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# ANTENNAS

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



## FM/BIII

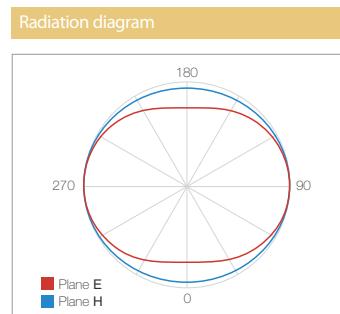
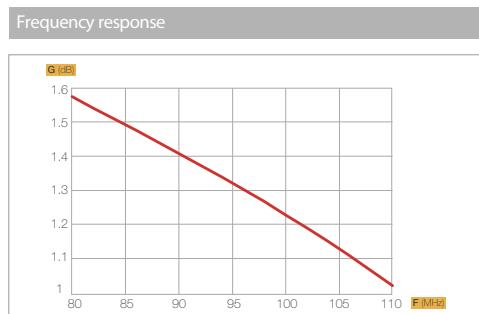
## Circular FM

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



▲ 1201

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



## Band III

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

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

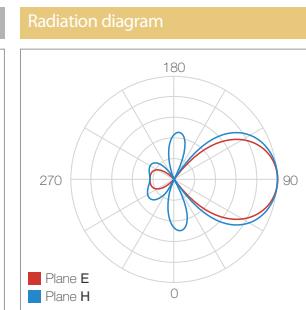
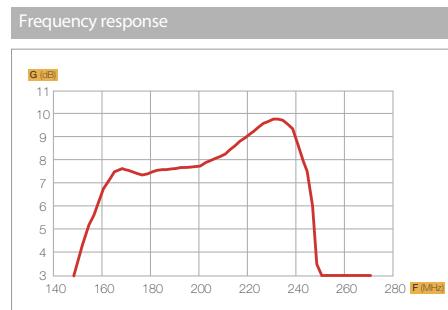
PRODUCT RANGE

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	dB	9.5	9.5	10
		20	20	24
Length		mm	1460	1460
Wind load	800 N/m <sup>2</sup>	N	71	69.1
	1100 N/m <sup>2</sup>	N	97.7	95
Wind pressure		N/m <sup>2</sup>	800	1100
Wind speed		Km/h	130	150



## 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.

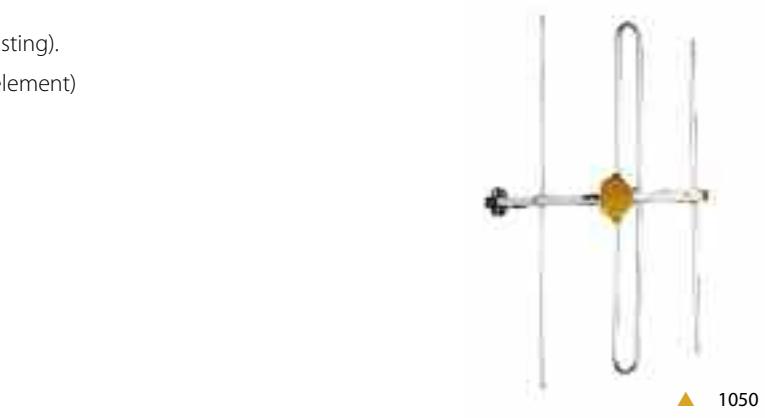
Includes the balloon in the connection box.

## PRODUCT RANGE

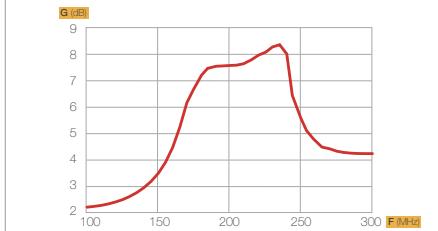
## REF. DESCRIPTION

1050 DAB, 3 elements

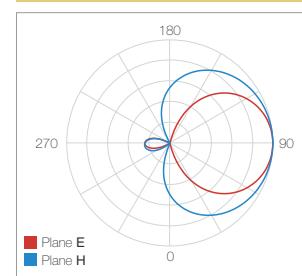
References		1050	
Band		DAB/BIII 190-232 MHz	
Gain	dB	8	
F/B ratio		>15	
Length	mm	555	
Wind load	800 N/m <sup>2</sup>	N	36.5
	1100 N/m <sup>2</sup>		50.2
Wind pressure	N/m <sup>2</sup>	800	1100
Wind speed	Km/h	130	150



## Frequency response



## Radiation diagram



## VHF/UHF

## PRODUCT RANGE

## REF. DESCRIPTION

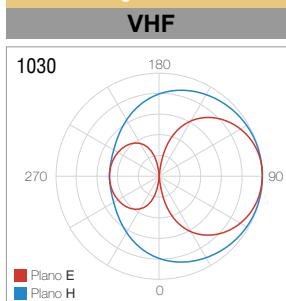
1030 Logarithmic BIII/UHF

Designed for Band III and UHF reception.

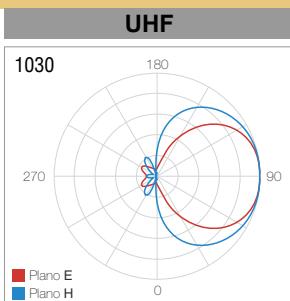
The 1030 is a logarithmic antenna composed of a number of active dipoles, each of them tuned to a different frequency. The result is a broadband antenna.



## Radiation diagram



## VHF



## UHF

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

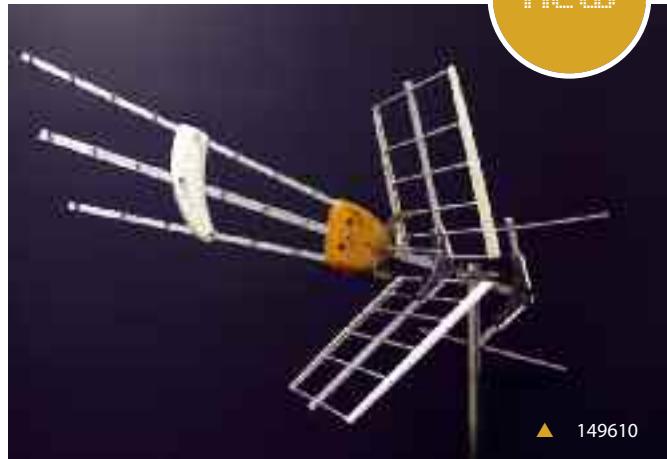
## Dat HD Boss Mix

PRODUCT RANGE	
REF.	DESCRIPTION
149610	DAT HD BOSS Mix
149611	DAT HD BOSS Mix single pack

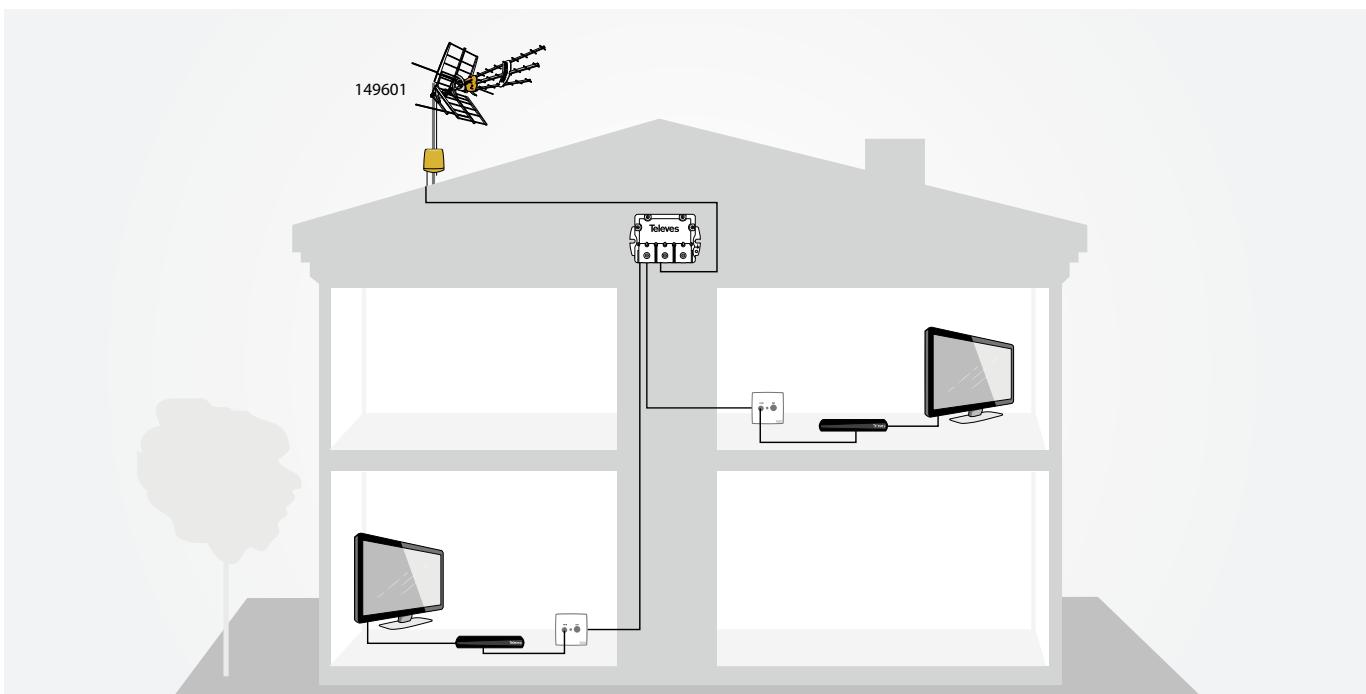
FULLY SHIELDED  
F connector

- Mixed antenna for BIII (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 BIII 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 BIII elements.
- The BossTech is activated or not depending on the power supply voltage. The gain regulation affects both to the UHF, and the BIII signals.

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



References		149610/149611			
Band		Passive		Active	
		5-12	21-69	5-12	21-69
Gain	dB	8.5	16	21	28 max.
Output level	dB $\mu$ V	-	-	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>	N		185	



## UHF

## Dat HD Boss

PRODUCT RANGE	
REF.	DESCRIPTION
1495	DAT HD BOSS multipack
149501	DAT HD BOSS single pack
149503	DAT HD BOSS Single Pack (60 mm bracket)

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

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

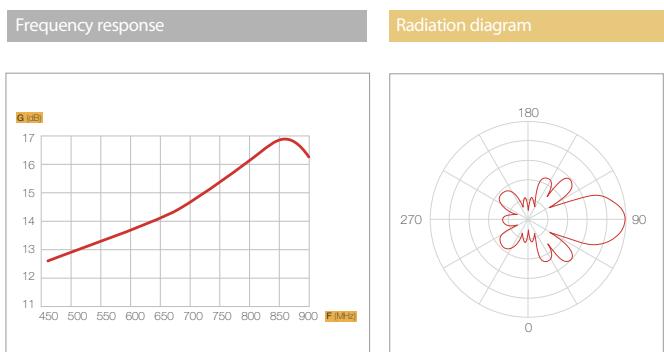
Whether in automatic or passive mode, the **DAT HD** offers exclusive functionality to maximize the reception of the DTT.



▲ 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)



## UHF

## ADDITIONAL FEATURES

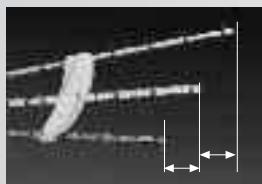
The asymmetrical directors provide the perfect radiation diagram to reduce ECHOES

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

## 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

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

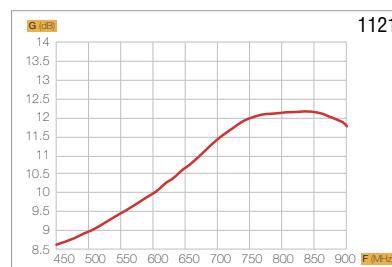


▲ 1121

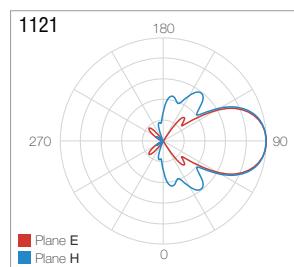
References		8024	1108	1121	
Channel		21-69	21-37	21-69	
Gain		dB	7	12	12
F/B ratio			15	28	26
Length		mm	757	1174	1180
Wind load	800 N/m <sup>2</sup>	N	27.8	73	73
	1100 N/m <sup>2</sup>	N	38.2	100.3	100.3

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

## Frequency response



## Radiation diagram



## 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 form the effects of impulsive noise of DTT signals.



Director anchorage system



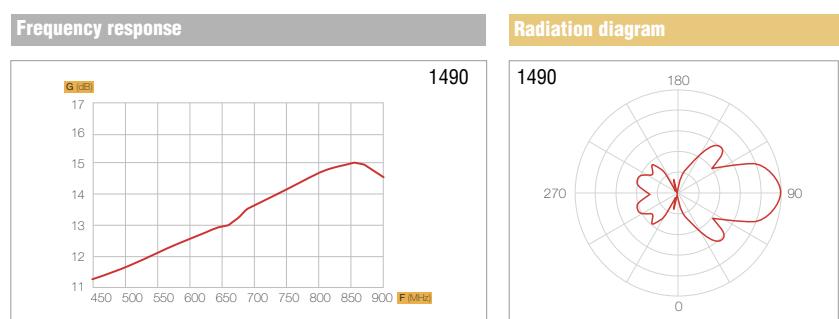
Reflector fixing system



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	N	93	
	800 N/m <sup>2</sup>		
	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°	
	N	141 (130 Km/h) 194 (150 Km/h)	



## Panel Antenna

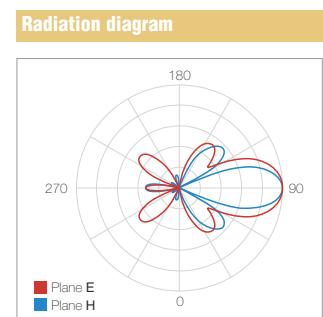
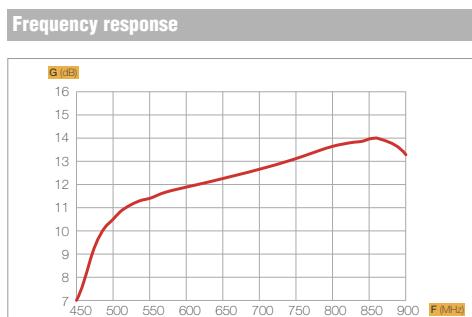
PRODUCT RANGE	
REF.	DESCRIPTION
1083 4 Dipoles, ch. 21-69, 14 dB	

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.



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 radome 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.



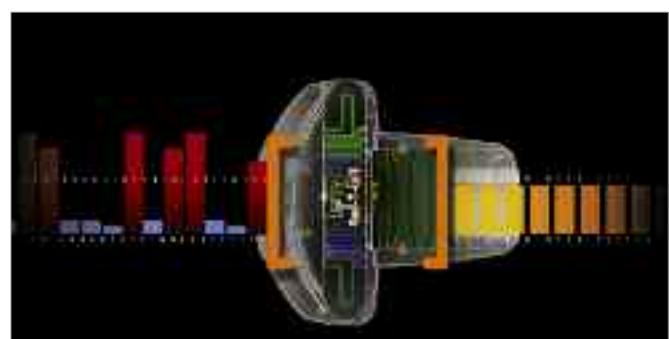
WEATHERPROOF

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

▲ 144110

## Technical features

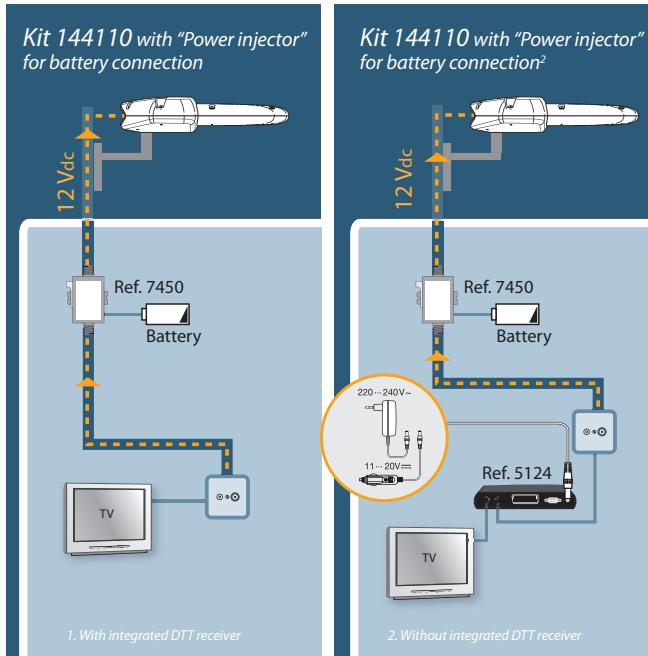
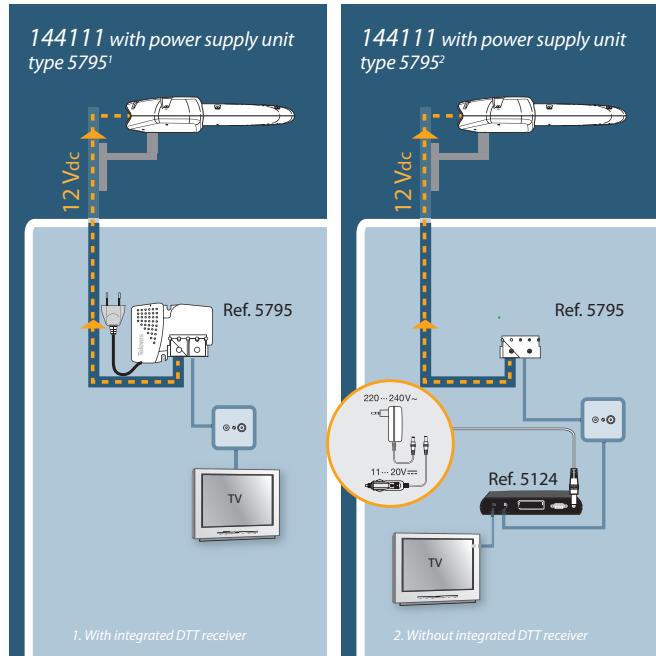
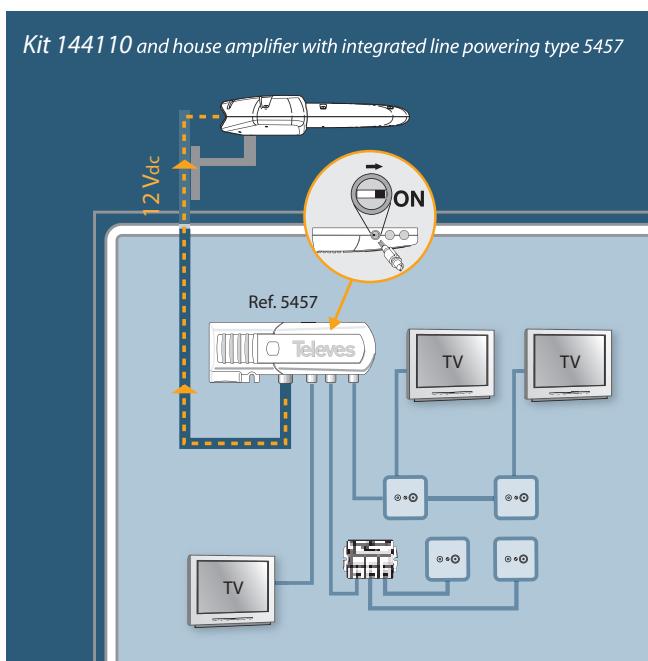
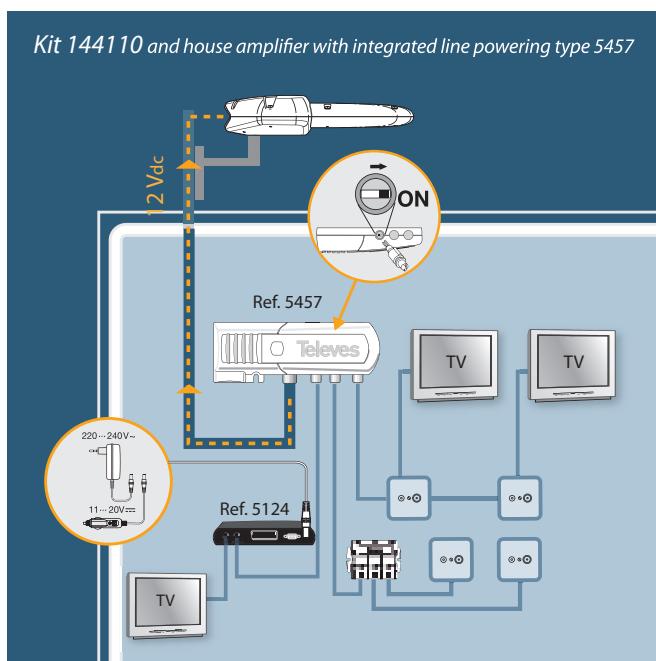
- ▶ Adapts itself to the received signal level. When the installer fits it, he does not have to worry about the input level as the antenna guarantees the most adequate output to the received signal.
- ▶ Corrects the signal fluctuations, autoadjusting the output level to the optimal value, independently 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, BIII and DTT (UHF) in caravans and motorhomes**2** Reception of FM, BI, BIII and DTT (UHF) for TV sets**3** Reception of FM, BIII and DTT (UHF) for TV sets with integrated DTT receiver**4** Reception of FM, BIII and DTT (UHF) for TV sets without integrated DTT receiver

