

# Televes®

# 2011

▲ CATALOGUE

**PASSION** for QUALITY



# Index

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## ANTENNAS

Made of aluminium and ABS plastic, Televes line of antennas are constructed to resist the hardest climatic conditions such as UV radiation, drastic changes of temperature and rust.





FM/BIII

### Circular FM

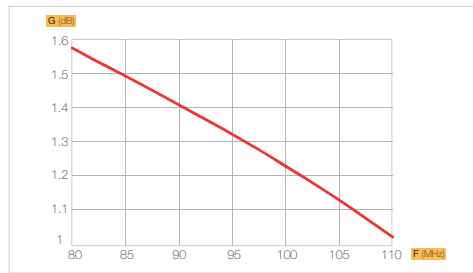
Dipole antenna folded in a circular shape to obtain an omnidirectional radiation pattern.



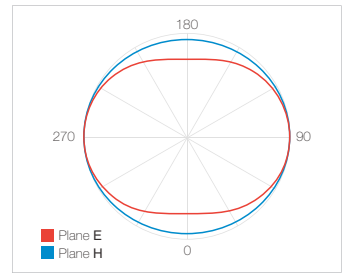
▲ 1201

References		1201	
Band		FM	
Gain		1	
F/B ratio		0	
Length		mm	500
Wind load	800 N/m <sup>2</sup>	N	27
	1100 N/m <sup>2</sup>		37
Wind pressure	N/m <sup>2</sup>	800	1100
Wind speed	Km/h	130	150

Frequency response



Radiation diagram



### Band III

Yagi style Antennas for Band III reception, composed of a reflector, a folded dipole and directional elements.

The connection box includes the baloon between the dipole and the coaxial cable.

**PRODUCT RANGE**

Ref. DeSCRIPTION

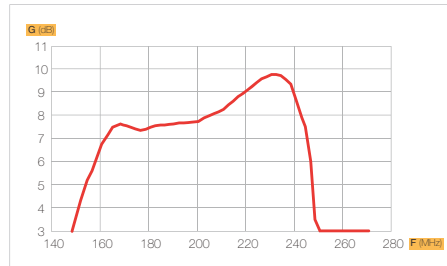
1065	5-12 ch., 7 elements
106501	5-12 ch., 7 elements (single pack)
1048	9-10 ch., 7 elements
1291	5-12 ch., 9 elements



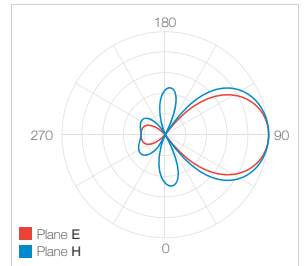
▲ 1065

References		1065	1048	1291	
Elements		7	7	9	
Gain		9.5	9.5	10	
F/B ratio		20	20	24	
Length		mm	1460	1460	1650
Wind load	800 N/m <sup>2</sup>	N	71	69.1	80.6
	1100 N/m <sup>2</sup>		97.7	95	110.8
Wind pressure	N/m <sup>2</sup>	800	1100		
Wind speed	Km/h	130	150		

Frequency response



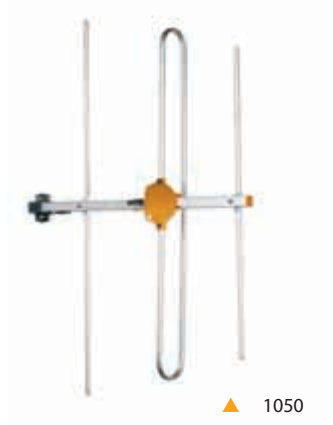
Radiation diagram



DAB/COMBINED ANTENNAS

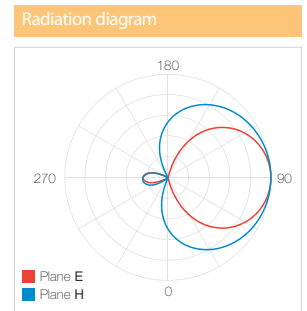
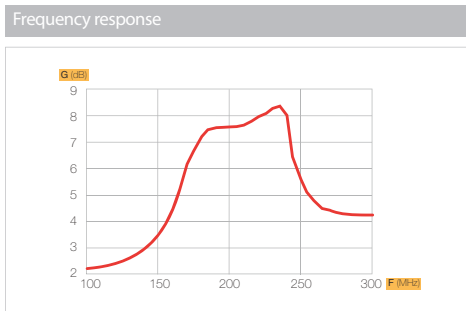
DAB

Specially designed for DAB reception (Digital Audio Broadcasting).  
 It is a three-element antenna (reflector, dipole and directive element) that covers the whole reserved band for DAB transmissions.  
 Includes the baloon in the connection box.



PRODUCT RANGE	
Ref.	DeSCRIPTION
1050	DAB, 3 elements

References		1050	
Band		DAB/BIII 190-232 MHz	
Gain		dB 8	
F/B ratio		>15	
Length		mm 555	
Wind load	800 N/m <sup>2</sup>	N	36.5
	1100 N/m <sup>2</sup>		50.2
Wind pressure	N/m <sup>2</sup>	800	1100
Wind speed	Km/h	130	150



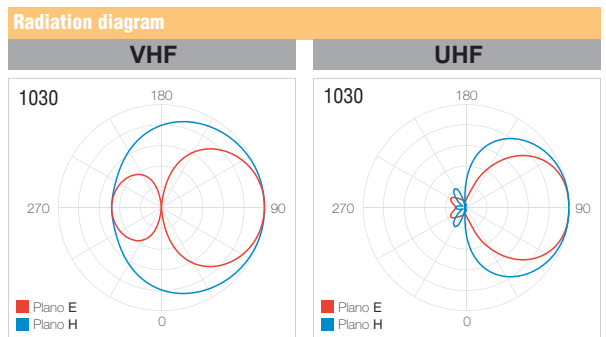
VHF/UHF

PRODUCT RANGE	
Ref.	DeSCRIPTION
1030	Logaritmico BIIII/UHF

Designed for Band III and UHF reception.  
 The 1030 is a logarithmic antenna composed of a number of active dipoles, each of them tuned to a different frequency. The result is a broadband antenna.



References		1030	
Band		5-12/21-69	
Gain		dB 8.5/10	
Length		mm 900	
Wind load	800 N/m <sup>2</sup>	N	33.6
	1100 N/m <sup>2</sup>		46.2



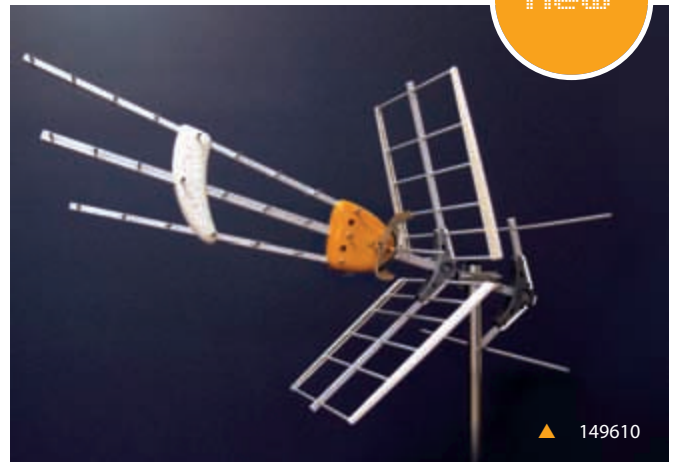
COMBINED ANTENNAS

Dat HD Boss Mix



PRODUCT RANGE	
Ref.	DeSCRIPTION

149610	DAT HD BOSS Mix
149611	DAT HD BOSS Mix single pack

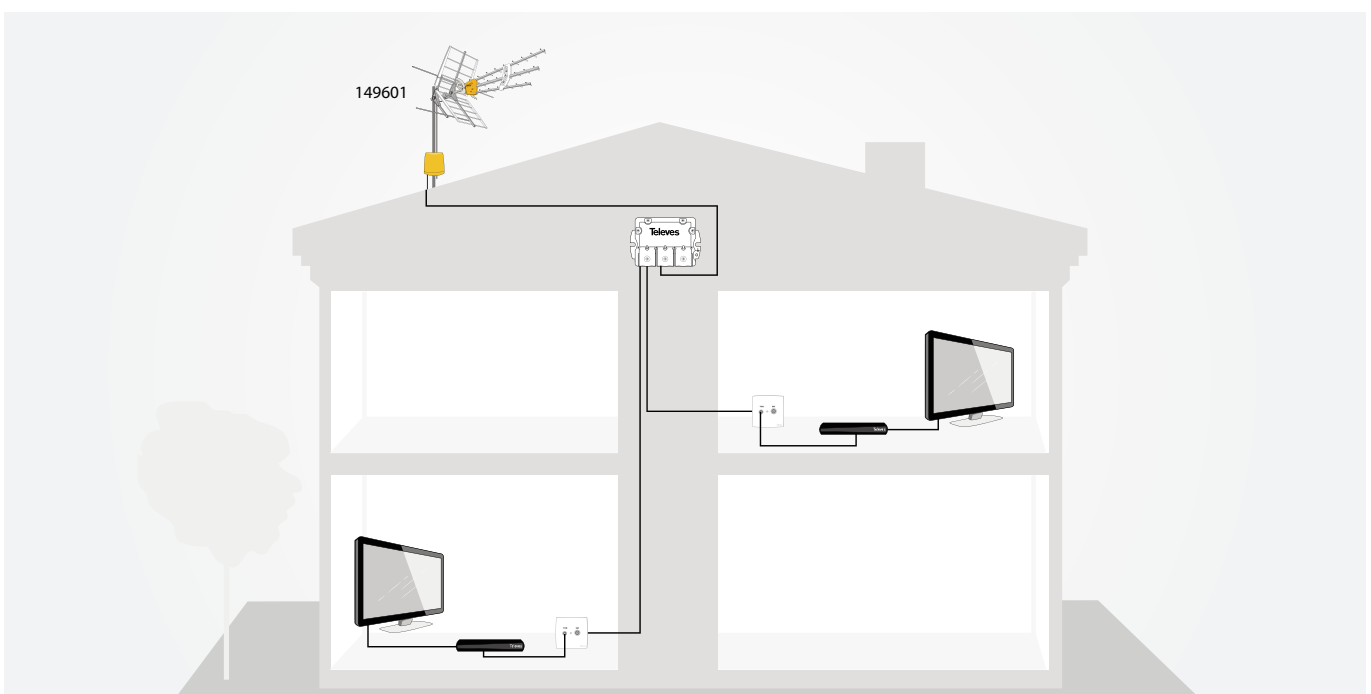


▲ 149610

- Mixed antenna for BIll (174-230) and UHF (470-862) reception.
- The UHF antenna is a Yagi style antenna of 39 elements, with 24 director elements distributed in a angled array of three rows, giving high directivity and balanced bandwidth.
- The part for the BIll is also a Yagi style antenna of 3 elements, with 1 dipole and 2 reflectors.
- The structure is based on the DAT HD antenna with additional BIll elements.
- The BossTech is activated or not depending on the power supply voltage. The gain regulation affects both to the UHF, and the BIll signals.

References		149610/149611			
		Passive		Active	
Band		5-12	21-69	5-12	21-69
Gain	dB	8.5	16	21	28 max.
Output level	dBµV	-		Auto-regulated	
Noise figure	dB	-		2	
Powering voltage	Vcc	0		12-24	
Consumption	mA	-		40 max.	
Length	mm	1112			
Wind load	800 N/m <sup>2</sup>	N	135		
	1100 N/m <sup>2</sup>		185		

Wind pressure	N/m <sup>2</sup>	800	1100
Wind speed	Km/h	130	150



UHF

## Dat HD Boss

**PRODUCT RANGE**  
Ref. DeSCRIPTION

1495	DAT HD BOSS multipack
149501	DAT HD BOSS single pack

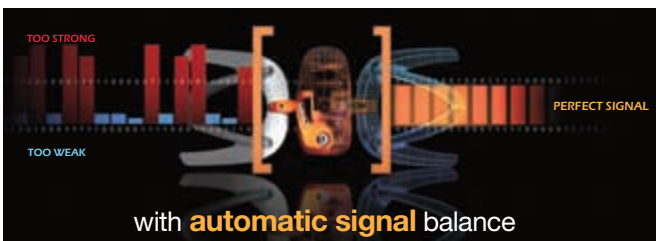
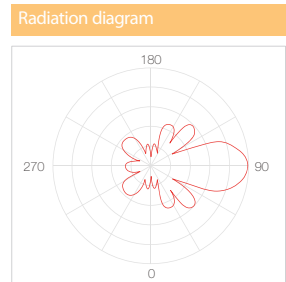
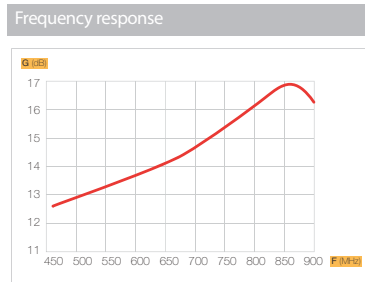
The **DAT HD** is designed to function in automatic mode (**Boss-Tech activated**) or passive mode.

Do not worry about signal strenght just align antenna and the **Boss-Tech** device will automatically adjust the output signal to the optimum level (\*)

Whether in automatic or passive mode, the **DAT HD** offers exclusive functionality to maximize the reception of the DTT.



▲ 1495



Reference	1495	
Mode	Passive	Active
Bands	UHF	
Gain	17 dB	29 dB máx.
Output Level	---	Auto-regulated
Noise figure	-	2 dB tip.
Recommended signal level	> 75 dBµV	< 75 dBµV
Powering	0 Vcc	12-24 Vcc
Consumption	-	40 mA
Beamwidth	30°	
Windload	120N (130 Km/h)	165N (150 Km/h)

ADDITIONAL FEATURES

The asymmetrical directors provide the perfect radiation diagram to reduce ECHOES

Fully shielded BOSS-Tech enclosure to protect against impulsive noise

State-of-the-art Multilayer technology providing highest stability and reliability

Newly patented dipole that greatly improves the reception margins throughout the complete terrestrial band

All the antenna's electronic elements are grounded, giving unprecedented protection against electrostatic discharges



(\*) The Automatic Mode is activated with a 12-24Vdc power supply, not included

UHF

Monolithic Range

PRODUCT RANGE	
Ref.	DeSCRIPTION
8024	10 Elem., ch. 21-69 (Black)
1108	13 Elem., ch. 21-37, 12 dB
1121	13 Elem., ch. 21-69, 12 dB
112101	13 Elem., ch. 21-69, 12 dB Black

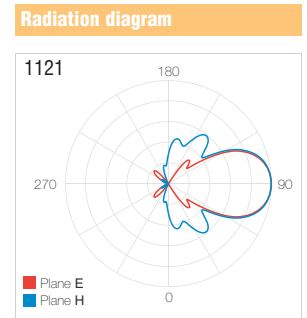
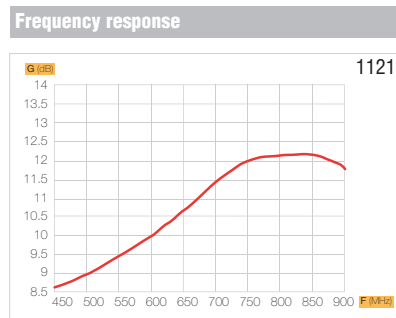
**FULLY SHIELDED**  
F connector



▲ 1121

Yagi style antennas composed of 10, 13 or 23 directive elements, triangular dipole and double V-reflector.

References		8024	1108	1121
Channel		21-69	21-37	21-69
Gain	dB	7	12	12
F/B ratio		15	28	26
Length	mm	757	1174	1180
Wind load	800 N/m <sup>2</sup>	N	27.8	73
	1100 N/m <sup>2</sup>		38.2	100.3
Wind pressure	N/m <sup>2</sup>	800	1100	
Wind speed	Km/h	130	150	



Infinito

PRODUCT RANGE	
Ref.	DeSCRIPTION
1125	Infinito UHF antenna
1425	Infinito UHF antenna (Single Pack)

This antenna presents a double array configuration, in the horizontal plane, of circular elements made of aluminium thread.

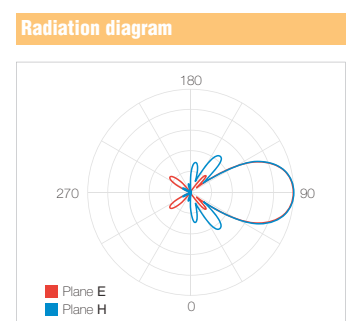
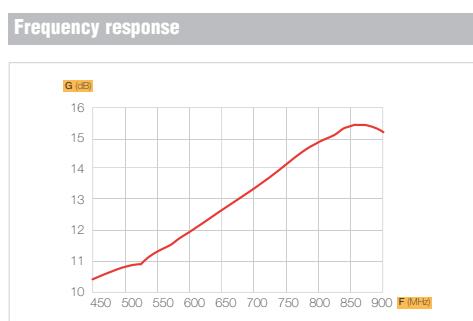
It shares the reflector of the V range antennas and a triangular type dipole in a junction box tested for outdoors.

It is as easy to install as the X-range antennas, simply by rotating its elements, which come folded.



▲ 1125

References		1125	
Channel		21-69	
Gain	dB	15.5	
F/B ratio		>25	
Length	mm	1044	
Wind load	800 N/m <sup>2</sup>	N	67
	1100 N/m <sup>2</sup>		92
Wind pressure	N/m <sup>2</sup>	800	1100
Wind speed	Km/h	130	150



UHF

V antenna

PRODUCT RANGE	
Ref.	DeSCRIPTION
1490	V Antenna
149001	V Antenna (single pack)

- Yagi-type antenna made of a dipole, a corner-reflector antenna made up of two parts of five elements each and two grids of 7 director-elements disposed in angle and vertically stacked.
- Made of high quality aluminium, ironlees.
- Total quality guaranteed thanks to its automatic manufacturing.
- Directive high-gain antenna and discrete size.
- Integrates an opened/closed dipole that supplies straightness to the frequency response.
- Equipped with shielded impedance matching that prevents from the effects of impulsive noise of DTT signals.



Director anchorage system



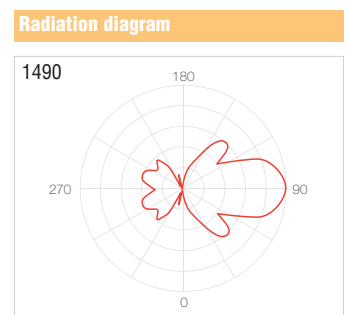
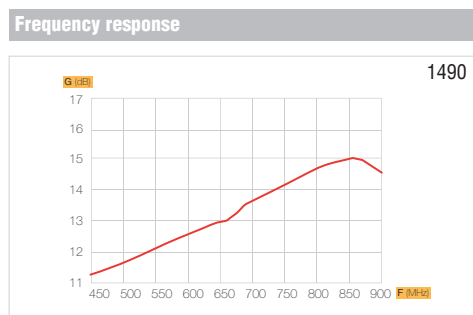
Reflector fixing system



Reflectors of manual insertion, with one single safety screw.



References		1490	
Frequency range	Mhz	470-862	
Gain	dB	15	
F/B ratio		22	
Length	mm	890	
Wind load	800 N/m <sup>2</sup>	N	93
	1100 N/m <sup>2</sup>		128
Wind pressure	N/m <sup>2</sup>	800	1100
Wind speed	Km/h	130	150





UHF

## DAT HD 75 BOSS

**PRODUCT RANGE**

Ref. DeSCRIPTION

149701 DAT HD 75 Boss

■ Where no other antenna has gone before

References		149701	
Mode		Passive	Active
Band		UHF	
Gain	dB	19	31 max.
Output level		---	Auto-regulated
Signal level of use (recommended)		> 75 dB $\mu$ V	
Noise figure	dB	-	2 typ.
Power voltage	Vcc	0	12-24
Consumption	mA	-	40
Beamwidth		30°	
Wind load	N	141 (130 Km/h)	
		194 (150 Km/h)	



## Panel Antenna

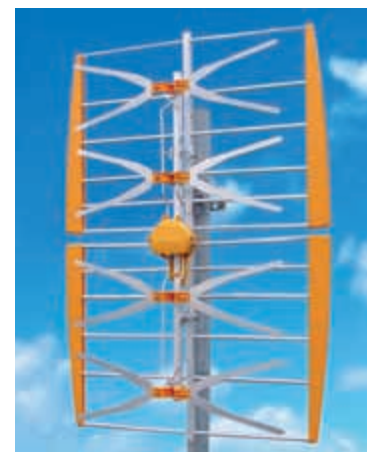
**PRODUCT RANGE**

Ref. DeSCRIPTION

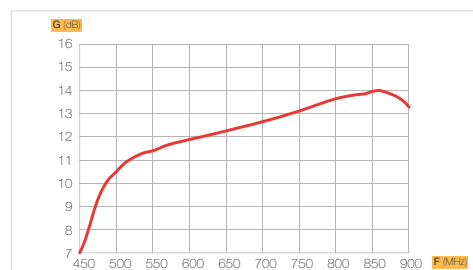
1083 4 Dipoles, ch. 21-69, 14 dB

Antenna designed for those cases where the TV signal comes from several directions especially suitable for over-water transmission.

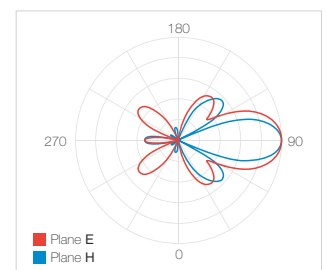
It is composed of 4 dipoles in a vertical pattern and a reflective panel. Dipoles are in phase along the line that joins them.



Frequency response



Radiation diagram



References		1083
Frequency range	MHz	470-862
Gain	dB	13
Output level	dB $\mu$ V	102
Noise figure	dB	2
Powering	Vcc	12-24
Consumption	mA	40



SPECIAL COMBINED ANTENNAS

# DIGINOVA BOSS



**PRODUCT RANGE**

Ref.	DeSCRIPTION
144111	Diginova BOSS tech (U/VHF) antenna
144110	Diginova BOSS tech (U/VHF) KIT

The Diginova Boss antenna is the only radomized antenna of low visual impact that, automatically, optimizes the installation.

- ▶ Low consumption
- ▶ Low visual impact
- ▶ 10 element Yagui-type UHF antenna implemented on a printed circuit board of latest technology.
- ▶ Protection. The watertight set, isolates and protects from the elements with an IP53 protection index.
- ▶ UV resistant
- ▶ Easy installation
- ▶ Versatility. Enables the installation of vertical and horizontal polarization.

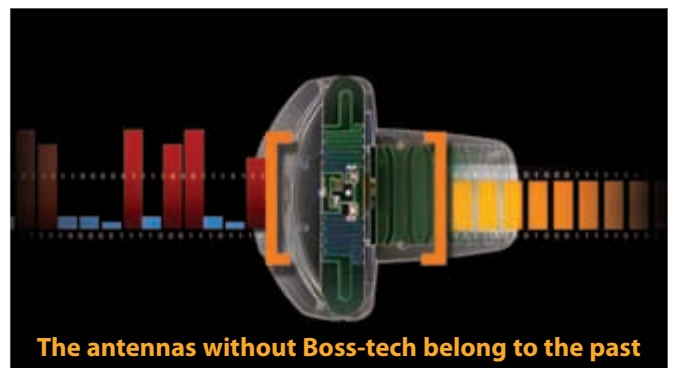


**FM-DAB-VHF-UHF DVB-T**

▲ 144110

**Technical features**

- ▶ Adapts itself to the received signal level. When the installer fits it, he does not have to worry about the input level as the antenna guarantees the most adequate output to the received signal.
- ▶ Corrects the signal fluctuations, autoadjusting the output level to the optimal value, independently from the input variations. The signal reception will remain protected against fluctuations, in a transparent way for the user.
- ▶ Keeps the output level independently from the radioelectric spectrum in the moment of installation.
- ▶ The evolution of the number of channels is not important. At the antenna output the spectrum will be: without intermodulation, without noise, with the best possible BER and the C/N optimized. The antenna adjusts itself to future channels.

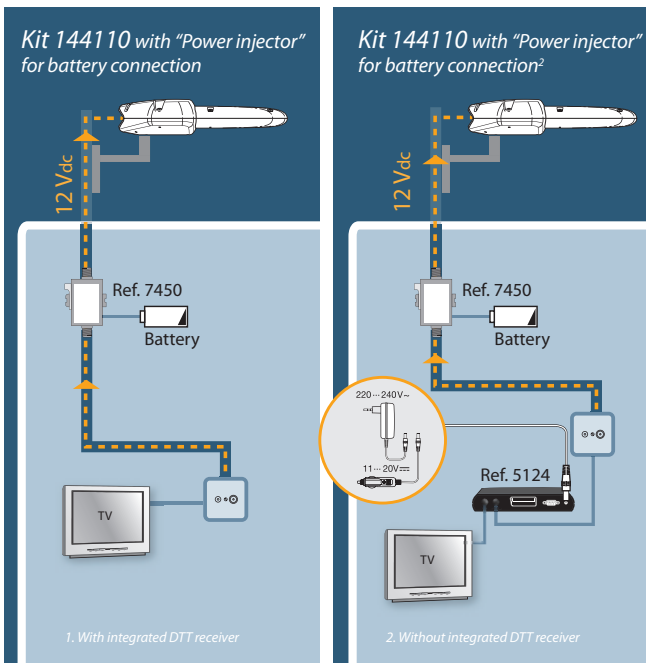


**The antennas without Boss-tech belong to the past**

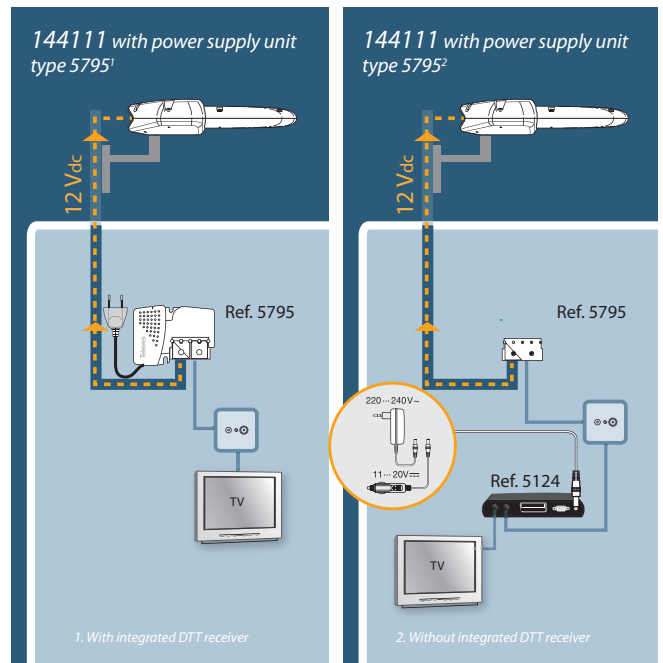
**The antenna determines the quality of the signal which cannot be improved by any other element of the TV network. If this antenna is the Diginova BOSS, the installation will have the best possible signal quality while preserving the aesthetic in fronts and balconies, historic buildings, protected environments, etc.**

SPECIAL COMBINED ANTENNAS

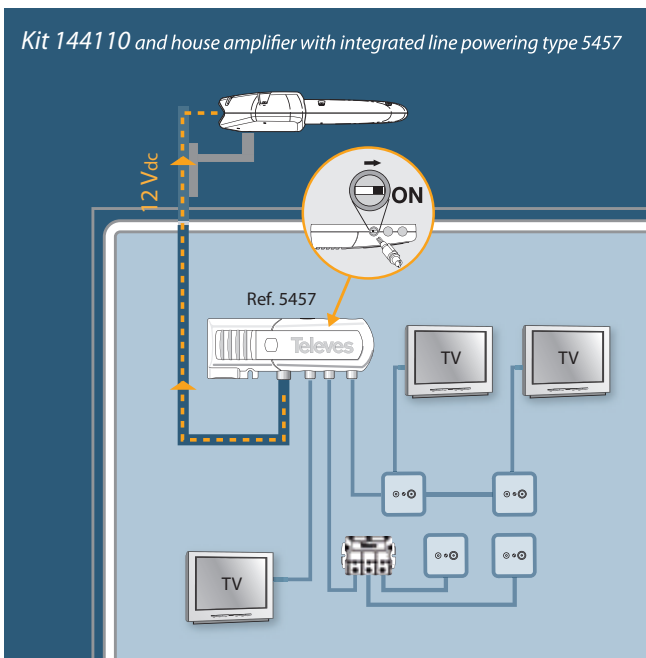
**1** Reception of FM, BIll and DTT (UHF) in caravans and motorhomes



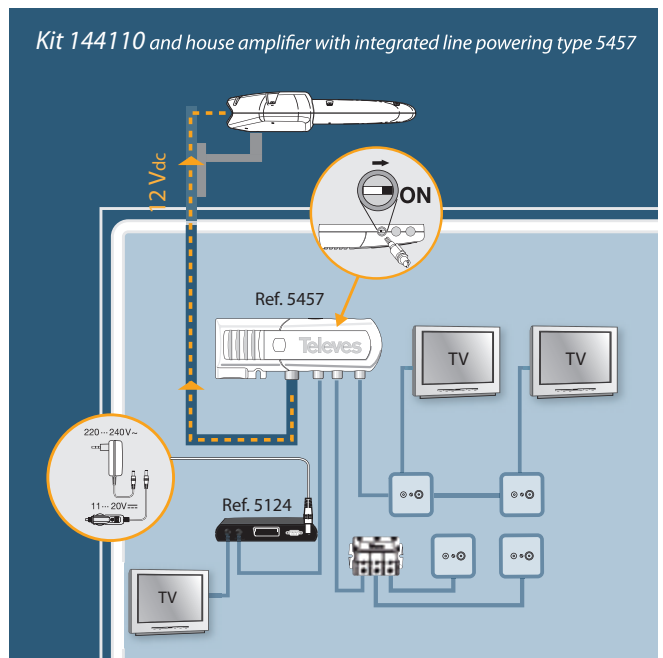
**2** Reception of FM, BI, BIll and DTT (UHF) for TV sets



**3** Reception of FM, BIll and DTT (UHF) for TV sets with integrated DTT receiver



**4** Reception of FM, BIll and DTT (UHF) for TV sets without integrated DTT receiver



SPECIAL COMBINED ANTENNAS

# DIGINOVA BOSS

**PRODUCT RANGE**

Ref . DeSCRIPTION

144110 Diginova Boss Kit

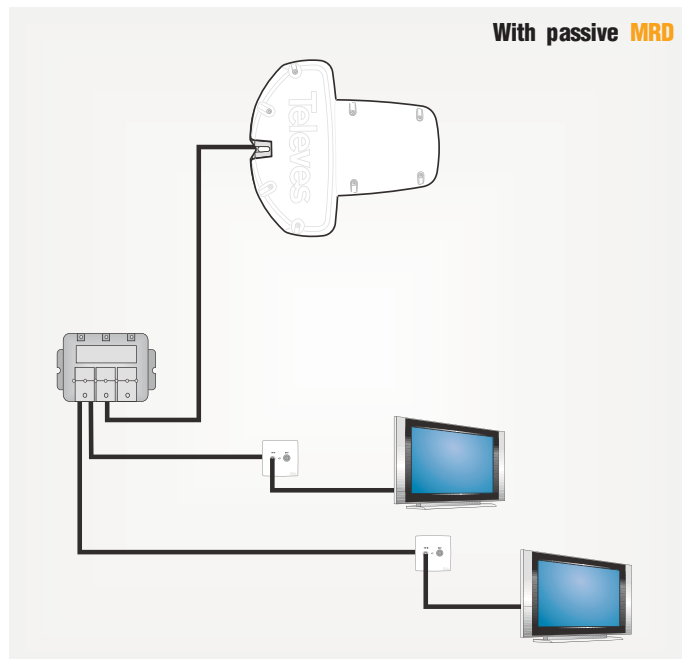
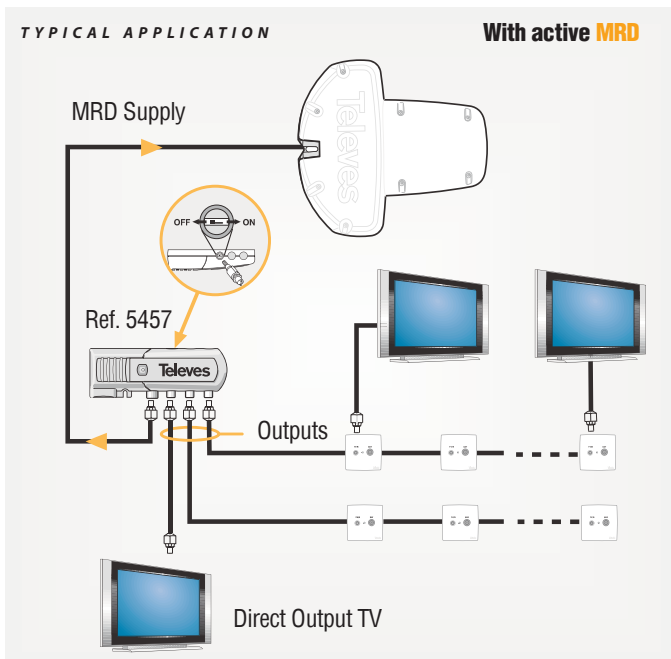
Diginova (Ref. 144110) is supplied together with accessories, among which is an active power supply Ref. 5457, that provides extra gain in UHF and BIII; at the same time allows to distribute the TV signal to several outlets, according to the needs of the house.

**Contents of the Kit:**

- 1 Antenna Diginova.
- 1 Domestic amplifier (ref. 5457)
- 1 "Current injector" for power supply connection. (ref. 7450)
- 1 Cable reel T-100 (14 meters).
- 1 Male/Female cable of 1,5 m.
- 1 Shielded IEC connector.
- 3 Connectors F-type.
- 1 Connector cap F.



Reference		144110		
Band		FM	BIII	UHF
Amplifier gain	dB	-	13	13
Output level	dBμV	-	Auto-regulated	
Power Supply	mA	32@12Vdc - 42@24Vdc		
Wind Load	N	69,6 (130 km/ h)		
		95,7 (150 km/ h)		



SPECIAL COMBINED ANTENNAS

# OMNI-NOVA BOSS



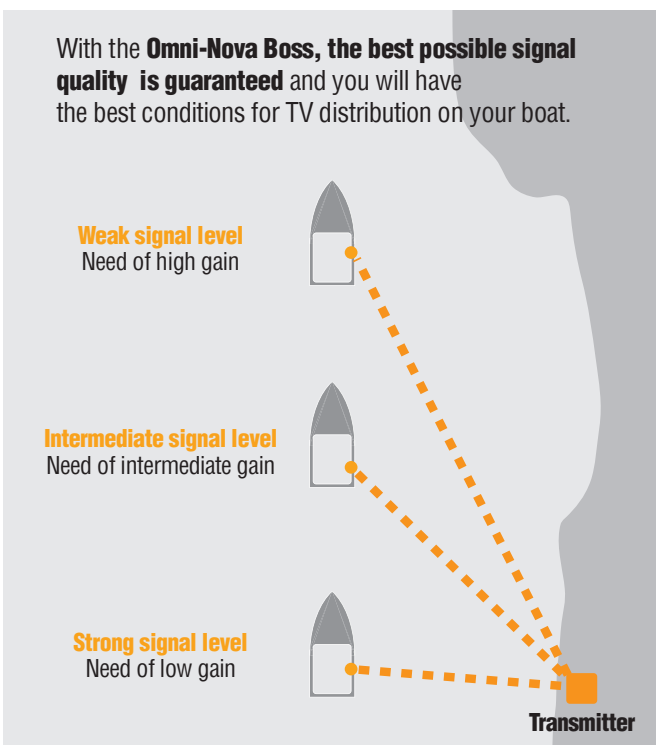
PRODUCT RANGE	
Ref.	DeSCRIPTION
144401	Omninova Boss

The first intelligent omni-directional antenna.

- Includes 3 amplifiers, one for each band (FM, BI-BIII, UHF) which avoids interferences, minimizing cross-modulation effects.
- Incorporates an AM antenna.
- Equipped with rejection-filters for out-band signals, especially for marine telecommunication bands.
- Independent outputs for Radio and TV.
- Made highly resistance materials to nitre, humidity and climatic elements in general.
- Stable reception in case of movement, turning or swinging.
- Protected from electrical discharges.
- Completely watertight.



▲ 144401



Reference	144401	
UHF		
Polarization	Horizontal Omnidireccional	
Gain	30 dB	
VHF		
Polarization	Horizontal Omnidireccional	
Gain	BI	26 dB
	FM	20 dB
	BIII	28 dB
AM		
Polarization	Horizontal Omnidireccional	
Gain	-1 dB	
Protection index	IP 53	
POWER SUPPLY		
Input	11...20 Vdc	
Output	10 (ON) / 8 (OFF) Vdc	
Attenuation	R	1,5 typ (3 máx)
	TV	
Max. current	100 mA	
Protection index	IP 53	

INDOOR ANTENNAS

# INNOVA BOSS



**Intelligent Indoor Antenna with automatic signal balance (BOSS Tech).**

- ▶ Prepared for 4G networks:  
Soon, the frequencies used by DTT will be allocated to mobile telephony 4G (Digital Dividend), those forcing users to change again the settings of their antennas. Thanks to the INNOVA BOSS antenna, prepared for "4G Networks", that change will not be necessary. INNOVA BOSS has a rear switch, which allows to switch between normal reception and reception adapted to 4G networks. An investment for the future.
- ▶ No orientation needed



▲ 130201

References		130201	
Bands	MHz	LTE mode: 470-790	UHF mode:470-862
Gain		27	
Noise figure	dB	3	
DC Powering	V	5-12	
Consumption	mA	30 (5V) - 40 (12V)	

## MIRA

The Indoor Mira Antenna has been especially designed for the reception of terrestrial digital signals.

**The new MIRA antenna provides:**

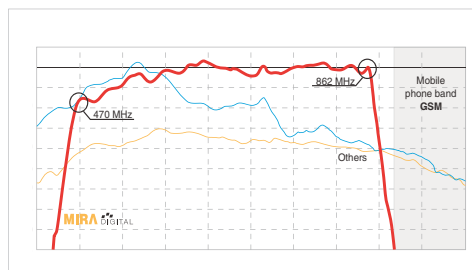
- Protection against interfering signals from outside the UHF band (it has filters that reject the mobile phone bands).
- Better image quality in analogue television.
- Digital TV reception in areas where other domestic antennas cannot guarantee reception.



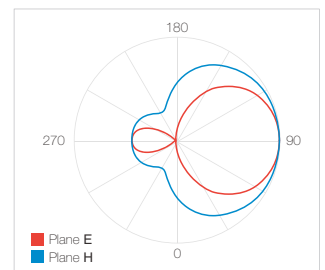
▲ 1301

References		1301	
Bands	MHz	UHF	
Gain		25	
Noise figure	dB	2.5	
DC Powering	V	12	
AC Powering		230	
Consumption	mA	75/8 (ON/OFF)	

Frequency response



Radiation diagram



## SATELLITE

Satellite dishes made of steel and finished with polyester paint. Wide range of LNBS to cover any possible solution.



SATELLITE DISHES

OFF-SET

**PRODUCT RANGE**  
Ref. DeSCRIPTION

**DISHES AL HQ**

7902	850	1	orange
790201	850	1	white
7903	950	1	orange
790301	950	1	white

**DISHES AL**

7599	900	1	orange
759901	900	1	white
9306	650	1	orange
930601	650	1	white
930611	650	10	white
930621	650	100	white
7574	1300	1	white

**DISHES FE**

790011	600	10	white
790020	600	100	orange
790021	600	100	white
7535	650	1	orange
753501	650	1	white
753510	650	10	orange
753511	650	10	white
753520	650	100	orange
753521	650	100	white
7901	800	1	orange
790101	800	1	white
790110	800	5	orange
790111	800	5	white
790120	800	100	orange
790121	800	100	white
7534	1000	1	orange
753401	1000	1	white
753410	1000	5	orange
753411	1000	5	white
753420	1000	100	orange
753401	1000	1	white
7572	1100	1	orange
757201	1100	1	white
7575	1300	1	white

The new QSD line of Televés satellite dishes are launched to market after careful and strict product requirements that guarantee maximum performance against corrosion, resistance to wind and ease of installation.

- Aluminium dish reflector, with diecast Zamak LNB holder.
- Folding arm for fast and easy mounting
- Pre-mounted support and arm
- Robust back support. Hot galvanized
- Hidden cable routing system with folding tabs
- Inox screws
- TÜV Approved



Dish size (mm)			650	800	900	1000	1100
Gain at 11.7 GHz	dB		36.0	39.0	39.5	40.5	41.5
Bandwidth	GHz		10.7 a 12.75				
OFFSET angle	(°)		26.5		25	24	
Thickness	mm		1(AL); 0.65 (FE)	0.7	1.6	0.8	1
Elevation angle	(°)		10--60				
Wind load	800	N/m2	345.6	499.2	706.2	739.2	912
	1100		475.2	686.4	980.4	1016.4	1254

Wind pressure	N/m <sup>2</sup>	800	1100
Wind speed	Km/h	130	150



LNB AND SUPPORTS

Supports

PRODUCT RANGE		
Ref.	DeSCRIPTION (length, height, diameter)	
7390	"Y" wall/ground support 294x294	Ø45X1,5
7393	"L" wall support offset 284x194	Ø35X1,5
7349	"L" support 380x350	Ø45X1,5
7371	"L" wall support 500x450	Ø45X2
7576	"T" ground base 750x200	Ø60X2,9
7409	Embedded base for 7392/7576 (325 high)	



Zinc plated surface as well as an special Reactive Sealing Treatment to increase its resistance against corrosion.

LNB

PRODUCT RANGE	
Ref.	DeSCRIPTION
7475	Universal single orange
747701	Universal QUATTRO orange
747702	Universal QUATTRO grey
747802	Universal TWIN orange
761001	Universal QUAD orange
7613	Universal OCTO grey
7611	Monoblock (2 LNB) offset dishes (80 cm) grey



Low noise figure and high gain LNBs.



References		7475	747701/02	747802	761001	7611	7613
Input frequency	GHz	10.7-12.75					
Output frequency	MHz	950/1950 - 1100/2150					
No. of outputs		1 (H/V)	4 (Ha-Va-Hb-Vb)	2 (H/V - H/V)	4 (H/V-H/V-H/V-H/V)	1 (H/V)	8x (H/V- I/h)
Gain	dB	51	57	57	58	57	57
Noise figure		0.5	0.5	0.5	0.5	0.7	
Local oscillator	GHz	9.75/10.6					
Powering	Vdc	12--20					
Max. consumption	mA	90	190	170	180	120	200
Operating temperature	°C	-30...+60					

FEEDHORNS AND SUPPORTS

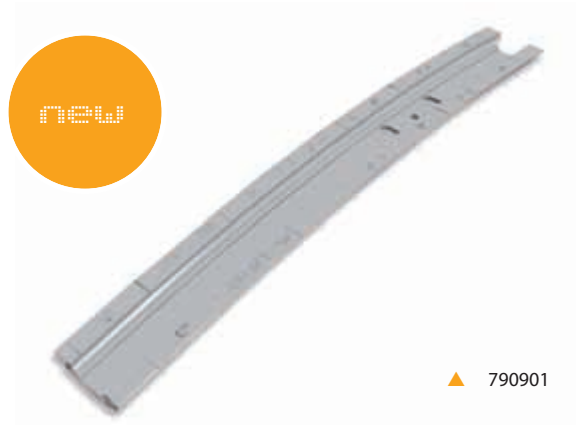
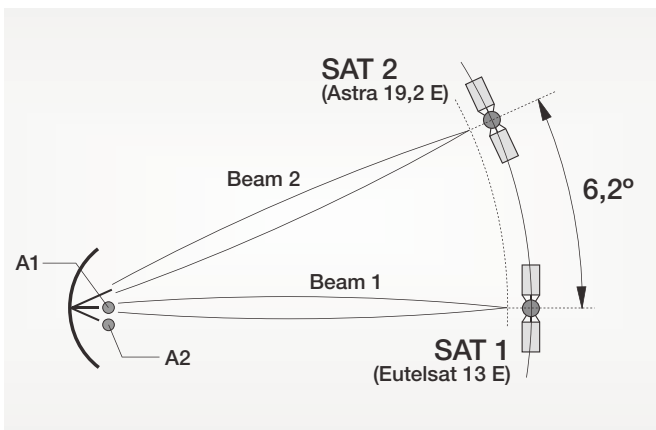
Multisatellite

PRODUCT RANGE		
Ref.	DeSCRIPTION	
7508	For 800 mm offset antenna	6°
790901	QSD Multisatellite	6°

A Televés patent that allows the user to receive signals from various satellites located in different orbital positions with a single dish.



▲ 7508



▲ 790901

Accessories

Current injector for LNB powering.

References		7450
Max. input voltage	Vdc	24
Max. current	A	1
Frequency margin	MHz	10-2150
Through losses	dB	0.5
Return losses		>10



▲ 7450



# MECHANICAL ACCESSORIES

The mechanical accessory line is treated with Reactive Sealing Coating, improving the zinc cover process already applied to every product by adding an extra protection against oxidation.



MECHANICAL ACCESSORIES

Masts

**PRODUCT RANGE**  
Ref. DeSCRIPTION

3008	35 mm	2,5 m
3009	40 mm	2,5 m
3010	45 mm	3 m
3072	40 mm	3 m
3040	40 mm	1,5 m
3041	40 mm	2 m
3042	35 mm	2,5 m
2407	35 mm	1,5 m
3075	45 mm	3 m red

Ref. 3040	1500x 40Ø	Ref. 3042	2500 x 35Ø
Ref. 3041	2000x 40Ø	Ref. 3009	2500 x 40Ø
Ref. 2407	1450x 35Ø	Ref. 3072	3000 x 40Ø
Ref. 3008	2500 x 35Ø	Ref. 3010, 3075	3000 x 45Ø

Referencias		3008	3009	3010	3072	3040	3041	3042	2407	3075 <sup>(1)</sup>
Length		2500		3000		1500	200	2500	1450	3000
Diameter	mm	35	40	45	40	40	40	35	35	45
Thickness		1,5	2	2	2	1,25	1,25	1	1,5	2
Bending moment	Nxm	299,70	508,75	656,75	508,75	170	170	207,20	299,70	656,75

<sup>(1)</sup> Red

Supports and clamps for masts

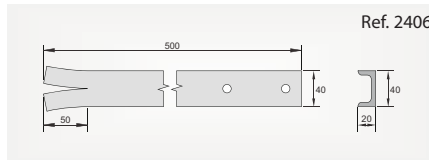
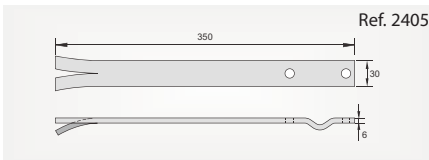
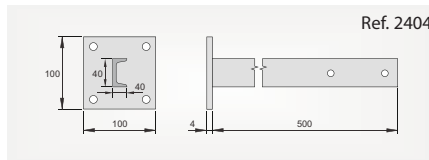
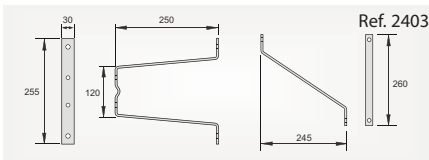
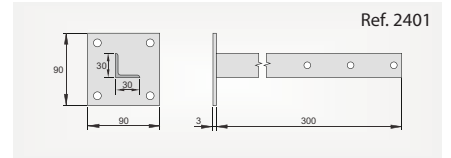
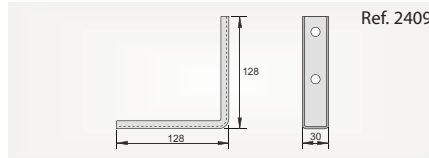
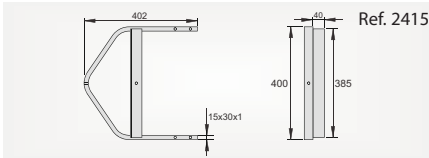
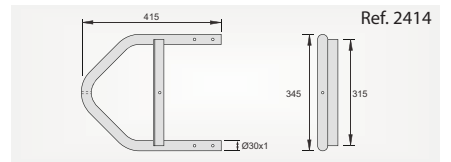
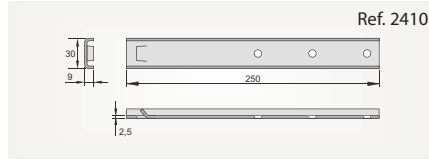
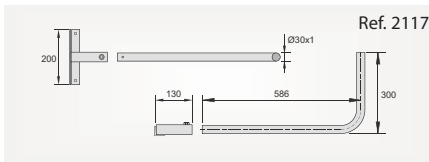
**PRODUCT RANGE**  
Ref. DeSCRIPTION

**Mast clamps**

2117	Window mast clamp
<b>For chimney</b>	
2414	Tubular
2415	Reinforced tubular
<b>For bolting</b>	
2409	L-Shape
2401	300 mm "L"
2403	"V" bracket
2404	500 mm "U"
2083	Retractable wall mount
<b>For embedding</b>	
2405	350 mm "I"
2406	500 mm "U" reinforced
2410	250 mm "I" reinforced



MECHANICAL ACCESSORIES



Cables

PRODUCT RANGE	
Ref.	DeSCRIPTION

Steel cables	
2043	2 mm
2044	2,5 mm
3034	4 mm
3059	5 mm



▲ 3034

Accessories

PRODUCT RANGE	
Ref.	DeSCRIPTION

Cable clips	
2000	Opened
2011	Closed

Accessories	
2047	Jaw clamp for masts up Ø45
2408	Saddle & clamp
2412	Corner piece
2413	Mast clamp
4361	Guy wire mounting kit



▲ 2000/2011



▲ 2408



▲ 2412



▲ 2413



▲ 2047



▲ 4361

MECHANICAL COMPLEMENTS

Towers

**PRODUCT RANGE**  
Ref. DeSCRIPTION

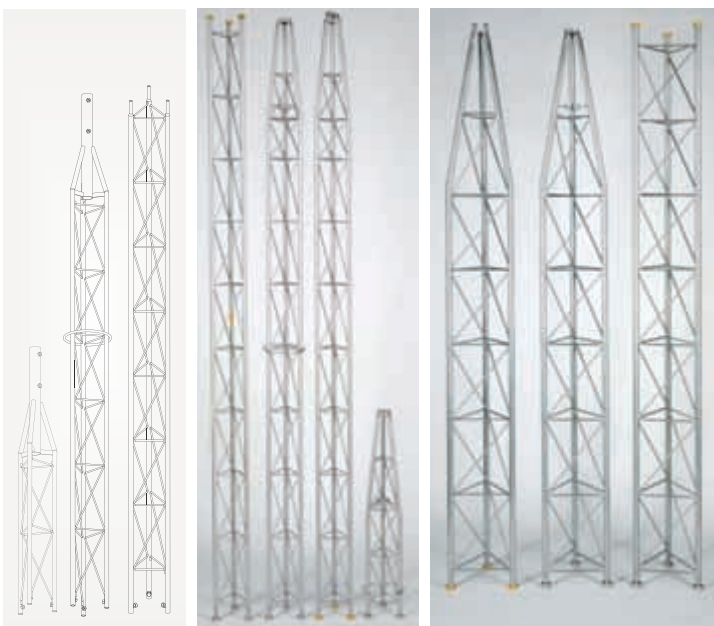
180 SE RPR (*)		
3014	Upper section	1,25 m
3015	Upper section w/ring	2,5 m
3017	Middle section	2,5 m
180 RPR		
3021	Upper section	0,6 m
3032	Upper section	3 m
3031	Middle section	3 m
3037	Lower section	3 m

360 RPR		
3085	Upper section	
3086	Lower section	
3087	Middle section	
360 Colour		
308601	Lower section	red
308701	Middle section	red
308702	Middle section	white
308501	Upper section	red

(\*) Spanish abbreviation for Reactive Sealing Treatment

References		180 SE	180	360
Transversal stainless steel rods	mm	20x1,5 6	20x2 6	30x2 10
Max. height with mast 3m	m	7,5	20,5	50,5

Types of finishing		
<b>RPR</b> Reactive Covering Coat	<b>Red colour</b> Lacquered in oven with electro-tactic powder of Polyester	<b>White colour</b> Lacquered in oven with electro-tactic powder of Polyester



Made of zinc steel and bi-chrome coating, are supplied in two types of finishing (RPR or poliester painting). They can be installed at heights from 1 to 50,5 m.

