/FM-BIII/DAB-2xUHF ; 1 output),
  NBS-695 (5 inputs BI/FM-BIII/DAB-2xUHF-IF SAT ; 1 output)

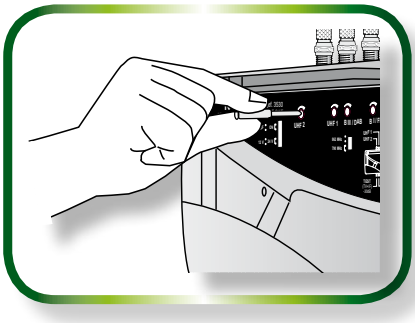
- Input attenuators interstage.
- Powered by switching power supply, in removable box.
- By inserting a bridge, you can select the cutoff frequency low-pass filter in the upper UHF, switchable between 862 MHz and 790 MHz.
- Power passing to input.
- Zamak housing with protective cover for adjustment potentiometers.
- F Connectors. Wall fixing and indoor mounting. Grounding terminal.

Model		NBS-604	NBS-695
Ref.		3529	3530
Inputs		**4** BI /FM - BIII/DAB - 2xUHF	**5** BI /FM - BIII/DAB - 2xUHF - IF SAT
Frequency range	MHz	BI/FM: 45 - 112 BIII/DAB: 174 - 240 2xUHF: 470 - 862 / 470 - 790 *	BI/FM: 45 - 112 BIII/DAB: 174 - 240 2xUHF: 470 - 862 / 470 - 790 * IF-SAT: 950 -2150
Gain	dB	BI/FM: 36 BIII/DAB: 36 2xUHF: 39	BI/FM: 36 BIII/DAB: 36 2xUHF: 39 IF-SAT: 34
Gain adjustment	dB	0 - 18	0 - 18
IF Slope control range	dB	—	0 / 6
Response flatness	dB	BI/FM: ±2 BIII/DAB: ±2 2xUHF: ±1,5	BI/FM: ±2 BIII/DAB: ±2 2xUHF: ±1,5 IF-SAT: ±2
Outputs		1	1
Output test	dB	-30	-30
RF output level	dBµV	112 (DIN-45004B IMD -60 dB)	TV: 112 IF-SAT: 114 (EN 50083-3 IMD -35 dB)
Noise figure	dB	BI/FM: 7 BIII/DAB: 7 2xUHF: 8	BI/FM: 7 BIII/DAB: 7 2xUHF: 8 IF-SAT: 9
Input/output return loss	dB	10	TV: 10 IF-SAT: 6
Voltage/current for preampifiers mast LNB		UHF2: 12-24 V / 100 mA —	UHF2: 0-12-24 V / 100 mA IF-SAT: 0-13-18 V / 100 mA 0/22 kHz
Mains supply voltage	VAC	240 (+10% -15%)	240 (+10% -15%)
Consumption	W	8	11
Mains connector		IEC	IEC
Dimensions	mm	230 x 145 x 45	230 x 145 x 45

* Switchable frequency range by inserting a plug-in bridge supplied.
** Other crossover channels on request.

1. Compatible with UNICABLE TM





Zamak housing with protective cover for adjustment potentiometers

NBS Series. Terrestrial amplification Headend

NBS-200

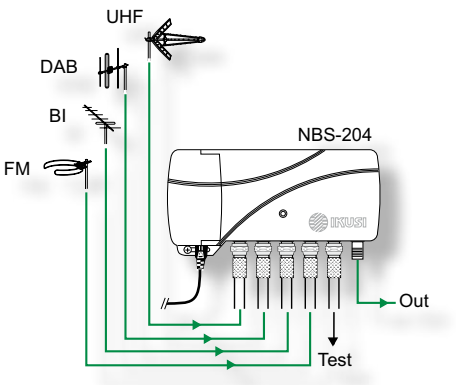
- Low-power broadband amplifiers, for terrestrial signals in small installations.
- Three models : NBS-201 (1 input VHF/UHF ; 1 output),
  NBS-204 (4 inputs BI-FM-BIII/DAB-UHF ; 1 output),
  NBS-241 (1 input VHF/UHF ; 5 outputs)

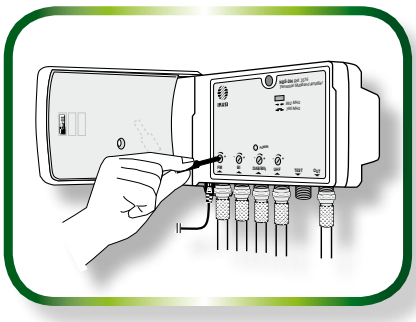
- Input attenuators.
- By inserting a bridge, you can select the cutoff frequency low-pass filter in the upper UHF, switchable between 862 MHz and 790 MHz.
- Zamak chassis housed in plastic box.
- F Connectors. Wall fixing and indoor mounting.

Model		NBS-204	NBS-201	NBS-241
Ref.		3516	3517	3518
Inputs		**4** BI - FM - BIII/DAB - UHF	**1** VHF/UHF	**1** VHF/UHF
Frequency range	MHz	BI: 45 - 68 FM: 88 - 108 BIII/DAB: 174 - 240 UHF: 470 - 862/790*	45 - 862/790*	45 - 862/790*
Gain	dB	BI: 31 FM: 31 BIII/DAB: 31 UHF: 31	31	21
Gain adjustment	dB	BI-FM-BIII/DAB: 0 - 18 UHF: 0 - 15	0 - 15	0 - 15
Slope control range	dB	—	0 - 10/20	0 - 10/20
Response flatness	dB	BI-FM-BIII/DAB: ±2 UHF: ±2	±2	±2
Outputs		1	1	5
Output test	dB	-30	-30	—
RF output level (DIN-45004B IMD -60 dB)	dBµV	106	106	96
Noise figure	dB	BI-FM-BII/DAB: 4.5 UHF: 5	5	5
Input/output return loss	dB	10	10	10
Mains supply voltage	VAC	240 (+10% -15%)	240 (+10% -15%)	240 (+10% -15%)
Consumption	W	3	3	3
Mains connector		IEC	IEC	IEC
Dimensions	mm	155 x 80 x 40	155 x 80 x 40	155 x 80 x 40

* Switchable frequency range by inserting a plug-in bridge supplied.

Application example





Input attenuators

MAC SERIES

NEW!

AV-COFDM STANDALONE MODULATOR

- *MAC-201*
- *MAC-401*

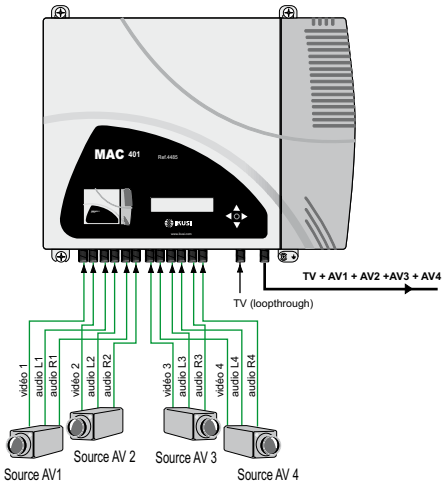
The MAC model is an AV analogue TV signal to COFDM digital TV signal standalone modulator unit. Suitable for individual residential installations, it is an ideal solution for the distribution of analogue video signals with COFDM digital TV modulation in a single standalone unit.

◊ Programming:
- User interface with LCD display and control button for basic configuration.
- User interface from web browser via Ethernet connection.
- All settings are automatically memorised.
- Reprogrammable as many times as required.
- Firmware updated via Ethernet connection with web browser.

MAC Series. AV-COFDM standalone modulator

- 2 or 4 video and stereo audio inputs
- RF COFDM DVB-T output
- Excellent modulation quality MER: 38dB
- Processing and insertion of PSI/SI tables
- LCN support (Logical Channel Number)
- Remote control and firmware updates via web/Ethernet

MODÈLE			MAC-201	MAC-401
RÉF.			4449	4485
Input Section (A/V)	Video inputs		2x CVBS SD	4x CVBS SD
	Video input level	Vpp	0.7 ... 1.4	
	Coding		PAL / NTSC / SECAM	
	Impedance	Ω	75	
	Audio inputs		2x mono/stereo	4x mono/stereo
	Audio input level	Vpp	0.5 ... 4.0	
	Connectors		RCA	
Processing	Video compression		MPG2 Main Profile @ Main Level	
	Maximum resolution		PAL 720X576@25fps NTSC 720X480@30fps	
	Quality		DVD Full D1	
	Audio compression		MPEG1 Layer II	
	Insertion of PSI/SI tables		Yes PAT, PMT, SDT, NIT, TDT, TOT, EIT	
	LCN processing		Yes	
Output Section (COFDM)	DVB-T standard		ETSI EN 300 744	
	Carriers		2K, 4K, 8K	
	Modulation		QPSK, 16QAM, 64QAM	
	Guard intervals		1/4, 1/8, 1/16, 1/32	
	Code rate		1/2, 2/3, 3/4, 5/6, 7/8	
	Frequencies	MHz	51 ... 858	
	Bandwidths	MHz	6, 7, 8	
	Average output power	dBµV	80	
	Output attenuation	dB	1	
	Level adjustment	dB	-15	
	MER	dB	38 (typ.)	
	Band aliasing	dB	≤ 50	
	Band noise (ΔB=8 MHz)	dBc	≤ 70	
	Frequency stability	ppm	≤ ±30	
	Frequency pitch	kHz	1	
	Connectors		2 x F	
	Impedance	Ω	75	
General	Power Supply	Vca	230 - 240	
	Consumption		0.45A /30W	
	Operating temperature	ºC	0 ... +45	
	Dimensions / weight	mm / kg	302 x 251 x 44 / 2.5	
Interface	Standard		Ethernet 10Base-T	
	Local interface		LCD + Joystick	
	Remote interface / updates		Web / Ethernet	
	Languages		English, Spanish, French	



programming through the button and the LCD display

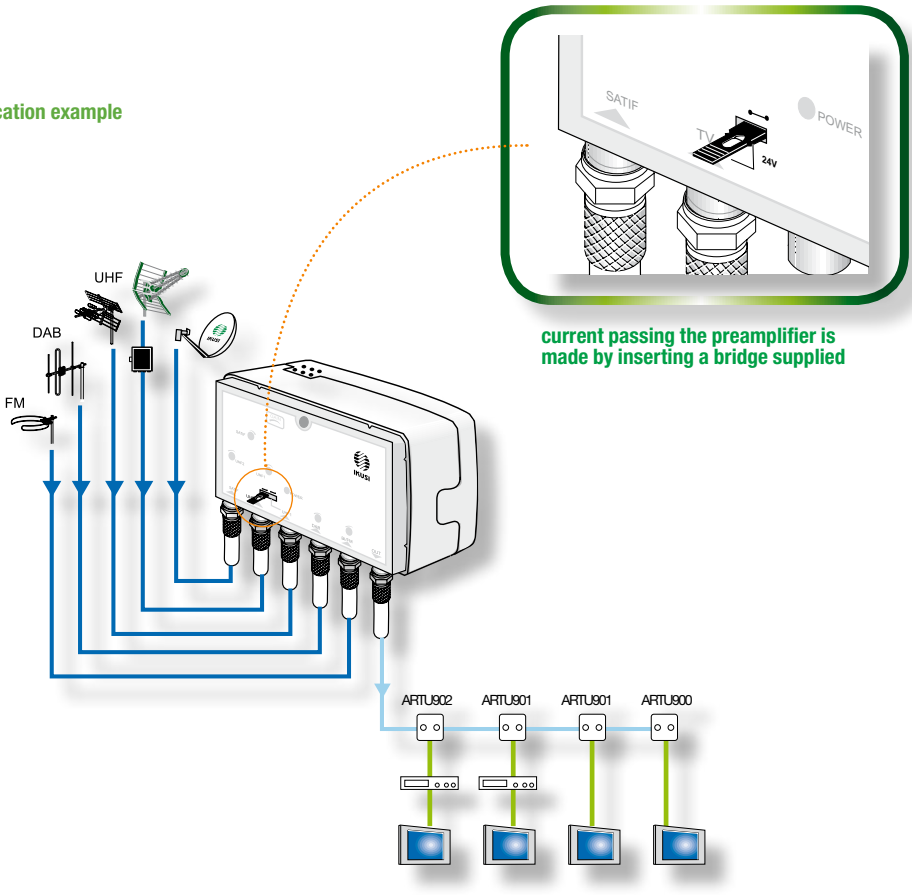
CBM. Terrestrial and Satellite amplification Micro-Headends

- Designed for single-family homes (chalets, villas). Also for small-size collective installation, in cases of only-terrestrial reception.
- Complete range to meet all terrestrial and satellite configuration requirements. Available models with 45-862 MHz "extension" input for combining video/audio modulated sources (surveillance cameras, for example).
- Adjustment pots on the inputs. Small plastic box. F type connection. Indoor mounting. Wall fixing.

MODEL		CBM-175	CBM-184	CBM-193	CBM-113
REF.		3547	3540	3542	3543
RF inputs		**5**	**4**	**3**	**3**
Frequency range		IF - UHF - UHF DAB/BIII - BI/FM	IF - UHF DAB/BIII - BI/FM	IF - TV (BI a BV) DAB/BIII - BI/FM Ext (45-862 MHz)	UHF - VHF Ext (45-862 MHz)
Nominal gain	dB	IF:27-32 UHF: 29 UHF: 29 DAB/BIII: 30 BI/FM: 29	IF:27-32 UHF: 31 DAB/BIII: 30 BI/FM: 29	IF:27-32 TV: 29-32 Ext: 17-20	UHF:31 VHF: 30 Ext: 17-20
Attenuation adjustment on the inputs	dB	IF: 0-18 UHFs: 0-15 VHFs: 0-18	IF: 0-18 UHF: 0-15 VHFs: 0-18	IF: 0-18 TV: 0-15 Ext: 0-10	UHF: 0-15 VHF: 0-18 Ext: 0-10
Noise figure	dB	IF, UHF: ≤ 9 rest: ≤ 7	IF: ≤ 9 rest: ≤ 7	IF: ≤ 9 TV: ≤ 7	≤ 7 (except Ext)
Input return loss	dB	IF: ≥ 6 rest: ≥ 10			
IF signal output level	dBµV	106 IMD3 -35 dB			
Terrestrial signal output level	dBµV	106 IMD3 -60 dB			
Powering voltage (50/60 Hz)	VAC	100 - 240			
Voltage/Current for preampl.		+24 VDC / 60 mA			
Consumption	W	4			
Dimensions	mm	120x85x50			

CBM-184

Application example



current passing the preamplifier is made by inserting a bridge supplied

AFI. Sat-IF Combiner/Amplifier

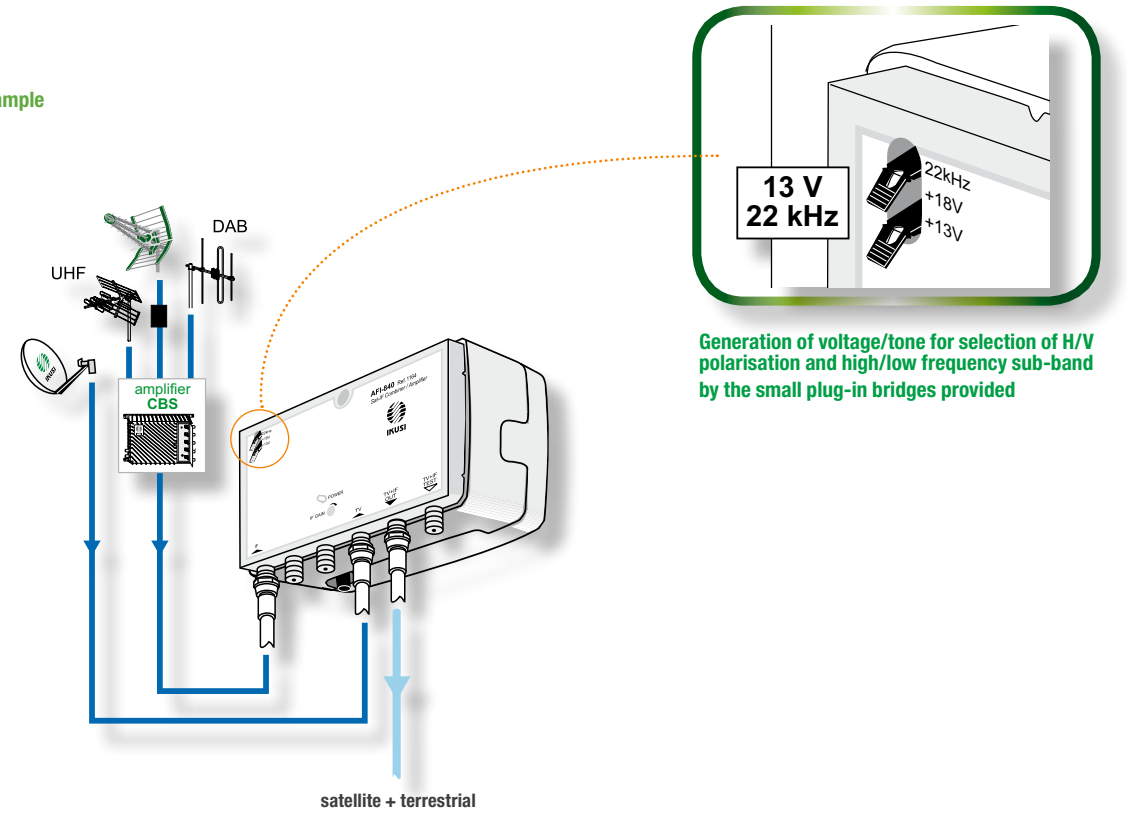
- 1 Satellite 950-2150 MHz input port, with adjustable gain and pre-emphasized response to compensate for cable losses;
- 1 Terrestrial coupling 5-862 MHz input port; 1 Combined Satellite+Terrestrial output port; 1 output test port. F type connection.
- Mains powered 50/60 Hz. Electrical safety protection level: Class II. Mains lead and plug included.
- Line powering of LNB. Generation of voltage/tone for selection of H/V polarisation and high/low frequency sub-band by the small plug-in bridges provided.
- Small plastic box, with protective cover. Internal zinc alloy chassis. F type connection.
- Indoor mounting. Wall- fixing.

MODEL		AFI-840
REF.		1164
Sat-IF band	MHz	950 - 2150
Response flatness	dB	± 1.5
Gain	dB	34 - 40 (6 dB fixed slope)
Continuous gain adjustment	dB	0 - 18
Output level (-35 dB IMD3, EN 50083-3)	dBµV	120
Input/output return loss	dB	≥ 6
Noise figure	dB	< 9
TV band	MHz	5 - 862
TV coupling loss	dB	≤ 1.5
Output test (TV+IF)	dB	-30 ±1.5
Mains voltage	VAC	100 - 240
Consumption	W	6
Insertable voltage/tone to SAT-IF input port		+13 VDC / +18 VDC [1] 0 / 22 kHz [1]
Max LNB power current	mA	200 (at +13 VDC & at +18 VDC)
Dimensions	mm	120x85x50

[1] Selection by plug-in bridges.

AFI-840

Application example



satellite + terrestrial

Generation of voltage/tone for selection of H/V polarisation and high/low frequency sub-band by the small plug-in bridges provided

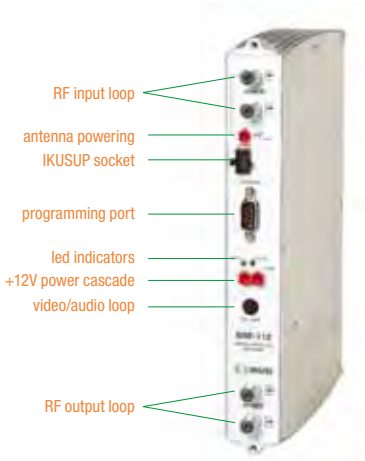
Range and General Features

ClassA is a complete range of functional modules for processing of analogue and digital terrestrial, satellite, cable and baseband signals. It also includes optical transmitters and receivers and IP streamers. All modules have identical format and simply to place on a wall-fixing baseplate or n a 6RU rack-frame. All connection and control ports are located on the front panel.

PROGRAMMING AND FIRMWARE UPDATE

ClassA modules are programmed and set locally with the SPI-300 programming unit from IKUSI. If an HMS control unit is installed in the headend, programming and setting can be done remotely with a PC and a standard browser. Parameter values are controlled in each module by a built-in, powerful microprocessor and remain unalterable unless they are modified with the SPI or PC.

programmed and set locally with the SPI-300 programming unit from IKUSI



ClassA module

FUNCTIONAL DESCRIPTIONS

- Signal processing:
  Terrestrial & Satellite / Analog & Digital
- Software for local and remote programming
- Firmware update from our website
- Agile & adjacent channels
- VSB or DSB output channel spectrums
- B/G, D/K, I, L TV systems
- Mono, A2 or NICAM stereo/dual sonds
- Embedded Conditional Access:
  . Viaccess ™
  . Conax ™
  . Mediaguard ™
  . Videoguard (Viasat)

AGILITY AND ADJACENT CHANNELS

ClassA modules feature frequency agility handled by a high-performance PLL heterodyne double conversion. The broadband noise floor generated is exceptionally low, so multiple modules can be installed in the headend with very little deterioration of the CNR. The use of SAW filters provides, on the other hand, a true vestigial sideband response that enables frequency planning using adjacent channels.
These characteristics mean the installations are highly flexible and the maintenance problems are simplified.

VIDEO/AUDIO LOOP AND BISS OPERATION

ClassA receivers have an external video/audio loop that is switchable under control software. So, these receivers can be used in scrambling systems (vHOTEL from IKUSI, for example).
The receivers can also operate in BISS systems (Basic Interoperable Scrambling Systems).

Wall-fixing ClassA Headend

Rack-mountable ClassA Headend

HMS. Headend Control Unit

HMS-120

APPLICATION

The HMS-120 unit provide advanced remote control features for ClassA headends. These features include sending alarms via SMS, detecting RF levels of the headend multichannel output signal, automatically equalising these levels and the possibility of scheduling parameter settings, generating OSD messages and updating firmwares. The

The HMS units include a web server which allows the control operation to be performed from any local or remote PC using a standard browser.

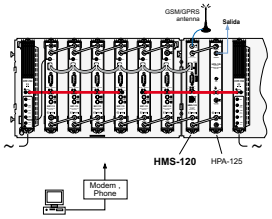
The control unit is positioned in the ClassA headend as the last module on the right of the cascade of signal modules (processors, receivers, transmodulators, regenerators). The installation of the communication local bus (IKUSUP) along the modules is required, as well as the connection of a tapped signal from the HPA amplifier to the HMS control unit.

Access Interfaces

The HMS control units have two interfaces for remote communication:

- A GSM/GPRS interface which uses an internal modem to perform control operations from any remote PC connected to the modem telephone number. A slot on the front panel allows to insert the SIM card.
- An Ethernet interface which, via an external modem/router, allows monitoring from any remote PC connected to Internet. If the headend is installed in a LAN environment, the control operations can be performed from any PC integrated therein. The interface also allows local use of a PC connected directly connected to the HMS module.

MODEL	HMS-120
REF.	4435
INFO channel	NO



SOFTWARE

Operation software embedded
Web server
Internal GSM/GPRS modem
HTTP and support for SNMP v2
Access password
Multi-language support (english, spanish, french)

MONITORING/PROGRAMMING

Monitoring/Programming of headend through a web browser
Identification of the headend and dates of interventions
Reading of the RF level outgoing from each signal module
Reading of the RF levels of the multichannel signal outgoing from the headend
Equalization of the RF multichannel signal outgoing from the headend
Scheduling of parameter settings, OSD messages and firmware updates
Statisticians
Automatic alarm advertisements via SMS
Configuration of the HMS module through a PC

READING OF MODULES' RF OUTPUT LEVELS

Frequency range : 45-862 MHz
Range of levels : 55-90 dBµV
Accuracy of the reading : ±1.5 dBµV

GSM/GPRS MODEM

Frequency range:
GSM900 → Tx: 880-915MHz ,, Rx: 925-960MHz
GSM1800 → Tx: 1710-1785MHz ,, Rx: 1805-1880MHz
Threshold: < -102 dBm
RF output power : 2W (GSM900) , 1W (GSM1800)
Frontal slot for SIM card
Antenna — 7cm height, 50 Ω impedance

READING OF LEVEL OF MULTICHANNEL SIGNAL TAPPED FROM HEADEND RF OUTPUT

Frequency range : 45-862 MHz
Range of levels : 55-90 dBµV
Accuracy of the reading : ±1.5 dBµV

LOCAL COMMUNICATION BUS

Electrical interface : RS-485 differential pair, full-duplex
Protocol : IKUSUP
Main feature : Automatic assignation of addresses to the modules of the headend

'TERMINAL' PORT

Electrical interface : V28/RS-232

INFO CHANNEL (only HMS-130)

Frequency range : 45-862 MHz
TV System : B-G-D-K-I-L, Pal-Secam
Adjustable output level : 70-80 dBµV

CONNECTORS

GSM antenna : FME
RF input (headend output's tapping) : female F
Local bus : 2x 4-pin socket
Monitoring : RJ-45
Terminal : DB-9
GSM modem card : SIM socket
RF output (loop-through) : 2x F female
DC : banana sockets
Peripheral accessories : USB

MONITORING ETHERNET PORT

Standard : IEEE 802.3 10/100 BaseT
Bit rate : up to 100 Mbps
Transmission protocol : TCP/IP

INDICATOR LEDS

POWER
STATUS
GSM (GSM link)
ALARM
LINK (ethernet link)
ACT (ethernet activity)

GENERAL

Supply voltage : +12 VDC
Consumption : 600 mA
Operating temperature : 0° to +45°C
Dimensions : 230 x 195 x 32 mm

SPI-300. Programming Unit

MODEL	SPI-300
REF.	4070

- For programming the ClassA modules. Cable connection to the DB-9 front panel socket.
- 20x4 character alphanumerical display. Numerical and function keys.
- Microprocessor controlled. User friendly software (selectable language: english, spanish, french). Built-in diagnostic and error identification. Module firmware update. Firmware of the SPI-300 can also be updated through a PC.
- Capacity of 500 preset memory allocations for repetitive ClassA module configurations.
- No battery required. Powered through the interface lead (max consumption: 150 mA). DC jack to connect a +15 VDC voltage from an auxiliary power supply when updating the internal firmware through a PC.
- Dimensions: 160x75x40 mm.

SPI-300

HPA. 47-862 MHz RF Power Amplifiers

MODEL			HPA-125	HPA-120
REF.			4427	4426
Technology			Push-pull	Push-pull
Bandwidth		MHz	47 - 862	47 - 862
Gain		dB	45	47
Interstage variable attenuator		dB	0 - 20	0 - 20
Noise figure		dB	≤ 6	≤ 6
Output level (IMD3 -60dB, DIN 45004B)		dBµV	≥ 125	≥ 120
Output level (IMD2 -60dB, DIN 50083-3)		dBµV	≥ 120	≥ 115
Input test		MHz	-20 ±1,5	-20 ±1,5
Output test		dB	-30 ±1	-30 ±1
Extension input	Bandwidth	MHz	47 - 862	47 - 862
	Gain	dB	6	6
Supply voltage		VDC	+12	+12
Consumption		mA	830	600
Dimensions		mm	230x195x32	230x195x32

HPA-125

CFP. Power Supplies

MODEL		CFP-700	CFP-507	CFP-500
REF.		4401	4439	4429
Regulation type		switch mode		
Mains supply voltage (50/60 Hz)	VAC	110 - 240		230 - 240
Outputs		+12 V (5A) for ClassA modules +24 V (60 mA) for mast-head preamplifiers +18 V (300 mA) +18 V / 22 kHz (300 mA) +13 V (300 mA) +13 V / 22 kHz (300 mA)	+12 V (7 A) for ClassA modules and LNB +24 V (60 mA) for mast-head preamplifiers	+12 V (5.3 A) for ClassA modules and LNB +24 V (60 mA) for mast-head preamplifiers
Max total current for +24, +18 and +13 V	mA	700	—	
Efficiency	%	75		
Dimensions	mm	230x195x32		

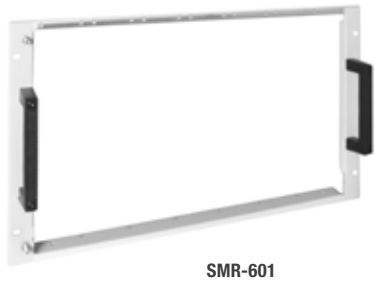
CFP-700

Installation Accessories

MODEL	REF.	DESCRIPTION
BAS-700	4403	Base plate. Capacity: 7 modules. Dimensions: 441x257x24 mm.
BAS-900	4411	Base plate. Capacity: 9 modules. Dimensions: 563x257x24 mm.
COF-700	4402	Housing for 1 BAS-700. Dimensions: 430x341x258 mm. Indoor mounting. Metallic. Lock/key closing system.
CTF-175	1519	75Ω load plug. To load both input tap-line(s) and output coupling line in a ClassA headend.
BUS-013	4430	Pack containing 11 (10x short + 1x long) jumpers for IKUSUP communication bus between ClassA modules.
CDP-102	4704	2-pair shielded, twisted cable (1m) to assemble the PC ↔ headend connecting cable.
COR-220	3616	Europe Schuko power cord, 1.5m. CEE 22 moulded socket on one end and a moulded plug on the other.
SMR-601	4280	Rack-frame for ClassA assemblies, 6U hight. Easy integration in standard 19" racks. Capacity: 7 modules.
PMR-601	4281	Fixing-plate to fasten a ClassA module to the SMR-600 rack-frame.
OMR-601	4282	6U - 12E (260x60 mm) blank panel to fill the unoccupied places on the SMR-601 rack-frame.

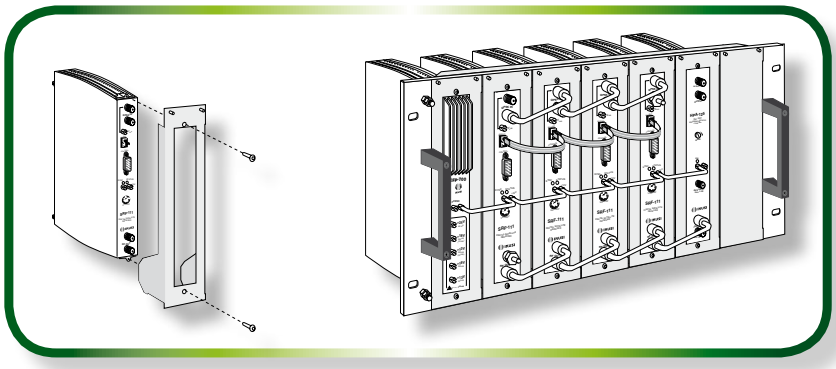
BAS-900

COF-700



SMR-601

PMR-601 OMR-601



Installing the modules in rack

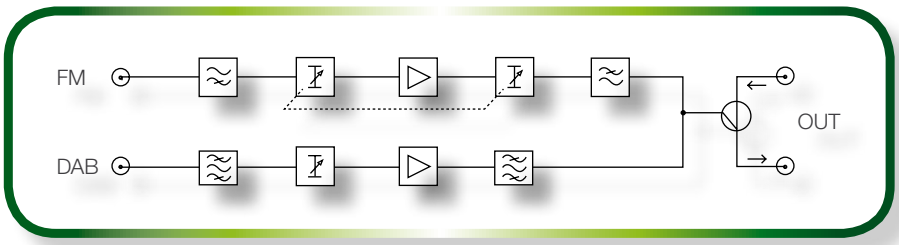
TBA. FM & DAB Radio Amplifier

- Insertion of FM and DAB radios in ClassA headends.
- FM and DAB separate amplification paths with gain adjustment by front panel attenuators. The FM attenuation is shared in two sections —behaviour-delayed input and interstage—, for maintenance of low noise figure.
- Output loop-through.
- Two "banana" sockets for +12 VDC power cascade.

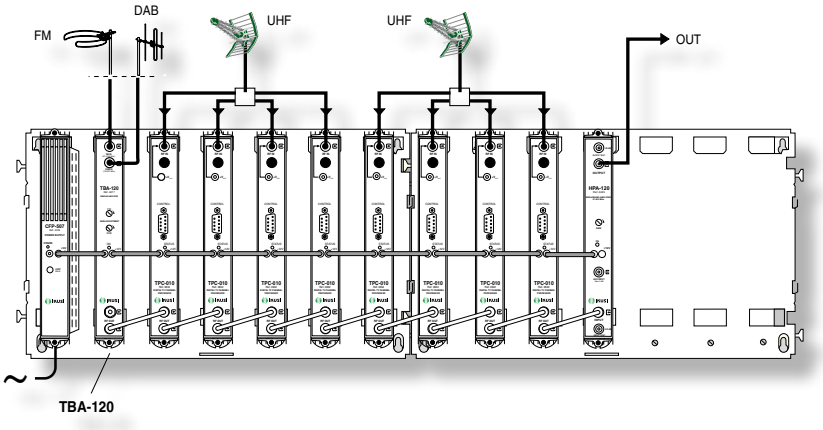
MODEL		TBA-120
REF.		4277
Inputs		2 FM (87.5 - 108 MHz) DAB (195 - 223 MHz)
Response flatness	dB	± 1
Nominal FM gain	dB	10
Nominal DAB gain	dB	2
Variable FM attenuator	dB	0 - 40
Variable DAB attenuator	dB	0 - 20
Noise figure	dB	< 8
FM output level (-50dB IMD3, 2 carriers)	dBµV	80
DAB output level (-50dB IMD3, 2 carriers)	dBµV	80
Output loop-through loss	dB	1.5
Supply voltage	VDC	+12
Consumption	mA	175
Dimensions	mm	230x195x32

The module is packed with:
- 1 F plug bridge, 64 mm length, for output coupling line.
- 1 DC plug bridge, 53 mm length, for connection of +12 VDC voltage.

Block diagram



Application example



TBA-120 installed in a TV channel processing «TPC» headend.

TBA

TPC. Terrestrial/Cable TV Channel Processing Equipment

- Agile Processing Modules, usable either as channel converters (output channel is different to input channel) or as channel processors (output channel is the same as input channel). Adjacent channel operation at input and output.

Channel Processors - Digital & Analogue

MODEL		TPC-110	TPC-010	
REF.		3843	3842	3651
Type of application channel		Digital	Digital	Analogue
Remote Programming Function		YES	NO	NO
TV System/Standard		B/G ,, D/K ,, I ,, L ,, DVB-T ,, DVB-C		B/G ,, D/K ,, I ,, L
Frequency band of input TV channel	MHz	45 - 862		
Selectable output channel located between:	MHz	45 - 862		
Frequency selection steps	MHz	0.500		0.250
Selectable tuning offset	kHz	(±) 125 / 250 / 375 / 500		
Input level (CAG 40 dB ; manual adjustment for L-system channels)	dBµV	40 - 80		50 - 90
Adjustable output level	dBµV	55 to 70		65 to 80
Supply voltage	VDC	+12		
Consumption	mA	590	540	

TPC-010

FUNCTIONAL DESCRIPTION OF THE TPC PROCESSORS

In a TPC module can be distinguished three main sections:

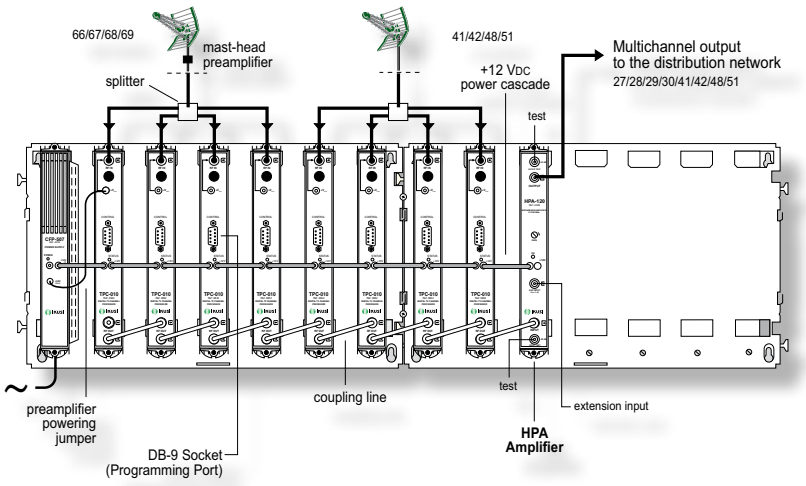
a) "Input Channel → IF" conversion. Includes a delayed AGC circuitry that operates in the 50-90 dBmV (analog) or 40-80 dBmV (digital) input level ranges.

b) IF filtering. A double SAW filter is used, what provides very high selectivity (>70 dB at ±5.25 MHz from the centre for 8MHz-wide channels).

c) "IF → Output Channel" conversion. The output level can be adjusted between 65 and 80 dBmV.

Programming of a TPC processor involves the following selections and settings:

- Input Frequency. Is the picture carrier for analog channel and the central frequency for digital channel.
- Tuning Offset (TPC-110 only). Applicable when a strong adjacent channel interferes with the channel being processed.
- AGC on/off. The automatic gain control must be switched off for system L channels.
- Manual Gain Control, only if the AGC function has been disabled.
- IF Bandwidth. Two options: 7 or 8 MHz.
- Output Frequency. Same indications stated above for input frequency.
- RF output level. 15 dB adjustable.



Example of TPC headend for conversion on three channels and processing of other five ones.

TPC

TRF. Free-To-Air Digital Terrestrial TV Reception Equipment

- Terrestrial TV reception, standard DVB-T / MPEG-2 (EN 300 744).
- Digital-to-Analogue Transmodulation Process (COFDM → AM) that presents the clear TV programmes transmitted in COFDM Terrestrial-TV channels on conventional VHF/UHF channels (any TV system and Colour system).

COFDM Receivers

MODEL	Output TV channel spectrum **VSB** (Vestigial Side Band)		TRF-011	TRF-112
REF.			4085	4420
Remote Programming Function			NO	YES
Output channel TV system			B / G / D / K / I / L	B/G
Output channel audio system			Mono [1]	A2
Output channel colour system			PAL , SECAM , NTSC	
Input frequency		MHz	174 - 230 and 470 - 862	
Input level		dBµV	35 ... 100	
Selectable output channel located between:		MHz	45 - 862	
Adjustable output level		dBµV	65 to 80	
Supply voltage		VDC	+12	
Consumption		mA	590	640

1 When selecting a stereo audio service, the output channel sound carrier is modulated with the "L+R" sum. If the audio service selected is dual, the carrier can be modulated with any of the "audio1", "audio2" or "audio1+audio2" signals.

TRF-112

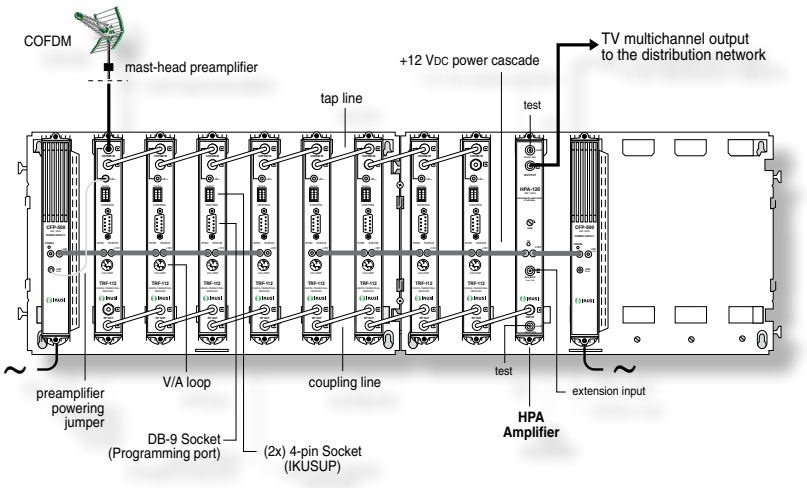
FUNCTIONAL DESCRIPTION OF THE TRF RECEIVERS

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

- tunes a COFDM digital channel within the BIII or UHF bands,
- selects a TV programme from the multiplex being received, and
- directs it to a conventional TV channel which is selectable throughout the 45-862 MHz band.

Programming of each module involves the following selections and settings:

- Central Input Frequency (125 kHz increments).
- Bandwidth (7 or 8 MHz).
- Hierarchy Level (high or low priority).
- TV Programme and Audio Service.
- Parameters of the output TV channel (video carrier frequency, TV system, colour system, video modulation depth, audio modulation index, carrier level ratio, output level).
- Image Format. Possible conversions are 16:9 to 4:3 Pan&Scan and 16:9 to 4:3 Letter-Box.



Example of TRF headend for eight clear digital terrestrial TV programmes.

TRF

ClassA

TDI. Digital Terrestrial COFDM-QAM Transmodulation Equipment

- Digital Transmodulation (COFDM → QAM) with Transport Stream Processing. The COFDM channels located in the 174-230 MHz or 470-862 MHz bands are transformed to QAM channels (16 to 256 symbols) located in the 47-862 MHz band. NIT table can be adapted to the new network created.

A TDI headend includes:

As many TDI Transmodulators as QAM channels to be distributed.
One HPA Amplifier that amplifies the sum of the combined output QAM channels from the transmodulators.
One or more CFP Power Supplies.
One or more Rack-Frames or wall-fixing Base-Plates. The base-plates can be joined horizontally.
Usually, housing units for the base-plates.
If the headend is large, one or more AMX-400 combiners.

The TDI headends provide a QAM multichannel signal whose level is appropriate to feed the distribution network. An extension input at the HPA amplifier allows easy coupling of the wideband 47-862 MHz signal provided by another existing headend. The user requires a DVB-C Receiver to convert the QAM signals into the appropriate signals that can be accepted by a conventional TV set, and to control access to encrypted TV programmes.