## SPECIAL COMBINED ANTENNAS

**DIGINOVA BOSS**

new

## 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.

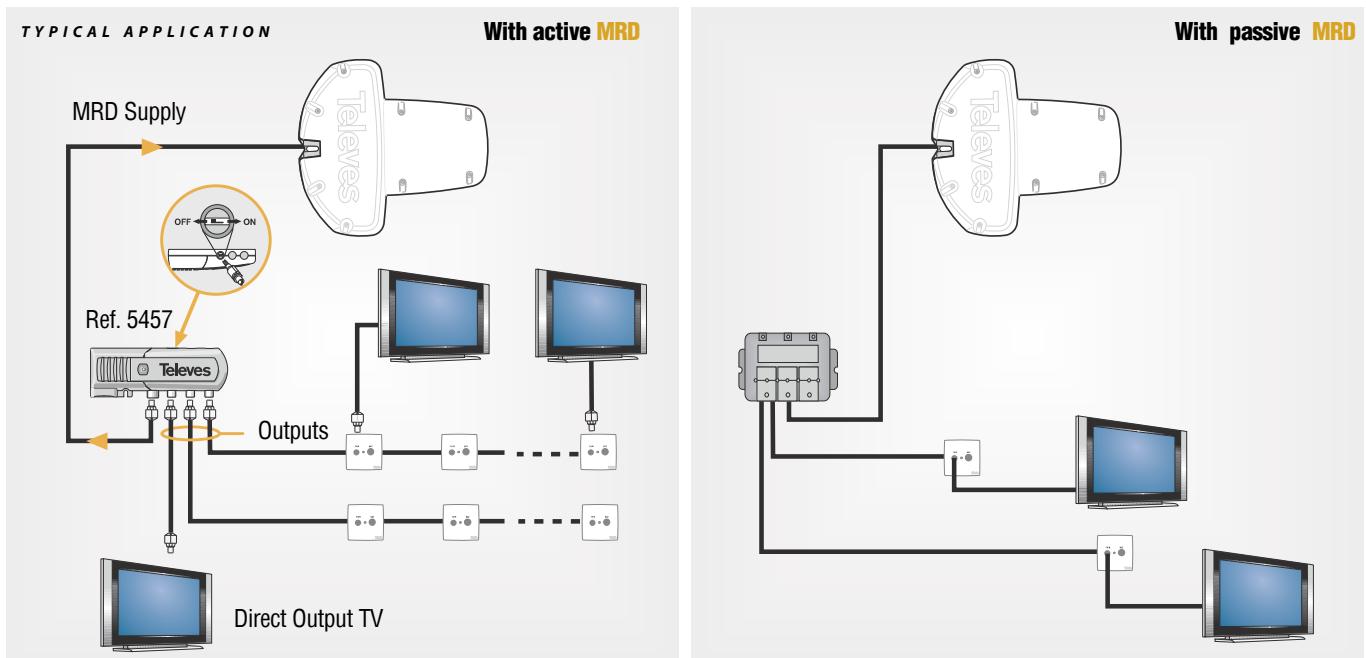
## Contents of the Kit:

- 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.



▲ 144110

Reference	144110		
Band	FM	BIII	UHF
Amplifier gain	dB	-	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**

new

PRODUCT RANGE	
REF.	DESCRIPTION
144401	Omninova Boss

The first intelligent omni-directional antenna.

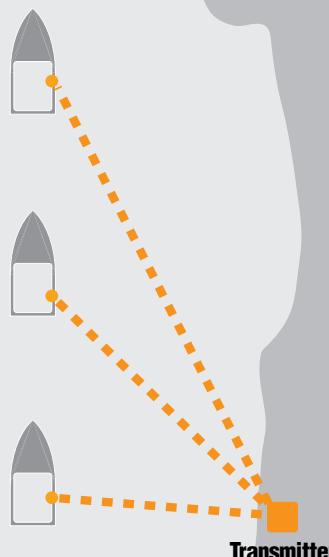
- Includes 3 amplifiers, one for each band (FM, BI-BIII, UHF) which avoids interferences, minimizing cross-modulation effects.
- Incorporates an AM antenna.
- Equipped with rejection-filters for out-band signals, especially for marine telecommunication bands.
- Independent outputs for Radio and TV.
- 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

With the **Omni-Nova Boss**, the **best possible signal quality is guaranteed** and you will have the best conditions for TV distribution on your boat.

**Weak signal level**  
Need of high gain



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**

NEW

**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

References		130201	
Bands	MHz	LTE mode: 470-790	UHF mode: 470-862
Gain	dB	27	
Noise figure		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.

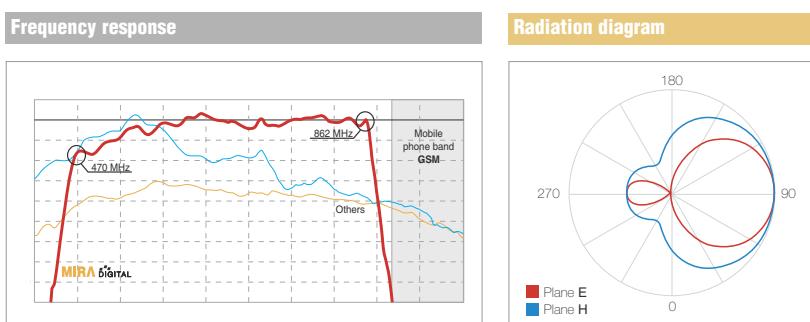
**The new MIRA antenna provides:**

- 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	dB	25
Noise figure		2.5
DC Powering	V	12
AC Powering		230
Consumption	mA	75/8 (ON/OFF)



# 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		
<b>DISHES AL HQ</b>			
7902	850	1	orange
790201	850	1	white
7903	950	1	orange
790301	950	1	white
<b>DISHES AL</b>			
9306	650	1	orange
930601	650	1	white
930611	650	10	white
930621	650	100	white
<b>DISHES FE</b>			
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
753421	1000	100	white
753401	1000	1	white
7572	1100	1	orange
757201	1100	1	white
7575	1300	10	white

The new QSD line of Televes 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



▲ 7902



▲ 7901

Dish size (mm)		650	800	900	1000	1100
Gain at 11.7 GHz		dB	36.0	39.0	39.5	40.5
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
Elevation angle		(°)	10..60			
Wind load	800	N/m <sup>2</sup>	345.6	499.2	706.2	739.2
	1100		475.2	686.4	980.4	1016.4
Wind pressure		N/m <sup>2</sup>	800	1100		
Wind speed		Km/h	130	150		

## LNB AND SUPPORTS

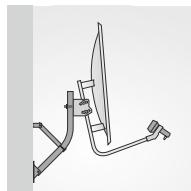
## Supports

## PRODUCT RANGE

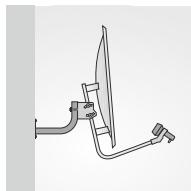
REF. DESCRIPTION (LENGTH, HEIGHT, DIAMETER)

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)	
<b>Galvanized</b>		
719201	Universal wall/ground support 223x610	Ø60X1,5
719202	Universal wall/ground support 211x604	Ø45X1,5
719203	Universal wall/ground support 287x440	Ø40X1,25

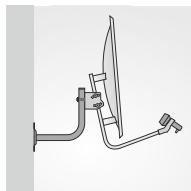
Zinc plated surface as well as an special Reactive Sealing Treatment to increase its resistance against corrosion.



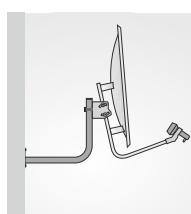
▲ 7390/719201



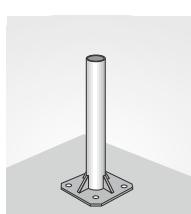
▲ 7393



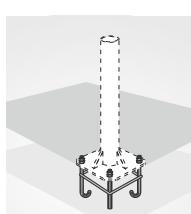
▲ 7349



▲ 7371



▲ 7576



▲ 7409

## 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



▲ 7475



▲ 747701

Low noise figure and high gain LNBs.



▲ 747802



▲ 761001



▲ 7613



▲ 7611

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)
Gain	dB	51	57	57	58	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
Operating temperature	°C			-30...+60		200

## FEEDHORNS AND SUPPORTS

## Multisatellite

PRODUCT RANGE		
REF.	DESCRIPTION	
7508	For 800 mm offset antenna	6°
790901	QSD Multisatellite	6°
790902	LNB support for QSD dishes	

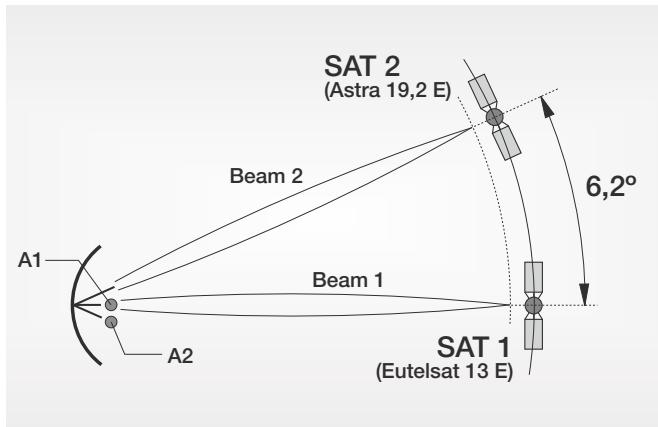


▲ 7508



▲ 790902

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



▲ 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

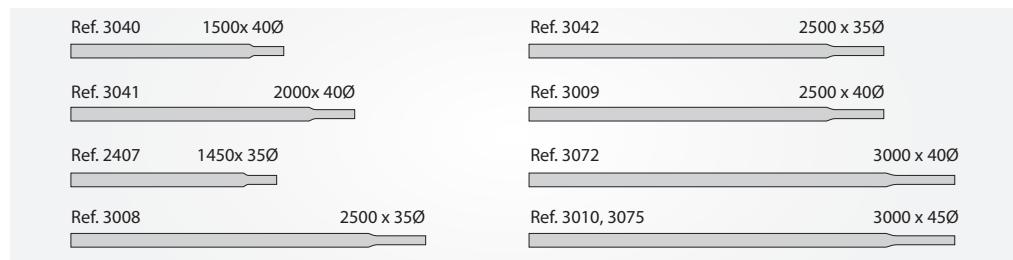
The mechanical accessory line is treated with Reactive Sealing Coating, improving the zinc cover process already applied to every product by adding an extra protection against oxidation.



## 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



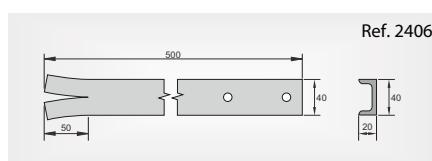
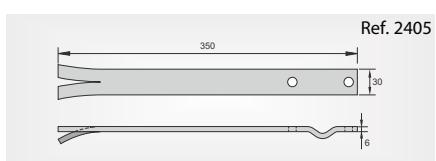
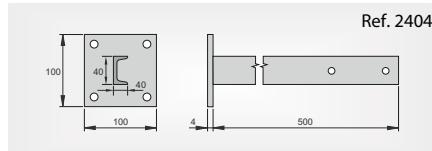
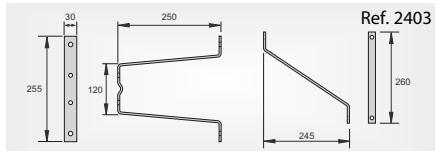
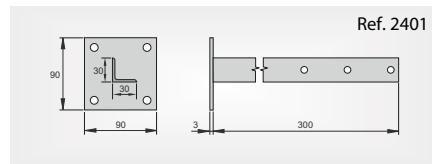
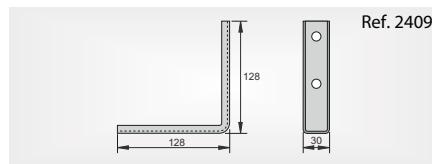
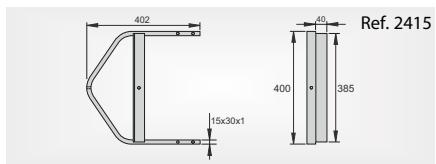
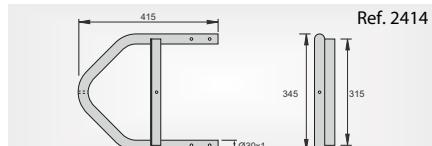
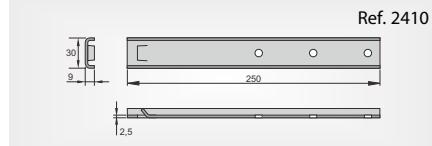
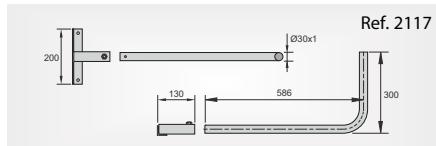
Referencias	3008	3009	3010	3072	3040	3041	3042	2407	3075(1)
Length	2500		3000		1500	200	2500	1450	3000
Diameter	mm	35	40	45	40	40	35	35	45
Thickness		1,5	2	2	2	1,25	1,25	1	1,5
Bending moment	Nxm	299,70	508,75	656,75	508,75	170	170	207,20	299,70
(1) Red									656,75

## Supports and clamps for masts

PRODUCT RANGE		
REF.	DESCRIPTION	
<b>Mast clamps</b>		
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 &amp; 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

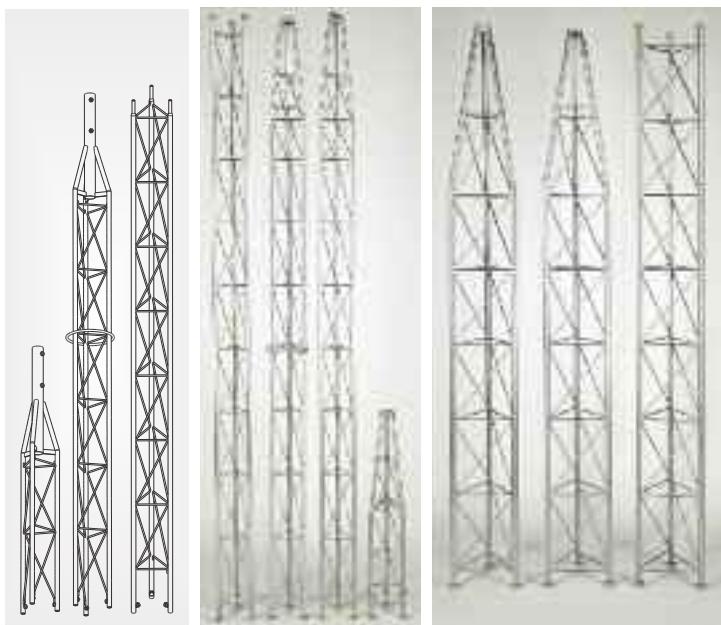
360 RPR		
360 Colour		
3085	Upper section	
3086	Lower section	
3087	Middle section	
308601	Lower section	red
308701	Middle section	red
308702	Middle section	white
308501	Upper section	red

(\*) Spanish abbreviation for Reactive Sealing Treatment

References	180 SE	180	360
Main stainless steel tubes	mm 20x1,5	20x2	30x2
Transversal stainless steel rods	mm 6	6	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 zinned 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

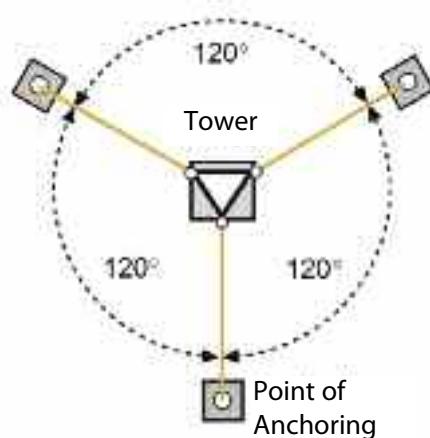
Fixing the lower section to the base in the proper vertical position, and then mounting the consecutive intermediate sections, which will be fixed with the corresponding guy-wire; the assembly is carried out by climbing the already placed sections and raising subsequently the section to be placed, using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

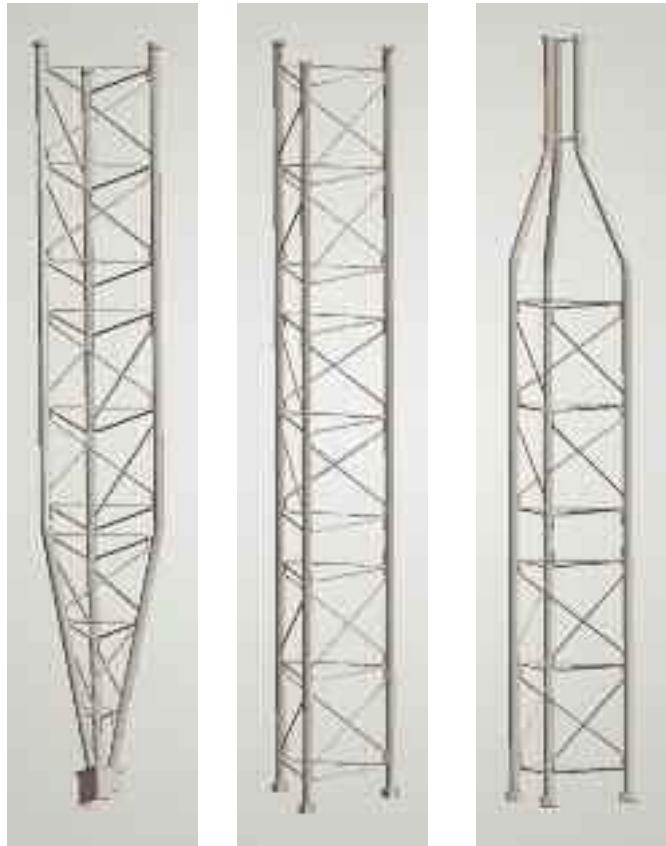
**Main characteristics:****Model 450**

- 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.