Depending on the model, they implement turned or plugged raccors (SE finishing) for its union.

**Installation types (Mod. 180 y 360)**

■ **Section by section**

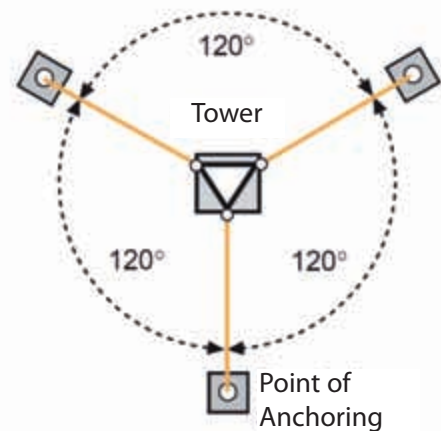
Fixing the lower section to the base in the proper vertical position, and then mounting the consecutive intermediate sections, which will be fixed with the corresponding guy-wire; the assembly is carried out by climbing the already placed sections and raising subsequently the section to be placed, using for it the adequate elevating tools.

The climbing has to be made with the appropriate safety conditions (safety-belt, anchoring, etc.); there won't be more than two sections without shoring up. In case of coinciding two sections without guy-wire, auxiliary guy-wire will be used for the bracing of the sections during the set-up. The tower will be balanced adjusting the tension of the guy-wire and the using of proper balance-appliances.

■ **Complete tower**

First assembling the tower over the ground and raising it, once mounted, by means of a crane.

This system can be used only with towers of heights lower than 18 meters in the model 180 and heights lower than 26 meters in the model 360.



■ **Safety**

If the installation of the tower is made on the roof, flat roof or other place of a building, the installer will take the necessary measures according to the indications of the architect responsible of the building, in order to know the mechanical resistance of these zones.



MECHANICAL COMPLEMENTS

**Towers. Model 450/550** (Recommended for special installations)

**PRODUCT RANGE**

Ref.	DeSCRIPTION	
450 (Sections of 3m.)		
3130	Reinforced low-end	Red
3131	Intermediate	Red
313101	Intermediate	White
3132	Reinforced Intermediate	Red
313201	Reinforced Intermediate	White
3133	Upper	Red

**Main characteristics:**

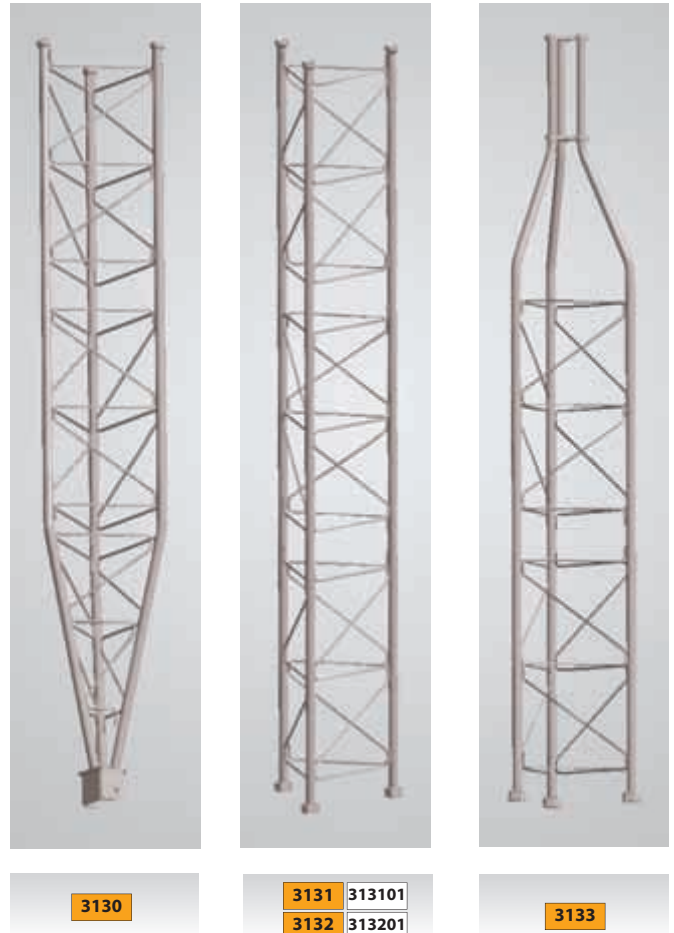
**Model 450**

- Two new types of sections are available: reinforced sections (thicker lattice and walltube) and slight sections.
- The reinforced sections will be the ones situated in the lower part of the tower and the light ones will be installed in the higher part. With this is possible to mount higher towers (up to 81m).
- Ideal to assemble towers of a height of 57 till 81m.

**Model 450/550**

These sections incorporate some improvements with regard to the previous range, consisting in:

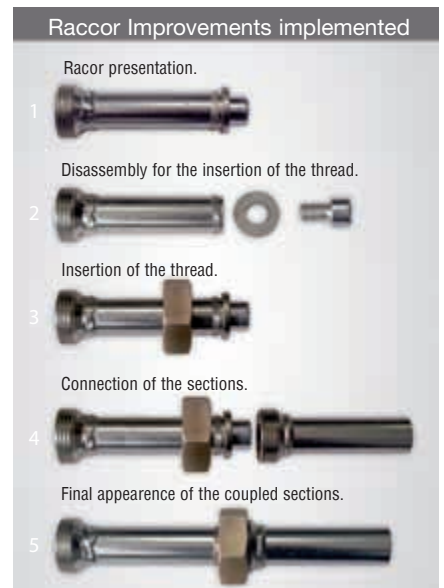
- New raccor: detachable element that makes the anticorrosive treatment of the whole section easier, getting a significant increase of the durability of the tower.
- New lattice: it increases the mechanical resistance to the torsion and it reduces its weight.
- New distribution of footing:
  - Less number of footing for guy-wire.
  - Reduction of distance needed between the footing for guy-wire and the tower.



References		450	
Main stainless steel tubes	mm	normal	reinforced
		38x2,6	40x3
Transversal stainless steel rods		10	12
Max. height with mast 3m	m	81	

**Types of finishing**

<b>RPR</b> Reactive Covering Coat	<b>Red colour</b> Lacquered in oven with electro-tactic powder of Polyester	<b>White colour</b> Lacquered in oven with electro-tactic powder of Polyester
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MECHANICAL COMPLEMENTS

Towers. Model 550



PRODUCT RANGE

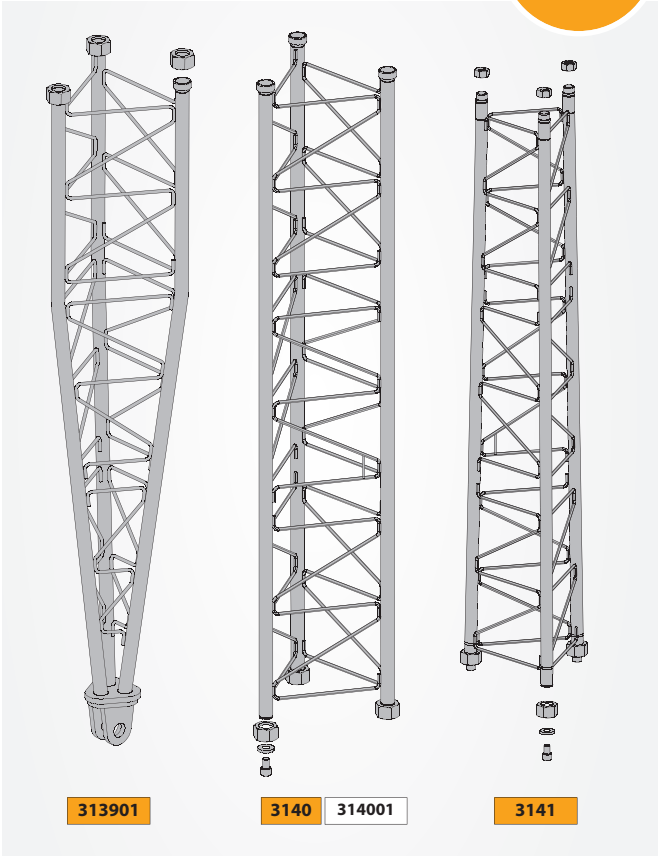
Ref.	DeSCRIPTION	
550 (Sections of 3m.)		
313901	Lower section	Red
3140	Middle section	Red
314001	Middle section	White
3141	Transition section 550 to 450	Red

Main characteristics:

- Specially designed to assemble towers of a height up to 120m

References	550	
Main stainless steel tubes	mm	60x4
Transversal stainless steel rods		14
Max. height with mast 3m	m	122

Types of finishing		
<b>RPR</b> Reactive Covering Coat	<b>Red colour</b> Lacquered in oven with electrostatic powder of Polyester	<b>White colour</b> Lacquered in oven with electrostatic powder of Polyester



Towers. Model 600

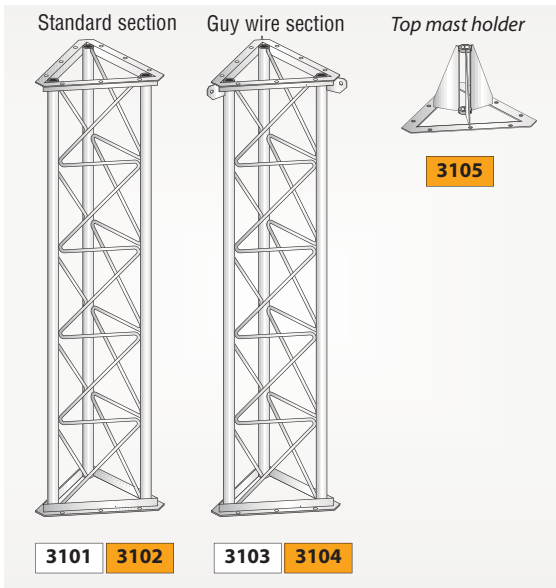
PRODUCT RANGE

Ref.	DeSCRIPTION	
600 Colour (Tramos de 3m.)		
3101	Standard section	white
3102	Standard section	red
3103	Guy wire section	white
3104	Guy wire section	red

Specially designed to achieve heights from 81 to 104 meters.

Types of finish	
<b>Red colour</b> Lacquered in oven with electrostatic powder of Polyester	<b>White colour</b> Lacquered in oven with electrostatic powder of Polyester

References	600	
Main stainless steel tubes	mm	70x4
Transversal stainless steel rods		20
Max. height with mast 3m	m	104



Tower bases

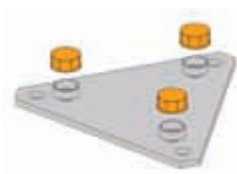
PRODUCT RANGE

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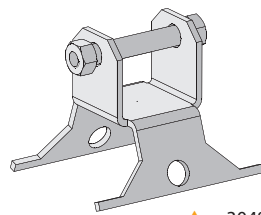
180 SE
3019 Frame embedded base
3020 Solid base
180
3048 Pivoting base embedded
3038 Solid base
3029 Frame base embedded
360
3088 Pivoting base embedded
3089 360 self-supporting emb. base
450
3134 Pivoting base embedded
550
3142 Pivot Embedded base 550
3143 Fixed Base 550
600
3106 Pivot bearing support
3107 Guy wire base
3108 Tower base bracketry
3109 Guy wire bracketry



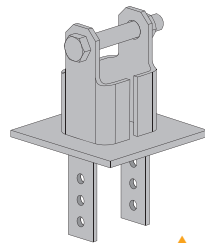
▲ 3019



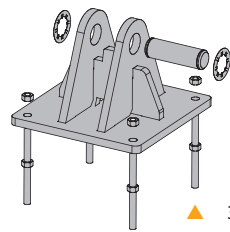
▲ 3038



▲ 3048



▲ 3088



▲ 3142



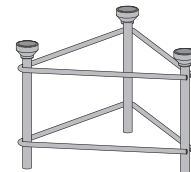
▲ 3020



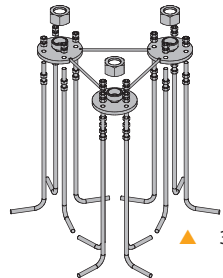
▲ 3029



▲ 3134

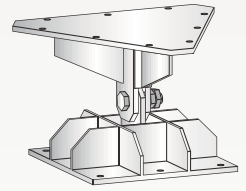


▲ 3089

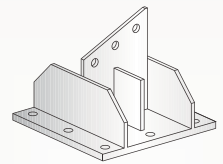


▲ 3143

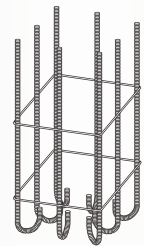
600 series



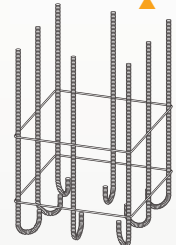
▲ 3106



▲ 3107



▲ 3108



▲ 3109

600 series

3105



3144



Tower accessories

PRODUCT RANGE

Ref. DeSCRIPTION

3034	Guy wire	Ø 4 mm
3059	Guy wire	Ø 5 mm
3058	Guy wire ring	(360)
3144	Guy wire ring	(450)
3105	Top mast holder	(600)

3059



3058



## ELECTRONICS

Our range of electronic products includes everything the installer may need. Innovative designs to make the job easier and using the most advanced technology to fulfill the Guidelines of the CE standards.



MAST

Mast mixers



Band mixers made of ABS plastic for outdoor use.  
New easy F connectors.

PRODUCT RANGE

Ref. DeSCRIPTION

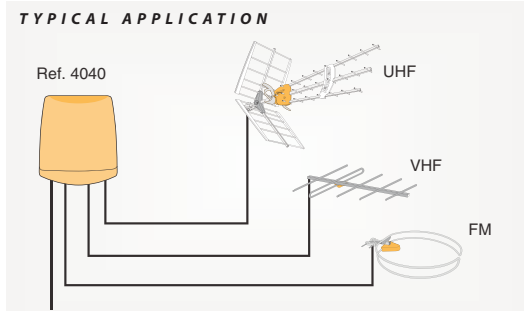
Terrestrial

4040	BI-FM/BIII-DAB/UHF
4041	VHF-UHF1/UHF2
4334	4041 blister

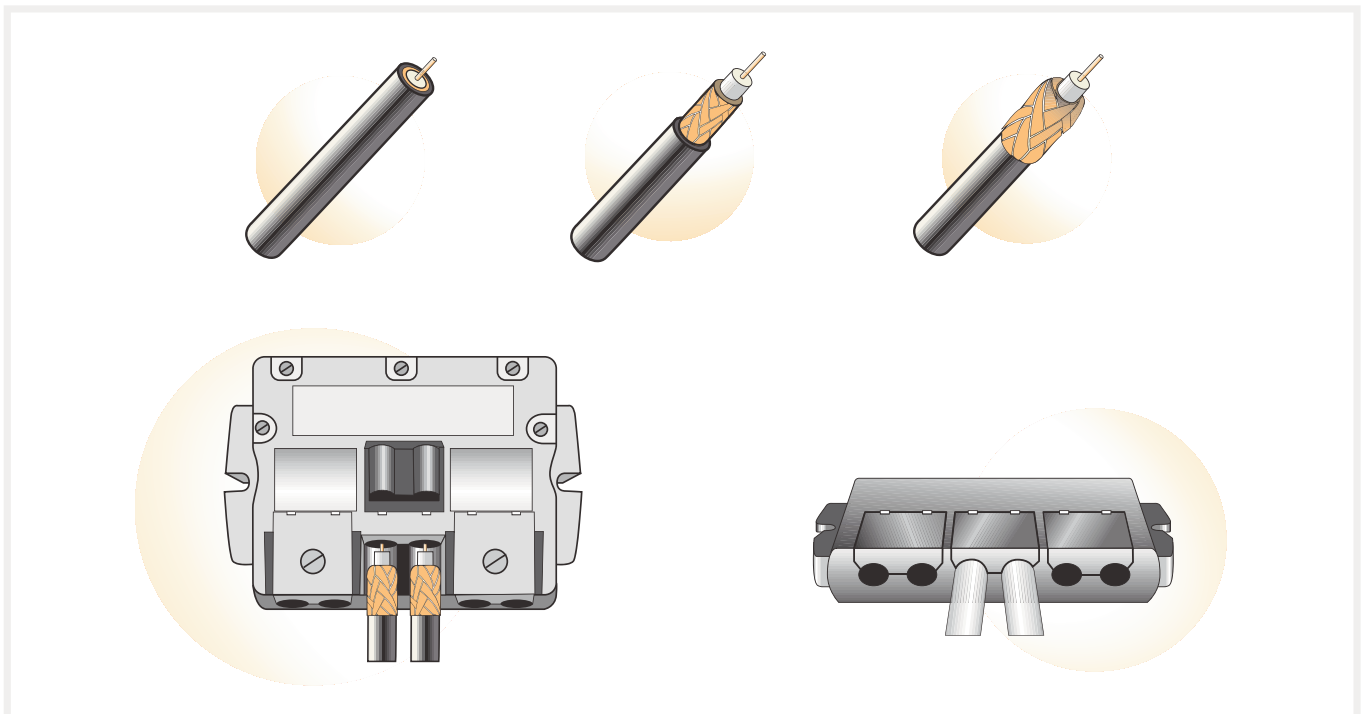


▲ 4040

References	4040			4041		
Mixed bands	BI-FM 47-108	BIII-DAB 174-254	UHF 470-862	VHF 47-254	UHF1 470-862	UHF2 470-862
Through losses	1 typ.		1 typ.	1 typ.	5 typ.	
Return losses	dB	10				
Rejection bet. inputs		>20			>40 (VHF-UHF) >18 (UHF1-UHF2)	
Max. DC bypass	mA	-	100	-	100	-
Protection index	IP 23					



DETAIL OF THE CONNECTION EASY F



## MAST

## Mast amplifiers



Broadband amplifiers made of ABS plastic for outdoor use.

Easy F connector gives the advantages of both F connector and saddle & clamp.

## PRODUCT RANGE

Ref. DeSCRIPTION

5356	1in/1out	BI-BIII-FM-UHF
5357	3in/1out	BI-BIII/FM/UHF
535802	4in/1out	BI-BIII/FM/UHF1-UHF2
5359	5in/1out	FM/BI-BIII/UHF/UHF1/UHF2
536001	3in/1out	BI-BIII-DAB/UHF1/UHF2
5370	3in/1out	BIII-DAB/UHF1/UHF2
5377	3in/1out	BIII-DAB/UHF
<b>Kits</b>		
5688	5356 +PSU 5795	
5698	5358 +PSU 5795	



▲ 5357

References		5356			5357			535802			5359				
Inputs		BI-BIII-DAB-FM-UHF			BI/BIII	FM	UHF	BI/BIII	FM	UHF1 UHF2	FM	BI/BIII	UHF	UHF1	UHF2
Frequency range	MHz	47-68 175-254	88-108	470-862	47-68 175-254	88-108	470-862	47-68 175-254	88-108	470-862	88-108	47-68 175-254	470-862	*Note	
Gain		25/30	15	41	25/30	15	41	25/30	15	38	15	30	40	38	
Gain regulation	dB	20		15	15	20	15	15	20	15	20	15			
Noise figure		4								7.5	4	7	8		
Output level	dBμV	112	114	112	114	112	114	112	114	112	114				
DC bypass	mA	40 automatic			-	40	-	40	-	40	-	40			
Input rejection	dB	-								18	18				
Powering	Vdc	24													
Consumption	mA	70													
Protection index		IP 23													

(1) According crossover channel: Higher crossover channel: 55 / Lower crossover channel: 30

References		536001			5370			5377	
Inputs		BI-BIII-DAB	UHF1	UHF2	BIII-DAB	UHF1	UHF2	BIII-DAB	UHF
Frequency range	MHz	47-68 175-254	470-862		175-254	470-862		175-254	470-862
Gain		23/27	27	27	18	21	21	20	26
Gain regulation	dB	20	15		15	13	13	15	15
Noise figure		7	8		8,5	7,5		6,5	7,5
Output level	dBμV	111	114		111	114		111	114
DC bypass	mA	40	-	40	40	-	40	40	
Powering	Vdc	12							
Consumption	mA	100							
Protection index		IP 23							

1) Crossover channels, Min: 28, Max: 55

## MAST

## Mast Amplifiers. IF Mix range



## PRODUCT RANGE

Ref. DeSCRIPTION

5354	2in/4out	U/Vmix-IF mix 4out
5350	3in/1out	U/Vmix-IF mix
5351	4in/1out	BI/BIII-FM-U-IF mix
5352	4in/1out	U-U-Vmix-IF mix
Kits		
5696	5351 +PSU 5795	
5697	5352 +PSU 5795	
4386	5350 +PSU 5796 (blister)	
4388	5351 +PSU 5796 (blister)	
5678	535101(black) +PSU 5796	

Broadband amplifiers in a housing made of ABS plastic for outdoor use.

New fast F connector gives the advantages of both F connector and saddle & clamp.

Capable of mixing SAT signals.



Referencias		5354			5350		
Inputs		VHF/UHF		FI	VHF	UHF	FI
Frequency range	MHz	47...254	470...862	950...2200	47...254	470...862	950...2150
Gain	dB	- 9	20	- 12	- 1.5	29	- 2
Gain regulation		-	15	-	-	15	-
Output level DIN 45004-B	dBμV	-	93	-	-	103	-
Noise figure	dB	-	2.5	-	-	2.5	-
DC bypass	mA	-	40	350	-	-	350
Powering	Vdc	12...24					
Consumption	mA	40					
Protection index		IP 23					

References		5351				5352			
Inputs		BI/BIII	FM	UHF	IF	VHF	UHF1	UHF2	IF
Frequency range	MHz	47...68 175...254	88...108	470...862	950...2150	47...254	470...862		950...2150
Gain	dB	18	18	29	-2	-1	27	-2	
Gain regulation		15	20	15	-	-	15	-	
Output level DIN 45004-B	dBμV	103			-	-	103	-	
Noise figure	dB	4.5		2.5	-	-	6.5		-
DC bypass	mA	-			350	-	40	-	350
Powering	Vdc	12...24							
Consumption	mA	40							
Connection type		Easy-F							

(1) Please specify channel when ordering



## DOMESTIC

## Power supply units

## PRODUCT RANGE

Ref. DeSCRIPTION

550101	130 mA 12 V F connectors
5504	130 mA 24 V F connectors

References		550101	5504
Bandwidth	MHz	47-860	47-860
Mains voltage AC	V	230	230
Mains voltage		12	24
Output current	mA	130	130
Connection type		F	F
Dimensions	mm	145x45x35	



▲ 5504

## Domestic amplifiers

## PRODUCT RANGE

Ref. DeSCRIPTION

## Digi amplifiers

5517	Dig-Setback 2 In-4 Out-DC
5514	Digi Ampl 4 Out DC Pass



References		5517	5514
Inputs	no.	2	1
Outputs	O1-O4	O1-O2-O3-O4	
Forward path			
Bandwidth	MHz	47...232 / 470...860	47... 862
Gain	dB	16	5
VHF/UHF variable gain		12	-
Output level DIN45004B	VHF	dB $\mu$ V	>94
	UHF		
Rejection between outputs	dB	>25	>25
Noise figure (typ.)		5.5	3.5
Return path			
Bandwidth	MHz	5...30	
Gain	dB	6	8
Output level	dB $\mu$ V	110	97
Noise figure	dB	16	12
Powering			
Input voltage	V/mA	230 Vac	jack:12Vdc/40mA I/P port: 9Vdc/30mA O/P ports: 8Vdc/10mA
Output line voltage	Vdc	11 (each O/P connector)	-
Max. output line current	mA	10	-

DOMESTIC

PRODUCT RANGE	
Ref.	DESCRIPTION
<b>MATV</b>	
5527	IEC 1 In-1 Out
5528	IEC 1 In-2 Out + TV
5529	IEC 1 In- 4 Out + TV
5457	IEC 1 In- 2 Out + TV, DC 100 mA
5519	F 1 In-1 Out split-band
5522	F 1 In-2 Out + TV
5523	F 1 In-4 Out + TV
5531	F 1 In-6 Out
5530	IF+MATV 1 In-2 Out TV
553201	1 In-2 Out + DC

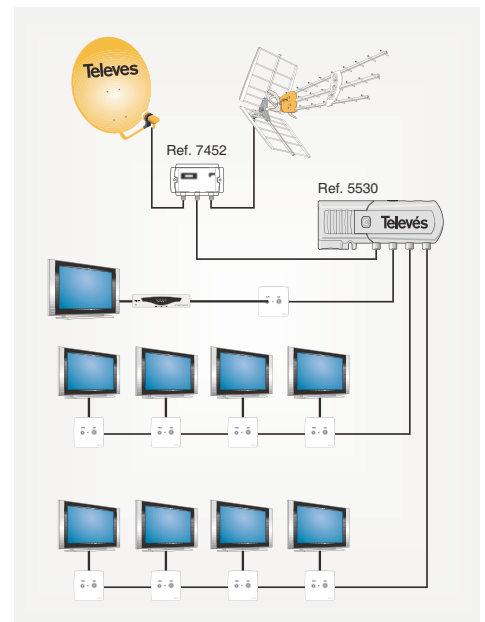
<b>CATV</b>	
5520	1 In-2 Out + TV Passive Return
5526	1 In-2 Out + TV Active Return
5525	1 In-2 Out + TV Var. Equaliser
5533	1 In-1 Out Passive Return 5-30 MHz
5535	1 In-1 Out Passive Return 5-30 MHz
<b>SAT IF</b>	
5530	IF+MATV 1 In-2 Out TV



References		5527	5528	5529	5522	5523	5531	5519	5457	553201
Bandwidth	MHz	47...862			47...862			47-320 470-862	47-862	47-862
Gain	O1...O6	25	20	16	20	16	16	17 / 27	20	20
	TV	-	14	13	14	13	-	-3 / 7	14	-
Variable gain		12								
Output level DIN45004B	dBµV	112	106	102	106	102	103	105	106	110
Rejection between outputs	dB	-	>20	>25	>20	>25	>25	>25	>25	-
Noise figure (typ.)		5							4	5
Input line powering	V	-							12	12
Input line Max. Current	mA	-							100	100
Connectors	type	IEC				F			IEC	F

References		5533	5535	5530	5520	5526	5525
Inputs	no.	1					
Outputs		1	3 (O1-O2-TV)				
<b>Forward path</b>							
Bandwidth	MATV	MHz	47...862	47...862	47...862	87,5...862	87,5...862
	SAT IF	MHz	-	-	950...2400	-	-
Gain	MATV	O1-O2	24	34	18	20	18
		TV	-	-	-	13	12
Gain	SAT IF		dB	-	19	-	-
	MATV		dBµV	112	105*	107	> 106
Output level DIN45004B	O1-O2		dBµV	-	-	101	-
	TV		dBµV	-	110**	-	-
Variable gain			dB	18	8	12	18
Variable equaliser			dB	18	-	-	18
Rejection between outputs			dB	-	>18	>20	-
Noise figure (typ.)	MATV		dB	7	5.5	5	5.5
	SAT IF		dB	-	<4	-	-
<b>Return path</b>							
Bandwidth	MHz	5...30	5...30	5...30	5...65	5...65	-
Gain	dB	-1	-1	-9	-7	9	-7
<b>Powering</b>							
Mains voltage (jack)	Vac	230					
In-Out DC bypass	mA	-	300	-	-	-	-

(\*) DIN45004B (\*\*) 2 tones @ -35dB



TYPICAL APPLICATION

DOMESTIC

Picokom Series

PRODUCT RANGE

Ref. DeSCRIPTION

5795 130 mA 24 Vdc Picokom

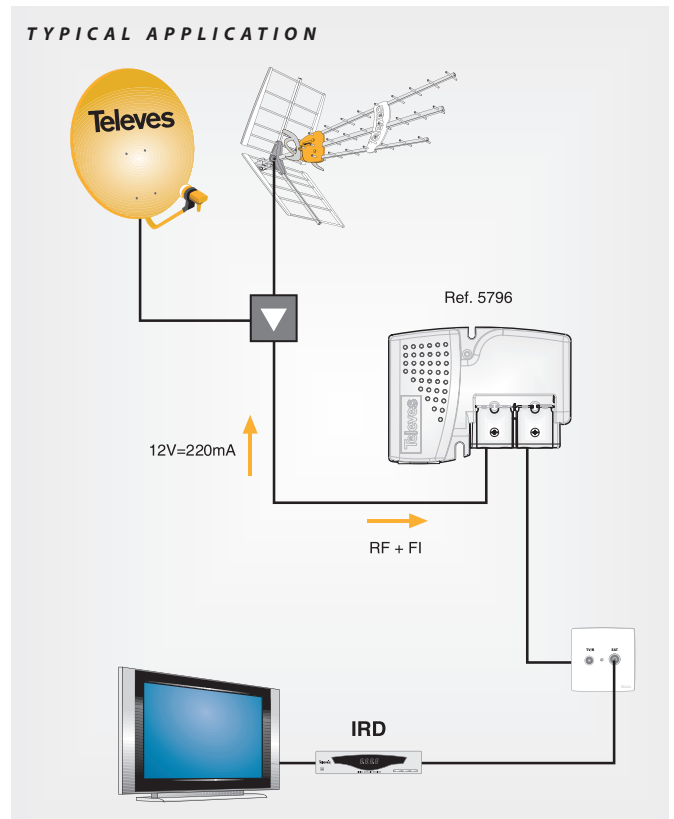
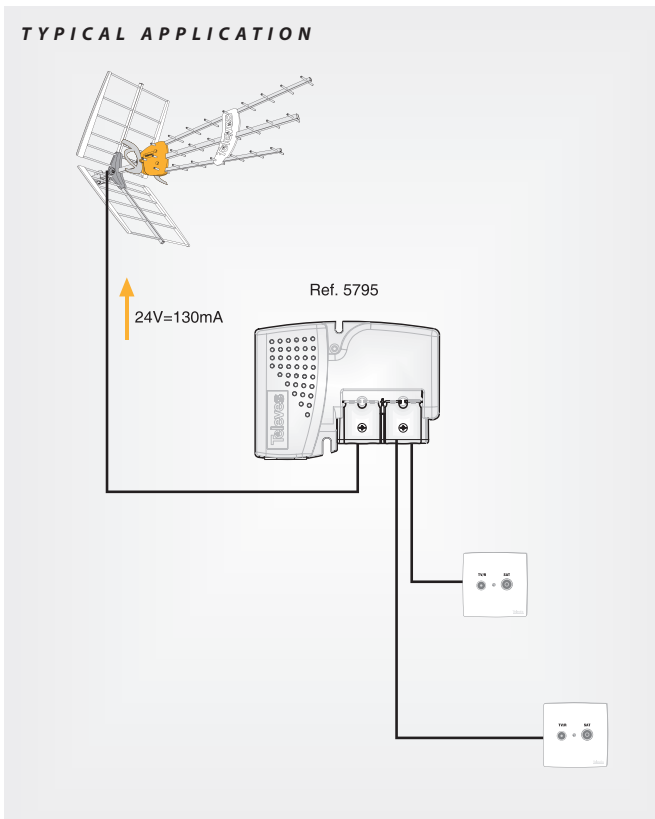
5796 220 mA 12 Vdc Picokom FI-MIX

- High efficiency switched-mode power supply unit
- Ultra compact design
- 40 % lower power consumption



▲ 5795

References		5795	5796
Frequency Margin	MHz	5-862	5-2500
Output voltage	V	24	12
Mains voltage		196-264	
Max. Output current	mA	130	220
Min. Output current		30	
Max. temp. operation		45° C	
Protection level	IP	20	
Consumption	W	4,4	3,7



DOMESTIC

Picokom Series

PRODUCT RANGE

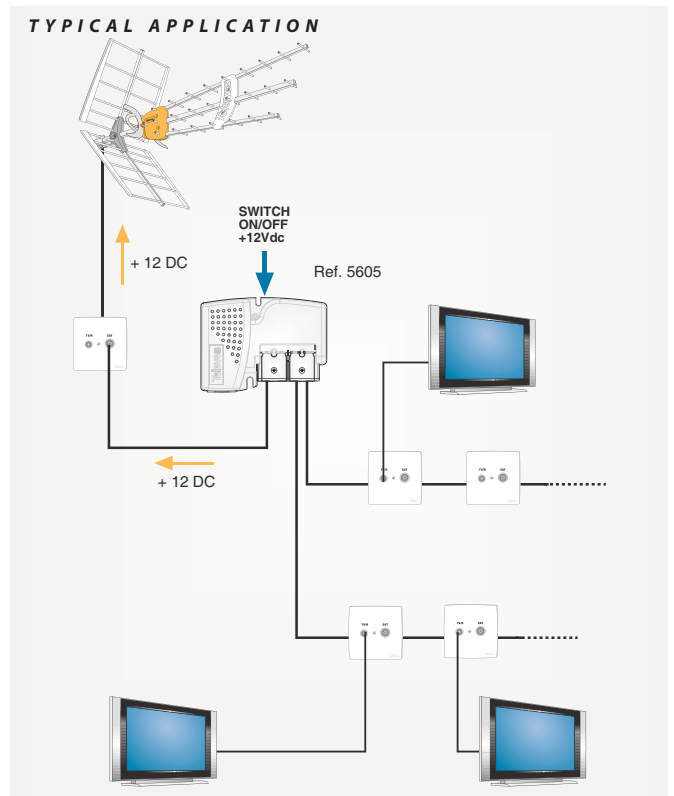
Ref. DeSCRIPTION

5605	Domestic amplifier Picokom 2 outputs
560502	5605 in Blister
560601	Domestic amplifier RF+SAT

Picokom is a new amplifier design of splitband amplification VHF/UHF with a built-in switched power supply unit.

- 1 Input and 2 outputs
- The amplification is carried out in two independent stages, one for UHF and the other for VHF.
- The Amplifier is able to reach 100 dBuV in VHF and 105 dBuV in UHF.
- Automatic Control Gain (AGC)
- EasyF connectors give the advantages of both F connector and saddle & clamp.

References		5605	560601
Frequency range MATV		47-400 470-862	47-862
Frequency range IF		-	950-2150
Gain VHF/UHF		12/20	15/15
Gain IF	dB	-	23
AGC Margin (only MATV)		20	12
Output level VHF/UHF DIN45004B	dBμV	105	97
IMD3 (2ch@-60 dB) VHF/UHF		97/102	94
IMD2 (2ch@-60 dB) VHF/UHF	dBμV	87/92	87
Output level IF DIN45004B		-	106
Return losses I/O	dB	10	10
Noise figure VHF/ UHF	dB	5/4,5	7
Noise figure IF	dB	-	9
Mains voltage	Vac	196-264	
Max power consumption preamplifiers 12Vdc.	mA	150	160
OUT-IN DC bypass	mA	-	300
Total max. consumption.	W	2,5	2,5



TERRESTRIAL/SATELLITE TV

Line amplifiers

PRODUCT RANGE	
Ref.	DeSCRIPTION
4006	UHF 13 dB
7485	IF 20 dB

Amplifier powered by means of coaxial cable to adapt the input level in the headend equipment.

The ref. 7485 also allows the powering bypass current for LNB conversor.

References		4006	7485
<b>MATV</b>			
Frequency range	MHz	470-862	
Gain	dB	13	-2,5
Output level DIN 45004 B	dBµV	98	-
Noise figure	dB	< 4.5	-
<b>IF</b>			
Frequency range	MHz	-	950-2150
Gain	dB	-	20
Output level DIN VDE0855/12	dBµV	-	112,5
Noise figure	dB	-	< 5,5
<b>General</b>			
Consumption	mA	23 (24 Vdc)	60 (12...18Vdc)
Max. bypass current		-	500 (OUT-IN)



▲ 4006



▲ 7485

Notch filters

PRODUCT RANGE	
Ref.	DeSCRIPTION
4162	2 ch. 2 adjustments
4007	1 ch. F connector
4163	ABS plastic case

References		4162	4007
Adjustments		2	1
N° of channels		1   2	1
Insertion losses	UHF	<1	<1
	BIII	<2	-
	FM	<10	-
	BI	<15	-
Pv* Attenuation	Pv n	>35	15-20
	Pv n±1	-	<3
	Pv n±2	<3	<1
Connectors		IEC	F
DC bypass		Yes	

(\*) Video carrier  
n: Tuned channel



▲ 4162



▲ 4007

Attenuators

PRODUCT RANGE	
Ref.	DeSCRIPTION
5165	Adjustable 20 dB
4005	0-20 dB adjustable, DC bypass

References		5165	4005
Range		adjustable	
Attenuation margin	dB	0-20	
Band	MHz	47-860	5-2200
DC bypass		Yes	



▲ 4005

## TERRESTRIAL/SATELLITE TV

## MicroKom series Home applications for Cable Operators

## PRODUCT RANGE

Ref. DeSCRIPTION

## C3 with modular Return Path

534602	Microkom 20/20 5-65 MHz
534702	Microkom 24/20 5-65 MHz
536602	Microkom 30/25 5-65 MHz
536702	Microkom 35/28 5-65 MHz

## C3 return Path Module

455320	Return Path 5-65 Mhz 20 dB
455325	Return Path 5-65 Mhz 25 dB
455328	Return Path 5-65 Mhz 28 dB

## C4 with Fixed Return Path

534202	Microkom 20/20 dB 5-65 MHz
534302	Microkom 30/25 dB 5-65 MHz
534402	Microkom 35/28 dB 5-65 MHz



new

- Configuration by means of internal jumpers
- Feature both system and cable equalisers
- Input and Output -20 dB test connectors

References		534602	534702	536602	536702	534202	534302	534402
<b>Forward path</b>								
Frequency range	MHz	85 - 862						
Gain	dB	20	24	30	35	20	30	35
Noise figure		7,5						
Vout DIN 45004B	dB $\mu$ V	118						
Vout EN 50083-3 IMD3 (2 ch, -60 dB)		100						
Vout EN 50083-3 CTB, CSO, XMOD (42 ch, -60 dB)		100						
Input Attenuator (2dB steps)	dB	0...18						
Return Losses		12						
Nominal value deviation		$\pm$ 1						
<b>Return path</b>								
Frequency range	MHz	5 - 65						
Gain	dB	20	20	25	28	20	25	28
Noise figure		6						
Interstage equalizer (2 dB steps)	0/3/6							
Return Losses	12							
Vout DIN 45004B	dB $\mu$ V	118						
Vout EN 50083-3 IMD3 (2 ch, -60 dB)		115						
Input Attenuator (2dB steps)	dB	18						
Nominal value deviation		$\pm$ 1						
<b>General</b>								
Mains voltage	Watt	207-253 / 50-60						
Power consumption	Vac/Hz	5	5	5,5	6	5	5,5	6
Operating temperature	$^{\circ}$ C	-10... + 45						
Protection Index	IP	20						
Connectors HF	type	F-Female						
Dimensions	mm/g	185x80x35 /400						

TERRESTRIAL/SATELLITE TV

## Minikom series - Splitband Amplification

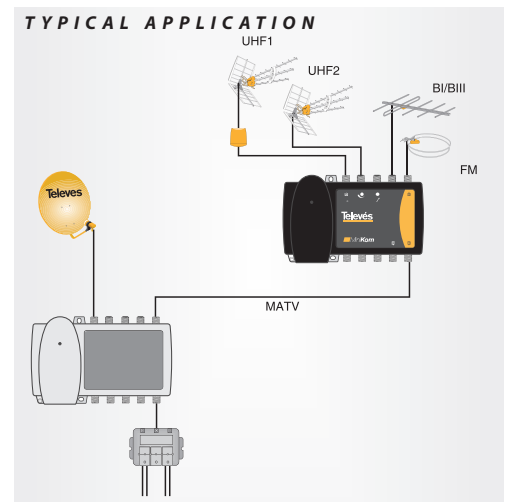
**PRODUCT RANGE**  
Ref. DeSCRIPTION

Terrestrial	IF
537302 1 input V-U	5363 2 inputs IF / mixed MATV includes a 22 KHz switch (0.6 ±1 Vpp)
537201 2 inputs V/U (7+1 outs.)+R5-7MHz	5317 2 inputs IF1-MATV/IF2-MATV
5399 2 inputs V/U (switch DC bypass, interstage atten.)	5396 4 inputs (VHF/BIII/BI-FM/IF)
531201 3 inputs FM/BIII-DAB/UHF	
539201 4 inputs FM/BIII-DAB/UHF1/UHF2	
539104 5 inputs FM/BIII-DAB/UHF/BV/BIV	



▲ 5317

References	5363	5317	5396
Inputs	IF/MATV	IF1-MATV/IF2	UHF/BIII/BI-FM/IF
Outputs	IF-MATV	IF1-MATV/IF2-MATV	IF-MATV
<b>IF path</b>			
Frequency range	MHz	950-2150	
Attenuator	dB	0-20	0-20
Equaliser	dB	0-12	0-15
Gain		35-45	35-40
Output level DIN VDE 0855/12	dBµV	124	123
Noise figure	dB	<9	10
<b>MATV path</b>			
Frequency range	MHz	47-862	
Attenuator	dB	-	0-15
Equaliser		-	0-20
Gain		-1.5	30-35
Output level DIN 45004 B		-	117
Output level CSB/CSO/XMOD		-	96
Return path	MHz	-	5-30 passive
<b>General</b>			
Powering voltage	Vac	230	230
22 KHz tone amplitude	Vpp	0.6±1	-
Max. DC current for LNB	mA	300 (13/17Vdc)	-



References	537302	537201	5399	531201	539201	539104
Inputs	UHF-VHF	Return Path VHF-FM/UHF	UHF/VHF	FM/BIII-DAB/UHF	FM/BIII-DAB/ UHF1/UHF2	FM/BIII-DAB /UHF/BV/BIV
Frequency range	MHz	47-454/ 470-862	5-7/47-230/ 470-862	47-232/470- 862	88-108/ 174-400/470-862	88-108/174-400/470- 862/614-862/470-590
Gain (high)	dB	30/37	VHF 5(16 - 0+1)	35/40	15/30/40	15/30/37
Gain (low)	dB	20/27	UHF 15(27 - 0+1)		15/20/30	15/20/27
Attenuation margin		0-20	-	0-20/0-15	0-20	0-20
Output level (DIN 45004B) High	dBµV	114/116	88/101 (OUT+1) 108 (Ret. Path)	115/117	114/114/117	114/114/117/117
Output level (DIN 45004B) Low					112/112/116	112/112/116/116
Output level (IDM3)(2ch -60dB) High					111/111/114	111/111/114/114
Output level (IDM3)(2ch -60dB) Low					109/109/113	109/109/113/113
Noise figure High	dB	7	2,5	6/4	9/6/5	9/6,5/8/9/9
Noise figure Low					9/6,5/6,5	9/7/9,5/10,5/10,5
Total input DC Bypass	mA	70@12Vdc	30 (UHF)	60@24Vdc	70@12Vdc (BIII-DAB, UHF)	70@12Vdc (BIII-DAB, UHF1)
Mains voltage	V	207-253				



TERRESTRIAL/SATELLITE TV

Outdoor CATV

PRODUCT RANGE

Ref. DeSCRIPTION

4513 Outdoor R5-65 MHz hybrid AC line powered

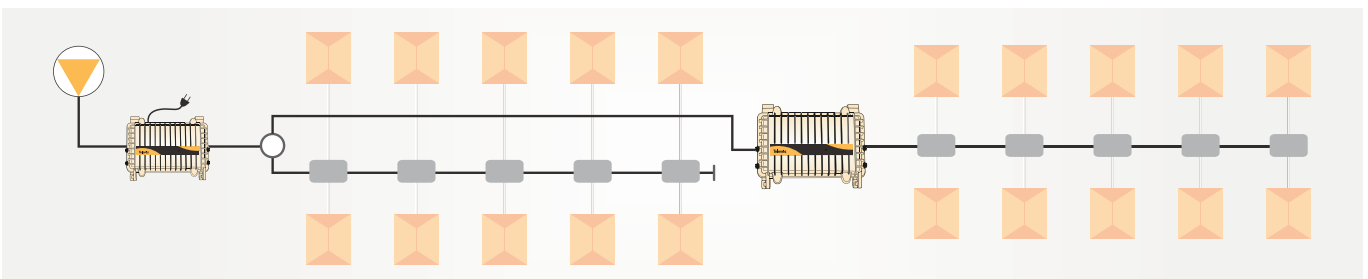
System accessories

5456 AC Outdoor power supply unit



References		4513
<b>Forward path</b>		
Frequency range	MHz	85 - 862
Attenuator	dB	20
Cable equaliser		7,5
System equaliser		118
Gain		100
Max. output level (DIN 45004B)	dBµV	100
Max. output level		0...18
2nd order distorsion	dB	12
Noise figure		±1
In-Out return losses		
<b>Return path</b>		
Frequency range	MHz	5 - 65
Attenuator	dB	20
Gain		6
Flatness		0/3/6
In-Out return losses		12
<b>General</b>		
Powering voltage	V	207-253 / 50-60
Power consumption	W	5
Protection Index	IP	20

References		5456
Mains voltage	Vac FIC	230±15
Output voltage		57
Max. output current	A	5
Max. power consumption	W	375
Frequency range	MHz	5-860
Dimensions	mm	278x217x100





## TERRESTRIAL/SATELLITE TV

## DT Kom

## PRODUCT RANGE

Ref. DeSCRIPTION

**PUSH-PULL HEADEND AMPLIFIERS**

5340 3 in/1 out - BI-FM/BIII/UHF

5341 5 in/1 out - BI-FM/BIII/BIV/BV/UHF

**POWER-DOUBLING HEADEND AMPLIFIERS**

4507 3 in/1 out - FM/VHF/UHF

4508 4 in/1 out - FM/VHF/UHF/UHF

4509 5 in/1 out - FM/VHF/BIV/BV/UHF

**PUSH-PULL LINE AMPLIFIERS**

5338 1 in/1 out - FP 47-862 MHz

5339 1 in/1 out - FP 47-862 MHz/RP 5-30 MHz

533901 1 in/1 out - FP 87-862 MHz/RP 5-65 MHz

5335 1 in/1 out - FP 47-862 MHz/RP 5-30 MHz + 1xIF 950-2150 MHz

533501 1 in/1 out - FP 47-862 MHz/RP 5-65 MHz + 1xIF 950-2150 MHz

**POWER-DOUBLING LINE AMPLIFIERS**

451201 1 in/1 out - FP 47-862 MHz/RP 5-65 MHz

451202 1 in/1 out - FP 87-862 MHz/RP 5-30 MHz

5337 2 in/2 out - FP 47-862 MHz/RP 5-30 MHz+2xIF 950-21502 MHz

new



- User friendly design
- Input signal detector
- LED for each band
- All controls accessible from outside

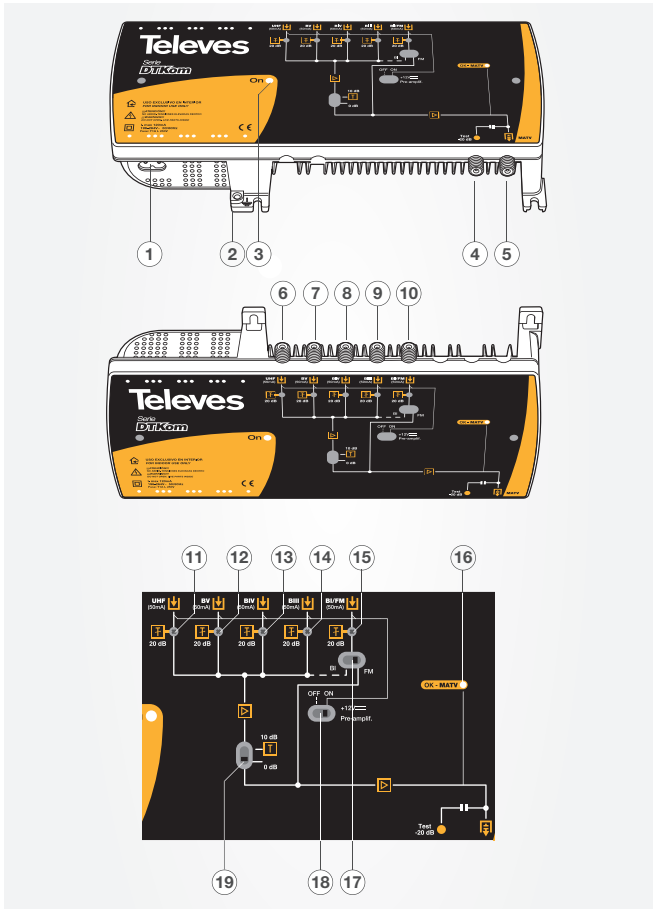
**POWER DOUBLING RANGE**

- up to 129 dB $\mu$ V for both VHF & UHF
- up to 120 dB $\mu$ V for 2xIF amplifiers with input equaliser
- High/Low selectable gain
- Active/passive selectable return path