TDI-900

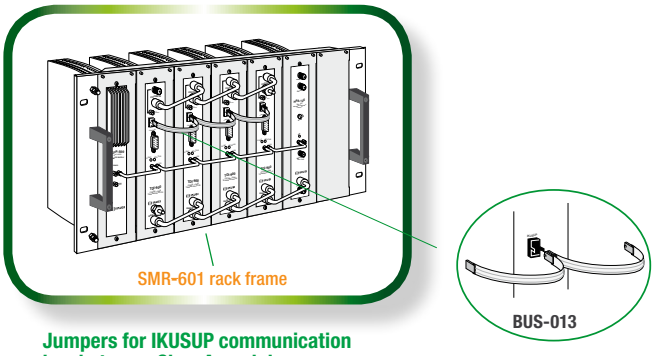
FUNCTIONAL DESCRIPTION OF THE TDI TRANSMODULATORS

A TDI transmodulator carries out the complete channel processing from the input to the output:

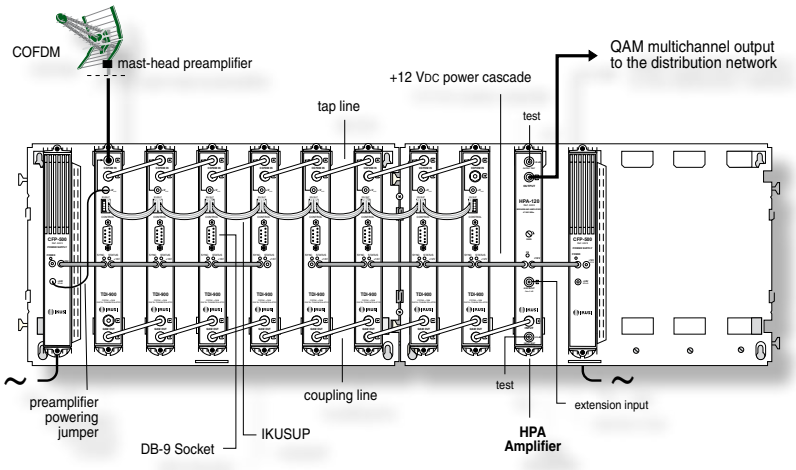
- tunes a COFDM digital channel,
- demodulates the signal being received,
- processes the transport stream, and
- re-modulates it in QAM format (16, 32, 64, 128 or 256 symbols) on an RF channel that is selectable within the 45-862 MHz frequency range.

Programming of the module involves the following selections and settings:

- Central Input Frequency (125 kHz increments)
- Bandwidth (7 or 8 MHz)
- Hierarchy Level (high or low priority)
- Central Output Frequency (250 kHz increments)
- Output Modulation Scheme (16, 32, 64, 128 or 256QAM)
- Roll-Off factor (“half Nyquist filter”)
- RF Output Level
- Output Symbol Rate
- Service and Conditionnal Access Blockade



Jumpers for IKUSUP communication bus between ClassA modules



Example of TDI headend for eight digital terrestrial channels.

TDI. Digital Terrestrial COFDM-QAM Transmodulation Equipment

COFDM-QAM Transmodulator

MODEL			TDI-900
REF.			4021
Transport Stream (TS) processing			YES
Input Section (COFDM)	Standard		EN 300 744
	Input frequency	MHz	174 - 230 and 470 - 862
	Bandwidth	MHz	7 ,, 8
	Mode (automatic detection)		2K ,, 8K
	Constellation (automatic detection)		
	Hierarchy		High Priority ,, Low Priority
	Input level	dBµV	35 ... 100
	Input loop-through gain	dB	0.5 (±
	Guard interval (automatic detection)		1/2 ,, 1/8 ,, 1/16 ,, 1/32
QAM Re-modulation Section	Data processing		EN 300 429
	Selectable Modulation Scheme of output signal		16QAM ,, 32QAM ,, 64QAM ,, 128QAM ,, 256QAM
	MER (Modulation Error Ratio)	dB	> 40
	Output symbol rate	MS/s	1 ... 8
	Selectable Roll-Off factor	%	12 ,, 13 ,, 15
Output Section (QAM)	Selectable output channel located between:	MHz	47 - 862
	Adjustable output level	dBµV	65 to 80
	Output loop-through loss	dB	1.1
	Spurious in band	dBc	< -55
	Broadband noise (ΔB=5 MHz)	dBc	< -75
General	Supply voltage	VDC	+12
	Consumption	mA	600
	Operating temperature	ºC	0 ... +45
	Input RF connector type		(2x) female F
	Output RF connector type		(2x) female F
	DC connector type		"banana" socket
	Programming Interface		RS 232 / DB-9
	IKUSUP bus connector		(2x) 4-pin socket
	Dimensions	mm	230 x 195 x 32

• The module is packed with:
- 2 F plug bridges, 64 mm length, for input tap line and output coupling line.
- 1 DC plug bridge, 53 mm length, for connection of +12 VDC voltage.

FUNCTIONS OF THE TS PROCESSING

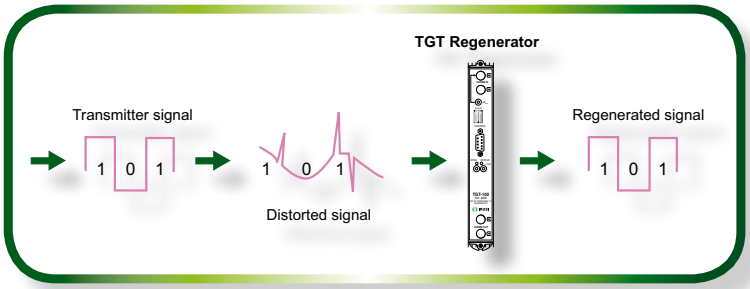
- Bit Rate adaptation with PCR restamping
- Adaptation of NIT table
  Adaptation to the particular adjustments of the headend is automatic.
  Name and identifier of the new network can be edited.
- Service and CA blockade
  Blockade is at service level and at conditional access level.
  Automatic regeneration of PAT, SDT and CAT tables.
- TS monitoring
  Usage level of the Transport Stream —percentage of null packets— is presented along the programming process.

Abbreviations

CA : Conditional Access
CAT : Conditional Access Table
NIT : Network Information Table
PAT : Program Association Table
PCR : Program Clock Reference
SDT : Service Description Table
TS : Transport Stream

TGT. COFDM-COFDM Regeneration Equipment

- The TGT is a COFDM → COFDM Transport Stream Regenerator/Processor. The product is designed to correct and rebuild a poor quality COFDM signal back to Quasi Transmission Standard. The product also allows the user to change various parameters of the regenerated COFDM stream at the output.
- A TGT headend includes:
  - As many TGT Regenerators as COFDM channels being received.
  - One or more AMX-400 combiners if the headend being assembled is extensive.
  - One HPA Amplifier to launch the combined output COFDM channels from the regenerators.
  - One or more CFP Power Supplies.
  - One or more Rack Frames or wall mounting Base Plates. The base plates can be joined horizontally.
  - Housing units for the base plates if required.
- The TGT headends deliver a multichannel COFDM signal with sufficient power to drive a distribution network. An extension input at the HPA amplifier allows easy coupling of the wideband 47-862 MHz signal provided by other existing headend equipment.



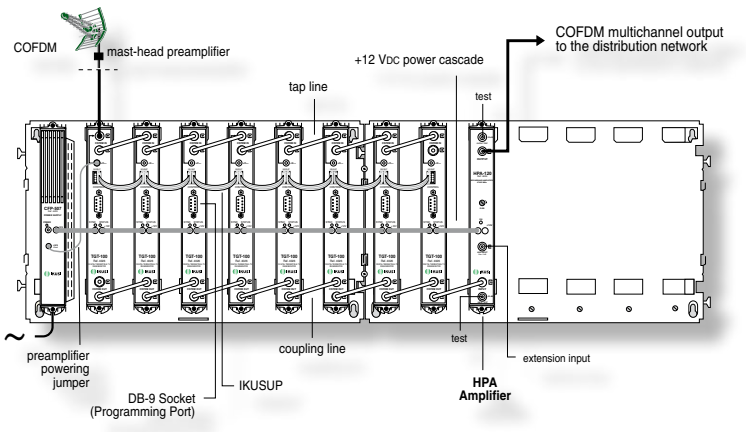
FUNCTIONAL DESCRIPTION OF THE TGT REGENERATORS

A TGT module carries out the complete COFDM stream regeneration plus full processing from input to output:

- tunes a COFDM digital channel in the range between 174-230 MHz or 470-862 MHz bands,
- demodulates the received signal,
- corrects errors within the actual COFDM data stream,
- processes the transport stream, and
- re-modulates an errorless data stream into an RF COFDM channel anywhere between 47-862 MHz.

Programming of the module involves the following selections and settings:

- Central Input Frequency (125 kHz steps)
- Bandwidth (7 or 8 MHz)
- Hierarchy Level (high or low priority)
- Central COFDM Output Frequency (1 kHz steps)
- Output Channel Bandwidth (6, 7 or 8 MHz; & 5 MHz for DVB-H)
- Output Operation Mode (2K or 8K; & 4K for DVB-H)
- Output Constellation (QPSK, 16QAM or 64QAM)
- Output Code Rate (1/2, 2/3, 3/4, 5/6 or 7/8)
- Output Guard Interval (1/4, 1/8, 1/16 or 1/32)
- RF Output Level
- FFT Window (Fast Fourier Transform), to reduce interference on adjacent channel
- In-depth Interleaving (only for DVB-H; with 2K and 4K modes)
- Optional Blockade of Services, PIDs and Conditional Accesses, with Regeneration of Tables
- NIT Regeneration (Adaptation)



Example of «TGT» headend for eight COFDM-modulated channels.

TGT

TGT. COFDM-COFDM Regeneration Equipment

COFDM-COFDM Regenerator

MODEL			TGT-100
REF.			4026
Remote mode			YES
Transport Stream (TS) processing			YES (see functions below)
Input Section (COFDM)	Standard		EN 300 744
	Input frequency	MHz	174 - 230 and 470 - 862
	Bandwidth	MHz	7 ,, 8
	Mode (automatic detection)		2K ,, 8K
	Cosntellation (automatic detection)		QPSK ,, 16QAM ,, 64QAM
	Hierarchy		High Priority ,, Low Priority
	Input level (contellation: 64QAM/code rate: 2/3)	dBµV	35 ... 100
	Input loop-trhough gain	dB	0.5 (±1)
	Guard interval (automatic detection)		1/4 ,, 1/8 ,, 1/16 ,, 1/32
COFDM Re-modulation Section	Data processing		EN 300 744
	Operation modes		2K ,, 4K (DVB-H) ,, 8K
	Constellation		QPSK ,, 16QAM ,, 64QAM
	Code rate		1/2 ,, 2/3 ,, 3/4 ,, 5/6 ,, 7/8
	Guard Interval		1/4 ,, 1/8 ,, 1/16 ,, 1/32
	In-depth interleaving (only on DVB-H)		Applicable (on 2K and 4K modes)
	MER (Modulation Error Ratio)	dB	> 38 (typ.)
Output Section (COFDM)	Selectable output channel located between:	MHz	47 - 862
	Bandwidth	MHz	5 (DVB-H) ,, 6 ,, 7 ,, 8
	Adjustable output level	dBµV	65 to 80
	Frequency stability	ppm	≤ ± 10
	Output loop-through loss	dB	1.1
	Spurious in band	dBc	< -50
	Broadband noise (ΔB=8MHz)	dBc	< -75
General	Supply voltage	VDC	+12
	Consumption	mA	600
	Operating temperature	°C	0 ... +45
	Input RF connector type		(2x) female F
	Output RF connector type		(2x) female F
	DC connector type		"banana" socket
	Programming interface		RS 232 / DB-9
	IKUSUP bus connector		(2x) 4-pin socket
	Dimensions	mm	230 x 195 x 32

- The module is packed with:
  - 2 F plug bridges, 64 mm length, for input tap line and output coupling line.
  - 1 DC plug bridge, 53 mm length, for connection of +12 VDC voltage.

FUNCTIONS OF THE TS PROCESSING

- Bit Rate adaptation with PCR restamping
- Adaptation of NIT table
  Adaptation to the particular adjustments of the headend is automatic.
  Name and identifier of the new network can be edited.
- Service and CA blockade
  Blockade is at service level and at conditional access level.
  Automatic regeneration of PAT, SDT and CAT tables.
- TS monitoring
  Usage level of the Transport Stream —percentage of null packets— is presented along the programming process.

Abbreviations

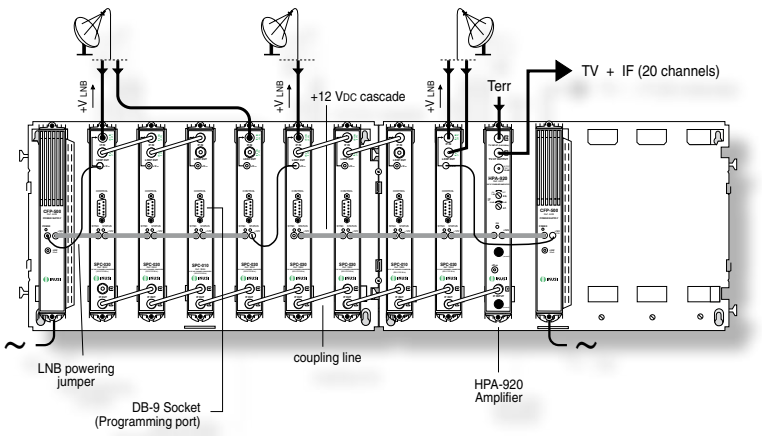
CA : Conditional Access
CAT : Conditional Access Table
NIT : Network Information Table
PAT : Program Association Table
PCR : Program Clock Reference
SDT : Service Description Table
TS : Transport Stream

SPC. Satellite IF-IF Conversion Equipment

- Frequency conversion of Sat-IF channels coming from different satellites or polarizations in order to establish a new frequency plan where all the converted channels are transmitted on a single cable.
- Use with digital channels. Range includes two types of converters:
  - **SPC-010** Single Converter. Conversion of one channel.
  - **SPC-030** Triple Converter. Conversion of three channels.
- An SPC headend includes:
  - Single and/or triple SPC Converters, as required.
  - One HPA-920 Sat-IF Combiner/Amplifier.
  - One or more CFP Power Supplies.
  - One or more Rack-frames or Base-plates. The base-plates can be joined horizontally.
  - Housing units for the base plates if required.
  - If the headend being assembled is extensive, one or more AMX-400 combiners.
- Programming of each converter involves the following settings:
  - Central Input Frequencies (1 MHz increments)
  - Symbol Rates (6 to 45 MS/s, 1 MS/s increments)
  - Central Output Frequencies (1 MHz increments)
  - RF Output Levels
  - Only for SPC-030 model: Input Configuration (loop-through or 2 independent inputs)
- Programming connection using the SPI-300 programming unit is individual —module by module.

IF-IF Converters

MODEL		SPC-010	SPC-030
REF.		3846	3844
Number of SAt-IF channels converted		1	3
Input connection		Loop-through	Configurable: a) Loop-through b) Two independent inputs: port up : 2-channel input port down : 1-channel input
Input frequency	MHz	950 - 2150	
Input level	dBm	-60 ... -20	
Input symbol rate	MS/s	6 ... 45	
Max level difference between input signals	dB	—	25
Noise figure	dB	< 10	
Output frequency	MHz	950 - 2150	
Output response flatness	dB	< 3	
Adjustable output level	dBm	-38 ... -23	
Phase noise		DVB-S2 compatible	
Output loop-through loss	dB	1 (typ) , 1.8 (max)	
Supply voltage	VDC	+12	
Consumption	mA	210	520



Example of «SPC» headend for conversion and amplification of 20 satellite channels.

SPC

SRF. Free-To-Air Digital Satellite TV Reception Equipment

- Satellite TV reception, standard DVB-S / MPEG-2 (EN 300 421).
- Digital-to-Analogue Transmodulation Process (QPSK → AM) that presents the clear TV programmes transmitted in QPSK Sat-TV channels on conventional VHF/UHF channels (any TV system and Colour system).

An SRF headend includes:

As many SRF Receiving Modules as free-to-air TV programmes to be distributed.
One HPA Amplifier that amplifies the sum of the combined output TV channels from the receivers.
One or more CFP Power Supplies.
One or more Rack-Frames or wall-fixing Base-Plates. The base-plates can be joined horizontally.
Usually, housing units for the base-plates.
If the headend is large, one or more AMX-400 combiners.
The SRF headends provide a TV multichannel signal whose level is appropriate to feed the distribution network. With a SRF installed in the headend, the end user does not require a Set Top Box or any additional devices to view the clear digital TV programs being distributed. An extension input at the HPA amplifier allows easy coupling of the wideband 47-862 MHz signal provided by another existing headend.

QPSK Receivers

MODEL	Output TV channel spectrum **VSB** (Vestigial Side Band)		SRF-011	SRF-112
REF.			4084	4062
Remote Programming Function			NO	YES
Output channel TV System			B / G / D / K / I / L	
Output channel Audio System			Mono	A2
Output channel Colour System			PAL , SECAM , NTSC	
Input frequency		MHz	950 - 2150	
Input level		dBm	-65 ... -25	
Selectable output channel located between:		MHz	45 - 862	
Adjustable output level		dBµV	65 to 80	
Supply voltage		VDC	+12	
Consumption		mA	540	590

SRF-112

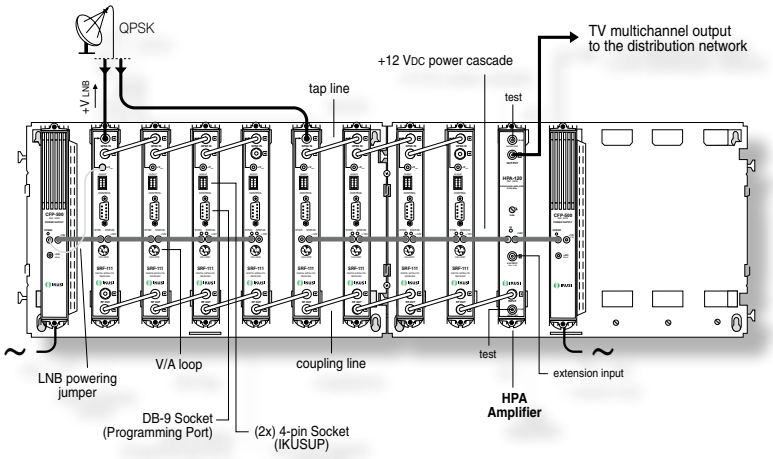
FUNCTIONAL DESCRIPTION OF THE SRF TRANSMODULATORS

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

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

Programming of each module involves the following selections and settings:

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



Example of SRF headend for eight clear digital saltellite TV programmes.

SRF

SDC. Digital SAT-TV Reception Equipment with Embedded CA

- Satellite TV reception, standard DVB-S / MPEG-2 (EN 300 421).
- De-encryption and Digital-to-Analogue Transmodulation Process (Encrypted QPSK → Clear AM). The encrypted TV programmes transmitted in QPSK Sat-TV channels are de-encrypted and presented on conventional vestigial side band VHF/UHF channels (any TV system and Colour system).

QPSK Receivers with Embedded Conditional Access

MODEL		SDC-G106
REF.		4023
Remote Programming Function		YES
Embedded Conditional Access		Videoguard™ (Viasat)
Output channel TV System		B/G
Output channel Audio System		Mono
Output channel Colour System		PAL , SECAM , NTSC
Input frequency	MHz	950 - 2150
Input level	dBm	-65 ... -25
Selectable output channel located between:	MHz	45 - 862
Adjustable Output level	dBµV	65 to 80
Supply voltage	VDC	+12
Consumption	mA	570

SDC-G106

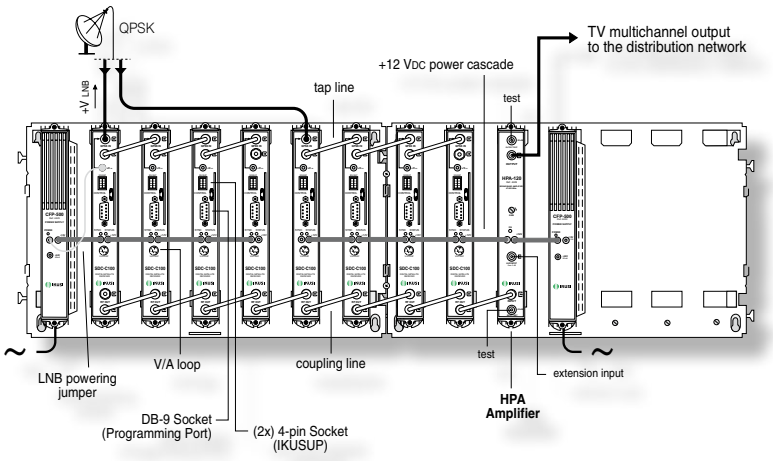
FUNCTIONAL DESCRIPTION OF THE SDC TRANSMODULATORS

An SDC embedded CA receiving module carries out a complete channel processing from the input to the output:

- tunes a QPSK Sat-IF digital channel in the 950-2150 MHz band,
- selects an encrypted TV programme from the multiplex being received, and
- de-encryptes and presents it on a conventional TV channel that is selectable throughout the 45-862 MHz band.

Programming of each module involves the following selections and settings:

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



Example of SDC headend for eight encrypted digital saltellite TV programmes.

SDC

SRC. Digital Sat TV MultiCrypt Reception Equipment

- Reception of encrypted Sat-TV programs. Standard DVB-S / MPEG-2 (EN 300 421).
- Receiving Modules with Common Interface (EN 50221). The encrypted TV programmes transmitted on QPSK channels are de-encrypted and presented on conven-tional VHF/UHF channels (any TV system or Colour system).

- An SRC headend includes:
  As many SRC Receiving Modules as de-encrypted TV programmes to be distributed. At each module, one CAM (Conditional Access Module) containing the Operator's Smart Card must fit the front panel slot.
  One HPA Amplifier that amplifies the sum of the receivers' output TV channels. One or more CFP Power Supplies.
  One or more Rack-Frames or wall-fixing Base-Plates. The base-plates can be joined horizontally. Usually, housing units for the base-plates.
  If the headend is large, one or more AMX-400 combiners.
  The SRC headends provide a TV multichannel signal whose level is appropriate to feed the distribution network. With an SRC installed in the headend, the end user does not require a Set Top Box or any additional devices to view the de-encrypted digital TV programs being distribu-ted. An extension input at the HPA amplifier allows easy coupling of the wideband 47-862 MHz signal provided by another existing headend.

QPSK Receivers with Common Interface

MODEL	Output TV channel spectrum **VSB** (Vestigial Side Band)	SRC-111
REF.		4096
Remote Programming Function		YES
Output channel TV System		B / G
Audio Operatin Mode		Mono
Output channel Colour System		PAL , SECAM , NTSC
Input frequency	MHz	950 - 2150
Input level	dBm	-65 ... -25
Selectable output channel located between:	MHz	45 - 862
Adjustable output level	dBµV	65 to 80 (63 to 78 in SRC-051)
Supply voltage	VDC	+12
Max Consumption (CAM included)	mA	680

SRC-111

FUNCTIONAL DESCRIPTION OF THE SRC RECEIVERS

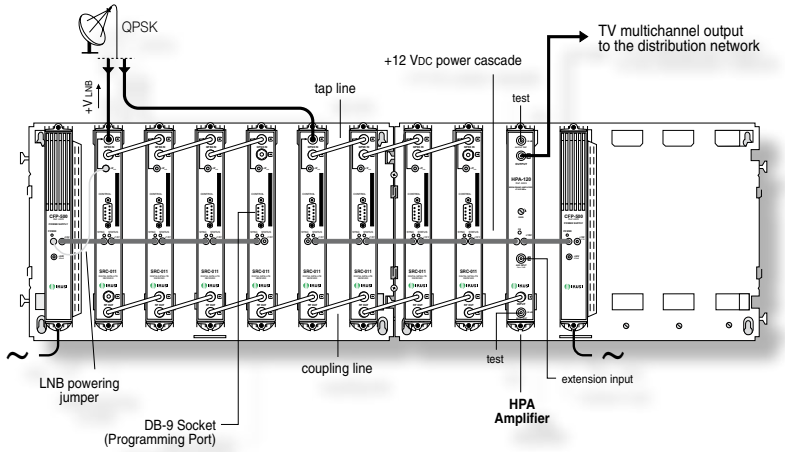
An SRC receiving module with CAM + Operator's Smart Card inserted, carries out a complete channel processing from the input to the output:

- tunes a QPSK Sat-IF digital channel in the 950-2150 MHz band,
- selects an encrypted TV programme from the multiplex being received, and
- de-encryptes and presents it on a conventional TV channel that is selectable throughout the 45-862 MHz band.

Range includes different mono sound models for VSB or DSB output channel spectrums and for available or non-available remote programming function.

Programming of each module involves the following selections and settings:

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



Example of SRC headend for eight clear digital saltellite TV programmes.

SRC

STC, STF

NEW!

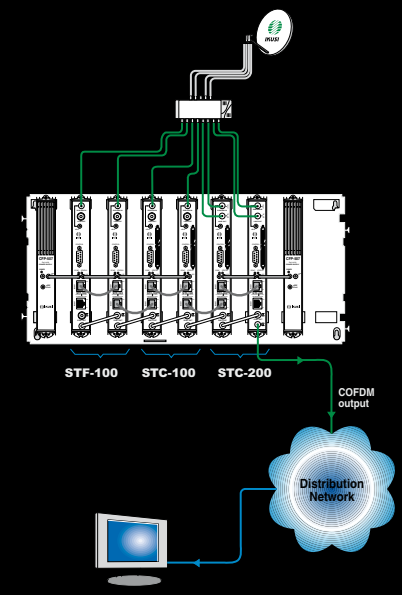
DVB-S/S2 TO DVB-T TRANSMODULATORS (QPSK/8PSK → COFDM)

- *STC-100*
- *STC-200*
- *STF-100*

◊ **STC-200**
- 2 DVB-S/S2 Reception input
- 1DVB-T RF Output
- Common Interface Slot

◊ **STC-100**
- 1 DVB-S/S2 Reception input
- 1DVB-T RF Output
- Common Interface Slot

◊ **STF-100**
- 1 DVB-S/S2 Reception input
- DVB-T RF Output
- Without Common Interface Slot



STC/STF. DVB-S/S2 to DVB-T Transmodulators

- This headend is designed for the emission of DVB-T (COFDM) signals from the input of free or encrypted DVB-S/S2 signals (QPSK/8PSK to COFDM).
- DVB-S/S2 Reception System
- DVB-T RF Output
- PSI/SI Tables Regeneration
- LCN (Logical Channel Number) Support
- Common Interface Slot (no in STF-100 model)
- Web Interface

- An STC headend includes:

- As many STC Receiving Modules as de-encrypted TV programmes to be distributed. At each module, one CAM (Conditional Access Module) containing the Operator's Smart Card must fit the front panel slot.
- CFP-507 (Ref. 4439): power supply +12 V/+24 V.
- CFP-700 (Ref. 4401): power supply +12 V/+24 V for selection of polarisation.
- BAS-900 (Ref. 4411): base-support with capacity for 9 modules (dimensions: 563x257x24 mm).
- MS-0504 (Ref. 1023): stand-alone multiswitch (4 SAT inputs and 4 outputs).

MODEL			STC-100	STC-200	STF-100
REF.			4465	4466	4464
Remote mode			YES		
Transport Stream (TS) processing			YES		
Input Section (QPSK/8PSK)	Standard		EN 300 421 DVB-S (QPSK) EN 302 307 DVB-S2 (QPSK/8-PSK)		
	Number of inputs		1	2	1
	Input mode		Loop	Loop or two independent inputs	Loop
	Input frequencies	MHz	950 - 2150		
	Symbol rate	MS/s	2 - 45		
	Input level	dBm	DVB-S: -65 ... -25 DVB-S2: -70 ... -25		
	DiSEqC		YES		
TS processing Section	PSI/SI Tables Regeneration		PAT, PMT, SDT, CAT, NIT, EIT, TDT, TOT, BAT		
	LCN Insertion		YES		
	PCR Restamping		YES		
	PIDs, SIDs and TS IDs Remapping		YES		
	Common Interface Slot		YES	YES	NO
Output Section (COFDM)	Standard		EN 300 744 DVB-T		
	Output Frequencies	MHz	51 - 862		
	Output level	dBµV	65 - 80		
	MER	dB	> 38 (Typ.)		
	Spurious in band	dBc	< -50		
	Broadband noise (ΔB=5MHz)	dBc	< -75		
	Output COFDM modulation schemes		QPSK ; 16QAM ; 64QAM		
	COFDM output guard interval		1/4 , 1/8 , 1/16 , 1/32		
General	Power voltage	VDC	+12		
	Consumption	A	1.3 (with CAM)	1.3 (with CAM)	1.08
	Operating temperature	°C	0 ... +45		
	Interface		Web		
	IKUNET Bus Connector		(2x) RJ45		
	Dimensions	mm	230 x 195 x 32		

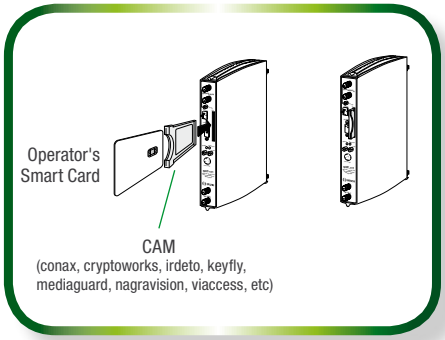
NEW!

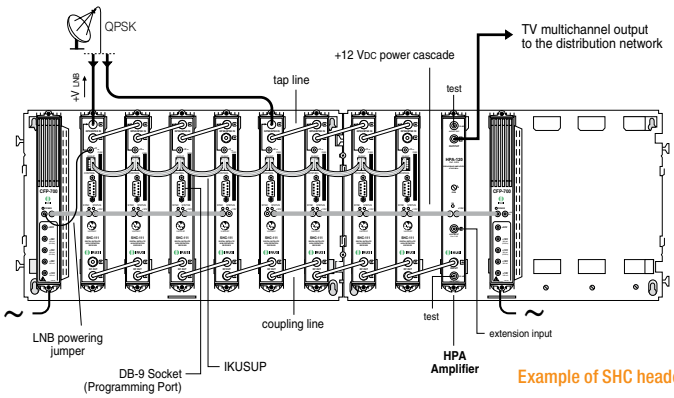
IKUSI

SHC. Modular Headend for Multicript DVB-S/S2 Reception

- Receives a digital TV signal modulated with QPSK or 8PSK, using MPEG2 or MPEG4 compression format, takes one channel from the input TS and outputs the selected channel in analogical format, modulated in a conventional vestigial side band VHF/UHF channels. The TV formats managed by the modules can be SD (Standard Definition) or HD (High Definition).
- The input signal can be free or encrypted by a conditional access system. The module opens the encrypted channel using a Common Interface card.
- It's possible the insertion, external processing and reinsertion of the audio and video signal in base band format.
- Finally, the module can be remotely controlled through the included IKUSUP bus, when connected to an HMS headend controller.

MODEL			SHC-111
REF.			4460
Input Section (QPSK/8PSK)	Input frequencies band	MHz	950 - 2150
	Step	MHz	1
	Input level	dBm	-25 ... -65
	Input loop-through attenuation	dB	0 ±4
	AFC Pull-range	MHz	±5
	Symbol rate	MS/s	2 - 45 DVB-S ; 2 - 45 DVB-S2
	Impedance	Ω	75
Digital Processing Section	DVB Processing		EN 300 468
	Video decoding		MPEG-4 AVC /H.264 HP@L4 MPEG-2 MP@HL (ISO/IEC 13818-2)
	Frequency Line conversion		NO
	Active Format Descriptor support		YES
	Supported Aspect Ratio		4:3 , 16:9 , 14:9
	Audio decoding		MPEG-1 Layer I/II ; MPEG-2 Layer II
	Aspect Ratio Correction		YES (Pan&Scan , Letter-Box)
	Firmware upgrade by user		YES, RS-232 configuration interface
External Video/Audio Loop	Firmware upgrade by user	Vpp	1.0 (video) ; 0 - 2.0 (audio)
	Video and audio L/R input levels	Vpp	0.9 - 1.1 (video) - 1.0 (audio)
V/A Re-modulation Section	Adjustable video modulation depth	%	80 - 90
	Adjustable audio peak deviation	kHz	±10 - ±50
	Adjustable output level	dBµV	65-80
	Carrier level ratio	dB	12/16
	Output loop-through attenuation	dB	1.0 (typ) ; 1.8 (max)
	Weighted SNR	dB	60
	Spurious in band	dBc	< -59
	Broadband noise (ΔB=5 MHz)	dBc	< -75
	Output channel TV system		B / G / D / K / K' / I / L
	Output channel audio system		Mono
	Output channel colour system		PAL, SECAM
	Output channel selectable betwenn	MHz	45 - 862
General	Supply Voltage	VDC	+12
	Max. consumption (including CAM)	A	1.2





Example of SHC headend for eight receivers.

SHC

MDI. xPSK-QAM Transmodulation Equipment

- Digital Transmodulation (xPSK → QAM). The QPSK or 8PSK channels located in the Sat-IF frequency band (950-2150 MHz) are transformed to QAM channels (16 to 256 symbols) located in the 45-862 MHz band.
- The equipment includes two transmodulator models: MDI-900 for DVB-S, and MDI-910 for DVB-S and DVB-S2. Both models perform transport stream processing, and the MDI-910 features moreover common interface.

xPSK-QAM Transmodulators

MODEL		MDI-910	MDI-900
REF.		4020	4094
Transport Stream processing		YES	
Common Interface (EN 50221)		YES (Conax, Cryptoworks, Irdeto, KeyFly, Mediaguard, Nagravision, Viaccess, ...)	NO
Reception		DVB-S2 / DVB-S (QPSK/8PSK) (QPSK)	DVB-S (QPSK)
Remote Programming Function		YES	
Standard		EN 302 307	EN 300 421
Input frequency	MHz	950 - 2150	
Input level	dBm	-70 ... -25	-65 ... -25
Selectable output channel located between:	MHz	47 - 862	
Adjustable output level	dBµV	65 to 80	
Supply voltage	VDC	+12	
Consumption	mA	770 (w/o CAM) ,, 910 (with CAM)	600

MDI-900 MDI-910

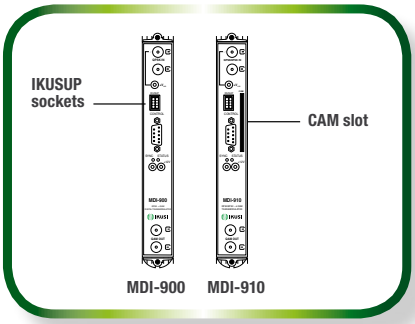
FUNCTIONAL DESCRIPTION OF THE MDI TRANSMODULATORS

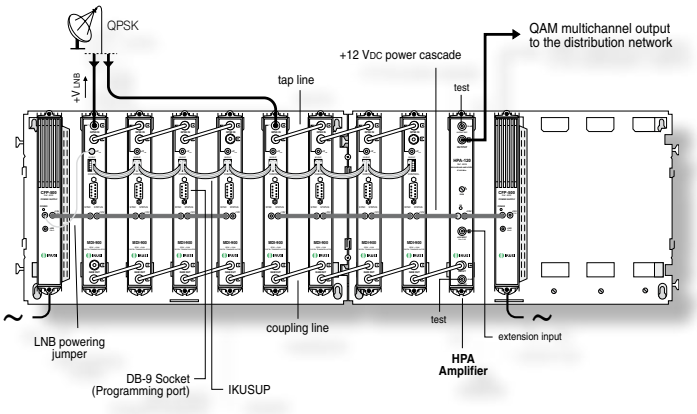
An MDI transmodulator carries out the complete channel processing from the input to the output:

- tunes a QPSK/8PSK digital channel of the 950-2150 MHz band,
- demodulates the signal being received,
- processes the transport stream (with programme de-encrypting for MDI-910 if a "CAM + Operator Card" couple is installed), and
- re-modulates it in QAM format on an RF channel that is selectable within the 47-862 MHz frequency range.

Module programming involves the following selections and settings:

- Central QPSK/8PSK Input Frequency (1 MHz steps)
- Input Symbol Rate (0.001 MS/s increments)
- Central Output Frequency (250 kHz increments)
- Output Modulation Scheme (16, 32, 64, 128 or 256QAM)
- Roll-Off factor ("half Nyquist filter")
- RF output level
- Output Symbol Rate and Service and CA Blockade





Example of MDI headend for eight transponders.

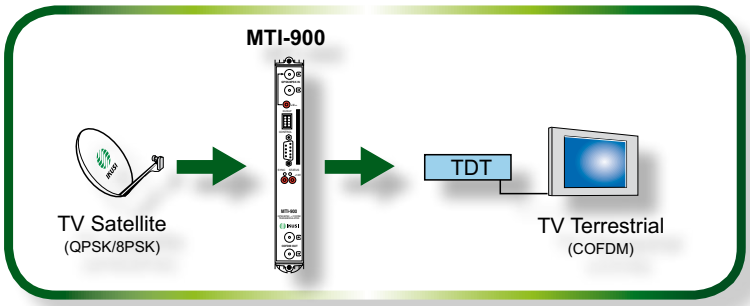
MDI

MTI. xPSK/COFDM Transmodulation Equipment

MTI HEADENDS

- Digital transmodulation (xPSK → COFDM) with Transport Stream Processing. The QPSK or 8PSK channels located in the Sat-IF frequency band (950-2150 MHz) are transformed to COFDM channels located in the 47-862 MHz band.
- Range includes two transmodulators: **MTI-900** and **MTI-800**.

The MTI-900 has Common Interface (EN 50221) for discretionary de-encrypting of TV programmes.



MTI-800 MTI-900

FUNCTIONAL DESCRIPTION OF THE MTI TRANSMODULATORS

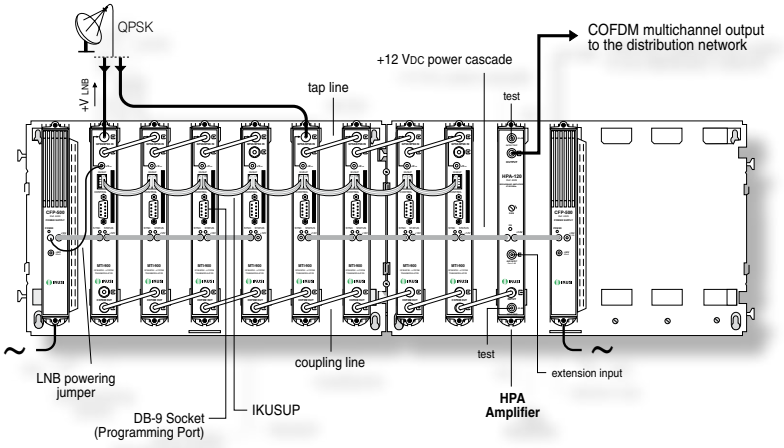
An MTI transmodulator carries out the complete channel processing from the input to the output:

- tunes a xPSK digital channel of the 950-2150 MHz band, demodulates the signal being received,
- processes the transport stream (with programme de-encrypting in the MTI-900, if this one has a "CAM + Operator Card" couple is installed), and
- re-modulates it in COFDM format on an RF channel that is selectable within the 47-862 MHz frequency range.

Module programming involves the following selections and settings:

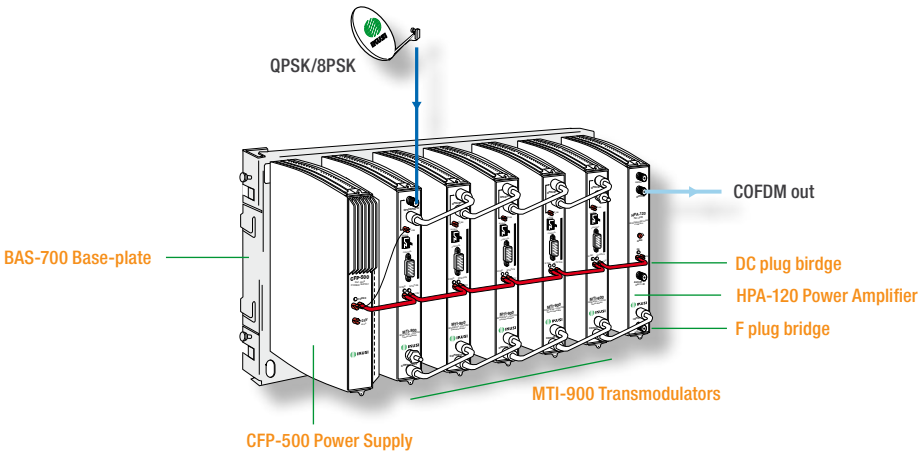
- Central xPSK Input Frequency (1 MHz steps)
- Input Symbol Rate (0.001 MS/s steps)
- Central COFDM Output Frequency (1 kHz steps)
- Output Channel Bandwidth (6, 7 or 8 MHz; also 5 MHz on DVB-H)
- Output Operation Mode (2K or 8K; also 4K on DVB-H)
- RF Output Level
- FFT Window (Fast Fourier Transform), to reduce interference on adjacent channel
- In-depth interleaving (only on DVB-H; with 2K and 4K modes)
- Discretionary de-encrypting of one or more Services (only for MTI-900)
- Optional Blockade of Services, PIDs and Conditional Accesses, with Regeneration of Tables
- NIT Adaptation

MTI



Example of «MTI» headend for eight transponders

MTI. xPSK/COFDM Transmodulation Equipment



xPSK-COFDM Transmodulator with Common Interface

MODEL			MTI-900	MTI-800
REF.			4098	4099
Reception			**DVB-S** (QPSK) ,, **DVB-S2** (QPSK/8PSK)	
Transport Stream (TS) processing			**YES**	
Number of encrypted programmes being supported			**Variable** (depends on the CAM)	—
Input Section (QPSK/8PSK)	Input frequency	MHz	950 - 2150	
	Input level	dBm	-65 ... -25 (DVB-S) ,, -70 ... -25 (DVB-S2)	-65 ... -25
	Input loop-through gain	dB	0 (±1)	
	AFC pull-in range	MHz	±5	
	Input Symbol rate	MS/s	2 ... 45 (DVB-S) ,, 10 ... 30 (DVB-S2)	
COFDM Re-modulation Section	Constellation		QPSK ,, 16QAM ,, 64QAM	
	Code rate		1/2 ,, 2/3 ,, 3/4 ,, 5/6 ,, 7/8	
	Guard interval		1/4 ,, 1/8 ,, 1/16 ,, 1/32	
	MER (Modulation Error Ratio)	dB	> 38 (typ.)	
RF Output Section (COFDM)	Selectable output channel located between:	MHz	47 - 862	
	Bandwidth	MHz	5 (DVB-H) ,, 6 ,, 7 ,, 8	
	Adjustable output level	dBµV	65 a 80	
General	Supply voltage	VDC	+12	
	Input CAM		1 slot (EN 50221)	—
	Consumption	mA	600 (w/o CAM) ,, 740 (with CAM)	600
	Operating temperature	˚C	0 ... +45	
	IKUSUP bus connector		(2x) 4-pin socket	
	Dimensions	mm	230x195x32	

• The module is packed with:
- 2 F plug bridges, 64 mm length, for input tap line and output coupling line.
- 1 DC plug bridge, 53 mm length, for connection of +12 VDC voltage.