3130

3131 313101  
3132 313201

3133



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

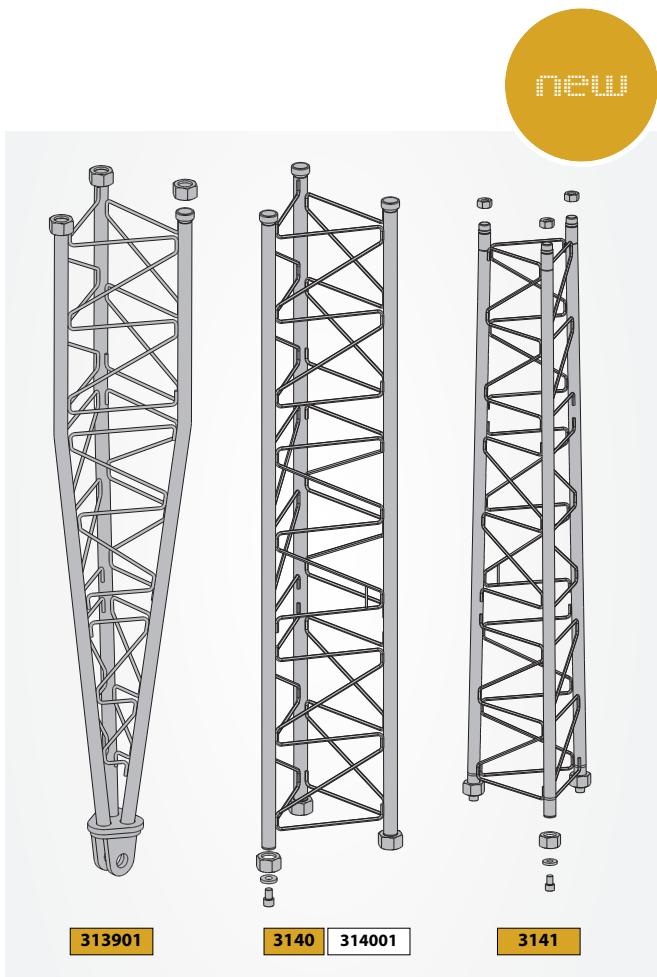
## Main characteristics:

- 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
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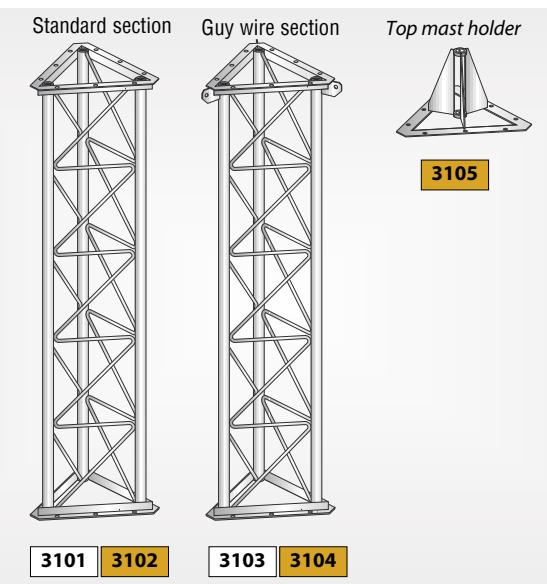
## Towers. Model 600

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



## MECHANICAL COMPLEMENTS

**Towers. Q1500** (Recommended for urban zones and densely populated areas)

PRODUCT RANGE	
REF.	DESCRIPTION
3049	KIT Tower Q1500 stainless steel 14,5m

INOX316

1,5m

**Main characteristics:**

The new tower Q1500 allows us to reach the 14.5 m high with a completely new design made of stainless steel of high purity. The alloy INOX316 remove iron impurities, preventing oxidation and offering more long-term security with less maintenance.

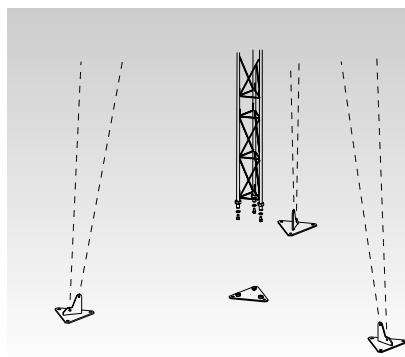
The whole design of the tower, the structure and the anchors of the guy wires have relied on Navy technology. This new configuration allows us to install a tower at 14.5 m occupying only an area of 1.5 m radius. Save 401m<sup>2</sup> of yard to a conventional tower.

**Q1500**

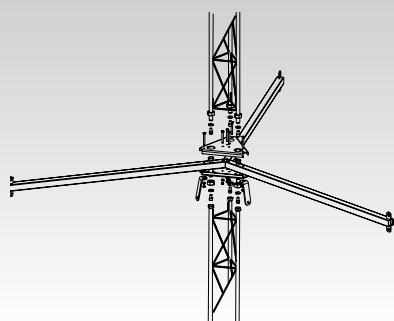
- Made of AISI 316 Stainless Naval. Ensures the structural characteristics of the tower along the time.
- Virtually unlimited duration.
- Greater torsional strength and stiffness.
- Easier handling and assembly.
- New system of couplings that facilitate the connection between the sections.
- Complete kit for installation, with all its accessories.



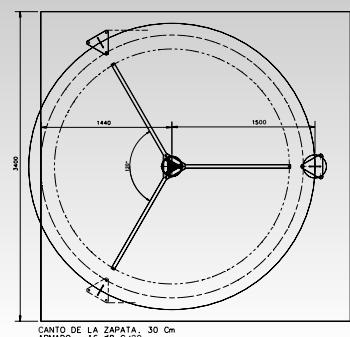
Base section + guy wires anchoring



Middle cross section



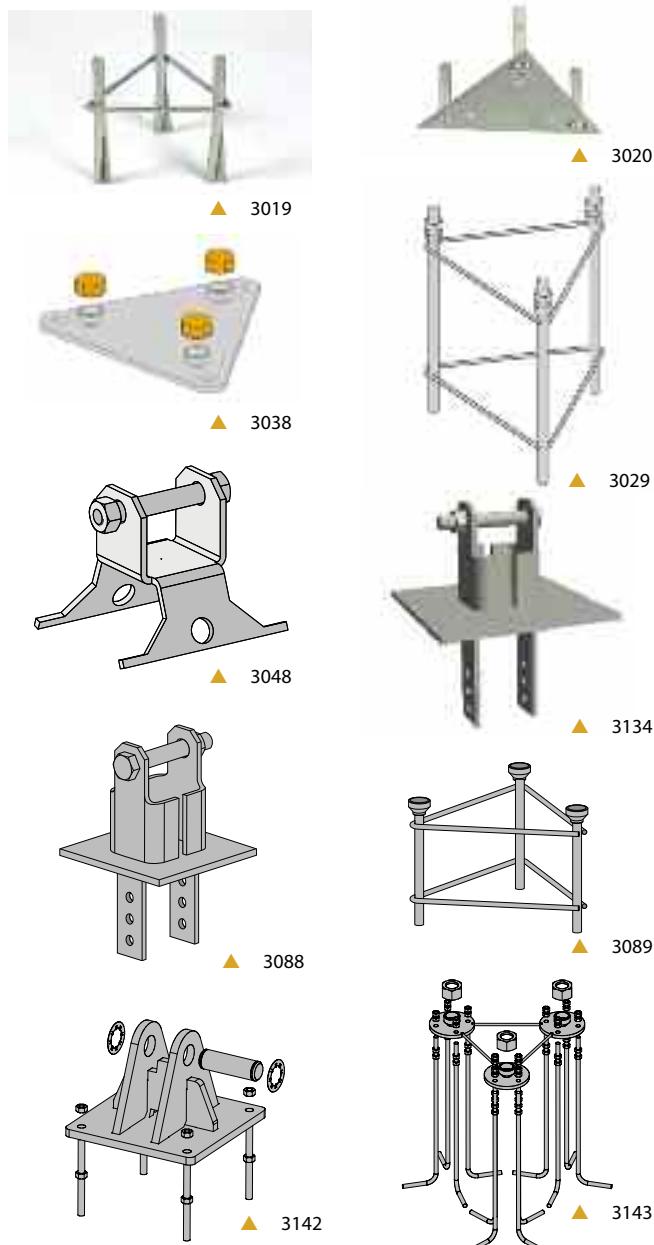
Dimensioning of the winds



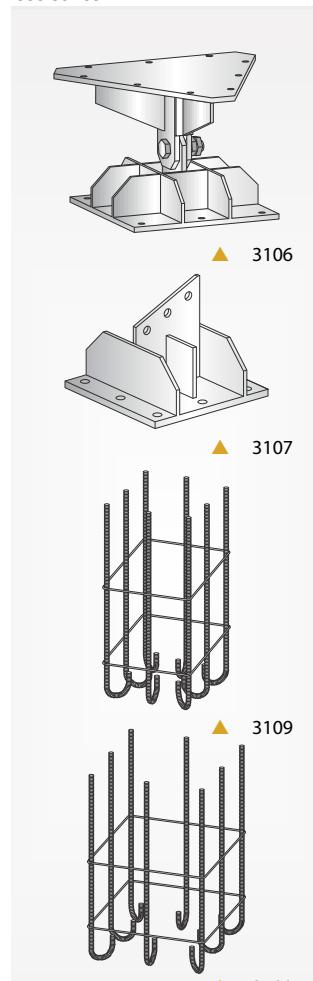
## MECHANICAL COMPLEMENTS

## Tower bases

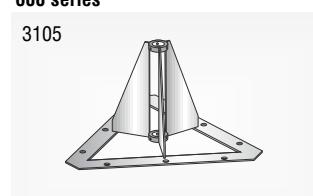
PRODUCT RANGE	
REF.	DESCRIPTION
180 SE	
3019	Frame embedded base
3020	Solid base
180	
3048	Pivoting base embedded
3038	Solid base
3029	Frame base embedded
360	
3088	Pivoting base embedded
3089	360 self-suporting emb. base
450	
3134	Pivoting base embedded
550	
3142	Pivot Embedded base 550
3143	Fixed Base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



600 series



600 series



## 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)





# 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.

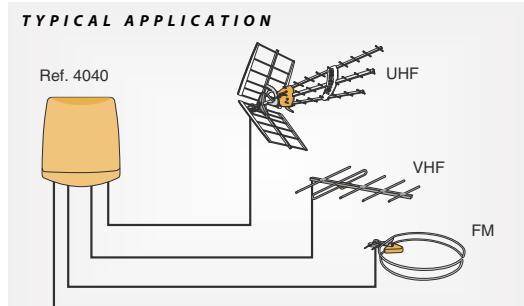
New easy F connectors.

PRODUCT RANGE	
REF.	DESCRIPTION
<b>Terrestrial</b>	
4040	BI-FM/BIII-DAB/UHF
4041	VHF-UHF1/UHF2
4334	4041 blister

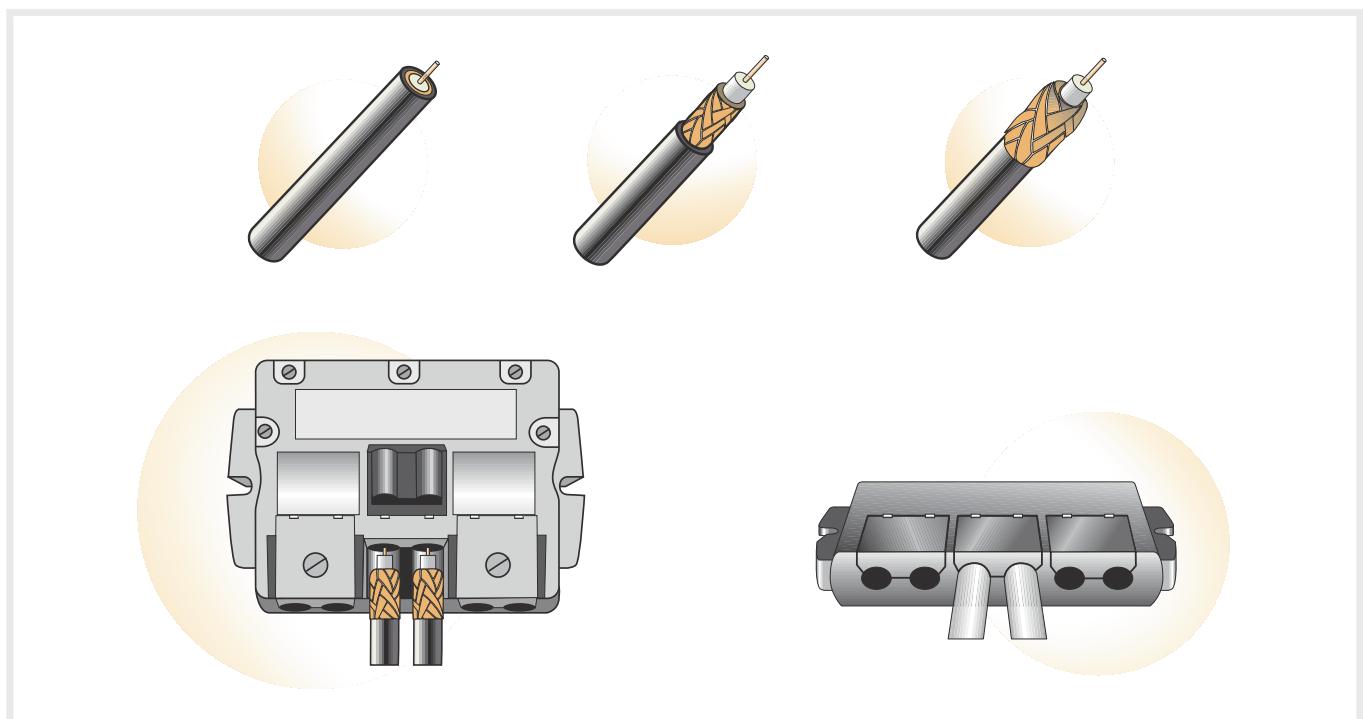


▲ 4040

References		4040		4041		
Mixed bands		BI-FM 47-108	BIII-DAB 174-254	UHF 470-862	VHF 47-254	UHF1 470-862
Through losses		1 typ.	1 typ.	1 typ.	5 typ.	UHF2 470-862
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
Kits	
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	dB $\mu$ V	112	114	112	114	112	114	112	114	112	112		114											
DC bypass	mA	40 automatic			-	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	dB $\mu$ V	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	dB $\mu$ V	-	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	dB $\mu$ V	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
Mair	V	230	230
Mains voltage		12	24
Output current	mA	130	130
Connection type		F	F
Dimensions	mm	145x45x35	



## Domestic amplifiers

PRODUCT RANGE	
REF.	DESCRIPTION
<b>Digi amplifiers</b>	
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	
<b>Forward path</b>			
Bandwidth	MHz	47...232 / 470...860	47... 862
Gain	dB	16	5
VHF/UHF variable gain		12	-
Output level	VHF	108	>94
DIN45004B	UHF	105	
Rejection between outputs	dB	>25	>25
Noise figure (typ.)	dB	5.5	3.5
<b>Return path</b>			
Bandwidth	MHz	5...30	
Gain	dB	6	8
Output level	dBµV	110	97
Noise figure	dB	16	12
<b>Powering</b>			
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

CATV	
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

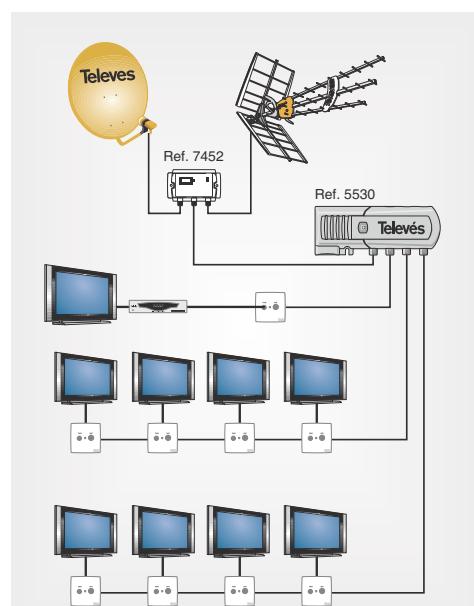


References		5527	5528	5529	5522	5523	5531	5519	5457	553201	
Bandwidth		MHz	47...862			47...862			47-320 470-862	47-862	47-862
Gain	O1...O6	dB	25	20	16	20	16	16	17 / 27	20	20
	TV		-	14	13	14	13	-	-3 / 7	14	-
Variable gain		dB $\mu$ V	12								
Output level DIN45004B			112	106	102	106	102	103	105	106	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)					
Forward path									
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		
Output level DIN45004B	SAT IF	dB	-	19	-				
	MATV	O1-O2	112	105*	107	> 106			
		TV	-		101				
Variable gain	dB $\mu$ V		110**		-				
	dB		18	8	12	18			
Variable equaliser	dB		18	-	-	18			
	-		-	>18	>20				
Rejection between outputs	MATV	7	5.5	5	5.5	6			
	SAT IF	-	<4	-	-	-			
Return path									
Bandwidth		MHz	5...30	5...30	5...30	5...65	5...65		
Gain		dB	-1	-1	-9	-7	9	-7	
Powering									
Mains voltage (jack)		Vac	230						
In-Out DC bypass		mA	-	300	-				

(\*) DIN45004B

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



## DOMESTIC

## Picokom Series

## PRODUCT RANGE

REF. DESCRIPTION

5795 130 mA 24 Vdc Picokom

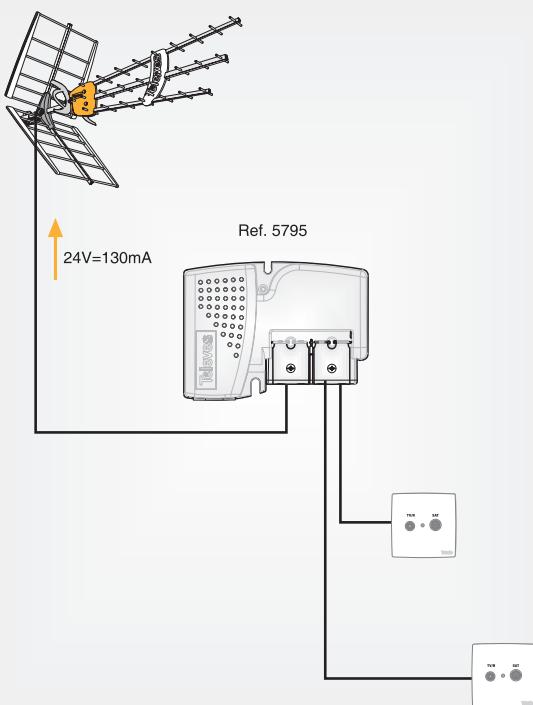
5796 220 mA 12 Vdc Picokom FI-MIX

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

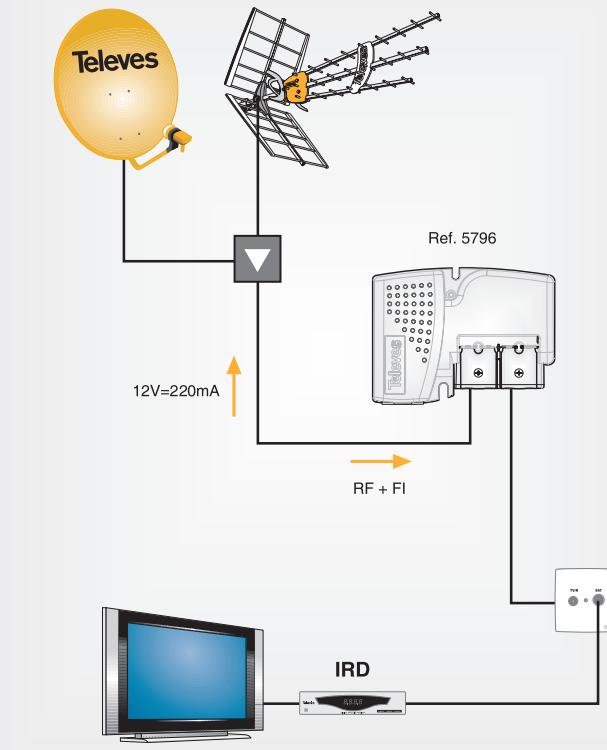


References		5795	5796
Frequency Margin	MHz	5-862	5-2500
	V	24	12
Mains voltage		196-264	
Min. Output current	mA	130	220
		30	
Max. temp. operation		45° C	
Protection level	IP	20	
		4,4	
Consumption	W	3,7	

## TYPICAL APPLICATION



## TYPICAL APPLICATION



## DOMESTIC

## Picokom Series

PRODUCT RANGE	
REF.	DESCRIPTION
5605	Domestic amplifier Picokom 2 outputs
560502	5605 in Blister
560601	Domestic amplifier RF+SAT

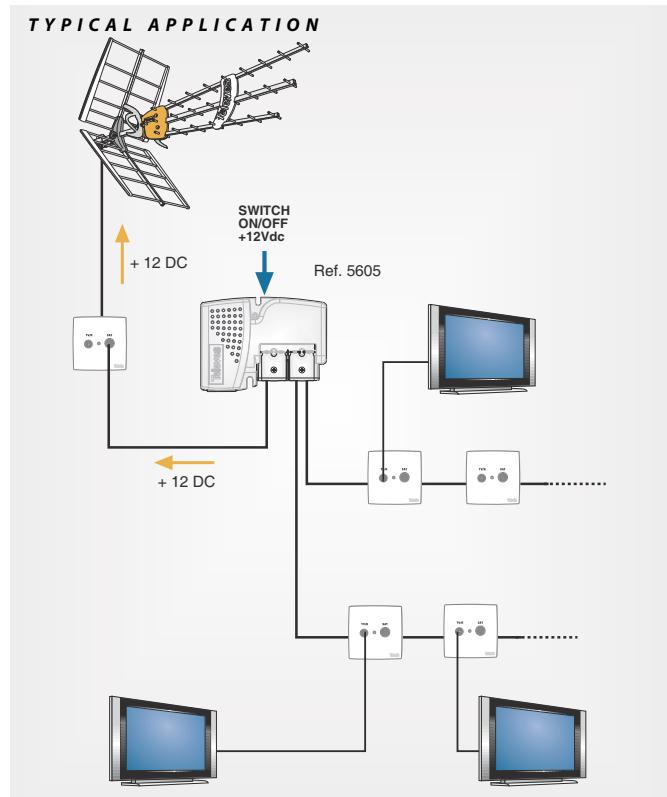
Picokom is a new amplifier design of splitband amplification VHF/UHF with a built-in switched power supply unit.