**PUSH-PULL RANGE**

- up to 120 dB $\mu$ V for 2xIF amplifiers with input equaliser
- Active/passive selectable return channel
- High/Low selectable gain
- Line powered (switchable)

TERRESTRIAL/SATELLITE TV



Ref. 5341

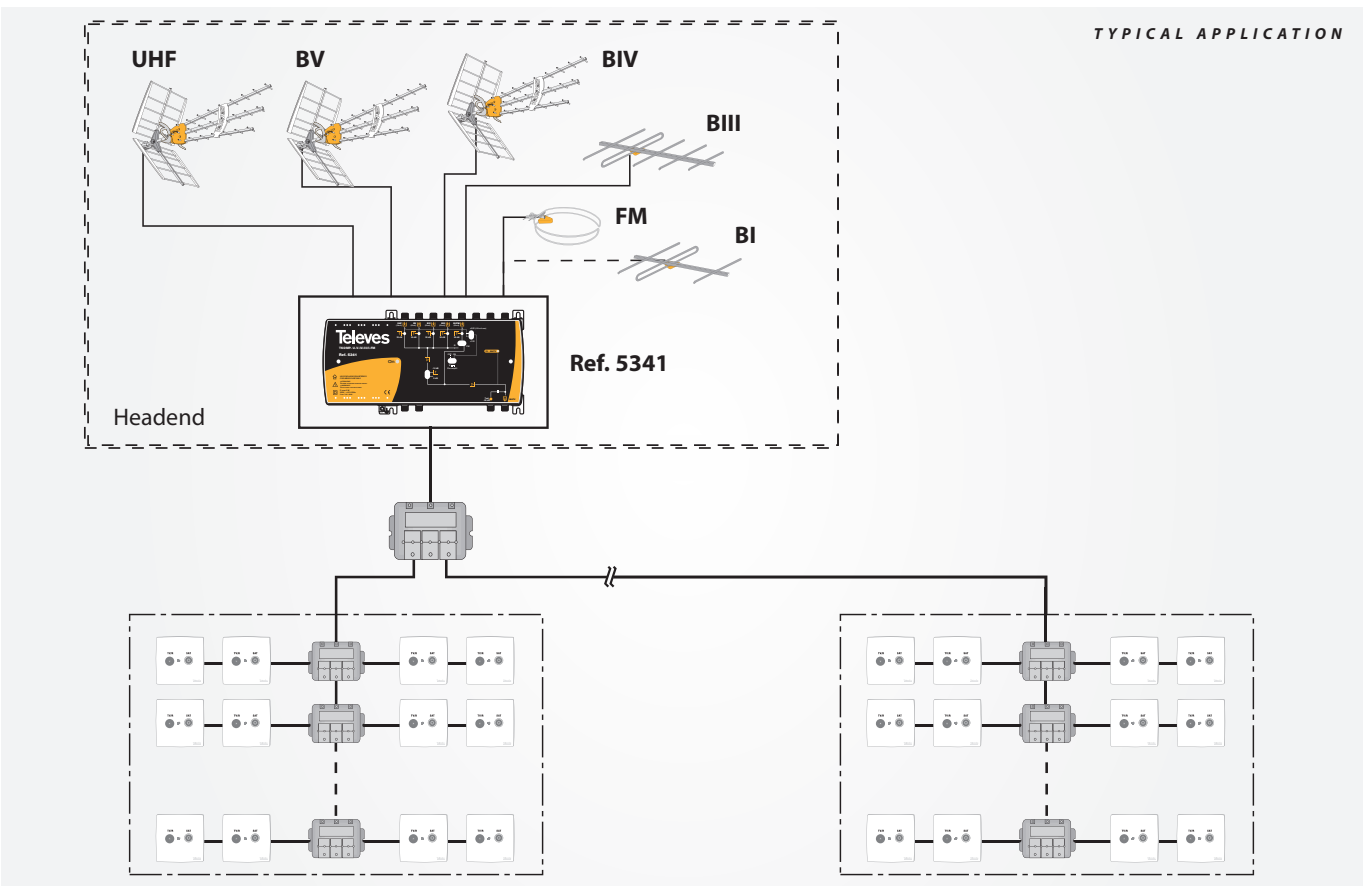
1. Mains supply input (196-264V~ 50/60Hz)
2. Ground connection
3. On LED
4. MATV output test
5. MATV signal output
6. UHF signal input. Current output for preamplifiers.
7. BV signal input. Current output for preamplifiers.
8. BIV signal input. Current output for preamplifiers.
9. BIII signal input. Current output for preamplifiers.
10. BI/FM signal input. Current output for preamplifiers.
11. UHF input attenuator
12. BV input attenuator
13. BIV input attenuator
- 14.- BIII input attenuator
15. BI/FM input attenuator
16. Status LED. "On" position means signal presence.
17. BI or FM Amplifier Selection
18. Power Voltage Selection for preamplifiers 12 Vdc. (ON/OFF)
19. Selection of high gain / low gain

References		5340	5341	4507	4508	4509
Inputs		BI,FM/BIII/UHF	BI,FM/BIII/BIV/BV/UHF	UHF/VHF/FM	UHF1/UHF2/VHF/FM	BIV/BV/UHF/VHF/FM
Frequency range	MHz	47-68, 88-108 174-370/470-862	47-68, 88-108 174-370/470-590/ 614-862/470862	470-862/ 174-400/88-110	470-862/470-862/ 174-400/88-110	470-590/614-862/ 470-862/174-400/88-110
Gain (high)	dB	39, 25/44/53		55/45/30	52/52/45/30	50/50/52/45/30
Gain (low)		31, 21/36/43		42/32/--	40/40/42/-	38/38/40/32/--
Maximum output level (DIN 45004B)	dBµV	123			129	
Maximum output level (EN 50083) CTB,CSO,XMOD (35ch -60dB)		120			113	
Noise figure		8, 10/6,5/5,5	8, 10/6,5/9/9/8	7/7/12	10/10/7/12	11/11/10/7/12
Attenuator inputs UHF and VHF	dB	0-20				
Attenuation test		20				
Powering voltage	V	196 - 264 @ (50/60Hz)				
Total consumption max.	W	16				
Max. consumption preamplifiers	mA	50 @ 12Vdc		50 @ 12Vdc (UHF, VHF)	70 @ 12Vdc (UHF2, VHF)	50 @ 12Vdc (BIV, UHF, VHF)
Operating temperature	°C	-5 ... +45				
Protection index		IP20				

TERRESTRIAL/SATELLITE TV

References		5338	5339/533901			5335/533501			
Channels			Main MATV	Return		Main MATV	Return		FI
				Active	Passive		Active	Passive	
Frequency range	MHz	47-862	47-862 (ref.5339) 87-862 (ref.533901)	5-30 (ref.5339) 5-65 (ref.533901)		47-862 (ref.5335) 87-862 (ref.533501)	5-30 (ref.5335) 5-65 (ref.533501)		950-2150
Gain	dB	41-53 (select.)	41-53 (select.)	20	-4	40-53 (select.)	20	-4	42
Maximum output level (DIN 45004B)		123	122	115	-	124	115	-	-
Maximum output level (EN 50083)	dB $\mu$ V	120	119	113	-	119	113	-	121 <sup>(3)</sup>
Noise figure		10	10	9	-	10	10	-	13
Return losses	dB	10							
Attenuator		0-18	0-18	-	-	0-18	-	-	-
Equalizer		0-18	0-18	-	-	0-18	-	-	0-12
Powering voltage	W	196 - 264 @ (50/60Hz)							
Total consumption	mA	130							
Operating temperature	$^{\circ}$ C	-5 ... +45							
Protection index		IP20							

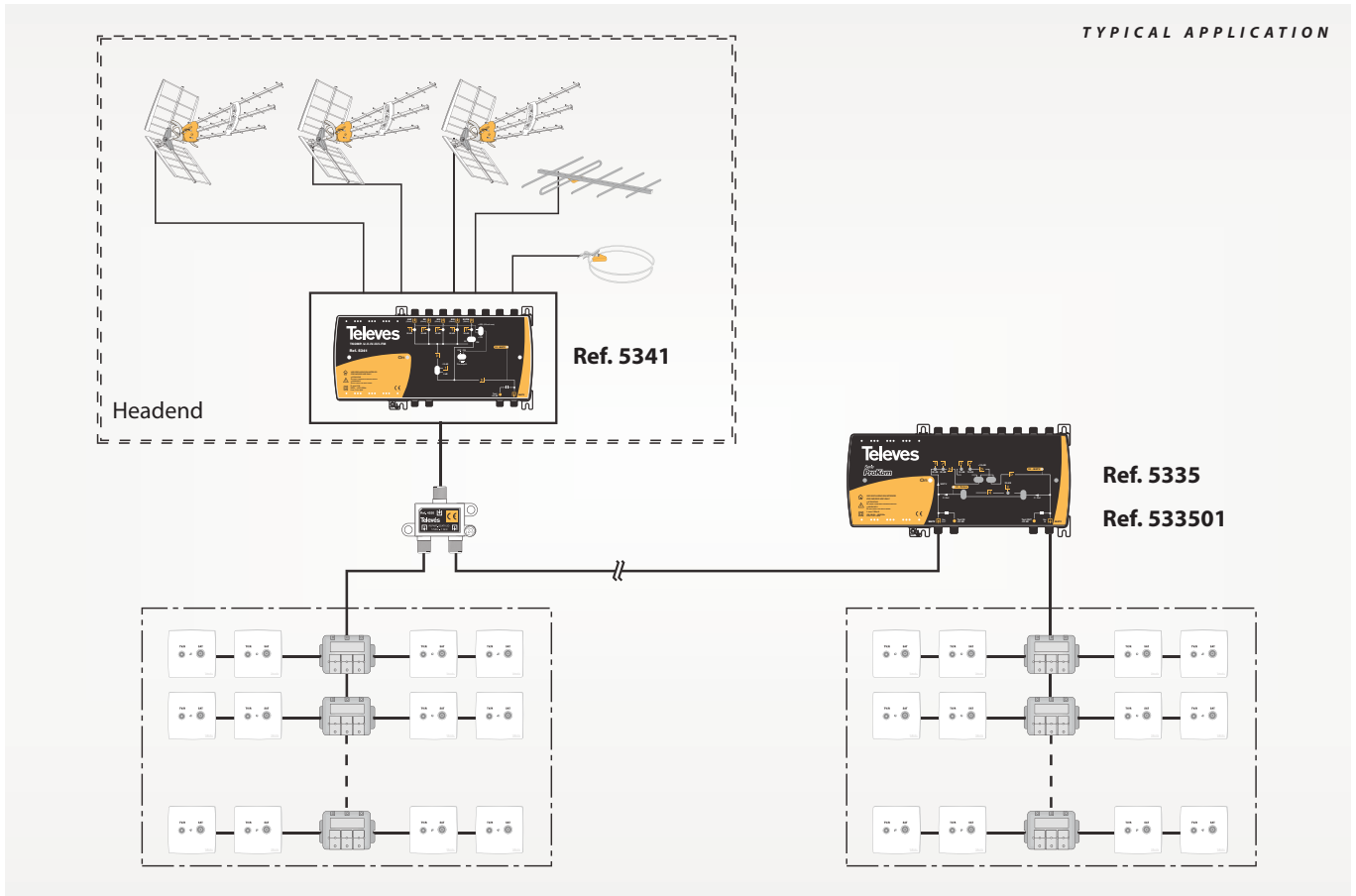
(3) 2 Ch. -35 dB



TERRESTRIAL/SATELLITE TV

References		451201 / 451202			5337			
Channels		Main MATV	Return		Main MATV	Return		FI 1 / FI 2
			Active	Passive		Active	Passive	
Frequency range	MHz	47-862 (ref.451202) 87-862 (ref.451201)	5-30 (ref.451202) 5-65 (ref.451201)		47-832	5-30	-	950-2150
Gain	dB	40-53 (select.)	20	-3	34-47 (select.)	17	-5	42
Maximum output level (DIN 4)	dBμV	129	116	-	123	116	-	-
Maximum output level (EN 50083)		126	113	-	120	113	-	120 <sup>(3)</sup>
Noise figure	dB	10	10	-	10	15	-	12
Return losses		10						
Attenuator		0-20	-	-	0-20	-	-	-
Equalizer		0-20	-	-	0-20	-	-	0-12
I/O Test attenuation		20						
Powering voltage	W	196 - 264 @ (50/60Hz)						
Total consumption	mA	150			70 @ 12Vdc (UHF2, VHF)			
Operating temperature	°C	-5 ... +45						
Protection index		IP20						

(3) 2 Ch. -35 dB



TERRESTRIAL/SATELLITE TV

Avant Series

**PRODUCT RANGE**  
Ref. DeSCRIPTION

5328	Avant HD BI/III/DAB-FM-10 UHF-SAT
5329	Avant HD MATV 1 out

**System accessories**

2168	PC programming Sw. + Accs.
7234	Universal Programming Unit
5750	Outdoor cabinet

**CONTROL MODE**  
via modem PC



**Copy & Paste any configuration with the new Intelligent Handset**

**2 Easy steps**

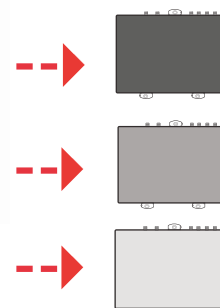
**1** Copy configuration into handset



**2** Paste it to any unit



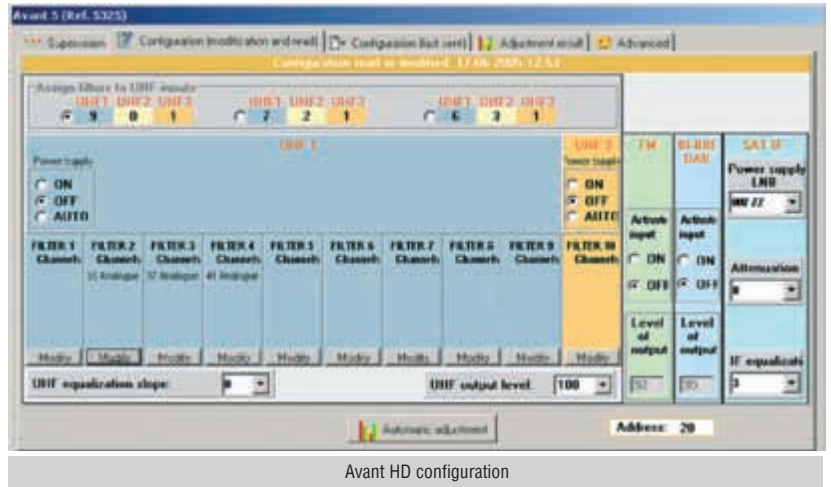
up to 30



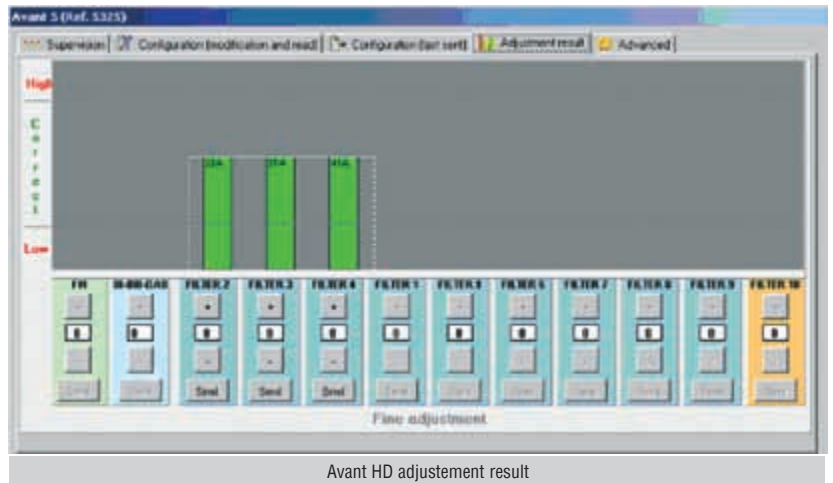
References		5328/5329						
Inputs		UHF 1	UHF 2	UHF3	FM	BI/BIII/DAB	VHF/UHF	IF/SAT (5328 only)
Frequency bands	MHz	470-862			87-108	47-68/174-230	47-430 470-862	950-2150
Filters configuration		10	0	0	-	-	-	-
		9	0	1	-	-	-	-
		7	2	1	-	-	-	-
		6	3	1	-	-	-	-
		5	3	2	-	-	-	-
N° channels per filter		0-5 <sup>(2)</sup>			-	-	-	-
Gain	dB	Automatic						42...45
Gain regulation		0-20 <sup>(1)</sup>			0-25 - OFF <sup>(1)</sup>		-	0-12 - OFF <sup>(2)</sup>
Optimum input margin	dBµV	60-105			60-85	62-87	69-73 70-74	-
Manual reg. gain	dB	±9 (by single channel)			±9	±9	-	-
Slope adjustment		0-9			-	-	-	0-12 <sup>(2)</sup>
Output level	dBµV	117 <sup>(3)</sup> /121			111 <sup>(3)</sup> /115		117 <sup>(3)</sup> /121	123
Regulation Output level		96-111			76-101	91-106	96-111	-
Noise figure	dB	9 tip			10		-	9
Rejection		20 (±16 MHz)			20 (±16 MHz)		-	40 (862 MHz)
Input line powering <sup>(5)</sup>	Vdc	24			-	24	-	13/17 (22 kHz)
(Automatic) I max. <sup>(4)</sup>	mA	60			-	60	-	300
Mains voltage	Vac	230±15% - 50/60 Hz						
Consumption	w	30						
Protection index		IP 20						
Dimensions	mm	320x250x60						

<sup>(1)</sup> Automatic regulation / <sup>(2)</sup> Programmable / <sup>(3)</sup> The output level depends of the number of channels / <sup>(4)</sup> Available current / <sup>(5)</sup> ON - OFF - AUTO

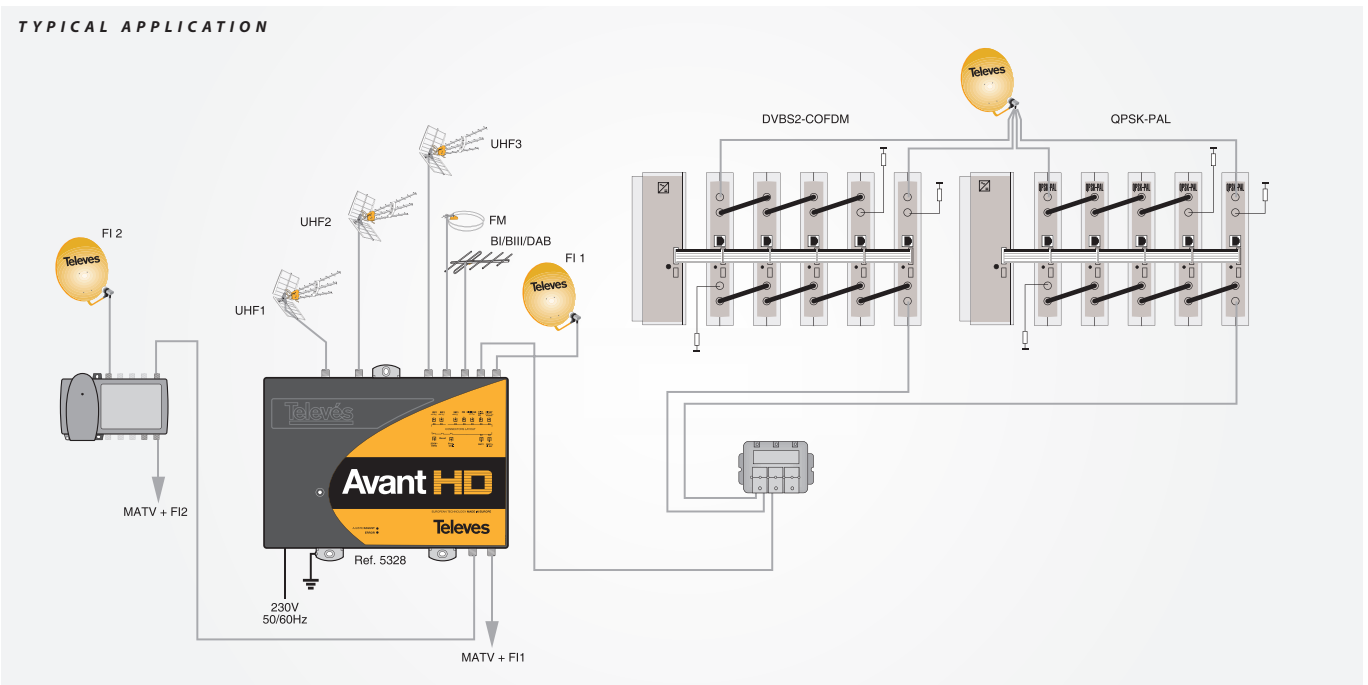
TERRESTRIAL/SATELLITE TV



Avant HD configuration



Avant HD adjustment result



TERRESTRIAL/SATELLITE TV

## Avant 3

**PRODUCT RANGE**  
REF. DESCRIPTION

5326	Avant 3
5327	Avant 3 (Broadband VHF)

**Accessories**

7234	Universal Programming Unit
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**Main features**

- 5 UHF filters and 1 VHF filter
- 2 UHF inputs with two possible filter assignments (2-3 or 5-0); each filter can cluster up to 7 channels.
- VHF input that can cluster up to 4 channels (7-28 MHz) (only 5326)
- Input loopthru to mix the output of another AVANT3
- Broadband output to another AVANT3
- Split-band amplification
- FM/BI input

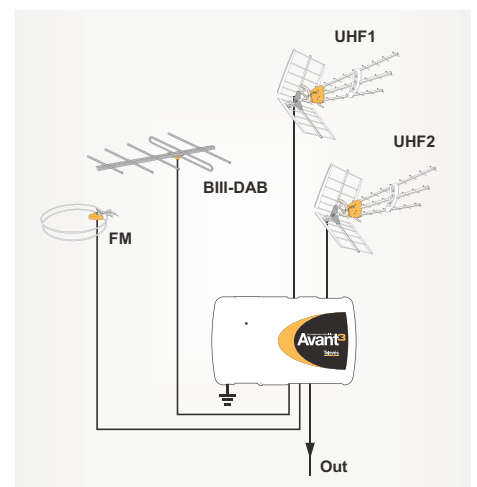


▲ 5326



▲ 7234

Reference		5326 /5327					
Inputs		UHF 1	UHF 2	FM/BI	BIII (ref. 5326)	VHF (ref. 5327)	IN/MIX
Bandwidth	MHz	CCIR Ch. 21-Ch. 69		47-68 87-108	CCIR Ch. 5-Ch. 12 Ch. S11-Ch. S20	47-406/ 470-862	174-300 470-862
Number of filters/output		2/5	3/0	-	1	-	-
Number of channels/filter		1-5(B.IV) /1-7(B.V)		-	1-4	-	-
General attenuation	dB	0-20					
Filter attenuation		0-15	-	0-15	-	-	
Input level	dBμV	60-80	65-90	65-90	65-90	-	-
Output level		117	-	115	113/116	-	
Output level IMD3		114	-	112	110/113	-	
Rejection	dB	20 (±16 MHz)	20 (±16 MHz)	20 (±8 MHz)	-	-	
Noise figure		9 typ / 7 typ		9 typ / 7 typ		-	
Input powering (12 dB)	Vac	50 mA	50 mA	-	50 mA	-	-
Powering voltage		230±20% - 50/60 Hz					





T03 HEADEND EQUIPMENT

T03. Single Channel Amplification

**PRODUCT RANGE**  
Ref. DeSCRIPTION

Amplifiers	
5081	BI
5082	FM
5099	DAB
5087	S Low band
5083	BIII
5088	S High band
5089	Hyperband
5086	UHF multichannel DTT
5098	UHF High selectivity
5080	Satellite IF

Power supply units	
5498	T03 PSU 24V/60 W
502905	T03/T05 PSU
Mounting	
5071	Wall mount (10M+PSU)
5239	Wall mount (12M+PSU)
5301	19" Rack frame (10M+PSU)
5072	Lockable cabinet (10M+PSU)
5069	Lockable cabinet (14M+PSU)
5235	Lockable cabinet (22M+PSU)
Various	
4221	Current injector
5074	F connector Link push fit type
4061	F type 75 ohms load DC blocked
5073	Blank plate
4071	F type DC blocker terminal load
4058	F type DC 75 ohms load



▲ 5082

References		5081	5082	5083	5085	5086	5087	5088	5089
Bandwidth	MHz	7	20.5	7	32	16/24/32/40	7	7	8
Frequency range		47-88	87.5-108	174-230	830-862	470-862(1) / 470-862(2)	104-174	230-300	302-470
Gain	dB	50	35	50	57	50	58	58	58
Output level	dBμV	123	114	123	106	111/109/108/108	125	124	125
Standard		EN 50083-5							
Noise figure	dB	<9			<8	<9			
Regulation margin		35	35	35	30				
Rejection between channels		40 (n±2)	30(3)	30 (n±2)	22 (ch.65)	20 (ch.65)	30 (n±2)	30 (n±2)	30 (n±2)
Flatness		<1	<3	<1	<3	<3	<1	<1	<1
Consumption at 24 Vdc	mA	65			90	70	90		
Preamp. max. current (24Vdc)	mA	100							
Dimensions	mm	35x197x83							

References		5098	5099
Bandwidth	MHz	8	37
Frequency range		470-862	195-232
Gain	dB	55	45
Output level	dBμV	125/118(4)	114
Standard		EN 50083-5	di=50dB (2ch 4MHz)
Noise figure	dB	<11	<9
Regulation margin		30	35
AGC margin		-	-
Rejection between channels		18 (n±1) 50 (n±2)	20 (n±2)
Flatness		<2	<3
Consumption at 24 Vdc	mA	90	
Preamp. max. current (24Vdc)		100	
Dimensions	mm	35x197x83	

(1) 2, 3 or 4 UHF channels  
 (2) 5 UHF channels  
 (3) Rejection at 77 (MHz) and 120 (MHz)  
 (4) Analogue/Digital



T03 HEADEND EQUIPMENT

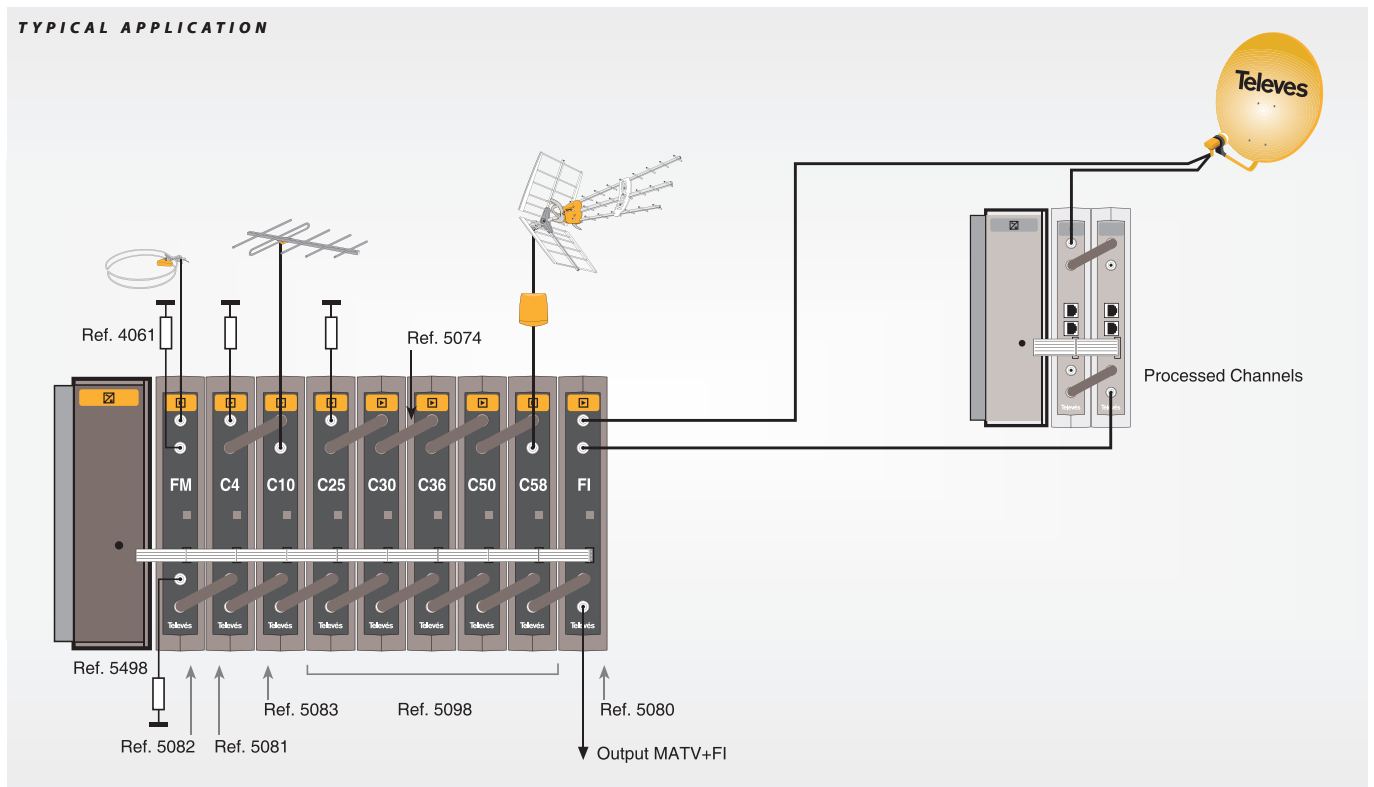
T03. Single Channel Amplification

References		5080
Inputs/outputs		2-1
<b>SAT IF</b>		
Frequency range	MHz	950-2150
Gain		35...50
Equaliser	dB	0-12
Attenuator		0-20
Output level DIN VDE0855/12	dBµV	124
Noise figure	dB	<12.5
<b>MATV</b>		
Frequency range	MHz	47-862
Through losses	dB	1.5
<b>General</b>		
Consumption (24 Vdc)		130
LNB Power supply	mA	400
Dimensions	mm	35x197x83



▲ 5080

TYPICAL APPLICATION



## TOX HEADEND EQUIPMENT

## T.OX: Logical Evolution

Televes pioneered the creation of the first compact indoor unit for the reception, demodulation and transmodulation to PAL of TVSAT channels.

In the 80s, SAT90 was the first of a series that marked the birth of the PAL satellite distribution.

His next release, SAT92, lived the rise of this new technology and the TVSAT implementation as a complement to the terrestrial distribution.

The microprocessors implementation in these kind of devices, led to the birth of STAR93 and STAR94 in the early 90's.

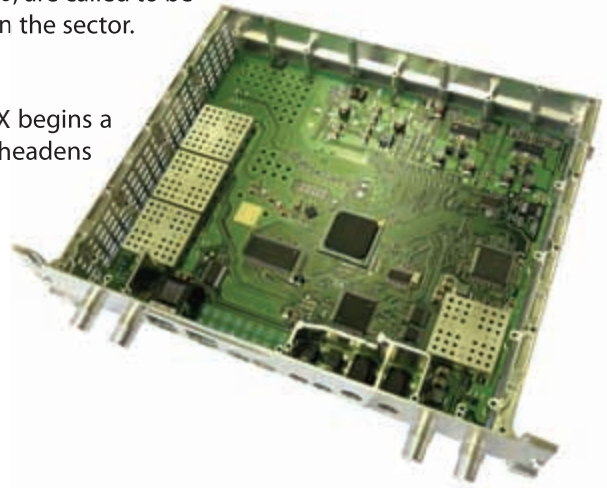
The TVSAT signal digitalization came in the second mid 90's. It was when the T05 series was born with QPSK to PAL and QAM solutions. The evolution towards new standards and to HD, made possible the design of modules compatible with DVB-S2 and DVB-T.

After the first decade of the XXI century, it is necessary a new evolution in the concept of transmodulators. The implanted

DVB-S2 and DVB-T standards are leaving way to new systems, fruit of the unstoppable technological progress in the transmission of audiovisual content.

This evolution is the one that carried Televes to create T.OX: modules ready for new systems such as DVB-T2 or DVB-C2 and, as SAT90, are called to be a reference in the sector.

With the T.OX begins a new era of headens equipment.



## SMATV

Modules that receive the TVSAT signal, transmodulate it to different formats depending on the network topology distribution: PAL, DVB-T and DVB-C.

The digital T.OX modules (COFDM and QAM) are capable of receiving DVB-S2 signals, enabling the facility site to provide content in high definition (HDTV).

The COFDM modules have an automatic detection system of the input signal, allowing a better setting and programming performance.

The installer can set the output signal format to the requirements of the network at issue.

In the adjustment phase, the modules generate information on the quality of the input signal, the digital output modules also provide information about the occupation state of the output signal.



## MATV

Modules that process terrestrial signal or base-band signal (A/V or ASI).

The first ones enable transmodulation or DVB-T signal processing in order to set the multiplexes on demand.

The latter, transform base-band signals into self-produced channels to mix them with the other services present in SMATV network.

**45% less**  
consumption  
in PAL  
distributions

**33% less**  
consumption  
in QAM  
distributions

## TOX HEANDEND EQUIPMENT. SMATV

## DVB-S2 / COFDM T.OX

## PRODUCT RANGE

## REF. DESCRIPTION

563101	DVB-S2 COFDM
563301	DVB-S2 COFDM CI

The DVB-S2 transmodulator to COFDM receives a satellite transponder in some DVBS (QPSK) or DVBS2 (QPSK or 8PSK) modulation formats and demodulates it by obtaining an MPEG-2 transport package. The TS is then modulated in COFDM format and converted to the output channel (UHF or VHF).

- ▶ TS settings in order to comply with DVB-T requirements:
  - ▶ Stuffing, to perform faster scanning in the STB or when using STB with a fixed symbol rate.
  - ▶ MUX services removing to avoid STB detection/loading
- ▶ Configurable TS identifier in the NIT. It is possible to substitute the satellite descriptor for the DTT descriptor allowing a better STB service detection
- ▶ Occupation per service and of the complete MUX COFDM, allowing output space optimization.
- ▶ LCN (Logical Channel Number) setting to facilitate the sorting of the services in the STB.



▲ 563101

References	563101 / 563301			
<b>Satellite Demodulator</b>	Input frequency	950-2150 MHz	Through loss	<1,5 dB typ.
	Symbol rate	10-30 Mbaud (QPSK-8PSK)	Modulation	DVB-S2 (QPSK, 8PSK) DVB-S (QPSK)
	Frequency steps	1 MHz	Internal FEC	LDPC (9/10, 8/9, 5/6, 4/5, 3/4, 2/3, 3/5, 1/2, 1/4, 1/3, 2/5)
	Input connectors and output	"F" female	External FEC	BCH (Bose-chaudhuri-hocquenghem)
	Input impedance	75 ohm	Roll-off factor	20%, 25%, 35%
	LNB power supply	13/17V/OFF 22 Khz (ON/OFF)	Input VSWR	10 dB min.
<b>COFDM Modulator</b>	Modulation format	QPSK, 16QAM, 64QAM	Scrambling	DVB ET300744
	Guard Interval	1/4, 1/8, 1/16, 1/32	Interleaving	DVB ET300744
	FEC	1/2, 2/3, 3/4, 5/6, 7,8	Cell_id	Selectable
	Bandwidth	7 MHz, 8 MHz	Output spectrum	Normal /Inverted (Select)
<b>RF Output</b>	Output frequency	45-862 MHz / 474-858 MHz (UHF)	Through loss	<1,5 dB typ.
	Frequency steps	166 KHz	Return loss	>12 dB typ.
	Maximum output level	80±5 dBμV (prog.)	Input and output connectors	"F" female
	Attenuation	>15 dB (prog.)	Output impedance	75 ohm
<b>General</b>	Power supply	24 V	Protection index	IP20
	Consumption 24 V	300 mA		

## TOX HEANDEND EQUIPMENT. SMATV

## DVB-S2 / QAM T.0X

## PRODUCT RANGE

## REF. DESCRIPTION

5630 DVB-S2 QAM TWIN

563501 DVB-S2 QAM CI

The TWIN DVBS2 to QAM unit consists of two transmodulator referred to as modules A and B. Each module receives a satellite transponder signal (DVB-S2 standard: QPSK or 8PSK) and demodulates it to obtain a MPEG2 transport packet. The TS is then modulated in QAM format and sent to the output channel (UHF or VHF).

- ▶ TS settings in order to comply with DVB-T requirements:
  - ▶ Stuffing, to perform faster scanning in the STB or when using STB with a fixed symbol rate.
  - ▶ MUX services removing to avoid STB detection/loading.
- ▶ Configurable TS identifier in the NIT. It is possible to substitute the satellite descriptor for the DTT descriptor allowing a better STB service detection.
- ▶ It is possible to replace the operator\_id field received in the input transport stream with a value corresponding to the cable network operator.
- ▶ Occupation per service and of the complete MUX QAM, allowing output space optimization.



▲ 5630

References	5630 / 563501			
<b>Satellite Demodulator</b>	Input frequency	950-2150 MHz	Modulation	DVB-S2 (QPSK, 8PSK) / DVB-S (QPSK)
	Input level	49 to 84 dB $\mu$ V (-60 to -25 dBm)	Symbol Rate	2 to 42.5 Mbaud (DVB-S) 10-30 Mbaud (DVB-S2)
	Frequency steps	1 MHz	FEC Input	LDPC (9/10, 8/9, 5/6, 4/5, 3/4, 2/3, 3/5, 1/2)
	Input connectors and output	"F" female	FEC Output	BCH (Bose-chaudhuri-hocquenghem)
	Input impedance	75 ohm	Roll-off factor	20%, 25%, 35%
	LNB power supply	13/17V/OFF 22 Khz (ON/OFF)	Return Losses	10 dB min.
	Throughput Losses:	< 1,5 dB typ.		
<b>QAM Modulator</b>	Modulation format	16, 32, 64, 128, 256 QAM	Scrambling	DVB ET300429
	Symbol Rate	6,9 Mbaud max	Interleaving	DVB ET300429
	Roll-Off Factor	15%	Bandwidth	8 MHz max.
	Block Code	Reed Solomon (188, 204)	Spectral inversion:	Normal /Inverted (Select)
<b>UP Converter</b>	Output frequency	45-862 MHz (Select.)	Through loss	<1,5 dB typ.
	Frequency steps	250 KHz	Return loss	>12 dB typ.
	Phase Noise	90 dBc/Hz @10KHz typ	Input and output connectors	"F" female
	Output level	80 $\pm$ 5 dB $\mu$ V	Output impedance	75 ohm
	Adjustable Output level	>15 dB (prog.)	Spurious level:	
<b>General</b>	Power supply	24 V	Consumption 24 V	550 mA typ. (without powering LNB) 800 mA typ. (powering LNB)
	Protection index	IP20		

## TOX HEANDEND EQUIPMENT. SMATV

## QPSK/PAL CI TWIN T.0X

## PRODUCT RANGE

## REF. DESCRIPTION

5537 QPSK-PAL TWIN CI STEREO

The TWIN QPSK-PAL CI allows the user to trasmodulate two channels (TV or radio) selected from those in two satellite transponders (same band and polarisation), into two VHF/UHF PAL channels, with the possibility of stereo modulation.

- ▶ The unit allows access to scrambled services by using a conditional access module (CAM) that performs the service's descrambling.
- ▶ Two 3.5 mm jack connectors that make available in baseband the two audio & video channels of each module.
- ▶ IF loop-through for the input connectors on the top of its front, in order to enable the passage of the input signal to other modules.
- ▶ RF loop-through for the output connectors on the bottom of its front, in order to mix the channels for further amplification.

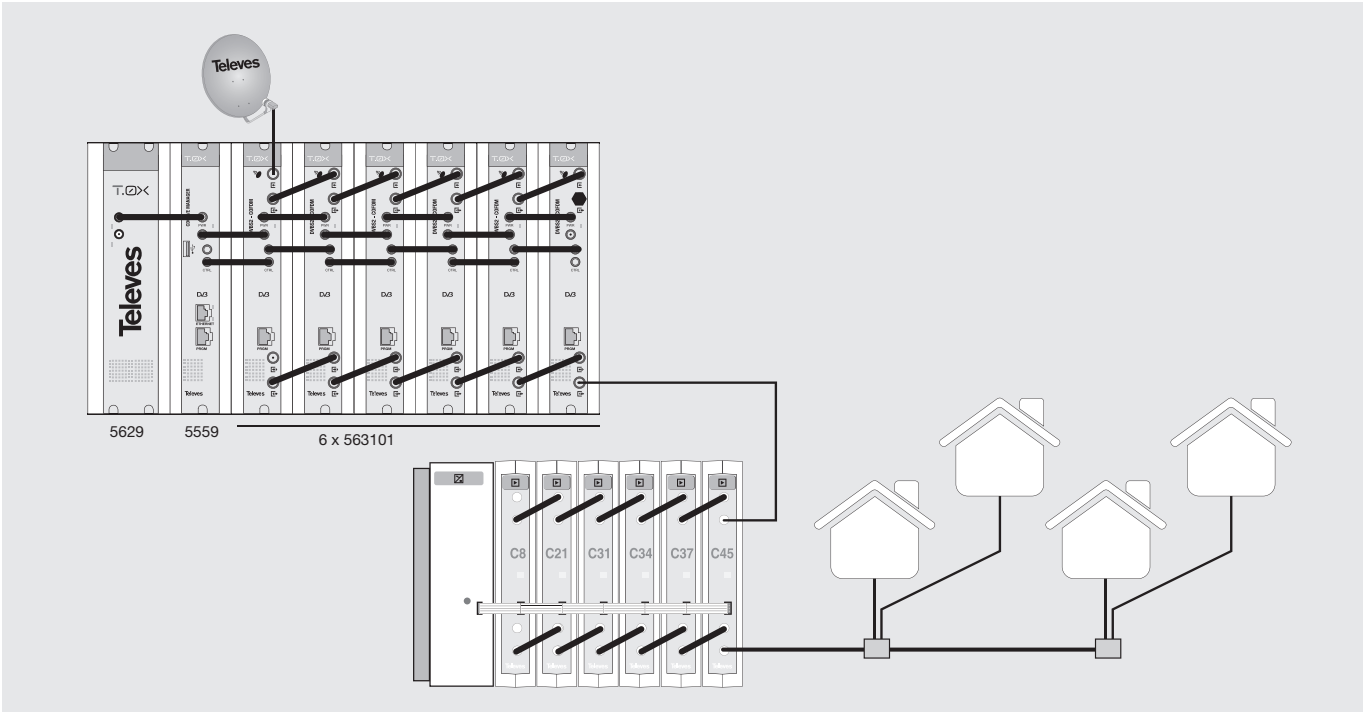


▲ 5537

References	5537			
<b>QPSK Demodulator</b>	LNB Powering (1unit)	13/17V (±0.5 V) / OFF 22KHz (±2KHz) (Select. ON/OFF)	Input VSWR (75 ohm)	> 7 dB (950 - 2150 MHz)
	Input through losses	< 1.5 dB (950-2150 MHz)	Input symbol rate	2 - 42,5 Mbaud
	Input frequency	950 - 2150 MHz	Capture range	± 960 ppm
	Frequency steps	1 MHz	Roll-off factor	35%
	Locking margin	± 1 MHz (<5 Mbaud) ± 2 MHz (5-10 Mbaud) ± 5 MHz (>10 Mbaud)	Convolutional code	1/2, 2/3, 3/4, 5/6, 7/8
	Input level	44 to 84 dBµV (-65 to -25 dBm)	Descrambling	ETS300421
<b>MPEG-2 Video decoders</b>	Decoding	ISO/IEC 11172-2	Deinterleaving	ETS300421
	Input 1 format	MPEG-1	Block code	RS(204,188)
	Decoding	ISO/IEC 13818-2 (MP@ML)	Chrominance format:	4:2:0
	Input 2 format	MPEG-2	Video resolution	Max. 720 x 576
	Decoding	ISO/IEC 13818-2 (MP@ML)	WSS signalling	Active
	TS input rate	Max. 90 Mbits/seg	Subtitle insertion PAL:	Active
<b>MPEG-2 Audio decoders</b>	Video rate	1.5 to 15 Mbits/seg	Base band video output:	Jack 2,5 mm.
	Input format	MPEG-1, MPEG-2	Audio output	Stereo, Dual
	Decoding	LAYER 1, LAYER 2	VSWR Output (75 ohm):	10 dB min. 14 dB typ.
<b>RF Output</b>	Output frequency	46- 862 MHz	Through losses:	< 1.5 dB (46-862 MHz)
	Frequency steps	250 KHz	Spurious band level:	55 dBc min. >60 dBc typ.
	Maximum output level	80 ±5 dBµV		
	Attenuation	>15 dB		
<b>General</b>	Consumption	24V : 550 mA typ., no CAM inserted; 24V: 590 mA typ.,CAM inserted (LNB power OFF) 24V : 755 mA typ., no CAM inserted; 24V : 810 mA typ., CAM inserted (LNB power ON)		
	Protection index	IP20		

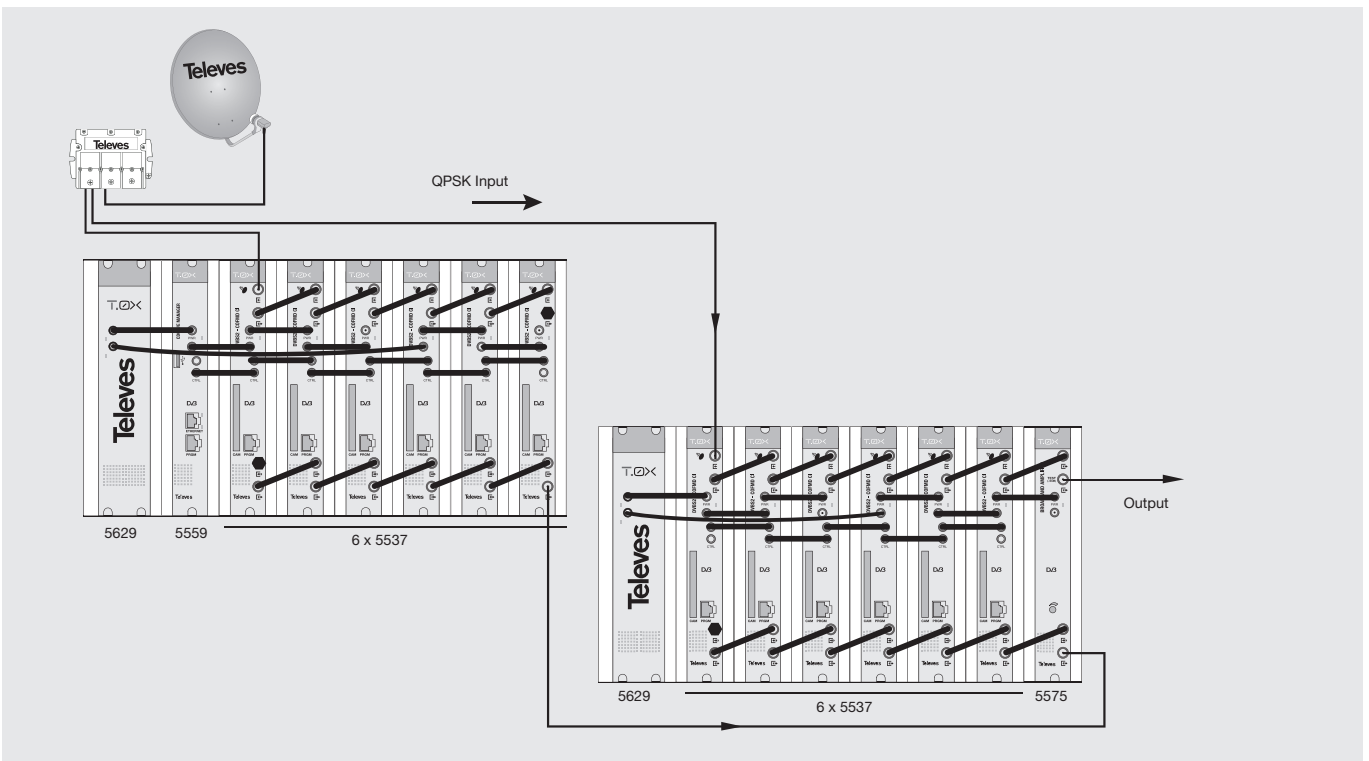
TOX HEANDEND EQUIPMENT. SMATV

SMATV APPLICATION



QPSK input, 6 COFDM channels output.

▲ 563101



QPSK input, 24 PAL channels output.

▲ 5537

## TOX HEANDEND EQUIPMENT. MATV

## COFDM/COFDM CI T.0X

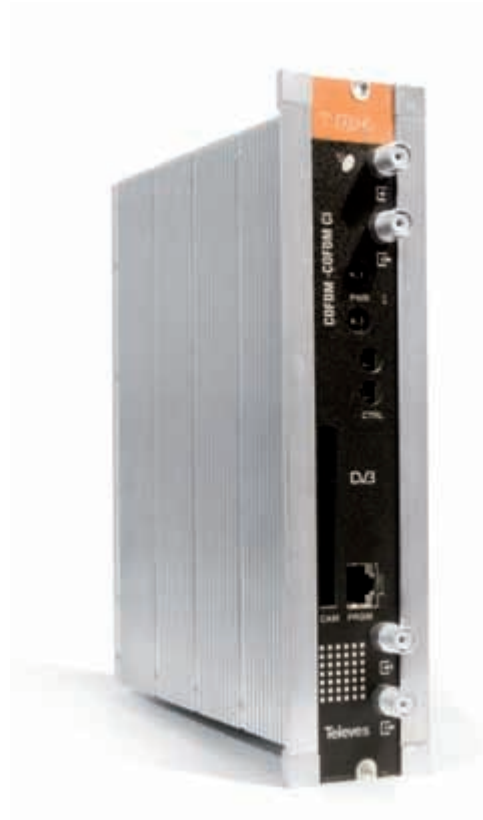
## PRODUCT RANGE

## REF. DESCRIPTION

563401 COFDM-COFDM CI

The COFDM transmodulator to COFDM receives a DTT multiplex and demodulates it by obtaining an MPEG-2 transport package which can be edited to remove and/or descramble services. The TS is then modulated in COFDM format and converted to the output channel (UHF or VHF).