FUNCTIONS OF THE TS PROCESSING

- Bit Rate adaptation with PCR restamping
- Adaptation of NIT table
  Adaptation to the particular adjustments of the headend is automatic. Name and identifier of the new network can be edited.
- Service and CA blockade
  Blockade is at service level and at conditional access level. Automatic regeneration of PAT, SDT and CAT tables.
- TS monitoring
  Usage level of the Transport Stream —percentage of null packets— is presented along the programming process.

Abbreviations

CA : Conditional Access
CAT : Conditional Access Table
NIT : Network Information Table
PAT : Program Association Table
PCR : Program Clock Reference
SDT : Service Description Table
TS : Transport Stream

CRC. Digital Cable-TV MultiCrypt Reception Equipment

- Reception of encrypted Cable TV programs. Standard DVB-C / MPEG-2 (EN 300 429).
- Receiving Modules with Common Interface (EN 50221). The encrypted TV programmes transmitted on QAM Cable-TV channels are de-encrypted and presented on conventional VHF/UHF channels (VSB vestigial side band; any TV system or Colour system).

A CRC headend includes:

As many CRC Receiving Modules as de-encrypted TV programmes to be distributed. At each module, one CAM (Conditional Access Module) containing the Operator's Smart Card must fit the front panel slot.
One HPA Amplifier that amplifies the sum of the receivers' output TV channels.
One or more CFP Power Supplies.
One or more Rack-Frames or wall-fixing Base-Plates. The base-plates can be joined horizontally.
Usually, housing units for the base-plates.
If the headend is large, one or more AMX-400 combiners.

The CRC headends provide a TV multichannel signal whose level is appropriate to feed the distribution network. With an CRC installed in the headend, the end user does not require a Set Top Box or any additional devices to view the de-encrypted digital TV programs being distributed. An extension input at the HPA amplifier allows easy coupling of the wideband 47-862 MHz signal provided by another existing headend.

QAM receiver with Common Interface (Conax, Cryptoworks, Irdeto, keyFly, Mediaguard, Nagravision, Viaccess, ...)

MODEL		CRC-121
REF.		4441
Output channel TV System - VSB		B / G / D / K / I / L
Audio mode		Mono
Output channel Colour System		PAL , SECAM , NTSC
Remote Programming Function		YES
Input channel located between	MHz	51 - 858
Input level	dBm	-64 ... -20 (64QAM modulation)
Selectable output channel located between:	MHz	45 - 862
Adjustable output level	dBµV	65 to 80
Supply voltage	VDC	+12
Max consumption (CAM included)	mA	700

CRC-121

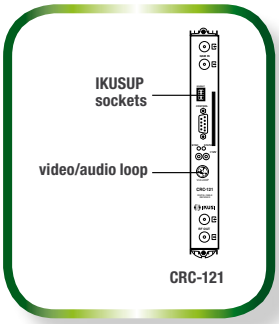
FUNCTIONAL DESCRIPTION OF THE CRC RECEIVERS

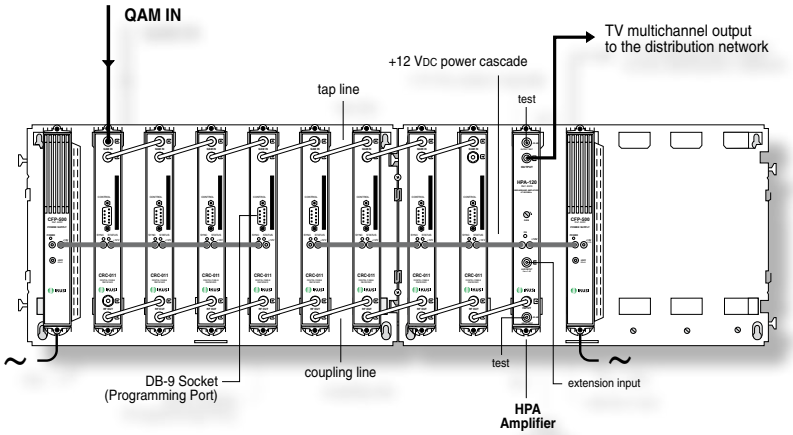
A CRC receiving module with CAM + Operator's Smart Card inserted, carries out a complete channel processing from the input to the output:

- tunes a QAM-modulated RF carrier in the 51-858 MHz band,
- selects an encrypted TV programme from the multiplex being received, and
- de-encryptes and presents it on a conventional TV channel that is selectable throughout the 45-862 MHz band.

Programming of the module involves the following selections and settings:

- Central Input Frequency (250 kHz steps).
- Input Symbol Rate (0.001 MS/s steps).
- Input Modulation Scheme (16, 32, 64, 128 or 256QAM).
- TV Programme and Audio Service.
- Parameters of the output TV channel (video carrier frequency, TV system, colour system, video modulation depth, audio modulation index, carrier level ratio, output level).
- Image Format. Possible conversions are 16:9 to 4:3 Pan&Scan and 16:9 to 4:3 Letter-Box.





Example of CRC headend for eight encrypted digital cable TV programmes.

CRC

CGT. Cable TV QAM-QAM Regeneration Equipment

- TV Standard : DVB-C / MPEG-2 (EN 300 429).
- Transparent Digital Transmodulation Process (QAM → QAM) that regenerates the QAM modulated carriers by correcting the errors arisen in the data stream in the transmission along the cable network. Carrier frequencies (from 51 to 858 MHz) and modulation scheme (16 to 256QAM) of the errorless, regenerated QAM signals can be set equal or different to those of the QAM incoming signals.

A CGT headend includes:

As many CGT Regenerators as QAM channels to be regenerated.
One HPA Amplifier that amplifies the sum of the combined output QAM channels from the regenerators.
One or more CFP Power Supplies.
One or more Rack-Frames or wall-fixing Base-Plates. The base-plates can be joined horizontally.
Usually, housing units for the base-plates.
If the headend is large, one or more AMX-400 combiners.

The CGT headends provide a QAM multichannel signal whose level is appropriate to feed the distribution network. An extension input at the HPA amplifier allows easy coupling of the wideband 47-862 MHz signal provided by another existing headend.

QAM-QAM Regenerator

MODEL		CGT-100
REF.		4074
Remote Programming Function		YES
Input channel located between:	MHz	51 - 858
Input level	dBm	-64 ... -20 (64 QAM modulation)
Selectable output channel located between:	MHz	51 - 858
Adjustable output level	dBµV	65 to 80
Supply voltage	VDC	+12
Consumption	mA	620

CGT-100

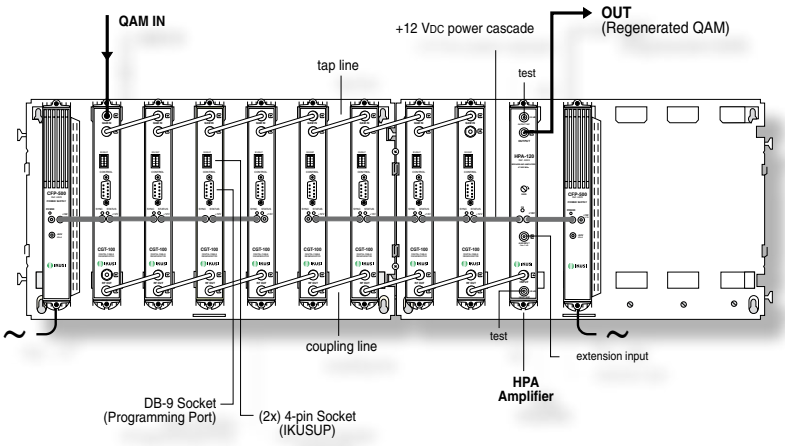
FUNCTIONAL DESCRIPTION OF THE CGT REGENERATORS

A CGT regenerator carries out the complete channel processing from the input to the output:

- tunes a QAM modulated RF carrier in the 51-858 MHz band,
- demodulates this carrier,
- corrects errors of data stream, and
- re-modulates the errorless data signal on a QAM channel that is selectable within the 51-858 MHz frequency range.

Programming of the module involves the following selections and settings:

-Central Input Frequency (250 kHz increments)
-Input Symbol Rate (0.001 MS/s increments)
-Input Modulation Scheme (16, 32, 64, 128 or 256QAM)
-Central Output Frequency (250 kHz increments)
-Output Modulation Scheme (16, 32, 64, 128 or 256QAM)
-Roll-Off factor (“half Nyquist filter”)
-RF output level



Example of CGT headend for eight QAM modulated channels.

CGT

MCP. Vestigial Side Band TV Modulators

MCP-411

- Vestigial Side Band TV Modulators. Mono and A2 or Nicam Stereo/Dual Sounds. TV Systems: B/G, D/K, I, L.
- Range includes single (MCP-4xx) and twin (MCP-8xx) modulators. The twin ones integrate two modulators in one module.
- IF modulation and SAW filtering for maximum harmonic reduction and true VSB response. Adjacent channel operation.
- Frequency agility. Any selectable TV channel within the 45-862 MHz band. PLL frequency synthesized.
- Built-in test pattern generator.

In twin modulators, the two generated TV channels are combined internally to make up one bi-channel output signal.
An MCP headend includes:

- Single MCP-4xx and/or twin MCP-8xx Modulators.
- One HPA amplifier that amplifies the sum of the combined output TV channels.
- One or more CFP Power Supplies.
- One or more Rack-Frames or wall-fixing Base-Plates. The base-plates can be joined horizontally.
- Usually, housing units for the base-plates.
- For large headends, one or more AMX-400 combiners.

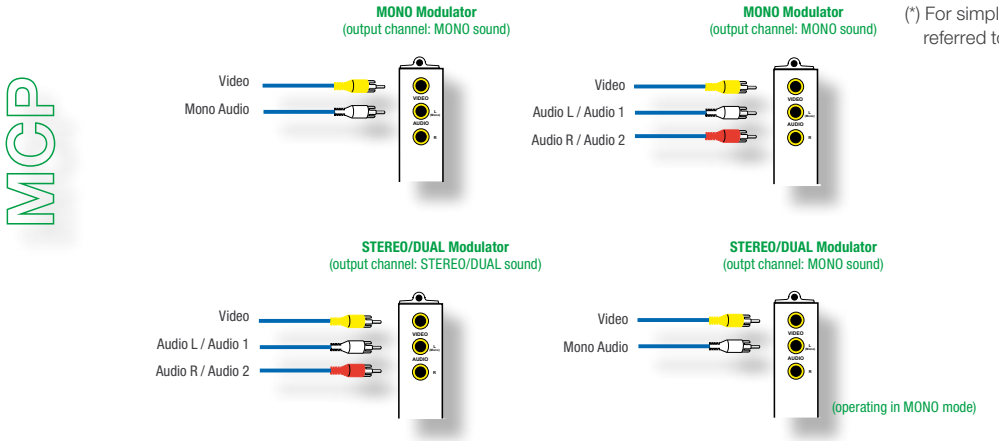
The MCP assembly provides a TV multichannel signal whose level is appropriate to feed the distribution network. An extension input at the HPA amplifier allows easy coupling of the wideband 47-862 MHz signal provided by an existing reception headend.

TV Modulators - Vestigial Side Band

MODEL			MCP-411	MCP-412
REF.			3826	3829
TV System			B / G	
Audio System			Mono	A2
Selectable output channel located between:		MHz	45 - 862	
Adjustable RF output level		dBµV	70 to 80	
Intercarrier frequency	Audio 1	MHz	5.5	5.5
	Audio 2	MHz	—	5.742
Carrier level ratio		dB	12/16 (Mono ; A2/Nicam:Audio1) ,, 20 (A2:Audio2) ,, 18 to 27 (Nicam:Audio2)	
Video input level		Vpp	0.7 ... 1.4	
Video input impedance		Ω	75	
Adjustable video modulation depth		%	80 to 90	
Audio input level		Vpp	0.5 ... 4.0	
Audio input impedance		Ω	> 600	
Broadband noise (ΔB=5 MHz)		dBc	< -77	
Supply voltage		VDC	+12	
Comsumption		mA	370	460

Audio functionality

The MCP modulators family includes models for mono and stereo/dual operations. The following pictures (*) show the normal use —1 audio source with "mono" models and 2 audio sources with "stereo/dual" models— as well as other possible uses: stereo sources with "mono" models (L and R signals are summed internally) and mono sources with "stereo/dual" models (the modulator is programmed for operating in mono mode).



(*) For simplicity, the pictures are referred to MCP-4xx models.

MCP. Vestigial Side Band TV Modulators

MCP-812

Twin TV Modulators - Vestigial Side Band

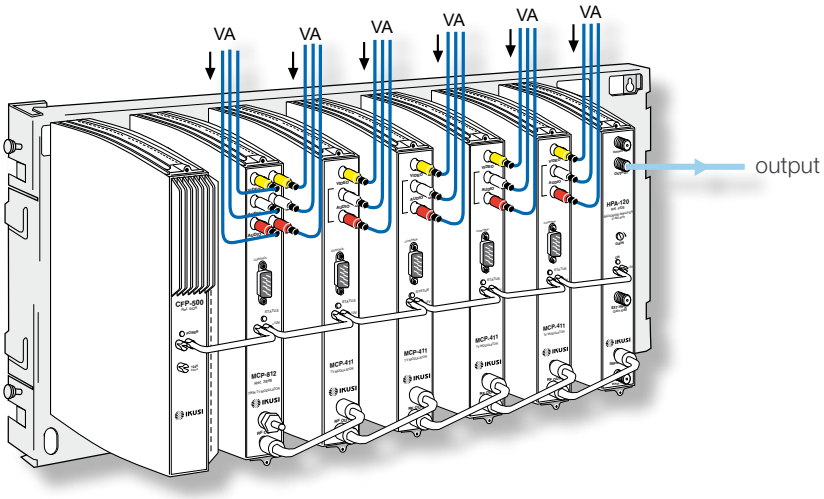
MODEL			MCP-801	MCP-811	MCP-812
REF.			3849	3851	3848
TV System			B / G / D / K / I / L	B / G	
Audio System			Mono		A2
Input			(2x) Video ,, (2x) Audio		
Output			TV Bi-Channel each one of the two channels is selectable between: 45 - 862 MHz		
Group delay precorrection			NO	YES	YES
Adjustable output level		dBµV	68 to 78		
Intercarrier frequency	Audio 1	MHz	5.5 (B,G) ,, 6.5 (D,K,L) ,, 6(I)	5.5	5.5
	Audio 2		—	—	5.742
Carrier level ratio		dB	12 / 16	12 / 16	12 / 16 (Audio1) ,, 20 (Audio2)
Video input level		Vpp	0.7 ... 1.4		
Video input impedance		Ω	75		
Adjustable video modulation deph		%	80 to 90		
Audio input level		Vpp	0.5 ... 4.0		
Audio input impedance		Ω	> 600		
Adjustable audio modulation deph		%	60 to 80 (System L)	—	
Broadband noise (ΔB=5 MHz)		dBc	< -73		
Supply voltage		Vdc	+12		
Comsumption		mA	460		560

• The module is packed with:
- 2 F plug bridges, 64 mm length, for input tap line and output coupling line.
- 1 DC plug bridge, 53 mm length, for connection of +12 VDC voltage.

Programming is carried out with the SPI-300 unit, which is connected to each module individually. The process involves the following selections and settings:

- Video Carrier Frequency
- TV System
- Video Modulation Depth
- Audio Modulation Deviation
- Carrier Level Ratio
- Audio Mode (mono-stereo-dual)
- RF Output Level
- Generation of Video Test Signal

Application example



Example of MCP headend with 5 modualtors, 1 amplifier and 1 power supply, al fixed con 1 baseplate

HPA. Sat-IF Combiner/Amplifier

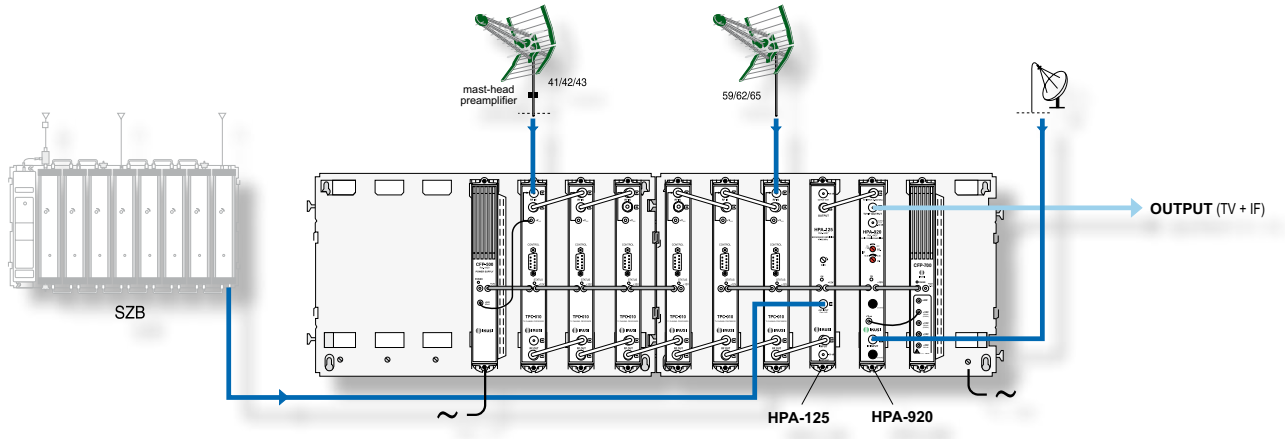
- Application in ClassA headends to drive Sat-IF distribution lines. One HPA-920 per polarity or IF signal being distributed.
- 1 satellite IF input port, with adjustable gain and 0 / 7 dB switchable slope to compensate for cable losses ; 1 terrestrial TV coupling port ; 1 combined TV+IF output port; 1 output test port.
- "Banana" socket to connect the power for the attached LNB.

MODEL		HPA-920
REF.		4437
Sat-IF band	MHz	950 - 2150
Response flatness	dB	±1
Nominal gain	dB	40
Continuous gain adjustment	dB	0 - 18
Slope switchable	dB	0 / 7
Output level (-35 dB IMD3, EN 50083-3)	dBµV	≥ 120
Input/output return loss	dB	≥ 10
Noise figure	dB	< 7
TV band	MHz	5 - 862
Output test (TV+IF)	dB	TV : -30 ±1 ,, IF : -30 ±1.5
Supply voltage	VDC	+12
Consumption	mA	250

- The module is packed with:
  - 2 F plug bridges, 64 mm length, for input tap line and output coupling line.
  - 1 DC plug bridge, 53 mm length, for connection of +12 VDC voltage.

HPA-920

Application example

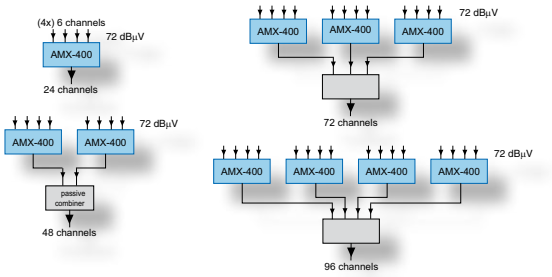


Application of 1 HPA-920 within a ClassA headend which process 6 terrestrial TV channels and amplifies one satellite polarity.

AMX. 4-Way 47-862 MHz Active Combiner

- Application in large ClassA headends where the modules (processors, receivers, transmodulators, modulators, regenerators) are mounted in several deck-arranged rack-frames or baseplates. The AMX-400 is a 4-input combiner that has been designed to combine up to 24 channels (6 channels per input). The system is expandable, so that it is possible to combine up to 96 channels by using 4 AMX-400 and one final passive combiner (or another AMX at IMD decrease's expense). The sum of the combined signals is connected to the HPA launch amplifier.
- Total isolation between inputs.
- Net combining gain. Push-pull amplification technology.
- Adjustable output level. 75Ω output test port.

MODEL		AMX-400
REF.		4433
No. of inputs		4
Frequency range	MHz	45 - 862
Gain	dB	7
Supply voltage	VDC	+12
Consumption	mA	470



AMX-400

Programming and Firmware update

- ClassA modules are programmed and set locally with the SPI-300 programming unit from IKUSI. Firmwares of modules and programming unit can be updated. The corresponding files are downloaded from www.ikusi.com.

SPI-300

DVB→IP and A/V→IP Streamers - Range and General Features

Streaming Modules for ClassA Headends

The IP Streamers from IKUSI are gateways designed to broadcast in multicast on an IP network the services (TV or Radio programmes) issued from DVB reception (satellite, terrestrial, cable), or DVB professional equipment, or local audio/video sources. The IP streams can be viewed using the IPR-110 set-top box or a software video player.

The streamers have IKUSI ClassA mechanical format. As such, they are fixed on the BAS-700 / BAS-900 baseplates or in the SMR-601 rack frame, and they are +12 VDC powered from a CFP module.

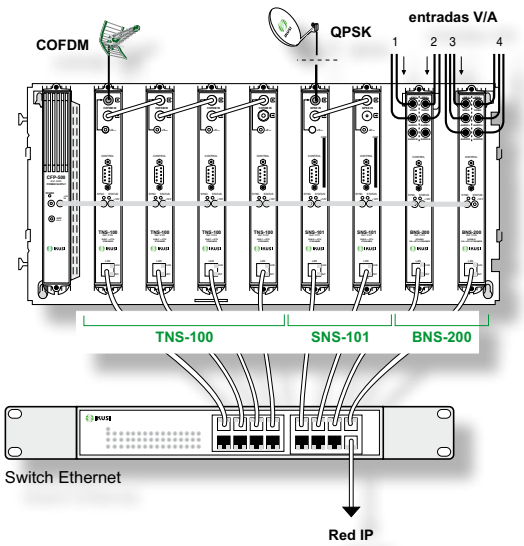
Range includes the following models:

— **TNS-101**. Free-to-air or MultiCrypt DVB-T reception. Common Interface.
— **SNS-102**. Free-to-air or MultiCrypt DVB-S/S2 reception. Common Interface.
— **RNS-101**. Exclusive for Radio programmes. Free-to-air or MultiCrypt DVB-S reception. Common Interface.
— **BNS-200**. Streaming of baseband audio/video signals. Double.

Main features

- DVB to IP streamers:
  Output: up to 8 simultaneous IP-encapsulated services (TV or Radio programmes), or 28 only-Radio programmes, with individual multicast addresses.
- A/V to IP streamer:
  Output: 1 or 2 IP-encapsulated TV broadcasts with individual multicast addresses.
- Filtering of information contained in the MPEG-2 tables.
- UDP and RTP transmission protocols.
- Web interface for module configuration.
- Alarm information SNMP agent.
- SAP and SDP protocols to facilitate automatic programme selection in the set-top box and to provide programme information to external servers.

ADVANCED FEATURES
PID filtering
PSI/SI parsing
ECM and EMM transparent passthrough
Regeneration of PAT and PMT tables
Passthrough or blockade of CAT, NIT, SDT, EIT and TDT tables
QoS marking configurable
TTL configurable



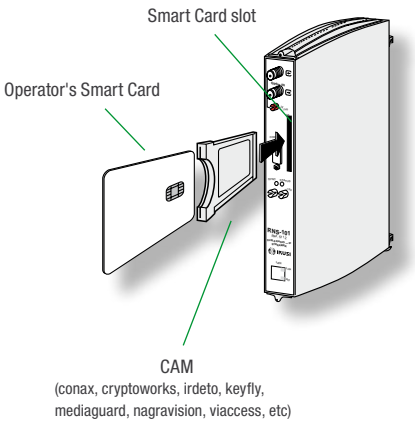
ASI : Asynchronous Serial Interface. Serial transmission method for MPEG-2 streams.
CAT : Conditional Access Table
CVBS : Chroma Video Blanking Synchro
ECM : Entitlement Control Messages
EIT : Event Information Table
EMM : Entitlement Management Messages
IPTV : Internet Protocol Television
MPTS : Multiple Program Transport Stream
NIT : Network Information Table
PAT : Program Association Table
PID : Packet IDentifier
PMT : Program Map Table
PSI : Program Specific Information
QoS : Quality of Service
RTP : Real-Time Transport Protocol
SAP : Service Advertisement Protocol
SDP : Session Description Protocol
SDT : Service Description Table
SI : Service Information
SPTS : Single Program Transport Stream
TDT : Time and Date Table
TTL : Time to Live
UDP : User Datagram Protocol

TNS. DVB-T to IP Streaming Equipment

DVB-T → IP Streamer

MODEL			TNS-101
REF.			5114
Reception			DVB-T FTA or MultiCript (Common Interface - EN50221)
Maximum number of de-encrypted services			Variable (CAM depending)
SNMP Support - traps			YES
Input Section (COFDM)	Frequency range	MHz	174 - 230 and 470 - 862
	Frequency step	kHz	125
	Input level	dBµV	35 ... 100
	Input loop-through gain	dB	0.5 (±1)
Output Section (IP)	Standard		IEEE 802.3 10/100 BaseT
	Bit rate	Mbps	up to 100
	Transmission protocols		UDP / RTP
	No. of simultaneous streams		up to 8
	Multicast		YES
Connectors	RF input (loop-through)		(2x) female F
	DC connection		"banana" socket
	Configuration		RS 232 / DB-9
	Ethernet output		RJ-45
General	Supply voltage	VDC	+12
	Consumption	mA	550 (CAM included)
	Indicator leds		ON - STATUS - LINK - ACT
	Operating temperature	°C	0 ... +45
	Dimensions	mm	230x195x32

TNS-101



Each module is packed with:
- 1 F plug bridge, 64 mm length, for input tap line.
- 1 DC plug bridge, 53 mm length, for connection of +12 VDC voltage.

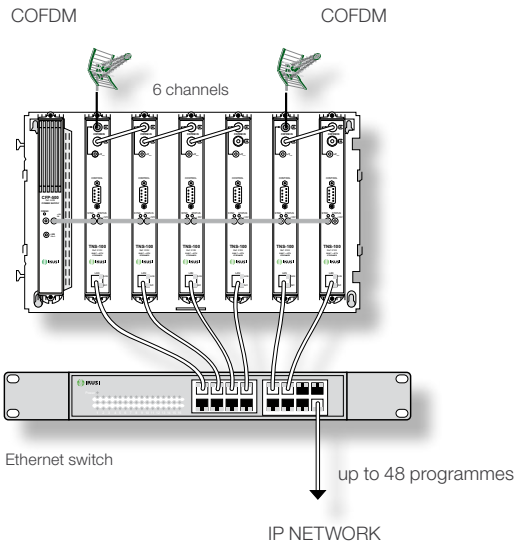
TNS Headends

A TNS headend for DVB-T to IP streaming includes:

- As many TNS-101 Streamers as there are DVB-T channels whose programmes you want to broadcast on the IP network. The TNS-101 features Common Interface to be utilized when the DVB-T channel includes one or more encrypted programmes that one want to de-encrypt; a CAM (Conditional Acces Module) containing an Operator's Smart Card must fit the front panel slot. CAM modules are not supplied by IKUSI.
- One or more CFP Power Supplies.
- One or more Rack-frames or Baseplates. The baseplates can be joi ned horizontally.
- Usually, one housing unit.

The TNS modules have two directionally coupled input ports that facilitate simple connection of the incoming COFDM-modulated signal using the plug bridges supplied. For power connection each module has two DC banana sockets that allow to build the +12 VDC cascade from the power supply module. A third banana socket is available to connect the power for an optional mast-head preamplifier.

Application example



Example of TNS headend for six digital terrestrial TV channels. Contains 6 TNS-101 streamers and 1 CFP-500 power supply, all fixed on 1 BAS-700 baseplate.

SNS. DVB-S/S2 to IP Streaming Equipment

DVB-S/S2 → IP Streamer

MODEL			SNS-102
REF.			5113
Reception			DVB-S/S2
			FTA or MultiCrypt (Common Interface - EN50221)
Number of encrypted programmes being supported			Variable (CAM depending)
SNMP Support - traps			YES
DiSEqC equipped (vers. 1.08)			YES
Input Section (QPSK/8PSK)	Frequency range	MHz	950 - 2150
	Input level	dBm	-65 ... -25
	Input loop-through gain	dB	0 (±1)
	Input symbol rate	MS/s	2 ... 45
Output Section (IP)	Standard		IEEE 802.3 10/100 BaseT
	Bit rate	Mbps	up to 100
	Transmission protocols		UDP / RTP
	No. of simultaneous streams		up to 8
	Multicast		YES
Connectors	RF input (loop-through)		(2x) female F
	DC connection		"banana" socket
	CAM entrance		slot
	Configuration		RS 232 / DB-9
	Ethernet output		RJ-45
General	Supply voltage	VDC	+12
	Consumption	mA	790 (CAM included)
	Max DiSEqC current	mA	300
	Indicator leds		ON - STATUS - LINK - ACT
	Operating temperature	°C	0 ... +45
	Dimensions	mm	230x195x32

Each module is packed with:
- 1 F plug bridge, 64 mm length, for input tap line.
- 1 DC plug bridge, 53 mm length, for connection of +12 VDC voltage.

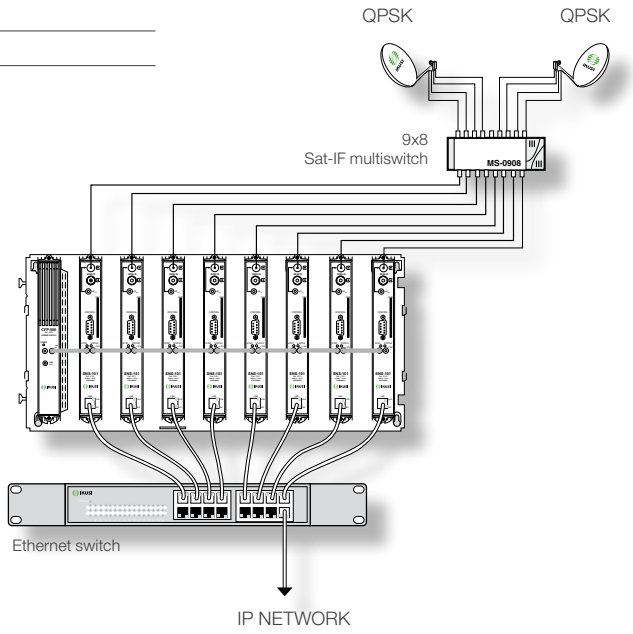
SNS-102

SNS Headends

An SNS headend for DVB-S/S2 to IP streaming includes:

- As many SNS streamers as there are DVB-S/S2 transponders whose programmes one want to broadcast on the IP network. The SNS-102 must be utilized when the transponder transmits one or more encrypted programmes that one want to de-encrypt; a CAM (Conditional Acces Module) containing an Operator's Smart Card must fit the front panel slot. CAM modules are not supplied by IKUSI.
- One or more CFP Power Supplies.
- One or more Rack-frames or Baseplates. The baseplates can be joined horizontally.
- Usually, one housing unit.

The SNS streamers have two directionally coupled input ports that facilitate simple connection of the incoming Sat-IF signal using the plug bridges supplied. Besides this, the headends with SNS-102 models are able to use Sat-IF multiswitches, what allows to change at any time the Sat-IF signal fed into each streamer without recabling the headend.



Example of SNS headend for eight digital satellite TV transponders. Contains 8 SNS-102 and 1 CFP-500 power supply, all fixed on 1 BAS-900 baseplate.

This headend can feed the IP network with up to 64 programmes TV (8 programmes at the most per streamer).

RNS. DVB-S to IP Streaming Equipment

DVB-S Radio → IP Streamer

MODEL			RNS-101
REF.			5112
Reception			FTA or MultiCrypt DVB-S (Common Interface - EN5022)
Number of simultaneous "Radio Programme" streams delivered			up to 28
Max number of de-encrypted Radio Programmes			Variable (CAM depending)
SNMP Support - traps			YES
DiSEqC equipped (vers. 1.08)			YES
Input Section (QPSK)	Frequency range	MHz	950 - 2150
	Input level	dBm	-65 ... -25
	Input loop-through gain	dB	0 (±1)
	Input symbol rate	MS/s	2 ... 45
Output Section (IP)	Standard		IEEE 802.3 10/100 BaseT
	Bit rate	Mbps	up to 100
	Transmission protocols		UDP / RTP
	Multicast		YES
Connectors	RF input (loop-through)		(2x) female F
	DC connection		"banana" socket
	CAM entrance		—
	Configuration		RS 232 / DB-9
	Ethernet output		RJ-45
General	Supply voltage	VDC	+12
	Consumption	mA	310 (without CAM) ,, 480 (with CAM)
	Max DiSEqC current	mA	300
	Indicator leds		ON - STATUS - LINK - ACT
	Operating temperature	°C	0 ... +45
	Dimensions	mm	230x195x32

RNS-101

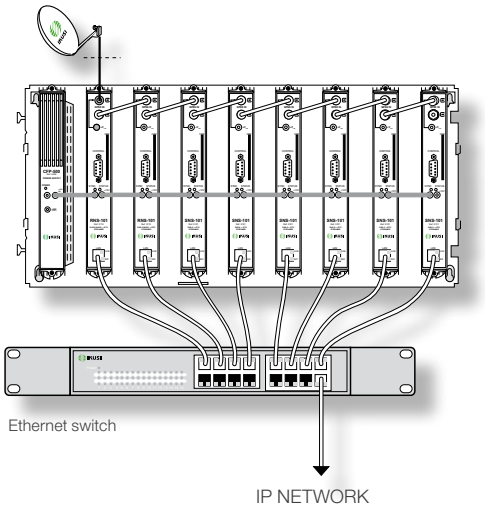
The module is packed with:
- 1 F plug bridge, 64 mm length, for input tap line.
- 1 DC plug bridge, 53 mm length, for connection of +12 VDC voltage.

RNS Headends

A RNS headend for DVB-S Radio to IP streaming includes:

- As many RNS-101 streamers as there are DVB-S transponders whose Radio programmes one want to broadcast on the IP network. The streamers feature Common Interface to be utilized when the input DVB-S transponder includes one or more encrypted programmes that one want to de-encrypt; a CAM (Conditional Acces Module) containing an Operator's Smart Card must fit the front panel slot. CAM modules are not supplied by IKUSI.
- One or more CFP Power Supplies.
- One or more Rack-frames or Baseplates. The baseplates can be joined horizontally.
- Usually, one housing unit.

The DiSEqC control and the input loop-through at each streamer provide a high flexibility for connecting the Sat-IF signal: one can configure the voltage/tone signal for the LNB; one can install input tap-lines (see example on the right); one can use Sat-IF multiswitches; one can, well, consider a mixed solution.
For power connection each module has two DC banana sockets that allow to build the +12 VDC cascade from the power supply module.



Example of a mixed SNS/RNS headend for eight digital satellite TV transponders. Contains 6 SNS-101 streamers, 2 RNS-101 and 1 CFP-500 power supply, all fixed on 1 BAS-900 baseplate.

The headend can feed the IP network with 48 TV programmes (8 programmes per SNS streamer) plus 56 Radio programmes (28 programmes per RNS streamer).

BNS. V/A to IP Streaming Equipment

Double V/A → IP Streamer

MODEL			BNS-200
REF.			5105
Inputs			(2x) Video (CVBS - PAL , SECAM , NTSC) (2x) Audio (ANALOGUE - Mono , ST/Dual)
SNMP support - traps			YES
Input Section (V/A)	Video input level	Vpp	(2x) 0.7 ... 1.4
	Video input impedance	Ω	(2x) 75
	Max video resolution		PAL: 720x576 ,, NTSC: 720x480
	Audio input level	Vpp	(2x) 0.5 ... 4.0
	Audio input impedance	Ω	(2x) > 600
MPEG Coding	Video coding		MPEG-2 MP&ML ,, MPEG-4 ASP
	Audio coding		MPEG-1 Layer II
Output Section (IP)	Standard		IEEE 802.3 10/100 Base T
	Bit rate	Mbps	up to 100
	Transmission protocols		UDP / RTP
	No. of simultaneous streams		2
	Multicast		YES
Connectors	Video connection		(2x) female RCA
	Audio connection		(4x) female RCA
	DC connection		"banana" socket
	Configuration		RS 232 / DB-9
	Ethernet output		RJ-45
General	Supply voltage	VDC	+12
	Consumption	mA	640
	Indicator LEDs		ON - STATUS - LINK - ACT
	Operating temperature	°C	0 ... +45
	Dimensions	mm	230x195x32

The module is packed with:
- 1 DC plug bridge, 53 mm length, for connection of +12 VDC voltage.

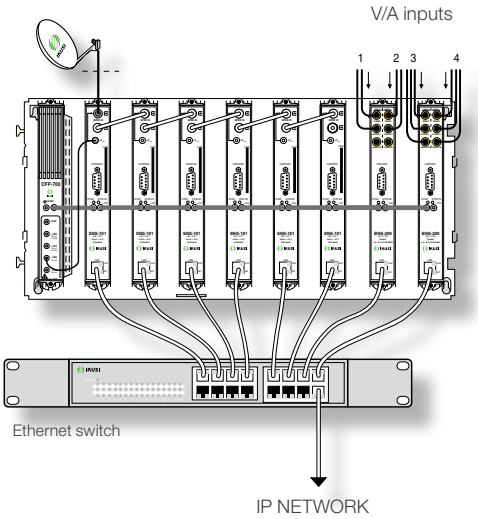
BNS-200

BNS Headends

A BNS headend for V/A to IP streaming includes:

- One BNS-200 streamer per two local video/audio sources.
- One or more CFP Power Supplies.
- One or more Rack-frames or Baseplates. The baseplates can be joined horizontally.
- Usually, one housing unit.

The V/A input connections of the BNS module (two RCA connectors for video signals and four of the same type for L and R signals) are disposed at the top of the front panel. For power connection the module has two DC banana sockets for performing a +12 VDC cascade.



Example of mixed SNS/BNS headend for six digital satellite TV transponders and four video/audio local sources. Contains 6 SNS-101, 2 BNS-200 and 1 CFP-700 power supply, all fixed on 1 BAS-900 baseplate.

The headend can feed the IP network with 48 TV programmes (8 programmes at the most per SNS streamer) plus 4 local TV broadcasts (2 mono sound's and 2 stereo sound's).

Monitor Redundant Power for «xNS» Streaming Headends

The CFP-702 Power Supply

With the object of helping to ensure uninterrumped operation, the «xNS» streaming headends can be provided with a monitor redundant power system based on the specific CFP-702 power supply module. One must install in the headend two CFP-702, one at each edge of the assembly, which power jointly the whole of the streamers; if one of the power supplies fails, the other starts to supply the whole of the current.
Each CFP-702 power supply of the «xNS» headend is linked to the adjacent streamer module with a supplied monitoring jumper, so that it is integrated into the SNMP/traps system supported by the streamers. In case of breakdown, the power supply itself transmits an alarm warning that permits to proceed quickly with its replacement.

SNMP Monitor Power Supply

MODEL		CFP-702
REF.		4447
Regulation type		switch mode
Mains supply voltage (50/60 Hz)	VAC	110 - 240
Outputs		+12 V (5A) for streamers +24 V (60 mA) for mast-head preamplifiers +18 V (300 mA) +18 V / 22 kHz (300 mA) +13 V (300 mA) +13 V / 22 kHz (300 mA) for LNB
Max total current for +24, +18 and +13 V	mA	700
Efficiency	%	75
Dimensions	mm	230x195x32

The module is packed with:

- 1 USB-DB9 monitoring jumper, 22 cm in length, for interconnecting the power supply with the adjacent streamer in the headend.
- 1 DC plug bridge, 53 mm in length, for +12VDC cascade.
- 2 “banana” jumpers, 50 cm in length, for connecting the appropriate outputs of the power supply to one or two streamers in order to line power a terrestrial preamplifier or LNB.

IPR. Set-Top Box (STB) for IPTV

The IPR-110 is a compact and elegant set-top box for Multicast IPTV built in one-piece aluminium extrusion. With an Ethernet input and flexible video/audio output, together with S/P-DIF and an RF modulator output, it delivers to the user the digital television services that are broadcasted in multicast video by the IKUSI’s «xNS» streaming headends.

Interface to 10/100BaseT Ethernet
Flexible video and audio output: composite, RGB, S-Video, stereo audio
Digital Audio via S/P-DIF (electrical)
RF Modulator with loop-through
USB 1.1 interface supporting peripheral expansion
Graphics resolution: 640x512 (625-line), 24 bit RGB colour
MPEG1&MPEG2, MP@ML, up to 10 Mbps
Teletext and Subtitle support
Opera Browser
Multicast IPTV Protocol (IGMP control —Internet Group Management Protocol)
Power: +5VDC, 700mA
Dimensions: 114 x 100 x 35 mm

Accessories supplied:

- 1 multi-function IR remote
- 1 plug-top power supply
- 1 anti-slip baseplate
- 1 SCART cable

MODEL	REF.	DESCRIPTION
IPR-111	5107	Set-Top Box for IPTV

rear panel

Solution for distribution of terrestrial TV and satellite IF signals (analog and digital) over large collective installations: residential districts, hotels, hospitals.