- 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
Frequency range IF		-	950-2150
Gai		12/20	15/15
Gain IF	dB	-	23
AGC Margin (only MATV)		20	12
Output level VHF/UHF DIN45004B	dB $\mu$ V	105	97
IMD3 (2ch@-60 dB) VHF/UHF		97/102	94
IMD2 (2ch@-60 dB) VHF/UHF	dB $\mu$ V	87/92	87
Output level IF DIN45004B		-	106
Returnt 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



▲ 5605



## 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
	dBµV	98	-
Noise figure	dB	< 4,5	-
<b>IF</b>			
Frequency range	MHz	-	950-2150
Gain	dB	-	20
	dBµV	-	112,5
Noise figure	dB	-	< 5,5
<b>General</b>			
	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
Nº of channels		1	2
Insertion losses	UHF	<1	<1
	BIII	<2	-
	FM	<10	-
	BI	<15	-
Pv*	Pv n	>35	15-20
Attenuation	Pv n±1	-	<3
	Pv n±2	<3	-
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								
Gain	MHz				85 - 862			
	dB	20	24	30	35	20	30	35
Noise figure					7,5			
Vout DIN 45004B					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)					0...18			
Return Losses	dB				12			
Nominal value deviation					±1			
<b>Return path</b>								
Frequency range	MHz				5 - 65			
Gain		20	20	25	28	20	25	28
	dB				6			
Noise figure					0/3/6			
Interstage equalizer (2 dB steps)					12			
Return Losses					118			
Vout DIN 45004B					115			
Vout EN 50083-3 IMD3 (2 ch, -60 dB)					18			
Input Attenuator (2dB steps)	dB				±1			
Nominal value deviation								
<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	°C				-10... + 45			
Protection Index	IP				20			
Connnectors HF	type				F-Female			
Dimensions	mm/g				185x80x35 /400			

## TERRESTRIAL/SATELLITE TV

## Minikom series - Splitband Amplification

## PRODUCT RANGE

REF. DESCRIPTION

## Terrestrial

537302	1 input V-U
537201	2 inputs V/U (7+1 outs.)+R5-7MHz
5399	2 inputs V/U (switch DC bypass, interstage atten.)
531201	3 inputs FM/BIII-DAB/UHF
539201	4 inputs FM/BIII-DAB/UHF1/UHF2
539104	5 inputs FM/BIII-DAB/UHF/BV/BIV
539105	5 inputs FM/BIII-DAB/UHF/BV(590-862)/BIV(470-566)

## IF

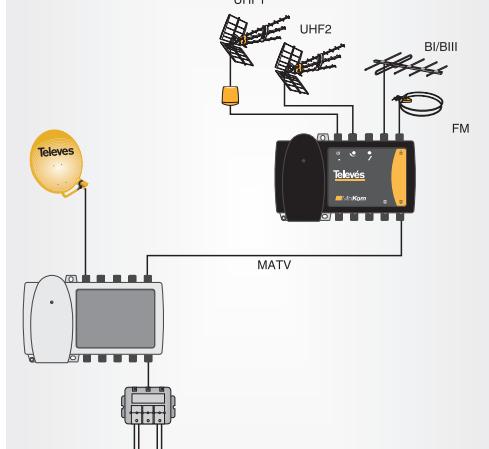
5363	2 inputs IF / mixed MATV includes a 22 KHz switch (0.6 ±1 Vpp)
5317	2 inputs IF1-MATV/IF2-MATV
5396	4 inputs (VHF/BIII/BI-FM/IF)



▲ 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		0-20	0-20	0-20
Equaliser	dB	0-12	0-15	0-15
Gain		35-45	35-40	35-42
Output level DIN VDE 0855/12	dBµV	124	123	121
Noise figure	dB	<9	10	14
<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	196-264
22 KHz tone amplitude	Vpp	0.6±1	-	-
Max. DC current for LNB	mA	300 (13/17Vdc)	-	500

## TYPICAL APPLICATION



References	537302	537201	5399	531201	539201	539104/539105*
Inputs		UHF-VHF	Return Path VHF-FM/UHF	UHF/VHF	FM/BIII-DAB/UHF	FM/BIII-DAB/ UHF2
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
Gain (high)		30/37	VHF 5(16 - 0+1)		15/30/40	15/30/37
Gain (low)	dB	20/27	UHF 15(27 - 0+1)	35/40	15/20/30	15/20/27
Attenuation margin		0-20	-	0-20/0-15	0-20	0-20
Output level (DIN 45004B) High			88/101 (OUT+1)	114/114/117	114/114/117/117	114/114/117/117/116
Output level (DIN 45004B) Low			108 (Ret. Path)	115/117	112/112/116	112/112/116/116/115
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	70 @ 12Vdc (excep FM)

\* Ref. 539105 BV(590-862)/BIV(470-566)

## TERRESTRIAL/SATELLITE TV

## Outdoor CATV

## PRODUCT RANGE

REF. DESCRIPTION

4513 Outdoor R5-65 MHz hybrid AC line powered

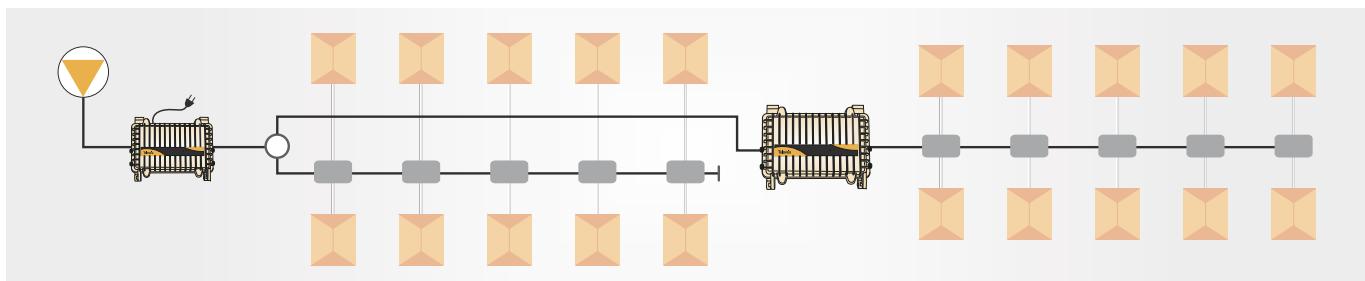
## System accessories

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)	dB $\mu$ V	100	
Max. output level		0..18	
2nd order distortion	dB	12	
Noise figure		$\pm 1$	
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 $\pm$ 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

NEW

PRODUCT RANGE	
REF.	DESCRIPTION
<b>PUSH-PULL HEADEND AMPLIFIERS</b>	
5340	3 in/1 out - BI-FM/BIII/UHF
5341	5 in/1 out - BI-FM/BIII/BIV/BV/UHF
539105	5 inputs FM/BIII-DAB/UHF/BV(590-862)/BIV(470-566)
<b>POWER-DOUBLING HEADEND AMPLIFIERS</b>	
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
<b>PUSH-PULL LINE AMPLIFIERS</b>	
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
<b>POWER-DOUBLING LINE AMPLIFIERS</b>	
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



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

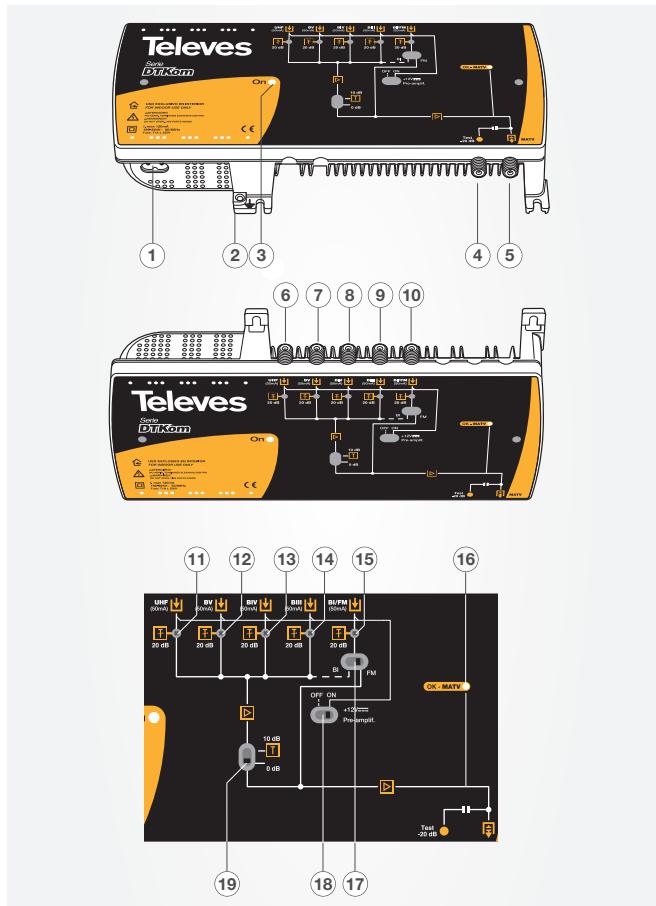
**POWER DOUBLING RANGE**

- 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 (just 5338)

## 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

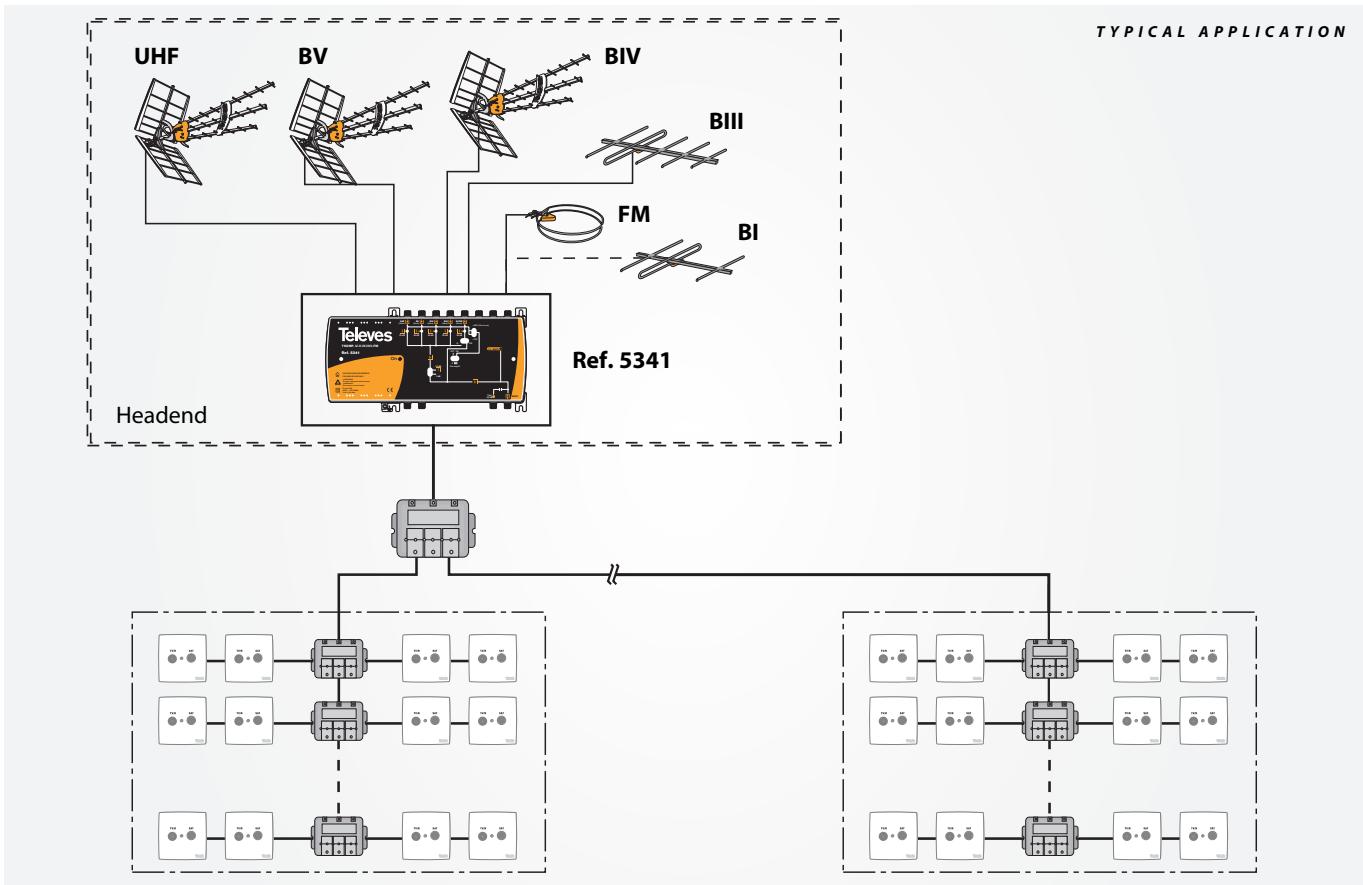
References		5340	5341/534101*	4507	4508	4509
Inputs		BI,FM/BIII/UHF	BI,FM/BIII/BIV/BV/UHF	UHF/VHF/FM	UHF1/UHF2/VHF/FM	BIV/BV/UHF/VHF/FM
Frequency range	MHz	47-68, 88-108 174-370/470-862	47-68, 88-108 174-370/470-590/ 614-862/470862	470-862/ 174-400/88-110	470-862/470-862/ 174-400/88-110	470-590/614-862/ 470-862/174-400/88-110
Gain (high)	dB	39, 25/44/53	39, 25/44/48/50/50	55/45/30	52/52/45/30	50/50/52/45/30
Gain (low)		31, 21/36/43	31, 21/36/39/40/40	42/32/-	40/40/42/-	38/38/40/32/-
Maximum output level (DIN 45004B)		123			129	
Maximum output level (EN 50083) CTB,CSO,XMOD (35ch -60dB)	dBµV	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		

\* Ref. 534101 BV(590-862)/BIV(470-566)

## TERRESTRIAL/SATELLITE TV

References		5338		5339/533901			5335/533501					
Channels				Main MATV		Return		Main MATV		Return		FI
				Active	Passive	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	°C			-5 ... +45								
Protection index				IP20								

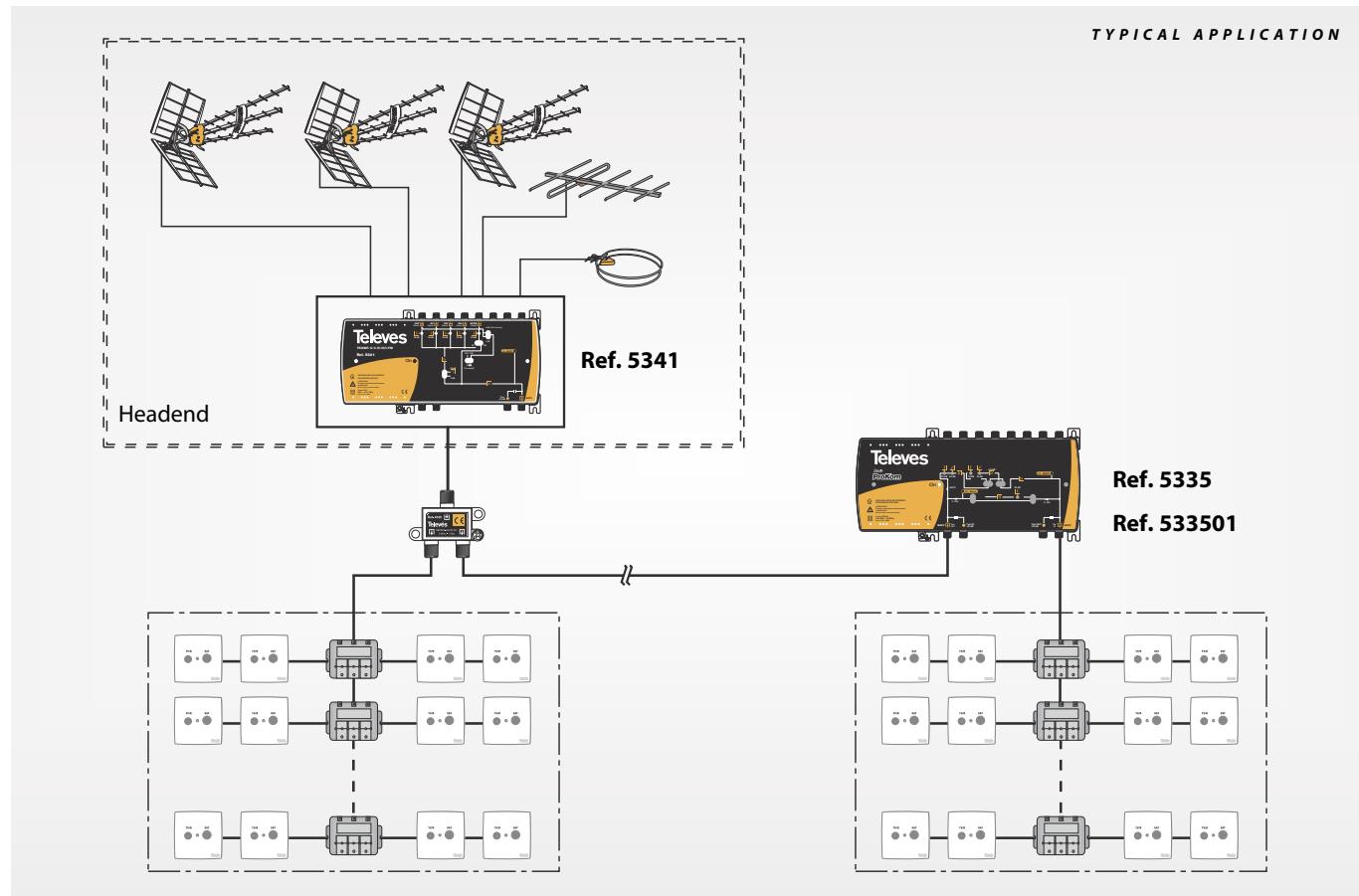
(3) 2 Ch. -35 dB



## 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)	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 45004B)	dB $\mu$ V	129		116	-	123	116	-	-		
Maximum output level (EN 50083)	dB $\mu$ V	126		113	-	120	113	-	120 <sup>(3)</sup>		
Noise figure		10		10	-	10	15	-	12		
Return losses						10					
Attenuator	dB	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

new

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

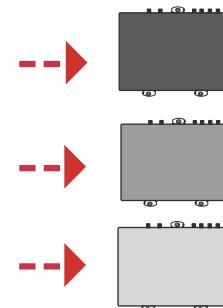
**2 Easy steps**

**1** Copy  
configuration into handset



**2** Paste it to any unit

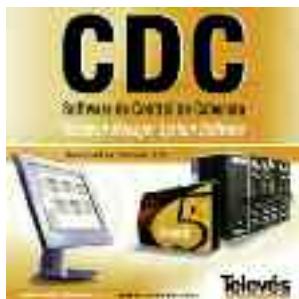
up to 30



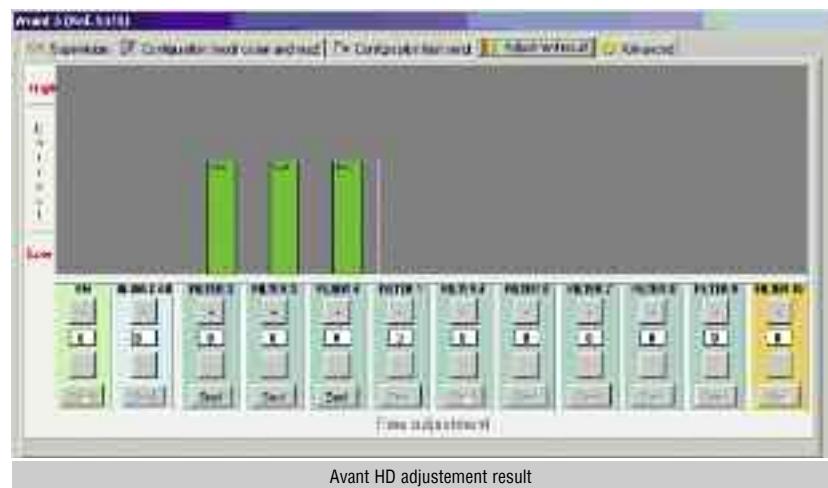
References		5328/5329							
Inputs		UHF 1	UHF 2	UHF3	FM	BI/BIII/DAB	VHF/UHF	IF/SAT (5328 only)	
Frequency bands	MHz	470-862			87-108	47-68/174-230	47-430	470-862	950-2150
		10	0	0	-	-	-	-	-
		9	0	1	-	-	-	-	-
Filters configuration		7	2	1	-	-	-	-	-
		6	3	1	-	-	-	-	-
		5	3	2	-	-	-	-	-
		0-5 <sup>(2)</sup>		-	-	-	-	-	-
		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