- ▶ TS settings in order to comply with DVB-T requirements:
  - ▶ Stuffing, to perform faster scanning in the STB or when using STB with a fixed symbol rate.
  - ▶ MUX services removing to avoid STB detection/ loading.
- ▶ LCN (Logical Channel Number) setting to facilitate the sorting of the services in the STB.
- ▶ The unit allows access to scrambled services by using a conditional access module (CAM) that performs the service's descrambling.



▲ 563401

References	563401			
<b>COFDM Demodulator</b>	Input frequency	77-227 Mhz (VHF) 474-858 Mhz (UHF)	Guard interval	1/4, 1/8, 1/16, 1/32
	Connectors input/output	"F" female	Scrambling	DVB ET300744
	Input impedance	75 Ohm	Interleaving	DVB ET300744
	Modulation	QPSK, 16 QAM, 64 QAM	Input trough losses	< 1.5 dB typ
	Input FEC	1/2, 2/3, 3/4, 5/6, 7/8	Input VSWR	10dB min.
<b>COFDM Modulator</b>	Modulation	QPSK, 16 QAM, 64 QAM	Scrambling	DVB ET300744
	Guard interval	1/4, 1/8, 1/16, 1/32	Interleaving	DVB ET300744
	FEC	1/2, 2/3, 3/4, 5/6, 7/8	Cell_id	selectable
	Band width	7 Mhz, 8 Mhz	Output spectrum	Normal/ Inverted (Select.)
<b>RF Output</b>	Output frequency	45 – 862 Mhz	Through losses	< 1.5 dB typ
	Frequency steps	166 Khz	Return losses	> 12 dB typ
	Maximum output level	80 ±5 dBμV (progr.)	Connectors input/output	"F" female
	Attenuation	>15 dB (progr.)	Output impedance	75 Ohm
<b>General</b>	Consumption	24V/ 320 mA		
	Protection index	IP20		



## TOX HEANDEND EQUIPMENT. MATV

## COFDM/QAM CI T.OX

## PRODUCT RANGE

## REF. DESCRIPTION

563601 COFDM-QAM CI

The COFDM transmodulator to QAM receives a DTT multiplex and demodulates it by obtaining an MPEG-2 transport package which can be edited to remove and/or descramble services. The TS is then modulated in QAM format and converted to the output channel (UHF or VHF).

- ▶ TS settings in order to comply with DVB-T requirements:
  - ▶ Stuffing, to perform faster scanning in the STB or when using STB with a fixed symbol rate.
  - ▶ MUX services removing to avoid STB detection/ loading.
- ▶ LCN (Logical Channel Number) setting to facilitate the sorting of the services in the STB.
- ▶ The unit allows access to scrambled services by using a conditional access module (CAM) that performs the service's descrambling.



▲ 563601

References	563601			
<b>COFDM Demodulator</b>	Input frequency	77-227 Mhz (VHF) 474-858 Mhz (UHF)	Guard interval	1/4, 1/8, 1/16, 1/32
	Connectors input/output	"F" female	Scrambling	DVB ET300744
	Input impedance	75 Ohm	Interleaving	DVB ET300744
	Modulation	QPSK, 16 QAM, 64 QAM	Input trough losses	< 1.5 dB typ
	Input FEC	1/2, 2/3, 3/4, 5/6, 7/8	Input VSWR	10dB min.
<b>QAM Modulator</b>	Modulation	16, 32, 64, 128, 256 QAM	Scrambling	DVB ET300744
	Symbol rate	6,9 Mbaud max	Interleaving	DVB ET300744
	Roll-off factor	15%	Band width	8,3 Mhz max.
	Block code	RS (188,204)	Output spectrum	Normal/ Inverted (Select.)
<b>QAM Output</b>	Output frequency	45 – 862 Mhz	Through losses	< 1.5 dB typ
	Frequency steps	166 Khz	Return losses	> 12 dB typ
	Maximum output level	80 ±5 dBμV (progr.)	Connectors input/output	"F" female
	Attenuation	>15 dB (progr.)	Output impedance	75 Ohm
<b>General</b>	Consumption	24 V/ 360 mA - 24 V/ 420 mA (CAM)		
	Protection index	IP20		



## TOX HEANDEND EQUIPMENT. MATV

## A/D PROCESSOR TWIN T.OX

## PRODUCT RANGE

## REF. DESCRIPTION

564901 A/D PROCESSOR TWIN

Analogue & Digital channel processor allowing conversion (different input and output channels) or amplification ( same input and output channel).

- ▶ In conversion mode allows to perform a distribution network of DTT services.
- ▶ In amplifier mode allows to equalize a DTT MUX to adapt the signal level. SAW filtering gives high selectivity.



▲ 564901

References	564901			Prog.	
<b>Input A/D</b>	<b>RF</b>	Input frequency range	MHz	46-862	X
		Frequency steps	KHz	125, 166	X
		Lock margin		± 500	
		Input loop-through gain	dB	0± 3	
		Filter	MHz	7,8	X
		Pre-amplifier powering	Vdc	0, 12, 24	X
		Return losses	dB	>10	
		Impedance	ohm	75	
<b>Output A/D</b>	<b>RF</b>	Output frequency range	MHz	46-862	X
		Frequency steps	KHz	125 (digital), 166 (digital), 250 (analog.)	X
		Max. output level	dBμV	80 typ.	
		Regulation margin	dB	65-80	X
		Spurious level	dBc	>55	
		END (Equivalent Noise Degradation)		<2	
		Loop-through loss	dB	<1,5	
		Return losses		> 12	
<b>General</b>		Impedance	ohm	75	
		Powering	Vdc	24	
		Consumption	mA	350	
		Protection index	IP	20	

## TOX HEANDEND EQUIPMENT. MATV

## A/V MODULATOR TWIN T.0X

## PRODUCT RANGE

## REF. DESCRIPTION

5806 A/V MODULATOR TWIN

Ref. 5806 features two A/V inputs (modules A and B) which generate two independent output channels. The A/V inputs for each module are modulated according to the TV standard in an IF of 38.9 Mhz. The modulated IF signal is converted to any channel or frequency between 46 and 862 Mhz.

- ▶ VSB output
  - ▶ Audio and video parameters configurable to set the signal in any standard.
- ▶ 9 possible channel tables : CCIR N.Z. Ind, China Taiwan, Chile M/N, Italy, France, Russia (OIR), Ireland, South Africa, Poland and Australia.
- ▶ Test socket (-30 dB) , located in the upper part of the front panel.



▲ 5806

References	5806			
<b>Video</b>	Bandwidth	0,00005 ... 5 MHz	Differential phase	< 4°
	input level (75 ohm)	1 Vpp	Chroma/luma Delay	< 100 ns
	Modulation depth	72,5 ... 90 %	Chroma/luma Delay	> 52 dB
	Differential gain	< 4 %	Flatness	< +1 dB
<b>Audio</b>	Bandwidth	0,04 ... 15 KHz	S/N Ratio	> 45 dB
	Impedance	10000 ohm	Flatness	< ±1 dB
	Pre-emphasis	0 μS	Input level	>-15 <7 dBm
	Deviation (1KHz/1.7Vpp input)	program. (see table)	Distortion (1KHz dev. ± 30KHz)	< 1 %
<b>RF Output</b>	Output frequency	46 ... 862 MHz	Return loss	10 dB (14 typ)
	Impedance	75 ohm.)	Audio carrier precision	VHF < 25 KHz
	Output level	80 ± 5 dBμV		UHF < 50 KHz
	Regulation margin	> 15 dB	Video carrier precision	VHF < 15 KHz
	Level stability	± 3 dB		UHF < 30 KHz
	Pa/Pv distance	-12, -16 (prog.)	Carrier ratio (MHz):	4,5 / 5,5 / 6 / 6,5
	IF Frequency	38,9 MHz	Band spurious level 46 ... 862MHz:	55 dBc min. > 60 dBc typ
	Frequency steps	250 KHz (prog.)		
	C/N (5 MHz)	> 56 dB	Through losses (46 - 862 MHz):	< 1.5 dB
<b>General</b>	Power supply	24 V	Protection index	IP20
	Consumption 24 V	300 mA		

TOX HEANDEND EQUIPMENT. CDC

CDC IP/GPRS T.OX

PRODUCT RANGE	
REF. DESCRIPTION	
5559	CDC IP
555901	CDC IP GSM/GPRS

Device that allows remote control and monitoring of a T.OX Televés headend. Ref. 5559 uses a 10/100 Mbps ethernet interface and Ref. 555901 has a GSM/GPRS internal modem.

- ▶ Headend's management and monitoring uses a centralize system " Televés Services ". The portal is located in our headquar- ters. Access is granted previous identification.
- ▶ Built-in RISC Micro under GNU/Linux OS assures 100% reliability when managing external interfaces end protocols.

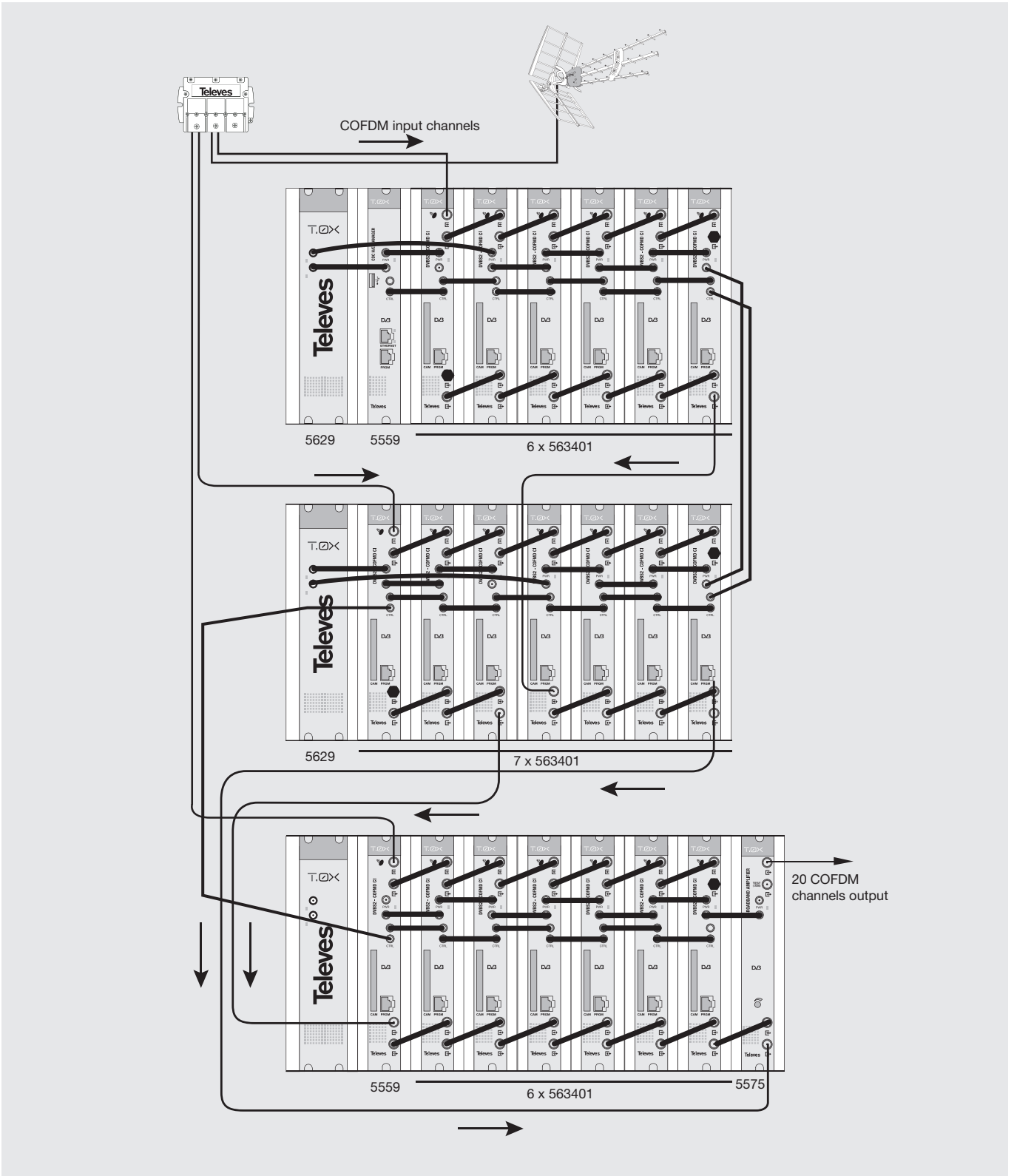


▲ 5559/555901

References		5559/555901				
<b>Firmware</b>	Operating system		Linux Kernel 2.6.16			
	Boot manager		U-boot 1.1.3.			
	File system		jffs2			
<b>Hardware</b>	Radio GSM/GPRS (only ref. 555901)	Frequency	MHz	GSM	850/900	
				DCS	1.800	
				PCS	1.900	
		Bandwidth		EGSM	80	
				GSM	150	
				DCS	170	
		Transmission power		PCS	140	
				dBm	GSM	+33
					DCS	+30
	PCS	+30				
	Sensitivity	GSM	-107			
		DCS	-106			
		PCS	-106			
	CPU		AT91RM9200			
	Memory	Flash	MB	8		
SD RAM		64				
NAND Flash		128 X 8bit				
Connexions	USB		2.0 Full Speed Host (12 Mbps)			
	RJ45 1		Ethernet 10/100 Base-T			
	RJ45 2		Remote PCT-5.0			
	SIM		Card reader			
	F (only ref. 555901)		Antenna GSM/GPRS (only ref. 555901)			
<b>General</b>	Powering	Vdc	24			
	Consumption	mA	220 (ref. 5559) / 292 (ref. 555901)			
	Protection Index	IP	20			

TOX HEANDEND EQUIPMENT

MATV APPLICATION

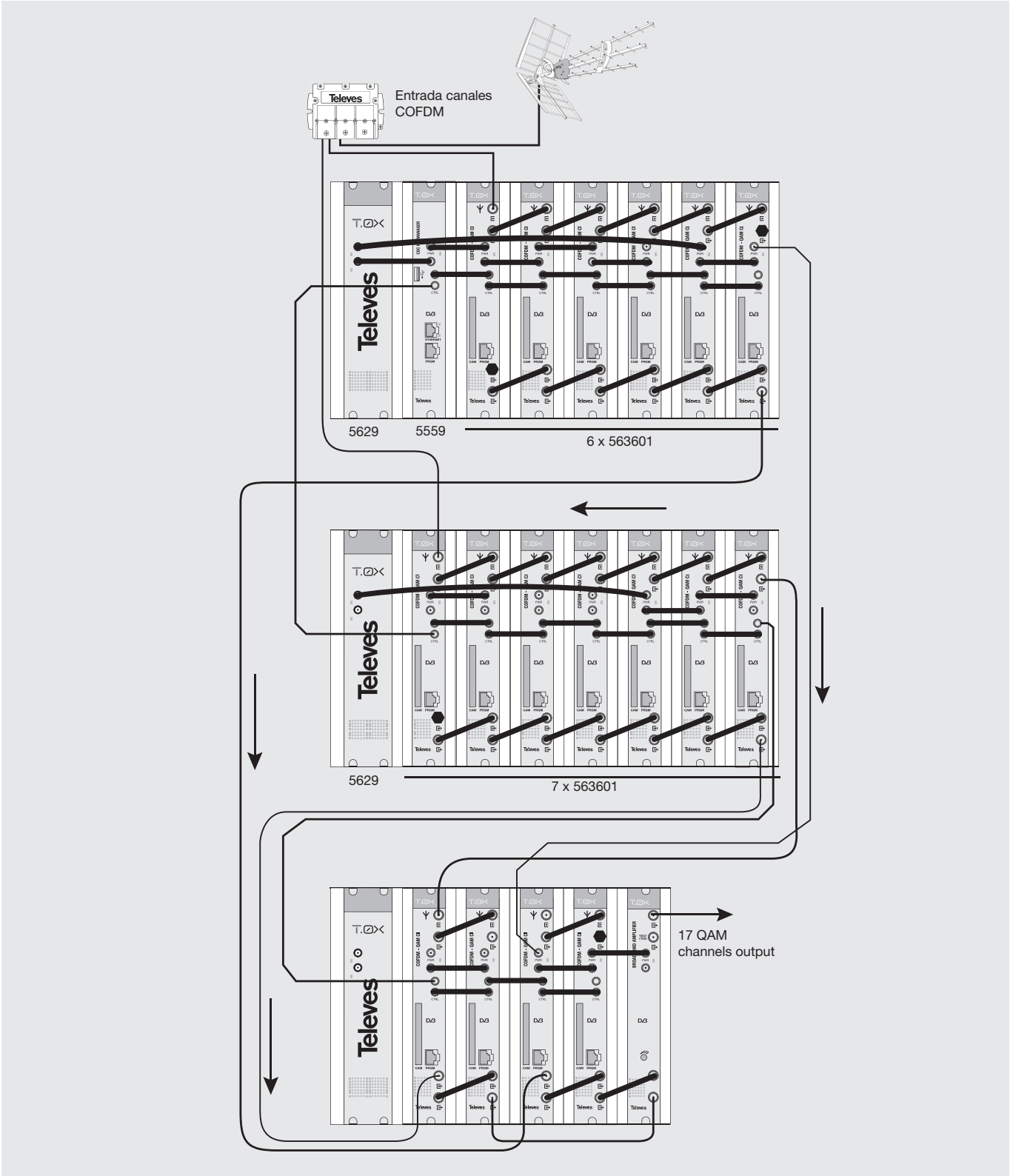


COFDM channels input, 20 COFDM channels output.

▲ 563401

TOX HEANDEND EQUIPMENT. MATV

MATV APPLICATION



COFDM channels input, 17 QAM channels output.

## T05 HEANDEND EQUIPMENT

## CDC system

## PRODUCT RANGE

Ref. DeSCRIPTION

5059 Headend controller CDC

## System accessories

502905 PSU

5075 Hybrid amplifier MATV

2168 PC programming Sw. + Accs.

7234 Universal Programming Unit

5837 Modem IP

## Mounting &amp; accessories

5071 Wall mount (10M+PSU)

5239 Wall mount (12M+PSU)

5301 19" Rack frame (10M+PSU)

5072 Lockable cabinet (10M+PSU)

5069 Lockable cabinet (14M+PSU)

5235 Lockable cabinet (22M+PSU)

5073 Blank plate

4061 F type 75 ohms load DC blocked



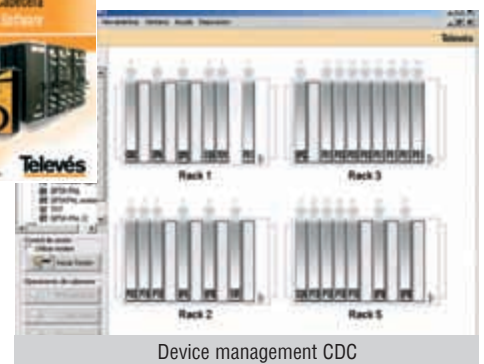
▲ 5059

The headend controller allows remote control of a headend by using an external modem connected to the phone line or local control by connecting a PC directly to the headend controller.

The offered services are:

- **Remote programming of devices.**
- **Headend's state monitorization**
- **Upload the configuration** of the headend from a PC.
- **Generate a private TV channel.**
- **State screen information** of the headend devices.

References		5059
<b>Devices management</b>		
Max. number of devices in the bus		254
Bus control		RS485, 3 thread
<b>OSD Management</b>		
Headend information screen		4 screen max.
Programmable data screen		4 screen max.
Delay between screens		programmable
<b>Modem connection</b>		
External modem		serie, compatible AT 9600 baud
Transmission speed		9600 baud
<b>RF VSB Output</b>		
Output frequency	MHz	46-862 (or list of channels)
Frequency steps	kHz	250
Max. output level	dBμV	80±5 (programmable)
USWR Output	dB	15
		14 typ.
Bypass losses		<1.5
Spurious	dBc	60 typ.
TV standard		PAL / NTSC
<b>General</b>		
Consumption	A (Vdc)	0.6 (5); 0.2 (15)



Device management CDC

REMOTE HEADEND CONTROLLER

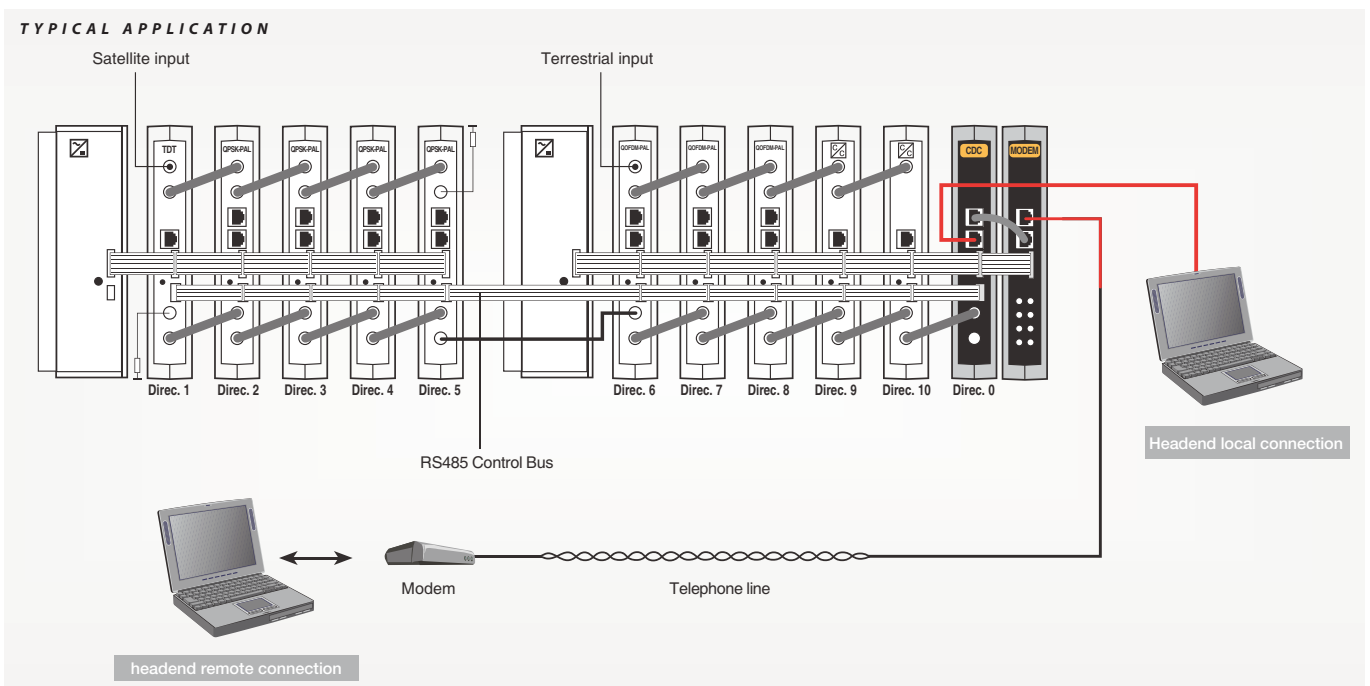
CDC System – Modem

PRODUCT RANGE	
Ref.	DeSCRIPTION
5837	IP Modem
5836	GSM Modem



References		5837
Serial Interface		RS232 (TX/RX)
Routing Buffer		12 Kbytes x 2
Ethernet Connection		10/100 BaseT
CDC Communication		RJ45 (RS232, TX/RX)
Consumption (5V)	mA	500

▲ 5837



T05 HEANDEND EQUIPMENT

**A/V - COFDM Modulator**

**PRODUCT RANGE**

Ref. DeSCRIPTION

5540	ASI - COFDM
5541	MPEG-2 QUAD encoder

Generates a DTT multiplex (COFDM) from 4 analogue A/V signals.



▲ 5541

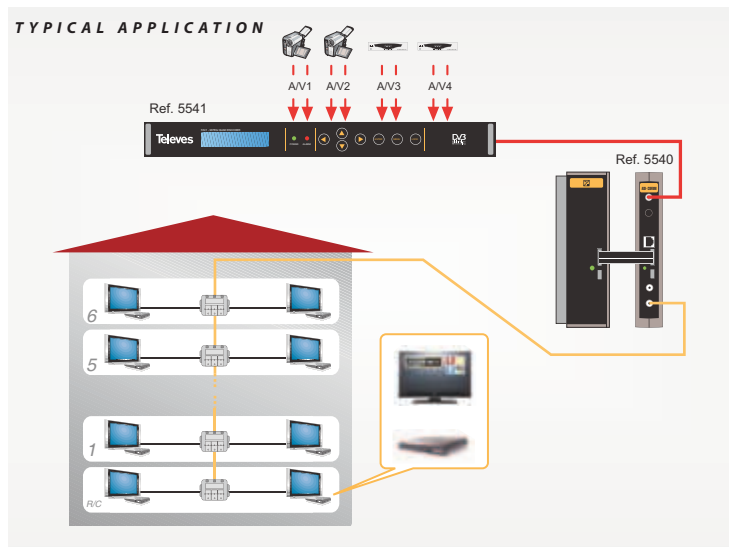


▲ 5540

Reference			5540
Standard			EN 50083-9
COFDM Modulation	Bandwidth	MHz	7-8
	Modulation		QPSK, 16QAM O 16 QAM
	IG	μS	1/4, 1/8, 1/16, 1/32
	FEC		1/2, 2/3, 3/4, 5/6, 7/8
Output	Frequency	MHz	117,5-226,5 / 474-858
	Offset	KHz	125 - 166
Power Supply	Powering	Vdc	5 - 15 - 18
	Consumption	mA	350(5V)-175(15V)-70 (18V)

- Adapts analogue signals to DTT receiver/tv sets.
- Control of the input signals degree of compression using the MPEG2 encoder (ref. 5541).
- The A/V inputs are fully independent, allowing for different degrees of quality depending on the service (sports, news, etc)
- Locally (front panel) or remotely (IP protocol) configurable.
- All-band output.

Reference			5541
Standard			ISO/ICE11172 ISO/ICE13818
Video	Codification		MPEG-2 MP@ML (4:2:0)
	Input		CVBS, S-VIDEO
	Bit Rate	Mbps	1,5 - 15
Audio	Codification		MPEG-1 Layer 1
	S.R.	KHz	32, 44.1, 48
Control			LCD + frontal keyboard Remote control SMNP
MPEG Output	ASI Bit Rate	Mbps	170
	Package		188/204
Power Supply	Powering	Vac	90-260
	Consumption	W	350(5V)-175(15V)-70 (18V)



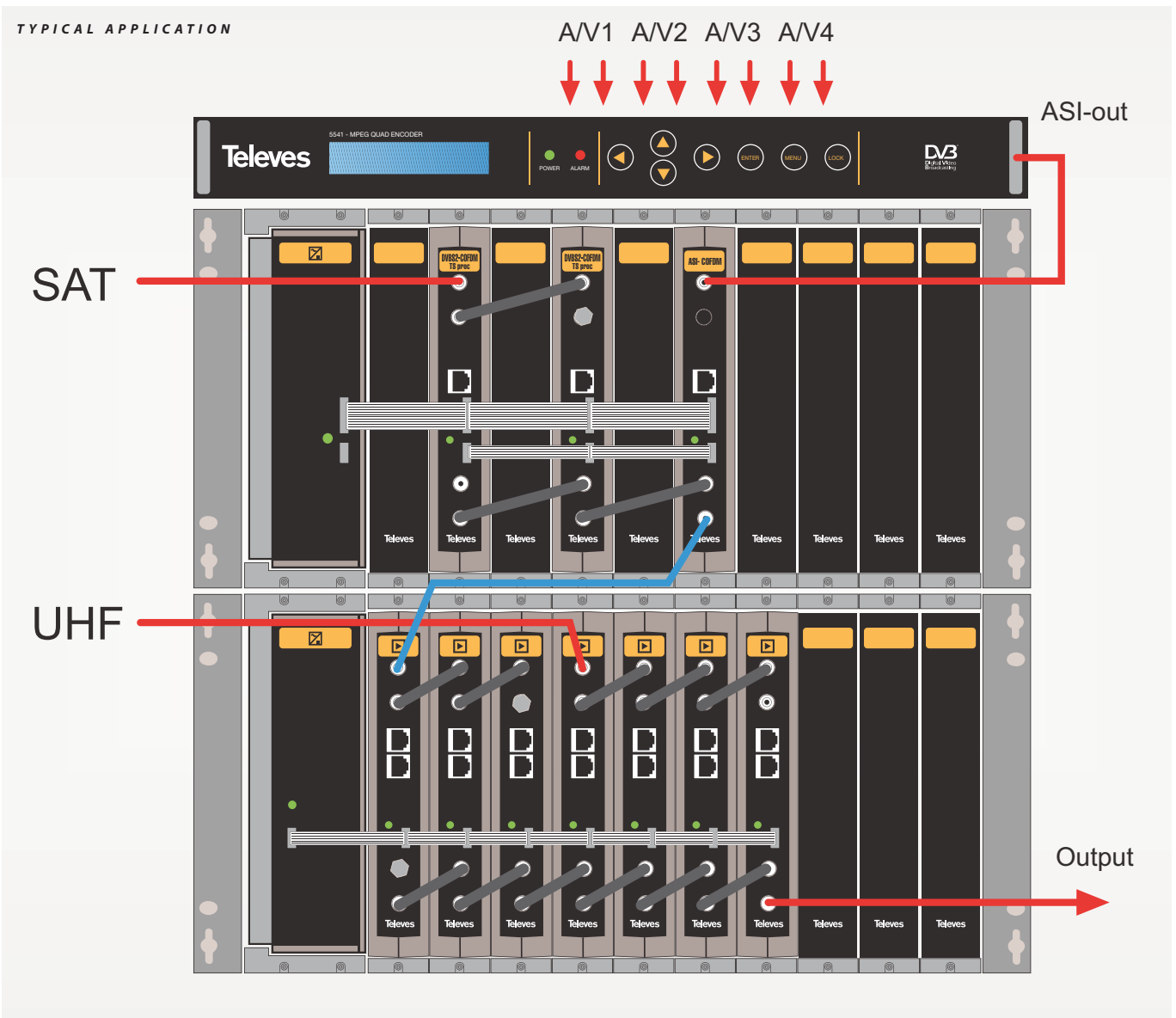


T05 HEANDEND EQUIPMENT

**A/V - COFDM Modulator**

Application example where 4 A/V analogue sources (cameras, DVD players...) are converted to a DTT multiplex that is then mixed with two additional TVSAT content multiplexes (DVB/S2-COFDM transmodulator ref. 5181).

These three COFDM multiplexes are amplified with T03 units and then mixed with the DTT signal received in the antenna resulting in a headend that permits the reception of analogue services and digital satellite contents in our DTT adapters/receivers.



T05 HEANDEND EQUIPMENT

Analogue / Digital Channel Processor

PRODUCT RANGE

Ref. DeSCRIPTION

5179 A/D Channel Processor

System accessories

502905 PSU

5075 Hybrid amplifier MATV

2168 PC programming Sw. + Accs.

7234 Universal Programming Unit

5837 Modem IP

Mounting & accessories

5071 Wall mount (10M+PSU)

5239 Wall mount (12M+PSU)

5301 19" Rack frame (10M+PSU)

5072 Lockable cabinet (10M+PSU)

5069 Lockable cabinet (14M+PSU)

5235 Lockable cabinet (22M+PSU)

5073 Blank plate

4061 F type 75 ohms load DC blocked

References		5179
<b>Input</b>		
Input frequency range	MHz	46...862
Frequency steps	KHz	D:166.66/125 A:250
Input level	dBµV	50-82 (AGC)
Input loop-through loss	dB	0±3
<b>Output</b>		
Output frequency range	MHz	46...862
Frequency steps	KHz	D:166.66/125 A: 250
Max. output level	dBµV	80±5
Regulation margin		15
Return loss		>10
Slope adjustment	dB	±3
Output Loop-through loss		<1.5
Equivalent noise degradation (END)		<2
<b>General</b>		
Consumption	mA (Vdc)	500 (5); 150 (15)
Preamplifier power	Vdc	12/24 (UHF in)
Dimensions	mm	35x197x163

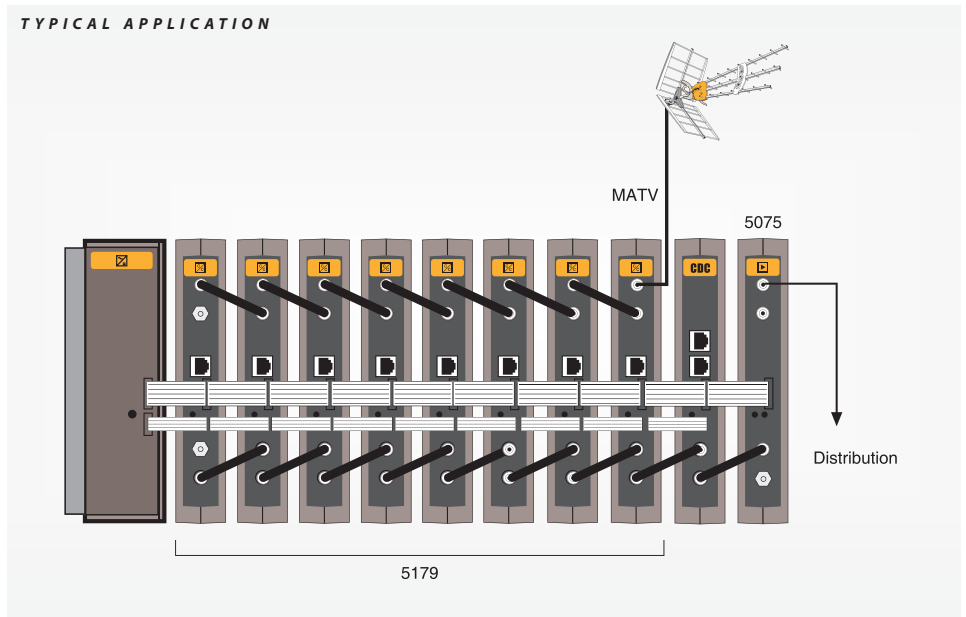


▲ 5179

Analogue & digital channel processor allowing the conversion or just processing of both digital & analogue channels. Fully input/output agile through the full VHF & UHF band. The product can also be used as channel processor using same input/output channel. The input AGC guarantees a stable output level.

Programmable parameters:

- Freq./Channel (Input / output).
- Output level
- Converter/Amplifier
- Channel slope.
- Analogue/Digital mode.
- Input bandwidth 7/8 MHz
- Remotely controllable via CDC



T05 HEANDEND EQUIPMENT

COFDM-PAL

**CONTROL MODE**  
via modem PC

PRODUCT RANGE	
Ref.	DeSCRIPTION
505403	COFDM-PAL
504403	COFDM-PAL stereo

System accessories	
502905	PSU
5075	Hybrid amplifier MATV
2168	PC programming Sw. + Accs.
7234	Universal Programming Unit
5837	Modem IP
Mounting & accessories	
5071	Wall mount (10M+PSU)
5239	Wall mount (12M+PSU)
5301	19" Rack frame (10M+PSU)
5072	Lockable cabinet (10M+PSU)
5069	Lockable cabinet (14M+PSU)
5235	Lockable cabinet (22M+PSU)
5073	Blank plate
4061	F type 75 ohms load DC blocked

References		505403 / 504403
<b>COFDM demodulator</b>		
Input through losses	dB	1,2
Input frequency	MHz	174-230 / 474-858 (or channel tables)
Frequency steps		1
Locking margin		±3
Input level	dBµV	49 to 89 (8k; 64 QAM; FEC 2/3)
Return losses	dB	>12 (46-862 MHz)
Bandwidth filter SAW	MHz	7 - 8 programmable
FFT		2k; 8k
Constellation		QPSK; 16QAM; 64 QAM
Guard interval		1/4; 1/8; 1/16; 1/32
Viterbi rate		1/2; 2/3; 3/4; 5/6; 7/8
Max. symbol rate	Mbaud	31.67
<b>MPEG Decoder</b>		
Input format		TS MPEG-2/DVB
Decoding		MP@ML
TS input rate	Mbps	60 max.
Video rate		1.5 to 15
Video resolution		Max. 720x576
Video output		composite PAL
<b>RF VSB Output</b>		
Output frequency	MHz	46-862 (or channel tables)
Frequency steps	KHz	250
Max. Output level	dBµV	80±5
Variable gain		15
Return losses	dB	14 typ.
Through losses		<1.5
Spurious band level	dBc	60 typ.
<b>General</b>		
Consumption	A (Vdc)	1.2 (5) / 0.4 (15)
Preamplifier PSU	mA	50 (0-12-24Vdc, prog.)
Dimensions	mm	35x197x163

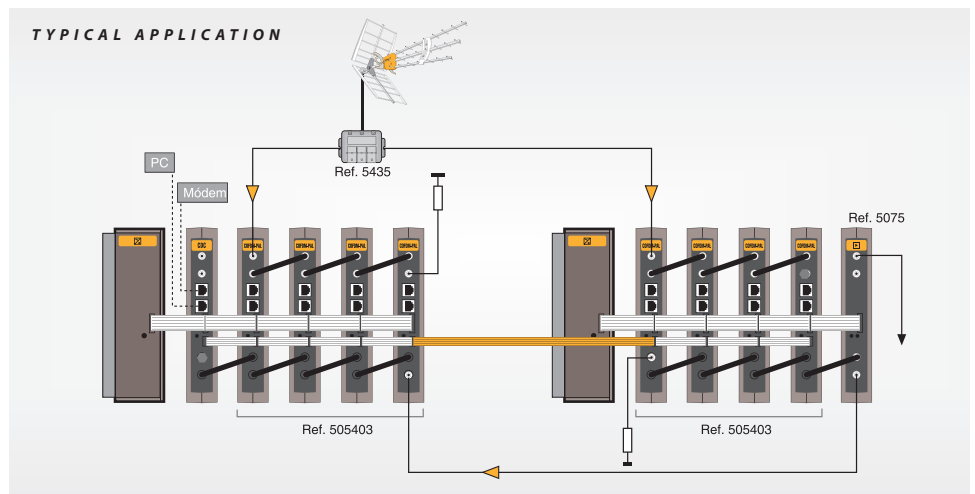


▲ 505403

Transforms a terrestrial digital channel to an analogue channel either in VHF or UHF.

**Programmables parameters:**

- Input and output channel.
- Output level.
- Video and Audio program selection.
- Video modulation index.
- Audio deviation.
- Audio carrier frequency.
- A/V ratio
- Remotely controllable via the CDC.



T05 HEANDEND EQUIPMENT

COFDM-PAL CI

**CONTROL MODE**  
via modem PC

PRODUCT RANGE	
Ref.	DeSCRIPTION

5544 COFDM-PAL CI

**Main features**

- Transmodulator with slot for CAM module.
- Generates an analogue channel from a scrambled MPEG2 DVBT service.
- The generated channel is single side band, allowing the configuration of adjacent channels within 46 and 862 MHz.
- Generates DVB and teletext subtitles.
- Both local and remote configuration & control capability.
- Monitor menu with quality measures (CBER) of the input signal.

**Advantages**

The COFDM-PAL transmodulator with Common Interface allows to:

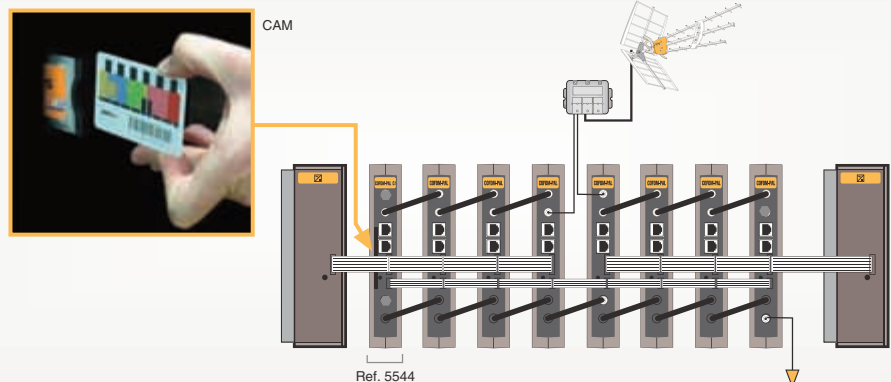
- Integrate paid-tv services in a free-tv headend, making both free and paid DTT compatible with every television so it is not necessary to replace the analogue TV sets.
- Used in headend for hotels, hospitals, etc... allows to keep the current CRT TV sets already installed.
- Protects of possible robberies of flat TV sets
- Only one remote control, same TV and same channel list than before the analogue switch off. Very suitable in installations where the service is provided to elderly or handicapped people

References		5544
<b>COFDM demodulator</b>		
Input through losses	dB	1,2
Input frequency	MHz	174-230 / 474-858 (or channel tables)
Frequency steps		1
Locking margin		±3
Input level	dBµV	49 to 89 (8k; 64 QAM; FEC 2/3)
Return losses	dB	>12 (46-862 MHz)
Bandwidth filter SAW	MHz	7 - 8 programmable
FFT		2k; 8k
Constellation		QPSK; 16QAM; 64 QAM
Guard interval		1/4; 1/8; 1/16; 1/32
Viterbi rate		1/2; 2/3; 3/4; 5/6; 7/8
Max. symbol rate	Mbaud	31.67
<b>MPEG Decoder</b>		
Input format		TS MPEG-2/DVB
Decoding		MP@ML
TS input rate	Mbps	90 max.
Video rate		1.5 to 15
Video resolution		Max. 720x576
Video output		composite PAL
<b>RF VSB Output</b>		
Output frequency	MHz	46-862 (or channel tables)
Frequency steps	KHz	250
Max. Output level	dBµV	80±5
Variable gain		15
Return losses	dB	10 min. 14 typ.
Through losses		<1.5
Spurious band level	dBc	60 typ.
<b>General</b>		
Consumption	A (Vdc)	0.7 (5)w/o CAM/0.95 (15)w/CAM
Preamplifier PSU	mA	50 (0-12-24Vdc, prog.)
Dimensions	mm	35x197x163



▲ 5544

**TYPICAL APPLICATION**



T05 HEANDEND EQUIPMENT

IF / IF processors

**CONTROL MODE**  
via modem PC

**PRODUCT RANGE**

Ref.	DeSCRIPTION
586301	Single IF processor DVBS2
586401	Triple IF processor DVBS2

**System accessories**

502905	PSU
5075	Hybrid amplifier MATV
2168	PC programming Sw. + Accs.
7234	Universal Programming Unit
5837	Modem IP

**Mounting & accessories**

5071	Wall mount (10M+PSU)
5239	Wall mount (12M+PSU)
5301	19" Rack frame (10M+PSU)
5072	Lockable cabinet (10M+PSU)
5069	Lockable cabinet (14M+PSU)
5235	Lockable cabinet (22M+PSU)
5073	Blank plate
4061	F type 75 ohms load DC blocked

References		586301	586401
Input freq. margin		950-2150	
Output freq. margin	MHz	950-2150	
Frequency steps		1	
Output impedance	$\Omega$	75	
Input return losses		>10	
Output return losses	dB	>10	
BW of the selected channel	MHz	10 a 72 (2 MHz steps)	
Input level		60 - 88	
Output level	dB $\mu$ V	75 $\pm$ 5	
Level regulator		Yes	
Powering LNB	Vdc	13/17 / OFF 22 KHz / OFF	
<b>General</b>			
Max. consumption	mA	5V:550 15V:50	5V:1100 15V:50
Protection index		IP 20	

**IF AMPLIFIER**

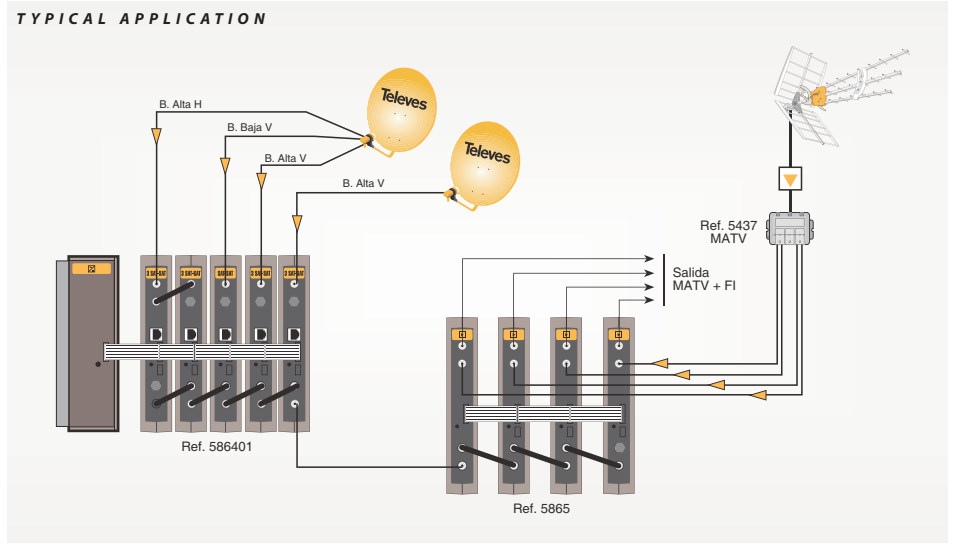
References		5865
Frequency range	MHz	950--2150
Gain (950 MHz)		35 $\pm$ 2
Gain (2150 MHz)	dB	40 $\pm$ 3
Adjustable margin		20
Output voltage (2 tones -35dB)	dB $\mu$ V	>123
Connector		"F"
Powering	Vdc	15
Consumption	mA(vdc)	200(15)



▲ 586301

**Programmable parameters:**

- Modular and programmable satellite system.
- Allows the selection of any channel in the IFband to be shifted into another channel inside the band.
- Remotely controllable via the CDC.



T05 HEANDEND EQUIPMENT

**MATV Hybrid amplifier**

**PRODUCT RANGE**

Ref. DeSCRIPTION

5075 MATV Hybrid amplifier

Hybrid amplifier for headend equipment. Provided with 2 inputs to mix its output with channels coming from different systems.

References		5075	
Frequency range		MHz	47-862
Gain		dB	45±2
Gain regulation			20
Output level	DIN 45004-B	dBµV	120
	IMD3 (-60 dB, 2c)		117
	IMD2 (-60 dB, 2c)		111
	CTB (-60 dB, 42c)		105
	CSO (-60 dB, 42c)		105
	XMOD (-60 dB, 42c)		105
Noise figure		dB	<10
<b>General</b>			
Powering voltage		Vdc	15
Consumption		A	0.8
Dimensions		mm	35x197x163



▲ 5075

**PSU**

**PRODUCT RANGE**

Ref. DeSCRIPTION

502905 Switched PSU T-03/T-05

5030 Switched PSU T-03 / T-05 110Vac UL

5498 Switched PSU T-03

Switched PSU for the T03 and T05 range.