TERRESTRIAL TV & IF SAT (5-2150 MHz)

FORWARD WAY (45-2150 MHz)
- Optical Transmitter: 2nd window
- Stand alone Optical Receiver
- 2 & 3 way Optical Splitters

RETURN WAY (5-300 MHz)
- Optical Transmitter: 2nd window
- ClassA Optical Receiver

✔ Optical Transmitter (FW) FTD-420 (Ref. 4915)
- 1 TV input (45-862 MHz) — 1 SAT-IF input (950-2150 MHz) — 1 Optical output (1310 nm)
- Fully compatible with PAL, SECAM, NTSC, FM, DVB-S, DVB-T, DVB-C and other standards.

✔ Optical Receiver (FW) FRD-400 (Ref. 4914)
- Forward RF output frequency 45-862 (TV) MHz and 950-2150 (IF) MHz

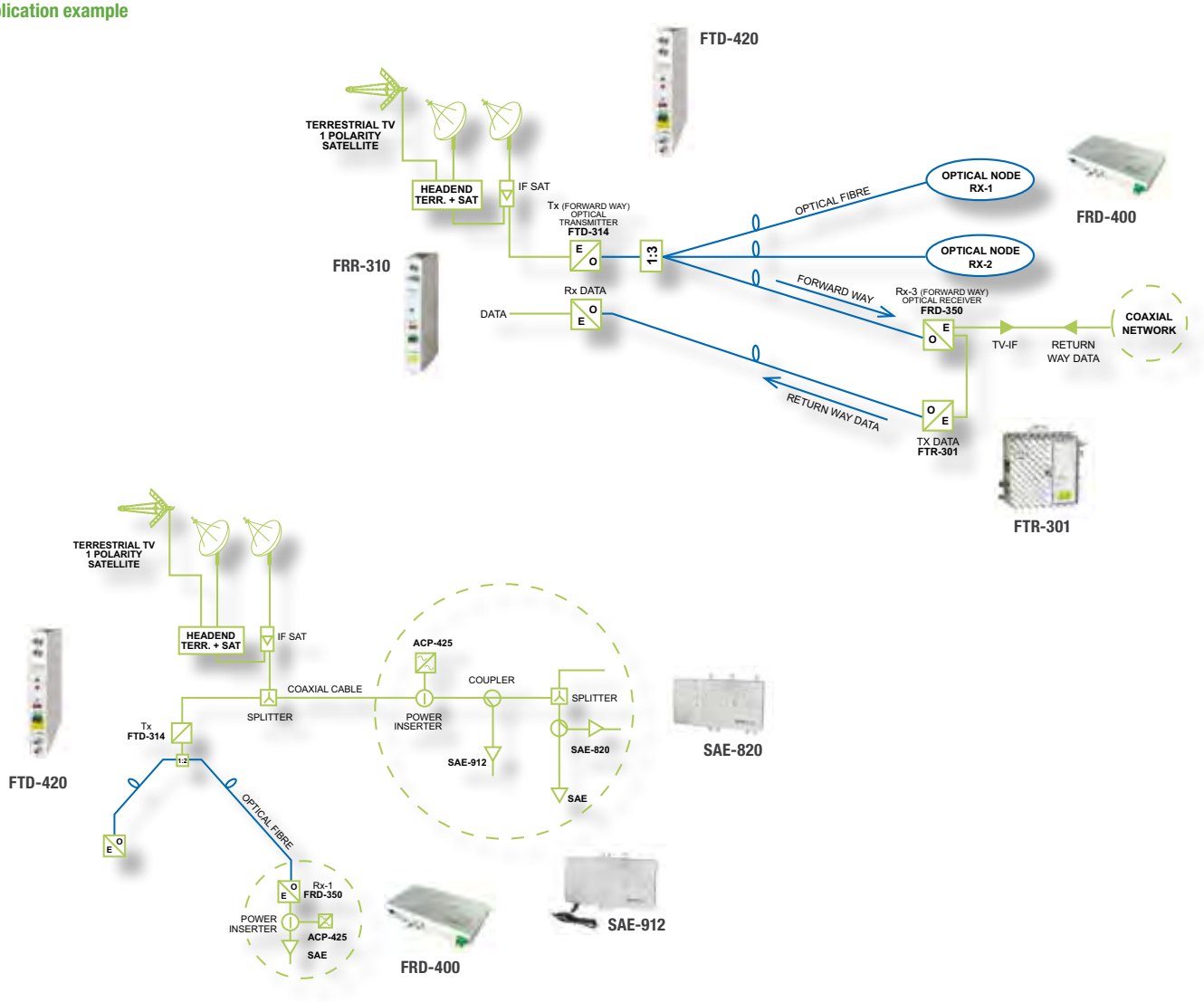
✔ Optical Splitters FSP-302/3/4/6 (Ref. 4904/05/16/18)
- 2 to 6-way optical splitter for singlemode fibre applications
- 1310 nm/1550 nm wideband operation.

✔ Optical Transmitter (RW) FTR-301 (Ref. 4906)
- Optical output power 1 mW (0 dBm)
- Frequency range 5-300 MHz

✔ Optical Receiver (RW) FRR-310 (Ref. 4907)
- Output frequency 5-300 MHz

✔ Accessories
- Distribution and Splice kits.
- Optical fibre cables and junpers.

Application example



FTD. TV+SAT-IF Optical Transmitter Modules

- 1 TV input (45-862 MHz) — 1 SAT-IF input (950-2150 MHz) — 1 Optical output (1310 nm). Connection of singlemode type optical fibre.
- Solution for distribution of terrestrial TV and satellite IF signals (analog and digital) over large collective installations: residential districts, hotels, hospitals.
- Ultralineal, APC-controlled, 4 mW DFB (Distributed Feedback) laser. Fully compatible with PAL, SECAM, NTSC, FM, DVB-S, DVB-T, DVB-C and other standards.
- TV and SAT-IF separate ways with very high RF amplification gain. Independent OMI settings for TV and SAT-IF.
- DC powered by a CFP power supply module. Mountable on baseplates or rack-frame of ClassA headend.

MODEL			FTD-420
REF.			4915
Optical output power		mW	4 (=6 dBm)
RF inputs		MHz	2 TV (45-862 MHz) IF (950-2150 MHz)
Optical section	Optical wavelength	nm	1310 (± 20)
	Relative intensity noise (RIN) of the laser	dB/Hz	< -150
	Optical output return loss	dB	> 50
	Optical output connector		SC / APC 8°
RF section	TV input level (for OMI 4% CENELEC carriers)	dBµV	72 ... 87
	IF input level (for OMI 1.6%)	dBµV	72 ... 87
	RF flatness	dB	± 0.75 (TV) ,, ±1 (IF)
	Adjustm. of TV level to laser - TV-OMI adjustment	dB	-15 ... 0
	Adjustm. of IF level to laser - IF-OMI adjustment	dB	-15 ... 0
	RF input impedance	Ω	75
	RF input return loss	dB	>12 (TV) ,, >10 (IF)
General	Power requirements		+12 VDC / 650vmA
	DC connector type		"banana" socket
	Dimensions	mm	230x195x32

FTD-420

FSP. Optical Splitting Modules

- 2, 3, 4, and 6-way optical splitters for singlemode fibre applications.
- Mountable on baseplates or rack-frame of ClassA headend. The splitters share out the optical power of FTD transmitters to feed multiple field nodes, hence maximizing the use of optical transmission equipment.
- The units are reciprocal and can also be used to combine multiple return path fibres to feed one FRR return path receiving module.

MODEL		FSP-302	FSP-303	FSP-304	FSP-306
REF.		4904	4905	4916	4918
No. of optical outputs		2	3	4	6
Wavelength	nm	1310 - 1550 (±40)			1310 (±40)
Insertion loss	dB	3.7	5.5	7.2	9.0
Return loss	dB	> 55			
Output isolation	dB	>55			
Input/output connectors		SC / APC 8°			
Dimension	mm	230x195x32			

FSP-303

FRD. Compact TV+Sat-IF Optical Receiver

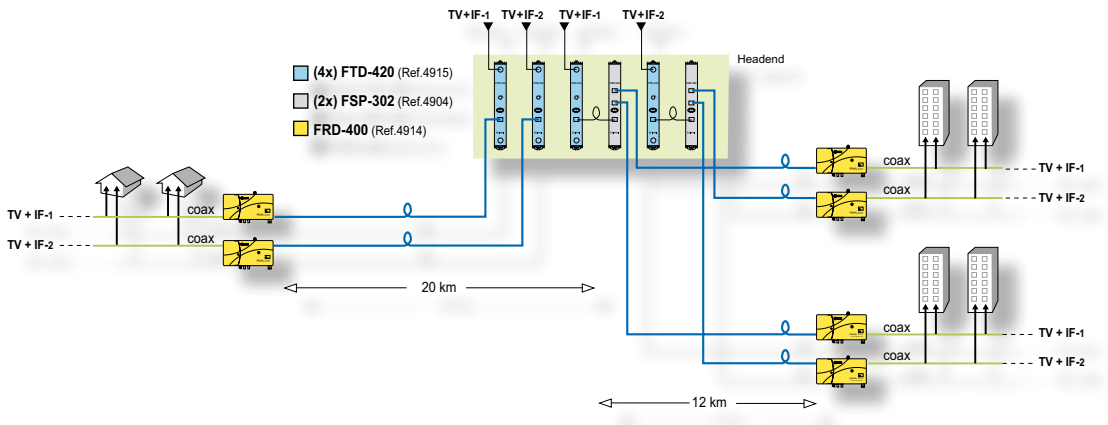
- 1 optical input (1290-1600 nm) — 1 RF output (45-2150 MHz).
- Connection of singlemode type optical fibre.
- Especially designed for the delivery of terrestrial and satellite signals (analog and digital) over large collective installations.
- Mains powered, 50/60 Hz. Electrical safety protection level: Class II. Insertable power cord with bipolar plug.
- Injection-moulded zinc alloy housings. Wall-fixing. Indoor mounting. Grounding terminal.

MODEL				FRD-400
REF.				4914
Optical window			dBm	-4 ... +1
Forward RF output frequency			MHz	45-862 (TV) and 950-2150 (IF)
Optical section	Optical wavelength		nm	1290 - 1600
	Optical output return loss		dB	> 50
	Optical input connector type			SC / APC 8°
RF - Forward way	RF output level	Analogue TV	dBµV	119 [1] / 104 [2]
		IF	dBµV	120 [3] / 105 [4]
	CNR	Analogue TV	dB	52.5 [5] / 50 [6]
		IF		36 [7] / 33.5 [8]
	CTB		dB	59 [5] / 63 [6]
	RF flatness		dB	± 1.5 (TV) , ± 2 (IF)
	Variable attenuator for TV		dB	0 - 15
	Range of slope control for TV		dB	0 - 15
	Output return loss		dB	>12 (TV) „ >10 (IF)
	Output test		dB	-30
RF Reverse way	Bandwidth		MHz	—
	Through loss		dB	—
General	Mains voltage		VAC	230 - 240
	Consumption		W	15
	Dimensions		mm	222x140x44

FRD-400

1 -60dB IMD3 (DIN 45004B)
2 With 42 Cenelec carriers and 4% OMI
3 -35dB IMD3 (EN 50083-3)
4 1.6% OMI5
5 For maximum optical input power and note[2]-marked RF output level.
6 For minimum optical input power and note[2]-marked RF output level.
7 For maximum optical input power and note[4]-marked RF output level.
8 For minimum optical input power and note[4]-marked RF output level.

Application example

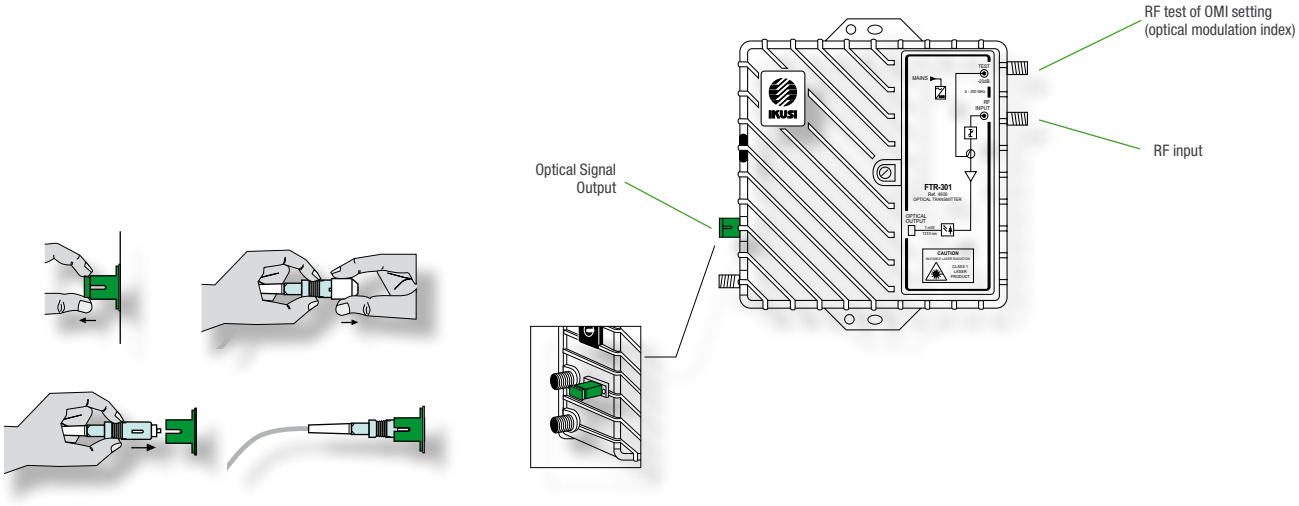


FTR. Compact Return Path Optical Transmitter

- 1 RF input 5-300 MHz — 1 optical output 1310 nm. Connection of singlemode type optical fibre.
- Application in two-way HFC networks that deliver data services to their subscribers (broadband internet access, VOD, IPTV, VoIP, etc.).
- Fabry-Pérot laser of 1 mW.
- An optical budget of 6 dB is available between the transmitter and the related FRR receiver module.
- Mains powered, 50/60 Hz. Electrical safety protection level: Class II. Insertable power cord with mains plug.
- Injection-moulded zinc alloy housing. Wall-fixing.
- Indoor mounting. Grounding terminal.

MODEL			FTR-301
REF.			4906
Optical output power		mW	1 (= 0 dBm)
RF input frequency		MHz	5 - 300
Optical section	Optical wavelength	nm	1310 (± 20)
	Relative intensity noise (RIN) of laser	dB/Hz	< -140
	Optical output return loss	dB	> 55
	Optical input connector type		SC / APC 8°
RF section	RF output level	dBµV	75 ... 90
	RF flatness	dB	± 0.5
	Optical Modulation Index (OMI) control	dB	-15 ... 0
	RF input impedance	Ω	75
	RF input return loss	dB	> 15
General	Mains voltage	VAC	230 - 240
	Consumption	W	5
	Dimensions	mm	150x50x55

Application example



Connecting the optical signal

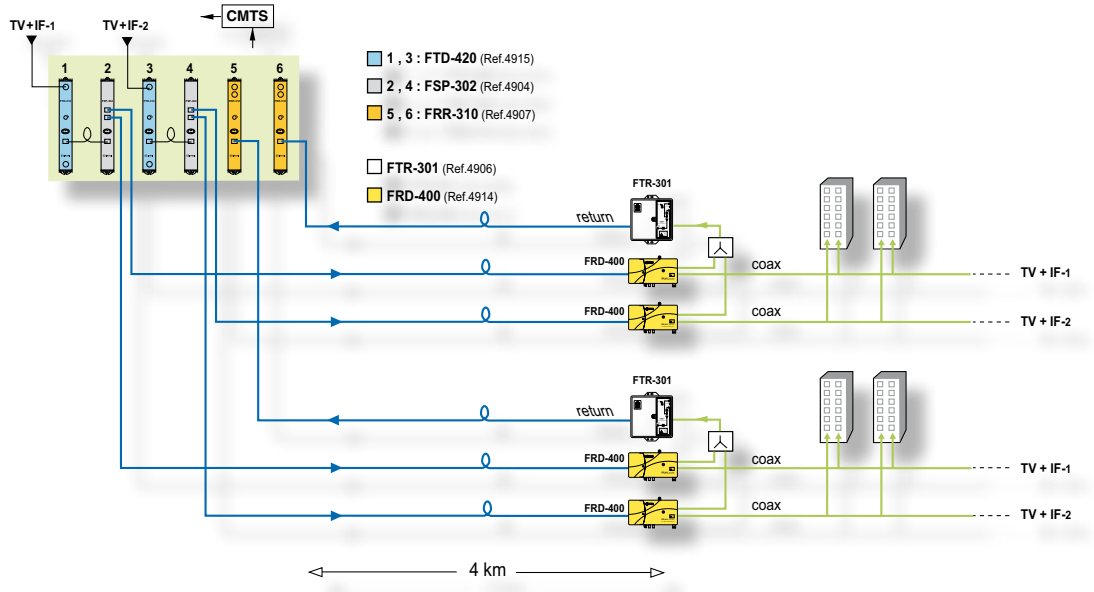
FRR. Return Path Optical Receiving Modules

- 1 optical input 1290-1600 nm — 1 RF output 5-300 MHz. Connection of singlemode type optical fibre.
- Application in two-way HFC networks. The RF signal at the output of the receiver module is used in the headend to deliver data services to the subscribers (broadband internet access, VOD, IPTV, VoIP, etc.). On an alternating application, such a signal could bring to the headend, as TV channels, events and images originated in particular sites of the network and transmitted via optical node.
- Low-noise PIN photodiode operating in the linear section of the “optical power - electrical current” transfer function.
- DC powered by a CFP power supply modules. Mountable on baseplates or rack-frame of the ClassA headend.

MODEL			FRR-310
REF.			4907
Optical window		dBm	-6 ... +1
RF output frequency		MHz	5 - 300
Optical section	Optical wavelength	nm	1290 - 1600
	Optical input return loss	dB	> 50
	Optical input connector type		SC / APC 8°
RF section	RF output level	dBµV	75
	RF flatness	dB	± 0.5
	Output variable attenuator	dB	0 - 15
	RF output impedance	Ω	75
	RF output return loss	dB	> 15
	RF output test	dB	-20
General	Supply voltage	VDC	+12
	Consumption	mA	85
	DC connector type		"banana" socket
	Dimensions	mm	230x195x32

FRR-310

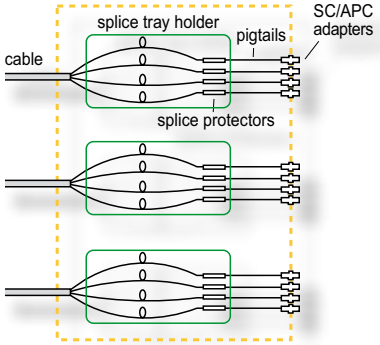
Application example



FKH. Distribution and Splice KITs - Headend Site

- Construction of optical splice and fibre distribution centres at the headend site.
- The kits include a rack-mount cabinet with a slide-out tray where the splice tray holders are fixed, and a complete set of loose accessories required for the application: splice protectors, pigtails, SC/APC adapters and stoppers. The side wings of the cabinet are movable,which allows an offset of the front panel.
- Three models made for with 1, 2 or 3 four-fibre cables.

MODEL	FKH-104	FKH-208	FKH-312
REF.	4909	4910	4911
CAPACITY (SPLICES)	4	8	12
Cabinet 19"-1U-250 mm, with slide-out tray. Material: epoxy painted, 1.5 mm thickness steel	1		
Splice protectors	4	8	12
SC/APC pigtails - 1 metre, 900 microns			
SC/APC adapters			
Stoppers	20	16	12



FKH-104

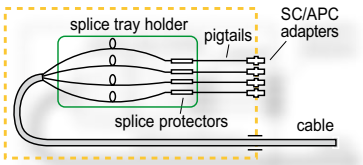
FKH-208

FKH-312

FKR. Distribution and Splice KIT - Node Site

- Construction of optical splice and fibre distribution centres at the optical node site.
- The kit includes a wall-mount cabinet with a slide-out tray where the splice tray holder is fixed, and a complete set of loose accessories required for the application: splice protectors, pigtails, SC/APC adapters and stoppers. It is specially made for 1 four-fibre cable.

MODEL	FKR-104
REF.	4908
CAPACITY (SPLICES)	4
Cabinet 175x145x44 mm - autoestinguishable plastic. Feed-through cable entry	1
Splice protectors	4
SC/APC pigtails - 1 metre, 900 microns	
SC/APC adapters	



Mounting diagram of the FKR-104

Mechanical Splicing of Optical Fibres

MODEL	REF.	DESCRIPTION
FEE-100	4919	MECHANICAL SPLICING EQUIPMENT Consists of : a) Assembly tool; b) Stripper; c) Cleaver; d) Scissors; e) Gauzes; f) Bottle of isopropyl alcohol; g) Splice Units (6).
FEM-060	4920	PACK OF MECHANICAL SPLICES Includes 60 mechanical splice units for fibres with a nominal cladding diameter of 125 microns.

Montage sequence

Cables and Jumpers

MODEL	REF.	DESCRIPTION
FCA-400	4912	OPTICAL FIBRE CABLE All dielectric cable (1m) with 4 optical singlemode fibres. Loose tube with anti-moisture filling gel. PE wrapping. Aramide spinning reinforcement. Black PE sheath. Diameter: 11 mm. Weight: 83 kg/km. Minimum bending radius: 222 mm. Attenuation @ 1310 nm: ≤ 0.38 dB/km. Attenuation @ 1550 nm: ≤ 0.23 dB/km
FJU-100	4913	OPTICAL FIBRE JUMPER Singlemode fibre jumper, SC/APC to SC/APC. Diameter: 3mm. Length: 1.5 m.

FJU-100

Line Amplifiers for 8 SAT-IF polarisations and 1 terrestrial signal

- Amplification of 8 SAT-IF polarisaitons and 1 Terrestrial-TV signal for compensating through losses of multiswitches, taps, splitters and interconnection cables in 9-cable distribution systems. Two line amplifiers can be used to amplify 16 IF and 1 TV signals in 17-cable systems.
- Cascadeable with multiswitches RC-9000 and other 9-cable system components.
- Two models for two levels of gain and RF power.
- Continuous attenuation adjustment. Fixed or adjustables slope response for satellite frequencies, depencing on model.
- Line powering (+15 VDC) through input or output SAT lines, with passing switch. Also local powering using the PSU-015 power supply. Three LEDs inform about power connection and +15 VDC presence at the input and output SAT ports.

Indoor mounting. Wall fixing.

MODEL			RL-9200	RL-9100
REF.			1121	1122
Powering mode			Remote / Local (DC)	
Line inputs			8 SAT + 1 Terr	
Line outputs			8 SAT + 1 Terr	
Frequency range		MHz	Sat: 950-2200 ; Terr: 47-862	Sat: 950-2200 ; Terr: 10-862
Gain		dB	Sat: 30 (±1) ; Terr: 25 (±1)	Sat: 15...18 (±1) ; Terr: 18 (±1)
Variable attenuation Sat/Terr		dB	0 - 15	
Variable equalization Sat/Terr		dB	0 - 8	—
Noise figure		dB	≤ 8	≤ 5
Line isolation		dB	≥ 65	
Input/output return loss		dB	≥ 10	≥ 12
Sat output level	(IMD3 -35dB, EN 50083-3)	dBµV	114	110
	(IMD2 -35dB, EN 50083-3)	dBµV	111	104
Terr output level	-60 dB IMD3, DIN 45004B	dBµV	116	112
	-60 dB IMD2, EN 50083-3	dBµV	110	106
Remote/Local Powering			+15 VDC / 850 mA	+15 VDC / 670 mA
Max current through SAT inputs			1	
Max current through SAT outputs			1	
Max total current through SAT in/out			1.150	1.330
Dimensions		mm	200x140x85	220x70x35

RL-9200

RL-9100

Power Supply unit

MODEL	PSU-015
REF.	1123
Mains voltage	100-240 VAC
Output voltage/current	+15 VDC / 3.3 A
Dimensions	40x65x130 mm

Cascadeable 9x4 Multiswitches

- Amplification of 8 SAT-IF polarizations for compensating distribution losses in 9-cable distribution systems. Two launch amplifiers can be used to amplify 16 SAT-IF polarizations in 17-cable systems.
- Cascadeable with multiswitches RC-9000 and other 9-cable system components.
- Continuous attenuation and equalization adjustments.
- Local DC powering using the PSU-015 power supply (see below). Power voltage stands on the 8 SAT input ports for line-powering LNBs and may be inserted on the 8 SAT output ports for line-powering possible RL-9100/9200 line amplifiers. Three LEDs inform about power connection and +15 VDC presence at the input and output ports.
- Indoor mounting. Wall fixing.

MODEL			RC-9410	RC-9415
REF.			1124	1125
Line inputs			8 SAT + 1 TERR	
Tap outputs			4	
Line outputs			—	8 SAT + 1 TERR
Frequency range	Sat	MHz	950-2200	
	Terr		10 - 862	
Tap loss	Sat	dB	6...2 (±2)	10...6 (±2)
	Terr		8 (±2)	14 (±2)
Through loss	Sat	dB	—	3 (±1)
	Terr		—	3 (±1)
Input and output isolation	Sat-Sat	dB	≥ 30	
	Sat-Terr		≥ 25	
Line input/output return loss	Sat	dB	≥ 12	
	Terr		≥ 12	
Tap output return loss	Sat	dB	≥ 10	
	Terr		≥ 10	
Tap output level (-35dB IMD3, EN 50083-3)		dBµV	103 (Sat)	
Tap output level (-35dB IMD2, EN 50083-3)		dBµV	104 (Sat)	
Current consumption per tap		mA	< 60	
Max line input-output pass current		A	2	
Line and Tap connector type			female F	
Operating temperature		°C	-20 ... +50	
Dimensions		mm	208x112x40	

RC-9410

Cascadeable 9x8 Multiswitches

- Cascadeable multiswitches for 9-cable systems. Distribution of 8 Sat-IF polarizations and 1 Terrestrial-TV signal. Eight tap lines per multiswitch.
- Remote powering from users' receivers. Active SAT and passive TERR.
- 4 models for 4 levels of tap loss. Sloped response for satellite frequencies.
- All models support DiSEqC 2.0 commands and are compatible with voltage/tone/ToneBurst switching signals.
- High isolation between polarizations by using multilayer technique.
- DC passing between input and output SAT lines.
- Indoor mounting. Wall fixing.

MODEL			RC-9810	RC-9815	RC-9820	RC-9825
REF.			1128	1129	1130	1131
Line inputs			8 SAT + 1 TERR			
Tap outputs			8			
Line outputs			—	8 SAT + 1 TERR		
Frequency range	Sat	MHz	950-2200			
	Terr		10 - 862			
Tap loss	Sat	dB	6...2 (±2)	10...6 (±2)	14...10 (±2)	21...17 (±2)
	Terr		12 (±2)	15 (±2)	18 (±2)	23 (±2)
Through loss	Sat	dB	—	4.5 (±1)	4.5 (±1)	3.5 (±1)
	Terr		—	4.5 (±1.5)	2.5 (±1.5)	2 (±1)
Input and output isolation	Sat-Sat	dB	≥ 30			
	Sat-Terr		≥ 25			
Line input/output return loss	Sat	dB	≥ 12			
	Terr		≥ 12			
Tap output return loss	Sat	dB	≥ 10			
	Terr		≥ 10			
Tap output level (-35dB IMD3, EN 50083-3)		dBµV	103 (Sat)			passive product
Tap output level (-35dB IMD2, EN 50083-3)		dBµV	104 (Sat)			passive product
Current consumption per tap		mA	< 60			< 30
Max line input-output pass current		A	2			
Line and Tap connector type			female F			
Operating temperature		°C	-20 ... +50			
Dimensions		mm	208x112x40			

RC-9815

RC-9810

Cascadeable 17x4 Multiswitches

- Cascadeable multiswitches for 17-cable systems. Distribution of 16 Sat-IF polarisations and 1 Terrestrial-TV signal. Four tap lines per multiswitch.
- Remote powering from users' receivers. Active SAT and passive TERR.
- 4 models for 4 levels of tap loss. Sloped response for satellite frequencies.
- All models support DiSEqC 2.0 commands and are compatible with voltage/tone/ToneBurst switching signals.
- High isolation between polarizations by using multilayer technique.
- DC passing between input and output SAT lines.
- Indoor mounting. Wall fixing.

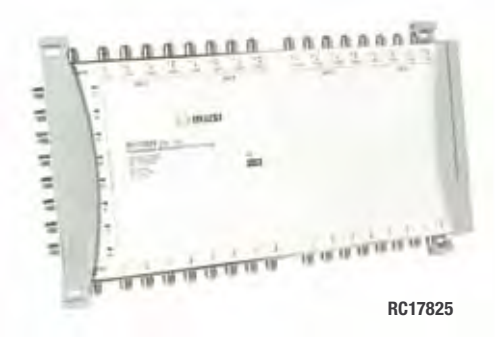
MODEL			RC17410	RC17415
REF.			1132	1133
Line inputs			16 SAT + 1 TERR	
Tap outputs			4	
Line outputs			—	16 SAT + 1 TERR
Frequency range	Sat	MHz	950-2200	
	Terr		10 - 862	
Tap loss	Sat	dB	7...3 (±2)	11...7 (±2)
	Terr		12 (±2)	15 (±2)
Through loss	Sat	dB	—	3 (±1)
	Terr		—	3 (±1.5)
Input and output isolation	Sat-Sat	dB	≥ 30	
	Sat-Terr		≥ 25	
Line input/output return loss	Sat	dB	≥ 12	
	Terr		≥ 12	
Tap output return loss	Sat	dB	≥ 10	
	Terr		≥ 10	
Tap output level (-35dB IMD3, EN 50083-3)		dBµV	103 (Sat)	
Tap output level (-35dB IMD2, EN 50083-3)		dBµV	104 (Sat)	
Current consumption per tap		mA	< 60	
Max line input-output pass current		A	2	
Line and Tap connector type			female F	
Operating temperature		°C	-20 ... +50	
Dimensions		mm	350x112x40	

RC17410

Cascadeable 17x8 Multiswitches

- Cascadeable multiswitches for 17-cable systems. Distribution of 16 Sat-IF polarisations and 1 Terrestrial-TV signal. Eight tap lines per multiswitch.
- Remote powering from users' receivers. Active SAT and passive TERR.
- 4 models for 4 levels of tap loss. Sloped response for satellite frequencies.
- All models support DiSEqC 2.0 commands and are compatible with voltage/tone/ToneBurst switching signals.
- High isolation between polarizations by using multilayer technique.
- DC passing between input and output SAT lines.
- Indoor mounting. Wall fixing.

MODEL			RC17810	RC17815	RC17820	RC17825
REF.			1136	1137	1138	1139
Line inputs			16 SAT + 1 TERR			
Tap outputs			8			
Line outputs			—	16 SAT + 1 TERR		
Frequency range	Sat	MHz	950-2200			
	Terr		10 - 862			
Tap loss	Sat	dB	7...3 (±2)	11...7 (±2)	15...11 (±2)	21...17 (±2)
	Terr		12 (±2)	15 (±2)	18 (±2)	23 (±2)
Through loss	Sat	dB	—	4.5 (±1)	4.5 (±1)	4.5 (±1)
	Terr		—	4.5 (±1.5)	2.5 (±1.5)	2 (±1)
Input and output isolation	Sat-Sat	dB	≥ 30			
	Sat-Terr		≥ 25			
Line input/output return loss	Sat	dB	≥ 12			
	Terr		≥ 12			
Tap output return loss	Sat	dB	≥ 10			
	Terr		≥ 10			
Tap output level (-35dB IMD3, EN 50083-3)		dBµV	103 (Sat)			passive product
Tap output level (-35dB IMD2, EN 50083-3)		dBµV	104 (Sat)			passive product
Current consumption per tap		mA	< 60			< 30
Max line input-output pass current		A	2			
Line and Tap connector type			female F			
Operating temperature		°C	-20 ... +50			
Dimensions		mm	350x185x40			



RC17825

RC17810

MULTI-TAPS AND MULTI-SPLITTERS

- One-way multi-taps and two-way multi-splitters of 8 SAT-IF polarisations and 1 Terrestrial-TV signal. Application in 9-cable systems as well as in 17-cable systems by using two units per level.
- Sloped response for satellite frequencies.
- DC passing between SAT inputs and outputs. DC jack for optional connection of a power supply (see “DC transit” diagrams below).
- L style case. Indoor mounting. Wall fixing.

One-way Multi-Taps of 8 and 1 TERR

MODEL			RDIS910	RDIS915	RDIS920
REF.			1140	1141	1142
Line inputs/outputs			8 SAT + 1 TERR		
Tap outputs					
Frequency range	Sat	MHz	950-2200		
	Terr		10 - 862		
Tap loss	Sat	dB	15...10 (±1)	20...15 (±1)	25...20 (±1)
	Terr		10 (±1)	15 (±1)	20 (±1)
Through loss	Sat	dB	1.5 (±1)	1.4 (±1)	1.3 (±1)
	Terr		2 (±1)	1.6 (±1)	1.2 (±1)
Input and output isolation	Sat-Sat	dB	≥ 30		
	Sat-Terr		≥ 30		
Return loss (all ports)		dB	≥ 12		
Green control LEDs			Presence of DC voltage on SAT line inputs and on line/tap SAT outputs		
Max through DC current		A	1		
Line and Tap connector type			female F		
Operating temperature range		°C	-20 ... +50		
Dimensions		mm	220x70x45		

RDIS920

Two-way Multi-Splitter of 8 and 1 TERR

MODEL			RSIS904
REF.			1144
Inputs			8 SAT + 1 TERR
Outputs			(2x) 8 SAT + 1 TERR
Frequency range	Sat	MHz	950-2200
	Terr		10 - 862
Insertion loss	Sat	dB	6 (±1)
	Terr		4 (±1)
Input and output isolation	Sat-Sat	dB	≥ 30
	Sat-Terr		≥ 30
Return loss (all ports)		dB	≥ 12
Green control LEDs			Presence of DC voltage on SAT inputs and on SAT outputs
Max through DC current		A	1
Line and Tap connector type			female F
Operating temperature range		°C	-20 ... +50
Dimensions		mm	220x70x45

RSIS904

Modular Launch SAT Amplification Equipment - 120µV

- Amplification of as many SAT-IF polarisations as required. One module SZB-190 per polarisation (SZB equipment).
- Application in 5-, 9- or 17-cable distribution systems for compensating distribution losses.
- Easy to assemble onto wall mounting baseplates with capacity for 6 or 9 modules. Two baseplates can be joined horizontally.
- Continuous attenuation adjustment. Fixed slope.
- Generation of voltage/tone signals for selection of H/V polarisation and high/low frequency sub-band.
- Power supply module. +24 VDC power voltage is automatically connected to the amplification modules through a connecting bar built in the baseplate.

Sat-IF Combiner/Amplifier

- 1 satellite input 950-2150 MHz with adjustable gain and sloped response to compensate for cable loss; 1 terrestrial coupling input 5-862 MHz; 1 satellite+terrestrial output.
- Automatic power connection, either via contact terminal (SZB application) or via terrestrial coupling input port (MZB applications).
- LNB coax line powering. The SZB-190 generates the required voltage/tone signals for the selection of H/V polarisation and high/low frequency sub-band.

MODEL		SZB-190
REF.		1346
Sat-IF Band	MHz	950 - 2150
Gain (7 dB fixed slope)	dB	33 (950 MHz) 40 (2150 MHz)
Gain adjustment	dB	18
Output level	dBµV	120
Noise figure	dB	< 8
Terrestrial band	MHz	5 - 862
Terrestrial coupling loss	dB	< 1
Operating voltage	VDC	+ 24
Consumption	mA	120
Insertable voltage/tone to Sat-IF input port		+13 / +18 VDC 0 / 22 kHz
Max LNB power current	mA	350 (at +18 VDC) / 250 (at +13 VDC)

SZB-190

Power Supplies

- Electrical safety protection level: Class II. Mains lead with bipolar plug.

MODEL		SZB-212	SZB-211
REF.		2228	1423
Regulation type		switch mode	
Mains supply voltage (50/60 Hz)	VAC	185 - 264	
Output voltage	VDC	+24 (±5%)	
Max output current	A	2	1

SZB-212

Accessories

MODEL	REF.	DESCRIPTION
BAS-916	2229	Base plate with power connecting bar. Capacity: 1p. supply+5 RF modules SZB; or 6 RF modules.
BAS-919	2225	Base plate with power connecting bar. Capacity: 1p. supply+8 RF modules SZB; or 9 RF modules.
COF-806	2231	Housing for 1 BAS-916. Dimensions: 294x346x180 mm.
COF-809	2224	Housing for 1 BAS-919. Dimensions: 420x346x180 mm.
COF-812	2233	Housing for 2 BAS-916. Dimensions: 546x346x180 mm.
COF-818	2226	Housing for 2 BAS-919. Dimensions: 798x346x180 mm.

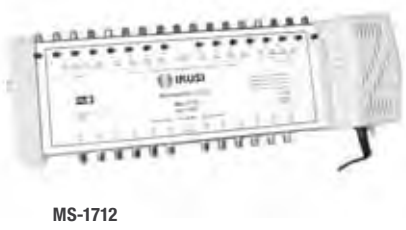
MS. Stand Alone Multiswitches

- Star distribution of 4, 8 or 16 SAT-IF polarizations plus terrestrial to 4, 8, 12 or 16 users.
- Eleven models: those for 8 and 16 polarizations support DISEqC 2.0 commands.
- Mains powered. F type connection. Indoor mounting. Wall fixing.
- The active and passive terrestrial band is selected by the switch on the input TERR. The return channel is available in passive mode.

MODEL		MS-0504	MS-0508	MS-0512	MS-0516	MS-0904	MS-0908	MS-0912	MS-0916	MS-1708	MS-1712	MS-1716	MS-1726
REF.		1023	1024	1025	1026	1027	1028	1029	1030	1031	1032	1033	1149
Number of SAT inputs		4				8				16			
Number of outputs (users)		4	8	12	16	4	8	12	16	8	12	16	26
Coupling terrestrial TV		YES											
SAT frequency band	MHz	950-2300											
Active/passive Terrestrial frequency band	MHz	active: 40-862 / passive: 5-862											
SAT insertion loss	dB	3	4	0									5
Active/passive Terrestrial insertion loss	dB	2/19	3/20	7/21	6/22	5/22	2/24	0/26	0/26	0/26	5/19	7/21	10/25
Variable atten. at SAT input	dB	0-15											
SAT output level (-35dB IMD3, EN 50083-3)	dBµV	97	96	90	90	85	85	85	85	90	90	90	85
Control by 10-14.5/ 15.5-20 V + 0/22 kHz ; + ToneBurst		YES								YES (partial control)			
DISEqC 2.0 support		—				YES							
Mains voltage (50 Hz)	Vac	230 ±10%		110-250									
Max LNBs current	mA	1000											
Dimensions	mm	235x150x80		315x150x80				435x150x80					

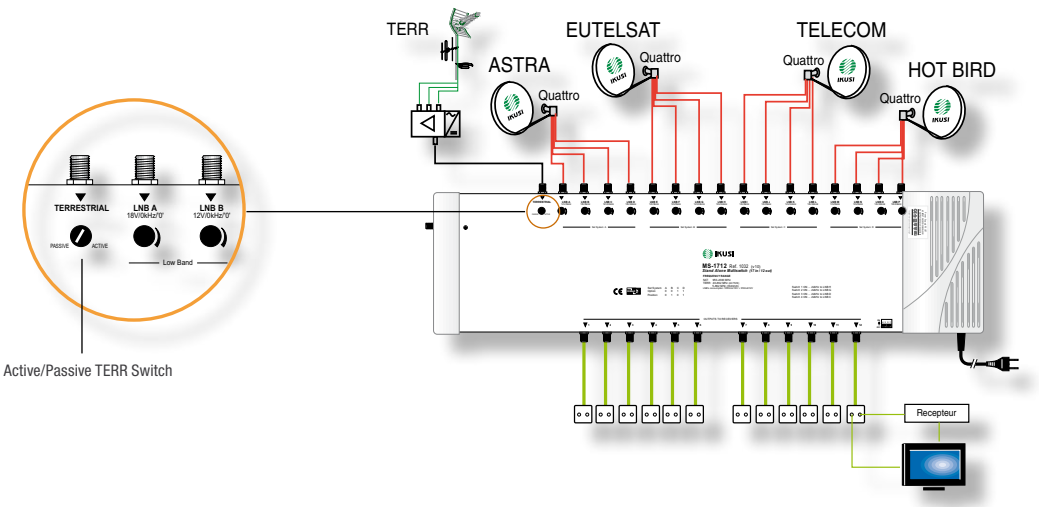
MS-0504

MS-0908



MS-1712

Application example



RS. Stand Alone Multiswitches

- Star distribution of 4 SAT-IF polarizations plus terrestrial to 4, 8, 12 or 16 users. High SAT input isolation.
- Control by voltage/tone from the user's receivers.
- Mains powered. Indoor mounting. Wall fixing.