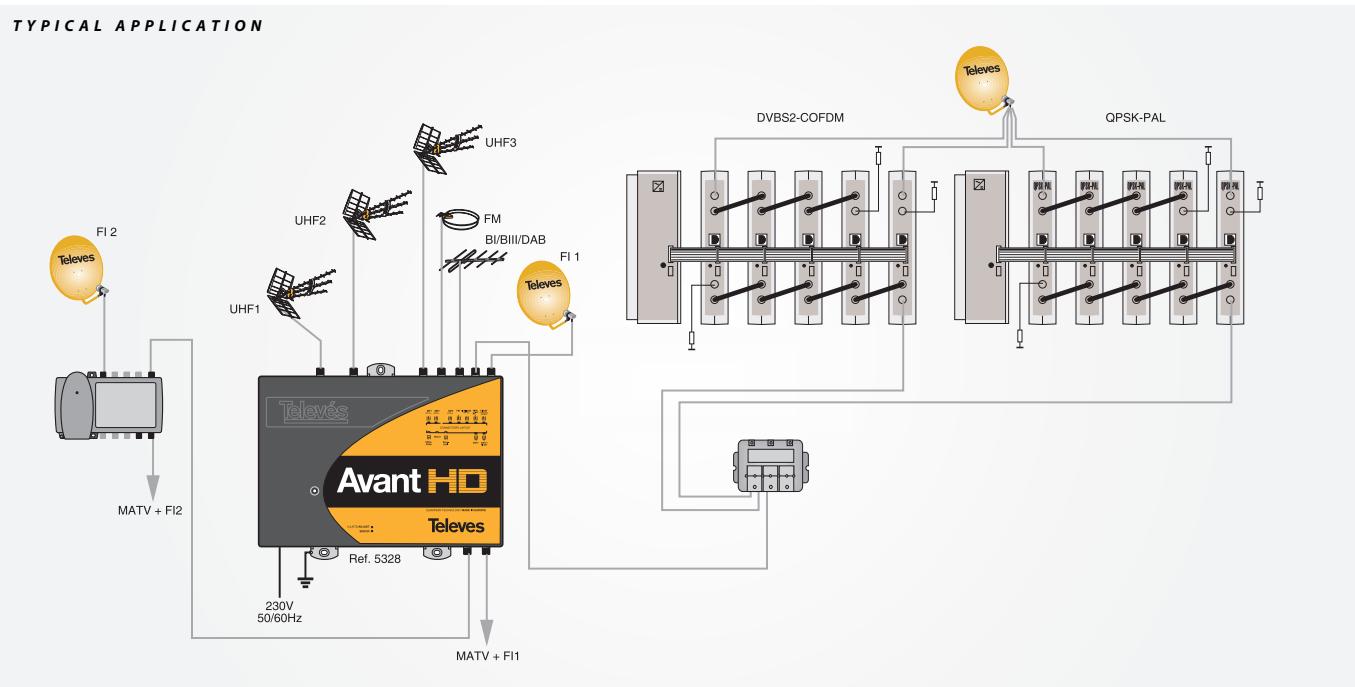
## TERRESTRIAL/SATELLITE TV



Avant HD configuration



Avant HD adjustment result



## TERRESTRIAL/SATELLITE TV

## Avant 3

## PRODUCT RANGE

## REF. DESCRIPTION

5326 Avant 3

5327 Avant 3 (Broadband VHF)

532701 Avant 3 XXXXXXX

## Accesories

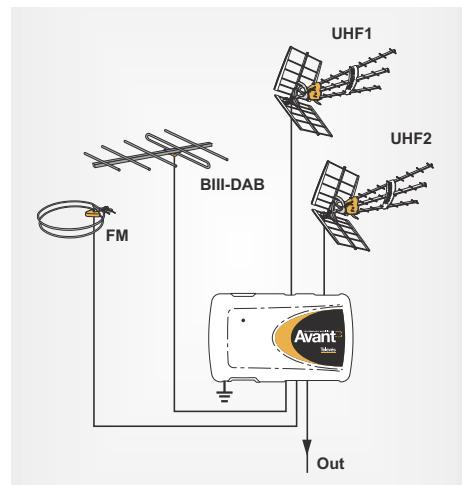
7234 Universal Programming Unit

## 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



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	dB $\mu$ V	60-80	65-90	65-90	-	-	-
Output level		117	-	115	113/116	-	-
Output level IMD3		114	-	112	110/113	-	-
Rejection	dB	20 ( $\pm$ 16 MHz)	20 ( $\pm$ 16 MHz)	20 ( $\pm$ 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 $\pm$ 20% - 50/60 Hz					



## T03 HEADEND EQUIPMENT

new

## T12. Single Channel Amplification

## PRODUCT RANGE

REF. DESCRIPTION

## Amplifiers

508112	T12 Single Channel Amplifier BI 47...88MHz G 50dB Vo 123dB $\mu$ V
508212	T12 Single Channel Amplifier FM 88..108MHz G 35dB Vo 114dB $\mu$ V
508712	T12 Single Channel Amplifier S-Low Band 104...174MHz G 58dB Vo 125dB $\mu$ V
508312	T12 Single Channel Amplifier BIII 174...230MHz G 45dB Vo 123dB $\mu$ V
509912	T12 Single Channel Amplifier DAB 195..232MHz G45dB Vo114dB $\mu$ V
508812	T12 Single Channel Amplifier S-High Band 230...300MHz G 58dB Vo 124dB $\mu$ V
508912	T12 Single Channel Amplifier HyperBand 302...470MHz G 58dB Vo 125dB $\mu$ V
508612	T12 Single/Multi Channel Amplifier UHF DTT 470...862MHz G 50dB Vo 125dB $\mu$ V (Up to 7 Channel)
509812	T12 Single Channel Amplifier UHF High Selectivity 470..862MHz G 55dB Vo 125dB $\mu$ V
508012	T12 Amplifier SAT 950...2150MHz G 35...50dB Vo 124dB $\mu$ V
549812	T12 Switched-mode Power Supply Unit 60W 24V-2.5A



▲ 508612

References	508112	508212	508312	508712	509912	508812	508912	508612	509812	508012	
	f <sub>w</sub>	MHz	47-88	87,5-108	174-230	104-174	195-232	230-300	302-470	470-862	950-2150
	BW	MHz	7	-	7	7	37	7	8	8→56	8
	<b>G</b>	dB	50	35	45	58	45	58	58	50	55
			35	35	35	35	35	35	35	30	30
	EQ		-	-	-	-	-	-	-	-	0→12
	<b>V<sub>out</sub></b>	A (dB $\mu$ V)	123*	114*	123*	125*	-	124*	125*	125→111*	125*
		B (dB $\mu$ V)	-	-	-	-	114***	-	-	118→102*	118*
	<b>I</b>	mA									400
	<b>I</b>	V <sub>dc</sub>									13/17
		KHz									0/22
	<b>I<sub>c</sub></b>	mA									130
		P	dB	<1	<3	<3	<1	<3	<1	<1	<2
	R <sub>n+1</sub>		-	-	-	-	-	-	>3	>18	-
	R <sub>n+2</sub>	dB	>40	-	>30	>30	>20	>25	>30	>15	>50
	R <sub>n+3</sub>		-	-	-	-	-	-	>20	-	-
Noise figure	NF	dB					<9			<11	<12,5

(\*): EN 50083-5; (\*\*): DIN VDE0855/12; (\*\*\*): di= 50 dB (2 ch. 4 MHz)

## T03 HEADEND EQUIPMENT

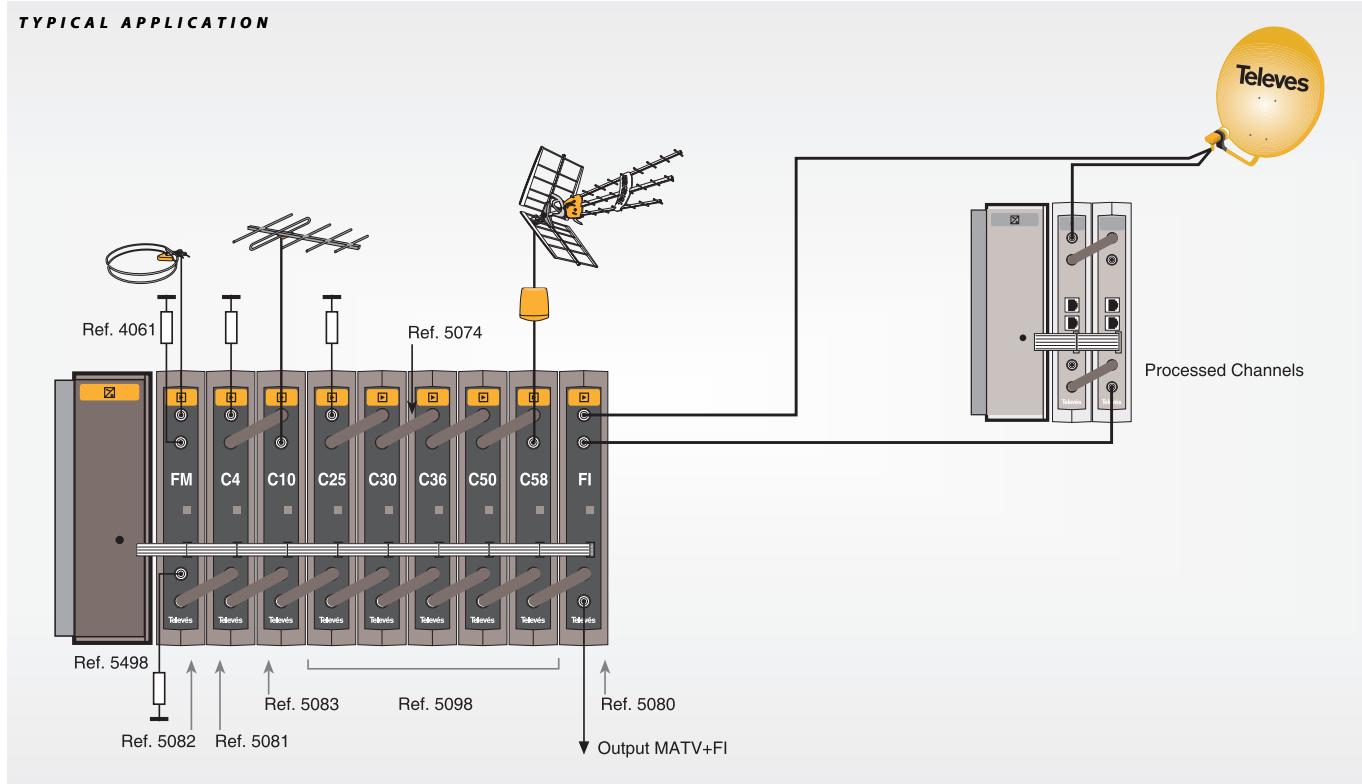
## T03. Single Channel Amplification

<b>References</b>		5080
<b>Inputs/outputs</b>		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	dB $\mu$ V	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**



## T0X HEANDEND EQUIPMENT

## T.0X: 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.

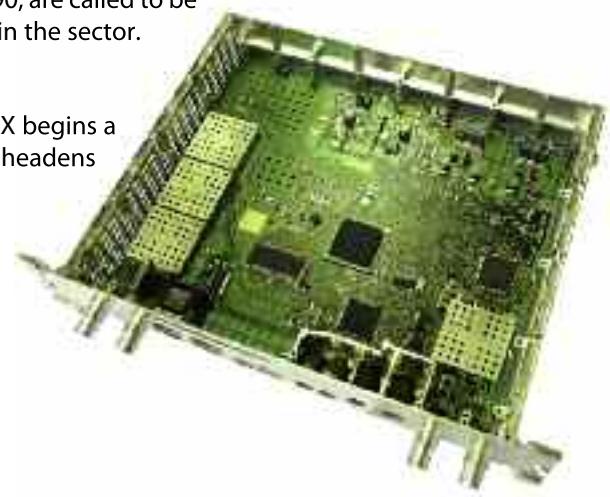
The TVSAT signal digitalization came in the second mid 90's. It was when the T05 series was born with QPSK to PAL and QAM solutions. The evolution towards new standards and to HD, made possible the design of modules compatible with DVB-S2 and DVB-T.

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.0X: 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.0X begins a new era of headends 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.0X 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.0X

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
	Comsuption 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 dBµV (-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 ±5 dBµV	Output impedance	75 ohm
	Adjustable Output level	>15 dB (prog.)	Spurious level:	
<b>General</b>	Power supply	24 V	Comsuption 24 V	550 mA typ. (without powering LNB)
	Protection index	IP20		800 mA typ. (powering LNB)

## TOX HEANDEND EQUIPMENT. SMATV

## QPSK/PAL CI TWIN T.0X

PRODUCT RANGE
REF. DESCRIPTION

553701 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.

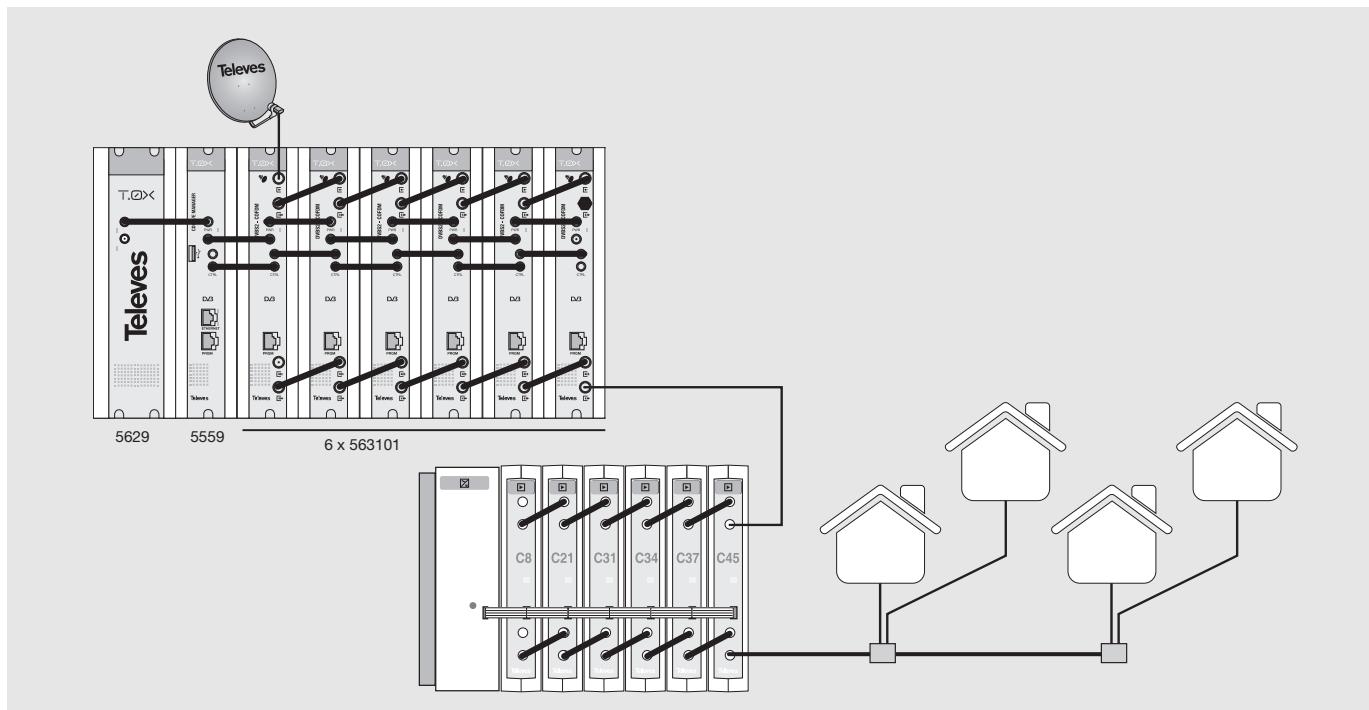


▲ 553701

References		553701		
<b>QPSK Demodulator</b>	LNB Powering (1unit)	13/17V ( $\pm 0.5$ V) / OFF 22KHz ( $\pm 2$ KHz) (Select. ON/OFF)	Input VSWR (75 ohm) Input symbol rate	> 7 dB (950 - 2150 MHz) 2 - 42,5 Mbaud
	Input through losses	< 1.5 dB (950-2150 MHz)	Capture range	$\pm 960$ ppm
	Input frequency	950 - 2150 MHz	Roll-off factor	35%
	Frequency steps	1 MHz	Convolutional code	1/2, 2/3, 3/4, 5/6, 7/8
	Locking margin	$\pm 1$ MHz (<5 Mbaud) $\pm 2$ MHz (5-10 Mbaud) $\pm 5$ MHz (>10 Mbaud)	Descrambling Deinterleaving	ETS300421
	Input level	44 to 84 dB $\mu$ V (-65 to -25 dBm)	Block code	RS(204,188)
<b>MPEG-2 Video decoders</b>	Input 1 format	MPEG-1	Chrominance format:	4:2:0
	Decoding	ISO/IEC 11172-2	Video resolution	Max. 720 x 576
	Input 2 format	MPEG-2	WSS signalling	Active
	Decoding	ISO/IEC 13818-2 (MP@ML)	Subtitle insertion PAL:	Active
	TS input rate	Max. 90 Mbits/seg	Base band video output:	Jack 2,5 mm.
<b>MPEG-2 Audio decoders</b>	Video rate	1.5 to 15 Mbits/seg		
<b>RF Output</b>	Input format	MPEG-1, MPEG-2	Audio output	Stereo, Dual
	Decoding	LAYER 1, LAYER 2		
<b>General</b>	Output frequency	46- 862 MHz	VSWR Output (75 ohm):	10 dB min. 14 dB typ.
	Frequency steps	250 KHz	Through losses:	< 1.5 dB (46-862 MHz)
	Maximum output level	80 $\pm 5$ dB $\mu$ V	Spurious band level:	55 dBc min. >60 dBc typ.
	Attenuation	>15 dB		
		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		

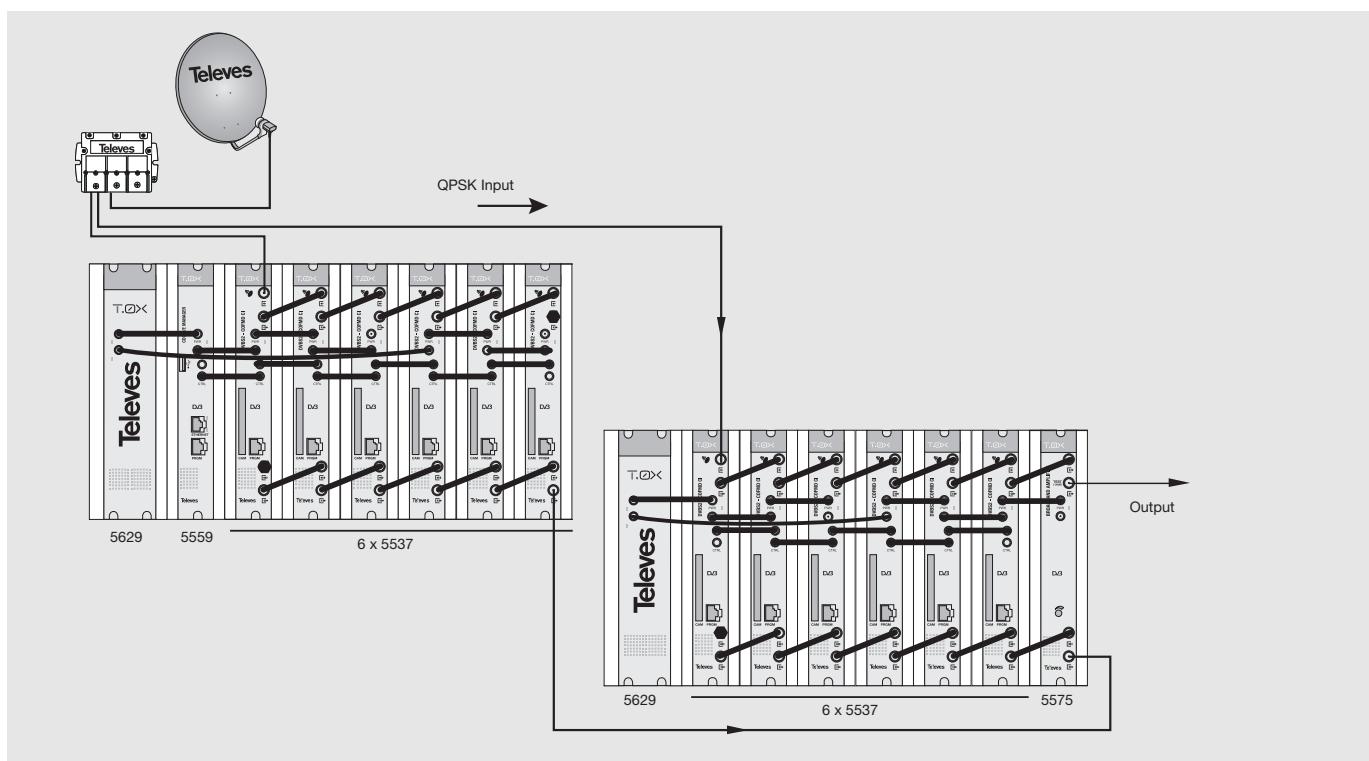
## TOX HEANDEND EQUIPMENT. SMATV

## SMATV APPLICATION



QPSK input, 6 COFDM channels output.