References		502905 / 5030 *					5498
Mains voltage	Vac	230±15					
Frequency	Hz	50/60					
Output voltage	Vdc	24	18	15	5	24	
Max. output current	A	0.55	0.8	4.2 <sup>(*)</sup>	6.6	2.5	
Max. output powering	W	13.2	14.4	63 <sup>(*)</sup>	33	60	
Dimensions	mm	56x197x163				55x197x83	

\*24 and/or 18V voltage are obtained from 63W (15V) PSU



▲ 502905



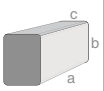
HEADEND EQUIPMENT

Cabinets and supports

PRODUCT RANGE

Ref. DeSCRIPTION

5071	Wall mount (10M+PSU)
5239	Wall mount (12M+PSU)
5301	19" Rack frame (10M+PSU)
5072	Lockable cabinet (10M+PSU)
507202	Lockable cabinet T0X (7M+PSU) with ventilation
5069	Lockable cabinet (14M+PSU)
5235	Lockable cabinet (22M+PSU)
5334	T03/T05 Ventilation system
5750	Outdoor cabinet
5331	19" Rack cabinet (30M) + accessories
5332	19" Rack cabinet (40M) + accessories

References	5072	5069	5235	5750
	a 610	760	1060	440
	b	295		440
	c	235		140

5071/5239



▲ 5071/5239

Ref.5069  
Compatible



▲ 5334

new



▲ 5750



▲ 5069/5235/5072



▲ 5301

Accessories

PRODUCT RANGE

Ref. DeSCRIPTION

5073	Blank plate T05
5673	Blank plate T0X
4061	F type 75 ohms load DC blocked
5074	Link F connector
4221	Power injector
7234	Universal programmer
4947	Coaxial surge arrester
422601	Power lead for T0X with T05 PSU
422602	Data lead for T0X with T05 CDC



▲ 4947



▲ 7234



▲ 5073



▲ 4061



▲ 5074



▲ 4221

MULTISWITCHES

Splitters and LNB switches

**PRODUCT RANGE**  
Ref. DeSCRIPTION

- 7268 DiSEqC 2in/1out switch
- 7269 DiSEqC 4in/1out switch

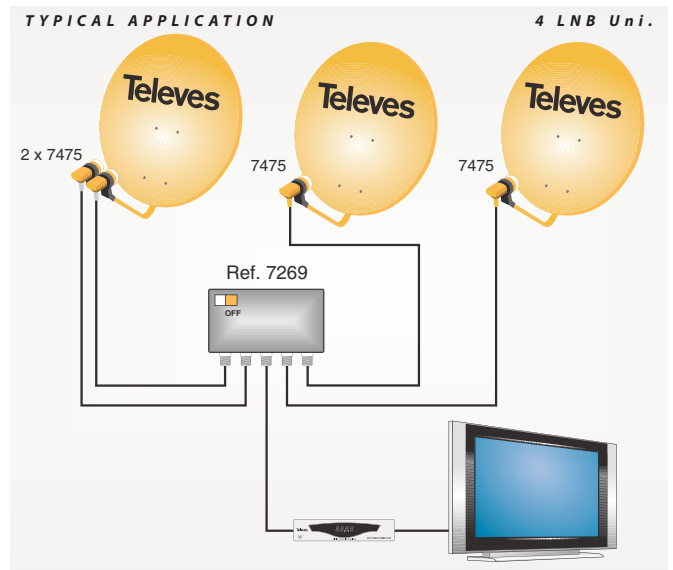
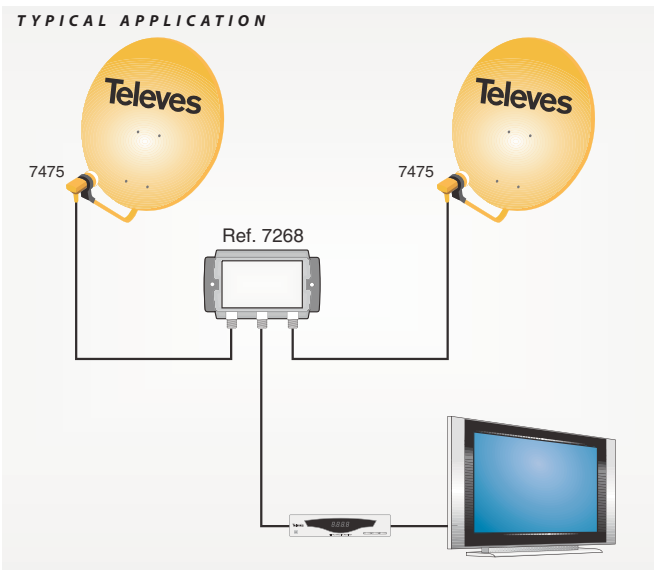
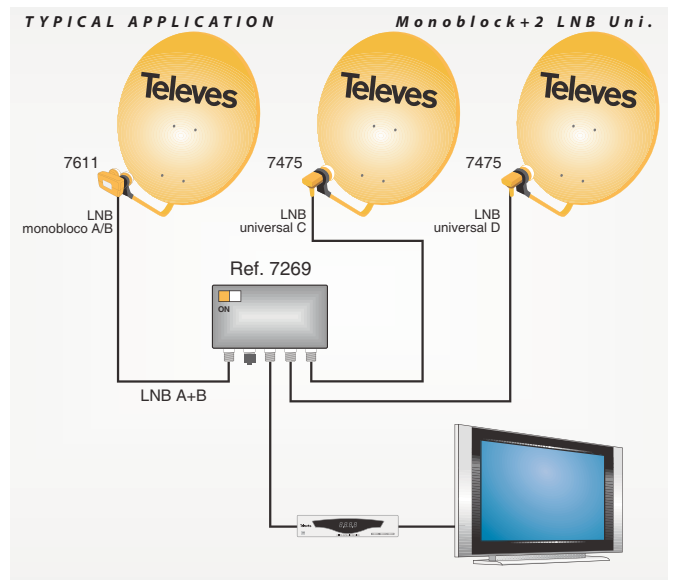


▲ 7268



▲ 7269

References		7268	7269
Bandwidth	MHz	0--2400	5--2150
Switching type		DiSEqC 2.0	DiSEqC 2.0
IF through losses	dB	<1.5	<6
RF through losses		<1.5	<6
Input rejection		>20	>20
Max. current bypass	mA	250	290
Powering	Vdc	12-20	12-20
Dimensions	mm	95x75x26	137x130x56





MULTISWITCHES

## Universal Multimat System

**PRODUCT RANGE**

Ref. DeSCRIPTION

7101	Main multiswitch
7102	MATV/IF passive combiner 13 dB
7108	MATV/IF passive combiner 9 dB
7109	MATV/IF passive combiner 17 dB
7110	MATV/IF passive combiner 21 dB
7103	Multimat PSU
7104	Multimat IF amplifier
7105	F terminal load block
7106	F connector block
7107	F terminal load DC block



▲ 7107



▲ 7101



▲ 7105

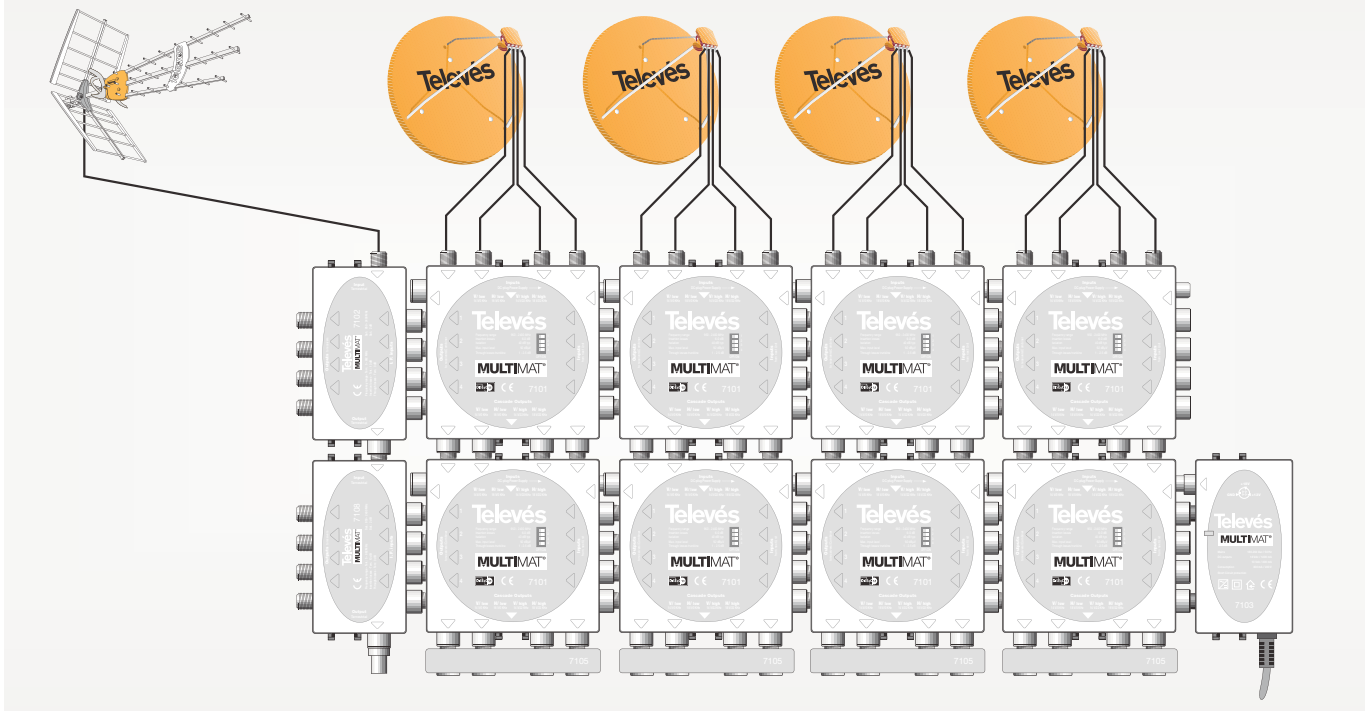


▲ 7106



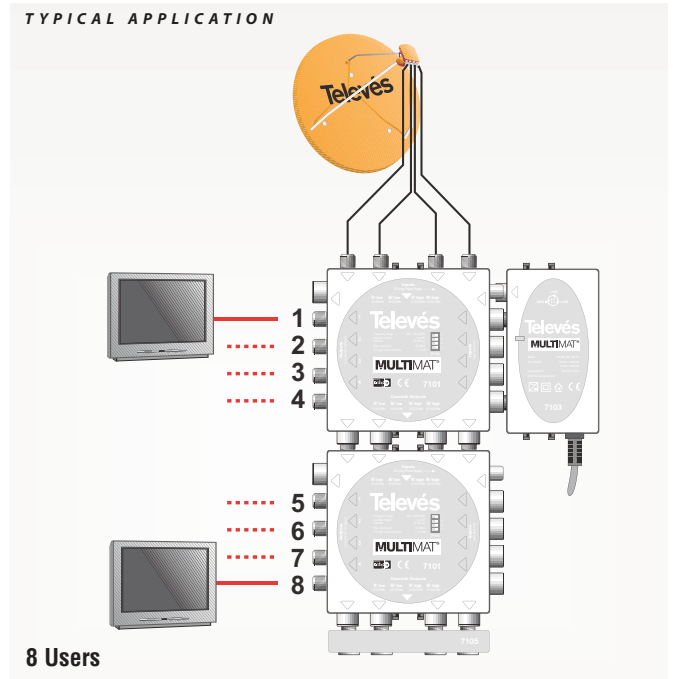
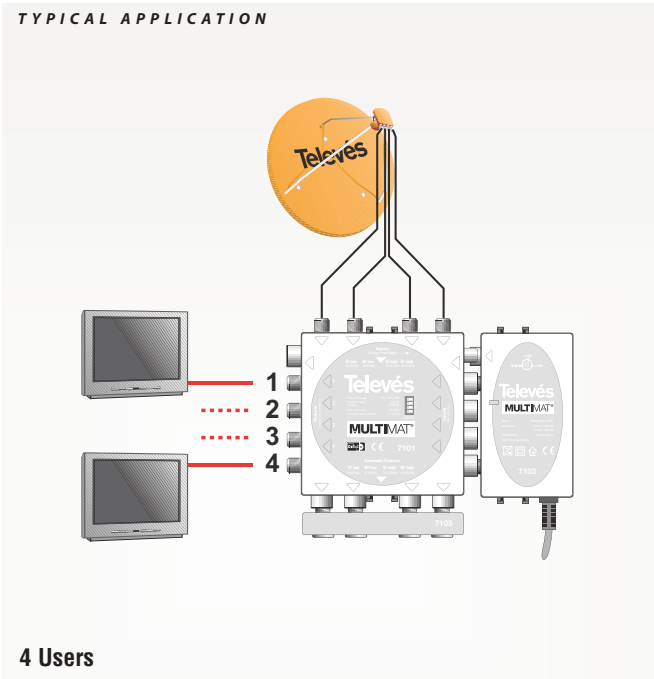
▲ 7104

**TYPICAL APPLICATION**

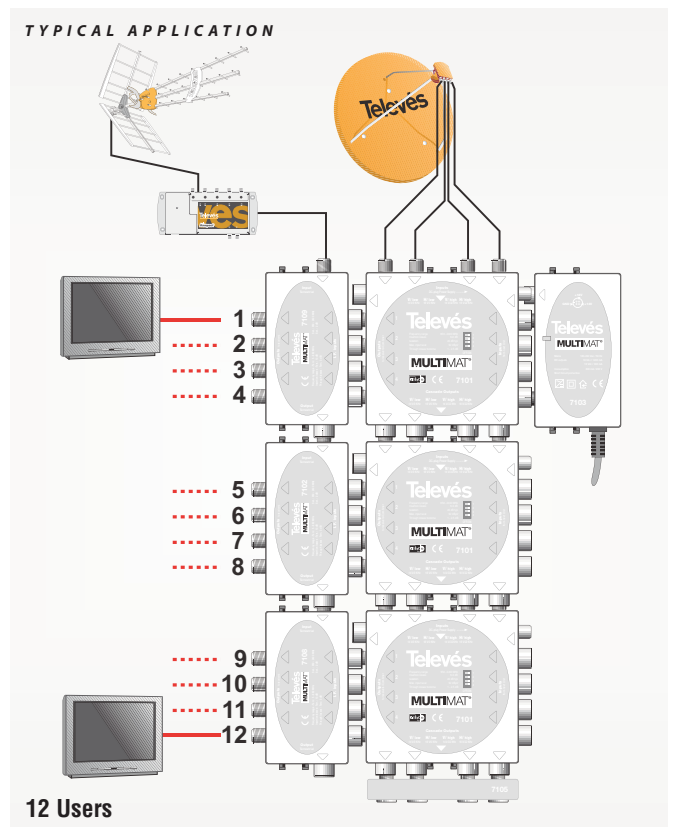
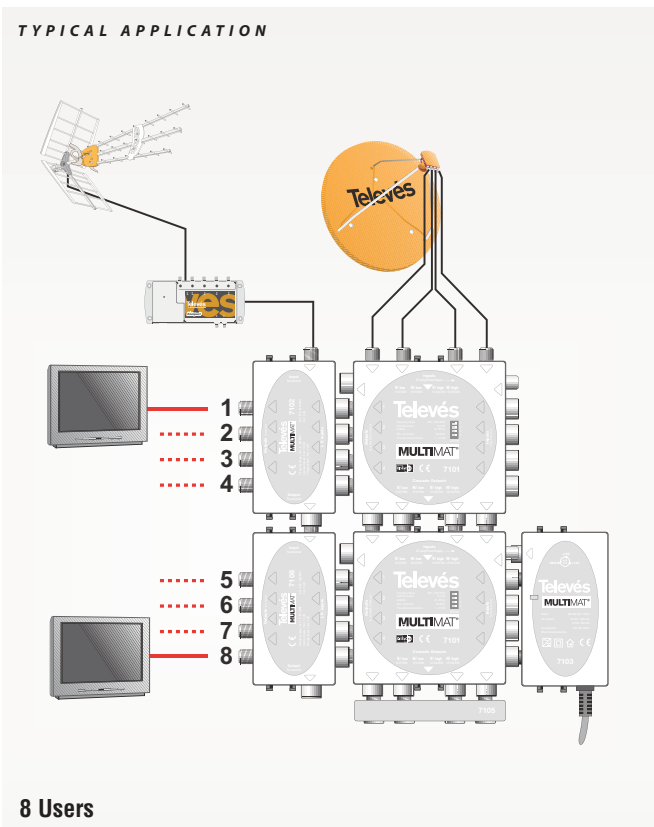


MULTISWITCHES

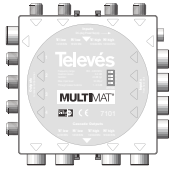
Star distribution



Star distribution + MATV



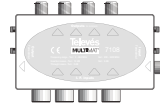
MULTISWITCHES



References		7101	
No. inputs (SAT)		No	4
No. outputs	for receivers	No	4
	for cascading		4
	for expansion		4
Frequency range	MHz		950
Through losses	Receiver output	dB	< 6
	Cascade output		< 2
	Expansion output		< 1
Isolation	Between inputs		35
	High band - Low band	35	
Input return losses		8	
Max. input level		dB $\mu$ V	92
Max. output level for receiver			89
Max. DC current consumption for receiver		mA	65
Max. DC bypass current			1200
Switching selection voltage V/H		Vdc	15.5
Switching voltage selection high band		22 KHz	
Selection inputs from extension		DiSEqC 1.1	
Max. No. of connected extensions		No	4
Max. No. of inputs			16
LNB powering mode		External	
Recommended PSU (switched-mode)		Vdc/A	18 / 1.2
			13 / 0.3
Dimensions		mm	115x115x33



References		7104	
Nº de inputs SAT		Nº	4
Nº de outputs			4
Frequency range		MHz	950 - 2400
Gain	@ 950 MHz	dB	3.5 $\pm$ 0.5
	@ 2000 MHz		8.5 $\pm$ 0.5
	@ 2400 MHz		9.5 $\pm$ 0.5
Isolation trunkline	>45		
Return-loss inputs		>10	
Return-loss outputs		>10	
Max. input level		dB $\mu$ V	95
Max. output level			105
Max. current consumption (from SMPS)		mA	4 x 25
Max. bypass current		A	1.2
Dimensions		mm	97x70x33



References		7108	7102	7109	7110		
No. inputs VHF/UHF passive		1	1	1	1		
No. outputs	for receivers	No	4	4	4		
	for cascading		1	1	1		
	for expansion		4	4	4		
Frequency range	MHz		5 - 860				
Through-Loss Cascade output	MATV	dB	< 3				
	SAT		< 2				
Isolation	SAT - TV		dB	> 30			
	TV - SAT			> 35			
Tap losses for receiver	dB	9	13	17	21		
Dimensions	mm	115x70x33					



References		7103	
Mains voltage	Vac	180 - 264	
	Vdc	18 $\pm$ 5%	
		13 $\pm$ 5%	
	A(Vdc)	1.2 (18)	
		0.3 (13)	
Maximum power consumption	W	30	
	A(Vdc)	2 (18)	
		1 (13)	
EMI/EMC standard		EN55022 (B)	
Safety standard		EN60950	
Temperature range	°C	-20...+60	
Dimensions	mm	105x65x33	

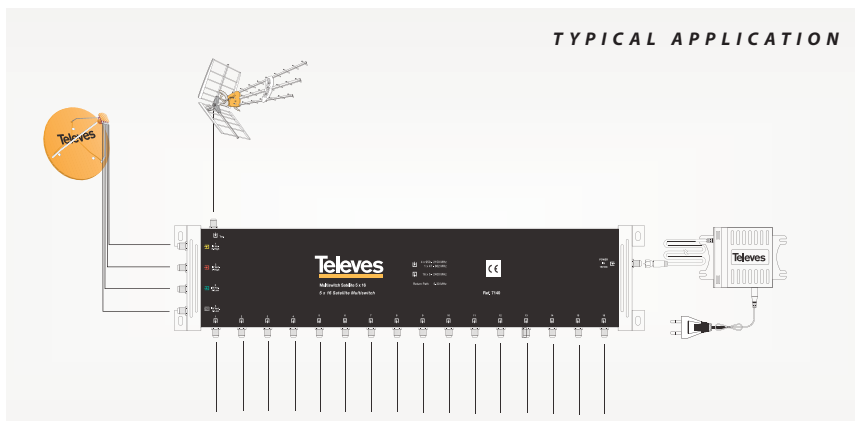
MULTISWITCHES

5 input stand alone

PRODUCT-RANGE	
Ref.	DeSCRIPTION
713601	5x4 Multiswitch
713701	5x6 Multiswitch
713801	5x8 Multiswitch
713901	5x12 Multiswitch
714001	5x16 Multiswitch
717001	5x24 Multiswitch
716901	5x32 Multiswitch
7321	PSU 1.6A
7328	PSU 3A



Power Supply Units			
References		7321	7328
Input voltage	Vac	180-264	
Mains frequency	Hz	47-63	
Output voltage	Vdc	12	
Max. out. current	mA	1600	3000



TYPICAL APPLICATION

Multiswitch specs		5x4	5x6	5x8	5x12	5x16	5x24	5x32
References		713601	713701	713801	713901	714001	717001	716901
Frequency range	SAT	950 - 2400						
	TER	47 - 862						
Input level	SAT	100						
	TER	100						
Tap Output level	SAT	100						
	TER	100						
Tap losses	SAT	5 gain	6 gain	6 gain	7 gain	3.5 gain	0±9	0±10
	TER	3	1	1.25	1	3	8±5	11±5
Isolation between inputs		60						
Isolation between outputs		20						
LNB powering	mA	300/input; 1200 (total)						
Powering voltage	Vac	230 / 12						
Maximum consumption	mA	40	40	40	120	110	70	70
Protection index	IP	20						

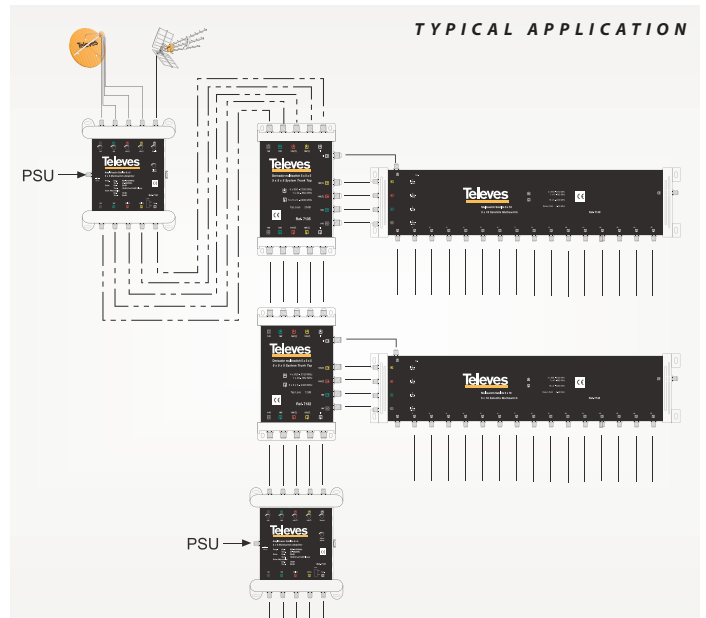
MULTISWITCHES

5 input cascade

PRODUCT RANGE

Ref.	DESCRIPTION
7132	12 dB Tap
7133	15 dB Tap
7134	20 dB Tap
7135	25 dB Tap
7131	5x5 Amplifier
717601	5x5x5 Splitter
7321	PSU 1.6A
7328	PSU 3A

- 4 to 16 Outputs
- Inputs labeled by colors
- Flexible and easy to install
- High input level
- Easy expansion via 4 outputs
- 5 Inputs with high output level
- Controllable gain
- Several powering options



Ref. 7131 - Amplifier 5x5			
Band		Satellite	Terrestrial
Freq. range	MHz	950-2400	47-862
Gain	dB	25±3	21.5±2
Regulation	dB	10	20
Slope	dB	-	7±3
Max. output level	dBµV	105	
Mains voltage	105	-	105
Consumption	105	-	300

Multiswitch specs			5x5			
References			7132	7133	7134	7135
Frequency range	SAT	MHz	950 - 2400			
	TER		47 - 862			
Input level	SAT	dBµV	-			
	TER		-			
Tap Output Level	SAT	dBµV	-			
	TER		-			
Through losses	SAT	dB	1.5		2	1
	TER		4	2.5	3	3
Tap Losses	SAT	dB	12	15	20	25
	TER		12	15	20	25
Isolation between inputs		dB	30			
Isolation between outputs			30			
LNB powering		mA	300/input; 1200 total			
Powering voltage		Vdc	230/12			
Max. consumption		mA	50			
Protection index		IP	20			

MULTISWITCHES

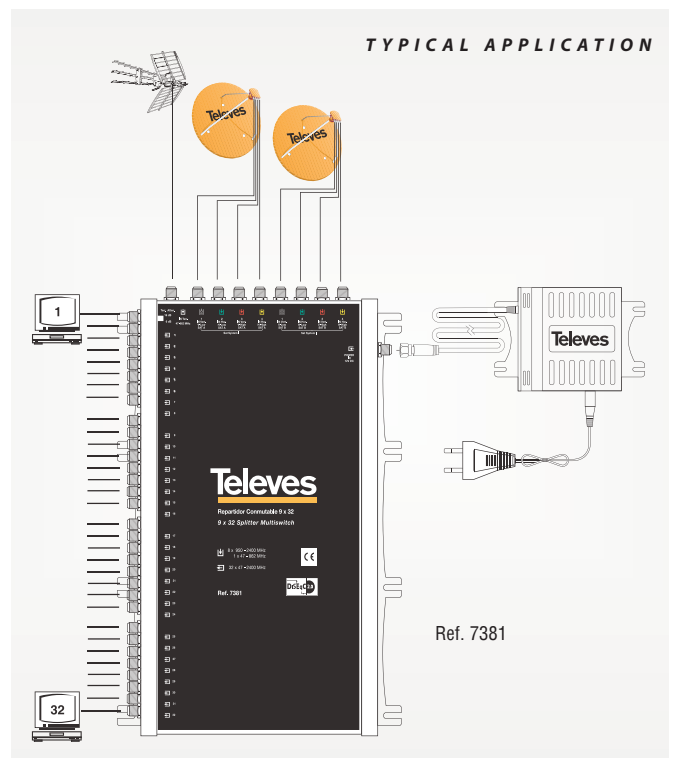
9 input stand alone

PRODUCT RANGE	
Ref.	DeSCRIPTION
7438	9x8 multiswitch
7430	9x12 multiswitch
7439	9x16 multiswitch
7379	9x24 multiswitch
7381	9x32 multiswitch
7321	PSU 1.6A
7328	PSU 3A



▲ 7379

Multiswitches		9x8	9x12	9x16	9x24	9x32
References		7438	7430	7439	7379	7381
Frequency range	SAT	950 - 2400				
	TER	47 - 862				
Input level	SAT	95				
	TER	89				
Tap output level	SAT	95				
	TER	89				
Tap losses	SAT	3	2	4	1	
	TER	2	3	5	SW P0: 13 SW P1: 4	
Isolation between inputs		35	30	40	30	35
Isolation between outputs		35	25	30	25	25
LNB powering		mA 300/input; 1200 total				
Powering voltage		Vac/Vdc 230 / 12				
Max. consumption		mA 50			160	
Protection index		IP 20				



TYPICAL APPLICATION

Ref. 7381

MULTISWITCHES

9 input cascade

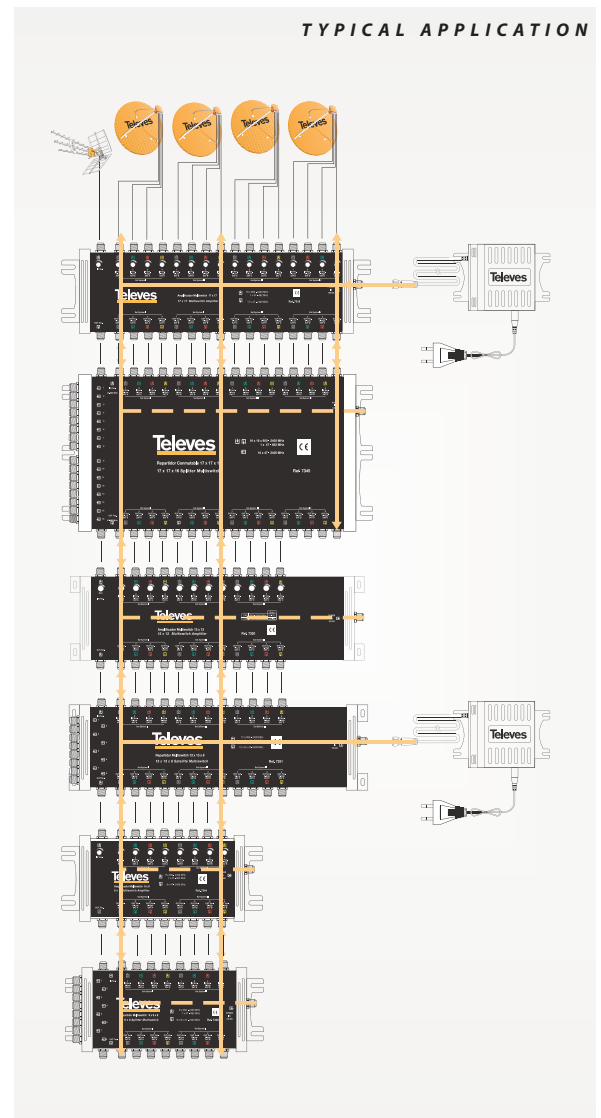
PRODUCT RANGE	
Ref.	DeSCRIPTION
7340	9x9x8 Multiswitch
7382	9x9x12 Multiswitch
7341	9x9x16 Multiswitch
7344	9x9 Amplifier
7321	Power Supply Unit
7328	Power Supply Unit



▲ 7341

Amplifier 9x9			
Reference		7344	
Frequency range	MHz	SAT	TER
		950 - 2400	88 - 862
Gain	dB	13/23	20/30
Regulation		9	7
Max. output level	dBμV	105	
Max. consumption	mA	500 (15 Vdc)	
Protection index	IP	20	

Multiswitch specs			9x9x8	9x9x12	9x9x16
References			7340	7382	7341
Frequency range	SAT	MHz	950 - 2400		
	TER		47 - 862		
Input level	SAT	dBμV	95		
	TER		89		
Tap Output Level	SAT	dBμV	95		
	TER		89		
Through losses	SAT	dB	3	4	4
	TER		3	4	4
Tap Losses	SAT	dB	1	2	2
	TER		6	8	10
Isolation between inputs			35	50	30
Isolation between outputs			35	35	35
LNB powering	mA		300/input; 1200 (total)		
Powering voltage	Vdc		230/12		
Max. consumption	mA		50		
Protection index	IP		20		



TYPICAL APPLICATION



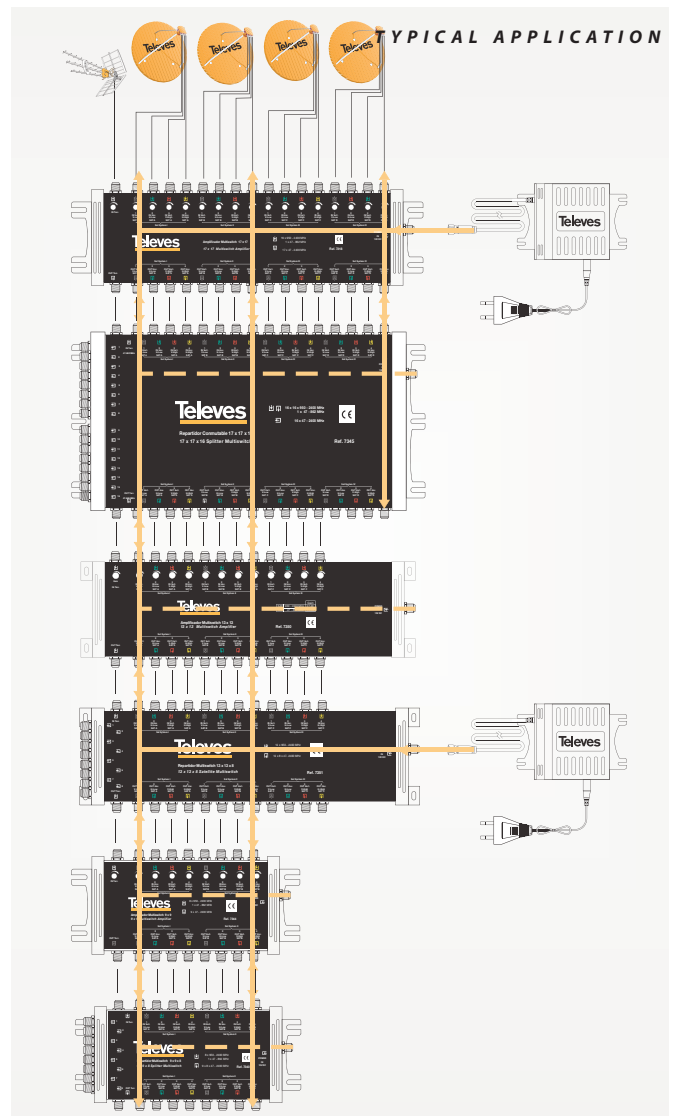
MULTISWITCHES

13 input stand alone

PRODUCT RANGE	
Ref.	DeSCRIPTION
7358	13x8 Multiswitch
7354	13x12 Multiswitch
7360	13x16 Multiswitch
7321	PSU 1.6A
7328	PSU 3A



Multiswitch specs		13x8	13x12	13x16
References		7358	7354	7360
Frequency range	SAT	950 - 2400		
	TER			
Input level	SAT	95		
	TER			
Tap output level	SAT	95		
	TER			
Tap losses	SAT	1	2	4
	TER	3	3	5
Isolation between inputs		40		
Isolation between outputs				
LNB powering	mA	300/input; 1200 total		
Powering voltage	Vac/Vdc	230 / 12		
Max. consumption	mA	50		
Protection index	IP	20		





MULTISWITCHES

13 input cascade

PRODUCT RANGE

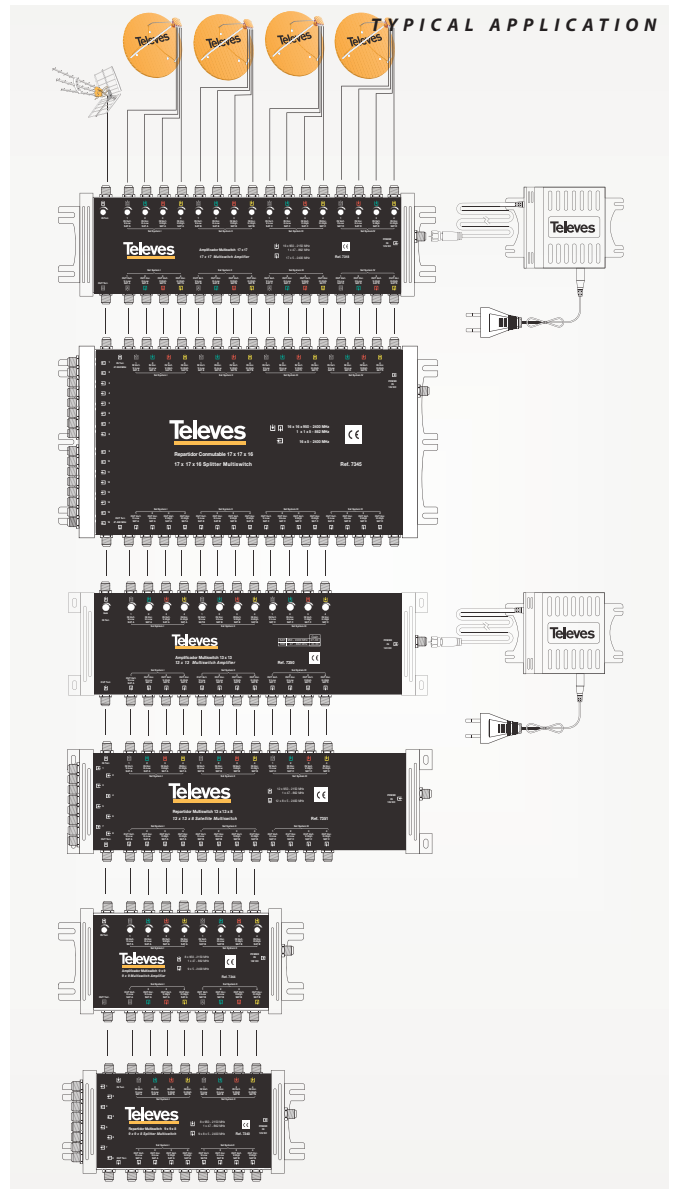
REF.	DESCRIPTION
7351	13x8 Multiswitch
7369	13x12 Multiswitch
7370	13x16 Multiswitch
7350	13x13 Amplifier
7321	Power Supply Unit
7328	Power Supply Unit



Amplifier 13x13

Reference		7350	
Frequency range	MHz	SAT	TER
		950 - 2400	47 - 862
Gain		27/30	24/30
Regulation	dB	10	7
Slope		-	10
Max. output level	dBμV	105	
Max. consumption	mA	560 (15 Vdc)	
Protection index	IP	20	

Multiswitch specs		13x13x8	13x13x12	13x13x16
References		7351	7369	7370
Frequency range	SAT	950 - 2400		
	TER			
Input level	SAT	95		
	TER	89		
Tap Output Level	SAT	95		
	TER	89		
Through losses	SAT	1	4	4
	TER	3	5	5
Tap Losses	SAT	6	2	2
	TER	0	8	8
Isolation between inputs	dB	50	40	50
Isolation between outputs		35		
LNB powering	mA	300/input; 1200 (total)		
Powering voltage	Vdc	230/12		
Max. consumption	mA	50		
Protection index	IP	20		



MULTISWITCHES

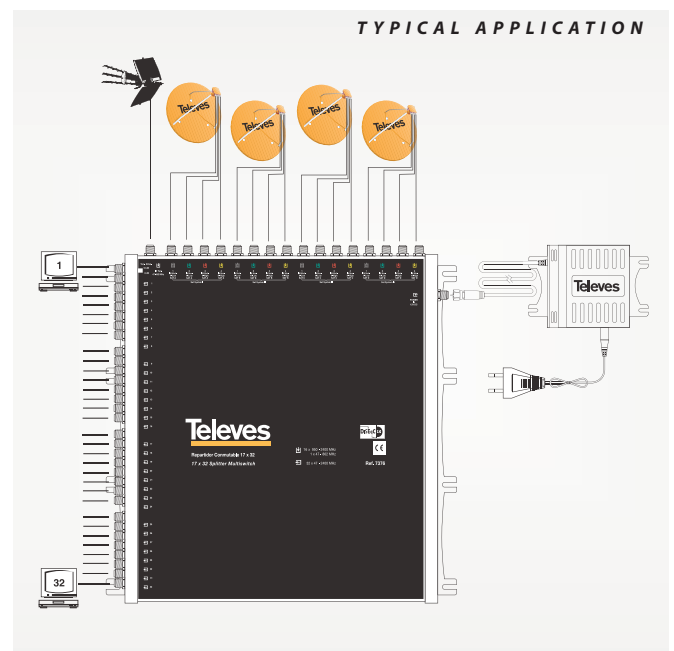
17 input stand alone

PRODUCT RANGE	
Ref.	DeSCRIPTION
7311	17x8 Multiswitch
7372	17x12 Multiswitch
7335	17x16 Multiswitch
7375	17x24 Multiswitch
7376	17x32 Multiswitch
7321	PSU 1.6A
7328	PSU 3A



▲ 7311

Multiswitch specs		17x8	17x12	17x16	17x24	17x32
References		7311	7372	7335	7375	7376
Frequency range	SAT	950 - 2400				
	TER	47 - 862				
Input level	SAT	95				
	TER	89				
Tap output level	SAT	95				
	TER	89				
Tap losses	SAT	1	3	2	1	
	TER	1	6	4	SW P0: 13 SW P1: 4	
Isolation between inputs		40	50	30	30	
Isolation between outputs		35	35	35	25	
LNB powering		300/input; 1200 total				
Powering voltage		230 / 12				
Max. consumption		50				
Protection index		20				



MULTISWITCHES

17 input cascade

**PRODUCT RANGE**  
Ref. DeSCRIPTION

7323	17x17x8 Multiswitch
7373	17x17x12 Multiswitch
7345	17x17x16 Multiswitch
7318	17x17 Amplifier
7321	PSU 1.6A
7328	PSU 3A

Amplifier 17x17			
References		7318	
Frequency range	MHz	SAT	TER
		950 - 2400	88 - 862
Gain	dB	12/21	24/32
		9	8
Regulation			
Max. output level	dBµV	105	
Max. consumption	mA	560 (15 Vdc)	
Protection in ex	IP	20	

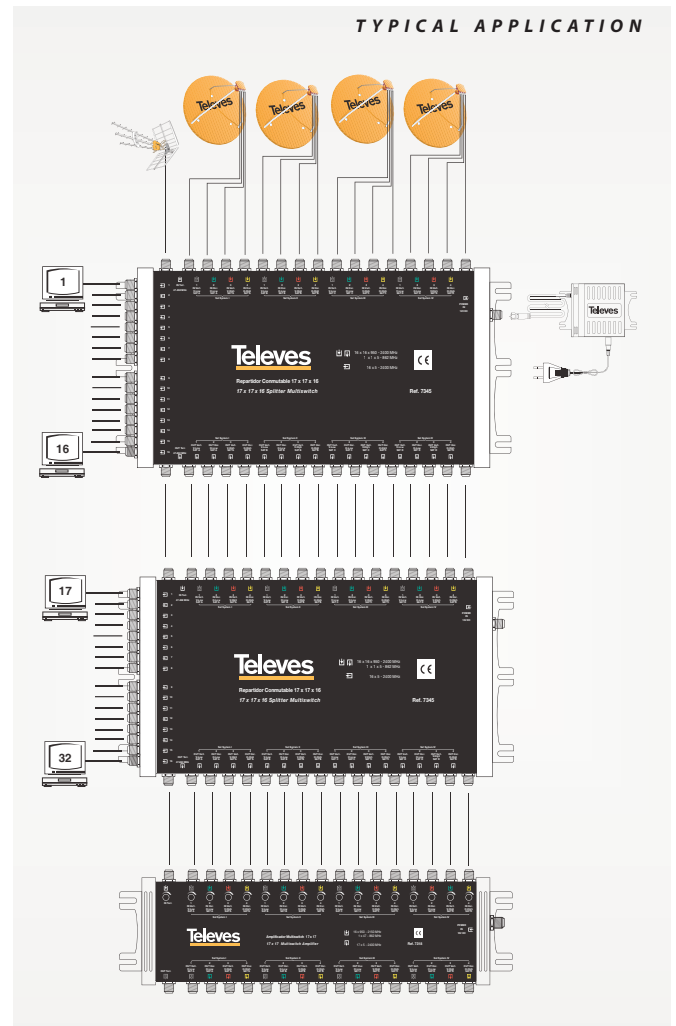


▲ 7345



▲ 7318

Multiswitches		17x17x8	17x17x12	17x17x16
References		7323	7373	7345
Frequency range	SAT	950 - 2400		
	TER			
Input level	SAT	95		
	TER			
Tap output level	SAT	95		
	TER			
Through losses	SAT	4	4	7
	TER	3	3	3
Tap losses	SAT	3	3	3
	TER	5	5	7
Isolation between inputs		30	30	50
Isolation between outputs		30	30	35
LNB powering	mA	300/input; 1200 total		
DC pass	-	In - Out		
Powering voltage	Vac/Vdc	230 / 12		
Max. consumption	mA	50		
Protection index	IP	20		



TYPICAL APPLICATION

TOOLS AND SOFTWARE

Tools

PRODUCT RANGE

Ref. DeSCRIPTION

2162	Coaxial cable stripper
2145	Coaxial cable stripper
7301	Satfinder
4008	IF simulator
7637	Return channel simulator



▲ 2145



▲ 2162

References		4008	7637
Powering	Vdc	12...18	12...15
Consumption	W	<2	<1.5
Input connector		"F" female	
Frequency range	MHz	960-1550-2140	7.5-14.75-22.65
Accuracy	KHz	±200	-
Spurious	dBc	> 20	> 40
Protection index		IP 20	IP 30



▲ 7301



▲ 4008/7637

Software

PRODUCT RANGE

Ref. DeSCRIPTION

216801	T-Suite
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## OPTICAL FIBER

Full range of products to deploy optical fiber networks capable of distributing television signals in the VHF, UHF & satellite bands.

These products have been designed to simplify the installation procedure and guarantee compatibility with the Televes range.



OPTICAL FIBER

Optical Output LNB and Optical Converters

PRODUCT RANGE	
Ref.	DeSCRIPTION
2350	Quattro MDU
2351	Quad MDU
2353	LNOG LNB optical
2370	Quattro MDU+ TDT
236901	Quad MDU+ TDT
236801	Optical LNB + TDT
<b>Optical Splitters</b>	
2357	Split 2OF
2358	Split 3OF
2359	Split 4OF
2360	Split 8OF
<b>Optical Fibers</b>	
2361	3m FC/PC F pre-ter
236101	5m FC/PC F pre-ter
236102	10m FC/PC F pre-ter
236103	20m FC/PC F pre-ter
236104	30m FC/PC F pre-ter
236105	40m FC/PC F pre-ter
236106	50m FC/PC F pre-ter
236107	75m FC/PC F pre-ter
236108	100m FC/PC F Bob. pre-ter
236109	200m FC/PC F Bob. pre-ter
<b>Optical Accessories</b>	
2354	FC/PC connector
2356	FC/SC connector
2362	F Pen Light
2364	5 dB attenuator FC/PC
2365	10 dB attenuator FC/PC

This innovate design stacks both horizontal and vertical I polarities, creating a single IF frequency range of 950 MHz-5,45 GHz. This new single band is then frequency modulated optically and output using a 1310nm internal to the Optical Output LNB.

Each converter receives the optically modulated frequency stacked signals from the Optical LNB or PON, typically via a 3mm fibre optic cable, utilising the FC/PC connector.

The optical signals are then converted back to their original IF format and output to the receiver via standard F connections.



▲ 2353

Optical Output LNB

- Converts all 4 Universal IF bands to a single optical output.  
(H/H-H/L-V/H-V/L=Single Optical Output)
- Capable of supplying all converted signal to 32 distribution points spread over a 10 kilometre radius.
- 40mm Feed Horn



▲ 237001

Twin and Quad Optical Converters

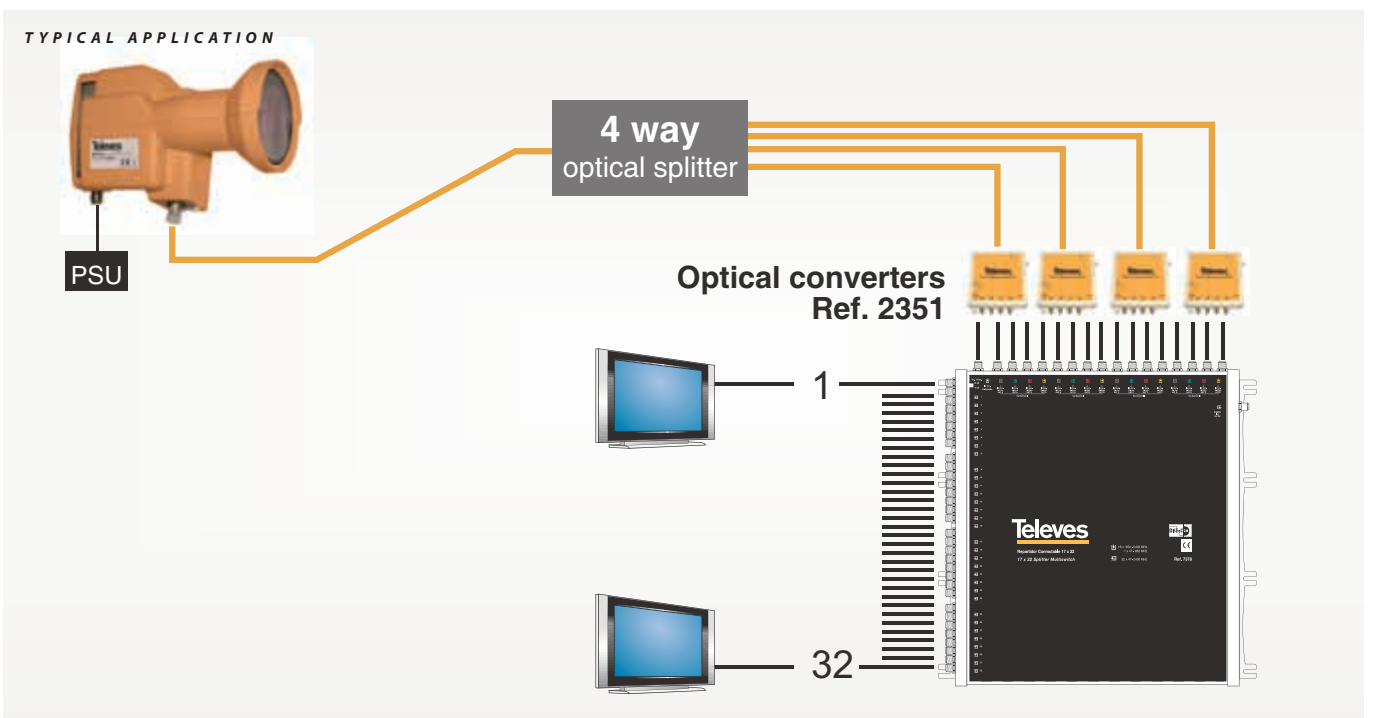
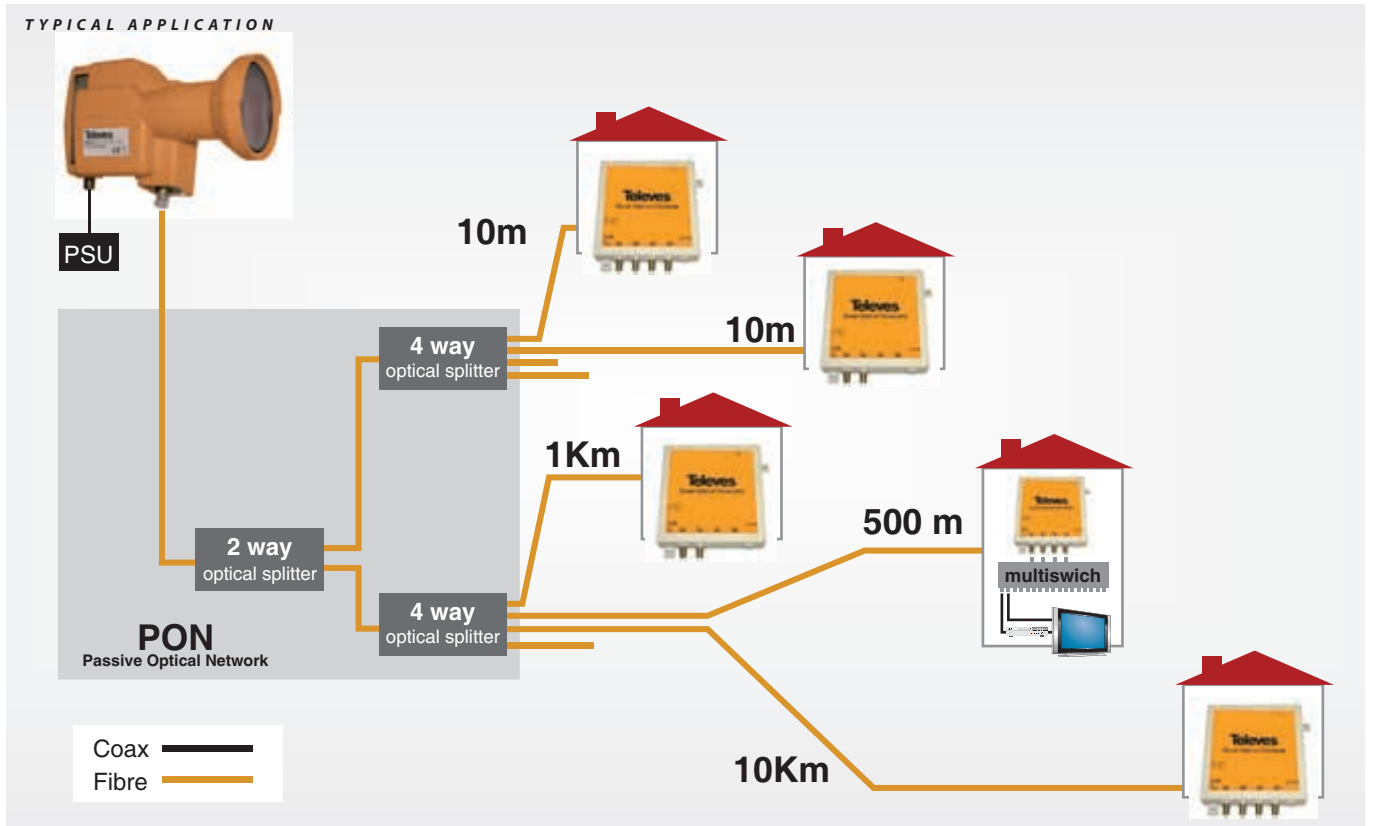
- Converts optical signal from a MDU Optical LNB to IF
- Provides up to 2/4 Universal Satellite feeds from 1 Fibre Optic connection.
- Plug and Play
- Powered via the STB

Reference			2351-2352
<b>Input parameters</b>			
Frequency range		GHz	0,950-5,45
Optical RLR		dB	20
Optical power	SML PON setting	dBm	- 13 min./0 max
	SMD PON setting		- 18 min./-14 max
Nominal transponder		dBm	- 180 min./-40 max
<b>Output parameters</b>			
RF frequency range	Horizontal high band	MHz	1100-2150
	Vertical high band		1100-2150
	Horizontal low band		950-1950
	Vertical low band		950-1950
Nominal output level/transponder		dBm	-65 min. / -25 max.
Rejection between outputs		dB	30
Out of band spurious level		dBm	-60
Impedance		ohm	75
Powering <small>(only for Quattro version, Twin &amp; Quad to be powered from STB)</small>	voltage	Vdc	12
	consumption	mA	330 max.
Operating temperature		°C	0 to 50
Connectors	DC Input	type	F Female
	Optical output		FC/PC

Reference		2353
Input frequency	GHz	10,7-12,75
Output frequency		0,950-5,45
Optical output power	dBm	7
Noise figure	dB	0,5 typ
Gain		72 max.
Cross polar rejection		30 typ
Powering	Vdc	12
Current consumption	mA	450 max.
Operating temperature	°C	-30 to 60
DC input connector	type	F Female
Optical output connector		FC/PC



### Optical Output LNB and Optical Converters



OPTICAL FIBER

## Optical transmitter

PRODUCT RANGE	
Ref .	DeSCRIPTION
2333	Optical Fiber transmitter
2334	Optical Fiber transmitter with return path
5629	PSU for T0X

The transmitters (Refs. 2333 and 2334) generate an optical output in 1.310 nm modulated according to the RF input.