MODEL		RS-A504	RS-A508	RS-A512	RS-A516
REF.		1145	1146	1147	1148
Number of SAT inputs		4			
Number of outputs (users)		4	8	12	16
Terrestrial TV coupling		YES			
SAT frequency band	MHz	950-2200			
TERR frequency band	MHz	47-862			
SAT output level (-35dB IMD3, EN 50083-3)	dBµV	90			
Mains voltage	VAC	100 - 240			

RS-A504

RS-A508

RS-A512

RS-A516

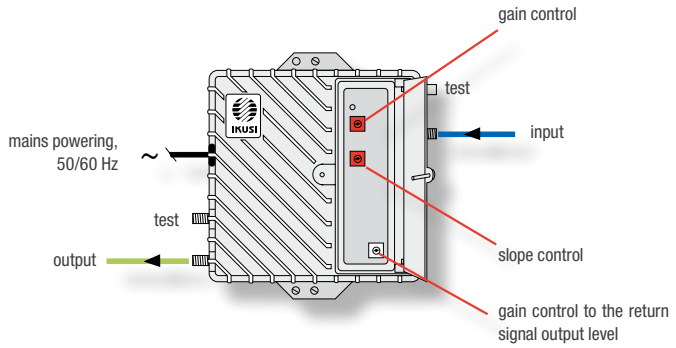
TAE-500 and TAE-700AR. Active Return Path, 862 MHz amplifiers

- Distribution of television, sound and interactive multimedia signals (TAE-500 ideal for hotels and dense multiple dwelling units).
- Continuous attenuation and equalization adjustment.
- External 75Ω output test F ports - forward and reverse.
- Power doubling technology in TAE-500 models; Push-pull technology in TAE-700AR models.

MODEL				TAE-581	TAE-583	TAE-588	TAE-733AR	TAE-736AR
REF.				3201	3207	3208	3976	3210
Powering mode				Mains		Line via RF input or RF output port input ↔ output [1] power passing	Mains	
Bandwidth - Forward way			MHz	47 - 862	86 - 862	86 - 862	47 - 862	86 - 862
Bandwidth - Reverse way			MHz	5 - 30	5 - 66	5 - 66	5 - 30	5 - 66
Forward way	Response flatness		dB	± 0.75			± 1.5	
	Nominal gain		dB	35			30	
	Input variable attenuator		dB	0 - 18			0 - 18	
	Slope control range		dB	0 - 18			0 - 15	
	Noise figure		dB	≤ 7.5			≤ 7	
	Output level	(-60 dB IMD3, DIN 45004B) (-60 dB IMD2, EN 50083-3)	dBµV	124 115			118 115	
	Output level	(-60 dB CTB 42 ch, EN) (-60 dB CSO 42 ch, EN)	dBµV	110 114			103 106	
	Output test		dB	-30			-30	
Reverse way	Gain		dB	25.5			12	
	Input variable attenuator		dB	0 - 18			0 - 18	
	Noise figure		dB	≤ 6.5			≤ 6	
	Output level	(-60 dB IMD3, DIN 45004B) (-60 dB IMD2, EN 50083-3)	dBµV	115 108			116 109	
	Output test		dB	-30			-30	
General	Operating supply voltage		VAC	100 - 264		24 - 90	230 - 240	
	Consumption		W	19			6	
	Dimensions		mm	220 x 150 x 55			150 x 150 x 55	

[1] Max AC through current: 1A

Application example



TAE-900 and TAE-700. Passive Return Path, 862 MHz amplifiers

- Distribution of television, sound and interactive multimedia signals.
- Continuous attenuation and equalization adjustment.
- External 75Ω output test F ports - forward and reverse.
- Push-pull technology.

MODEL			TAE-933	TAE-935	TAE-923	TAE-925	TAE-733	TAE-736
REF.			3183	3184	3181	3182	3931	3192
Powering mode			Mains		Line via RF input port		Mains	
Bandwidth - Forward way		MHz	47 - 862	86 - 862	47 - 862	86 - 862	47 - 862	86 - 862
Bandwidth - Reverse way		MHz	5 - 30	5 - 55	5 - 30	5 - 55	5 - 30	5 - 66
Response flatness		dB	± 0.75				± 1.5	
Nominal gain		dB	36				29.5	
Input variable attenuator		dB	0 - 18				0 - 18	
Slope control range		dB	0 - 15				0 - 15	
Noise figure		dB	≤ 7				≤ 7	
Output level	(-60 dB IMD3, DIN 45004B) (-60 dB IMD2, EN 50083-3)	dBµV	120 115				118 115	
Output level	(-60 dB CTB 42 ch, EN) (-60 dB CSO 42 ch, EN)	dBµV	105 108				103 106	
Output test - forward		dB	-30				-30	
Return path through loss		dB	≤ 2				≤ 2	
Output test - reverse		dB	-30				-30	
Operating supply voltage		VAC	185 - 264		24 - 60		230 - 240	
Consumption		W	6				6	
Dimensions		mm	220 x 150 x 55				220 x 150 x 55	

Application example

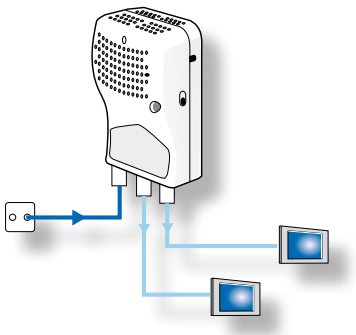
TAE-300. Two-way, 862 MHz amplifiers

- Push-pull technology: very low 2nd order intermodulation distortion.
- Continuous attenuation and equalization adjustments.
- F type connection. Indoor mounting. External plastic box. Dimensions: 125x85x55 mm.

MODEL			TAE-323	TAE-326	TAE-316
REF.			3964	3966	3963
Bandwidth - Forward way		MHz	47 - 862	86 - 862	86 - 862
Bandwidth - Reverse way		MHz	5 - 30	5 - 66	5 - 66
No. of RF outputs			2		1
Gain		dB	15.5		19
Input variable attenuator		dB	0 - 10		
Slope control range		dB	0 - 6		
Noise figure		dB	≤ 5		
Output level	(-60 dB IMD3, DIN 45004B) (-60 dB IMD2, EN 50083-3)	dBµV	(2X) 108 (2X) 97		111.5 100.5
Output level	(-60 dB CTB 42 ch, EN) (-60 dB CSO 42 ch, EN)	dBµV	(2X) 93 (2X) 96		96.5 99.5
Return path through loss		dB	4		1
Mains supply voltage (50/60 Hz)		VAC	230 - 240		
Consumption		W	3		

TAE-323

Application example



SAE. Two-way, 2150 MHZ Amplifiers

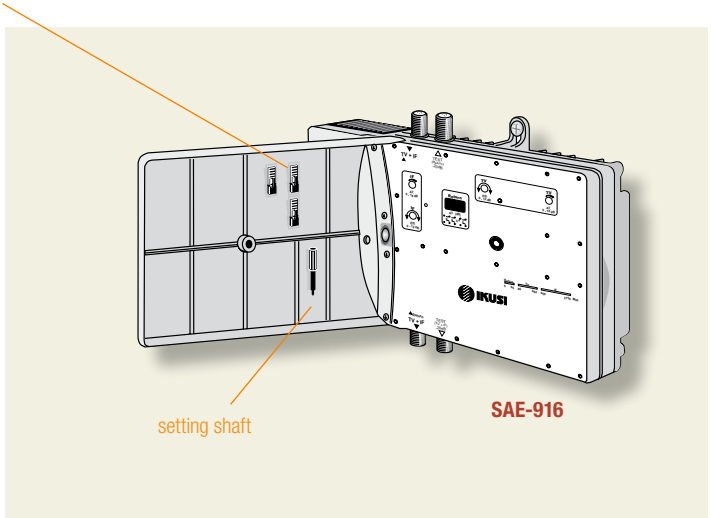
- Distribution of terrestrial TV, satellite IF and multimedia signals.
- 1 RF input - 1 RF output. Terrestrial and satellite frequencies amplified separately. Passive or active return path, with respective 35/45 MHz or 65/86 MHz splits. Attenuation and equalization adjustments of TV and IF signals by potentiometer.
- Zinc alloy housing with protective cover.
- F connectors. Wall fixing. Indoor mounting. Dimensions: 222x140x44 mm.

MODEL			SAE-912	SAE-916
REF.			3500	3503
Powering mode			Mains	
Bandwidth	Terrestrial (TV) Satellite (IF) Return	MHz	45 - 862 950 - 2150 5 - 35 (passive path)	86 - 862 950 - 2150 5 - 65 (active path)
Terrestrial path (TV)	Response flatness	dB	± 1.5	
	Nominal gain	dB	35	
	Variable interstage attenuator	dB	0 - 18	
	Noise figure	dB	≤ 8	
	RF output level	dBµV	118 (-60dB IMD3) 115 (-60dB IMD2) 103 (-60dB CTB, CSO)	
Satellite path (FI)	Response flatness	dB	± 2	
	Nominal gain	dB	40	
	Variable Interstage attenuator	dB	0 - 18	
	Noise figure	dB	≤ 6	
	RF output level	dBµV	118 (-35dB IMD3)	
Return path	Nominal gain	dB	-2.5	12
	Selectable attenuation	dB	—	0 - 11
	Max RF input level	dBµV	—	98 (-60dB IMD3) 93 (-60dB IMD2)
	Noise figure	dB	—	≤ 7
	RF Output level	dBµV	—	110 (-60dB IMD3) 105 (-60dB IMD2)
General	Operating temperature	˚C	-10 ... +55	
	Mains supply voltage (50/60 Hz)	VAC	23 0- 240	
	Consumption	W	8.5	9

SAE-912

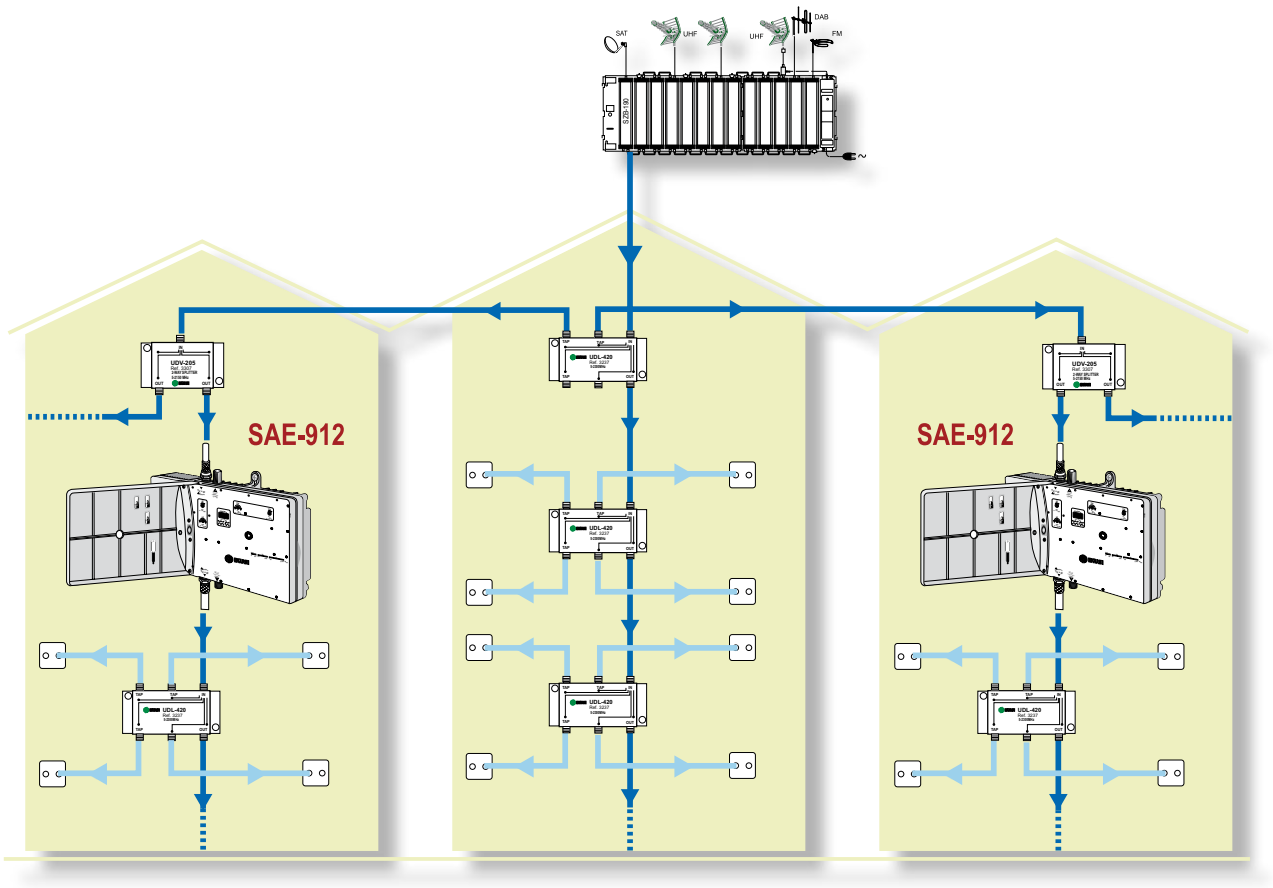
Application example

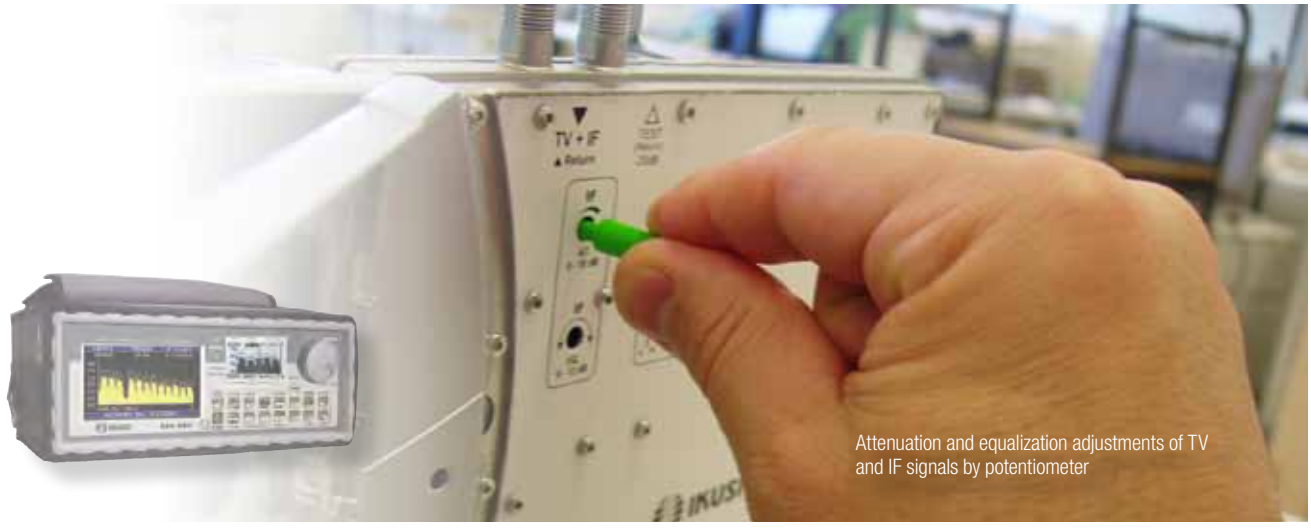
In model with active return path, selection of return signal attenuation by the insertion of small plug-in links provided.



SAE. Two-way, 2150 MHZ Amplifiers

Application example





Attenuation and equalization adjustments of TV and IF signals by potentiometer

SAE. One-way, Double 2150 MHz Amplifiers

- Application in collective installations with two downlead distribution cables carrying 2 satellite IF and 1 terrestrial TV signals.
- 1 TV + IF-1 input — 1 IF-2 input „ 1 TV + IF-1 output — 1 TV + IF-2 output.
- Separated amplification paths for TV, IF-1 and IF-2 signals, each including attenuation and equalization adjustment potentiometers. GaAs-MESFET technology used for terrestrial amplification.
- External 75Ω output test ports.
- Zinc alloy housing with protective cover for adjustment potentiometers. F type connection.
- Wall-fixing. Indoor mounting. Grounding terminal. Dimensions: 222x140x44 mm.

MODEL				SAE-920	SAE-820
REF.				3507	3515
Powering mode				Mains *	Line **
Bandwidth		TV IF-1 IF-2	MHz	45 - 862 950 - 2150 950 - 2150	
RF inputs				2 TV+IF-1 ; IF-2	
RF outputs				2 TV+IF-1 ; TV+IF-2	
Terrestrial path (TV)	Response flatness		dB	± 1.5	
	Nominal gain		dB	35	
	Variable interstage attenuator		dB	0 - 18	
	Noise figure		dB	≤ 8	
	RF output level		dBµV	118	
Satellite paths (IF-1 and IF-2)	Response flatness		dB	± 2	
	Nominal gain		dB	40	
	Variable interstage attenuator		dB	0 - 18	
	Noise figure		dB	≤ 6	
	RF output level		dBµV	120	
General	Operating temperature		˚C	-10 ... +55	
	Supply voltage		VAC	230 - 240	48 and 65 systems
	Consumption		W	15	

* Insertable mains lead. C8 type, 2-pin connection inlet.
** Connection (and passing, max 1A) of power current to the input or output TV + IF-1 port.

SAE-820

ACP-425. AC Power Supply

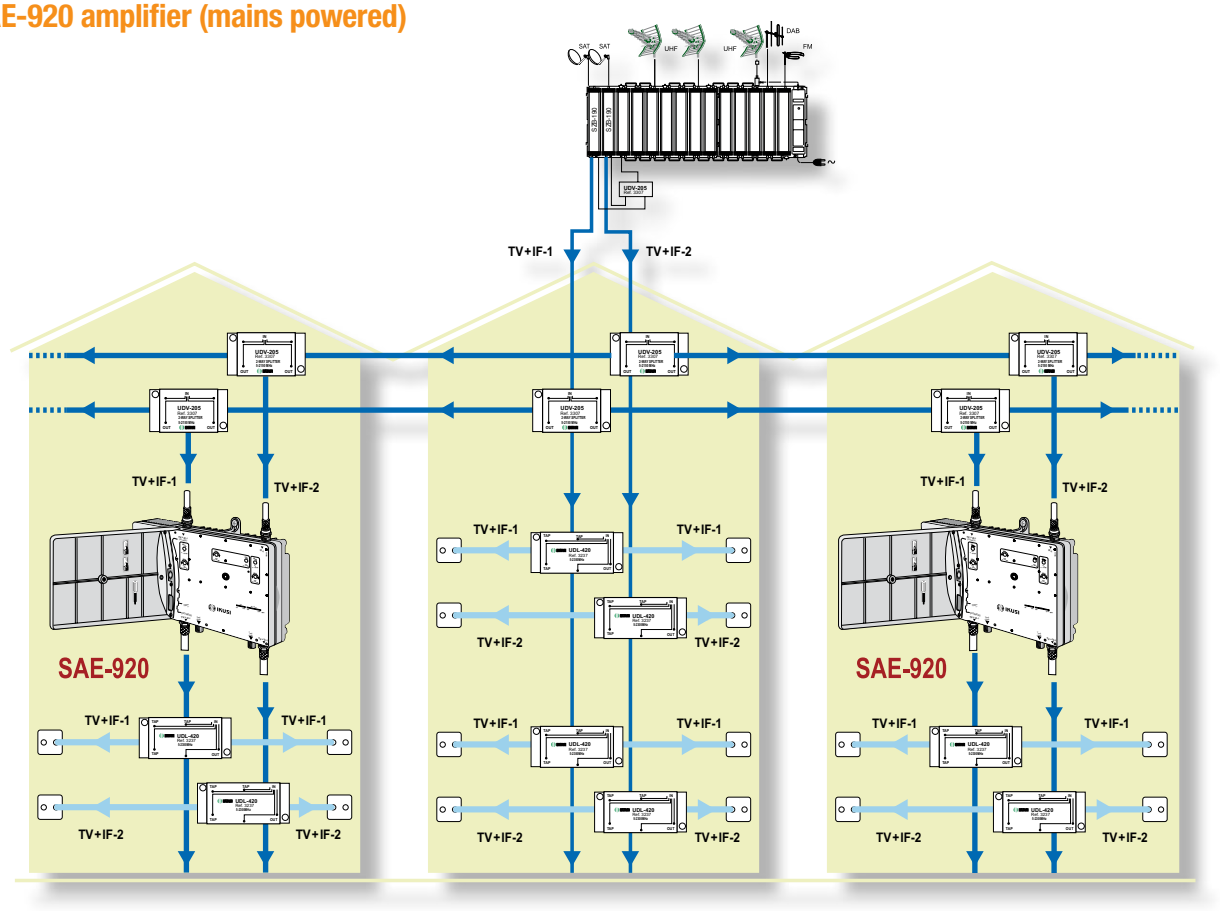
- Line powering of extension amplifiers. To be utilized in conjunction with one or more (up to 4) IIS-100 power inserters.
- Mains 230 VAC input. Four 60 VAC outputs.
- Mains lead with bipolar plug. All output ports: F female connector.
- Injection-moulded zinc alloy housing. Wall fixing.
- Indoor mounting. Grounding terminal. Dimensions (mm): 150X150X55.

MODEL		ACP-425
REF.		1163
Mains voltage	VAC	230
Output voltage	VAC	(4x) 60
Max current to 1 input	A	1.1
Max total current to 4 outputs	A	2.5
Fuse of transformer's primary		F 1A / 250V
Efficiency	%	90
AC requirements	VA	170
AC output connectors		(4x) female F
Operating temperature	°C	-20 ... +70

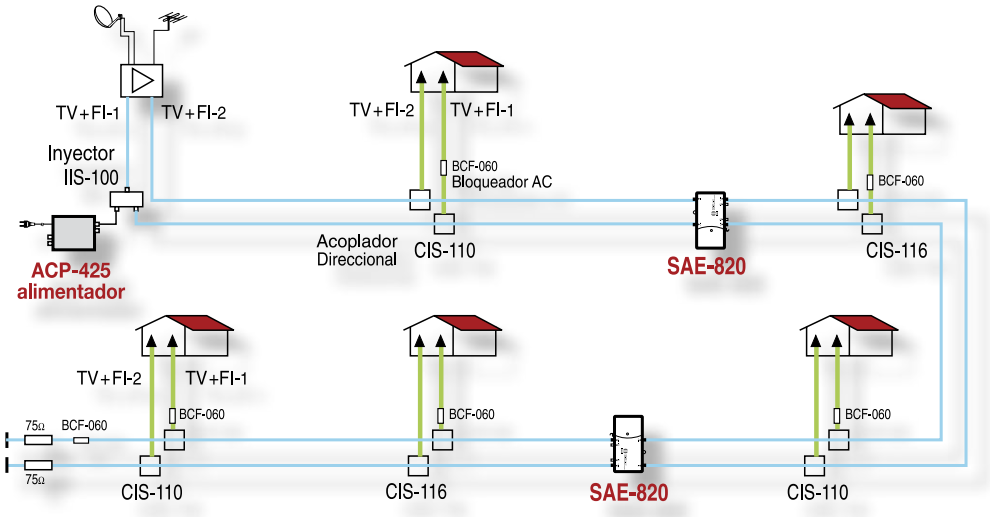
SAE. One-way, Double 2150 MHz Amplifiers

Application example

with SAE-920 amplifier (mains powered)



with SAE-820 amplifier (line powered)



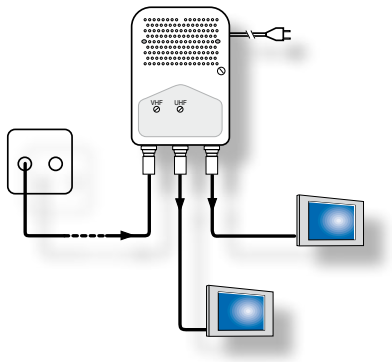
ATP-300. One-way, 862 MHz amplifiers - F connectors

- Forward path extends to 862 MHz. Passive return-path. Three available splits: 30/47 MHz, 42/54 MHz or 66/86 MHz.
- Push-pull technology: very low 2nd order intermodulation distortion.
- 1 RF input — 1 or 2 RF outputs.
- Continuous attenuation and equalization adjustments.
- Mains powering, 50/60 Hz. Electrical safety protection level: Class II. Mains lead with bipolar plug.
- External plastic box, dimensions: 125x85x55 mm. F type connection. Earthing facility. Wall fixing.

MODEL		ATP-332	ATP-322	ATP-302
REF.		3509	3489	3488
Frequency range	MHz	40 - 318 and 470 - 862	47 - 862	
No. of RF outputs		2 [1] (symmetrical)		2 (asymmetrical)
Gain	dB	14 (VHF) ,, 24 (UHF)	15 ... 21 (fixed slope: 6dB)	18 ... 24 and 7 .. 13 (fixed slope: 6dB)
Gain adjustment	dB	-16 (VHF) ,, -12 (UHF)	-10 (VHF/UHF)	
Noise figure	dB	4.5 (VHF) ,, 5.5 (UHF)		
RF output level [2]	dBµV	(2x) 105	(2x) 108	111 and 100
Mains supply voltage	VAC	230 - 240		
Consumption	W	2.3	2.5	

[1] If only one of the two outputs is being used, the spare port must be terminated with a CTF-125 (Ref. 1519) 75Ω terminator.
[2] IMD3=-60 dB (DIN 45004B). The indicated level refers to the amplification of 2 TV channels. If more than 2 channels are used, see Reduction table on Technical Annex.

ATP-332

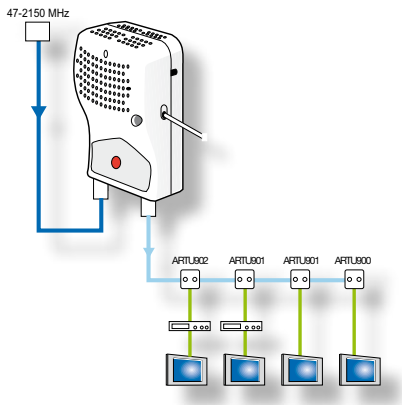


ATP-900. Two-way, 2150 MHz Amplifiers - F connectors

- Terrestrial (TV) and satellite (IF) frequencies amplified separately. Passive return path.
- Single RF Input and Single RF Output with DC power passing capability.
- Adjustable gain for terrestrial frequencies.
- Mains powered 50/60 Hz. External plastic box. Wall fixing. Dimensions: 125X85X55 mm.

MODEL			ATP-931	ATP-961
REF.			3490	3491
Frequency range	Terrestrial (TV) Satellite (IF) Return	dB	47 - 862 950 - 2150 5 - 30	86 - 862 950 - 2150 5 - 66
Terrestrial path (TV)	Nominal gain	dB	18	
	Gain adjustment	dB	-10	
	Noise figure	dB	≤ 7	
	RF output level	dBµV	108 (-60dB IMD3) / 100 (-60dB IMD2)	
Satellite path (FI)	Nominal gain	dB	18 - 24 (6 dB fixed slope)	
	Gain adjustment	dB	—	
	Noise figure	dB	≤ 10	
	RF output level	dBµV	112	
Return path	Through loss	dB	1.5	
General	Operating temperature	˚C	0 ... +45	
	DC tansit		24 V / 500 mA	
	Mains supply voltage	VAC	230 - 240	
	Consumption	W	3	

ATP-931



LINE AND DISTRIBUTION CATV AMPLIFIERS

TSI-500. AC Power Supply / Power Inserter - RF configurable

The TSI-500 is a «power supply/power inserter» that may be RF configured as single inserter, 2-way splitter or 1-port tapoff. Inserts a 60 VAC voltage to any of the coaxial cables connected to the unit —two cables when it is used as single inserter or three cables in the splitter or tapoff configurations. The unit is presented in a tough aluminium die-cast housing for outdoor mounting. A neoprene compression gasket and a neoprne/metal-mesh radiation gasket provide maximum RFI shieding and IP67 grade weatherproofing. RF ports are 5/8"-24 type.

MODEL			TSI-500
REF.			2179
Bandwidth		MHz	5 - 862
Nominal mains supply		VAC	230 - 240
Nominal inserted voltage (at max load)		VAC	58
Impedance		Ω	75
Return loss		dB	> 16
Max insertion loss	"single inserter" configuration	dB	0.6
	"splitter" configuration		(2x) 4.5
	"tapoff" configuration		1.6 and 12
Response flatness		dB	≤ ± 0.5
Max current to one RF port		A	5
Max current to all RF ports		A	5
Hum modulation		dB	≤ -70
Efficiency		%	90
Load regulation		%	0 ... -6
Screening factor		dB	> 80
Fuse/switch of AC injection			(3x) Semi-delay 6.3A / 250V
Fuse of transformer primary			T 3.15A / 250V
Fuse of transformer secondary			T 6.3A / 250V
AC requirements		VA	330
Operating temperature range		°C	-20 ... +70
Dimensions		mm	300x200x100

- Three fuses/switches for AC insertion to one, two, or the three RF ports.
- Built-in protection for overcurrents.
- Input and output fuses with status LED indicators.
- Output overvoltage VDR protection.
- Wall fixing.
- Grounding and sealing facilities.

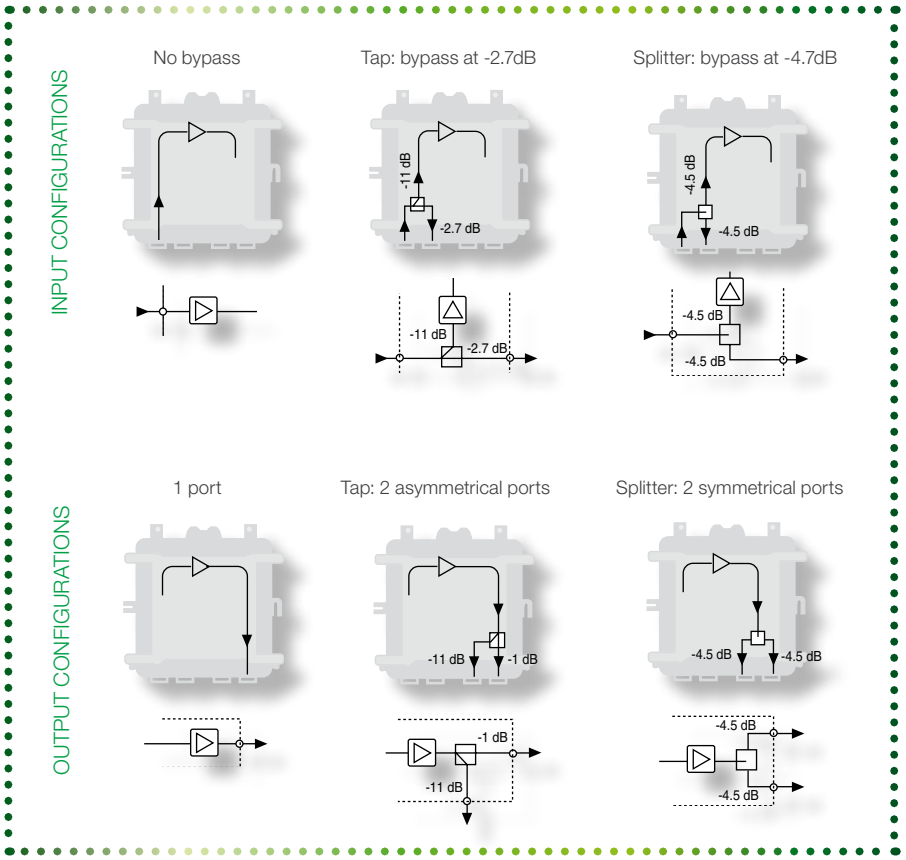
TAL-800. Configurable Line and Distribution Amplifiers

The line amplifiers «TAL-800» Series includes line and mains powered models for 862 MHz systems, with three available splits: 30/45 MHz, 42/54 MHz and 66/86 MHz. Advanced GaAsFET amplification technology is used providing excellent output levels at high channel capacities.

The «TAL-800» amplifiers come in a tough housing with drop-down front lid. The RF amplification block and the power supply are modular and can be taken out and replaced, when required, without removing the amplifier from its location and without the need of disconnection. Both modules are available as spare parts. At the bottom of the housing four separate 5/8" cable connections can be located; please note that alternatively both input and main output connections to the amplifier can be made to the side entry ports located at the bottom left and bottom right sides of the housing.

The amplifiers come fully optioned and do not require the purchase of additional modules, with the exception of the ALSC. By simply changing the internal plug-in links to the desired position, the amplifier can be configured to include a splitter or a tap at the input and output ports. Some of the other built in options are: add pre-amplification at the forward path, disable the return path, enable or disable both input and output power passing ports, just to name a few. An Automatic Level and Slope Control module, which will deliver a constant output level over temperature, can be simply plugged into the amplifier module if required.

- Aluminium die-cast housing with exceptional cooling characteristics. Weatherproofing IP67 grade and maximum RFI shielding. Stainless steel screws.
- Wall- and strand-fixing.
- Input and output RF connections by 5/8"—24 UNEF 2A pin connectors.
- Transient protected connection ports.
- Switch-mode power supply with automatic transient protection, output overvoltage protection and current limiting.
- 75 ohms test points on F type connectors.
- Earthing facility.



TAL-800. Configurable Line and Distribution Amplifiers

MODEL				TAL-883	TAL-886	TAL-893	TAL-896
REF.				3948	3950	3975	3974
Technology				GaAsFET			
Powering mode				Line		Mains	
Bandwidth - Forward way			MHz	45 - 862	86 - 862	45 - 862	86 - 862
Bandwidth - Reverse way			MHz	5 - 30	5 - 66	5 - 30	5 - 66
Forward way	Input bypass		dB	-2.7 (if tap is implemented) ,, -4.5 (if splitter is implemented)			
	Response flatness		dB	± 0.75			
	Nominal gain without input bypass	1 output	dB	27 [37 if preamplification is implemented]			
		2 symmetrical outputs		(2x) 22.5 [(2x) 32.5 if preamplification is implemented]			
		2 asymmetrical outputs		26 and 16 [36 and 26 if preamplification is implemented]			
	Nominal gain with input bypass -2.7dB	1 output	dB	16 [26 if preamplification is implemented]			
		2 symmetrical outputs		(2x) 11.5 [(2x) 21.5 if preamplification is implemented]			
		2 asymmetrical outputs		15 and 5 [25 and 15 if preamplification is implemented]			
	Nominal gain with input bypass -4.5dB	1 output	dB	22.5 [32.5 if preamplification is implemented]			
		2 symmetrical outputs		(2x) 18 [(2x) 28 if preamplification is implemented]			
		2 asymmetrical outputs		21.5 and 11.5 [31.5 and 21.5 if preamplification is implemented]			
	Input attenuat.	whitout preamplifica. implemented	dB	0, 3, 6, 9, 12 or 15 (4 cells or 0, 3, 6 and 9 dB)			
		whit preamplifica. implemented	dB	0, 3, or 6 (3 cells of 0, 3, and 6 dB)			
	Interstage attenuation		dB	0 to 8			
	Input equalization		dB	-6 to 18 (3 cells of -6, -3 and 0 dB, and 1 variable equalizer of 0-18 dB)			
	Sloped response		dB	0, 6 or 12 (3 cells of 0, 6 and 12 dB)			
	Output level (-60dB IMD3, DIN 45004B)		dBµV	≥ 124 (1 output) ,, ≥ (2x) 119.5 (2 symmetrical outputs) ,, ≥ 123 and 113 (2 asymmetrical outputs)			
	Output level (-60dB IMD2, EN 50083-3)		dBµV	≥ 115 (1 output) ,, ≥ (2x) 110.5 (2 symmetrical outputs) ,, ≥ 114 and 104 (2 asymmetrical outputs)			
	Output level (-60dB CTB, 42 ch, EN 50083-3)		dBµV	≥ 110 (1 output) ,, ≥ (2x) 105.5 (2 symmetrical outputs) ,, ≥ 109 and 99 (2 asymmetrical outputs)			
	Output level (-60dB CSO, 42 ch, EN 50083-3)		dBµV	≥ 114 (1 output) ,, ≥ (2x) 109.5 (2 symmetrical outputs) ,, ≥ 113 and 103 (2 asymmetrical outputs)			
	Noise figure		dB	≤ 7			
	Input/Output return loss		dB	> 14			
	Input test (on internal F port)		dB	-30 ±1			
	Output-1 test		dB	-19 ±1			
Reverse way	Nominal gain		dB	26			
	Input attenuation		dB	0 to 18			
	Interstage attenuation		dB	0 or 6 (2 cell of 0 and 6)			
	Output level (-60dB IMD3, DIN 45004B)		dBµV	118 (without input bypass)			
	Output level (-60dB IMD2, EN 50083-3)		dBµV	106 (without input bypass)			
	Noise figure		dB	≤ 7			
	Input/Output impedance		Ω	75			
	Input/Output return loss		dB	≥ 16			
	Output test	without input bypass	dB	-30 ±1			
		with input bypass -2.7 dB		-18 ±1			
		with input bypass -4.5 dB		-25.5 ±1			
General	Powering voltage		VAC	24 - 90 (line powered models) / 100 - 264 (mains powered models)			
	Consumption		W	21			
	Maximum AC/DC through current		A	7			
	Hum modulation, @ 7A		dB	< -70			
	Screening factor		dB	> 80			
	Dimensions		mm	215 x 215 x 80			

UDU Series. Splitters - 2450 MHz

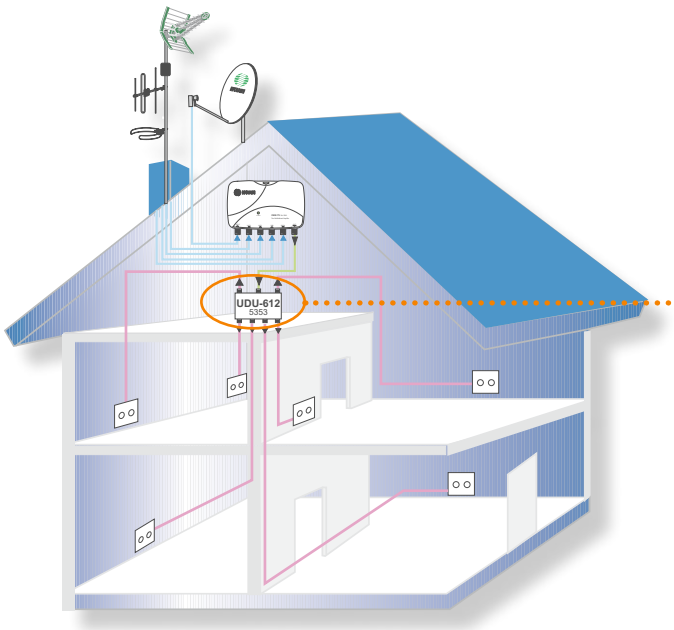
- 2-, 3-, 4-, 6- and 8-way shielded inductive splitters. Frequency range: 5-2450 MHz.
- Wall fixing, nickle-plated zinc diecast housing (2 screws attached). Grounding facilities. All ports F female connector.
- Unidirectional DC transit (max +24 VDC, 0.5 A) on all ports.
- The Splitter has a 9mm Pathway underneath to allow cable distribution.

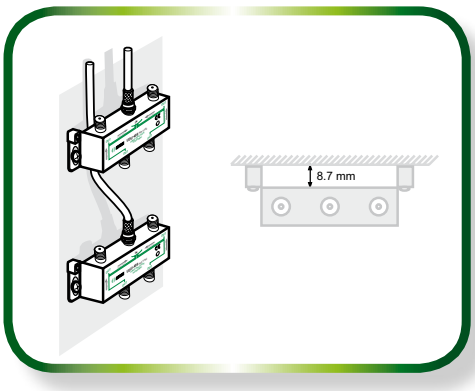
MODEL			UDU-205	UDU-307	UDU-408	UDU-612	UDU-813
REF.			5350	5351	5352	5353	5354
No. of ways			2	3	4	6	8
Insertion loss	5-862 MHz	dB	≤ 3,6	≤ 6,8	≤ 8,1	≤ 11,8	≤ 11,9
	950-1550 MHz		≤ 4,1	≤ 8,5	≤ 9,1	≤ 13,5	≤ 14,1
	1551-2300 MHz		≤ 4,8	≤ 9,7	≤ 10,4	≤ 15,1	≤ 15
Output isolation	5-300 MHz	dB	≥ 35	≥ 25	≥ 24	≥ 28,5	≥ 26
	301-862 MHz		≥ 34	≥ 21	≥ 22	≥ 25,5	≥ 28,4
	950-2300 MHz		≥ 20	≥ 21	≥ 22,5	≥ 25	≥ 28
Return loss		dB	≥ 12	≥ 10	≥ 10	≥ 10	≥ 10
Dimensions		mm	55x50x25	78x50x25	76x58x25	120x58x25	120x58x25

UDU-205

UDU-408

UDU-813





Diverse Indoor Passive Elements with 65VAC/1A Power Passing

- Directional Couplers (10 and 16 dB) — Two-way Splitter — Power Inserter.
- Frequency range: 5-2150 MHz.
- Power passing (65 VAC / 1A) through all ports.
- Nickle-plated zinc diecast housing. Wall-fixing (2 screws attached). All ports: F female connector. Grounding facilities.

Directional Couplers

MODEL			CIS-110	CIS-116
REF.			3374	3375
Through loss	5-862 MHz	dB	≤ 2.0	≤ 1.6
	950-1550 MHz		≤ 2.3	≤ 1.8
	1551-2300 MHz		≤ 2.5	≤ 2.2
Tap loss	5-300 MHz	dB	10.5 (±1.5)	16.0 (±1.5)
	301-862 MHz		10.5 (±1.5)	16.0 (±1.5)
	950-2300 MHz		11.0 (±2.0)	16.0 (±2.0)
Tap-to-Output isolation		dB	≥ 15	≥ 18
Power passing through every port			max 65 VAC / 1A	

CIS-110

2-way Splitter

MODEL			SIS-102
REF.			3376
No. of ways			2
Insertion loss	5-862 MHz	dB	≤ 4.2
	950-1550 MHz		≤ 5.0
	1551-2300 MHz		≤ 5.8
Output isolation	5-47 MHz	dB	≥ 12
	48-862 MHz		≥ 20
	950-2150 MHz		≥ 15
Power passing through every port			max 65 VAC / 1A

SIS-102

Power Inserter

MODEL			IIS-100
REF.			3377
Insertion loss	5-862 MHz	dB	≤ 0.8
	950-1550 MHz		≤ 1.0
	1551-2150 MHz		≤ 1.3
Return loss	5-862 MHz	dB	≥ 12
	950-2150 MHz		≥ 10
Voltage/Current of insertion		dB	max 65 VAC / 1A

IIS-100

- 1-, 2-, 4- and 8-way shielded directional tap-offs. Frequency range: 5-2300 MHz.
- Wall fixing, nickle-plated zinc diecast housing (2 screws attached). Grounding facilities. All ports F female connector.
- DC tansit (max +24 VDC, 0.5 A) on the main line.