▲ 563101



QPSK input, 24 PAL channels output.

▲ 553701

## 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.0X

## 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.0X

## 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

		564901			Prog.
Input A/D	RF	Input frequency range	MHz	46-862	X
		Frequency steps	KHz	125, 166	X
		Lock margin		± 500	
		Input loop-though gain	dB	0± 3	
		Filter	MHz	7,8	X
		Pre-amplifier powering	Vdc	0, 12, 24	X
		Return losses	dB	>10	
		Impedance	ohm	75	
Output A/D	RF	Output frequency range	MHz	46-862	X
		Frequency steps	KHz	125 (digital), 166 (digital), 250 (analog.)	X
		Max. output level	dB $\mu$ V	80 typ.	
		Regulation margin	dB	65-80	X
		Spurious level	dBc	>55	
		END (Equivalent Noise Degradation)		<2	
		Loop-though loss	dB	<1,5	
		Return losses		> 12	
General		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	Diferencial phase	< 4°
	input level (75 ohm)	1 Vpp	Chroma/luma Delay	< 100 ns
	Modulation depth	72,5 ... 90 %	Chroma/luma Delay	> 52 dB
	Diferencial 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	
	Frequency steps	250 KHz (prog.)	46 ... 862MHz:	55 dBc min. > 60 dBc typ
<b>General</b>	C/N (5 MHz)	> 56 dB	Through losses (46 - 862 MHz):	< 1.5 dB
	Power supply	24 V	Protection index	
	Comsuption 24 V	300 mA		IP20

## T0X HEANDEND EQUIPMENT. CDC

## CDC IP/GPRS T.0X

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

Device that allows remote control and monitoring of a T.0X Televes 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 "Televes Services ". The portal is located in our headquarters. Access is granted previous identification.
- ▶ Built-in RISC Micro under GNU/Linux OS assures 100% reliability when managing external interfaces end protocols.

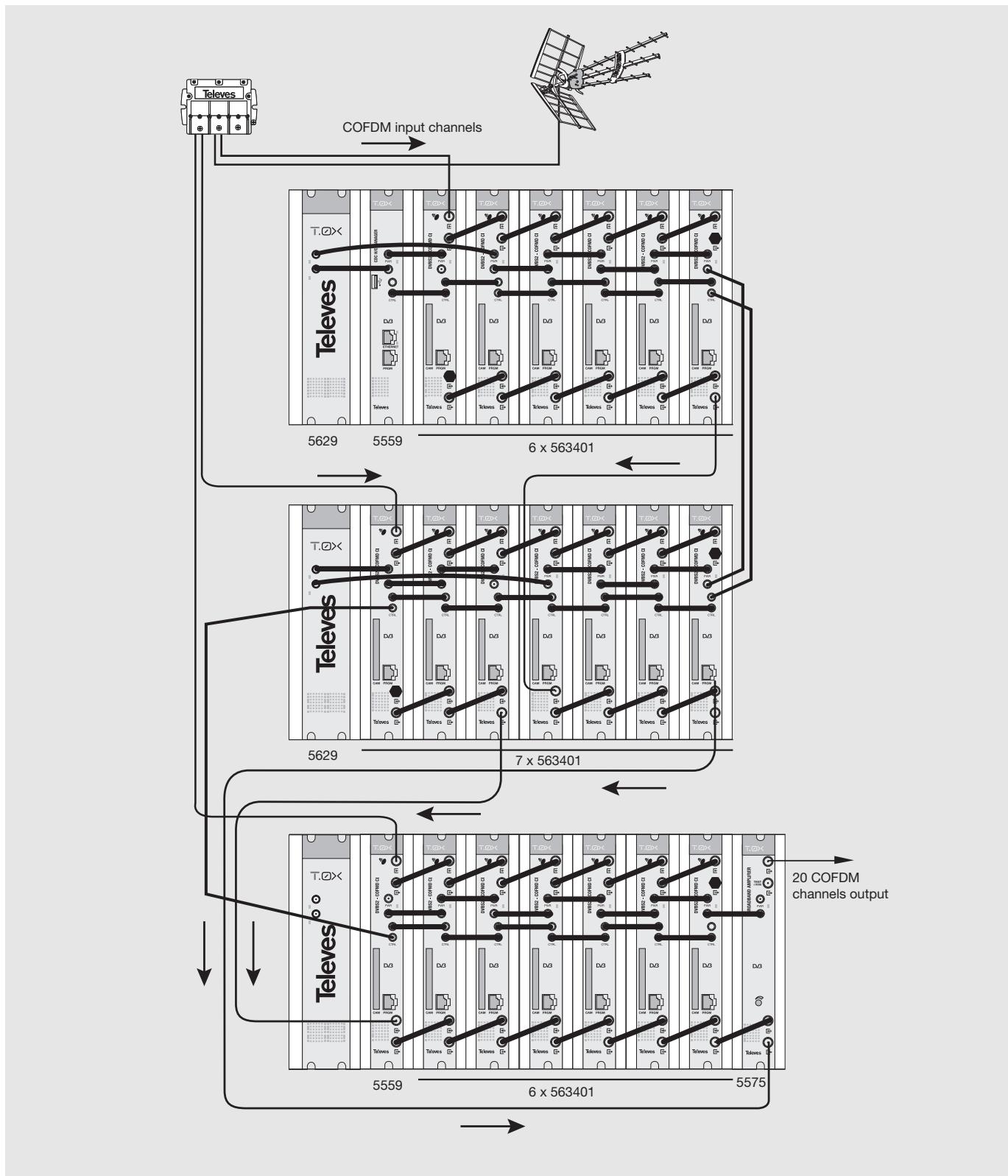


▲ 5559/555901

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	dBm	EGSM 80	
				GSM 150	
				DCS 170	
				PCS 140	
		Transmission power	dBm	GSM +33	
				DCS +30	
				PCS +30	
		Sensitivity		GSM -107	
				DCS -106	
				PCS -106	
	CPU			AT91RM9200	
		Memory	MB	8	
				64	
				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 HEADEND EQUIPMENT

## MATV APPLICATION

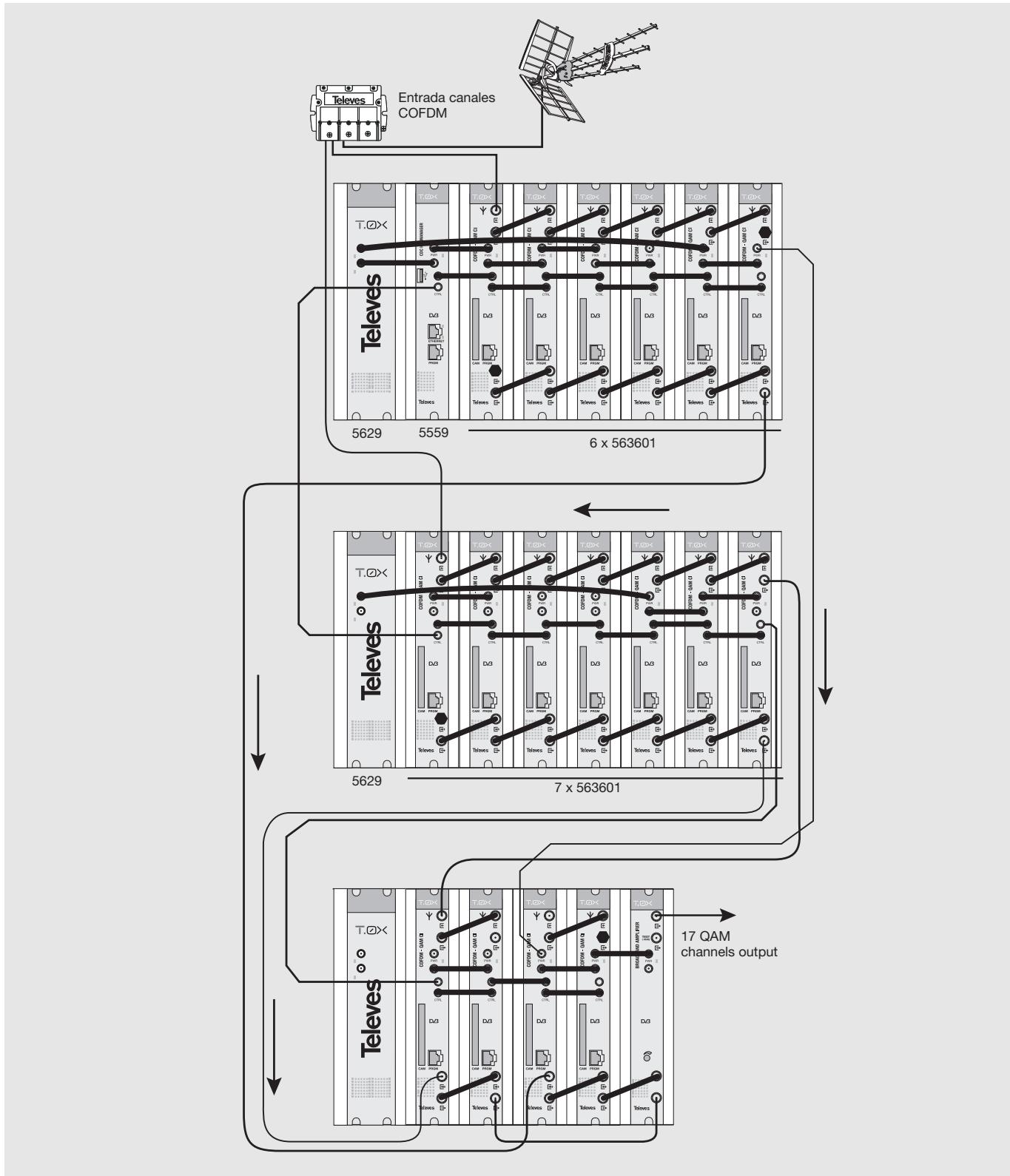


COFDM channels input, 20 COFDM channels output.

▲ 563401

## TOX HEANDEND EQUIPMENT. MATV

## MATV APPLICATION



COFDM channels input, 17 QAM channels output.

▲ 563401

## T05 HEANDEND EQUIPMENT

## CDC system

PRODUCT RANGE	
REF.	DESCRIPTION
5059	Headend controller CDC

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

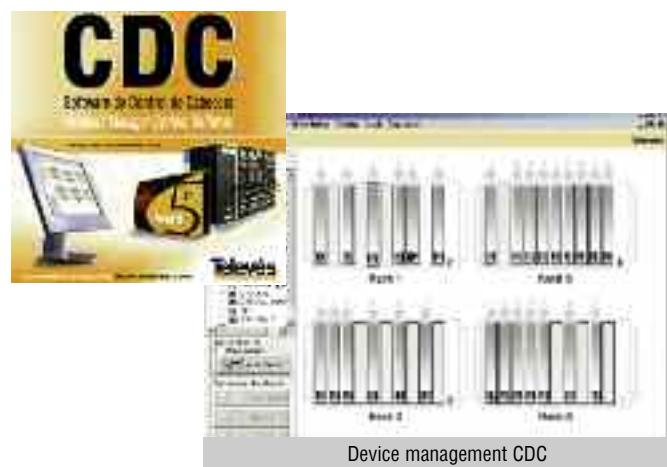


▲ 5059

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.

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
Transmition 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)
Regulation margin			15
USWR Output	dB		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)

- 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.



Device management CDC

## REMOTE HEADEND CONTROLLER

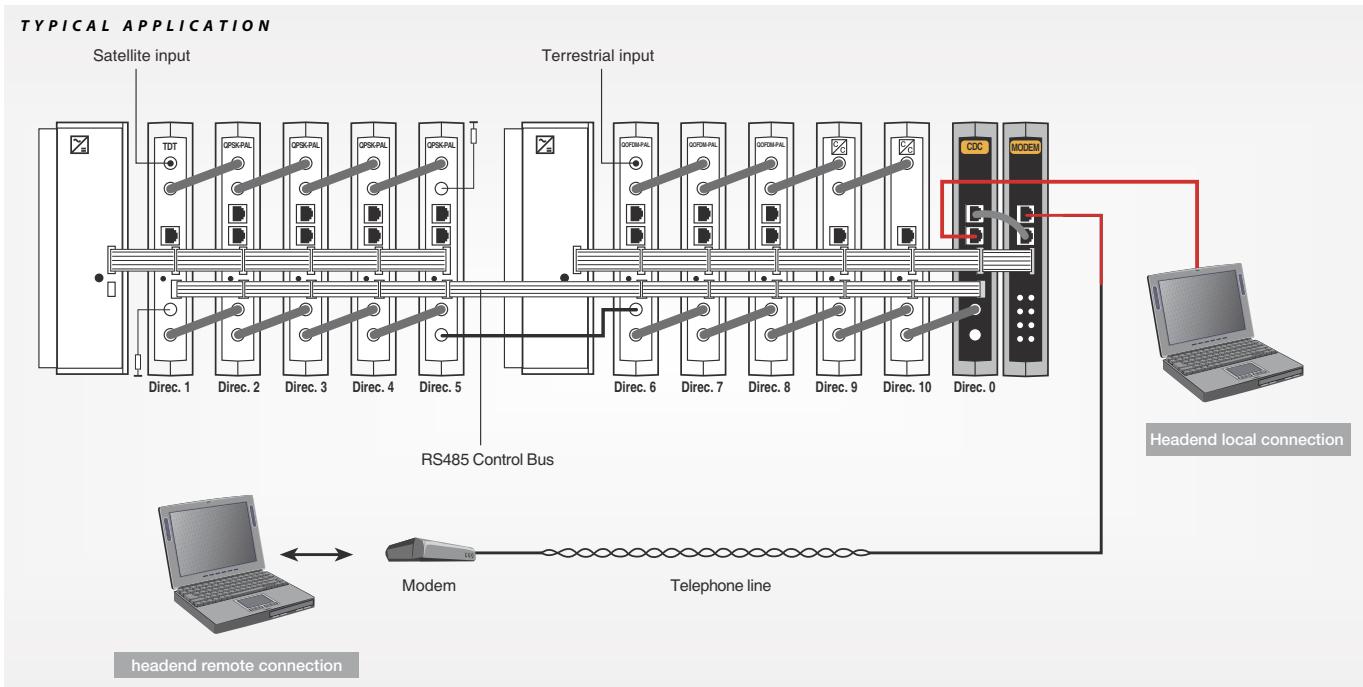
## CDC System – Modem

PRODUCT RANGE	
REF.	DESCRIPTION
5837	IP Modem
5836	GSM Modem



▲ 5837

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



## 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

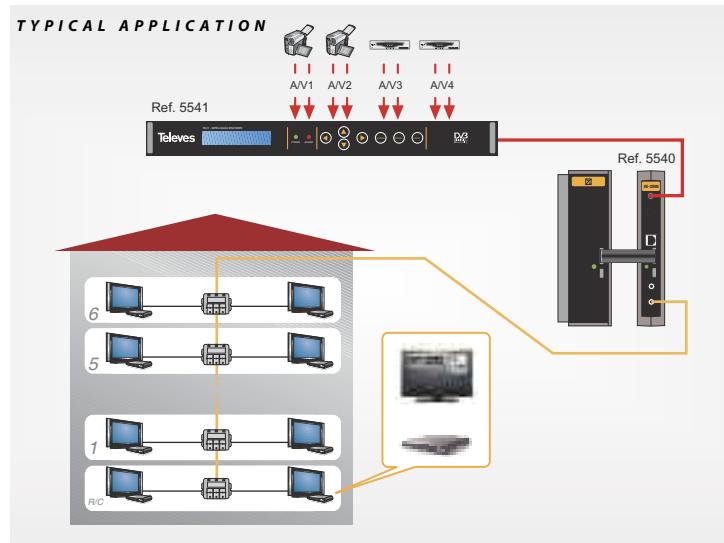


▲ 5540

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
Output	FEC		1/2, 2/3, 3/4, 5/6, 7/8
	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
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)

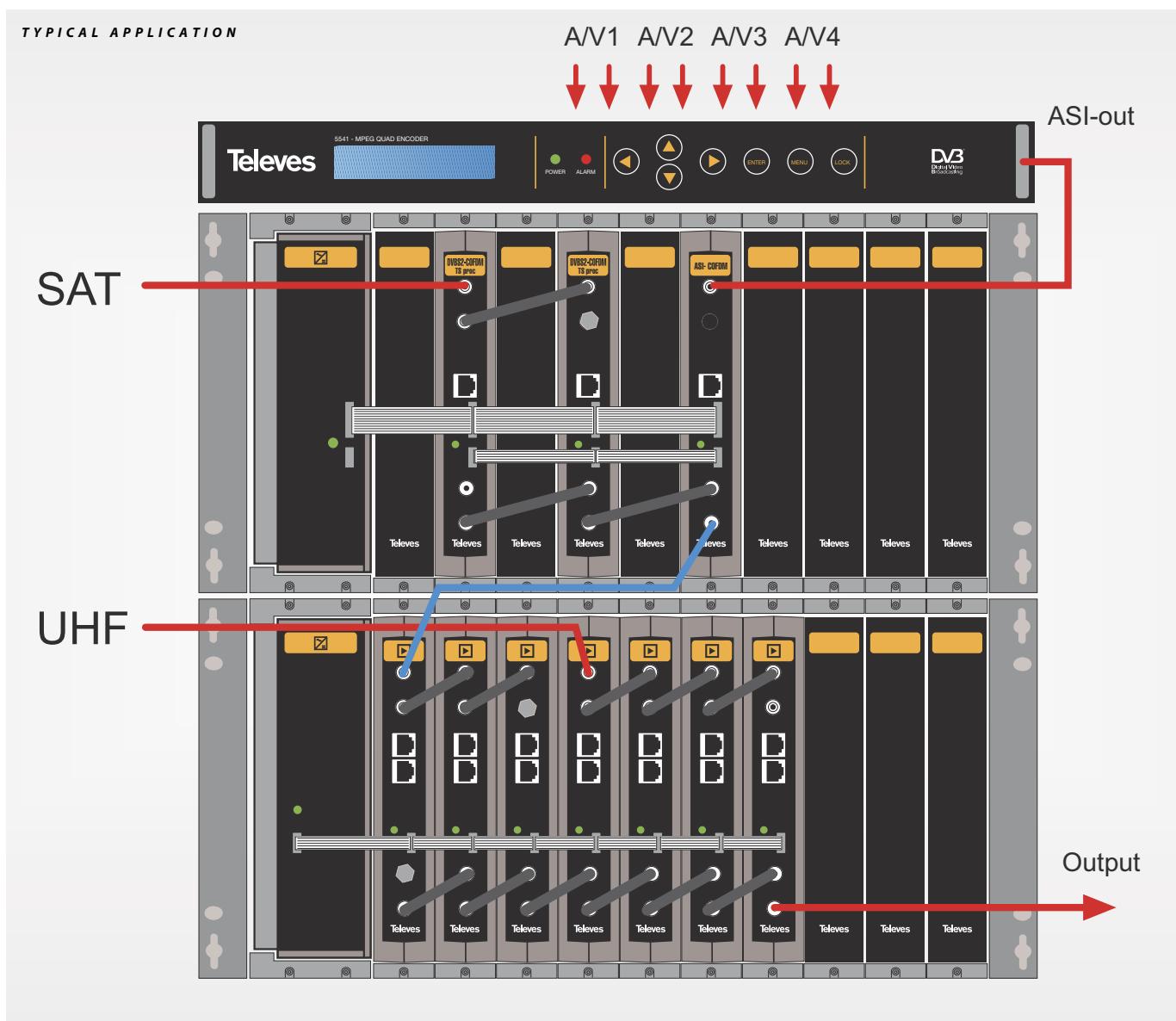


## T05 HEANDEND EQUIPMENT

## 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 &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

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

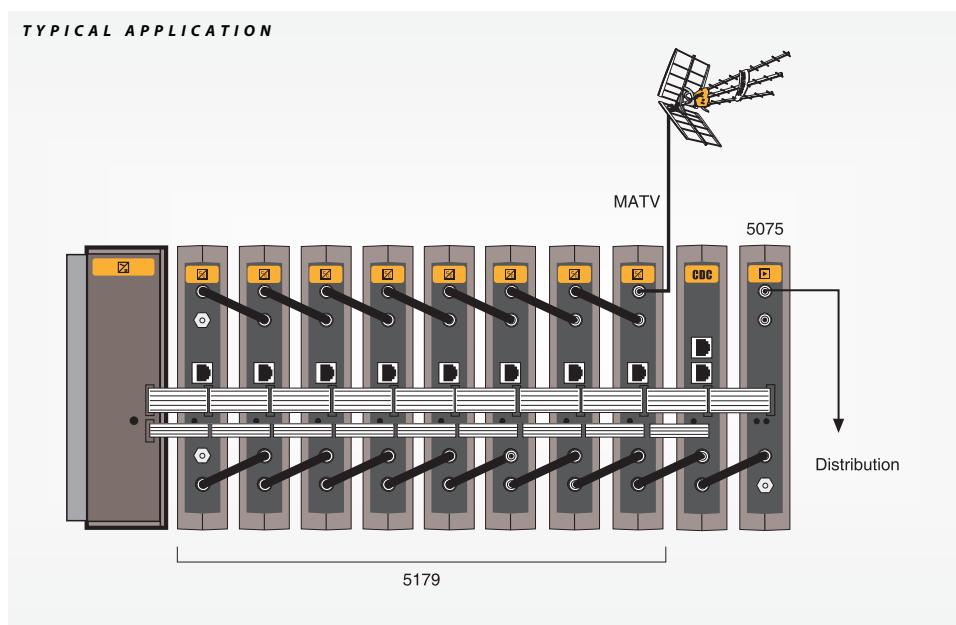


▲ 5179

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

<b>PRODUCT RANGE</b>	
REF.	DESCRIPTION
505403	COFDM-PAL
504403	COFDM-PAL stereo
<b>System accessories</b>	
502905	PSU
5075	Hybrid amplifier MATV
2168	PC programming Sw. + Accs.
7234	Universal Programming Unit
5837	Modem IP
<b>Mounting &amp; accessories</b>	
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	dB $\mu$ V	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	dB $\mu$ V	80±5
Variable gain	dB	15
Return losses		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