Ref. 2334 includes optical reception in the return path.

- ▶ RF input SMATV compatible, i.e (87- 2150 Mhz).
- ▶ High optical output power (4mW or 6dBm).
- ▶ RF input control level to adjust the quality parameters of the optical transmission. (Ref. 2334 includes output control level in the return path).
- ▶ Optical output signal monitoring. (Ref. 2334 input signal in the return path).
- ▶ Relé connexions (free of Voltage) in order to use them as an alarm threshold for the emitted optical power (Ref. 2334 received optical power via return path).



▲ 2333

References	2333/2334			
<b>Input</b>	RF Direct channel	Input frequency range	MHz	87-2150
		Max. Input level MATV DIN 45004B	dBµV	102
		Max. Input level FI DIN VDE0885/12		107
		Normalized equivalent input noise (EINn) in 807 Mhz	dBm/Hz	-150,7
		Normalized equivalent input noise (EINn) in 2 Ghz		-145,8
		Regulation margin	dB	0-18
		Return losses		>10
	Impedance	ohm	75	
	F.O. C. Ret. (only ref. 2334)	Wave length	nm	1200-1600
		Detection band width	MHz	1-3000
Max. received optical power		dBm	3	
Optical connector			SC/APC	
<b>Output</b>	F.O. Direct channel	Wave length	nm	1310
		Max. emitted optical power	dBm	6
		Optical connector		SC/APC
	RF C. Ret. (only ref. 2334)	Input frequency range	MHz	1-65
		Output level MATV DIN 45004B	dBµV	112
		Regulation margin	dB	0-18
		Return losses		>12
Impedance	ohm	75		
<b>General</b>	Powering	Vdc	12-24	
	Consumption	mA	105 (ref. 2333) / 160 (ref. 2334)	
	Protection index	IP	20	

OPTICAL FIBER

Optical receiver

PRODUCT RANGE	
Ref .	DeSCRIPTION
2335	Optical Fiber receiver
2336	Optical Fiber receiver with return path
5629	PSU for T0X

The optical receivers (Refs. 2335 and 2336) give back the original RF signal that has been previously converted by an optical emitter  
 Ref. 2336 includes an optical emitter in the return path.

- ▶ Large optical input window (1.200 – 1.600 nm).
- ▶ Wide dynamic input range (-10 to 5 dBm).
- ▶ RF output level: 114 dBμV MATV, 117 dBμV IF
- ▶ Optical input signal monitoring. (Ref. 2336 output signal in the return path).
- ▶ Relé connexions (free of Voltage) in order to use them as an alarm threshold for the received optical power (Ref. 2336 emitted optical power via return path).



▲ 2335

References		2335/2336		
<b>Input</b>	F.O. Direct channel	Wave length	nm	1200-1600
		Detection band width	MHz	1-3000
		Max. received optical power	dBm	6
		Optical connector		SC/APC
	RF C. Ret. (only ref. 2336)	Input frequency range	MHz	1-65
		Input level return path DIN 45004B	dBμV	95
		Normalized equivalent input noise (EINn) in 30 Mhz	dBm/Hz	152,5
Return losses		dB	>12	
Impedance		ohm	75	
<b>Output</b>	RF Direct channel	Output frequency range	MHz	87-2150
		Max. Output level MATV DIN 45004B	dBμV	114
		Max. Output level FI DIN VDE0885/12		117
		Regulation margin	dB	0-18
		Return losses		>10
		Impedance	ohm	75
	F.O. C. Ret. (only ref. 2336)	Wave length	nm	1310
		Max. emitted optical power	dBm	3
		Optical connector		SC/APC
<b>General</b>	Powering	Vdc	12-24	
	Consumption	mA	150 (ref. 2335) / 175 (ref. 2336)	
	Protection index	IP	20	

OPTICAL FIBER

Optical fiber receiver

PRODUCT RANGE	
Ref.	DeSCRIPTION
2310	Outdoor optical receiver
2311	Indoor optical receiver



▲ 2310



▲ 2311

References		2310	
<b>Direct Channel</b>		<b>Optical Stage</b>	
Wave length	nm	1200-1600	
Input Margin	dBm	-5...+2	
Maximum input level		+3	
		<b>RF Stage</b>	
Bandwidth	MHz	87-862	950-2150
Interstage attenuator	dB	0-20	
Equalizator		0-15	0-10
Maximum output level 42CH Cenelec	dBμV	104	-
Maximum output level DIN VDE0855/12		-	120
Test Output	dB	-25	-27
<b>Return Channel</b>		<b>Optical Stage</b>	
Laser type		Fabry-Perot (Class 1M)	
Wave length	Nm	1310	
Output power	dBm	3	
		<b>RF Stage</b>	
Bandwidth	MHz	5-65	
Maximum input level	dBm	90	
<b>General</b>			
Mains voltage	Vac	196-264	
Consumption	mA	36	
Protection Index	IP	61	

References		2311	
<b>RF Output</b>			
RF Connectors		F female	
Bandwidth	MHz	87 to 2150	
Impedance	Ohm	75	
Return losses	dB	>11	
AGC margin		0-18	
Max. output level TV (87-860 Mhz) 2 channel		dBμV	110/channel IMD>60dB
Max. output level SAT (950-2150 Mhz) 2 channel			107/channel IMD>60dB
Max. output level 41 TV channels (CENELEC) and 1 SAT transponder			93 / channel TV 90 / channel SAT
<b>Optical Input</b>			
Wave length	Nm	1200-1600	
Detection band width	MHz	1-3000	
Max. optical power received	dBm	3	
Min. optical power received	dBm	-10	
Optical input connector		SC/APC	
<b>General</b>			
Mains voltage	Vac	196-264	
Consumption	VA	35	
Temperature range	°C	0-45	

## Optical splitter

**PRODUCT RANGE**

Ref. DeSCRIPTION

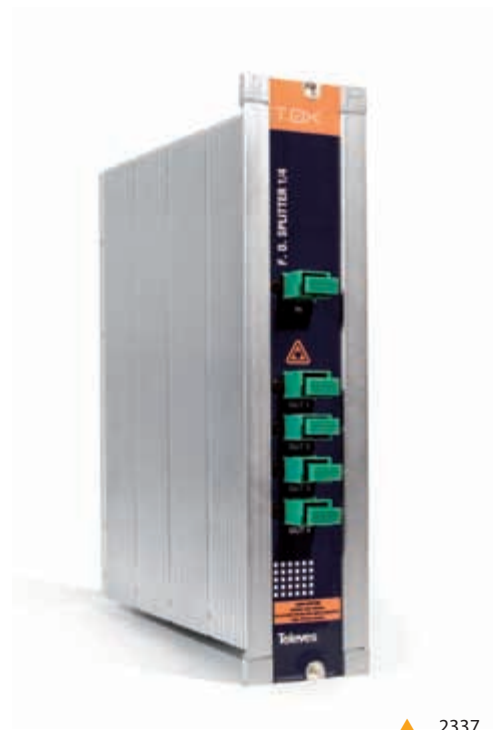
2337 Optical splitter, 2 ways

2339 Optical splitter, 4 ways

**Power supply**

5629 PSU for TOX

References	2337/2339		
<b>Input/Output</b>	Wave length	nm	1200-1600
	N° of outputs		1-3000
	Optical connector		6
	1310 nm through losses	dB	SC/APC
	1550 nm through losses		1-65
	Directivity		95
Return losses	152,5		
<b>General</b>	Protection index	IP	20



▲ 2337

# DISTRIBUTION AND ACCESSORIES

Complete range of products for the TV signal distribution, adapted to work in every band (VHF, UHF, IF Satellite).

Designed for an easy installation and time saving, using innovative connection systems.



SPLITTERS / MIXERS

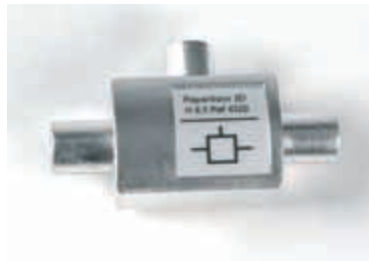
Plug-in

PRODUCT RANGE

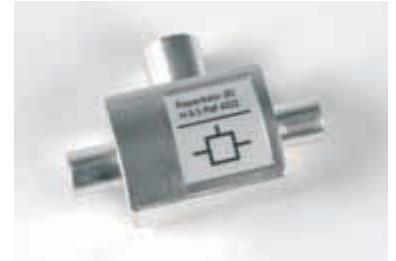
Ref. DeSCRIPTION

4322 2 ways F in / M-M out

4320 2 ways M in / F-F out



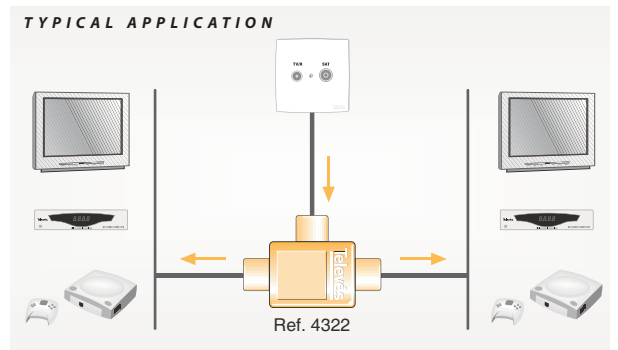
▲ 4320



▲ 4322

Shielded splitters/mixers that might be connected directly to the outlets, video tapes, TV or other equipment as they incorporate IEC connectors.

References		4322	4320
Band		V/U	
Through losses	dB	4.5	4.5
Rejection between outputs		>20	
Outputs with DC bypass		1	1
Output connectors	mm	2M 9.5	1M 9.5
Input connectors	mm	1F 9.5	2F 9.5



SAT-MATV Mixers

PRODUCT RANGE

Ref. DeSCRIPTION

Terrestrial-Satellite

7452 RF+IF Mixer

7407 Double mixer (2 outputs) 2FI-2D

Combiners/splitters for MATV and IF signals.

DC bypass in the IF line.

References		7452	7407
Mixed bands		MATV-IF	
Inputs with D/C bypass		1 (IF)	2 (IF)
MATV through losses	dB	<2	<5.5
IF through losses		<2	<3
MATV-IF rejection		>20	>15
Dimensions	mm	98x75x26	93x78x25



▲ 7452



▲ 7407



INDOOR SPLITTERS

Indoor Splitters

PRODUCT RANGE

Ref. DeSCRIPTION

5-2400 MHz

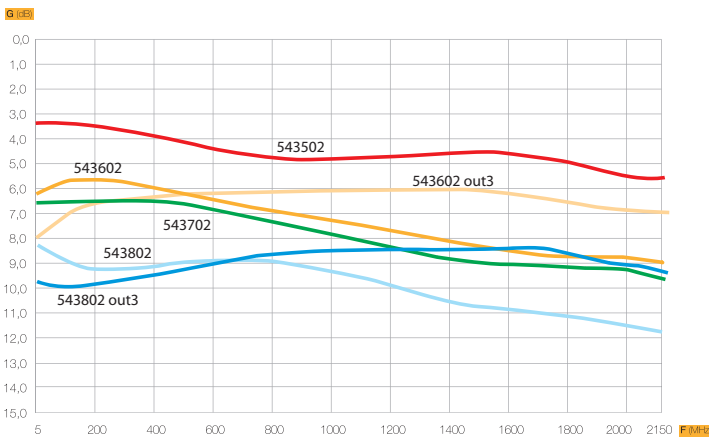
543502	2 Ways 4/5 dB
543602	3 Ways 7/9 dB
543702	4 Ways 7.5/9.5 dB
543802	5 Ways 9.5/12 dB
5469	6 Ways 11/14 dB
5489	8 Ways 14/16 dB

System accesories

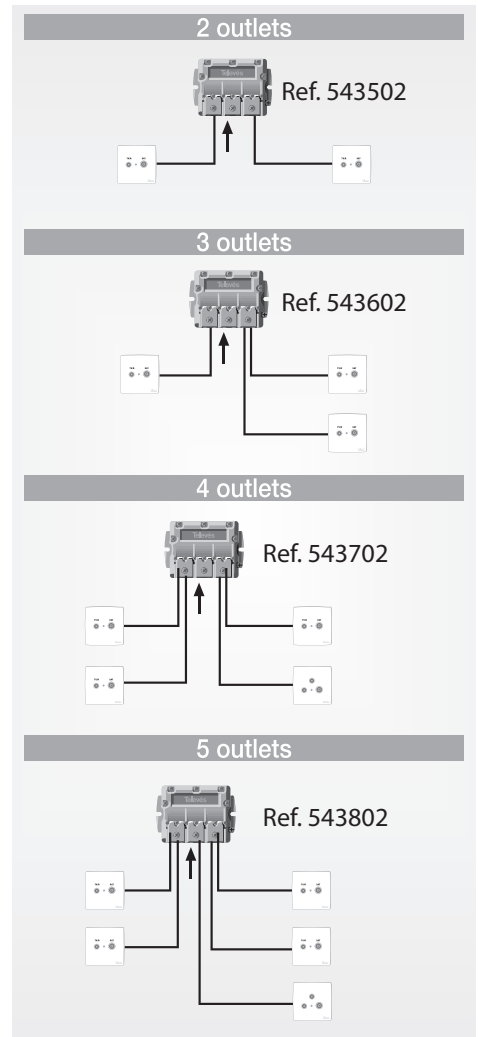
545501	Face plate
4177	Black plastic case (small)
4163	Black plastic case (big)
4087	Terminal load DC-blocked



▲ 543802



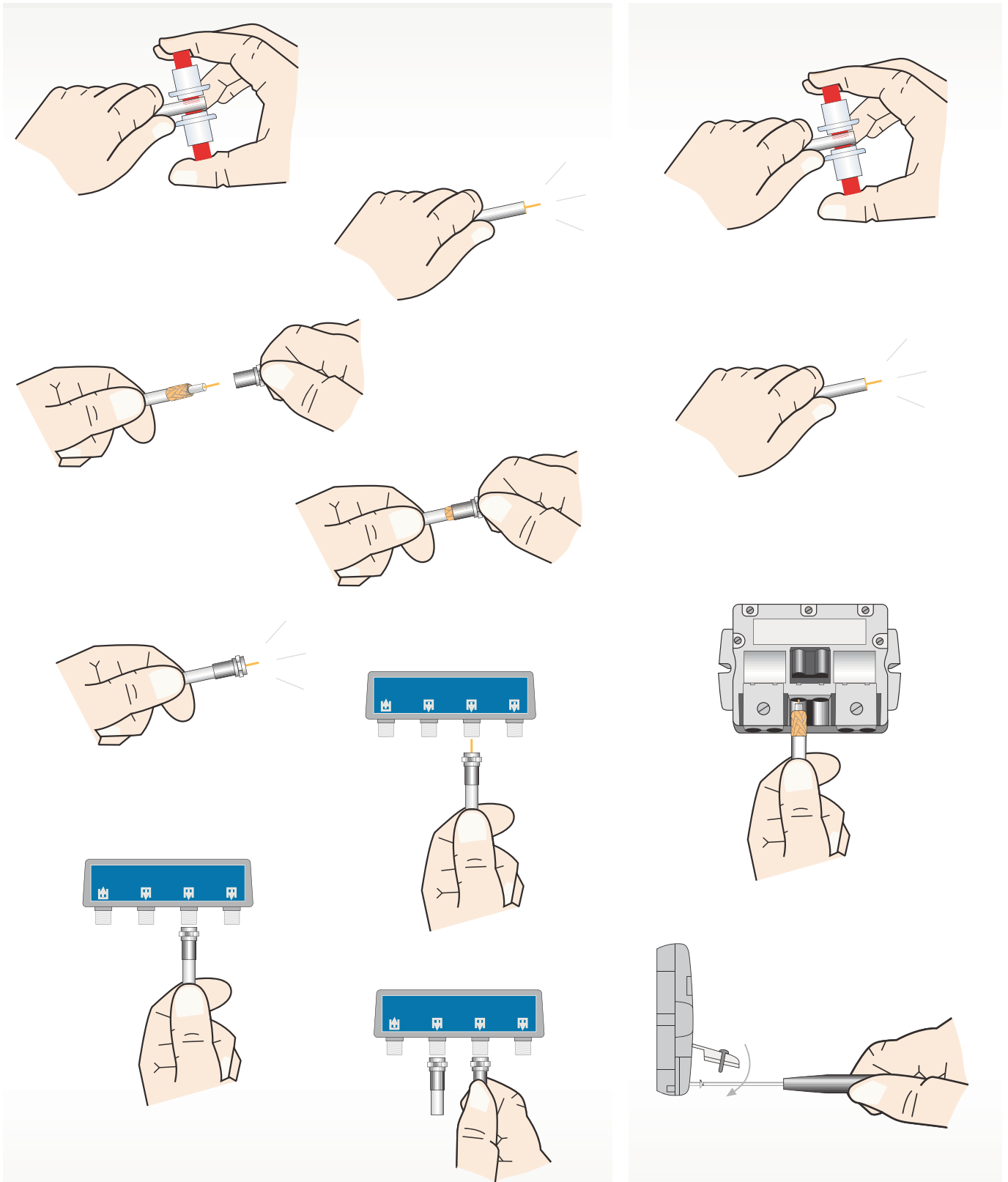
References		543502	543602	543702	543802	5469	5489
Band	MHz	5-2400					
Number of outputs		2	3	4	5	6	8
Through losses IN - OUT S1 ... S8	5-47	3.5 S1,2	6.5 S1,2,3	8 S1,2,3,4	10 S1,2,3,4,5	12 S1,2,3,4 17 (S5,6)	14 (S1,2) 17 (S3,4) 18 (S5,6) 20 (S7,8)
	47-862	4.5 S1,2	7 S1,2,3	7.5 S1,2,3,4		14 (S1,2) 12 (S3,4) 13 (S5,6)	14 (S1,2) 16 (S3,4) 14 (S5,6) 15 (S7,8)
	950-2400	5 S1,2	7...11 S1,2,3	9.5 S1,2,3,4	9.5...12 S1,2,3,4,5	14 (S1,2) 12 (S3,4) 11 (S5,6)	14 (S1,2) 16 (S3,4) 14 (S5,6) 15,5 (S7,8)
Reject. between outputs	5-862	>15	>17		>15	>9	>10
	950-2400		>12		>16	>12	
Outputs-inputs DC bypass	mA	300			300 S1,2,3,4	300 S1,2,3,4,5,6	
Max. voltage	Vdc	40					



INDOOR SPLITTERS



Detail of F connector and Easy F



INDOOR SPLITTERS

F connector

PRODUCT RANGE

Ref. DeSCRIPTION

5-2400MHz	
5150	2 Ways 4/5 dB
5151	3 Ways 7/9 dB
5152	4 Ways 7.5/10 dB
5153	5 Ways 10/12 dB
7441	6 Ways 12/16 dB
7406	8 Ways 14/19 dB
5155	2 Ways all DC
5156	4 Ways all DC
5157	5 Ways all DC
5158	6 Ways all DC
5159	8 Ways all DC

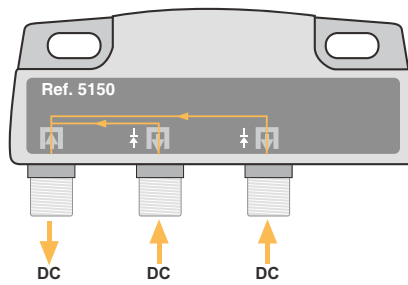
5-1000MHz	
4530	2 Ways
4532	3 Ways
4531	4 Ways
4534	6 Ways
4533	8 Ways
950-2150MHz active	
7402	8 Ways active



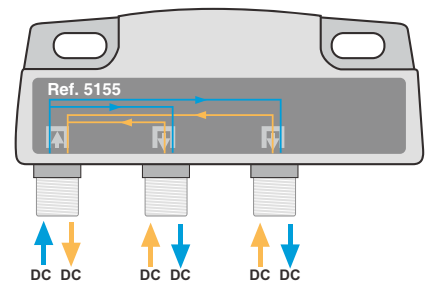
▲ 4534

System accessories

4061	F type 75 ohms load DC blocked
4058	F type DC 75 ohms load



DC bypass from the outputs to the input



ALL DC Splitters

References		4530	4532	4531	4534	4533	
Band	MHz	5-1000					
Number of outputs		2	3	4	6	8	
Through losses	VHF	dB	5	7	9	10	12
	UHF		5	7	9	10	12
Rejection between outputs		dB	15	20	15	20	15
Type of connectors		F					
Dimensions	mm	52x50x20	74x50x20	123x60x20			

References		7402
Band	MHz	950-2150
Number of outputs		8
IF gain	dB	5-7.5
Rejection bet. outputs	dB	12
DC bypass outputs-inputs		Yes
Noise figure	dB	<8
Dimensions	mm	141x97x24

References		5150	5151	5152	5153	7441	7406	5155	5156	5157	5158	5159	
Band	MHz	5 - 2400						5 - 2400					
Number of outputs		2	3	4	5	6	8	2	4	5	6	8	
Through losses	MATV	dB	4	7	7.5	10	12	14	4	7.5	10	10	11
	FI		5	9	10	12	16	19	5	10	10	11.7	13.6
Rejection between outputs	MATV	dB	> 20			> 17	> 19	> 20			> 28	> 34	
	FI												
Max. output-input DC bypass		A	1										

INDOOR TAPS

5-2400 MHz Easy F

PRODUCT RANGE

Ref. DeSCRIPTION

2 Ways		
542502	2D 12 dB (Floor 1)	TA
542602	2D 16 dB (Floor 2, 3)	A
542702	2D 20 dB (Floor 4-6)	B
542802	2D 24 dB (Floor 7-12)	C
4 Ways		
544402	4D 12 dB (Floor 1)	TA
544502	4D 17 dB (Floor 2, 3)	A
544602	4D 20 dB (Floor 4, 5)	B
544702	4D 25 dB (Floor 6, 7)	C
544802	4D 29 dB (Floor 8)	TD

6 Ways		
5492	6D 16 dB (Floor 1)	TA
5493	6D 20 dB (Floor 2, 3)	A
5494	6D 24 dB (Floor 4, 5)	B
8 Ways		
5610	8D 16 dB (Floor 1)	TA
5611	8D 22 dB (Floor 2)	A
5612	8D 28 dB (Floor 3)	B

The innovative easy fast F-connector provides the advantages of the S&C connector and the F-connector.

Fully shielded.

They allow an IN-OUT current bypass.



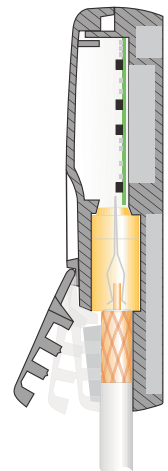
▲ 2W/4W



▲ 6W/8W

References	542502	542602	542702	542802	544402	544502	544602	544702	544802	
Number of outputs	2				4					
Floor	1	2...3	4...6	7...12	1	2...3	4...6	7...12	12...16	
Through losses IN - OUT	C. ret.	<4	<1.5	<2	<1	5.5	3	2.3	1.5	1.3
	MATV	2.2	1.2	1.1	0.7	4.7	2.3	1.6	1.3	1.2
	FI	2.4	2	1.2	0.9	5-7.5	2.3-3	2.1	1.4-3	1.3-3
Tap losses IN-D1/D2	C. ret.	<13	<16	<20	<24	12	17	20	25	28
	MATV	13	16	20	24	13	17	20	25	28
	FI	12	16	20	24	15	17	22	25	29
Rejection output-tap	MATV	> 32	> 27	> 35	> 42	> 33	> 32	> 33	> 35	> 40
	FI	> 25	> 24	> 35	> 38	> 30	> 33	> 30	> 33	> 35
Rejection bet. taps	MATV	> 37	> 42	> 30	> 30	> 28	> 27	> 28	> 30	> 32
	FI	> 31	> 34	> 22	> 23	> 21	> 20	> 22	> 25	> 30
Max. bypass current	mA				300					

Referencias	5492	5493	5494	5610	5611	5612	
Number of outputs	6			8			
Floor	1	2...3	4...5	1	2	3	
Through losses IN - OUT	C. ret.	<11	<6	<6	14	4	4
	MATV	5	3	3	7	2	2
	FI	5	3,5	4	8	5	5
Tap losses IN-D1/D2/D3/D4	C. ret.	<18	<20	<26	<18	<24	<30
	MATV	16	20	24	16	23	28
	FI	16	20	24	16	23	28
Rejection bet. taps	C. ret.	>30	>30	>35	>30	>30	>40
	MATV	>30	>30	>30	>30	>30	>35
	FI	>30	>25	>25	>20	>20	>30
Rejection bet. taps	C. ret.	>30	>40	>45	>35	>40	>40
	MATV	>30	>40	>45	>35	>40	>40
	FI	>30	>40	>45	>35	>40	>40
Max. voltage	Vdc			40			
Max. bypass current	mA			300			



INDOOR TAPS

5-2400 MHz F connector

2 Ways

PRODUCT RANGE

Ref. DeSCRIPTION

5130	12 dB
5131	15 dB
5132	18 dB
5133	23 dB
5134	27 dB



▲ 5142

4 Ways

PRODUCT RANGE

Ref. DeSCRIPTION

5141	4W 12 dB
5142	4W 16 dB
5143	4W 19 dB
5144	4W 24 dB
5145	4W 28 dB

References		5130	5131	5132	5133	5134
Frequency range	MHz	5-2400				
Through losses	MATV	2.5	1.2	1.5	1	1
	IF	2.6	2	1.5	1.5	1
Tap losses	MATV	12	15	18	23	27
	IF	12	15	19	23	27
Rejection output-tap	MATV	> 32	> 27	> 35	> 42	> 50
	IF	> 25	> 24	> 30	> 35	> 35
Rejection bet. taps	MATV	> 30				
	IF	> 30				
Max. bypass current	A	1				

6 Ways

PRODUCT RANGE

Ref. DeSCRIPTION

5135	18 dB
5136	20 dB
5137	24 dB

References		5141	5142	5143	5144	5145
Frequency range	MHz	5-2400				
Through losses	MATV	4.5	2.3	1.5	1	1
	IF	5	3.4	2.5	2	1.5
Tap losses	MATV	12	16	19	24	28
	IF	12	16	20	24	29
Rejection output-tap	MATV	> 50	> 35			
	IF	> 30				
Rejection bet. taps	MATV	> 25	> 20			
Max. bypass current	A	1				

8 Ways

PRODUCT RANGE

Ref. DeSCRIPTION

5146	18 dB
5147	20 dB
5148	23 dB

System accessories

4061	F type 75 ohms load DC blocked
4058	F type DC 75 ohms load

References		5135	5136	5137	5146	5147	5148
Frequency range	MHz	5-2400					
Through losses	Ret. Path	3	1.7	1.5	3	1.7	1.5
	VHF	3.3	2	1.5	3.3	2	1.5
	UHF						
	IF	5	4	2.5	5	4	
Tap losses	Ret. Path	18	20	24	18	20	23
	VHF	19	21	25	19	20	25
	UHF						
	IF						
Rejection between taps		>21					
Max. bypass current	A	1					

INDOOR TAPS

5-1000 MHz F connector

PRODUCT RANGE

Ref. DeSCRIPTION

1 Way

4516 8 dB

4517 11 dB

4518 14 dB

4519 17 dB

2 Ways

4560 4 dB terminal

4561 9 dB

4562 11 dB

4563 14 dB

4564 17 dB

4565 20 dB

4566 23 dB

4567 26 dB

4 Ways

4571 8 dB terminal

4572 11 dB

4573 14 dB

4574 17 dB

4575 20 dB

4576 23 dB

4577 26 dB

8 Ways

4578 12 dB terminal

4581 20 dB

System accessories

4061 F type 75 ohms load DC blocked

4058 F type DC 75 ohms load

This passive line for interior distribution provided with F connectors includes taps with 1,2, 4 and 8 ways, as well as a support for wall mounting.



▲ 4578



▲ 4571



▲ 4560

References	1D	4516	4517	4518	4519
Frequency range	MHz	5-1000			
Tap losses	dB	8	11	14	17
Through losses		2.4	1.5	1.5	1.3
Rejection between taps		30	33	35	37
Dimensions	mm	52x50x20			

References	2D	4560	4561	4562	4563	4564	4565	4566	4567
Frequency range	MHz	5-1000							
Tap losses	dB	4.5	8	11	14	17	20	23	26
Through losses		-	2.5	2.0	2.0	1.5	1.0	1.0	1.0
Rejection between taps		28	28	27	27	27	27	27	27
Dimensions	mm	52x50x20							

References	4D	4571	4572	4573	4574	4575	4576	4577	
Frequency range	MHz	5-1000							
Tap losses	dB	8	11	14	17	20	23	26	
Through losses		-	4.0	2.5	2.0	1.0	0.5	0.5	
Rejection between taps		25							
Dimensions	mm	66x56x20							

References	8D	4578	4581
Frequency range	MHz	5-1000	
Tap losses	dB	12	20
Through losses		-	<2
Dimensions	mm	92x56x20	

OUTLETS

Through

PRODUCT RANGE	
Ref.	DeSCRIPTION
<b>5-2150 MHz</b>	
5236	20 dB + DC
5227	14 dB + DC
5228	10 dB + DC
5229	4 dB+ DC end splitter outlet
<b>Low losses 5-862 MHz</b>	
5230	FM-TV 4 dB end outlet
5231	FM-TV BP 10 dB
<b>5-1000 MHz</b>	
5232	FM-TV End outlet SCATV
5233	FM-TV SCATV

End

PRODUCT RANGE	
Ref.	DeSCRIPTION
5226	Diplexed TV/FM-SAT
524605	Triplexed TV-R-SAT
5270	MATV ( <b>bridged</b> )
<b>System accessories</b>	
Ref.	DeSCRIPTION
5442	Back box
5441	Face plate R-TV
5440	Face plate TV/FM-SAT
544302	Face plate TV-R-SAT
5275	Face plate FM-TV-SAT-RJ45



Ref.	Symbol	Bands	Tap losses (dB)										Through losses loss (dB)		
			Return	BI	Subband	FM	Low S	BIII/DAB	High S Hyperb.	UHF	IF - SAT		DC bypass (350mA)	MATV	IF SAT
			5-47	47-68	68-89	88-108	104-174	174-230	230-446	470-862	950-2150	2150-2400			
<b>SCATV 5-1000 MHz</b>															
5232		TV	<1	-	-	<1	-	-	-	-	-	-	-	-	-
		R	-	-	3	-	-	-	-	-	-	-	-	-	-
5233		TV	<8	7	-	7	-	-	-	-	-	-	2.6	3	
		R	-	-	26	-	-	-	-	-	-	-	-	-	
<b>DC pass outlets 5-2150 MHz</b>															
5229		TV/R	1	-	-	4	-	-	-	5	6.5	-	-	-	
		SAT	1	-	-	4	-	-	-	5	6.5	SAT→IN	-	-	
5228		TV/R	6	-	-	7.5	-	-	-	10.5	13	IN→OUT	3.5	5	
		SAT	11	-	-	8.5	-	-	-	9	10	SAT→IN	-	-	
5227		TV/R	10.5	-	-	13	-	-	-	13.5	14	IN→OUT	1.2	2	
		SAT	10.5	-	-	13	-	-	-	14	14.5	SAT→IN	-	-	
5236		TV/R	20	-	-	20	-	-	-	24	23	IN→OUT	0.6	1	
		SAT	18	-	-	20	-	-	-	24	24.5	SAT→IN	-	-	
<b>Low losses 47-860 MHz</b>															
5231		TV	10	9.5	-	9.5	-	-	-	-	-	-	<1.3	2	
		R	-	-	26	-	-	-	-	-	-	-	-	-	
5230		TV/R	4.3	4.5	-	4.5	-	-	-	-	-	-	-	-	
		SAT	-	-	18	-	-	-	-	-	-	-	-	-	
<b>End bridged</b>															
5270		TV/R	-	-	-	<5*	-	-	-	-	-	Yes	-	-	
		SAT	-	-	-	<5*	-	-	-	-	-	-	-	-	
<b>Splitters - 2 outputs</b>															
5226		TV/R	0.3	-	-	0.6	-	-	-	-	-	SAT→IN	-	-	
		SAT	-	-	-	-	-	-	-	1.5 ± 0.2	-	-	-	-	
<b>Triple triplexed</b>															
524605		TV	<8	-	-	4.5	-	-	-	-	-	-	-	-	
		R	<8	-	-	4.5	-	-	-	-	-	-	-	-	
		SAT	-	-	-	-	-	-	-	1.5 ± 0.2	-	SAT→IN	-	-	

	End outlet		Through outlet		Female IEC connector		Male IEC connector		F Female
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TV response      R response      SAT response

\* Depending on the output loaded



OUTLETS

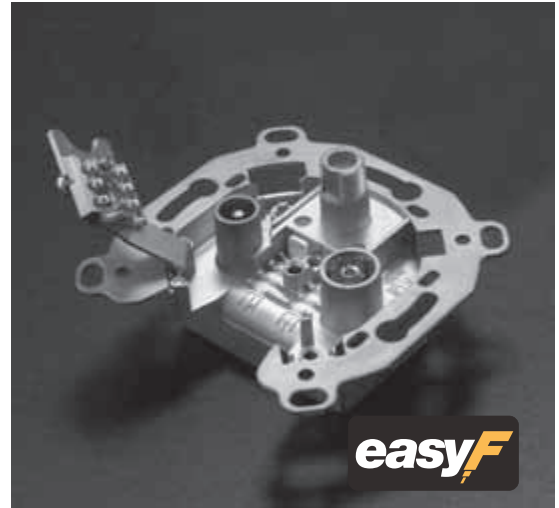
Multimedia

**PRODUCT RANGE**  
Ref. DeSCRIPTION

5240	Multimedia end outlet
5247	10dB pass-through outlet
5248	15dB pass-through outlet
5249	20dB pass-through outlet

**NEW** Lateral Opening Clamp

- ✓ **Easy and fast connection system** for different inner conductor diameters
- ✓ **Snap-in terminals** for inner conductor
- ✓ **Inner conductor conical** guiding path for ease of connection
- ✓ Holes to release the inner conductor cable by pressing **the self-retaining contact**
- ✓ **180° opening** lateral clamp
- ✓ **Class A** screening



Total quality in one step  
Click - and-go system

References	5240	5247	5248	5249
Frequency range (MHz)	TV-RF-DATA / 110..1000-87..108-5..1000			
Through losses (dB)	-	<2	1,5	1
Tap losses DATA (dB)	<3,5	10,5	15	20
Tap losses TV (dB)	<5	10	15	20
Tap losses RF (dB)	<10	15	20	25
Isolation DATA-TV (dB)	>70			
Isolation DATA-RF (dB)	>30			
VSWR input (dB)	>14			
VSWR DATA (dB)	>14			
VSWR TV (dB)	>10			
HF- connections	IEC Male/Female/F			

■ The choice of distribution products is automatically produced to receive a great high-class level. This family consists in a complete product range which fulfils all demands from single systems up to CATV systems.



FULLY AUTOMATED MANUFACTURING





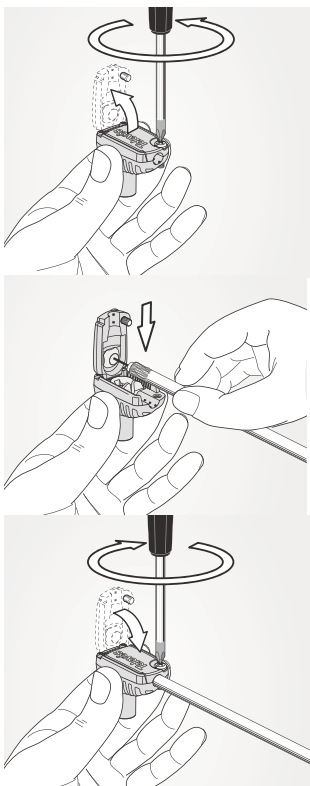
CONNECTORS

IEC Elbowed shielded



PRODUCT RANGE	
Ref.	DeSCRIPTION

IEC Shielded	
4130	Male 9.5 mm Ø
4131	Female 9.5 mm Ø
413201	Male 9.5 mm Ø pro
413301	Female 9.5 mm Ø pro
437401	Male 9.5 mm Ø pro (blister)
437501	Female 9.5 mm Ø pro (blister)
437601	M/F 9.5 mm Ø pro (blister)



The Televes connector "EASY" guarantees the maximum quality in the equipments and systems connexion, providing the SHIELDING to the digital signals in the installation at issue.

The coaxial cable junction turns into an easy and fast operation. Not having different pieces, makes it ideal to connect-rize the cable in difficult locations, where the elements handling is a tricky task.

Simplicity and speed of assembly:

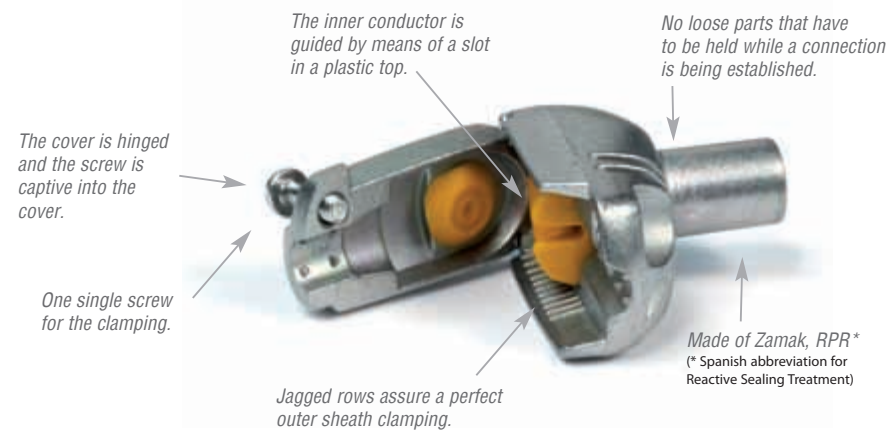
- One single screw.
- Connection always visible.
- Without curled up pieces.
- Without detachable pieces

Safe connection:

- Assures the fiability of the connection and does not need future revisions.
- The installer will have the feeling that if something fails, it is not the connectors fault.

Electrically perfect:

- Automat fabrication.
- Total shielding that prevents from unwanted effects in the DTT reception.
- Perfect adaptation to the distribution network elements.
- Due to its performance and quality, it is the connector tobe used with the actual DTT and in the future HDTV.



SCATV 5/8" Type

PRODUCT RANGE	
Ref.	DeSCRIPTION

4121	5/8" cable 1/2"
4122	5/8" cable TR165



CONNECTORS

F Type

PRODUCT RANGE

Ref. DeSCRIPTION

4176	Elbow push fit (CXT&T100)
4171	Plug twist (CXT&T100)
9349	Plug twist (TR165)
4120	Plug crimp (1/2")
4127	Plug twist (CXT 5 mm)
413401	Elbow male professional
4135	F connector T100
4104	F compress
4105	F compress
4106	F compress
4306	F type + weatherproof over
2163	Compressing tool



▲ 4176



▲ 4134



▲ 4104



▲ 4171



▲ 4120



▲ 4127



▲ 9349



▲ 2163

Connection accessories

PRODUCT RANGE

Ref. DeSCRIPTION

Join connectors

4006	Coaxial joint
4173	F female - F female

Adapters

4123	5/8" - F connector
4071	DC block F connector
<b>75 Ω Terminal loads</b>	
4061	F type 75 ohms load DC blocked
4058	F type DC 75 ohms load
4087	For saddle&clamp, DC blocked

SCART leads

7352	2 SCART 21 pin
------	----------------

HDMI/HDMI

494501	cable extender 1,5 m Black
494502	cable extender 3 m Black
494503	cable extender 5 m Black



▲ 4006



▲ 4173



▲ 4123



▲ 4071



▲ 4061



▲ 4058



▲ 4087



new

▲ 494501

Cases for Easy F splitters and taps

PRODUCT RANGE

Ref. DeSCRIPTION

545501	Face plate
4177	Black plastic case (small)
4163	Black plastic case (big)



▲ 545501



▲ 4177

COAXIAL CABLE

PRODUCT RANGE

Ref. DeSCRIPTION

Copper braid		
2106	CXT5 PVC	150 m
2138/02/03	CXT PVC	100/250/500 m
2139	CXT PVC Black	100 m
2141/05/07	T100 PVC	100/100/250 m
2155/03	T100 PE	100/250 m
2140	1/2" PE	500 m



References		2141 05/07	2155/03	2106	2138 02/03 2139	2140	
Model		T100		CXT5	CXT	1/2"	
Inner cond.	Ø (mm)	1,13	1,13	0,8	1	2,7	
	Material	Cu	Cu	Cu	Cu	Cu	
	Resist. (Ω/Km)	20	20	35	23	3,2	
Dielectric	Ø (mm)	4,8	4,8	3,4	4,8	11,5	
	Material	PEE	PEE	PEE	PEE	PEE	
Overlapping shielding foil		B	B	A	B	B	
Braid	Resist. (Ω/Km)	20	20	25	35	7	
	Material	Cu	Cu	CuSn	Cu	Cu	
Antimigration film		Yes	Yes	No	No	No	
Petrol jelly		No	No	No	No	Yes	
Outer sheath	Ø (mm)	6,6	6,6	5	6,6	15	
	Colour	W/B/W	Black	White	W/W/W/B	Black	
	Material	PVC	PE	PVC	PVC	PE	
Minimum bending radio (mm)		33	33	25	33	75	
Shielding (dB)		>75	>75	>75	>75	>75	
Capacitance (pF/m)		55	55	53	55	55	
Impedance (Ω)		75	75	75	75	75	
Meters / reel (m)		100/100/250	100/250	100	100/250/500 100	500	
Attenuations							
Freq. (MHz)	200	dB/m	0,08	0,08	0,11	0,09	0,03
	500		0,12	0,12	0,19	0,14	0,06
	800		0,15	0,15	0,23	0,18	0,07
	1000		0,18	0,18	0,26	0,20	0,08
	1350		0,21	0,21	0,31	0,23	0,10
	1750		0,24	0,24	0,35	0,27	0,11
	2050		0,27	0,27	0,39	0,29	0,12
	2150		0,27	0,27	0,40	0,30	0,13
	2300		0,28	0,28	0,42	0,31	0,14

Sheath	Environment
PVC	Indoor
PE	Outdoor
LSFH	Special

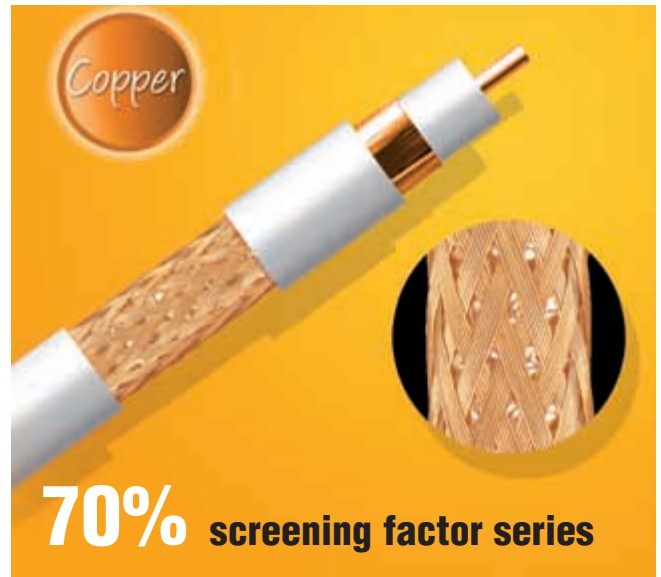
<b>Cu + Fe:</b> Copper clad steel	<b>PE:</b> Polyethylene
<b>Al:</b> Aluminium	<b>PEE:</b> Foam polyethylene
<b>Cu:</b> Copper	<b>LSFH:</b> Low Smoke Free Hallogen

Overlapped foil	
<b>A</b>	Al + Polyester + Al
<b>B</b>	Cu + Polyester

COAXIAL CABLE

**PRODUCT RANGE (70% screening factor series)**

Ref.	DeSCRIPTION	
214102/04/08	T100 PVC	100/250/100 m
215101	T100 LSFH	100 m
2128 /01	CXT PVC	100/250 m
2127/01/02/03/04	CXT1 PVC	100 m
215501/02	T100 PE	100/250 m
2126/01/02/03	T100 PVC	100/250/250/100 m
2149/01	TR165 PE	250 m



References		2126 01/02/03	214102 /04/08	2149 /01	215101	2128/01	2127 01/02/03/04	215501/02
Inner conductor	Ø mm	1,12	1,13	1,63	1,12	1	1	1,13
	Material	Cu	Cu	Cu	Cu	Cu	CCS	Cu
	Resistance (Ω/Km)	18	16	9	18	20	97	18
Dielectric	Ø mm	4,8	4,8	7,2	4,7	4,5	4,7	4,8
	Material	PEE	PEE	PEE	PEE	PEE	PEE	PEE
Overlapping Foil	Material	B	B	A	B	A	A	B
	Resistance (Ω/Km)	27	12	8	14	31	30	13
Outer conductor	Dimensions (carrier x strands x Ø mm)	16x6x0,14	16x8x0,11	16x7x0,15	16x8x0,11	16x6x0,14	16x7x0,13	16x8x0,11
	Screening (%)	74	73	70	73	74	73,4	73
	Material	Al	Cu	Cu	Cu	Al	Al	Cu
	Antimigrating film	no	yes	no	yes	no	no	yes
Outer Sheath	Ø (mm)	6,9	6,6	10,1	6,6	6,5	6,7	6,6
	Colour	W/W/B/B	W/W/B	black	white	white	W/B/B/W/W	black
	Material	PVC	PVC	PE	LSFH	PVC	PVC	PE
Minimum bending radius (mm)	34,5	33	50,5	33	32,5	33,5	33	
Shielding (dB)	>75	>75	>75	>75	>75	>75	>75	
Impedance (Ω)	75	75	75	75	75	75	75	
Metres / reel (m)		100/250/250/100	100/250/100	250	100	100/250	100/100/250/250/500	100/250

Attenuations			2126 01/02/03	214102 /04/08	2149 /01	215101	2128/01	2127 01/02/03/04	215501/02
Frequency (MHz)	85	dB/100 m	5,35	5,40	3,59	4,85	5,82	6,38	5,07
	200		8,02	7,88	5,44	7,50	8,68	9,39	7,88
	500		13,15	12,69	8,97	12,00	14,13	15,24	12,69
	750		16,49	15,80	11,20	15,00	17,72	19,27	15,74
	800		17,06	16,32	11,59	15,60	18,33	20,00	16,33
	1000		19,3	18,37	13,13	17,00	20,68	22,84	18,36
	1350		22,76	21,62	15,48	20,50	24,27	27,50	21,64
	1750		26,35	24,87	18,00	23,50	28,12	32,26	24,82
	2050		28,88	27,22	19,78	25,70	30,71	35,67	27,12
	2150		29,55	27,85	20,31	26,00	31,42	36,87	27,81
	2300		31,54	29,15	21,12	27,00	32,75	38,50	29,47

Sheath	Environment of use
PVC	Indoor
PE	Outdoor
LSFH	Special

Al: Aluminium	PE: Polyethylene
Cu: Copper	PEE: Foam Polyethylene
PVC: Polyvinyle Chlorhidre	LSFH: Low Smoke Free Hallogen
CCS: Copper Clad Steel	

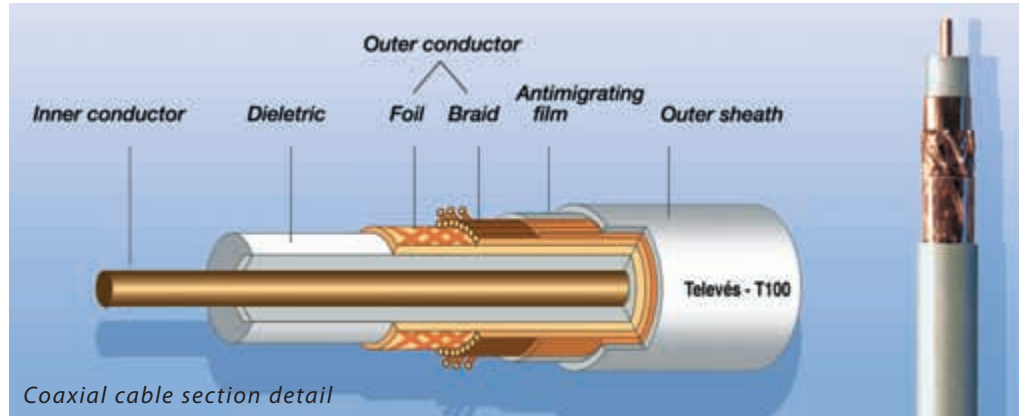
Overlapping foil composition	
A	Al + Polyester + Al
B	Cu + Polyester
C	Cu + Polyester

COAXIAL CABLE

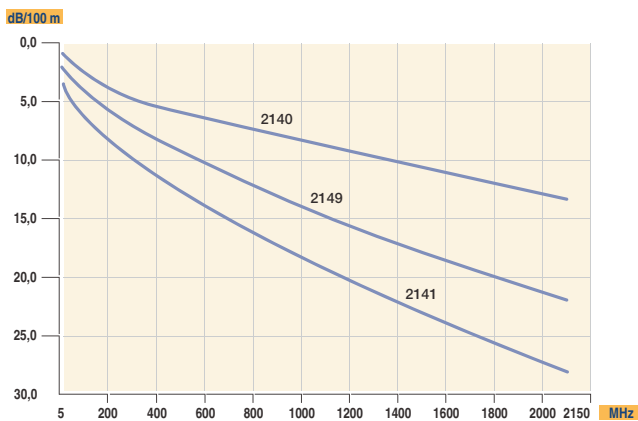
Remark:

The PE cables (polyethylene) are used for outdoor applications.