UDL-100 Series. 1-way Tap-offs

MODEL			UDL-110	UDL-115	UDL-120
REF.			3226	3227	3228
Tap loss (± 0.7 dB)		dB	10	15	20
Through loss	5-862 MHz	dB	≤ 1.1	≤ 1.0	≤ 0.9
	950-1550 MHz		≤ 1.7	≤ 1.7	≤ 1.6
	1551-2300 MHz		≤ 2.3	≤ 2.2	≤ 2.1
Directional isolation	5-300 MHz	dB	≥ 29	≥ 28	≥ 31
	301-862 MHz		≥ 29	≥ 27	≥ 28
	950-2300 MHz		≥ 19	≥ 23	≥ 19
Return loss		dB	≥ 15 (TV) ≥ 10 (SAT)		

Dimensions (mm): 54x58x26

UDL-110

UDL-200 Series. 2-way Tap-offs

MODEL			UDL-210	UDL-215	UDL-220
REF.			3244	3245	3232
Tap loss (± 0.7 dB)		dB	10	15	20
Through loss	5-862 MHz	dB	≤ 2.3	≤ 1.6	≤ 1.1
	950-1550 MHz		≤ 3.0	≤ 2.0	≤ 1.9
	1551-2300 MHz		≤ 3,7	≤ 2.6	≤ 2.6
Directional isolation	5-300 MHz	dB	≥ 26	≥ 29	≥ 31
	301-862 MHz		≥ 26	≥ 27	≥ 29
	950-2300 MHz		≥ 20	≥ 22	≥ 26
Tap-to-tap isolation	5-300 MHz	dB	≥ 38	≥ 39	≥ 46
	301-862 MHz		≥ 35	≥ 37	≥ 42
	950-2300 MHz		≥ 28	≥ 37	≥ 39
Return loss		dB	≥ 12 (TV) ≥ 10 (SAT)	≥ 14 (TV) ≥ 10 (SAT)	≥ 12 (TV) ≥ 10 (SAT)

Dimensions (mm): 54x58x26

UDL-215

UDL-400 Series. 4-way Tap-offs

MODEL			UDL-410	UDL-415	UDL-420
REF.			3235	3236	3237
Tap loss (± 1 dB)		dB	10	15	20
Through loss	5-862 MHz	dB	≤ 4.0	≤ 1.9	≤ 0.9
	950-1550 MHz		≤ 4.4	≤ 2.8	≤ 1.5
	1551-2300 MHz		≤ 4.6	≤ 3.5	≤ 2.1
Directional isolation	5-300 MHz	dB	≥ 35	≥ 30	≥ 37
	301-862 MHz		≥ 33	≥ 30	≥ 33
	950-2300 MHz		≥ 29	≥ 23	≥ 25
Tap-to-tap isolation	5-300 MHz	dB	≥ 29	≥ 30	≥ 29
	301-862 MHz		≥ 26	≥ 28	≥ 26
	950-2300 MHz		≥ 24	≥ 28	≥ 24
Return loss		dB	≥ 10 (TV) ≥ 10 (SAT)	≥ 10 (TV) ≥ 10 (SAT)	≥ 12 (TV) ≥ 10 (SAT)

Dimensions (mm): 76x58x26

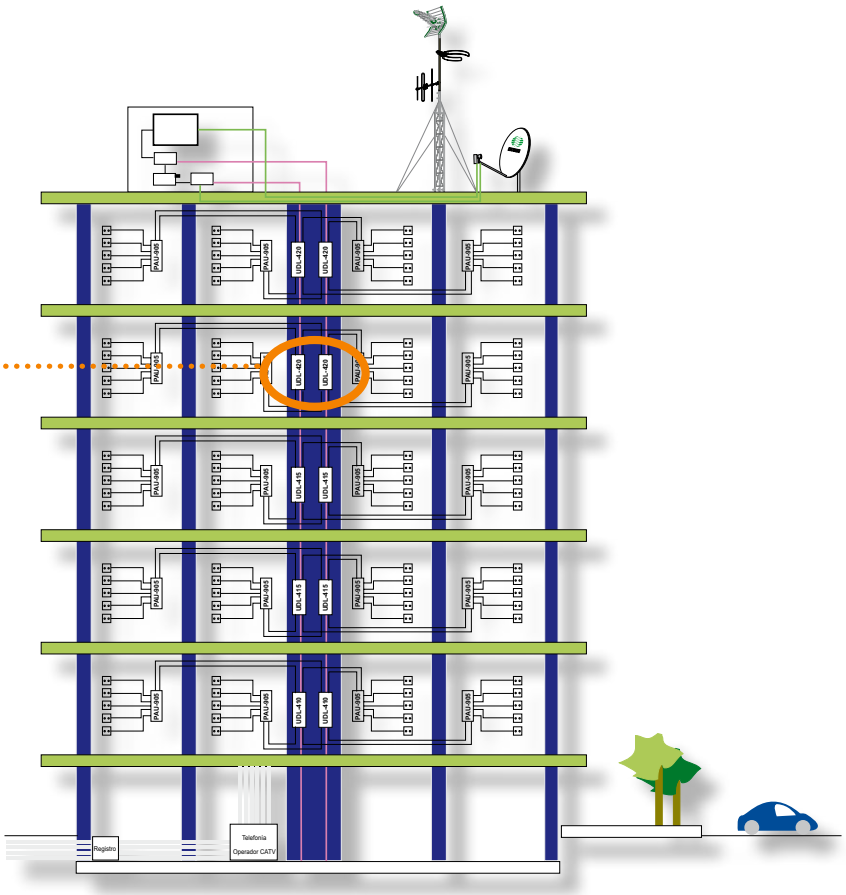
UDL-420

UDL-800 Series. 8-way Tap-offs

MODELO			UDL-816	UDL-820
REF.			3366	3367
Tap loss (± 1 dB)		dB	16	20
Through loss	5-862 MHz	dB	≤ 4.0	≤ 1.8
	950-1550 MHz		≤ 4.4	≤ 2.0
	1551-2300 MHz		≤ 4.8	≤ 2.2
Directional isolation	5-300 MHz	dB	≥ 30	≥ 30
	301-862 MHz		≥ 30	≥ 30
	950-2300 MHz		≥ 27	≥ 23
Tap-to-tap islolation	5-300 MHz	dB	≥ 34	≥ 30
	301-862 MHz		≥ 32	≥ 28
	950-2300 MHz		≥ 25	≥ 28
Return loss		dB	≥ 10 (TV) ≥ 10 (SAT)	

Dimensions (mm): 120x60x20

UDL-816



- For use in single-cable tree distributions and for single systems or star distributions.
- Sturdy injection-moulded zinc alloy housing. Flush mounting in box Ø56 mm. Dimensions of coverplate: 80x80 mm. Fast and easy connection of the coaxial cable. Surface mounting using the ABT-210 (Ref. 1460).
- Versions without coverplate available.
- Connectors:

  TV: male IEC
  RD: female IEC

TV-RD — Line Outlets

MODEL			ARTU201	ARTU251
REF.			2750	2763
Coverplate			YES	NO
Frequency range		MHz	5 - 862	
Transfer loss (±0.5 dB)	input - TV	dB	7.5	
	input - RD		27.5	
Max through loss		dB	2.5	
Isolation	output - TV	dB	> 26	
	output - RD		> 44	
TV-RD isolation		dB	> 20	

TV-RD — Stub Outlets

MODEL			ARTU001	ARTU051	ARTU002	ARTU000	ARTU050
REF.			2736	2766	2737	2735	2734
Coverplate			YES	NO	YES	YES	NO
Technology			Resistive		LC filters	Bridged	
Frequency range		MHz	5 - 862		TV: 5 - 68 and 118 - 1000 RD: 87.5 - 108	5 - 862	
Transfer loss	input - TV	dB	≤ 3.5		≤ 1	—	
	input - RD		≤ 10		≤ 3	—	
TV-RD isolation		dB	> 12.5		> 10	—	

The ARTU001 and ARTU051 models may be also used respectively as final outlets for a cascade of ARTU201 or ARTU251 outlets.

- For use in single-cable tree distributions and for single systems or star distributions.
- Sturdy injection-moulded zinc alloy housing. Flush mounting in box Ø56 mm. Dimensions of coverplate: 80 x 80 mm. Fast and easy connection of the coaxial cable. Surface mounting using the ABT-210 (Ref. 1460).
- Versions without coverplate or fixing hooks available.
- Connectors:

  TV/RD: male IEC
  SAT: female IEC
- DC transit through the SAT output (24V/350mA, plus 22 kHz and DiSEqC signals). Easy elimination.

TV/RD-SAT — Line Outlets

MODEL			ARTU900	ARTU901	ARTU951	ARTU902	ARTU903
REF.			2474	2475	2479	2476	2477
Coverplate and fixing hooks			YES	YES	NO	YES	YES
Frequency range		MHz	TV/RD: 5 - 862 SAT: 950 - 2300				
Transfer loss (±0.5 dB)	input - TV/RD	dB	4.5	11		15	19
	input - SAT		5.5	11		15	18
Max through loss	5-862 MHz	dB	—	2		1.3	1.3
	950-2300 MHz			3		2.5	2.5
Isolation	output - TV/RD	dB	—	> 23		> 26	> 25
	output - SAT			> 16		> 17	> 19
TV/RD - SAT isolation		dB	> 25	> 25		> 25	> 25
DC transit through the SAT output			YES	YES		YES	YES

ARTU900 and ARTU950 are final outlets.

TV/RD-SAT — Stub Outlets

MODEL			ARTU009	ARTU058	ARTU059
REF.			2472	2740	2473
Coverplate and fixing hooks			YES	NO	NO
Frequency range		MHz	TV/RD: 5 - 862 SAT: 950 - 2300		
Transfer loss	input - TV/RD	dB	≤ 1.5		
	input - SAT		≤ 2		
TV/RD - SAT isolation		dB	> 25		
DC transit through the SAT output			YES	YES	NO

Coverplate

MODEL	REF.	DESCRIPTION
PBT-200	2469	Coverplate for ARTU95x and ARTU059. Dimensions: 80x80 mm.

Surface Mounting Frame

MODEL	REF.	DESCRIPTION
ABT-210	1460	Mounting of the outlets without embedding the body in the wall.

NEW!

TV-RD-SAT. 3 outputs Outlets

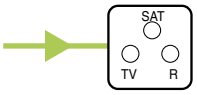
- For use in single-cable tree distributions and for single system or star distribution.
- Sturdily injection-moulded zinc a Ø 56 mm.
- Convenient and fast connection of coaxial cable.
- It incorporates a socket for wall mounting.
- Coverplate (80 x 80 mm) including.
- Connectors type, TV: IEC male; RD: IEC female; SAT: F female.
- DC transit through the SAT output (24V/350mA, plus 22 kHz and DiSEqC signals).

MODEL			PSE-300	PSE-301
REF.			5360	5359
Frequency range		MHz	TV : 5 - 68 and 125 - 862 RD : 88 - 108 SAT : 950 - 2300	
Transfer loss	input - TV	dB	≤ 2	≤ 13
	input - RD		≤ 2	≤ 13
	input - SAT		≤ 3	≤ 14
Max. through loss	5-68 MHz & 125-862 MHz	dB	—	2
	88-108 MHz	dB	—	2
	950-2300 MHz	dB	—	3
TV-RD and TV-SAT isolation		dB	> 18	
SAT-RD isolation		dB	> 18	
DC transit through the SAT output		dB	YES	

Surface Mounting Frame including

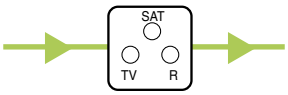
Application example

PSE-300

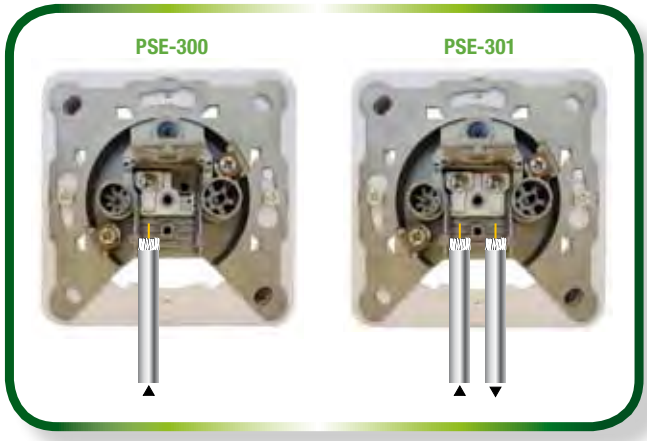


Final Outlet

PSE-301



Line Outlet



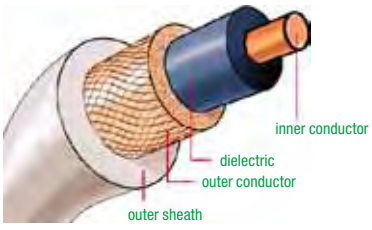
Indoor Distribution Cables

MODEL		CCH-175	CCI-174	CCI-175	CCSB175	CCIB175	CCI-179	CCI-190	CCSB190	CCIB190
REF.		2506	2016	2522	2050	2012	2521	2520	2051	2014
Inner conductor Diameter	mm	Cu 1.13	Cu 1.13	Cu 1.13	Cu 1.13	Cu 1.13	Cu 1.10	Cu 1	Cu 1	Cu 1
Dielectric Diameter	mm	PE 4.8	PE 4.8	PE 4.8	PE 4.8	PE 4.8	PE 5	PE 4.6	PE 4.6	PE 4.6
Outer conductor Diameter	mm	Cu (tape) + Cu (braid) 6,1	Cu (tape + Cu (braid) 6,1	Cu (tape) + Cu (braid) 6,1	Cu (tape) + Cu (braid) * 6,1	Cu (tape) + Cu (braid) 6,1	Al (tape) + Al (braid) 6,3	Al (tape) + Al (braid) 5	Al (tape) + Al (braid) * 5	Al (tape) + Al (braid) 5
Outer sheath Diameter	mm	white polyolefin (LSOH) ** 6.8	PVC black 6.1	PVC white 6.8	PVC white 6.8	PVC white 6.8	PVC white 7	PVC white 6.8	PVC white 6.8	PVC white 6.8
Attenuation/100m										
47 MHz	dB	3.7	3.7	3.7	3.7	3.7	4.6	4.9	4.9	4.9
100 MHz	dB	5.3	5.3	5.3	5.3	5.3	6.0	6.5	6.5	6.5
230 MHz	dB	8.0	8.0	8.0	8.0	8.0	8.9	9.5	9.5	9.5
470 MHz	dB	11.9	11.9	11.9	11.9	11.9	13.2	14.0	14.0	14.0
862 MHz	dB	16.6	16.6	16.6	16.6	16.6	18.0	19.6	19.6	19.6
950 MHz	dB	17.5	17.5	17.5	17.5	17.5	19.5	21.0	21.0	21.0
1750 MHz	dB	24.5	24.5	24.5	24.5	24.5	27.0	29.4	29.4	29.4
2150 MHz	dB	27.5	27.5	27.5	27.5	27.5	29.8	32.5	32.5	32.5
Characteristics impedance	Ω	75 ±3								
Supply unit		(6x) reel 100 m			(4x) reel 250 m	(1x) reel 250 m	(4x) reel 100 m	(4x) reel 100 m	(1x) reel 100 m	(1x) reel 250 m

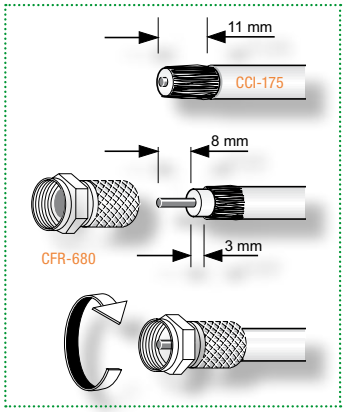
All the cables are manufactured using the Physical Process. Advantages: high mechanical strength, optimum electrical isolation and good stability of characteristics over time.

* Braid is highly thick (coverage factor: 70%).

**LSOH: Low Smoke Zero Halogen. Outer sheath of the CCH-175 does not contain halogens. It is flame retardant (EN/IEC 60332-3), the density of the smoke produced when the cable is burnt is very low (EN/IEC 61034-2) and the fumes are nontoxic (IEC 60754-2).



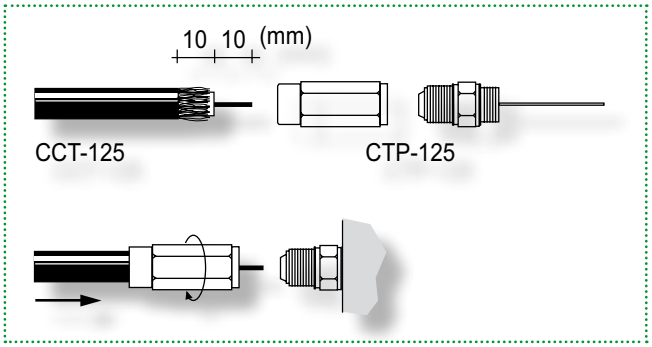
Preparing the cable CCI-175 to fit the CTF-125 connector



CATV Trunk&Feeder Cables

MODEL		CCT-171	CCT-125	CCTB125	CCT-650
REF.		2505	2514	2013	2507
Inner conductor (copper) / diameter	mm	1.10	1.65		3.15
Dielectric (Foam polythene) / diameter	mm	5	7.1		13
Outer conductor / diameter	mm	Al + Al / 6.3	Al + Cu / 7.8		Al (tube) /13.7
Characteristics impedance	Ω	75 ±3			
Outer sheath (black polythene) / diameter	mm	7	10.2		15.4
Max Attenuation at 20°C f = 100 MHz 200 MHz 500 MHz 600 MHz 750 MHz 862 MHz 950 MHz 1750 MHz 2150 MHz	dB	 6.0 8.2 13.4 14.4 16.6 18.0 19.5 27.0 29.8	 4.6 6.2 10.1 11.0 12.3 13.1 15.2 20.5 23.0		 2.1 3.0 4.9 5.4 6.1 6.5 7.5 10.2 11.5
DC resistance of: - inner conductor - outer conductor	Ω/100m	 1.72 1.14	 0.9 1.2		 0.33 0.19
Velocity ratio of propagation	%	77			88
Nominal capacitance	pF/m	55			50
Minimum bending radius	cm	7	8		13
Pulling tension	daN	40	60		100
Weigth	kg/100m	4.2	8.6		20
Supply uit		(6x) reel 100m	(1x) reel 500m	(1x) reel 200m	—

Preparing the cable CCT-125 to fit the CTP-125 connector



Connectors for Indoor Distribution Cables

MODEL	REF.	DESCRIPTION
		F CONECTORS
CFR-680	2377	Screw-on plug. Use cable: CCS, CCH, CCI, CCIB, CCT-171.
CTF-190	2368	Crimp plug. Use cable: CCS, CCH, CCI, CCIB, CCT-171.
		F ADAPTERS
FDH-215	2371	Joining connector: F female - F female.
FRH-081	2350	Joining connector: F male - F male.
ARF-100	2360	Fast-fit adapter, F male.
CFD-100	1508	90 degree adapter: Fast-fit elbow F connector..
FAR-900	2351	90 degree adapter: F male - F female.
		IEC CONNECTORS
CAD	1502	Elbow plug.
CHD-950	1503	Elbow jack.
		CONNECTOR TYPE ADAPTERS
TBF-101	2364	F female - BNC male.
TIF-100	2365	IEC male - F female.
TIF-102	2366	IEC female - F mele.
		COMPRESSION CONNECTORS
CFC-600	3131	F - male. Use cable: CCS, CCH, CCI, CCIB, CCT-171.
		COMPRESSION CONNECTOR TOOL
UCR-600	3132	Easy to handle and secure attachment.


2377


2368


2371


2351


2350


2360


2366


1502


1503


3131


3132

Connectors for CATV Trunk & Feeder Cables

MODEL	REF.	DESCRIPTION
		F CONNECTORS
CTF-125	2513	Crimp F plug. Material: nickeled brass. Use cable: CCT-125.
CPF-650	2689	F plug. Material: nickeled brass. Use cable: CCT-650.
CMC-650	1382	Pin 5/8". Chromate coating aluminium. Use cable. CCT-125.
CTP-125	2512	Pin 5/8". Nickeled brass. Use cable: CCT-125.
		ADAPTERS-DOUBLE
SAI-311	1640	F Double female. Nickeled brass.
EHP-162	1538	5/8" Double female. Nickeled brass.
		ADAPTADERS
TCF-580	1516	F female - 5/8". Nickeled brass .
TTF-090	2517	5/8" female - F male. Nickeled brass.
		TOOLS
UCF-170	1847	Hex crimp tool for CTF-125 connector.
PLC-650	1851	for preparing the CCT-650 cable to fit pin 5/8" connectors.
		75Ω LOAD
CTF-075	2221	F type. For loading an F port. Idem a 5/8" port through the TCF-580 adapter. Nickeled brass.


2513


1382


1640


1516


2221


1847

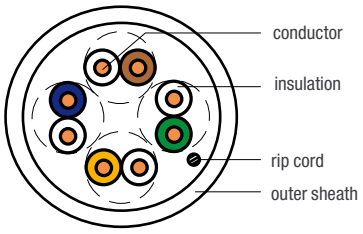
UTP (unshielded twisted pair) Cables

MODEL	REF.	DESCRIPTION
CPI-004U	5022	UTP cable, 4-pair, Cat 5E, 100 MHz.
CPI-604U	5023	UTP cable, 4-pair, Cat 6, 250 MHz, halogen free.

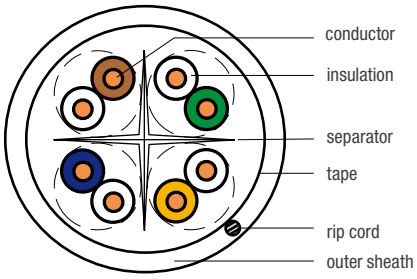
DESCRIPTION		CPI-004U	CPI-604U
		5022	5023
CONDUCTOR	Number of pairs	4	
	Total number of conductors	8	
	Conductor material	Solid bare copper	
	Wire gauge	24 AWG	23 AWG
	Conductor diameter	≥Ø 0.51 mm	≥Ø 0.57 mm
	Elongation rate	≥ 15%	
INSULATE	Insulate material	HDPE - Polyethylene	
	Nominal insulate wall thickness	0.18 mm	0.19 mm
	Insulate diameter	Ø 0.88 ±0.05 mm	Ø 0.96 ±0.05 mm
	Elogation rate	≥ 300	
	Pair colour	Pair 1: Blue & White/Blue Pair 2: Orange & White/Orange Pair 3: Green & White/Green Pair 4: Brown & Wht/Brown	
CABLING	Order of the pair	see picture	
	Cross filler	—	PE
	Tape	—	PET - 0.02x20 mm
OUTER SHEATH	Sheath material	PVC	LSZH
	Sheath colour	White	
	Rip cord	200Dx3	
	Min thickness	0.40 mm	
	Nominal diameter	Ø 5.20 ±0.30 mm	Ø 6.20 ±0.30 mm

ELECTRICAL CHARACTERISTICS			CPI-004U	CPI-604U
			5022	5023
Max conductor DC resistance 20°C		Ω/100m	9.5	7.5
Unbalance of pair DC resistance 20°C		%	≤ 2.5	
Dielectric strength between pairs		kv/min	≤ 1.0	
Insulation resistance		MΩ·km	≥ 500	
Capacitance		nf/100m	≤ 5.6	—
Unbalance of capacitance		pf/100m	≤ 330	
Characteristics impedance		Ω	100 ±15	
Return loss		dB	≥ 20.0	
Max delay		ns/100m	45.0	
Max insertion loss	1 MHZ	dB	2.0	2.0
	4 MHz		4.0	3.8
	10 MHz		6.4	6.0
	16 MHz		8.2	7.5
	20 MHz		9.2	8.4
	31.25 MHz		11.6	10.6
	62.5 MHZ		16.8	15.4
	100 MHz		21.7	19.8
	200 MHz			29.0
	250 MHz			32.8
Min Near End Cross Talk	1 MHZ	dB	65.3	74.3
	4 MHz		56.3	65.3
	10 MHz		50.3	59.3
	16 MHz		47.2	56.2
	20 MHz		45.8	54.8
	31.25 MHz		42.9	51.9
	62.5 MHZ		38.4	47.4
	100 MHz		35.3	44.3
	200 MHz			39.8
	250 MHz			38.3

CPI-004U



CPI-004U



CPI-604U

OTHER CHARACTERISTICS	CPI-004U	CPI-604U
	5022	5023
Operating temperature	-20° to +75°C	
Min bend radius	8 x D	
Net weight	28 kg/km	40 kg/km
Supply unit	(1x) reel 1000 ft	

ARE. Rack Cabinets 19"

- Inner and outer frame made in high quality steel.
- Four inner 19" frames mase in 2 mm. SPCC cold rolled steel and scrollable.
- Fornt glass and vented door with loock.
- Top and bottom cable entrance.
- 19'' schuko socket board.
- Caged nuts included.
- High resistance casters.
- The cabinet has a temperature control unit on its top which controls the operation of the fans.

MODEL		ARE-120	ARE-220	ARE-320	ARE-420
REF.		2174	2169	2171	2172
Panel height	U	12	22	32	42
Outside dimensions (hxwxd)	mm	658 x 600 x 450	1110 x 600 x 600	1649 x 600 x 600	1999 x 600 x 600
Packed weight	kg		63	76	88

ARE-320

19"-1U Fan Tray

- Front fixing to the cabinets. Three fans. Grilles are integrated.
- IEC mains inlet fitted in the rear (mains lead not supplied). Illuminated switch fitted in the front panel.
- Material: epoxy painted, 1 mm thickness steel. Front panel of silver anodised aluminium.
- Dimensions: 19" x 225 mm x 1U. Packed weight: 3.6 kg.

MODEL	VRT-602
REF.	3645

19"-1U Brushed Cable Entry Panel

- Provides a solution for cable access into cabinet while providing protection to the ingress of airborne dust or dirt.
- Material: epoxy painted, 1.5 mm thickness steel.
- Dimensions: 19" x 11.5 mm x 1U. Packed weight: 320 g.

MODEL	CRT-119
REF.	3644

Ventilation 19" - 1U Panel

- Material: epoxy painted, 1.5 mm thickness steel.
- Dimensions: 19" x 1.5 mm x 1U. Packed weight: 120 g

MODEL	FIT-501
REF.	3626

Blank 19" - 1U Panel

- Material: epoxy painted, 1.5 mm thickness steel.
- Dimensions: 19" x 1.5 mm x 1U. Packed weight: 200 g

MODEL	BEC-400
REF.	2605

Plug-in Electronic Accessories. F connectors

MODEL	REF.	DESCRIPTION
		FILTERS
RVR-066	2376	5-66 MHz reverse signal trap. Reject.: ≥55 dB. Insert. loss (88-862 MHz): ≤0.5 dB. F-M.
		ATTENUATORS
FAV-020	3105	Variable 0-20dB in VHF/UHF. Constant impedance. F-M.
FAM-006	2353	Fixed 6dB in VHF/UHF. F-M.
FAM-012	2355	Fixed 12dB in VHF/UHF. F-M.
FAM-020	2357	Fixed 20dB in VHF/UHF. F-M.
		75Ω LOADS
CTF-175	1519	Shielded load.
CFA-075	3127	DC-isolated load. External jack for insertion/extraction of +24 VDC.
		OTHERS
BCF-060	2379	60V AC/DC block. F-M.

3105

2379

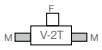
3127

1519

2353

With IEC Connectors

MODEL	REF.	DESCRIPTION
		ATTENUATOR
AV-020	1674	Variable 0-20 dB in VHF/UHF. Constant impedance. F-M.
		2-WAY SPLITTERS / 2-INPUT COMBINERS
V-2T	1408	Insertion loss: ≤ 4dB



Splitting: ☐ input ■ outputs
Combining: ■ inputs ☐ output

1674

Others

MODEL	REF.	DESCRIPTION
FAV-920	3242	18 dB variable attenuator. Min attenuation: ≤ 1.5 dB (5-1000 MHz) and ≤ 4 dB(1001-2150 MHz). DC by-pass. F-type male-female connectors. Dimensions: 51x49x22 mm.
FIS-950	1107	950-2150 MHz IF amplifier. Sloped gain: 12 up to 20 dB. Noise figure: 7 dB. Operating voltage: +15 ... +18 VDC. Consumption: 40 mA. Mounting outdoors. F-type female connectors. Dimensions: 80x27x20 mm.
IFC-215	3241	Power inserter (1A/24 V). Frequency range: 10-2150 MHz. Insertion loss: ≤ 1 dB. F-type female connectors. Dimensions: 66x45x25 mm.
OMH-110	3378	Plastic box to install oudoors the DMS-200 combiner. No screws required. Plastic fixing clamp for mast. Dimensions: 100 x 90 x 45 mm.

3378

OMH-110 + DMS-200

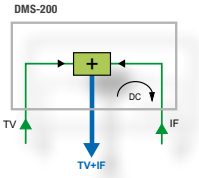
3242

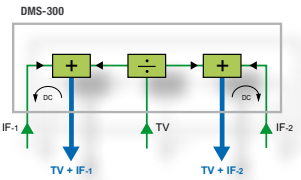
1107

3241

TV - IF Combiners - 2150 MHz

MODEL		DMS-200	DMS-300
REF.		3371	3372
RF inputs		2 TV (5-862 MHz) FI (950-2150 MHz)	3 TV (5-862 MHz) FI-1 (950-2150 MHz) FI-2 (950-2150 MHz)
RF outputs		1 TV + FI	2 TV + FI-1 TV + FI-1
Insertion loss	dB	TV: ≤ 1.0 " FI: ≤ 1.5	TV: ≤ 4 " FI-1/FI-2: ≤ 2
Input isolation	dB	≥ 25	≥ 25
Power passing to IF input/s		YES (18V/500 mA max)	
Dimensions	mm	80 x 45 x 20	122 x 45 x 20
Housing for using outdoors		OMH-110 (Ref. 3378)	—





DMS-300

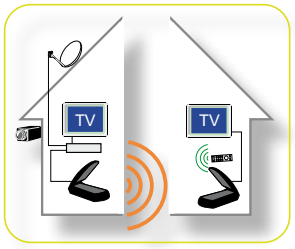
DMS-200

AVS-058. Video Sender

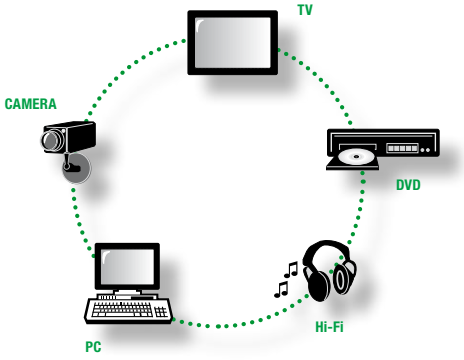
NEW!

This device transmits the active video and audio Hi-Fi stereo VCR from a TV, DVD, VCD, satellite receiver or cable box to any TV or monitor. It can also be used with a camcorder or a closed circuit camera and turns into a wireless monitoring system. As for the transmission capacity, the signal can go up to 100m clear line of sight and walk through walls.

- Simultaneous display of video programs on a second TV / monitor wirelessly.
- Distribution of local audio / video programs for multiple viewers even in different rooms.
- 5.8 GHz wireless transmitter and receiver with 7 selectable channels.
- High gain antennas to improve reception range and resistance to interference.
- A clear transmission and reception of video and Hi-fi stereo even through walls.
- Transmission line clear up to 100m.
- Video format compatible with PAL / NTSC.
- Built-in IR remote extender.
- Avoids interference problems experienced product of 2.4 GHz.
- Compact size, 12 x 6.5 x 3 cm



MODEL		AVS-058
REF.		5310
Frequence	GHz	5.725 - 5.875
Channels number		7 selectable channels
Video input level	Vpp	1
Audio input level	Vrms	1
Video impedance	Ω	75
Audio impedance	Ω	10K
input/output connector		3,5 mm AV jack
Antenna type		Patch
Power supply		CC 9V adapter
Dimensions	cm	12 x 6.5 x 3



DVB-T
ATSC

Digital Terrestrial TV Transmitters

RF Transmission Solutions Catalogue

+ information in the
Transmitter catalogue
www.ikusi.com

IKUSI

www.ikusi.com

DVB-T Gap Fillers and Digital & Analogue Transmitters

INTRODUCTION

The RA family of DVB-T Gap-Fillers and Digital&Analogue Microrepeaters from IKUSI has been created for:

a) providing coverage to shadow zones for DTT (digital terrestrial television),

b) retransmitting VHF or UHF analogue channels on UHF channels,

c) retransmitting, as COFDM channels, QPSK(FTA) channels from digital satellite reception, and

d) broadcasting, on UHF analogue channels, TV programmes issued from FTA digital satellite reception or video/audio sources.

The family includes all the elements that are characteristic of this type of stations, its modular design making easy the construction of stations adapted perfectly to the number of existing channels and to the range and coverage desired.

COMPONENTS

The input channelised ways are constituted by the well-known ClassA headend modules: TPC processors, MTI transmodulators, SRF receivers, MCP modulators, QRA processor-Echo canceller.

The output amplification is configurated from two modules, one driver (LRA) and one power amplifier (HRA), both having ClassA format. An economical variant of the latter is the HPA-125 ClassA headend amplifier, which provides half RF power and does not feature AGC. Gap-fillers and QPSK(FTA)-COFDM microrepeaters perform broadband amplification of the processed input signals, so they include a unique LRA and, normally, a unique HRA. For coverage increasing purpose, they can include two HRAs, which are connected either to two transmission antennas or to a single one using an auxiliary in-phase combiner. The analogue microrepeaters perform separate amplification, so they include as many LRA+HRA pairs as there are input channels; a low-loss multiplexer (XRA) combines the output TV channels and connect them to the transmission antenna.

The family is completed with a radomized, UHF panel antenna (PRA).

RANGE

300 mW Gap-Fillers *

- Input: COFDM / UHF — Output: COFDM / UHF

300 mW SAT → TERR Digital Microrepeaters *

- Input: QPSK(FTA) / Sat-IF — Output: COFDM / UHF

2 W Analogue Microrepeaters

- Input: Analogue / VHF-UHF — Output: Analogue / UHF
- Input: QPSK(FTA) / Sat-IF — Output: Analogue / UHF
- Input: V/A — Output: Analogue / UHF

* Output power of single channel stations.
The level (= 25 dBm) is reduced by 10 log n for n-channel stations.

• See other solutions in web catalogue

4-Channel Gap-Filler

PROBLEMS!

SOLUTIONS!

- Driver (LRA-112) and Power Amplifier (HRA-128) designed to make up varied output amplification configurations for «RA» gap-fillers and microrepeaters.
- Wide band UHF amplification. Push-pull technology in the LRA and FET-AsGa one in the HRA. AGC circuit in the HRA.
- Two symmetrical RF outputs in the LRA simplify the assemblies that use 2 HRAs to feed two antennas (or only one through a power-adding device).
- Impedance 75Ω.
- Power voltage +12 VDC from a CFP module. Mountable on ClassA's baseplates or rack frames.

UHF Driver Amplifier

MODEL		LRA-112
REF.		2158
Frequency band	MHz	470 - 862
Response flatness	dB	± 1
Nominal gain	dB	23
Interstage attenuation	dB	0 - 10
Noise figure	dB	< 8
Output level - digital channel	dBµV	(2x) 115 (shoulders at -38 dB)
Output level - analogue channel	dBµV	(2x) 124 (-54 dB, DIN 45004K)
Input/output impedance	Ω	75
Input/output return loss	dB	> 10
Input test	dB	-20 ±1
Supply voltage	VDC	+12
Consumption	mA	290
Operating temperature	°C	-10 ... +55
Dimensions	mm	230x195x32

UHF Power Amplifier

MODEL		HRA-128
REF.		2154
Frequency band	MHz	470 - 862
Response flatness	dB	± 1
Nominal gain	dB	46
Interstage attenuation	dB	0 - 10
AGC range		> 10
Noise figure (at max gain)	dB	< 8
Output level - digital channel	dBµV	(2x) 134 (shoulders at -38 dB)
Output level - analogue channel	dBµV	(2x) 142 (-54 dB, DIN 45004K)
Input/output impedance	Ω	75
Input/output return loss	dB	> 10
Input test	dB	-20 ±3
Output test		-40 ±2
Supply voltage	VDC	+12
Consumption	A	1.35
Operating temperature	°C	-10 ... +55
Dimensions	mm	230x195x49

QRA. DTT Channel Processor - Echo Canceller

- The equipment can tune a DTT channel in the UHF band for its processing, adding the echo cancellation feature.
- Its configuration is done via the SPI-300 remote control.
- The equipment can work with the canceller activated or desactivated. In both cases, the system is regulated through an AGC, adapting itself to the input level and indicating with a red light, only when the canceller is active, if the signal is out of the input range.

MODEL		QRA-110
REF.		2152
Input and output frequencies	MHz	470-862
Tuning offset	kHz	(±) 125/250
Input level	dBµV	40-80 (digital)
AGC range	dB	40
Noise figure	dB	< 9 (Ne < 70 dBµV)
Selectivity 8 MHz channel	dB	> 40 (fc ± 4.25 MHz) > 70 (fc ± 5.25 MHz)
Image rejection	dB	> 70
Adjustment output level	dBµV	75-93
Phase noise @ 1 kHz	dBc/Hz	< -92
Power voltage	VDC	+12
Consumption	mA	900
Operating temperature	ºC	0 ... +45
Echo-signal max relation	dB	10
Cancellation window width	µs	1
Dimension	mm	230 x 195 x 32

4 UHF Channel Combiner

- Application in analogue RA microrepeaters for 2, 3 or 4 UHF channels. It combines the single-channel signals coming from LRA+HRA pairs while reducing emission of noise and intermodulation products.
- Frontal made of galvanized steel with plastic covering. Rack format 19".

MODEL		XRA-400
REF.		2155
Frequency band	MHz	470 - 862
No. of input channels		up to 4
Minimum channel spacing		2 channels
Insertion loss	dB	1.3 to 2.2
Isolation between inputs	dB	≥ 13
Ripple	dB	< ± 0.6
Input/output impedance	Ω	75
Output return loss	dB	> 14
Outside dimensions		19"x1Ux240mm

UHF outdoor Splitter - 2 way

MODEL		EAS-102
REF.		2165
Frequency band	MHz	470 - 862
Insertion loss	dB	≤ 3.3
Input return loss	dB	≥ 12
Output return loss	dB	≥ 10

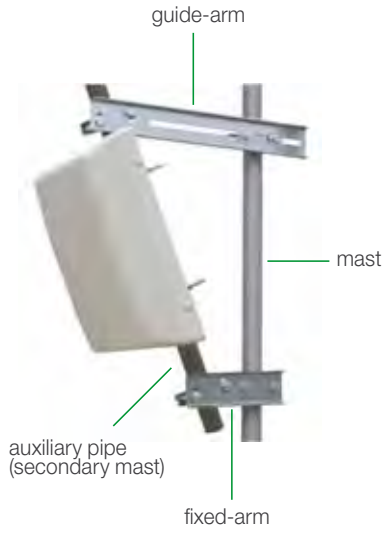
UHF Transmitter Antenna

- Panel type. Radome made of HIPS (high-impact polystyrene).
- Double clamp for masts of Ø25 to 50mm. Variable tilt angle by using the DRA-020 (Ref. 2159).
- Impedance 75Ω

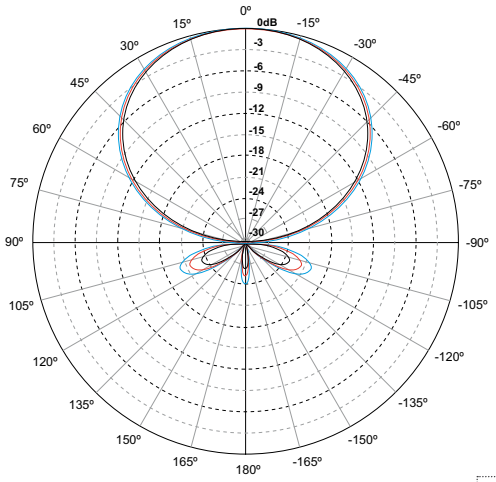
MODEL		PRA-012
REF.		2156
Frequency band	MHz	470 - 862
Polarization		Horizontal or Vertical
Dipole numbers		3
Impedance	Ω	75
Gain	dBi	11
Beamwidtlh - horizontal	°	63
Beamwidtlh - vertical	°	50
Front-to-back ratio	dB	> 25
Potencia máxima	W	25
Connector type		female F
Front windload for 150/200 km/h	N	190/340
Side windload for 150/200 km/h	N	105/185
Dimensions	mm	350x400x140
Packed weight	kg	3

Tilt kit

MODEL	REF.	DESCRIPTION
DRA-020	2159	The kit includes 1 fixed-arm, 1 guide-arm and 4 clamps for Ø25 to 50 mm mast. The antenna is fixed to an auxiliary pipe (secondary mast) not supplied. Variable antenna tilt: 0 to -30°.