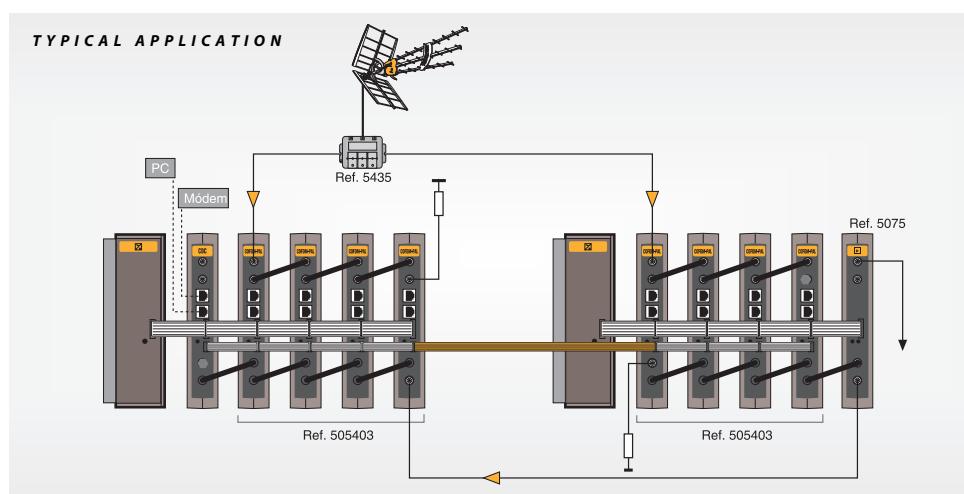


▲ 505403

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

## 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
Inp	MHz	950-2150	950-2150
Output freq. margin	MHz	1	1
Frequency steps	Ω	75	75
Output impedance	dB	>10	>10
Inp	dB	>10	>10
Output return losses	MHz	10 a 72 (2 MHz steps)	10 a 72 (2 MHz steps)
Inp	dBµV	60 - 88	75±5
Output level		Yes	Yes
Level regulator	Vdc	13/17 / OFF	22 KHz / OFF
Powering LNB		5V:550 15V:50	5V:1100 15V:50
		13/17 / OFF	22 KHz / OFF
General			
Max. consumption	mA	5V:550 15V:50	5V:1100 15V:50
Protection index		IP 20	

## IF AMPLIFIER

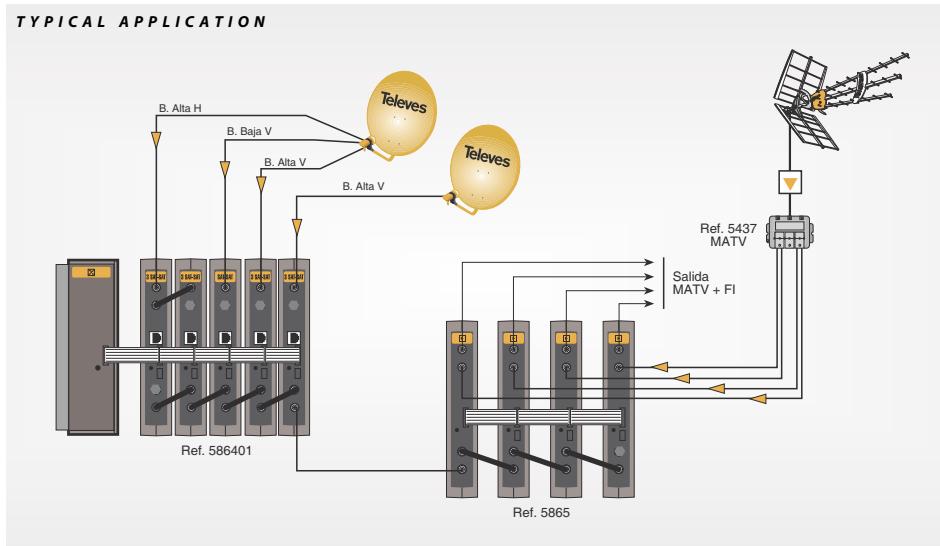
References		5865
Frequency range	MHz	950-2150
Gain (9!)		35±2
Gain (2150 MHz)	dB	40±3
Adjustable margin		20
Output voltage (2 tones -35dB)	dBµV	>123
Connector		"F"
Powering	Vdc	15
Consumption	mA(vdc)	200(15)



▲ 586301

## Programmable parameters:

- Modular and programmable satellite system.
- Allows the selection of any channel in the IF band 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 comming from different systems.

References			5075
Frequency range	MHz	47-862	
Gain	dB	45±2	
Gain regulation		20	
	DIN 45004-B	120	
Output level	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-05 110 Vac UL
5498	Switched PSU T-03

Switched PSU for the T03 and T05 range.



▲ 502905

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 (*)	6.6	2.5	
Max. output powering	W	13.2	14.4	63 (*)	33	60	
Dimensions	mm	56x197x163				55x197x83	

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

## 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



▲ 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 arrestor
422601	Power lead for T0X with T05 PSU
422602	Data lead for T0X with T05 CDC



▲ 4947



▲ 7234



▲ 4061

▲ 5074



▲ 4221



▲ 5073

## MULTISWITCHES

## Splitters and LNB switches

PRODUCT RANGE	
REF.	DESCRIPTION
7268	DiSEqC 2in/1out switch
7269	DiSEqC 4in/1out switch

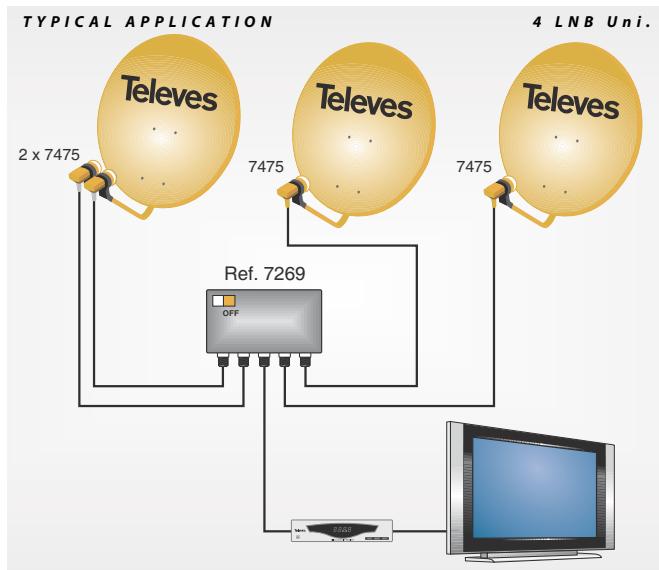
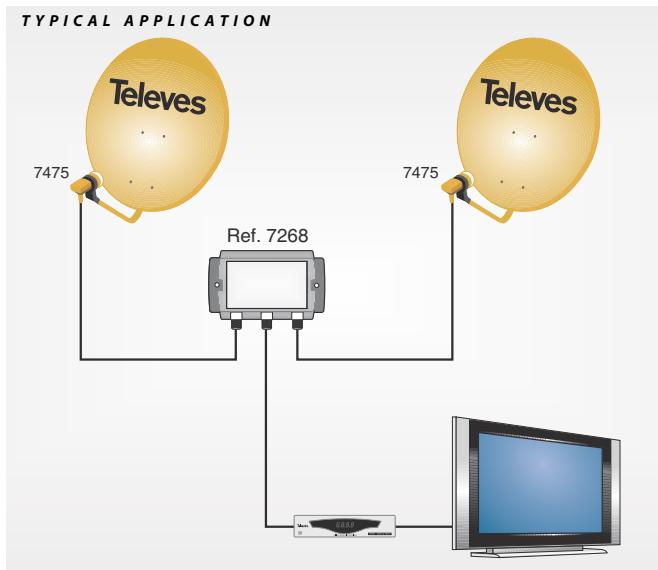
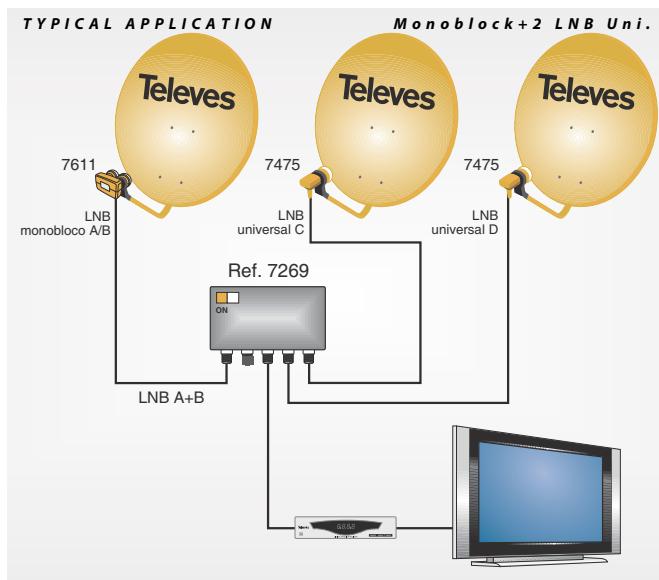


▲ 7268



▲ 7269

References		7268	7269
Bandwidth	MHz	0...2400	5...2150
Switching type		DiSEqC 2.0	DiSEqC 2.0
	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

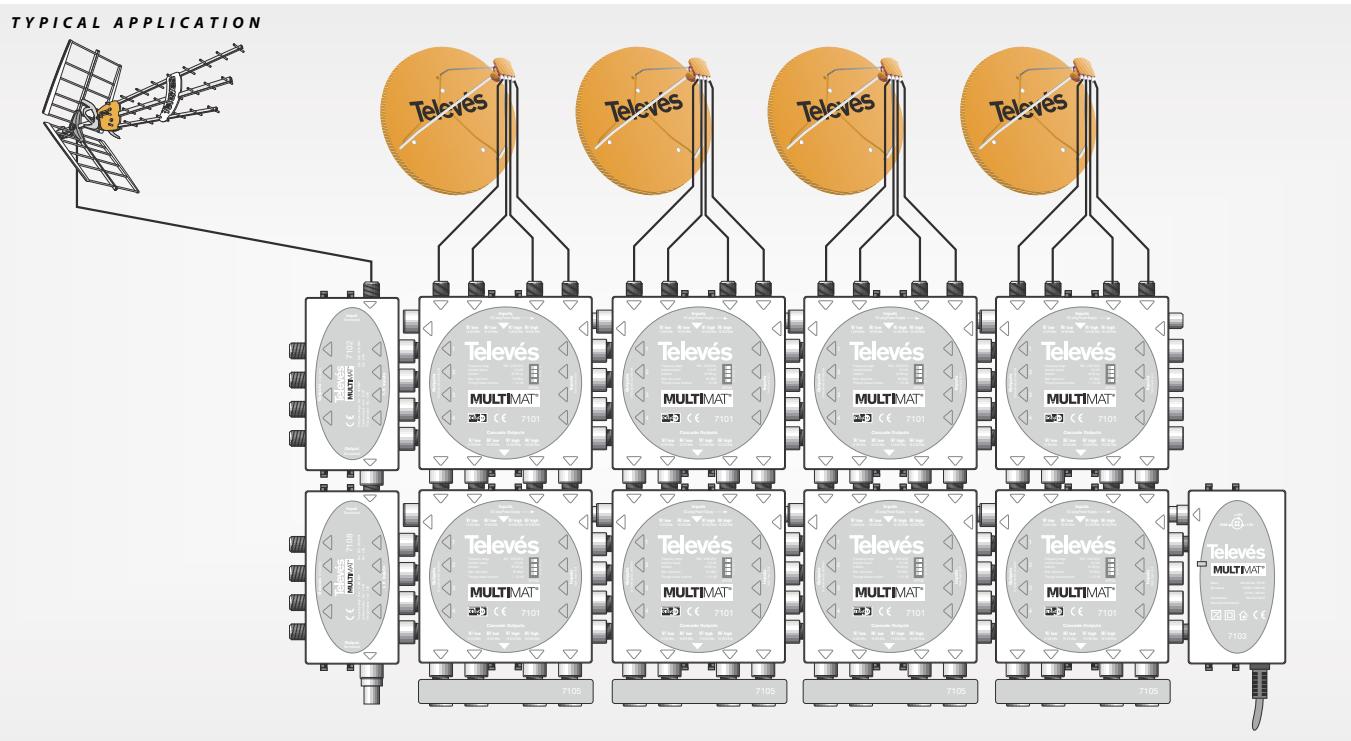


## MULTISWITCHES

## Universal Multimat System

PRODUCT RANGE	
REF.	DESCRIPTION

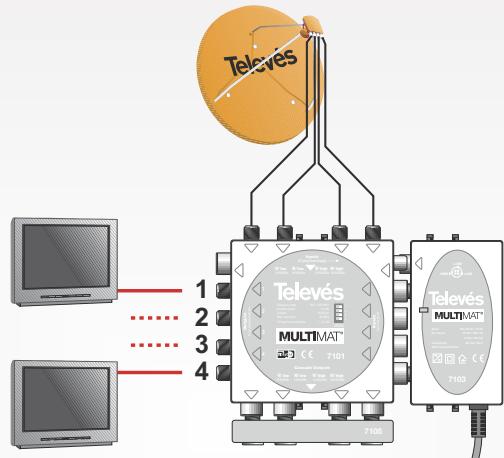
- 7101 Main multiswitch
- 7102 MATV/IF passive combiner 13 dB
- 7108 MATV/IF passive combiner 9 dB
- 7109 MATV/IF passive combiner 17 dB
- 7110 MATV/IF passive combiner 21 dB
- 7103 Multimat PSU
- 7104 Multimat IF amplifier
- 7105 F terminal load block
- 7106 F connector block
- 7107 F terminal load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



## MULTISWITCHES

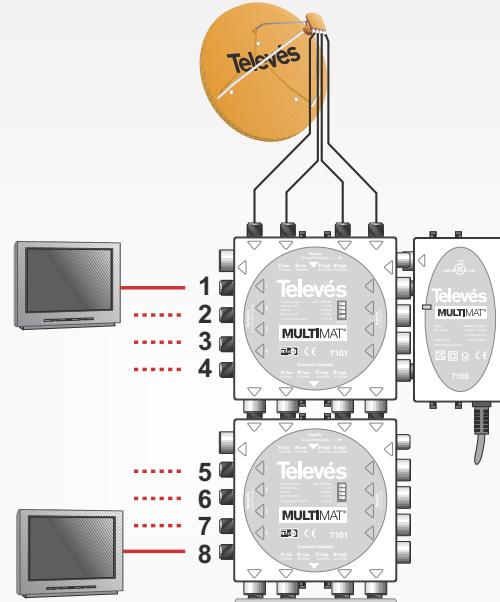
## Star distribution

TYPICAL APPLICATION



4 Users

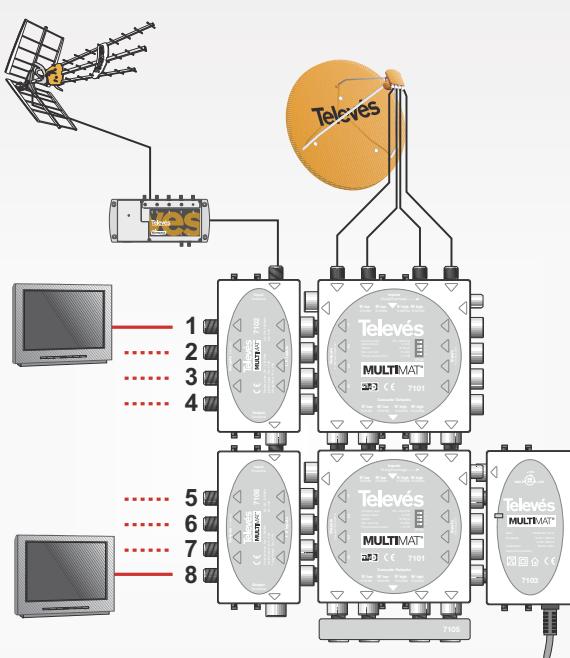
TYPICAL APPLICATION



8 Users

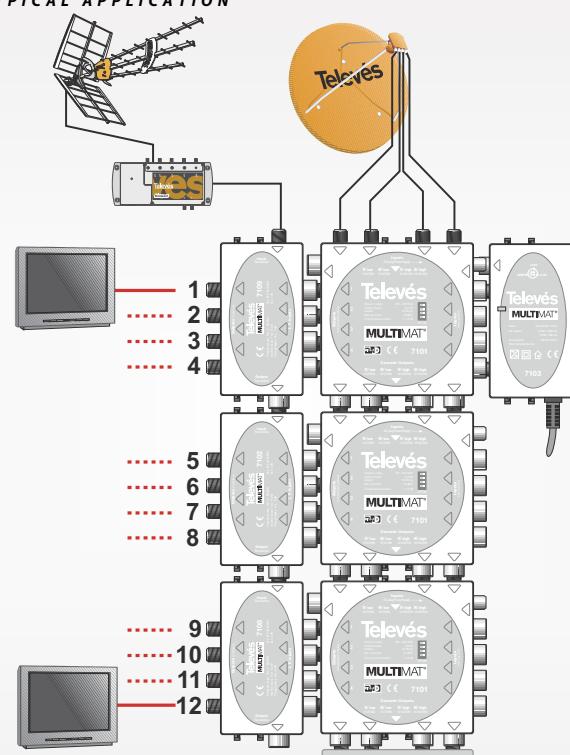
## Star distribution + MATV

TYPICAL APPLICATION



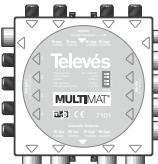
8 Users

TYPICAL APPLICATION

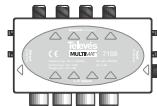


12 Users

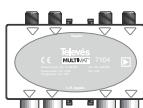
## MULTISWITCHES



References		7101	
No. inputs (SAT)		No	4
No. outputs	for receivers		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		dBµV	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		7108	7102	7109	7110
No. inputs VHF/UHF passive		No	1	1	1
for receivers			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
Dimensions	mm	115x70x33			