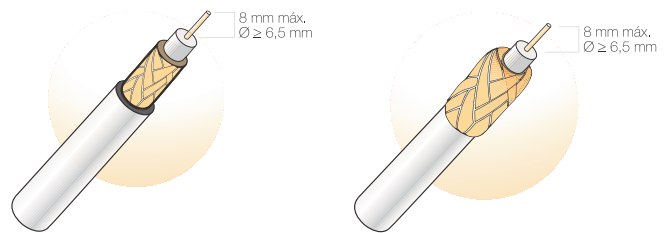
The PVC cables are used for indoor applications.



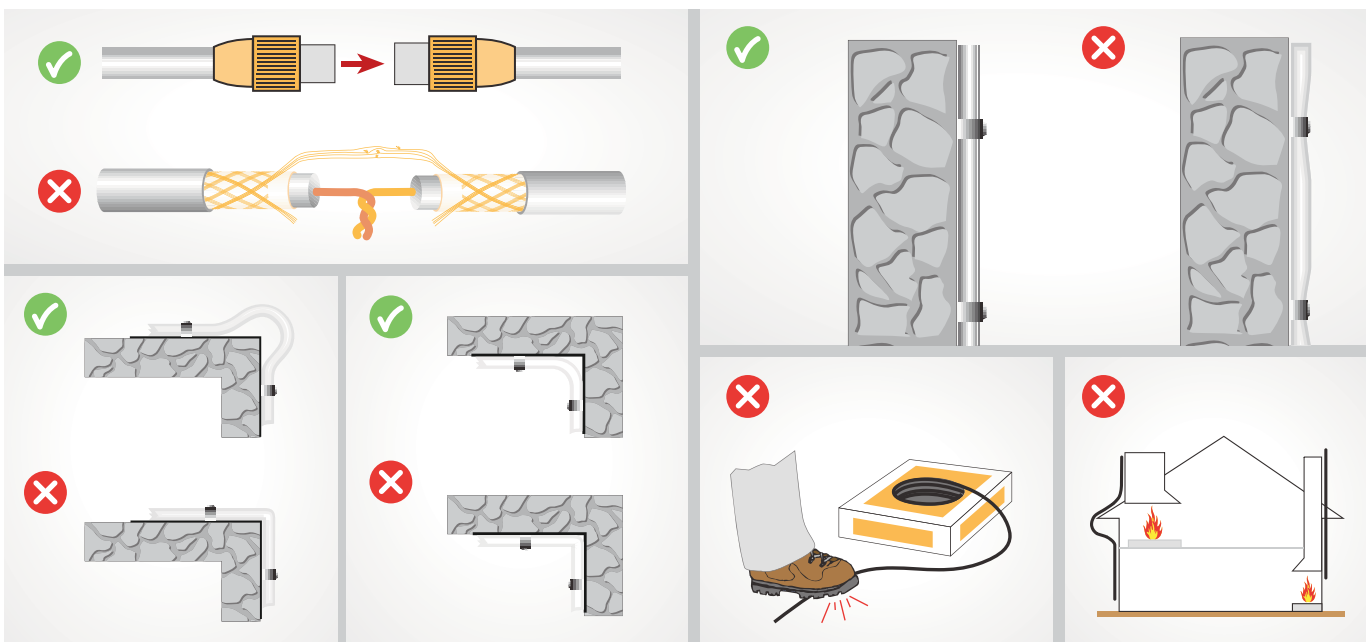
Cable losses



Coaxial cable stripping detail



Recommendations



# DTH RECEIVERS

Indoor receivers for terrestrial and satellite channels. Easy to use, with easy and intuitive menus.



TERRESTRIAL TV

# zAs HD



▲ 5124

## New functions:

- **Teletext:** Withstanded function by the own adapter, that makes it independent from teletext function on behalf of the television set.
- **Subtitles:** Function of special demand in professional associations, as:
  - People with hearing deficiency.
  - People interested in languages and/or in programs in original version.
- **Complete EPG:** More information about programming and events.
- **Channel sorting:** Function that is independent from the list of favourites and that allows the channel sorting at the users ease.
- **Less consumption:** The compromise with the environment leads the zAs to carry out, through the remote control, a real standby time (consumption lower than 2,5W). The ecological zAs.



TERRESTRIAL TV

Functions:

- Incorporated modulator: Configurable through the menu, with output in any UHF channel.
  - Its advantages:
    - Be part of a coaxial distribution network. The service tuned by the zAs can be distributed over the whole house by means of the antenna network.
    - It is compatible with old television sets, without SCART, and/or with television sets from secondary houses.
    - It is not necessary to throw away old television sets.
- High sensibility: It adapts televisions in zones of poor coverage. The tuners sensibility is higher than the one incorporated in televisions that are compatible with DTT. Besides, it provides telesupply to activate devices (DAT HD, MRD and Amplifiers FI\_MIX).
- Size: Its discrete dimensions make it perfect for reduced locations.
- European Technology **Made in Europe**: From the design and manufacturing up to the firmware, everything is made in Spain.



Reference		5124	
<b>General</b>			
Channels		198 (99TV + 99 Radio)	
EPG		yes	
Through output	MHz	47-862	
<b>Demodulator</b>			
Signal range		COFDM, 2K, 8K	
Input band	MHz	174-862	
Input Level	dBµV	45-90	
Constellations		16QAM, 64QAM	
FEC		1/2, 2/3, 3/4, 5/6, 7/8	
Guard interval		1/4, 1/8, 1/16, 1/32	
Ouput frequency	MHz	474-862	
Ouput channel		CH 21 - 69 (CCIR)	
TV		PAL B/G	
<b>Video</b>			
Input format and decod.		MPEG-2 MP @ ML	
Max. video rate	Mbps	15	
Screen format		4:3 / 16:9	
Video resolution		720 x 576	
<b>Audio</b>			
Audio decoder		MPEG/MusiCam Layer I & II	
<b>INPUT/OUTPUT Port</b>			
Input connector		1 x IEC (female)	
Output connector		1 x IEC (male)	
Serial port connection		RS232C, SUB-D female 9-pins	
Video output RGB		1 x SCART TV connector	
Video output CVBS Analogue audio output		1 x SCART TV connector	
Analogue audio output		1 x SCART TV connector	
<b>Powering</b>			
Consumption	mA(V)	0.40 (12)	
Consumption (Stand-by)	W	< 2,5	
Mains voltage		220-240 Vac, 50/60 Hz	
<b>Physical characteristics</b>			
Dimensions	mm	180 x 29 x 140	
Weight	Kg	0.3	



TERRESTRIAL TV

ZAS Satellite

PRODUCT RANGE

Ref. DeSCRIPTION

717501 Zas Satellite



▲ 717501

- Standard DVB-S / DVB-S2.
- Free-to-Air channels (FTA).
- Video: MPEG2 and MPEG4/H.264 compatible.
- Audio: MPEG-1 (layer 1,2), Dolby Digital+, MPEG-4, AAC and HEAAC compatible.
- PVR via USB 2.0. External hard disk (FAT32) or "Pen Drive" (FAT32) needed (\*).
- Simple and user friendly menus. First installation guided.
- Advanced reproduction functions: forward, rewind, previous / next, pause, go to, etc.
- "Time Shift" via USB 2.0.
- Timer.
- Electronic Programmes Guide (EPG) up to seven days.
- Up to 3.500 programmes and up to 6 favorite lists.
- VBI teletext, OSD teletext, standard subtitles and teletext subtitles.
- Parental lock.
- Auto save function for last channel used.
- Software Upgrading via USB 2.0.
- HDMI Output (Auto, 576i, 576p, 720p, 1080i, 1080p).
- Optical audio output.
- Multi-video Scart output (CVBS, RGB).
- Low consumption.

References		717501
<b>Tuner / LNB input</b>		
Input connector	1 "F"	
Output connector	1 "F"	
Input band	950-2150 MHz	
LNB powering	volt/mA	13-18 / 300
De-modulation	QPSK (DVB-S, DVB-S2)	
FEC	1/2, 2/3, 3/4, 5/6, 7/8, Auto	
<b>Digital video</b>		
Compatible	15 Mbit/s Max.	
Video format	4:3, 16:9	
Video resolution	1080p, 1080i, 720p, 576p, 576i	
Audio	MPEG/MusiCam Layer I & II	
Teletext	DVB compatible	
Flash memory	4 Mbytes	
RAM memory	16 Mbytes	
<b>Video / Audio decodification mode</b>		
Video	MPEG-2	
Video format	4:3, 16:9	
Audio	MPEG-1	
Audio modes	Mono; Dual; Stereo; "Joint stereo"	
<b>Output signal</b>		
Output signal mode	RGB, CVBS, Analog Audio	
Input connector	1 SCART	
Optical	HDMI (audio/video)	
<b>Powering and physical characteristics</b>		
Mains voltage	Vdc	12
Consumption	mA	325
Stand-by max.	mA	50
Working temperature	°C	10-40
Dimensions	mm	280 x 165 x 43
Weight	Kg	1.3

SATELLITE TV

Satellite Digital Receiver

Domestic unit for digital satellite channels reception.

Audio/video signals are provided via SCART or RCA outputs.

Compatible with both DiSEqC and USALS positioners.



▲ 7118

PRODUCT RANGE	
Ref.	DeSCRIPTION
7118	FTA Satellite receiver w/modulator

modulator

References		7118
<b>General</b>		
Number of channels		4000
Number of channels		various
Channels block		yes
Teletext		no
Subtittles		no
Timer		yes
<b>Tuner / LNB input</b>		
Input band	MHz	950 - 2150
Frequency scanning		yes
Number of LNB inputs		1 "F"
Loop through signal for LNB		yes
LNB powering	volt/mA	13-18 / 350
DiSEqC		1.0 / 1.2 / toneburst A/B
Positioner system		USALS / DiSEqC 1.2
Symbol rate		2 - 45 Msps
SAT Bands		C & Ku
<b>Video / Audio decodification mode</b>		
Video		MPEG-2
Video format		4:3, 16:9
Audio		MPEG-1
Audio modes		Mono; Dual; Stereo; "Joint stereo"
<b>Output signal</b>		
Output signal mode		(A/ V) RGB, CVBS, Audio L/R
Input connector		1 SCART
<b>INPUT/OUTPUT Ports</b>		
RS232		1 x (9-pin D-sub)
SCARTS		2 x (TV / VCR)
RCA		3 x (video - L audio - R audio)
LNB		2 x "F" (in-out)
<b>Powering and physical characteristics</b>		
Mains voltage		90 - 260 V, 50/60 Hz
Consumption	W	15
Dimensions	mm	280 x 165 x 43
Weight	Kg	1.3





## FIELD STRENGTH METERS

The fastest and most precise portable meter in the world within arm's reach. The H45 meter has been designed with digital processing technology allowing Real-time sweeping and unthinkable versatility and preciseness.



FIELD STRENGTH METERS

# H45

## MPEG-4

viewing and measuring  
TRUE 1080P DEFINITION

Upgrade now!

### The meter you are looking for displays and measures MPEG4 SIGNALS

#### FIRST HANDHELD METER WITH DIGITAL PROCESSING

The H45 meter has been designed to obtain all the information instantaneously from the signal by the development of mathematical algorithms. Up to 20 MHz digitally captured in less than 10 ms. That simple, yet that dramatically important and difficult to develop. Only Televés could be the first to do it in a small Field Strength Meter.

What colour TV was to black&white, or how broadband ADSL compares to the old rotary dialling... that is what the H45 with Digital Processing is to other portable meters.

A total revolution:

- Real-Time sweeping speeds
- Unprecedented preciseness
- Unthinkable versatility.

Televés H45 with Digital Processing. Because revolution is not making a smaller meter.

Revolution is making a Digital Processing meter in a smaller format.

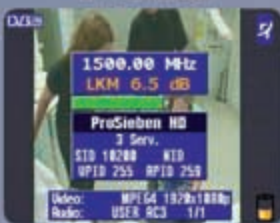


DVB T2

Full HD  
1080p

DOLBY  
DIGITAL

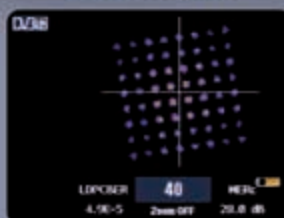
MPEG4 H.264



OPTICAL INPUTS



DVB-T2 OPTION



ANALYSIS IN THREE WINDOWS



FIELD STRENGTH METERS

H45 meter

Televés H45 is a milestone in the field strength meters world. The latest technology and high-end features in a complete range, that will never be outdated, due to its capability of being upgradable at any time.

Its easy and intuitive interface, becomes the instrument in a reference for all the installers.

PRODUCT RANGE	
Ref.	DeSCRIPTION
5990	H45 Compact
599001	H45 Compact Full HD
599002	H45 Compact Full HD + CI
5992	H45 Advance
599201	H45 Advance Full HD
599202	H45 Advance Full HD + CI
Optical Meter	
599003	H45 Compact with Optical Receiver
599004	H45 Compact Full HD + Optical Receiver
599203	H45 Advance with Optical Receiver
599204	H45 Advance Full HD + CI + Optical Receiver

The Televés H45 Meters

are based on Digital Processing

as the engine for the advanced features as well as the key to be lightweight, fast and scalable.

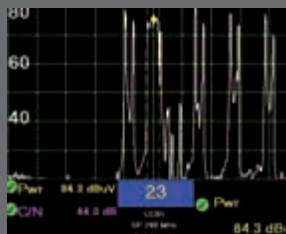
- ✓ Digital processing
- ✓ Combo mode display
- ✓ Advanced spectrum analyzer
- ✓ UAL (Universal Auto Log) and Scan&Log functions
- ✓ Ergonomic design
- ✓ Compact, lightweight and user friendly
- ✓ Upgrading and Scalability

COMBO MODE DISPLAY



Pictures, Spectrum and Measurements (with Quality Check Marks) in 1 screen. Signal information is updated real time. Everything you need regarding the signal measurements is displayed in the screen of the meter.

ADVANCED SPECTRUM



Advanced Spectrum Analyzer with a wide dynamic margin, to measure spurious and very low noise levels.

LINK MARGIN



Specific measurements for second generation digital standards (DVB-S2 and DVB-T2). The LINK MARGIN is the measurement that gives more information about the quality of these signals.





FIELD STRENGTH METERS

**SPECTRUM ANALYZER**

- Adjustable reference level
- Saturation alarm
- Max hold and marks
- Noise representation
- Automatic satellite identification
- Real time sweeping

**MEASUREMENTS**

- Level: from -15 to 130dBμV
- C/N (automatic and referenced)
- BER and MER in QPSK, QAM and COFDM
- DVB-S2 - 8PSK and DVB-T2 measurements (\*)
- Services (with their resolution) identification
- Echoes

**VIDEO AND AUDIO**

- HD digital signals: MPEG-4 or MPEG-2 (\*)
- SD digital signals: MPEG-2
- Digital audio: AAC, EAC3, AC3 and EAC3 (\*)

**AUTONOMY**

- More than 4 hours
- Special Firmware for charging management
- Battery status indicator

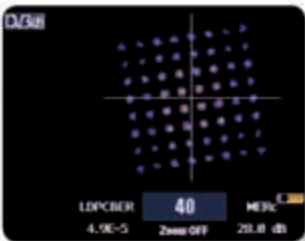
**HSUITE**

- Software tool to generate reports
- Instant Log function
- Check quality marks management
- Data Log function
- Graph logger (\*).






**DVB-T2 OPTION**



Constellation, measurements, demodulation and DVB-T2 visualization.

**DVB-S2 HD (1080i) PARAMETERS**



To watch digital signals transmitted via Fibre Optics (Full HD depending on the options)

**COMMON INTERFACE MODULE**  
Compatible with DVB-CI



The Meter incorporates a slot for a Conditional Access Module (CAM), which, combined with the corresponding smart card, allows to watch encrypted TV channels.

**MPEG-4 OPTION**



MPEG4 H.264: 576i, 720p, 1080i, 1080p.

**THE H45, THE METER YOU NEED TO CHECK THE RESPONSE OF AN OPTICAL DISTRIBUTION NETWORK**

The H45 Meters with Optical Receiver can measure optical power and attenuation as well

as all TV signal quality parameters like (Level, V/A, C/N, BER, MER,...)

**OPTICAL RECEIVER**



Combined with the triple light source OPS3L the H45 with optical receiver (optional) allows to check the response of an optical distribution network.

**SPECTRUM ANALYZER IN OPTICAL MODE**



To represent the spectrum of the RF signal transmitted via Fibre Optics. A great help for accurate adjustment of optical links.

**OPTICAL ATTENUATION MEASUREMENT**



Simultaneous analysis in three windows: 1310, 1490 and 1550 nm.



FIELD STRENGTH METERS

MODEL		COMPACT					ADVANCE					
References		5990	599001	599002	599003	599004	5992	599201	599202	599203	599204	
GENERAL CHARACTERISTICS	Digital Processing Technology											
	Scan & Log with Automatic Channel Identification	Terrestrial										
		Satellite										
	U.A.L. Technology (Universal Auto Lock) DVB-T, DVB-C, DVB-S & DVB-S2											
	Q.A.L. (QPSK Auto Lock) Technology											
	Interfaces		USB & SCART					SD card				
	SW upgrading through USB port											
	HW & SW upgrading to the latest technology											
	Faster and more precise Navigation via Capative Knob Technology											
	Satellite Frequency Selection		IF, Real RF, Channel and Memory									
	Measuring Units		dBµV, dBmV, dBm, dBµV/m									
	Programmable Automatic Shut-down (1- 59 min.)											
	Programmable Automatic Suspend (1- 59 min.)											
	Languages		English, German, Spanish, French, Italian, Portuguese, Russian and Polish									
	Menu and Measurements Presentation		On-Screen-Display (OSD)									
	Teletext		Analog and Digital									
	All measurements in one screen											
	Quality Checkmarks											
	Real-Time COMBO Mode (3 windows, spectrum, all measurements and video image)											
	Dynamic Margin	Terrestrial	50 dB					60 dB				
Satellite		45 dB					55 dB					
OPTICAL Receiver		Option 5999					Option 5999					
HDMI		-			-		-			-		
ANALYSER Mode	SPAN	Terrestrial	5, 10, 20, 50, 100, 200, 500 MHz and FULL					100, 200, 500 KHz; 1, 2 MHz; 1, 1.5 & 2 GHz and FULL				
		Satellite	5, 10, 20, 50, 100, 200, 500 MHz and FULL					100, 200, 500 KHz; 1, 2 MHz; 1, 1.5 & 2 GHz and FULL				
	RBW	Terrestrial	100, 200, 800 and 3200 KHz User selectable: NO Automatic depending on SPAN: YES					Configurable from 300 Hz to 6.4 MHz				
		Satellite	200, 800 & 3200 KHz User selectable: NO Auto based on SPAN: YES									
	B.E.R. Measurement in Spectrum		-									
	Vertical Reference Level		configurable, 5 & 10 dB					configurable 1, 2, 5, 10 dB				
	Saturation Warning Signal (Vertical Reference Level colour change)											
	Real-time Sweep		< 250 ms					< 10 ms				
	Screen Refreshing Rate		< 250 ms					< 100 ms				
	Hold	Maximums Minimums										
	Marks		2					Up to 3				
	Spectrum ZOOM within same screen		-									
	Visualisation of 2 Configurable Traces (max. and min.)		-									
	Event Triggers to detect Pulsing Signals		-									
	Represents Background Noise											
Configurable Detectors for Sampling Digital Signals		-										
VBW Variable		-										
Satellite Identification according to the trace visualised												
PROGRAMMED Measurements	Memories		250					1000				
	Macros		100 macros with 250 memories each macro									
	Datalogs											
	Stored Measurements Capacity		Up to 30.000									
	Download Datalogs into SD card		-									
	Outlet type selection when executing automatic measurements											
	Classification of Datalogs by Installation or Outlets											
	Instant Log											
Hsuite PC applications	Data Logger											
	Graphs Logger		-									
	Check Quality Marks											

FIELD STRENGTH METERS

MODEL		COMPACT					ADVANCE									
References		5990	599001	599002	599003	599004	5992	599201	599202	599203	599204					
BANDS	Return Channel (5-47 MHz) Measurement and Demodulation of Analog Channels, DVB-T and DVB-C	-					Continuous Band (without gaps) from 5 to 2500 MHz									
	Terrestrial (47-880 MHz) DVB-T, DVB-C, DVB-H and Analog Channels Demodulation															
	FM Radio (80-110 MHz) Measurements and Demodulation															
	GSM (880-950 MHz) Measurements in Spectrum Mode	-														
	Satellite (950-2220 MHz) Measures Analog Satellite. Measurements and Demodulation of DVB-S & DVB-S2	DVB S2 HD Option ref. 5991				DVB S2 HD Option ref. 5991										
	WiFi (2220-2500 MHz) Measurements in Spectrum Mode	-														
	Extended Spectrum (2500 - 3300 MHz)	-										Option 598902				
ANALOG Signal Measurements	Level with Colour-coded Level Scale representing Signal State															
	Audible Signal according to Level and C/N															
	V/A and C/N (without losing video visualisation)	C/N 45 dB					C/N 52 dB									
	Synch Impulse: Real representation						(Terrestrial)									
	Video Line Representation (user defined, with off-set and zoom)	-														
	Automatic C/N															
	Line C/N	-														
	TV Norms						PAL B/G, D/K, I, SECAM B/G, D/K, L, NTSC									
	Measure Margin						-15 to 130 dBµV									
	Power						-15 to 130 dBµV									
DIGITAL Signal Measurements	Automatic C/N															
	Referenced C/N	-					in spectrum mode									
	Audible signal according to Power and C/N															
	Impulse Channel Response in COFDM (Echoes)	HD Option ref. 5991				DVB S2 HD Option ref. 5991										
	Constellation QAM, DVB-S2 (8PSK or QPSK), COFDM (with manual carrier selection)															
	Packet Error Rate	-														
	NICAM	-														
	DVB - T2	-					Option 598901									
	QAM	BER	9.9E - 2 to 1.0E - 8													
		MER	> 38 dB													
		Att. Auto.														
		PWR	40 - 125 dBµV													
	COFDM	Symbol Rate	AUTO, (700 - 7200 Kbaud)													
		cBER	9.9E - 2 to 1.0E-6													
		vBER	1.0E - 4 to 1.0E-8													
		MER	> 35 dB													
	QPSK (with Q.A.L.technology)	PWR	40 - 125 dBµV													
		Auto Offset Detection														
		cBER	1.0E - 2 to 1.0E - 6													
		vBER	1.0E - 4 to 1.0E - 8													
	8PSK - DVB S2	MER														
		PWR	40-120 dBµV													
		Symbol Rate	AUTO, from 1 to 45 Mbaud													
Code Rate		AUTO, 2/3, 3/4, 5/6, 7/8, 1/2														
Link Margin							(- 8.3) to 20 dB									
cBER							1.0E-2 to 1.0E-8									
BCH BER							5.0E-2 to 1.0E-8									
MER																
Att. Auto.																
PWR							40 - 120 dBµV									
Symbol Rate						AUTO, 1 - 30 Mbaud										
Code Rate						AUTO (supports 1/4, 1/3, 2/5, 3/5, 1/2, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10)										
MPEG	Decodes Free-to-Air MPEG-2 with Standard Resolution															
	Decodes Free-to-Air MPEG-4 Resolution up to 1920x1080p - Full HD	Option 5997				Option 5997				Option 5997						
	Number of Services, Service Selected, Service Audios															
	NID, VPID, APID, SID (with Network Descriptor)															
	Video Resolution, Audio Type and Language															
	HD Identification															
Conditional Access Module (only MPEG-2)	Option 5998				Option 5998	Option 5998			Option 5998							
LNBS Powering	Voltage, Extra burst (14V, 19.5V to compensate cable losses)	13/18/24 V - 13 + 1/18 + 1/24 V (Extra Burst)														
	22 KHz tone															
	DiSEqC and SCR															
	Motor Control	-														
Battery	Type / Autonomy	Litio-ION (more than 4 hours in Low Consumption mode)														
	Advanced Energy Management: Normal, Low Power and Auto															
	Battery Status Indicator (icon and tone)															

FIELD STRENGTH METERS

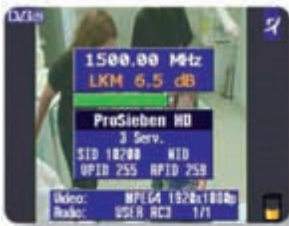
PRODUCT RANGE	
Ref.	DeSCRIPTION
<b>Options</b>	
5991	H45 HD measurements option*
5997	H45 MPEG - 4 option (Requires option ref. 5991)
5998	H45 C.I. option (Requires options ref. 5991 and ref. 5997)
598901	H45 DVB - T2 option (Requires options ref. 5997 and ref. 5998). H45 Advance exclusive
598902	H45 frequency range extension (5-3.300MHz) option. H45 Advance exclusive
5999	H45 Optical Receiver option
5994	H45 Upgrade Compact to Advance (Requires option ref. 5991)
5909	Calibration
<b>Accessories</b>	
5930	Noise generator
2340	OPS 3L Triple light source
5995	Weatherproof bag



▲ 5930



▲ 2340



**FULL HD PICTURES**

MPEG4 H.264: 576i, 720p, 1080i, 1080p.  
For services up to 1080p.  
Compatible with all the digital audio standards: AAC, EAAC, AC3 and EAC3.



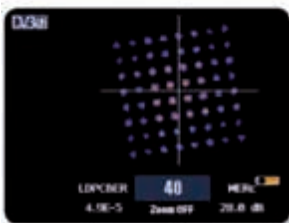
**COMMON INTERFACE MODULE COMPATIBLE WITH DVB-CI.**

Compatible with dvb-ci.  
The Meter incorporates a slot for a Conditional Access Module (CAM), which, combined with the corresponding smart card, allows to watch encrypted TV channels.



**OPTICAL SIGNAL MEASUREMENTS**

Analysis in three windows: 1310, 1490 y 1550 nm.  
It measures the optical power as well as all TV signal quality parameters like (Level, V/A, C/N, BER, MER,...)



**DVB-T2 OPTION**

Constellation, measurements, demodulation and DVB-T2 visualization.



▲ 5995

## COAXDATA

The bandwidth of the coaxial cable allows to multiplex a number of services other than television. Coaxdata is a state-of-the-art system that converts a television coaxial network into a high speed local network. By means of Coaxdata, sharing resources (computers, printers, an internet connection, etc) does not need any additional cable..



COAXDATA

## Coaxdata HOMEPLUG

**PRODUCT RANGE**  
Ref. DeSCRIPTION

7689 Ethernet Hybrid Adapter 200Mbps

The existing infrastructures such as hotels, residential homes, schools and hospitals can face with ref. 7689 the increasing number of internet-users, offering them an access to the net from their own rooms.

In those cases where the existent infrastructure is coaxial (i.e hotels), sharing the system to offer TV Digital Broadcast services (QAM, COFDM) and IP services (IPTV, VoD, Internet, VoIP) at a time, is a great choice.

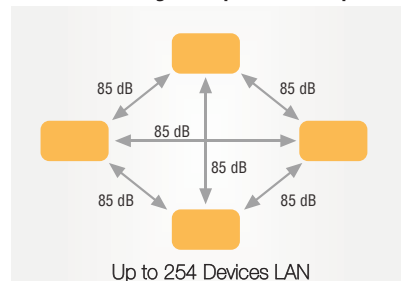
The new Ethernet Hybrid Adapter 200Mbps brings advantages to the installations, thanks to several improvements in design, as well as in functionality.



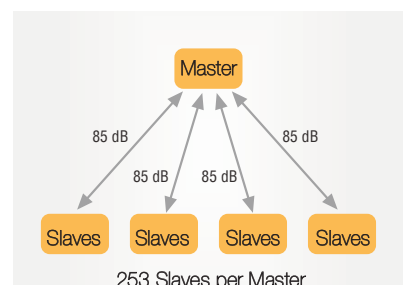
▲ 7689

References	7689
<b>Connectors</b>	
Ethernet interface	2 RJ45
Coaxial interface	2 F: TV + Data
Powering	AC 100 - 240V (50-60 Hz)
<b>Data Coaxial Interface</b>	
Output power	130 dBμV
Minimum Power spectral density	-135 dBm/Hz
Output impedance	75 ohms
Bandwidth	2-30 Mhz
Return losses	> 10 dB
<b>TV Coaxial Interface</b>	
Through losses	2 dB
Return losses	> 10 dB
Bandwidth	57 a 2150 MHz
Output impedance	75 ohms
<b>Power/Temperature</b>	
Working temperature (min., max.)	-10°C, 45°C
Maximum consumption	4.6 Watts (45mA)
<b>Firmware features</b>	
Maximum number of slaves	253 (1012 using 4 masters)
Maximum length of data network (Coax Cable)	900 m.
Maximum length of data network (Power Line)	200 m.
Users per slave	2

**Home Networking: multipoint-to-multipoint**



**MxU: point-to-multipoint**



Possible coverage when big number of users, by means of masters multiplexation over the same frequency band.

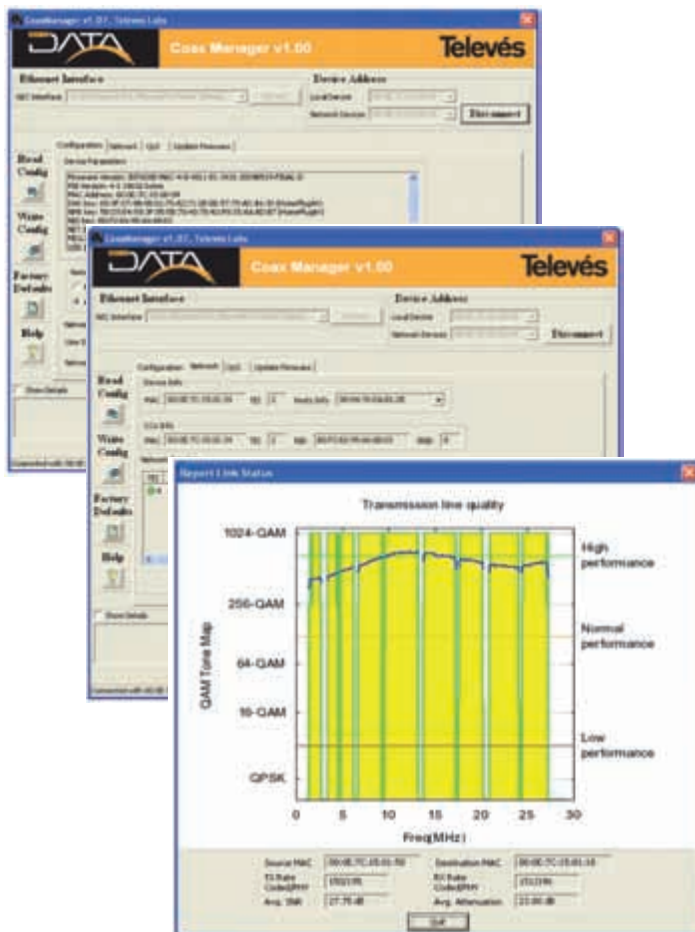
## LEDs indicators of the channel quality



### Coax Link Status

Tricolor LED (green/orange/red) will be illuminated if connectivity with another element in the network is possible.

- 120 Mbps < Throughput < 150 Mbps
- 70 Mbps < Throughput < 120 Mbps
- 0 Mbps < Throughput < 80 Mbps



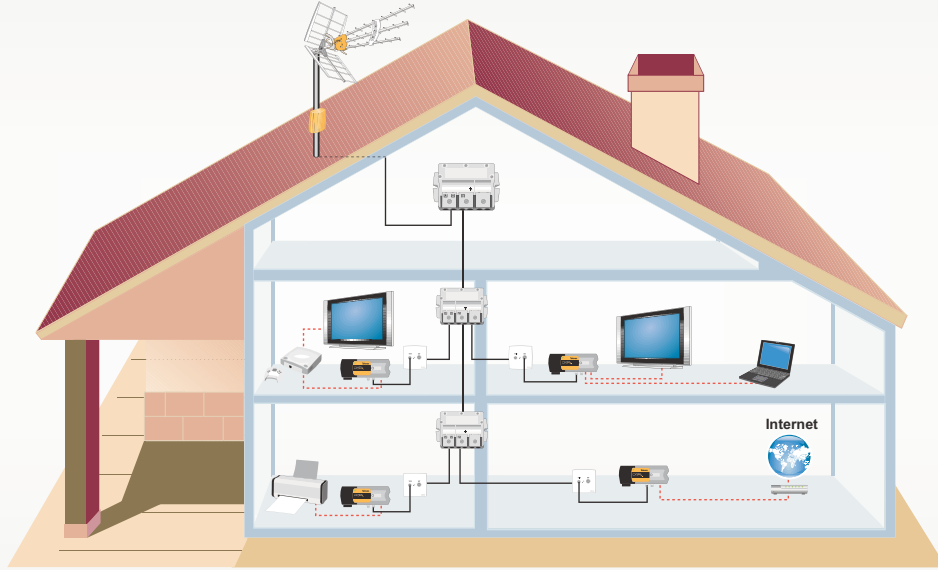
CoaxManager Software tool allows setting the installation parameters. Ad-hoc software development option i.e, Management and Invoicing applications.

- Networking or MxU.
- Private networks (encryption).
- QoS parameters configuration.
- MACs limitation per Slave.
- IGMP configuration.
- Status link information detailed, i.e SNR attenuation and tone-map list; allowing to get an itemized view of the installation performance.

COAXDATA

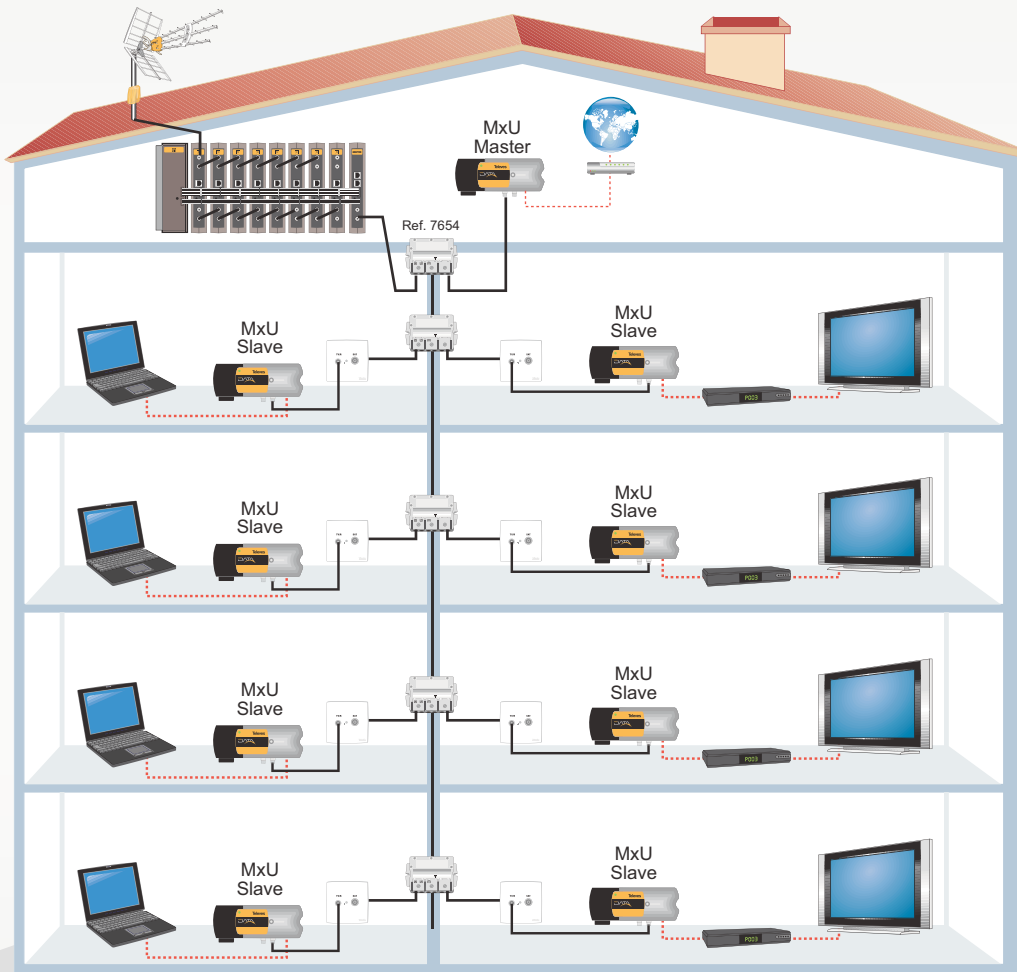
TYPICAL APPLICATION

Home Networking



TYPICAL APPLICATION

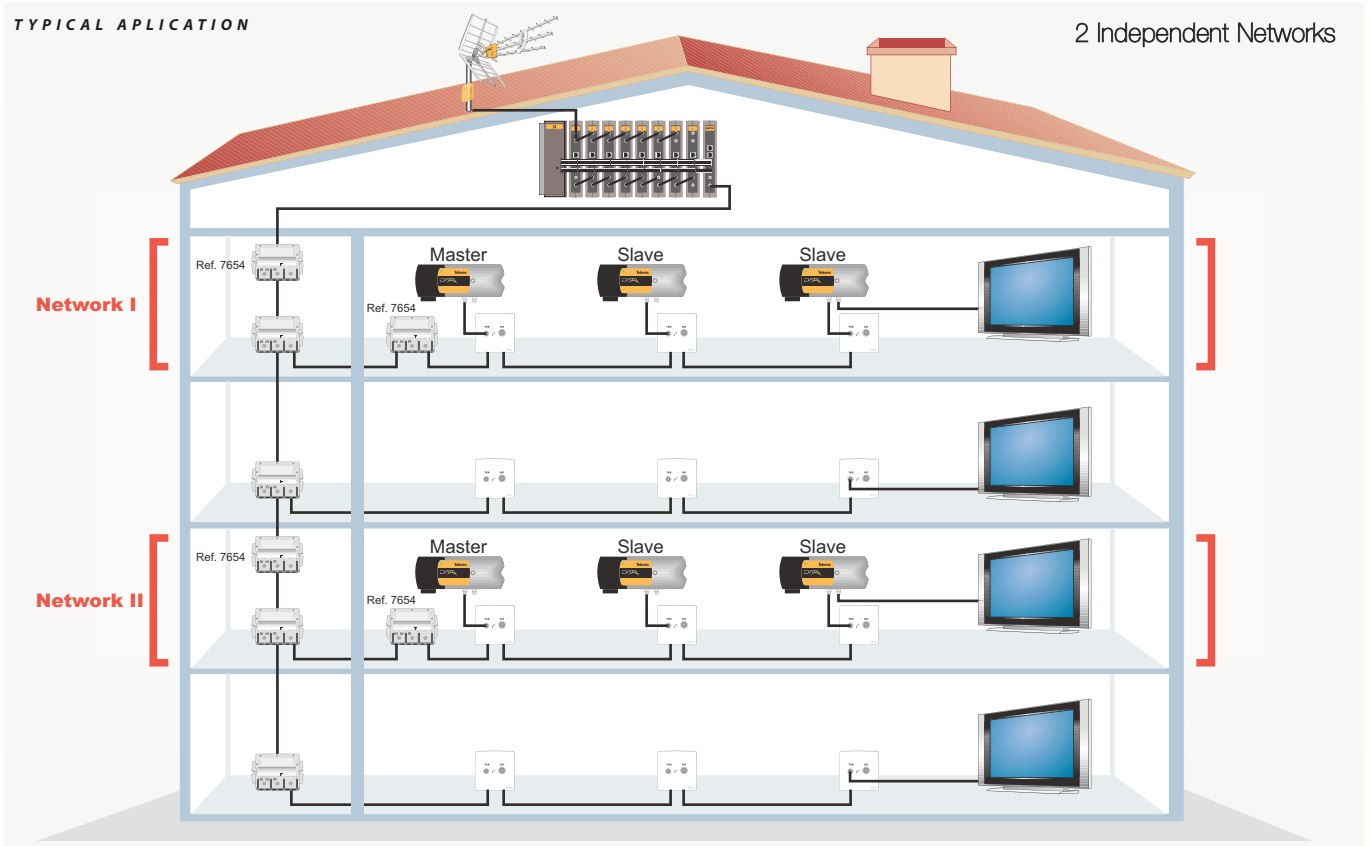
MXU





TYPICAL APPLICATION

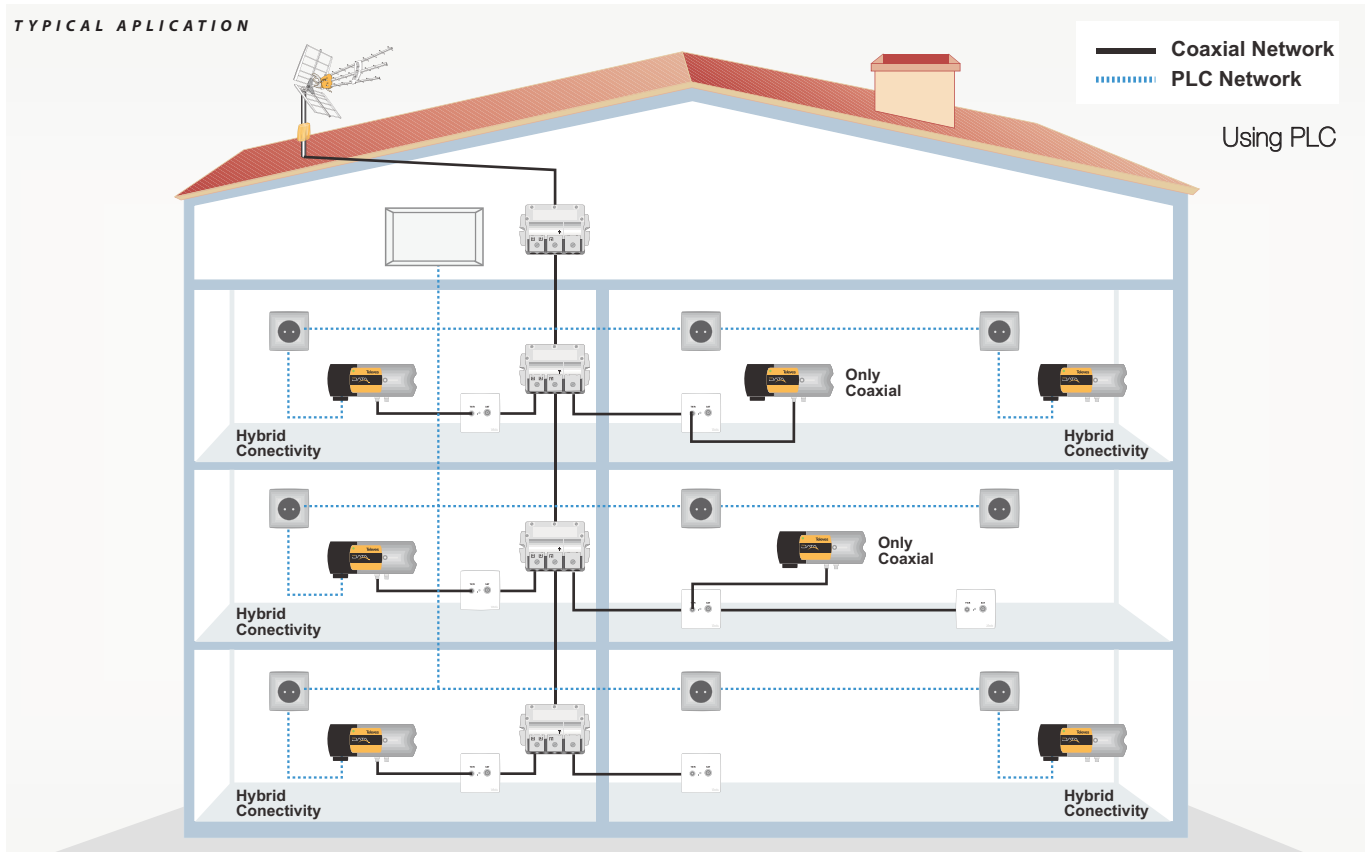
2 Independent Networks



TYPICAL APPLICATION

— Coaxial Network  
 ..... PLC Network

Using PLC



**Televes**

# HOME ACCESSORIES

Complete range of product for domestic use.



DIGIDOM

AV and infrared transmitters



**PRODUCT RANGE**

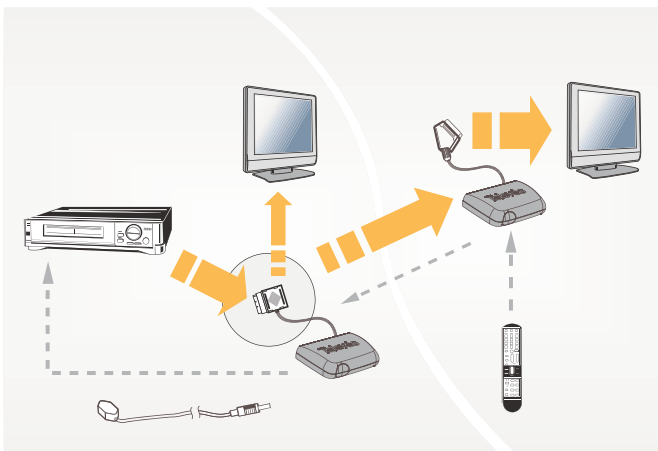
Ref.	DeSCRIPTION
7167	Digidom AV 5.8 GHz (Trans.+Receiver)
7307	Digidom AV (Trans.+Receiver)
7604	Digidom AV (Receiver)
7237	Digidom I/R disc shape (Trans.+Receiver)
7219	Digidom IR disc shape (Transmitter)



▲ 7237



▲ 7307



▲ 7167

References		7237/7219	7307/7604
RCU Transmission band	MHz	434	400
Video transmission band		-	2400
Video input signal	Vpp	-	1
Modulation		AM	FM
No. of channels		1	4

References		7167	
<b>Transmitter (TX)</b>			
Channel / Frequency	(N° / MHz)	1 / 5733	5 / 5809
		2 / 5752	6 / 5828
		3 / 5771	7 / 5847
		4 / 5790	8 / 5866
Output level	dBm	10	
Video Input Level	Vpp	1	
Audio Input Level		1	
Video Input Impedance	ohm	75	
Audio Input Impedance		600	
Supply Voltage	Vdc, 300 mA)	9	
Power Consumption	mA	150	
Dimension	mm	129 x 113 x 36	
<b>Receiver (RX)</b>			
Output Level A/V	Vpp	1	
Receiver Sensitivity	dBm	-85	
Supply Voltage	Vdc, 300 mA)	9	
Power Consumption	mA	270	
Single-Channel IR Transmission Frequency	MHz	433,99	
Dimension	mm	129 x 113 x 36	

DIGIDOM

AV and infra-red transmitters

PRODUCT RANGE

Ref. DeSCRIPTION

7605	IR extensor with coaxial link (Trasmitter + Receiver)
7606	IR extensor with coaxial link (Receiver)

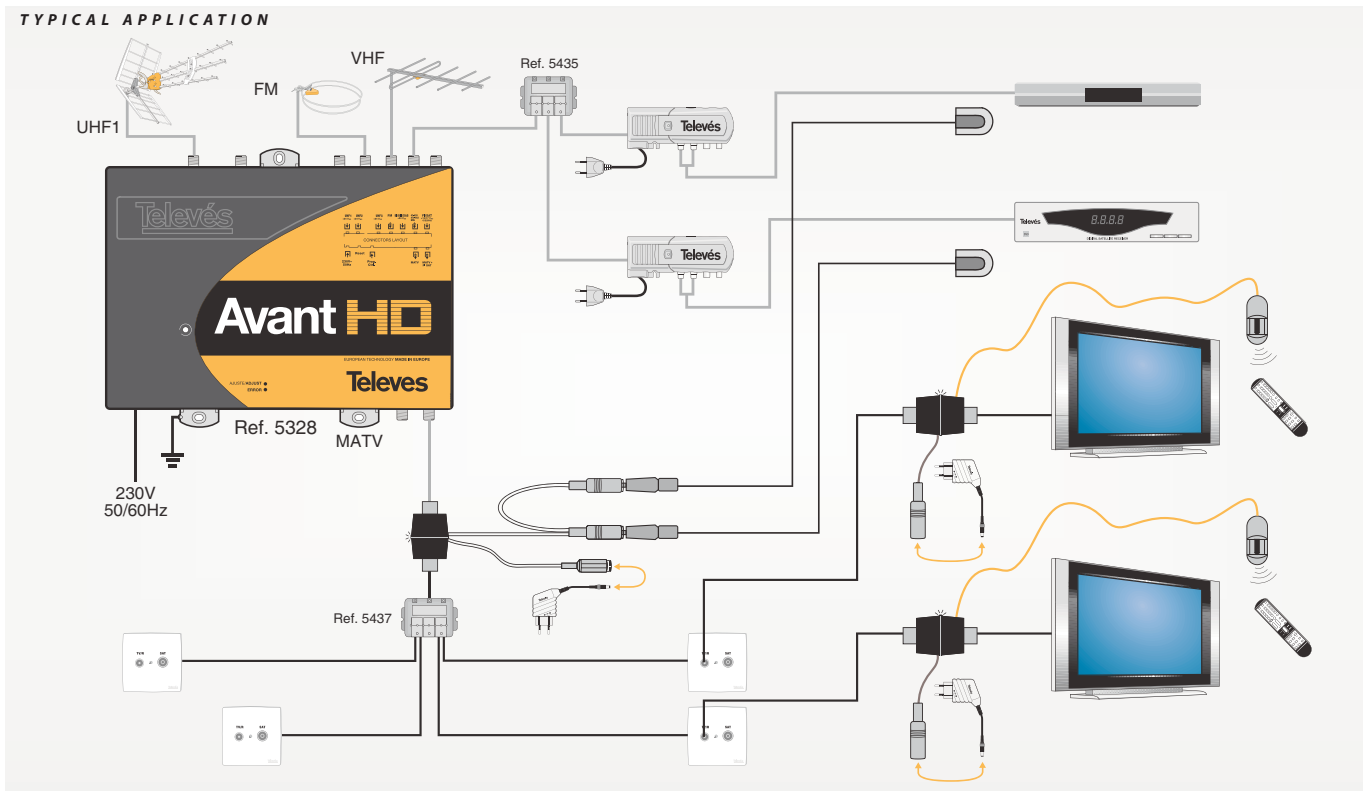
- IR Remote control extensor, using coaxial cable link.
- Interference free.