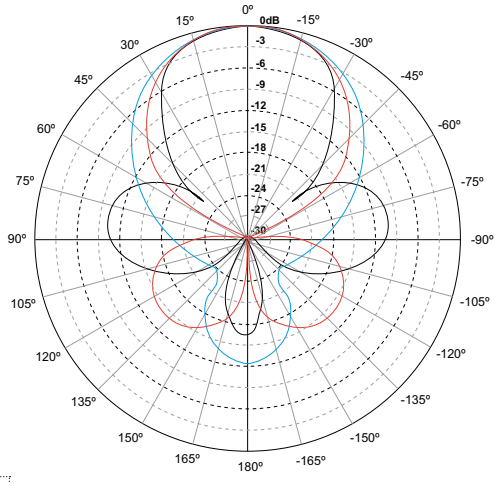


RADIATION PATTERNS



Horizontal plane

Colour	Frequency
	490 MHz
	650 MHz
	850 MHz

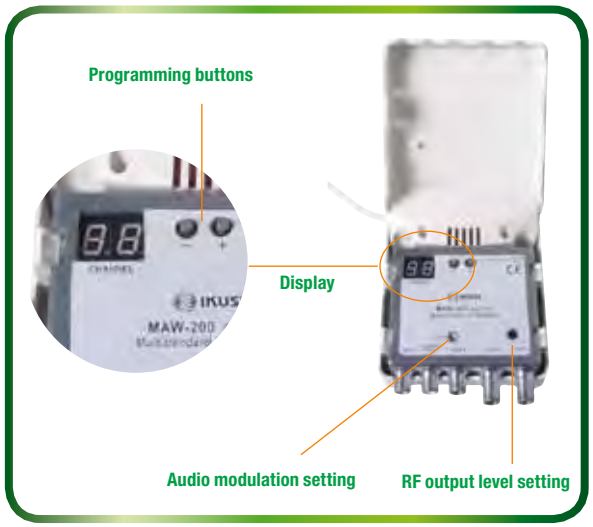


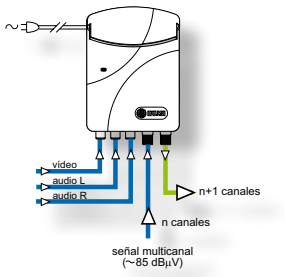
Vertical plane

MAW-200. Home DSB TV Modulator

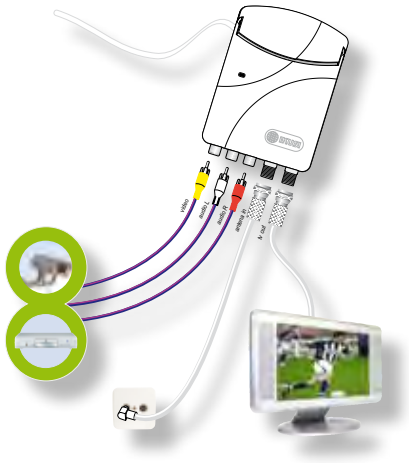
- Appropriate use with TV satellite receivers, VCR's and video cameras.
- Direct video/audio modulation. Multistandard. Mono sound. DSB (Double Side-Band) TV output channel.
- Agile selection of channel. Possibility of shifting the standard video carrier frequency up to ±2.5 MHz.
- Possible connection of stereo sound sources. L and R signals are sumed by the modulator itself.
- Built-in test pattern generator.
- Two buttons and one 2-digit LED display for selection and programming of operating parameters.
- Panel potentiometers for audio modulation and RF output level settings.
- Input port for RF coupling of antenna/SMATV signal.
- External plastic box. Indoor mounting. Wall fixing by two screws.
- Mains lead with bipolar plug. AC power indicator.

MODEL		MAW-200
REF.		3029
Output TV Channel Frequency	MHz	47 - 84 174 - 300 470 - 862
Selectable TV System		B, G, H, D, K, I, L, M, N
Output Channel Spectrum		Double Side-Band
Audio operation mode		Mono
RF coupling frequencies	MHz	45 - 2150 (TV+SAT)
Fine tuning of video carrier frequency	MHz	±2.5 MHz (steps of 0.25 MHz)
Adjustable output level	dBµV	65 - 85
Switchable carrier level ratio	dB	12±3 / 16±3
Video input level	Vpp	0.9 ... 1.1
Video input impedance	Ω	75
Audio input level	mV	150 ... 775
Audio input impedance	kΩ	10
Adjustable audio peak deviation	kHz	±50
RF coupling loss	dB	< 1.5 (TV) ,, < 2.7 (SAT)
Mains voltage	VAC	230 - 240
Consumption	W	3
Dimensions	mm	120x82x34





Application with TV satellite receivers, VCR's and video cameras



MODEL	REF.	DESCRIPTION
CVA-002	2245	Includes the following accessories: - 1 plug-to-jack SCART adapter, with 3 RCA sockets (2 audio and 1 video) and 1 min-Din socket (S-Video). A built-in switch allows to change from input mode to output mode. - 3 coaxial leads, length 1.5 m each, terminated in RCA plugs all ends.

IKUSI SMART mini

- Free-To-Air Digital Terrestrial Television reception.
- MPEG-2 recorder via external HDD or pendrive:
  inmediate recording and recordings scheduling
- LCN (Logical Channel Numbering).
- Channel order, rename, sort and delete functions.
- Multimedia player: MP3, JPEG, MPEG-2, MPEG-4.
- Multilingual OSD (english, spanish, french, basque, catalan, galician).
- Supports PAL/NTSC.
- Hi-speed software update.
- Favorite channels list.
- Games, Subtitles and Teletext.

DVB T TERRESTRIAL

Technical Specifications

Model	DTR-100 SMARTmini
Ref.	1060

RF Input
- FTA DVB-T, MGEG-2, COFDM
- Frequence band : 170-862 MHz
- Signal level : 29-99 dBµV
- COFDM modes : 2K and 8K
- Multiplex bandwidth : 6 / 7 / 8 MHz
- Loop-through frequency band : 47-862 MHz
- Power voltage for indoor antenna : +5 V

MPEG-2 Decoding
- Standard MPEG-2 MP@ML

A/V Inputs/Outputs
- SCART TV : RGB out, PAL/NTSC out, stereo audio out
- SCART VCR : PAL/NTSC in/out, stereo audio in/out
- Jack A/V : PAL/NTSC out, stereo audio out

Frontal panel
- Type A, female USB2 port
- Red/Green indicator LED
- IR sensor

Rear panel
- 1x IEC 169-2 female (RF input)
- 1x IEC 169-2 male (RF loop-through output)
- 2x SCART (TV , VCR)
- 1x Mini-jack 3.5mm
- 1x Jack DC (12V input)

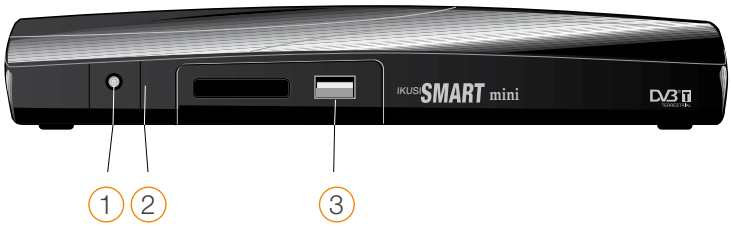
Power Supply
- AC in (power supply unit) : 100-240 V, ~50/60 Hz
- DC out (power supply unit) / DC in (receiver) : +12 V
- Consumption (receiver) : 5.5 W

Accessories
- 44 keys remote control
- Batteries : 2x 1.5 V (AAA - LR03)
- SCART lead 1.2 m
- External DC power supply with bipolar plug
- User manual

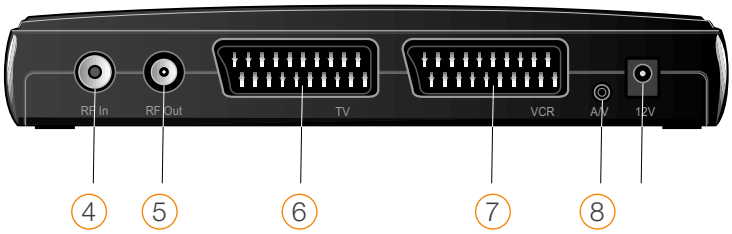
General
- Colour : black
- Operating temperature : 0°C to +45°C
- Storage temperature : -20C° to +65 C°
- Relative humidity : 25 to 75%
- Dimensions (WxHxD) : 210 x 30 x 90 mm
- Carton box dimensions : 240x240x70 mm
- Weight : 270 g (total weight : 800 g)

Software
- Electronic Programme Guide (EPG)
- Parental control (channel and configuration lock)
- USB 2.0
- Last channel auto-saving and recall key
- Recordings sheduling
- Image zoom

front panel

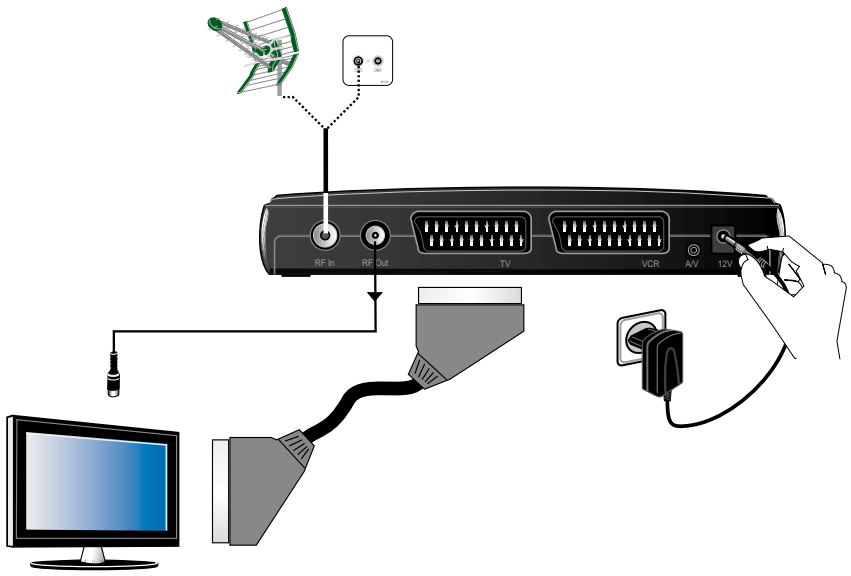


rear panel



1. operating LED
2. infrared sensor
3. USB : external device connection port
4. RF In : antenna input
5. RF Out : antenna output, for TV set, DVD or additional SMARTmini
6. TV : audio/video input/output for connecting to TV set
7. VCR : audio/video input/output for connecting to DVD
8. A/V : video and stereo audio output
9. 12V : power input (+12 VDC)

Application example



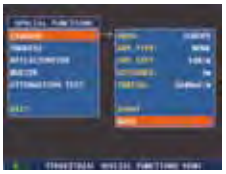
DSA-800 Touch. Completely Touchscreen Analyzer

- TV Tuner from 4 to 1.000 MHz, extended CABLE and GMS bands.
- Automatic recognition and selection of both analog and digital (COFDM) signals.
- Automatic quality analysis: FAIL-MARG-PASS.
- Colour and ultra-bright TFT touchscreen with excellent resolution.
- Tactile selector wheel.
- All measurements, program list, A/V PID, adjustments and picture on one screen.
- Mémoire automatique, mémoire manuelle et data logger.
- Automatic memory, manual memory and data logger.
- Conditional Access, Common Interface.
- Upgradeable on-line (USB-2 socket).
- Communication via Bluetooth (optional).
- Weight : 2.5 kg ; Dimensions : 24.5 x 11.5 x 18 cm.
- Battery autonomy: 2 to 3 hour.

MODEL	DSA-800
REF.	4820
MPEG-2 Decoder	YES
DVB-T	YES
DVB-S/S2	YES
DVB-C	YES
Feedback signals measurement	YES
Screen size	6.5"
Aspect ratio	16:9

- **TOUCHSCREEN**
- **DVB-T , DVB-S/S2, DVB-C**
- **AUTOMATIC SIGNAL RECOGNITION**
- **FAST SAT SPECTRUM**
- **CONDITIONAL ACCESS (CI)**
- **ICON NAVIGATION**

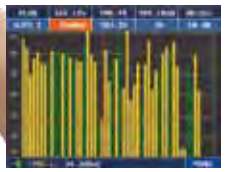
DVB-S2 measurements and pictures



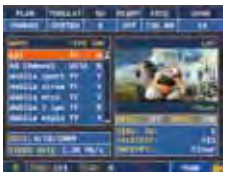
Special functions

Memory functions

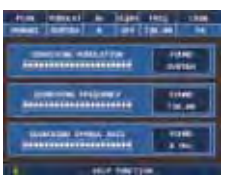
TV Spectrum with peak hold



Analog and digital channels level



MPEG Service List and A/V PID


Autodiscovery function

DVB-T & H measurements and pictures


DVB-C measurements and pictures

DSA-700. HD Analyzer with Optical and LAN input

- TV Tuner from 4 to 1.000 MHz, extended CABLE and GMS bands, SAT tuner 930-2250 MHz, extended
- Optical input Spect and Power.
- IPTV input.
- HDMI input.
- Conditional Access. Comon Interface
- Automatically recognises and selects analog and digital TV COFDM signals in both measurement and spectrum mode.
- Automatic quality analysis: FAIL-MARG-PASS.
- Detects, measures and Shows pictures of the MPEG4 HD High Definition programs.
- Rotational encoder & numerical keyboard.
- Simultaneous visualization of pictures and the program list, MPEG-2 & MPEG-4 HD and A/V PID.
- Dual display new, ultra-bright TFT with excellent resolution.
- Upgradeable online (USB-2 socket)
- Auto memory, Manual memory & Data Logger.
- 2 to 3 hour battery autonomy.
- Weighs: 2,5 kg. Dimensions: 11,5 x 24,5 x 18 cm
- Supplied with soft bag and hard case for transport, mains adaptor and 12V vehicle adaptor.
- Bluetooth communication (optional)

MODEL	DSA-700
REF.	4821
MPEG-4 Decoder (HDTV)	YES
MPEG-2 Decoder	YES
Display TFT (16:9)	4,5"+ 2,5"
DVB-T (COFDM)	YES
DVB-S/S2 (QPSK/8PSK)	YES
DVB-C (QAM)	YES
Return Frequency	YES
Conditional Access	YES

- **FULL MPEG2 & 4 HD**
- **DVB-T , DVB-S/S2, DVB-C**
- **OPTICAL & LAN IPTV PORTS**
- **FAST SPECTRUM WITH MEMORY**
- **ANALOG SAT PICTURE**
- **2 DISPLAYS: 4.5" + 2.5" 16:9**
- **CONDITIONAL ACCESS**

TV Spectrum with peak hold

DVB-S2=8PSK, T=COFDM, C=QAM Constellations and modulation parameters

TV Bars Scan

I=analog I=digital

Impulse response in real time (ECHOES in "SFN" NETWORKS)

NEW!

DSA-503. Compact & Light SAT, TV and CABLE Analyzer

- TV Tuner from 4 to 1.000 MHz, extended CABLE and GMS bands,
- SAT tuner 930-2250 MHz, extended.
- Automatically recognises and selects analog and digital TV COFDM signals in both measurement and spectrum mode.
- Detects ans measures MPEG4 HD High Definition programs.
- Automatic quality analysis: FAIL-MARG-PASS.
- New, ultra-bright TFT with excellent resolution.
- Rotational encoder and numerical keyboard.
- All measurements, prog, list, A/V PID, settings and picture on one screen.
- Auto memory. Manual memory and Data Logger.
- Upgradeable online (USB-2 socket).
- 2 to 3 hour battery autonomy.
- Weighs only 1,4 kg. Dimensions: 22 x 8 x 19 cm
- Supplied with soft bag for transport, mains adaptor and 12V vehicle adaptor.
- Only six direct keys for all functions.

MODEL	DSA-503
REF.	4822
MPEG-2 Decoder	YES
DVB-T (COFDM)	YES
DVB-S/S2 (QPSK/8PSK)	YES
DVB-C (QAM)	YES
Return Frequency	YES
Conditional Access	NO

- **DVB-T , DVB-S/S2, DVB-C**
- **HD MEASUREMENTS**
- **FAST SPECTRUM WITH MEMORY**
- **SIX DIRECT KEYS FOR ALL FUCNTIONS**
- **PICTURE ZOOM**

TV

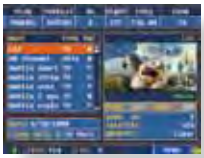
DVB-T & H measurements and pictures.

CATV

DVB-C measurements and pictures.

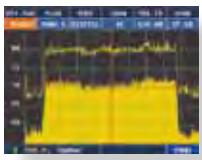
SAT

DVB-S2 measurements and pictures.



MPEG SERVICE LIST

MPEG Service List and A/V PID.



SPECT

TV Spectrum with peak hold.

BARSCAN

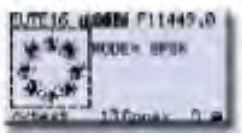
Analog and digital channels level.

DSA-103. Ultra-Compact SAT, TV and CABLE Analyzer

- TV tuner from 4 to 1.000 MHz, extended CABLE band and GSM band.
- Automatically recognises and selects analog and digital TV COFDM signals in both measurement and spectrum mode.
- Detects and measure all the MPEG4 HD signals & High Definition programs.
- Automatic quality analysis: FAIL-MARG-PASS.
- Rotational encoder and numerical keyboard.
- New, ultra-bright graphics display.
- Visualisation of the program list MPEG-2/4 HD and A/V PIDs.
- Auto and Manual memories, Data Logger.
- Pre-memorized Transponder navigation in all worldwide satellites and in all the worldwide standard TV channel plans.
- Assisted satellite dish pointing, double input (DUAL LNB) dish pointing and Sat Finder functions.
- All DiSEqC commands and SCR Ready with automatic search.
- Constellation, MER, PER, LDPC, BCH, aBER, bBER, EVM, Noise Margin, Level/Power measurements and Spectrum Analyzer.
- CABLE MEAS: DOCSIS downstream, INGRESS mode, LEAKAGE mode, BARS SCAN and TILT.
- Weighs only 1 kg, H 8 x L 22.5 x D 16.5 cm
- Up to 4-hour battery autonomy.
- Supplied with hard case for transport, soft bag, mains adaptor and 12V vehicle adaptor.
- Upgradeable online (USB-2 socket).
- Bluetooth communication (optional).

MODEL	DSA-103
REF.	4823
MPEG-2 Decoder	YES
DVB-T (COFDM)	YES
DVB-S/S2 (QPSK/8PSK)	YES
DVB-C (QAM)	YES
Conditional Access	NO

Fast digital TV spectrum with memory peak



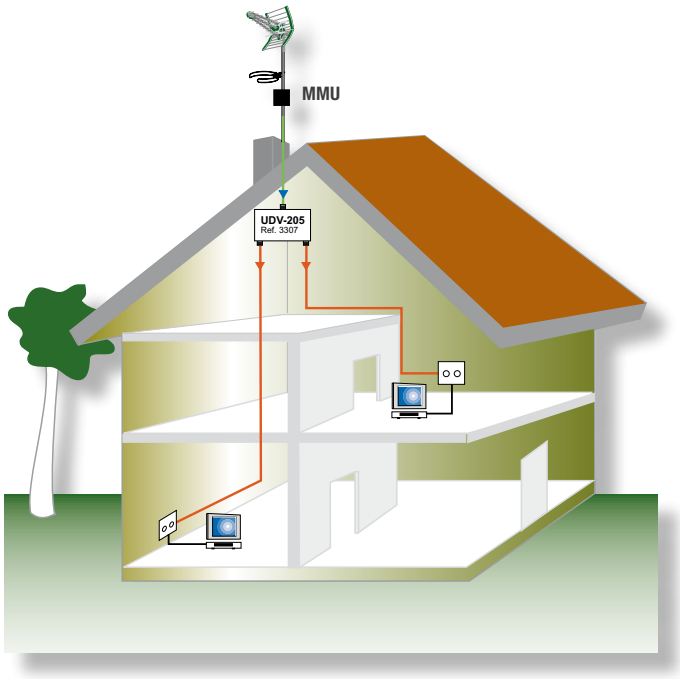
DVB-S2 = 8PSK, T = COFDM, C = QAM Constellations and modulation parameters

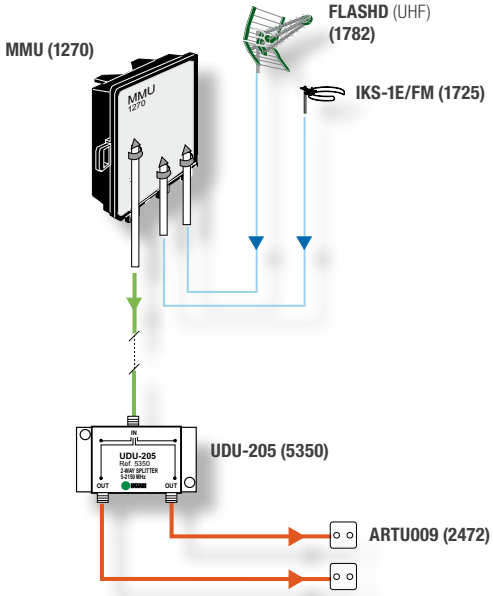
MPEG Program list and A/V PID

TV Bars Scan

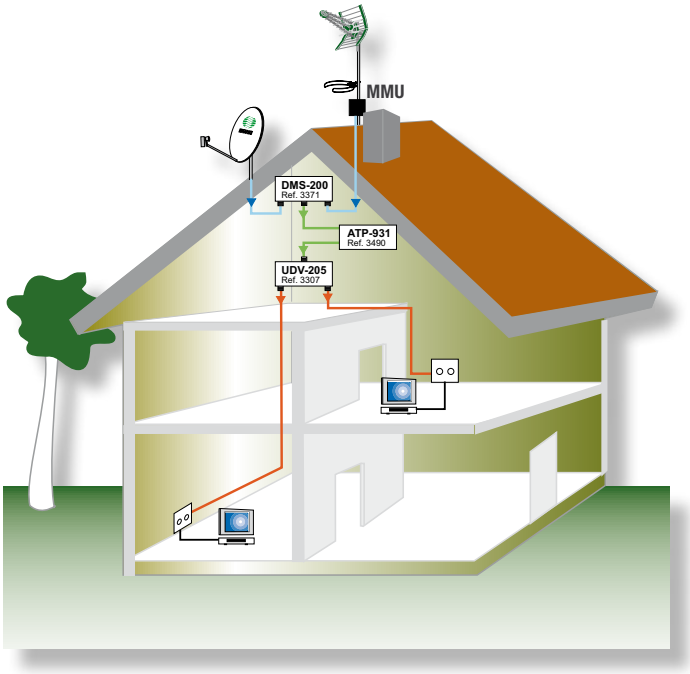
Impulse response (ECHO in COFDM TV)

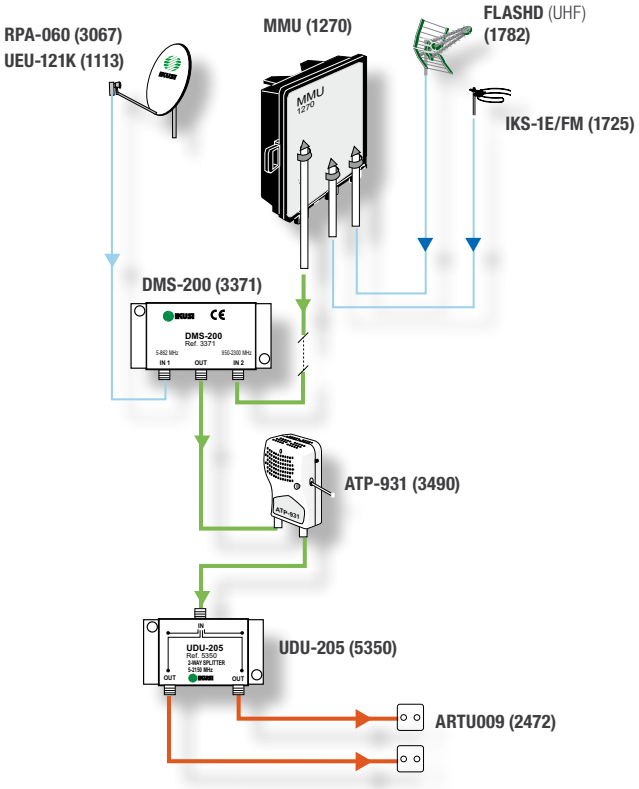
TV Terrestrial installation for 2 outlets *(high reception signal levels)*



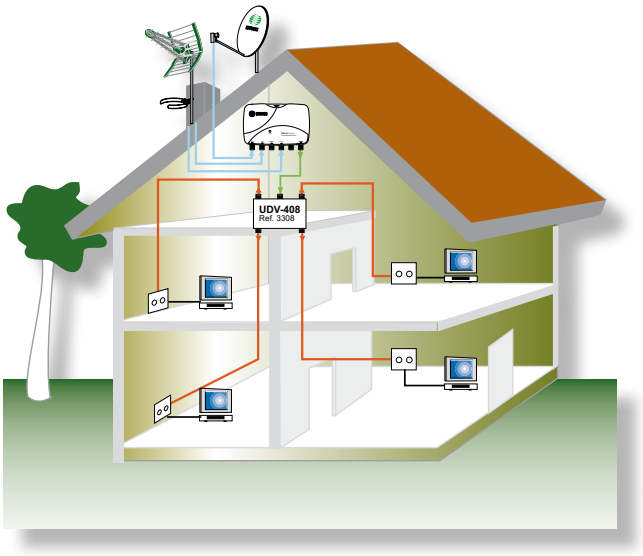


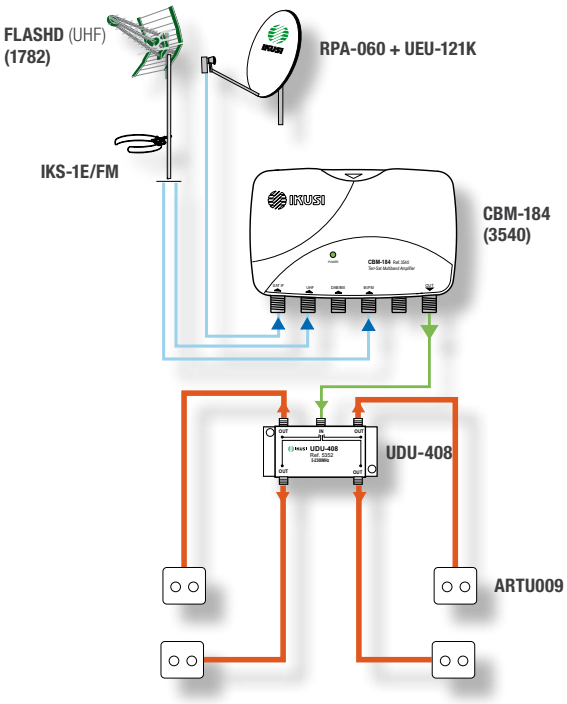
TV Terrestrial+Satellite installation for 2 outlets



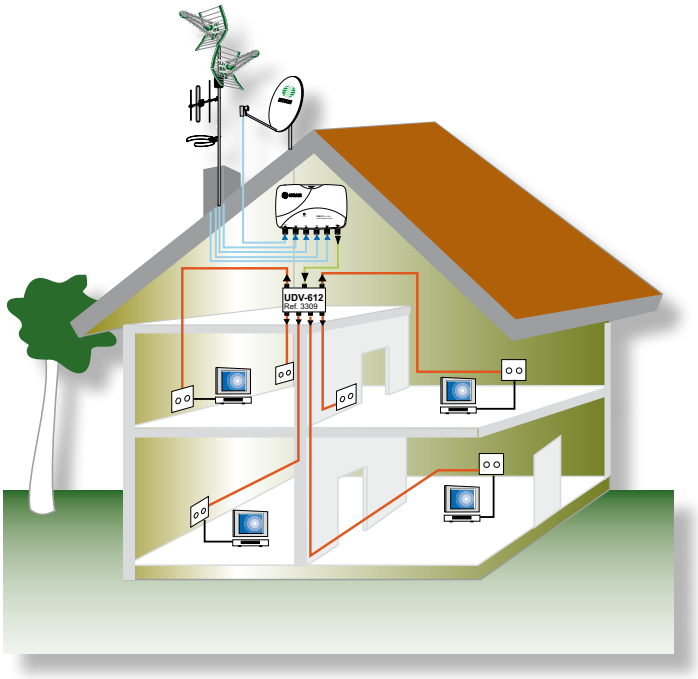


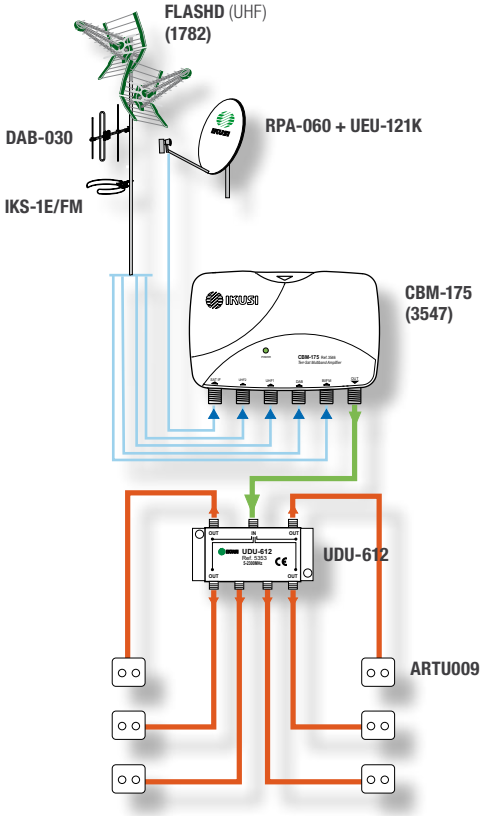
TV Terrestrial+Satellite installation for 4 outlets



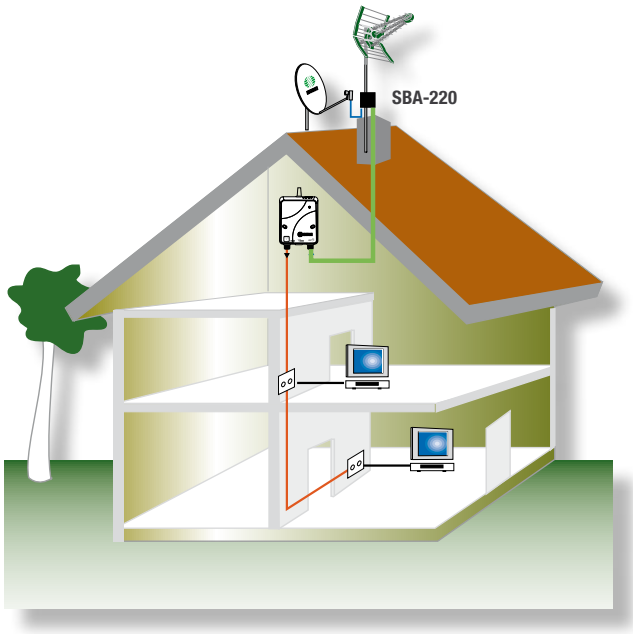


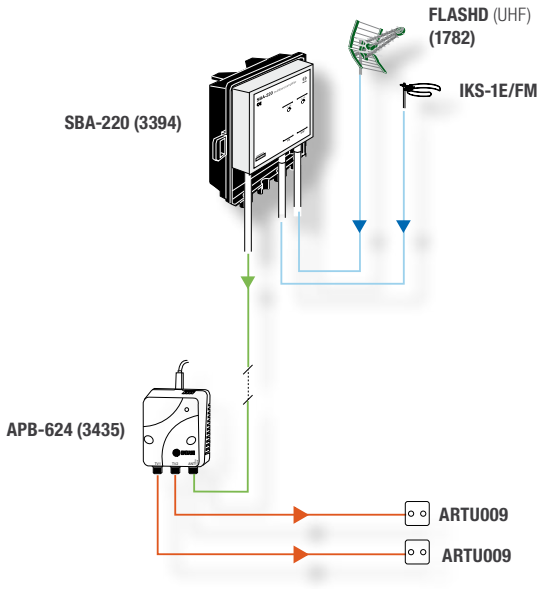
TV Terrestrial+Sat installation for 6 outlets



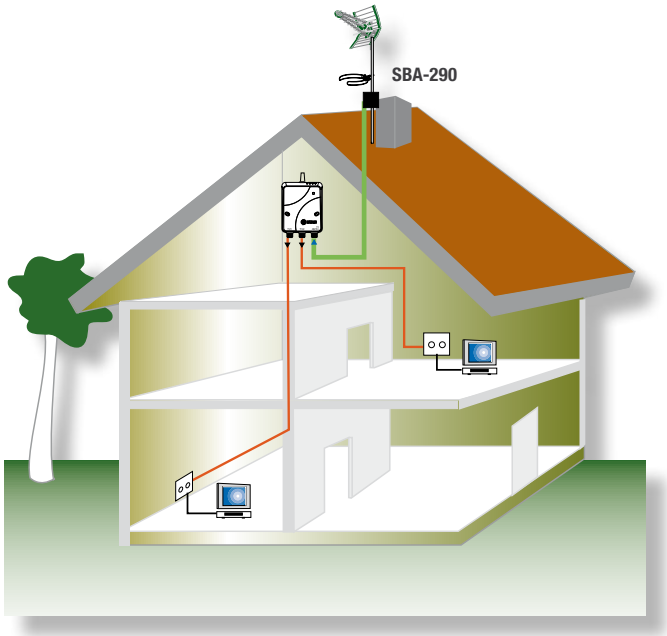


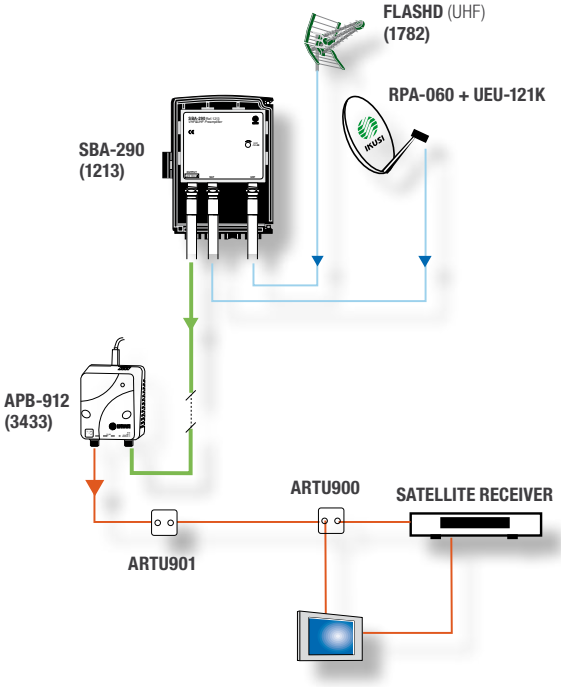
TV Terrestrial installation for 2 outlets



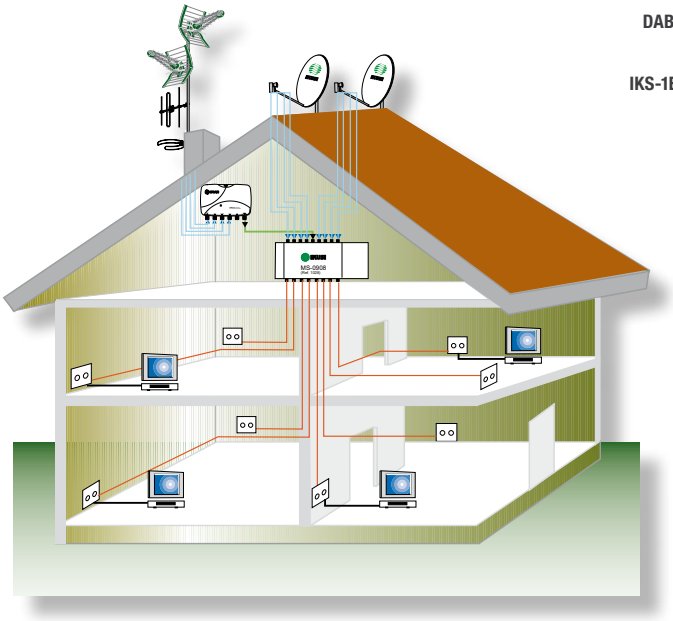


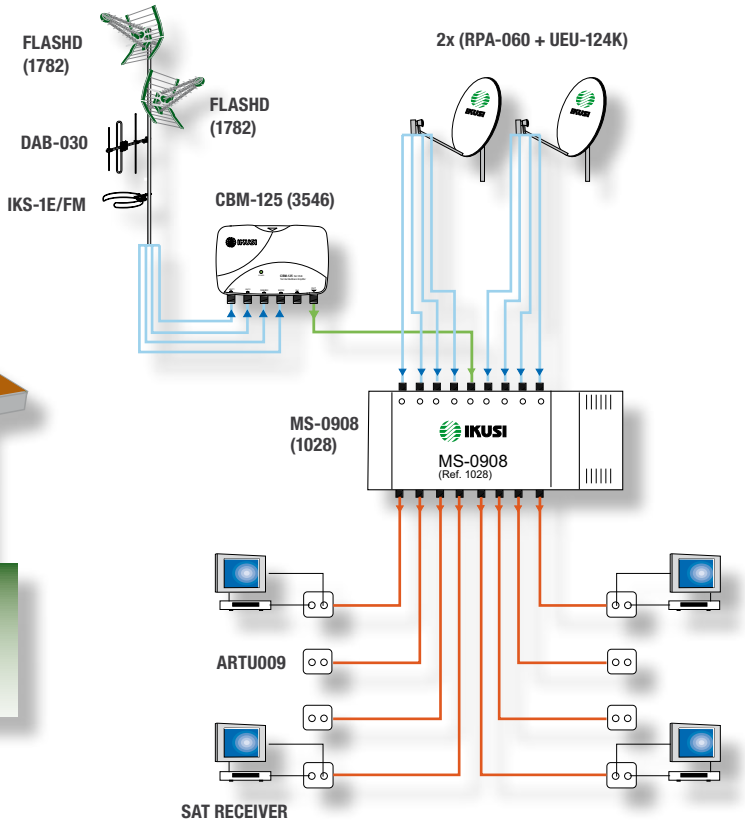
TV Terrestrial+Sat installation for 2 outlets *(single cable installation)*



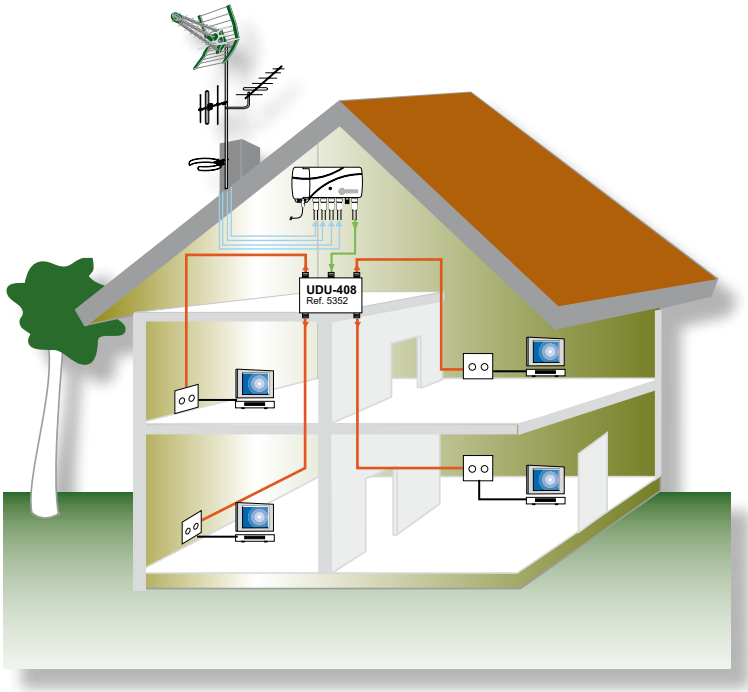


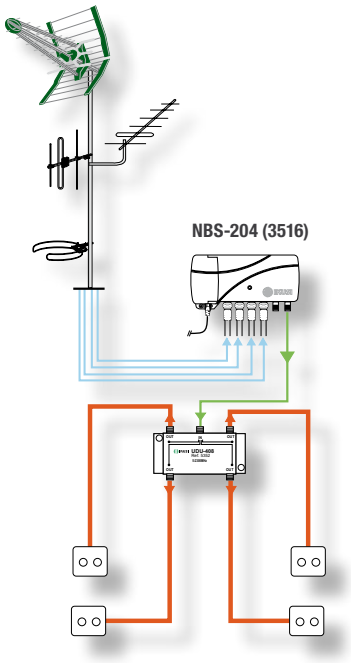
TV Terrestrial+2 Sat (8 polarities) installation for 2 users (4 outlets per user)