▲ 7605

References		7605 TR+IR
Output frequency	KHz	36 (RC5)
Sensitivity	dBm	< -60
Output powering	mA	12 (12Vdc)
		30 (12Vdc)
Through losses	dB	0,5 (5-862 Mhz)

References		7606 IR
Modulation frequency	MHz	14,7 MHz
Output level	dBm	> -10
Powering	mA	9-12 (9-12Vdc)
Through losses	dB	0,5 (5-862 Mhz)
Harmonic level	dBc	-45



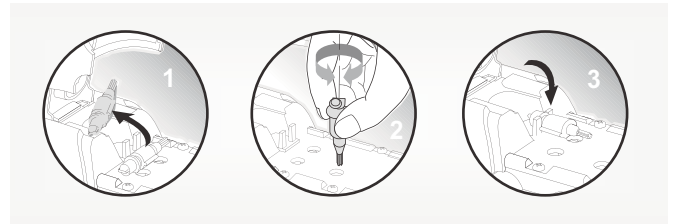
DOMESTIC MODULATOR

Domestic modulators

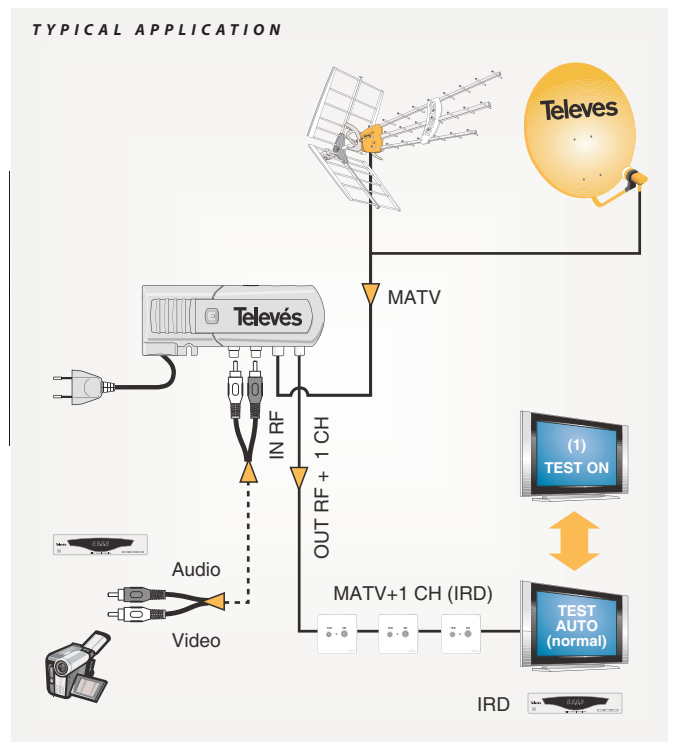
**PRODUCT RANGE**  
Ref. DeSCRIPTION

5858 UHF/VHF Modulator

- Push-buttons instead of rotating selectors.
- Interface with the user via displays
- Output level regulation to avoid interferences with other channels in the installations
- 5-2150 Mhz frequency range, IF included
- DC bypass Input-Output.
- Small size



References		5858
<b>Modulator</b>		
Standard	PAL B/G, B Australia, PAL I, K CCIR, M-N, SECAM L, D OIRT, D-K PAL	
Channels VHF (Pal B/G)	BS (S01-S10), BIII (C5-C12), BS (S11-S29)	
Channels UHF	Ch 21- 69	
Output level RF	dBµV	85-90
Attenuation	dB	15
Audio Carrier	MHz	5,5MHz (Pal B/G)
Modulation Depth	%	85
Video input level	W	1Vpp s/75
<b>Thru-input</b>		
Frequency range	MHz	5-2150
	dB	2 typ.
Return losses		10 typ.
<b>Powering</b>		
Mains voltage	196-264V~ 50-60Hz	
Total consumption (I máx)	A	0,026
DC bypass	mA	300 máx.





**TECH ICA DATA**





TECHNICAL DATA

Conversion table

Levels (measured over 75 Ω impedance)					
μV	dBμV	dBm	mV	dBμV	dBm
1	0	-109	1	60	-49
1.5	3.5	-105.5	1.5	63.5	-45.5
2	6	-103	2	66	-43
2.5	8.0	-101	2.5	68	-41
3	9.5	-99.5	3	69.5	-39.5
3.5	11	-98	3.5	71	-38
4	12	-97	4	72	-37
4.5	13	-96	4.5	73	-36
5	14	-95	5	74	-35
6	15.5	-93.5	6	75.5	-33.5
7	17	-92	7	77	-32
8	18	-91	8	78	-31
9	19	-90	9	79	-30
10	20	-89	10	80	-29
15	23.5	-85.5	15	83.5	-25.5
20	26	-83	20	86	-23
25	28	-81	25	88	-21
30	29.5	-79.5	30	89.5	-19.5
35	31	-78	35	91	-18
40	32	-77	40	92	-17
45	33	-76	45	93	-16
50	34	-75	50	94	-15
60	35.5	-73.5	60	95.5	-13.5
70	37	-72	70	97	-12
80	38	-71	80	98	-11
90	39	-70	90	99	-10
100	40	-69	100	100	-9
150	43.5	-65.5	150	103.5	-5.5
200	46	-63	200	106	-3
250	48	-61	250	108	-1
300	49.5	-59.5	300	109.5	0.5
350	51	-58	350	111	2
400	52	-57	400	112	3
450	53	-56	450	113	4
500	54	-55	500	114	5
600	55.5	-53.5	600	115.5	6.5
700	57	-52	700	117	8
800	58	-51	800	118	9
900	59	-50	900	119	10
1000	60	-49	1000	120	11

Conversión $\frac{V_2}{V_1}$ a $\frac{V_2}{V_1}$ (dB)										
dB.	0	1	2	3	4	5	6	7	8	9
0	1	1.12	1.26	1.41	1.59	1.78	2.00	2.24	2.51	2.82
10	3.16	3.55	3.98	4.47	5.01	5.62	6.31	7.08	7.94	8.91
20	10	11.2	12.6	14.1	15.9	17.8	20.0	22.4	25.1	28.2
30	31.6	35.5	39.8	44.7	50.1	56.2	63.1	70.8	79.4	89.1
40	100	112	126	141	159	178	200	224	251	282
50	316	355	398	447	501	562	631	708	794	891
60	1000	1122	1259	1413	1585	1778	1995	2239	2512	2818
70	3162	3548	39.81	4469	5012	5623	6310	7080	7943	8912

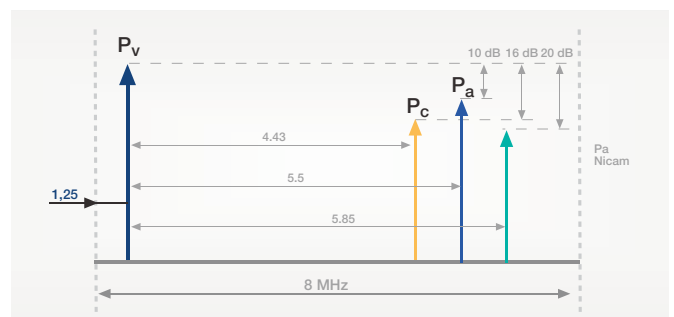
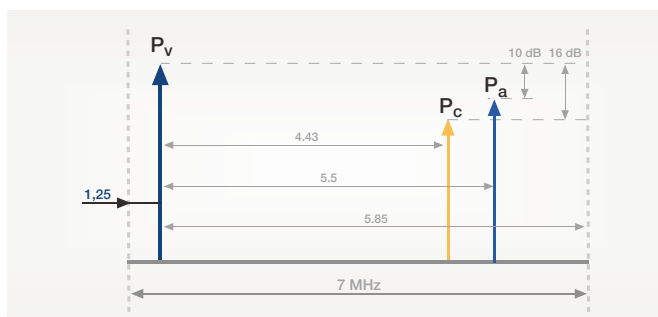
Conversion formula:  $\frac{V_2}{V_1}$  (dB) =  $20 \log \frac{V_2}{V_1}$   
 Example: ¿How many dB are  $\frac{V_2}{V_1} = 200$   
 Result: 40+6= 46 dB

Reduction of max. output level (derating)  
Broadband amplifiers

Channels	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	32
Reduction (dB)	0	2.5	3	4.5	5	5.5	6	6.5	7	7.5	8	8	8.5	8.5	9	9	12

TV frequency bands

VHF							UHF		
BI	Sub B	FM	Low S	BIII	High S	Hyperband	BIV		BV
C2	C3	C4	S1-S10	C5-C12	S11-S21	S21-S41	C21-C37		C38-C69
47	68	88	10	17	23	30	47	60	86



TECHNICAL DATA

Radio frequency standards

TV Bands	Ch.	Frequency Channel (MHz)	Video carrier (MHz)	Audio carrier (MHz)
<b>H Standard (Australia)</b>				
IV	H28	526-533	527,25	532,75
	H29	533-540	534,25	539,75
	H30	540-547	541,25	546,75
	H31	547-554	548,25	553,75
	H32	554-561	555,25	560,75
	H33	561-568	562,25	567,75
	H34	568-575	569,25	574,75
	H35	575-582	576,25	581,75
	H36	582-589	583,25	588,75
	H37	589-596	590,25	595,75
H38	596-603	597,25	602,75	
V	H39	603-610	604,25	609,75
	H40	610-617	611,25	616,75
	H41	617-624	618,25	623,75
	H42	624-631	625,25	630,75
	H43	631-638	632,25	637,75
	H44	638-645	639,25	644,75
	H45	645-652	646,25	651,75
	H46	652-659	653,25	658,75
	H47	659-666	660,25	665,75
	H48	666-673	667,25	672,75
	H49	673-680	674,25	679,75
	H50	680-687	681,25	686,75
	H51	687-694	688,25	693,75
	H52	694-701	695,25	700,75
	H53	701-708	702,25	707,75
	H54	708-715	709,25	714,75
	H55	715-722	716,25	721,75
	H56	722-729	723,25	728,75
	H57	729-736	730,25	735,75
	H58	736-743	737,25	742,75
H59	743-750	744,25	749,75	
H60	750-757	751,25	756,75	
H61	757-764	758,25	763,75	
H62	764-771	765,25	770,75	
H63	771-778	772,25	777,75	
H64	778-785	779,25	784,75	
H65	785-792	786,25	791,75	
H66	792-799	793,25	798,75	
H67	799-806	800,25	805,75	
H68	806-813	807,25	812,75	
H69	813-820	814,25	819,75	

TV Bands	Ch.	Frequency Channel (MHz)	Video carrier (MHz)	Audio carrier (MHz)
<b>I Standard (Great Britain -South Africa)</b>				
III	I4	174-182	175,25	181,25
	I5	182-190	183,25	189,25
	I6	190-198	191,25	197,25
	I7	198-206	199,25	205,25
	I8	206-214	207,25	213,25
	I9	214-222	215,25	221,25
	I10	222-230	223,25	229,25
	I11	230-238	231,25	237,25
	I(12)	238-246		
	I13	246-254	247,43	253,43

TV Bands	Ch.	Frequency Channel (MHz)	Video carrier (MHz)	Audio carrier (MHz)
<b>B Standard (Italy)</b>				
I	A	52,5-59,5	53,75	59,25
	B	61-68	62,25	67,75
II	C	81-88	82,25	87,75
III	D	174-181	175,25	180,75
	E	182,5-189,5	183,75	189,25
	F	191-198	192,25	197,75
	G	200-207	201,25	206,75
	H	209-216	210,25	215,75
	H1	216-223	217,25	222,75
	H2	223-230	224,25	229,75

TV Bands	Ch.	Frequency Channel (MHz)	Video carrier (MHz)	Audio carrier (Hz)
<b>L Standard (France)</b>				
III	L05	174,75-182,75	176,00	182,50
	L06	182,75-190,75	184,00	190,50
	L07	190,75-198,75	192,00	198,50
	L08	198,75-206,75	200,00	206,50
	L09	206,75-214,75	208,00	214,50
	L10	214,75-222,75	216,00	222,50

TV Bands	Ch.	Frequency Channel (MHz)	Video carrier (MHz)	Audio carrier (MHz)
<b>K Standard</b>				
III	K4	174-182	175,25	181,75
	K5	182-190	183,25	189,75
	K6	190-198	191,25	197,75
	K7	198-206	199,25	205,75
	K8	206-214	207,25	213,75
	K9	214-222	215,25	221,75

TV Bands	Ch.	Frequency Channel (MHz)	Video carrier (MHz)	Audio carrier (MHz)
<b>I Standard (Ireland)</b>				
I	A-1	44,5-52,5	45,75	51,75
	B-1	52,5-60,5	53,75	59,75
	C-1	60,5-68,5	61,75	67,75
III	D-1	174-182	175,25	181,25
	E-1	182-190	183,25	189,25
	F-1	190-198	191,25	197,25
	G-1	198-206	199,25	205,25
	H-1	206-214	207,25	213,25
	I-1	214-222	215,25	221,25

TV Bands	Ch.	Frequency Channel (MHz)	Video carrier (MHz)	Audio carrier (MHz)
<b>D Standard - OIRT</b>				
I	R1	48,5 - 56,5	49,75	56,25
	R2	58 - 66	59,25	65,75
	R3	76 - 84	77,25	83,75
II	R4	84- 92	85,25	91,75
	R5	92-100	93,25	99,75
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

TECHNICAL DATA

TV Standards

Country	VHF	UHF	Colour System
Algeria	B	H	PAL
Argentina	N	N	PAL
Australia	B	H	PAL
Austria	B	G	PAL
Bahrain	B	G	PAL
Belgium	B	H	PAL
Bulgaria	D	K	SECAM
China	D	K	PAL
Cyprus	B	G	PAL
Croatia	B	G	PAL
Czechoslovakia	D	K	SECAM
Denmark	B	G	PAL
Egypt	B	G, H	SECAM
Finland	B	G	PAL
France	EIL	L	SECAM
Germany	B	G	PAL
Gibraltar	B	H	PAL
Great Britain	I	I	PAL
Greece	B	G	SECAM
Holland	B	G	PAL
Hong Kong	(A)I	I	PAL
Hungary	D	K	SECAM
Iceland	B	G	PAL
India	B	-	PAL
Indonesia	B	-	PAL
Iran	B	G	SECAM
Iraq	B	-	SECAM
Ireland	I	I	PAL
Israel	B	G	PAL
Italy	B	G	PAL
Japan	M	M	NTSC
Jordan	B	G	PAL
Korea (Rep.)	M	-	NTSC
Kuwait	B	G	PAL

Country	VHF	UHF	Colour System
Lebanon	B	G	SECAM
Libya	B	H	PAL
Luxemburg	C	L	PAL/SECAM
Malta	B	H	PAL
Malaysia	B	G	PAL
Mexico	M	M	NTSC
Monaco	E	L	SECAM
Morocco	B	H	SECAM
Nigeria	B	G	PAL
Norway	B	G	PAL
Oman Sultanate	B	G	PAL
Pakistan	B	-	PAL
Philippines	M	M	NTSC
Poland	D	K	PAL
Portugal	B	G	PAL
Qatar	B	-	PAL
Romania	B	G	PAL
Russia	D	K	SECAM
Saudi Arabia	B	G	PAL/SECAM
Singapore	B	G	PAL
Slovenia	B	G	PAL
Spain	B	G	PAL
Sri Lanka	B/H	-	PAL
South Africa	I	I	PAL
Sweden	B	G	PAL
Switzerland	B	G	PAL
Syrian Arab. Rep.	B	H	SECAM
Thailand	B	R	PAL
Tunisia	B	G	SECAM
Turkey	B	G	PAL
U.A.E.	B	G	PAL
U.S.A.	M	M	NTSC
Yemen P.D. R.	B	-	PAL

TV standards											
Standard		B/G CCIR	D/K OIRT	H Belgium	I UK	K1 <sup>(1)</sup> FOPTA <sup>(2)</sup>	L France	M FCC	N South America		
Frequency band		VHF/UHF		UHF	VHF/UHF						
Number of lines		625						525	625		
Field frequency	Hz	50						60	50		
Line frequency		15625						15750	15625		
Video bandwidth	MHz	5	6	5	5.5	6		4.2			
RF channel bandwidth		7/8	8						6		
Video - audio <sup>(3)</sup> spacing		+5.5/5.74/5.85	+6.5	+5.5	+6/6.552	+6.5	±6.5		+4.5		
Vestigial Side Band		0.75		1.25				0.75			
Spacing between the left edge of the channel and the video carrier		+1.25									
RF sync level	%	100					<6	100			
Picture modulation		C3F negative					C3F positive	C3F negative			
Sound modulation		F3E / F3EH <sup>(2)</sup>		F3E			A3E	F3E			
Frequency modulation	KHz	±50								-	±25
AV carrier ratio		10:1 to 20:1 <sup>(4)</sup> 20:1:0.2 <sup>(5)</sup>	10:1 to 5:1	5:1 ato10:1	5:1	10:1		10:1 to 5:1 <sup>(4)</sup>	10:1 a 5:1		

<sup>(1)</sup> Also known as K' / <sup>(2)</sup> For dual audio or stereo, the second value for second carrier / <sup>(3)</sup> In Germany since April 1976  
<sup>(4)</sup> 6.7:1 y 2.9:1 in Japan / <sup>(5)</sup> Group of territories represented by the French Overseas Post and Telecommunications Agency (FOPTA)

TECHNICAL DATA

Channel - Frequency Tables

Bands	Channel	Frequency Channel (MHz)	Video carrier (MHz)	Audio carrier (MHz)	Subcarrier colour (MHz)
Channels distribution according to CCIR (B Standard +G Europe)					
I	2	47...54	48.25	53.75	52.68
	3	54...61	55.25	60.75	59.68
	4	61...68	62.25	67.75	66.68
Sub. Band	L1	68...75	69.25	74.75	73.18
	L2	75...82	76.25	81.75	80.25
	L3	82...89	83.25	88.75	87.32
II	FM	88...108			
S Low Band	S1	104...111	105.25	110.75	109.68
	S2	111...118	112.25	117.75	116.68
	S3	118...125	119.25	124.75	123.68
	S4	125...132	126.25	131.75	130.68
	S5	132...139	133.25	138.75	137.68
	S6	139...146	140.25	145.75	144.68
	S7	146...153	147.25	152.75	158.68
	S8	153...160	154.25	159.75	158.68
	S9	160...167	161.25	166.75	165.68
	S10	167...174	168.25	173.75	172.68
BIII	5	174...181	175.25	180.75	179.68
	6	181...188	182.25	187.75	186.68
	7	188...195	189.25	194.75	193.68
	8	195...202	196.25	201.75	200.68
	9	202...209	203.25	208.75	207.68
	10	209...216	210.25	215.75	214.68
	11	216...223	217.25	222.75	221.68
	12	223...230	224.25	229.75	228.68
	S11	230...237	231.25	236.75	235.68
	S12	237...244	238.25	243.75	242.68
	S13	244...251	245.25	250.75	249.68
	S14	251...258	252.25	257.75	256.68
S High Band	S15	258...265	259.25	264.75	263.68
	S16	265...272	266.25	271.75	270.68
	S17	272...279	273.25	278.75	277.68
	S18	279...286	280.25	285.75	284.68
	S19	286...293	287.25	292.75	291.68
	S20	293...300	294.25	299.75	298.68
	S21	302...310	303.25	308.75	307.68
	S22	310...318	311.25	316.75	315.68
	S23	318...326	319.25	324.75	320.68
	S24	326...324	327.25	332.75	331.68
Hyperband	S25	334...342	335.25	340.75	339.68
	S26	342...350	343.25	348.75	347.68
	S27	350...358	351.25	356.75	355.68
	S28	358...366	359.25	364.75	363.68
	S29	366...374	367.25	372.75	371.68
	S30	374...382	375.25	380.75	379.68
	S31	382...390	383.25	388.75	387.68
	S32	390...398	391.25	396.75	395.68
	S33	398...406	399.25	404.75	403.68
	S34	406...414	407.25	412.75	411.68
	S35	414...422	415.25	420.75	419.68
	S36	422...430	423.25	428.25	427.68
	S37	430...438	431.25	436.75	435.68
	S38	438...446	439.25	444.75	443.68

Bands	Channel	Frequency Channel (MHz)	Video carrier (MHz)	Audio carrier (MHz)	Subcarrier colour (MHz)	
Channels distribution according to CCIR (B Standard +G Europe)						
IV	21	470...478	471.25	476.75	475.68	
	22	478...486	479.25	484.75	483.68	
	23	486...494	487.25	492.75	491.68	
	24	494...502	495.25	500.75	499.68	
	25	502...510	503.25	508.75	507.68	
	26	510...518	511.25	516.75	515.68	
	27	518...526	519.25	524.75	523.68	
	28	526...534	527.25	532.75	531.68	
	29	534...542	535.25	540.75	539.68	
	30	542...550	543.25	548.75	547.68	
	31	550...558	551.25	556.75	555.68	
	32	558...566	559.25	564.75	563.68	
	33	566...574	567.25	572.75	571.68	
	34	574...582	575.25	580.75	579.68	
	35	582...590	583.25	588.75	587.68	
	36	590...598	591.25	596.75	595.68	
	37	598...606	599.25	604.75	603.68	
	V	38	606...614	607.25	612.75	611.68
		39	614...622	615.25	620.75	619.68
		40	622...630	623.25	628.75	627.68
		41	630...638	631.25	636.75	635.68
		42	638...646	639.25	644.75	643.68
		43	646...654	647.25	652.75	651.68
		44	654...662	655.25	660.75	659.68
		45	662...670	663.25	668.75	667.68
		46	670...678	671.25	676.75	675.68
		47	678...686	679.25	684.75	683.68
		48	686...694	687.25	692.75	691.68
		49	694...702	695.25	700.75	699.68
		50	702...710	703.25	708.75	707.68
		51	710...718	711.25	716.75	715.68
		52	718...726	719.25	724.75	723.68
		53	726...734	727.25	732.75	731.68
		54	734...742	735.25	740.75	739.68
		55	742...750	743.25	748.75	747.68
		56	750...758	751.25	756.75	755.68
		57	758...766	759.25	764.75	763.68
		58	766...774	767.25	772.75	771.68
59		774...782	775.25	780.75	779.68	
60		782...790	783.25	788.75	787.68	
61		790...798	791.25	796.75	795.68	
62		798...806	799.25	804.75	803.68	
63		806...814	807.25	812.75	811.68	
64		814...822	815.25	820.75	819.68	
65		822...830	823.25	828.75	827.68	
66		830...838	831.25	836.75	835.68	
67		838...846	839.25	844.75	843.68	
68		846...854	847.25	852.75	851.68	
69		854...862	855.25	860.75	859.68	

## GLOSSARY OF MEASUREMENTS

### GAIN (dB):

This is the difference between the output power of an amplifier with the characteristic impedance ( $75 \Omega$ ) and the input power. (Fig.1)

### FREQUENCY RESPONSE:

The variation in amplitude within a certain band or channel.

**FLATNESS (dB):** The difference between the maximum and minimum gain in a certain band or channel.

### NOISE FIGURE:

The ratio of the actual noise power generated at the output of an amplifier to that which would be generated in an ideal resistor. The lower the noise figure, the better the performance.

The noise figure is expressed in (dB):  $NF=10 \log F$ .

### MAXIMUM OUTPUT LEVEL (dB $\mu$ V):

#### Single channel amplifiers:

EN50083-5 standard

Intermodulation distance= 54 dB (Fig. 2)

#### PAL broadband amplifiers:

DIN45004B standard

Intermodulation distance= 60 dB (Fig.3)

#### IF Amplifier:

DIN VDE 0855/12 standard

Intermodulation distance= 35 dB (Fig.4)

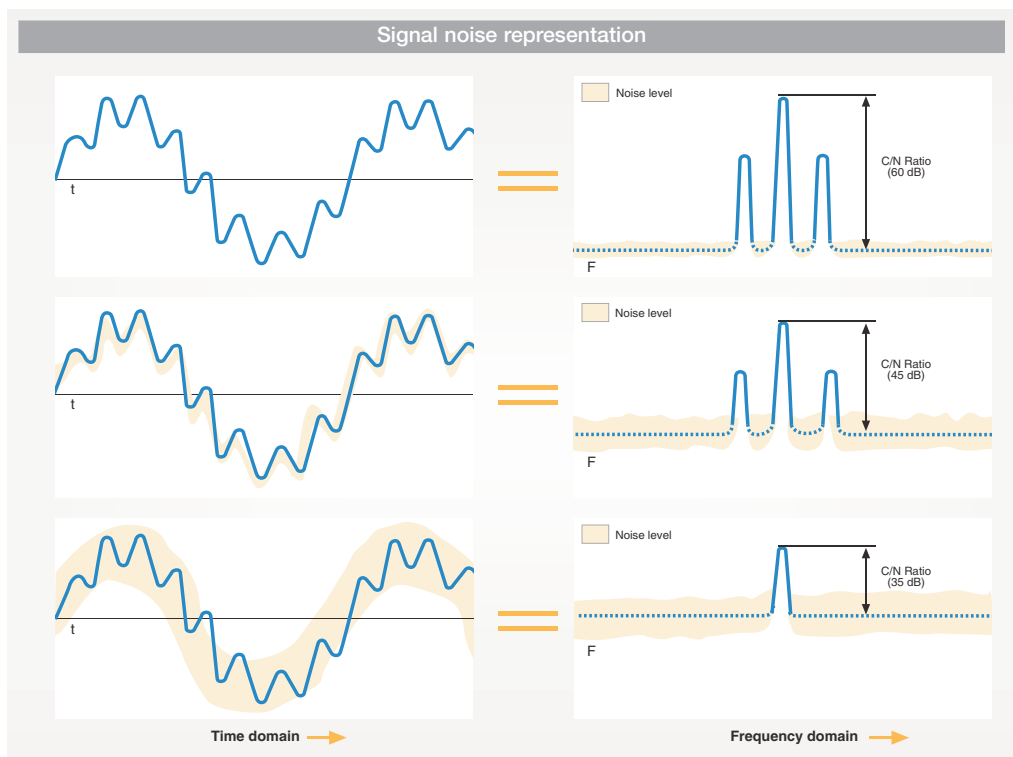
#### DAB Amplifier:

Intermodulation distance= 50 dB (2 canales de 4 MHz) (Fig.5)

#### FM Amplifier:

UNE 523/79 standard

Intermodulation distance= 54 dB (Fig.3)



### REJECTION BETWEEN INPUTS/OUTPUTS (dB):

The band attenuation between inputs/outputs.

(Fig.6 BIII rejection of UHF)

(Fig.7 UHF rejection of BIII)

(Fig.8 rejection of FM)

### ADJACENT CHANNEL REJECTION (dB):

The difference between the minimum gain in the channel and the maximum gain (minimum attenuation) in the adjacent channel. The adjacent channel in UHF is  $C \pm 2$  and in VHF is  $C \pm 1$ .

### AGC RANGE (dB):

The difference between the maximum and minimum signal that is necessary for a system with AGC to keep a constant output.

### BAND REJECTION (dB):

The difference between the minimum gain in the amplified band and the maximum attenuation in the rejected band.

### THROUGH LOSSES (dB):

The attenuation that is undergone by signal in a specific band between the input and output of a device.

### SPURIOUS (dBc):

The difference in levels between the channel carrier created by a modulator or converter and the lower side band or local oscillator. This only applies when there is a broadband channel.

### Working temperature

The optimum temperature to get the best performance from the electronic equipment is between  $-10$  and  $45$  °C.

(Unless otherwise specified)

## OBSERVATIONS

In general, the VHF band covers the following frequency ranges:

- For MATV: BI, FM, BSMID, BIII: 47...230 MHz.
- For SMATV & CATV: BI, FM, BSMID, BIII, BSUPP, BS HYPER: 47...446 MHz.
- In devices where FM rejection is not specified, this band is either amplified or combined
- Rejection of 27 (MHz) or FM does not mean that the band is not affected by the said bands as they can ingress into the system through the distribution network.
- All Televes headends are in compliance with the CE regulations.

GLOSSARY OF MEASUREMENTS

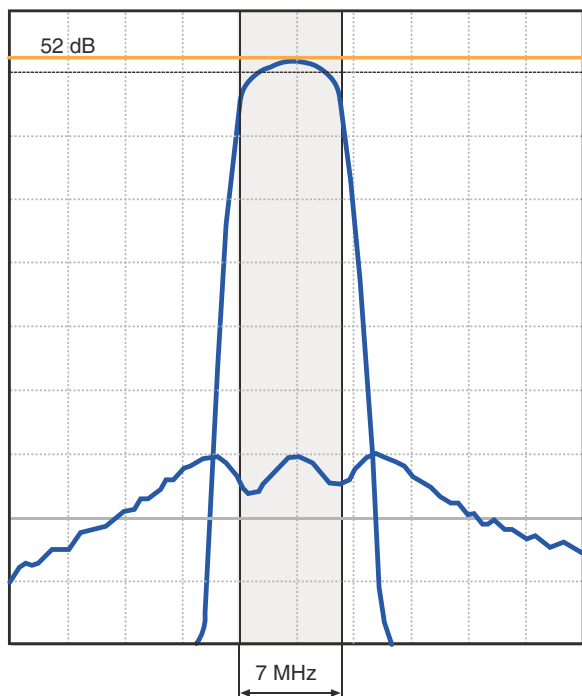


Fig. 1: Gain curve of a monochannel amplifier

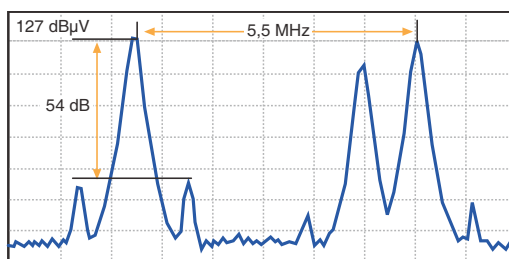


Fig. 2: Max. output volt. measurement for a monochannel amp.

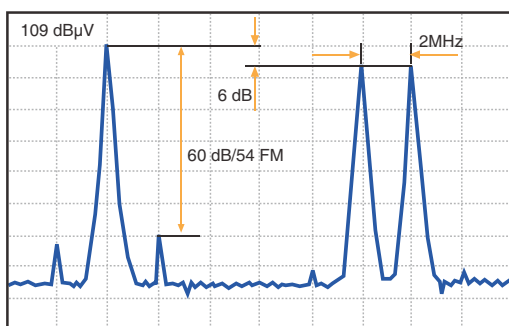


Fig. 3: Max. output volt. measurement for a wide band amp.

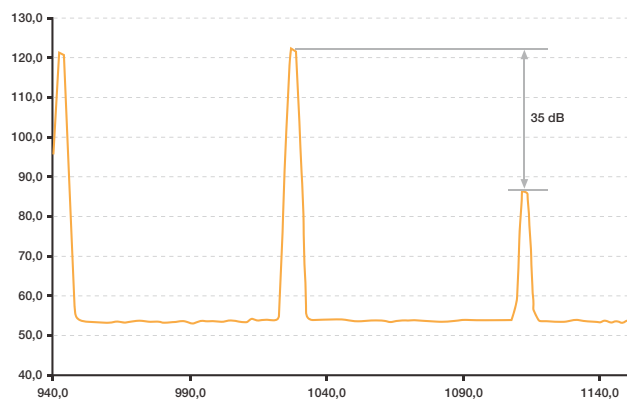


Fig. 4: Max. output volt. measurement for a IF amplifier

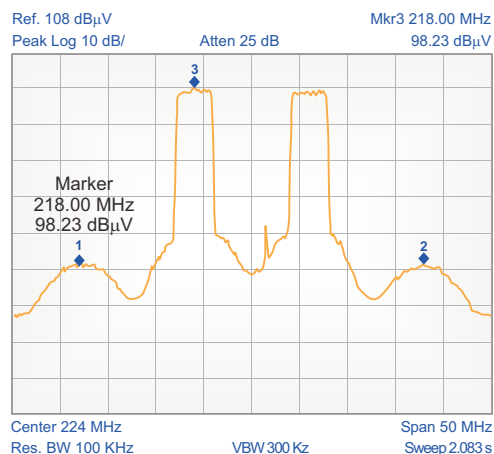


Fig. 5: Max. output volt. measurement for a DAB amp.

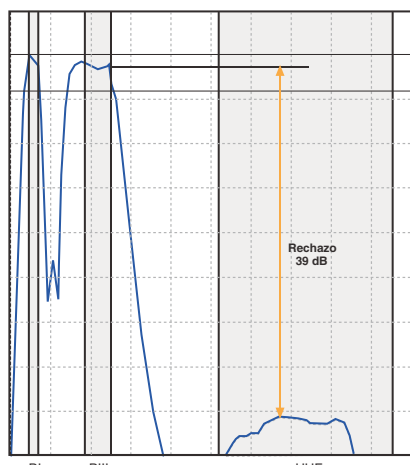


Fig. 6 BIII to UHF rejection

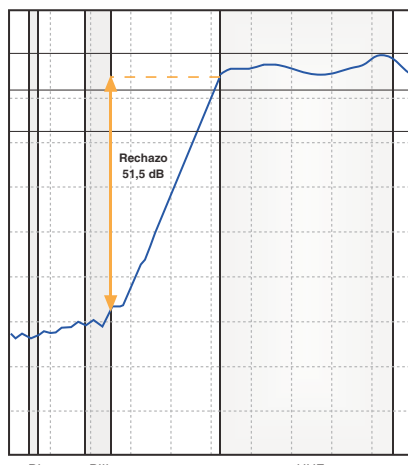


Fig. 7 UHF to BIII rejection

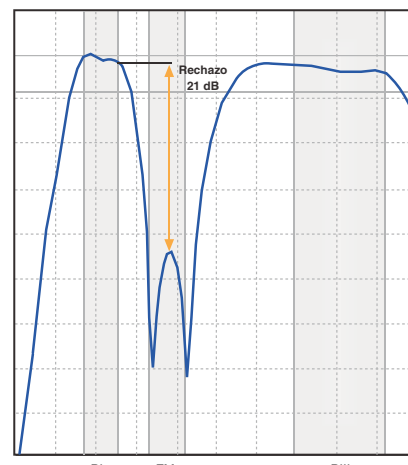


Fig. 8 BI to FM rejection

## GLOSSARY OF MEASUREMENTS

### Carrier-Noise ratio C/N

The carrier-to-noise ratio is defined as the ratio between the video carrier signal level and the RMS noise level. The ratio is expressed in decibels. The threshold of perceptibility of noise on a TV receiver occurs at a C/N ratio approximately 45 dB. Mathematically, for one amplifier it is calculated this way:

$$C/N_1 \text{ (dB)} = V_O - (Nt + NF + G)$$

$V_O$ : Output level

$Nt$ : Thermal noise (depends of the considered bandwidth)

$NF$ : Noise figure of the amplifier

$G$ : Gain

### Carrier-to-Cross Modulation Ratio C/XMOD

It is defined as the third order distortion which causes the modulation of one signal carrier to modulate another signal carrier.

The threshold of perceptibility of this ratio on a TV screen is less than 40 dB, so the C/X ratio is not the limiting factor in the design of most systems and is, therefore, below the threshold in system designs.

a) XMOD for 1 amplifier

$$XMOD = XMOD_{ref} + 2 \cdot (N_{output} - N_{ref})$$

b) XMOD for N identical amplifiers

$$XMOD_{N_{amp}} = XMOD_{1_{amp}} - 20 \log N$$

c) XMOD for N amplifiers with diferents XMOD

$$XMOD_{N_{amps}} = -20 \log [10^{XMOD_1/20} + 10^{XMOD_2/20} + \dots + 10^{XMOD_N/20}]$$

### Carrier-to-Third Order

#### Intermodulation Ratio C/IMD

Third-order intermodulation is the simultaneous pulse of 2 or 3 signal carriers to produce a spurious carrier, caused by the third-order distortion characteristic of the amplifier.

This type of third-order distortion is generally the limiting factor in the output capability of an amplifier. The following is a list of the parameters that one must be aware of when specifying composite triple beat:

1. Number of Channels.- The number of triple beats per channel increases exponentially as the number of channels increases.

2. Levels.- Because triple beat is a third-order distortion, the distortion

will increase in output level. If the amplifier operates with a tilt, the distortion will also be affected. A tilted output will give better improvement in the carrier-to-distortion ratio over a flat output.

a) CTB for 1 amplifier

$$CTB = CTB_{ref} + 2 \cdot (N_{output} - N_{ref})$$

b) CTB for N identical amplifiers

$$CTB_N = CTB_1 + 20 \log N$$

c) CTB for N amplifiers with diferents CTB

$$CTB_{total} = -20 \log [10^{-CTB_1/20} + 10^{-CTB_2/20} + \dots + 10^{-CTB_N/20}]$$

### Carrier to Second-Order Intermodulation Ratio (CSO)

It is the simultaneous pulse, or beating together, of 2 signal carriers because of the second-order distortion characteristics of the amplifier.

a) CSO (dB) for 1 amplifier

$$CSO \text{ (dB)} = CSO_{ref} + (N_{out} - N_{ref})$$

b) For N identical amplifiers.

$$CSO \text{ (dB)} = CSO_{1_{amp}} - 15 \log N$$

c) CSO for N amplifiers with diferents CSO

$$CSO_{total} = -15 \log [10^{CSO_1/15} + 10^{CSO_2/15} + \dots + 10^{CSO_N/15}]$$

### System calculations example

We would like to know the CTB resulting of the use of 5 amplifiers ref. 4511 in cascade, with a tilt of 8 dB.

#### Data:

From the technical specifications of the amplifier ref. 4511, we know that: CTB = 60 @ 117 dBuV (for plain output, without tilt)

As we will install 5 amplifiers in cascade, with a tilt of 8 dB, we will recalculate the CTB for a medium value of the Output level:

- Output level for C69: 117dBuV

- Output level for C2: 109dBuV

#### Step 1

Calculate the specification for a new reference level of 113 dBuV, which is the medium value of the tilt (109+8/2=113)

Because the new output level is lower (117 vs. 113 dBuV), it will improve its value.

General formula:

$$CTB = CTB_{ref} + 2 \cdot (N_{output} - N_{ref})$$

We extract  $CTB_{ref}$ :

$$CTB_{ref} = CTB + (N_{ref} - N_{output})$$

Known data:

$CTB_{117dBuV} = 60 \text{ dBc}$

Reference level: 117dBuV

Output level: 113 dBuV

Then:

$$CTB_{113dBuV} = 60 \text{ dB} + 2 \cdot (117 - 113) \text{ dB}\mu\text{V} = 60 + 2 \cdot 4 = 60 + 8 = 68 \text{ dBc}$$

#### Step 2

Make the calculation for the cascade of 5 amplifiers with a tilt of 8 dB, considering a new specification of CTB =

68dBc @ 113 dBuV (now it is considered as a plain response).

General formula for N amplifiers in cascade:

$$CTB_N = CTB_1 - 20 \log N$$

In this case:

$$N = 5 \text{ y } CTB_{1_{amp}} = 68 \text{ dBc}$$

#### Step 3

Substituting values:

$$CTB_5 = 68 - 20 \log 5$$

Already calculated values for the correction factor are shown in the table below.

$$CTB_5 = 68 - 20 \log 5 = 68 - 13,98 = 54,02 \text{ dBc}$$

SYSTEM CALCULATIONS  
AMPLIFIER CASCADE FACTOR

Cascade (N)	C/N + SSO 10*LOG (N)	CSO 15*LOG (N)	CTB & XMOD 20*LOG (N)
2	3,01	4,52	6,02
3	4,77	7,16	9,54
4	6,02	9,03	12,04
5	6,99	10,48	13,98
6	7,78	11,67	15,56
7	8,45	12,68	16,90
8	9,03	13,55	18,06
9	9,54	14,31	19,08
10	10,00	15,00	20,00
11	10,41	15,62	20,83
12	10,79	16,19	21,58
13	11,14	16,71	22,28
14	11,46	17,19	22,92
15	11,76	17,64	23,52
16	12,04	18,06	24,08
17	12,30	18,46	24,61
18	12,55	18,83	25,11
19	12,79	19,18	25,58
20	13,01	19,52	26,02
21	13,22	19,83	26,44
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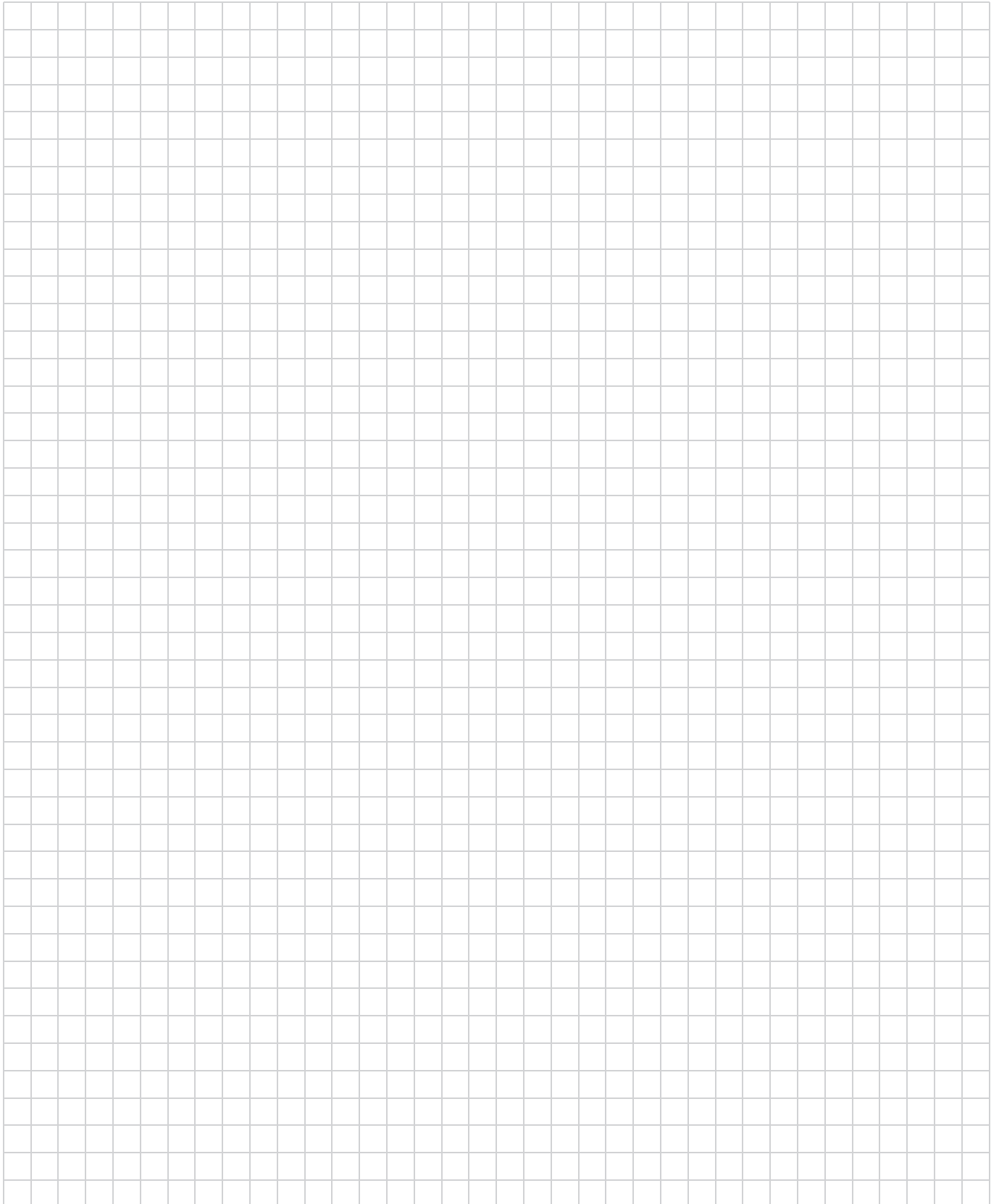
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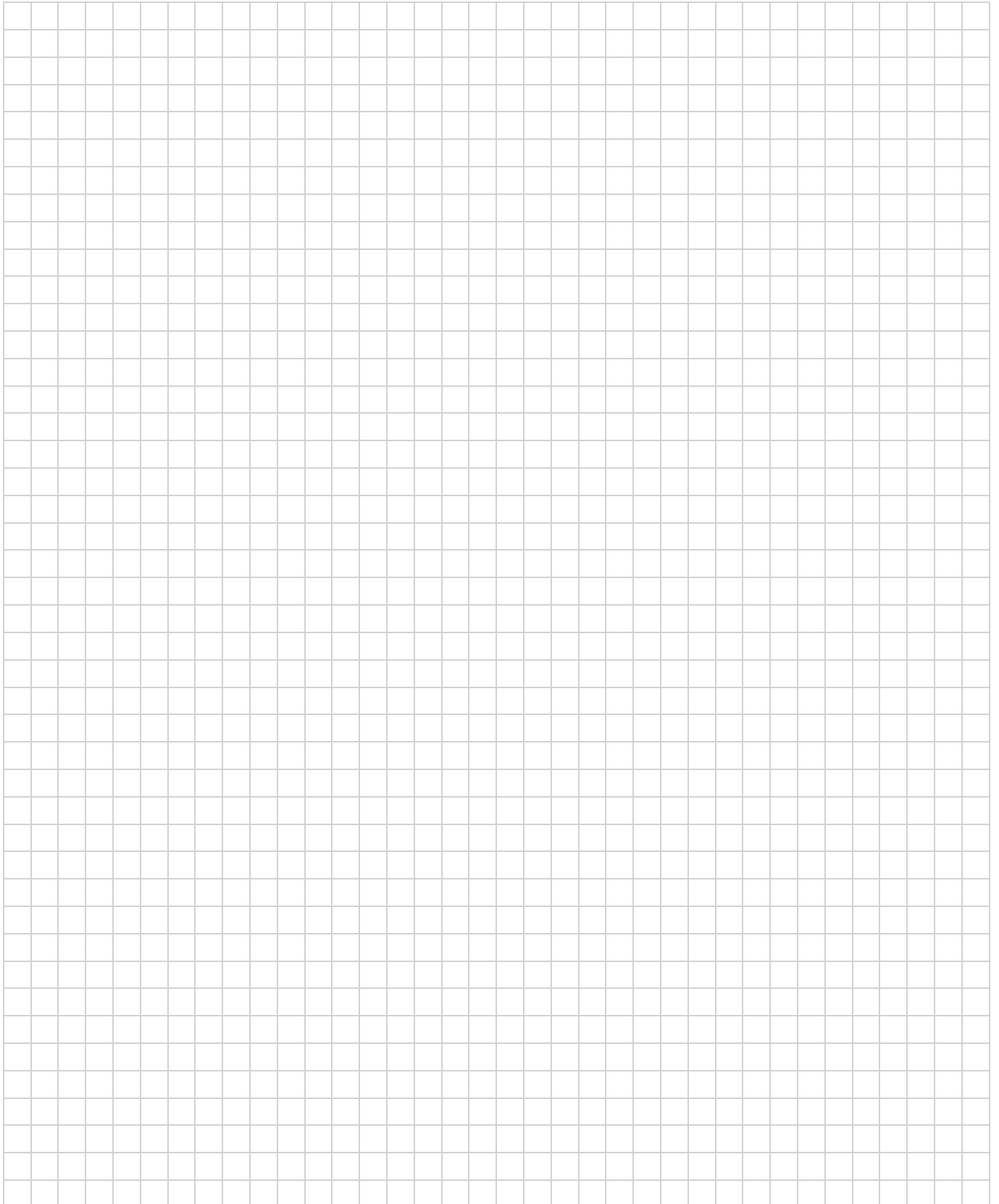
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NOTES



## Certificado del Sistema de Gestión de la Calidad



**ER-0224/1994**

AENOR, Asociación Española de Normalización y Certificación, certifica que la organización

### **TELEVES, S.A.**

dispone de un sistema de gestión de la calidad conforme con la Norma UNE-EN ISO 9001:2008

para las actividades: El diseño, la producción y el servicio posventa de dispositivos electrónicos y mecánicos para la recepción, emisión y distribución de señales de radiofrecuencia (televisión, radio, datos) tanto por vía terrestre como vía satélite.

que se realizan en: RÚA BENÉFICA DE CONXO, 17. 15706 - SANTIAGO DE COMPOSTELA (A CORUÑA)

Fecha de emisión: 1994-10-21  
 Fecha de renovación: 2009-11-04  
 Fecha de expiración: 2012-11-04

  
**AENOR** Asociación Española de Normalización y Certificación  
 El Director General de AENOR

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