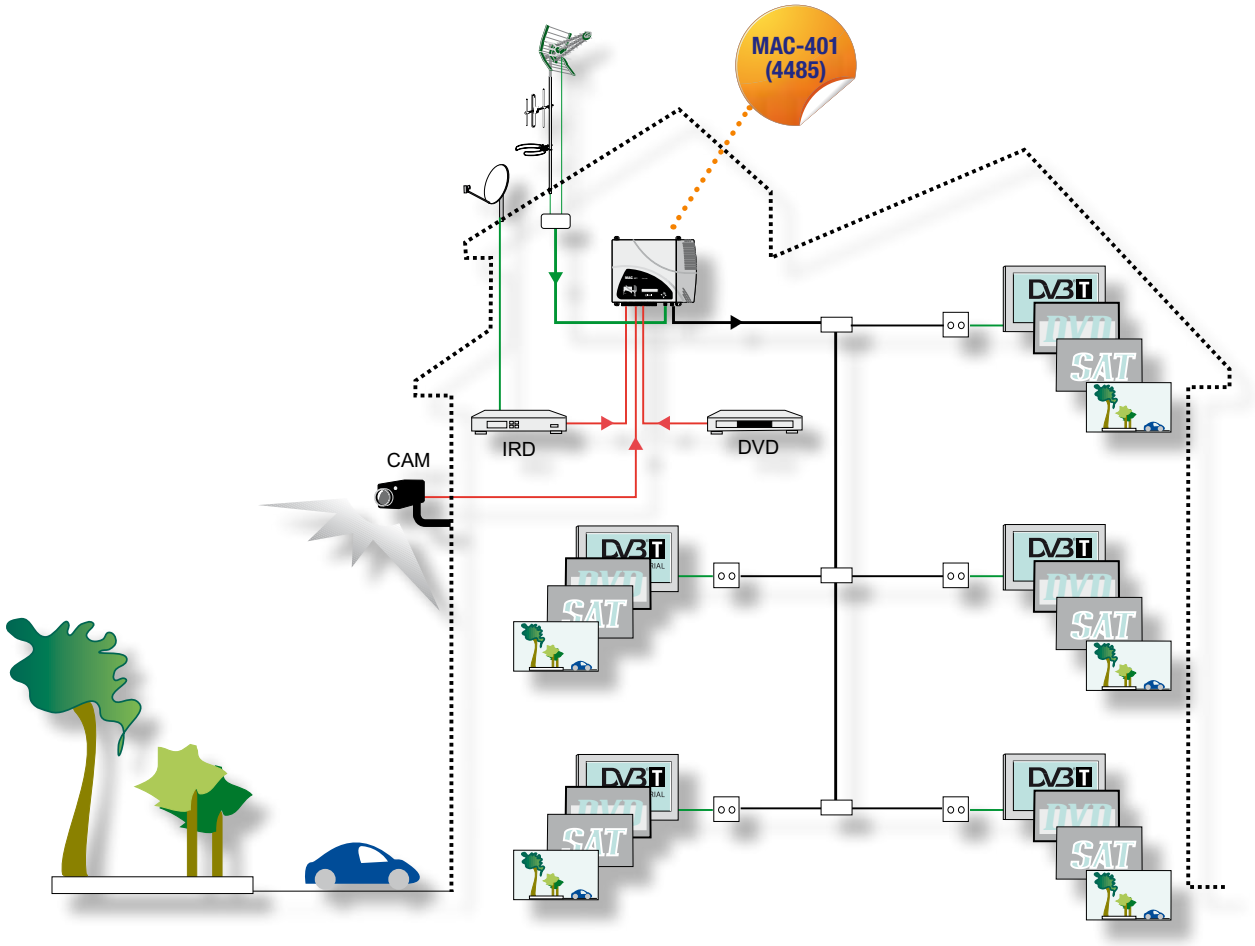


TV Terrestrial installation for 4 users

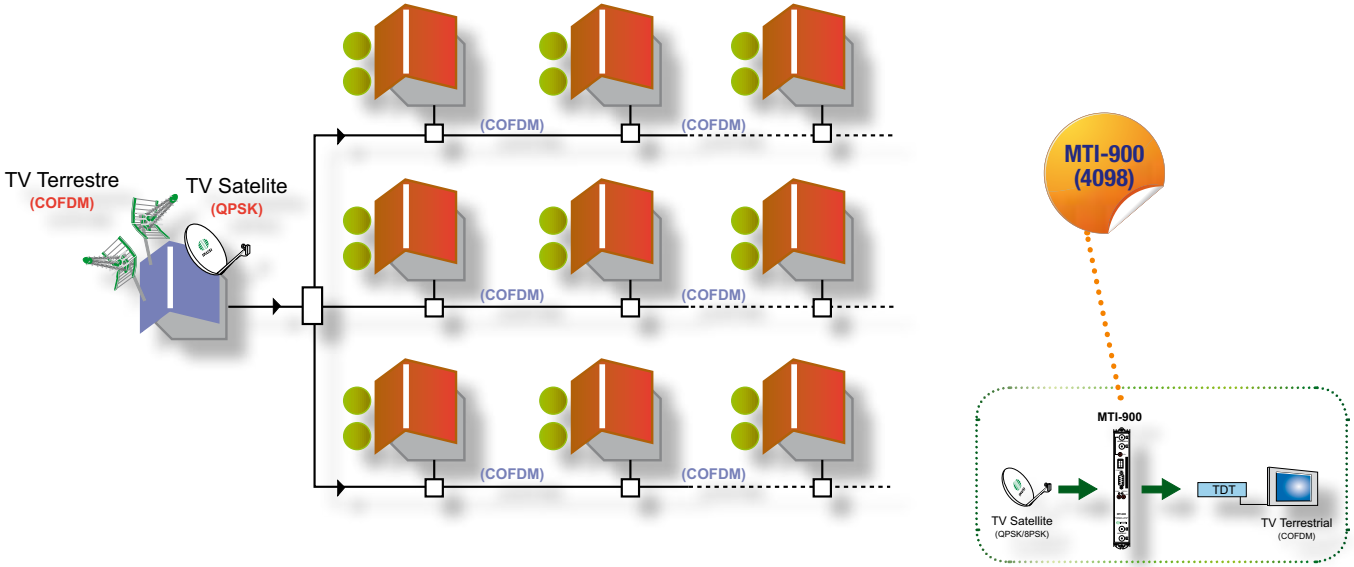




TV Terr+Sat+DVD+Camera Modulator installation for 5 outlets

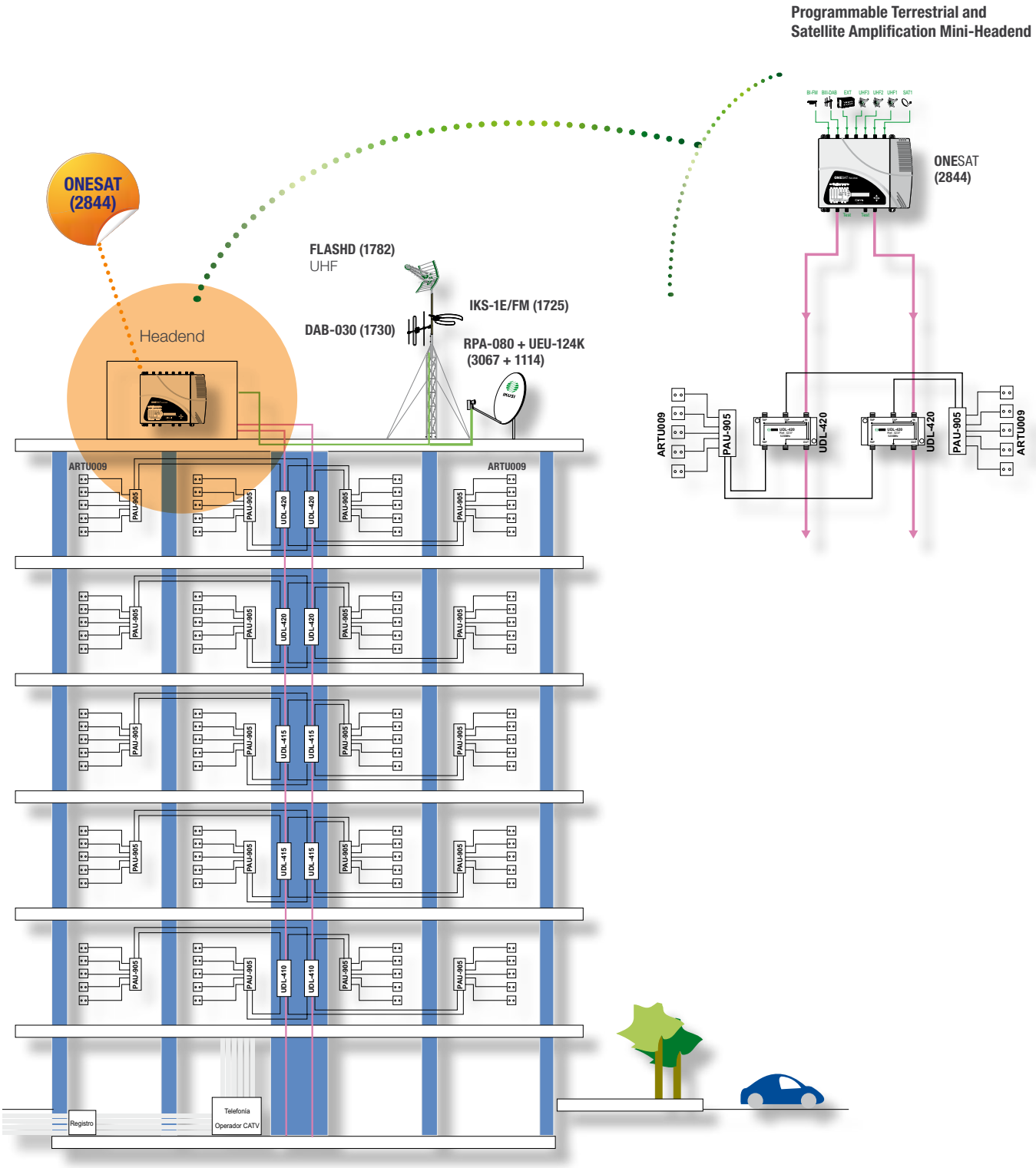


"Terrestrial + Satellite" TV installation with TDT receivers



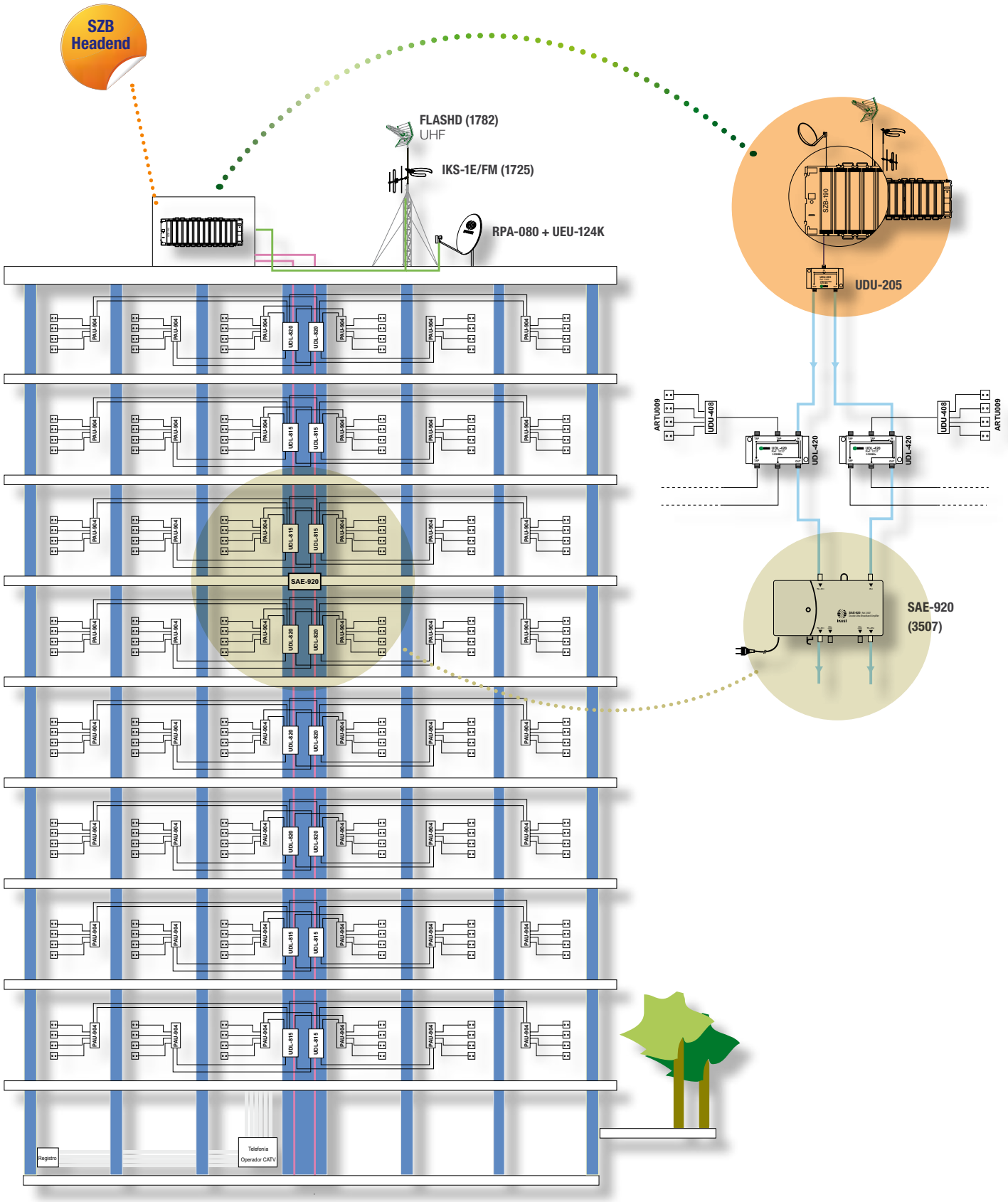
TV Terrestrial+Satellite installation - 20 apartments

(5 floors, 4 users per floor, 5 outlets per user. Total= 100 outlets)

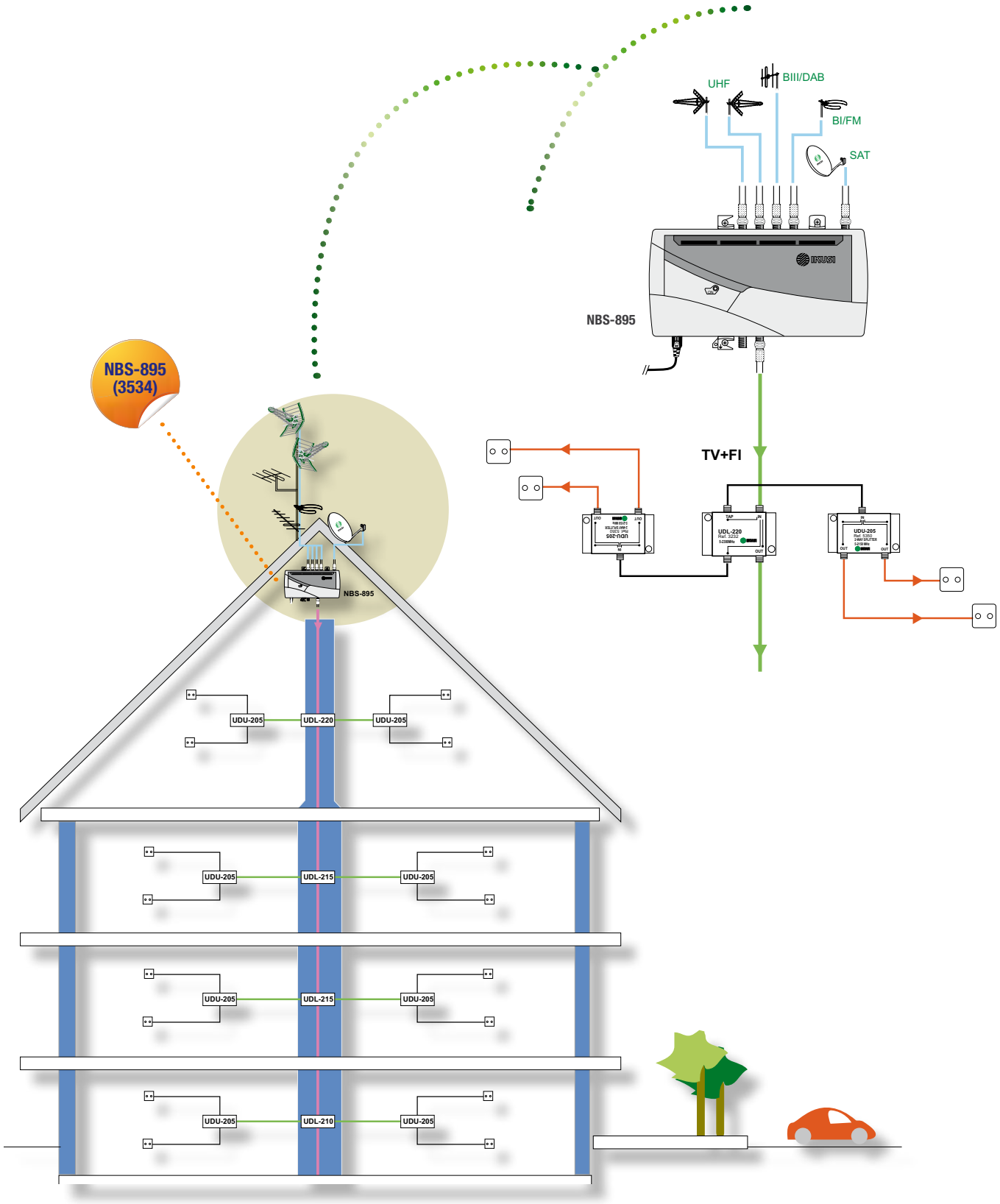


TV Terrestrial+Satellite installation - 48 apartments

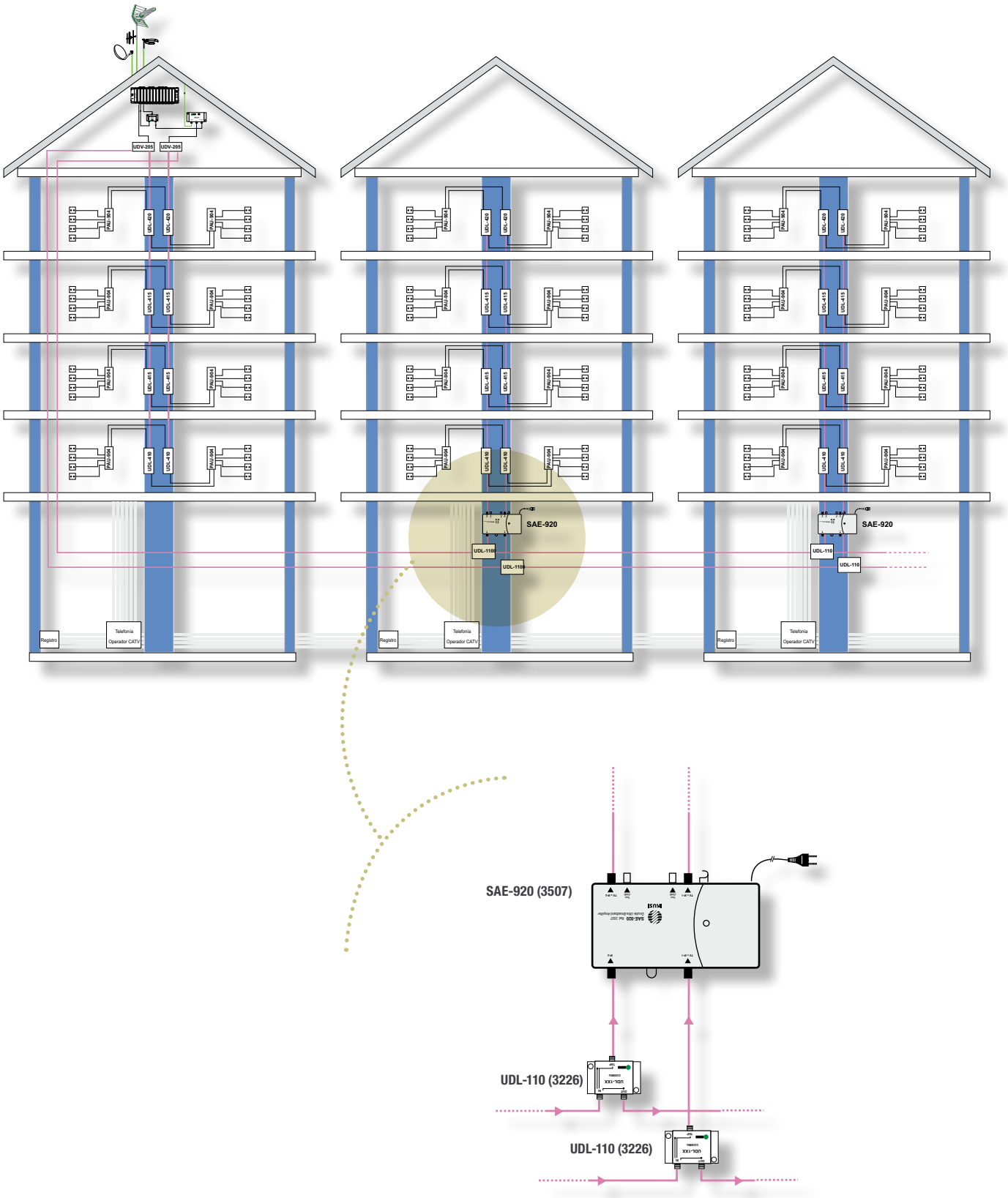
(8 floors, 6 users per floor, 4 outlets per user. Total= 192 outlets)



TV Terrestrial+Satellite installation - 8 apartments



TV Terrestrial+Satellite installation - several buildings



World Analog TV Standards

Country	VHF	UHF	Colour System
Algeria	B	H	PAL
Argentina	N	N	PAL
Australia	B	B	PAL
Austria	B	G	PAL
Bahrain	B	—	PAL
Belarus	D	K	SECAM
Belgium	B	H	PAL
Bulgaria	D	K	SECAM
China	D	K	PAL
Cyprus	B	G	PAL
Czech Republic	D	K	SECAM
Denmark	B	G	PAL
Egypt	B	G / H	SECAM
Estonia	D	K	SECAM
Finland	B	G	PAL
France	L	L	SECAM
Germany	B	G	PAL
Great Britain	I	I	PAL
Greece	B	G	SECAM
Holland	B	G	PAL
Hong Kong	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	M	—	NTSC
Kuwait	B	G	PAL
Latvia	D	K	SECAM
Lebanon	B	—	SECAM

Country	VHF	UHF	Colour System
Libya	B	H	SECAM
Lithuania	D	K	SECAM
Luxembourg	C	L	PAL/SECAM
Malaysia	B	G	PAL
Malta	B	H	PAL
Mexico	M	M	NTSC
Moldova	D	K	SECAM
Monaco	E	L	SECAM
Morocco	B	H	SECAM
Nigeria	B	G	PAL
Norway	B	G	PAL
Oman	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
Slovakia	D	K	SECAM
South Africa	I	I	PAL
Spain	B	G	PAL
Sri Lanka	B / H	—	PAL
Sweden	B	G	PAL
Switzerland	B	G	PAL
Syria	B	H	SECAM
Thailand	B	—	PAL
Tunisia	B	—	SECAM
Turkey	B	G	PAL
Ukraine	D	K	SECAM
United Arab Emirates	B	G	PAL
USA	M	M	NTSC
Yemen	B	—	PAL
Yugoslavia	B	G	PAL

TV Standard		B	D	G	H	I	K	K'	L	M	N
ALLOCATION		VHF	VHF	VHF/UHF	UHF	VHF/UHF	UHF	VHF/UHF	VHF/UHF	VHF/UHF	VHF/UHF
Number of lines		625	625	625	625	625	625	625	625	525	625
Number of raster per second		50	50	50	50	50	50	50	50	60	50
Number of images per second		25	25	25	25	25	25	25	25	30	25
Line frequency per socond		15 625	15 625	15 625	15 625	15 625	15 625	15 625	15 625	15 750	15 625
Channel bandwidth	MHz	7	8	8	8	8	8	8	8	6	8
Video bandwidth	MHz	5	6	5	5	5.5	6	5	6	4.2	4.2
Video-to-Sound spacing	MHz	5.5	6.5	5.5	5.5	6	6.5	6.5	6.5	4.5	4.5
Vestigial side band	MHz	0.75	0.75	0.75	1.25	1.25	0.75	1.25	1.25	0.75	0.75
Image modulation		Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Pos.	Neg.	Neg.
Sound modulation		FM	FM	FM	FM	FM	FM	FM	AM	FM	FM
Power ratio: vision/sound		5/1 - 10/1	2/1 - 5/1	5/1 - 10/1	5/1	5/1	2/1 - 5/1	2/1 - 5/1	8/1	5/1 - 10/1	5/1 - 10/1
Frequency deviation for sound	kHz	±50		±50	±50	±50				±25	±25
Pre-emphasis	µs	50		50	50	50				75	75

Systems B/G (Europe) +K, I, L for B IV/V (1)

Band	Channel	channel frequency MHz	Picture carrier MHz	Sound carrier MHz
I	E2	47 - 54	46.25	51.75
	E3	54 - 61	57.25	62.75
	E4	61 - 68	64.25	69.75
Low S-Band (SI)	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
III	E5	174 - 181	175.25	180.75
	E6	181 - 188	182.25	187.75
	E7	188 - 195	189.25	194.75
	E8	195 - 202	196.25	201.75
	E9	202 - 209	203.25	208.75
	E10	209 - 216	210.25	215.75
	E11	216 - 223	217.25	222.75
	E12	223 - 230	224.25	229.75
High S-Band (SI-1)	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 (SII)	S21	303 - 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

Band	Channel	channel frequency MHz	Picture carrier MHz	Sound carrier MHz
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
UHF	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

(1) Sound carrier is different :

Systems K, L :
Sound carrier = Picture carrier + 6.5 MHz

System I :
Sound carrier = Picture carrier + 6 MHz

Other Systems and Channels (Europe, Morocco)

Band	Channel	channel frequency MHz	Picture carrier MHz	Sound carrier MHz
System D (OIRT)				
I	R1	48.5 - 56.5	49.75	56.25
	R2	58 - 66	59.25	65.75
II	R3	76 - 84	77.25	83.75
	R4	84 - 92	85.25	91.75
	R5	92 - 100	93.25	99.75
Special channels	S1	110 - 118	111.25	117.75
	S2	118 - 126	119.25	125.75
	S3	126 - 134	127.25	133.75
	S4	134 - 142	135.25	141.75
	S5	142 - 150	143.25	149.75
	S6	150 - 158	151.25	157.75
	S7	158 - 166	159.25	165.75
	S8	166 - 174	167.25	173.75
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
	R12	222 - 230	223.25	229.75
Special channel	S11	230 - 238	231.25	237.75
	S12	238 - 246	239.25	245.75
	S13	246 - 254	247.25	253.75
	S14	254 - 262	255.25	261.75
	S15	262 - 270	263.25	269.75
	S16	270 - 278	271.25	277.75
	S17	278 - 286	279.25	285.75
	S18	286 - 294	287.25	293.75
	S19	294 - 302	295.25	301.75
	S20	302 - 310	303.25	309.75
	S21	303 - 310	311.25	317.75
	S22	310 - 318	319.25	325.75
	S23	318 - 326	327.25	333.75
	S24	326 - 334	335.25	341.75
	S25	334 - 342	343.25	349.75
	S26	342 - 350	351.25	357.75
	S27	350 - 358	359.25	365.75
	S28	358 - 366	367.25	373.75
	S29	366 - 374	375.25	381.75
	S30	374 - 382	383.25	389.75
	S31	382 - 390	391.25	397.75
	S32	390 - 398	399.25	405.75
	S33	398 - 406	407.25	413.75
	S34	406 - 414	415.25	421.75
	S35	414 - 422	423.25	429.75
	S36	422 - 430	431.25	437.75
	S37	430 - 438	439.25	445.75
	S38	438 - 446	447.25	453.75
	S39	446 - 454	455.25	461.75
	S40	454 - 462	463.25	469.75
	S41	462 - 470	471.25	477.75

Band	Channel	channel frequency MHz	Picture carrier MHz	Sound carrier MHz
System B (Italy)				
I	A	48.5 - 56.5	49.75	56.25
	B	58 - 66	59.25	65.75
II	C	81 - 88	82.25	87.75
III	D	174 - 181	175.25	180.75
	E	182.5 - 189.5	183.25	189.75
	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

Band	Channel	channel frequency MHz	Picture carrier MHz	Sound carrier MHz
System I (Great Britain, Ireland)				
I	A	44.5 - 52.5	45.75	51.75
	B	52.5 - 60.5	53.25	59.75
	C	60.5 - 68.5	61.25	67.75
III	D	174 - 182	175.25	181.75
	E	182 - 190	183.25	189.75
	F	190 - 198	191.25	197.75
	G	198 - 206	199.25	205.75
	H	206 - 214	207.25	213.75
	I	214 - 222	215.25	221.75
	J	222 - 230	223.25	229.75

Band	Channel	channel frequency MHz	Picture carrier MHz	Sound carrier MHz
System B (Morocco)				
III	M4	162 - 169	163.25	168.75
	M5	170 - 177	171.25	176.75
	M6	178 - 185	179.25	184.75
	M7	186 - 193	187.25	292.75
	M8	194 - 201	195.25	200.75
	M9	202 - 209	203.25	208.75
	M10	210 - 217	211.25	216.75

Band	Channel	channel frequency MHz	Picture carrier MHz	Sound carrier MHz
System L (France)				
I	02	49 - 57	55.75	49.25
	03	53.5 - 61.75	60.50	54.00
	04	57 - 65	63.75	57.25
III	05	174.75 - 182.75	176	182.50
	06	182.75 - 190.75	184	190.50
	07	190.75 - 198.75	192	198.50
	08	198.75 - 206.75	200	206.50
	09	206.75 - 214.75	208	214.50
	10	214.75 - 222.75	216	222.50

Australian Channels - Analogue & Digital

Band	Channel	Aust. Ch.	Picture carrier MHz	Digital Freq. MHz	Sound carrier MHz
I		0	46.25		51.75
		1	57.25		62.75
		2	64.25		69.75
Low S-Band (SI)	S2		112.25		117.75
	S3		119.25		124.75
	S4		126.25		131.75
	S5		133.25		138.75
	S6		140.25		145.75
	S7		147.25		152.75
	S8		154.25		159.75
	S9		161.25		166.75
	S10		168.25		173.75
III		6	175.25	177.5	180.75
		7	182.25	184.5	187.75
		8	189.25	191.5	194.75
		9	196.25	198.5	201.75
		9a	197.25	205.5	202.75
		10	209.25	212.5	214.75
		11	216.25	219.5	221.75
		12	223.25	226.5	228.75
High S-Band (SI-1)	S11		231.25		236.75
	S12		238.25		243.75
	S13		245.25		250.75
	S14		252.25		257.75
	S15		259.25		264.75
	S16		266.25		271.75
	S17		273.25		278.75
	S18		280.25		285.75
	S19		287.25		292.75
	S20		294.25		299.75
Hyperband (SII)	S21		303.25		308.75
	S22		310.25		315.75
	S23		317.25		322.75
	S24		324.25		329.75
	S25		331.25		336.75
	S26		338.25		343.75
	S27		345.25		350.75
	S28		352.25		357.75
	S29		359.25		364.75
	S30		366.25		371.75
	S31		373.25		378.75
	S32		380.25		385.75
	S33		387.25		392.75
	S34		394.25		399.75
	S35		401.25		406.75
	S36		408.25		413.75
	S37		415.25		420.75
	S38		422.25		427.75
	S39		429.25		434.75
	S40		436.25		441.75
	S41		443.25		448.75

Band	Channel	Aust. Ch.	Picture carrier MHz	Digital Freq. MHz	Sound carrier MHz
UHF	E 21		471.25		476.75
	E 22		479.25		484.75
	E 23		487.25		492.75
	E 24		495.25		500.75
	E 25		503.25		508.75
	E 26		511.25		516.75
	E 27		519.25		524.75
		28	527.25	529.5	532.75
		29	534.25	536.5	539.75
		30	541.25	543.5	546.75
		31	548.25	550.5	553.75
		32	555.25	557.5	560.75
		33	562.25	564.5	567.75
		34	569.25	571.5	574.75
		35	576.25	578.5	581.75
		36	583.25	585.5	588.75
		37	590.25	592.5	595.75
		38	597.25	599.5	602.75
		39	604.25	606.5	609.75
		40	611.25	613.5	616.75
		41	618.25	620.5	623.75
		42	625.25	627.5	630.75
		43	632.25	634.5	637.75
		44	639.25	641.5	644.75
		45	646.25	648.5	651.75
		46	653.25	655.5	658.75
		47	660.25	662.5	665.75
		48	667.25	669.5	672.75
		49	674.25	676.5	679.75
		50	681.25	683.5	686.75
		51	688.25	690.5	693.75
		52	695.25	697.5	700.75
		53	702.25	704.5	707.75
		54	709.25	711.5	714.75
		55	716.25	718.5	721.75
		56	723.25	725.5	728.75
		57	730.25	732.5	735.75
		58	737.25	739.5	742.75
		59	744.25	746.5	749.75
		60	751.25	753.5	756.75
		61	758.25	760.5	763.75
		62	765.25	767.5	770.75
		63	772.25	774.5	777.75
		64	779.25	781.5	784.75
		65	786.25	788.5	791.75
		66	793.25	795.5	798.75
		67	800.25	802.5	805.75
		68	807.25	809.5	812.75
		69	814.25	816.5	819.75

Systems M/N (South America, USA)

Band	Channel	channel frequency MHz	Picture carrier MHz	Sound carrier MHz
LOW	2	54 - 60		
	3	60 - 66	77.25	83.75
	4	66 - 72	85.25	91.75
	5	76 - 82	93.25	99.75
	6	82 - 88		
HIGH	7	174 - 180	175.25	181.75
	8	180 - 186	183.25	189.75
	9	186 - 192	191.25	197.75
	10	192 - 198	199.25	205.75
	11	198 - 204	207.25	213.75
	12	204 - 210	215.25	221.75
	13	210 - 216	223.25	229.75
UHF	14	470 - 476	471.25	475.75
	15	476 - 482	477.25	481.75
	16	482 - 488	483.25	487.75
	17	488 - 494	489.25	493.75
	18	494 - 500	495.25	499.75
	19	500 - 506	501.25	505.75
	20	506 - 512	507.25	511.75
	21	512 - 518	513.25	517.75
	22	518 - 524	519.25	523.75
	23	524 - 530	525.25	529.75
	24	530 - 536	531.25	535.75
	25	536 - 542	537.25	541.75
	26	542 - 548	543.25	547.75
	27	548 - 554	549.25	553.75
	28	554 - 560	555.25	559.75
	29	560 - 566	561.25	565.75
	30	566 - 572	567.25	571.75
	31	572 - 578	573.25	577.75
	32	578 - 584	579.25	583.75
	33	584 - 590	585.25	589.75
	34	590 - 596	591.25	595.75
	35	596 - 602	597.25	601.75

Band	Channel	channel frequency MHz	Picture carrier MHz	Sound carrier MHz
UHF	36	602 - 608	603.25	607.75
	37	608 - 614	609.25	613.75
	38	614 - 620	615.25	619.75
	39	620 - 626	621.25	625.75
	40	626 - 632	627.25	631.75
	41	632 - 638	633.25	637.75
	42	638 - 644	639.25	643.75
	43	644 - 650	645.25	649.75
	44	650 - 656	651.25	655.75
	45	656 - 662	657.25	661.75
	46	662 - 668	663.25	667.75
	47	668 - 674	669.25	673.75
	48	674 - 680	675.25	679.75
	49	680 - 686	681.25	685.75
	50	686 - 692	687.25	691.75
	51	692 - 698	693.25	697.75
	52	698 - 704	699.25	703.75
	53	704 - 710	705.25	709.75
	54	710 - 716	711.25	715.75
	55	716 - 722	717.25	721.75
	56	722 - 728	723.25	727.75
	57	728 - 734	729.25	733.75
	58	734 - 740	735.25	739.75
	59	740 - 746	741.25	745.75
	60	746 - 752	747.25	751.75
	61	752 - 758	753.25	757.75
	62	758 - 764	759.25	763.75
	63	764 - 770	765.25	76975
	64	770 - 776	771.25	775.75
	65	776 - 782	777.25	781.75
	66	782 - 788	783.25	787.75
	67	788 - 794	789.25	793.75
	68	794 - 800	795.25	799.75
	69	800 - 806	801.25	805.75
	70	806 - 812	807.25	811.75
	71	812 - 818	813.25	817.75
	72	818 - 824	819.25	823.75
	73	824 - 830	825.25	829.75
	74	830 - 836	831.25	835.75
	75	836 - 842	837.25	841.75
	76	842 - 848	843.25	847.75
	77	848 - 854	849.25	853.75
	78	854 - 860	855.25	859.75
	79	860 - 866	861.25	865.75
	80	866 - 872	867.25	871.75
	81	872 - 878	873.25	877.75
	82	878 - 884	879.25	883.75
	83	884 - 890	885.25	889.75

Output level reduction in broadband amplifiers

BROADBAND TERRESTRIAL TV AMPLIFIERS : The RF output levels specified in this catalogue for IMD3=-60 dB (DIN 45004 B) are applicable when 2 analog TV channels are amplified. If, as is usual, more than 2 TV channels are amplified, such levels have to be reduced according to the following table:

Number of Channels (n)		2	3	4	5	6	7	8	9	10	15	20
Output level reduction = 10 ·log (n-1)	dB	0	2	3.5	4.5	5	5.5	6	6.5	7	8.5	9.5

FM, DAB AND COFDM SIGNALS : If output levels of the FM, DAB and Digital TV (COFDM) signals are adjusted 10 dB or more below the levels of the analog TV channels, those signals can be ignored when calculating the output reduction level. If referred levels are not reduced as indicated, those signals must be counted as normal channels and the output level de-rated accordingly.

BROADBAND SATELLITE TV OR DIGITAL TERRESTRIAL TV AMPLIFIERS : The RF output levels specified in this catalogue for IMD3=-35 dB (EN 50083-3) are applicable when 1 FM-, QPSK- or COFDM-modulated TV channel is amplified. For a bigger number of channels, such levels have to be reduced according to the following table:

Number of Channels (n)		2	3	4	5	6	7	8	9	10	15	20
Output level reduction = 7.5 ·log (n-1)	dB	3	4.5	6	7	8	8.5	9	9.5	10	11.5	13

CASCADE REDUCTION : When m same-type broadband amplifiers are laid out in cascade, an additional reduction of the output level equals 10 · log m must be taken into account for every amplifier.

Channel allocation for CTB and CSO measurement - CENELEC Frequency Plan

Frequency MHz	
48.25	GROUP A
119.25	
175.25	
191.25	
207.25	
223.25	
231.25	
247.25	
263.25	
287.25	
311.25	
327.25	
343.25	
359.25	
375.25	
391.25	
407.25	
423.25	
439.25	

Frequency MHz	
447.25	GROUP B
463.25	
479.25	
511.25	
527.25	
543.25	
567.25	GROUP C
583.25	
599.25	

Frequency MHz	
663.25	GROUP D
679.25	
695.25	
711.25	
727.25	
743.25	
759.25	GROUP E
775.25	
791.25	
807.25	
823.25	
839.25	
855.25	

Level/Voltage conversion table

dBµV	0	1	2	3	4	5	6	7	8	9
0	1.0 µV	1.1 µV	1.3 µV	1.4 µV	1.6 µV	1.8 µV	2.0 µV	2.2 µV	2.5 µV	2.8 µV
10	3.2 µV	3.5 µV	4.0 µV	4.5 µV	5.0 µV	5.6 µV	6.3 µV	7.1 µV	7.9 µV	8.9 µV
20	10.0 µV	11.2 µV	12.6 µV	14.1 µV	15.8 µV	17.8 µV	20.0 µV	22.4 µV	25.1 µV	28.2 µV
30	31.6 µV	35.5 µV	39.8 µV	44.7 µV	50.1 µV	56.2 µV	63.1 µV	70.8 µV	79.4 µV	89.1 µV
40	100 µV	112 µV	126 µV	141 µV	158 µV	178 µV	200 µV	224 µV	251 µV	282 µV
50	316 µV	355 µV	398 µV	447 µV	501 µV	562 µV	631 µV	708 µV	794 µV	891 µV
60	1.0 mV	1.1 mV	1.3 mV	1.4 mV	1.6 mV	1.8 mV	2.0 mV	2.2 mV	2.5 mV	2.8 mV
70	3.2 mV	3.5 mV	4.0 mV	4.5 mV	5.0 mV	5.6 mV	6.3 mV	7.1 mV	7.9 mV	8.9 mV
80	10.0 mV	11.2 mV	12.6 mV	14.1 mV	15.8 mV	17.8 mV	20.0 mV	22.4 mV	25.1 mV	28.2 mV
90	31.6 mV	35.5 mV	39.8 mV	44.7 mV	50.1 mV	56.2 mV	63.1 mV	70.8 mV	79.4 mV	89.1 mV
100	100 mV	112 mV	126 mV	141 mV	158 mV	178 mV	200 mV	224 mV	251 mV	282 mV
110	316 mV	355 mV	398 mV	447 mV	501 mV	562 mV	631 mV	708 mV	794 mV	891 mV
120	1.0 V	1.1 V	1.3 V	1.4 V	1.6 V	1.8 V	2.0 V	2.2 V	2.5 V	2.8 V

Ex.: 66 dBµV = 2.0 mV
125 dBµV = 1.8 V

«dBµV / dBm» conversion on 75Ω

Convert dBµV to dBm → Subtract 108.7 from the figure in dBµV :
(N) dBµV = (N - 108.7) dBm
Ex.: 110 dBµV = 1.3 dBm

Convert dBm to dBµV → Add 108.7 to the figure in dBm :
(M) dBm = (M + 108.7) dBµV
Ex.: -50 dBm = 58.7 dBµV

«dBµV / dBmV» conversion

Convert dBµV to dBmV → Subtract 60 from the figure in dBµV :
(N) dBµV = (N - 60) dBmV
Ex.: 100 dBµV = 40 dBmV

Convert dBm to dBµV → Add 60 to the figure in dBmV :
(M) dBmV = (M + 60) dBµV
Ex.: 22 dBmV = 82 dBµV

Earthing and equipotencial bonding cables

The EN 50083-1 standard specifies the following earthing and equipotencial bonding cables for antenna systems:

Earthing cables:

Material	Cross-section	Ø	Condition
Copper	≥ 16 mm2	≥ 4.6 mm	bare or insulated
Aluminium	≥ 25 mm2	≥ 5.7 mm	bare (indoors only) or insulated
Steel wire	≥ 50 mm2	≥ 8.0 mm	galvanized
Steel strip	2.5 x 20 mm	-	galvanized

Cable type: single conductor or multi-conductor, but no fine wires

Equipotencial bonding cables:

Material	Cross-section	Ø	Condition
Copper	≥ 4 mm2	≥ 2.3 mm	bare or insulated

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