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



References		7103	
Mains voltage		Vac	180 - 264
			18 ± 5%
			13 ± 5%
		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	

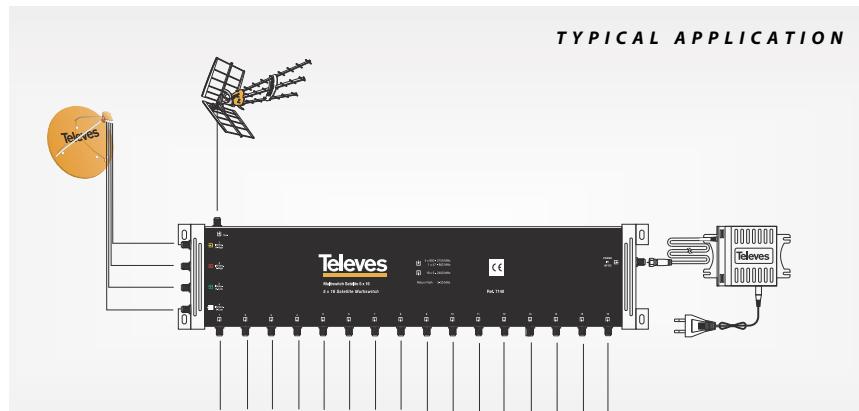
## MULTISWITCHES

## 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



Multiswitch specs			5x4	5x6	5x8	5x12	5x16	5x24	5x32				
References			713601	713701	713801	713901	714001	717001	716901				
Frequency range		SAT	MHz			950 - 2400							
		TER				47 - 862							
Input level		SAT	dB $\mu$ V			100							
		TER				100							
Tap Output level		SAT				100							
		TER				100							
Tap losses		SAT	dB			3±5	3±5	3±5	3±6	3±6			
		TER				3±3	3±3	3±3	5±3	5±3			
Isolation between inputs						60	40	30	45	35			
Isolation between outputs						20	20	30	25	25			
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

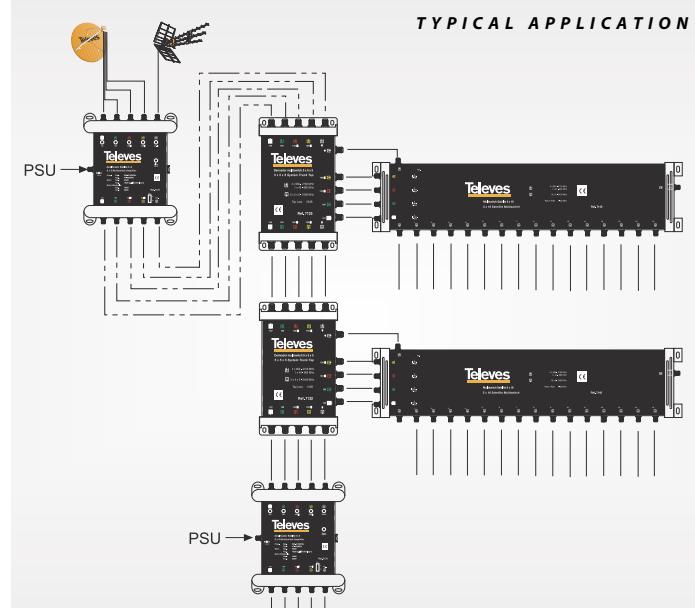
## 5 input cascade

PRODUCT RANGE	REF. DESCRIPTION
713201	12 dB Tap
713301	15 dB Tap
713401	20 dB Tap
713501	25 dB Tap
713101	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



▲ 7131



Ref. 713101 - Amplifier 5x5			
Band		Satellite	Terrestrial
Freq. range	MHz	950-2400	47-862
Gain	dB	30±2	27±2
Regulation	dB	11±1	10±1
Slope	dB	3	8
Input level	dBµV	94	100
Max. Output level	dBµV	125	125
Powering	Vdc	12	
Max. Consumption	mA	300	
Dimensions	mm	161x108x42	

Multiswitch specs			5x5				
References			713201	713301	713401	713501	
Frequency range	SAT	MHz	950 - 2400				
	TER		47 - 862				
Through losses	SAT	dB	1,5±1				
	TER		1±1				
Tap Losses	SAT	dB	12±3	15±3	20±3	25±3	
	TER		12±2	15±2	20±2	25±2	
Isolation between inputs			30				
Isolation between outputs			30				
DC pass LNB			mA	300/input max.; 1200 max.			
Protection index			IP	20			
Dimensions			mm	161x110x42			

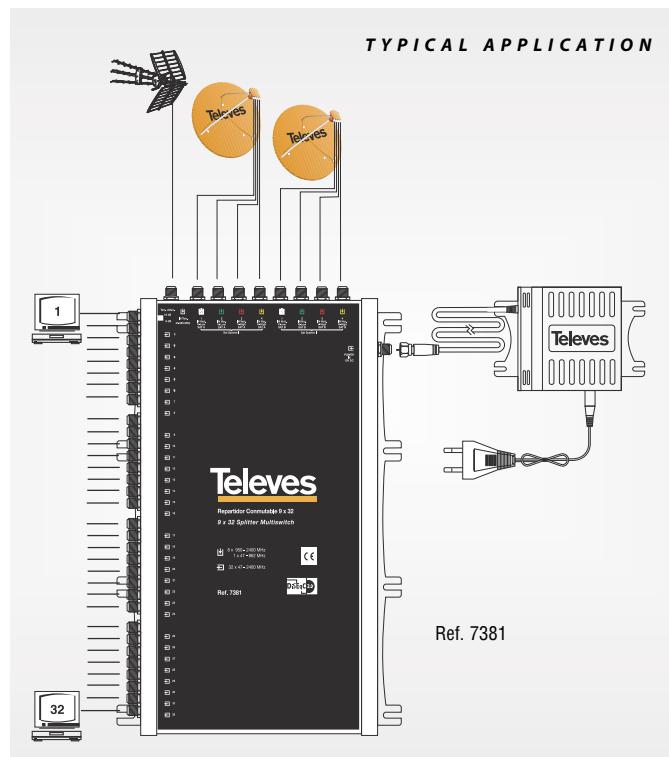
## MULTISWITCHES

## 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



Multiswitches			9x8	9x12	9x16	9x24	9x32
References			7438	7430	7439	7379	7381
Frequency range	SAT	MHz	950 - 2400				
	TER		47 - 862				
Input level	SAT		95				
	TER		89				
Tap output level	SAT		95				
	TER		89				
Tap losses	SAT	dB	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				



## MULTISWITCHES

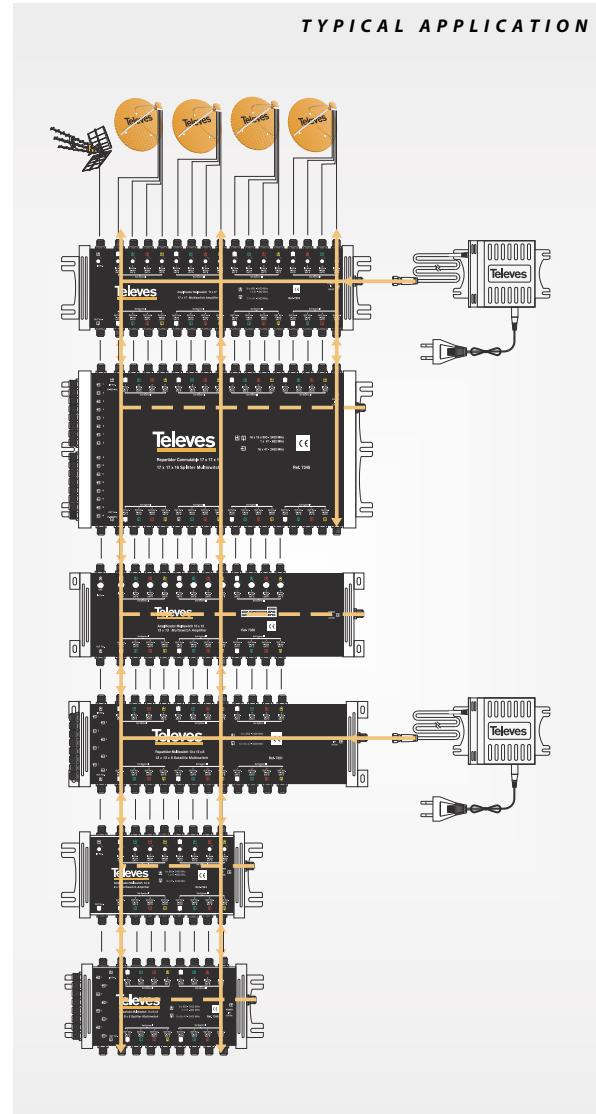
## 9 input cascade

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



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

Multiswitch specs			9x9x8	9x9x12	9x9x16	
References			7340	7382	7341	
Frequency range	SAT	MHz	950 - 2400			
				47 - 862		
Input level	SAT		95			
	TER			89		
Tap Output Level	SAT	dB $\mu$ V	95			
	TER			89		
Through losses	SAT		3	4	4	
	TER			3	4	
Tap Losses	SAT	dB	1	2	2	
	TER			6	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		



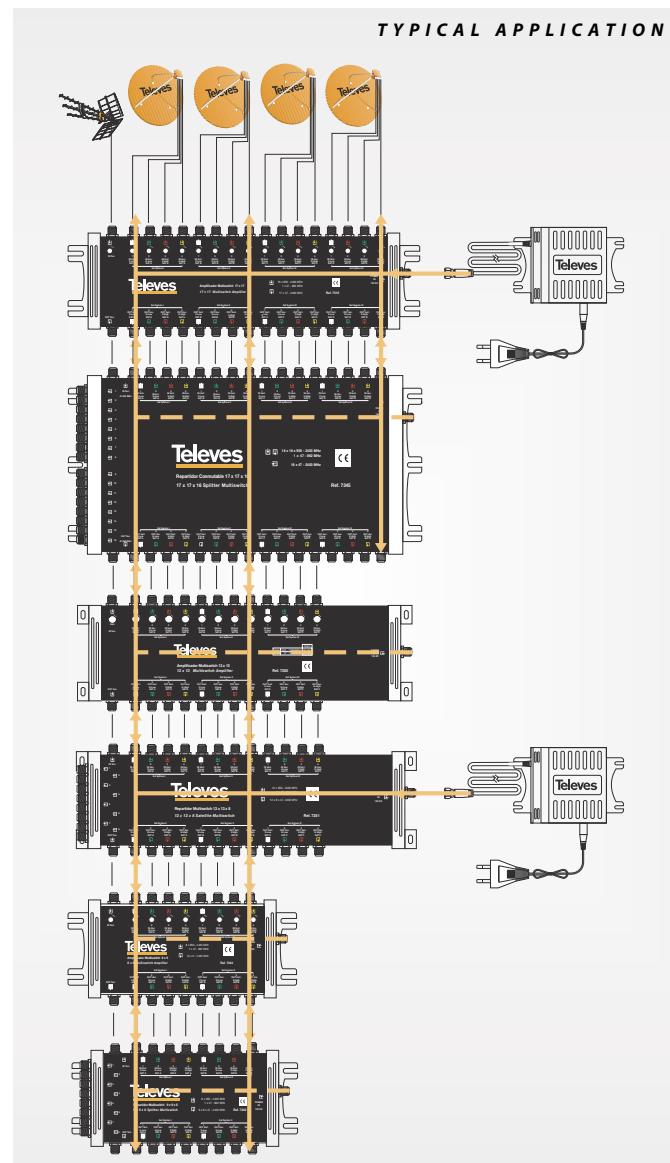
## MULTISWITCHES

## 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	MHz	950 - 2400			
	TER		47 - 862			
Input level	SAT	dB $\mu$ V	95			
	TER		89			
Tap output level	SAT		95			
	TER		89			
Tap losses	SAT	dB	1	2	4	
	TER		3	3	5	
Isolation between inputs			40	30	40	
Isolation between outputs			35	25	30	
LNB powering	mA	300/input; 1200 total				
Powering voltage	Vac/Vdc	230 / 12				
Max. consumption	mA	50				
Protection index	IP	20				



## MULTISWITCHES

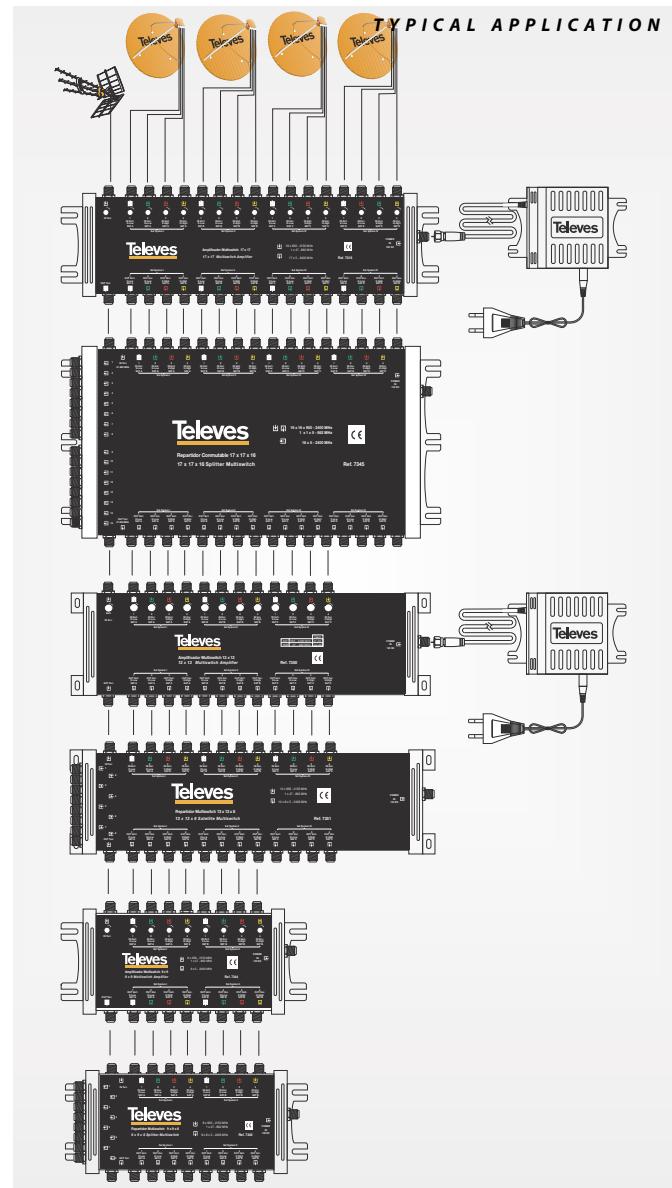
## 13 input cascade

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	dB	27/30	24/30
		10	7
Slope		-	10
		Max. output level	105
Max. consumption	mA	560 (15 Vdc)	
Protection index	IP	20	

Multiswitch specs		13x13x8	13x13x12	13x13x16
References		7351	7369	7370
Frequency range	SAT	MHz	950 - 2400	
	TER		47 - 862	
Input level	SAT	dBµV	95	
	TER		89	
Tap Output Level	SAT		95	
	TER		89	
Through losses	SAT	dB	1	4
	TER		3	5
Tap Losses	SAT		6	2
	TER		0	8
Isolation between inputs		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

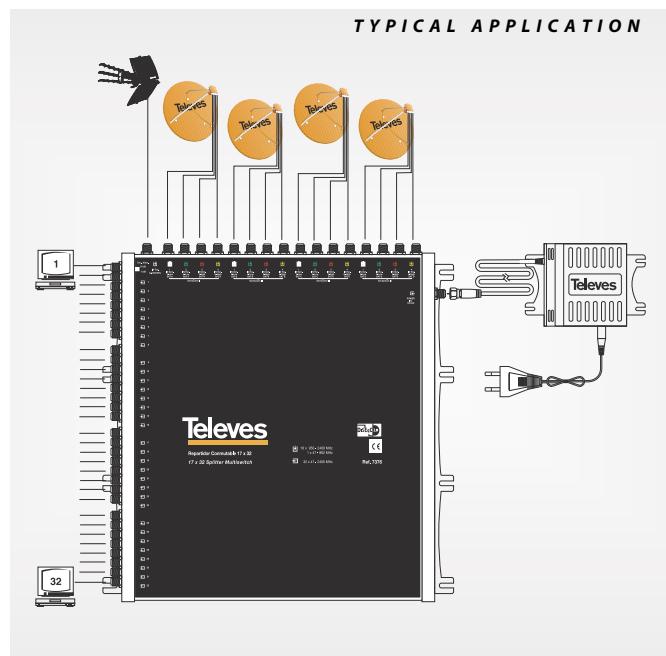
## 17 input stand alone

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	MHz	950 - 2400				
	TER		47 - 862				
Input level	SAT	dBµV	95				
	TER		89				
Tap output level	SAT		95				
	TER		89				
Tap losses	SAT	dB	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	mA		300/input; 1200 total				
Powering voltage	Vac/Vdc		230 / 12				
Max. consumption	mA		50				
Protection index	IP		20				



## MULTISWITCHES

## 17 input cascade

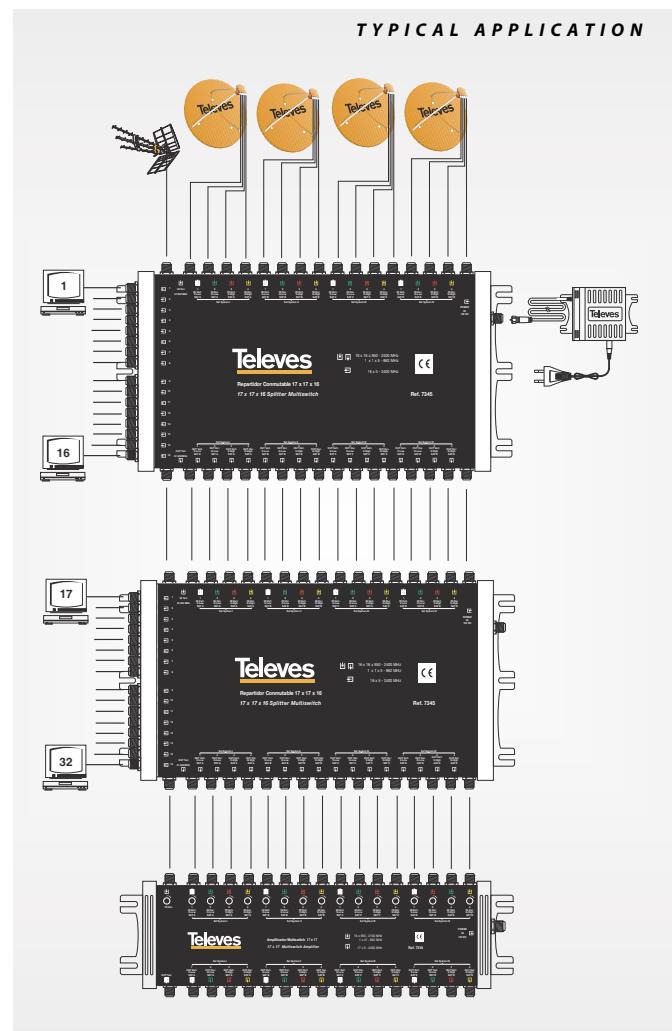
PRODUCT RANGE	
REF.	DESCRIPTION

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 950 - 2400 TER 88 - 862
Gain	dB	12/21 24/32
Regulation		9 8
Max. output level	dB $\mu$ V	105
Max. consumption	mA	560 (15 Vdc)
Protection index	IP	20



Multiswitches		17x17x8	17x17x12	17x17x16
References		7323	7373	7345
Frequency range	SAT	950 - 2400		
	TER		5 - 862	
Input level	SAT		95	
	TER		89	
Tap output level	SAT		95	
	TER		89	
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		



## 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



# 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	LNOc LNB optical
2363	Optical LNB + TDT
237001	Quattro MDU+ TDT
236901	Quad MDU+ TDT
236801	Optical LNB + TDT
<b>Optical Splitters</b>	
235701	Split 2OF
235801	Split 3OF
235901	Split 4OF
236001	Split 8OF
<b>Optical leads</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 innovative 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



▲ 237001



▲ 2363

**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

**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

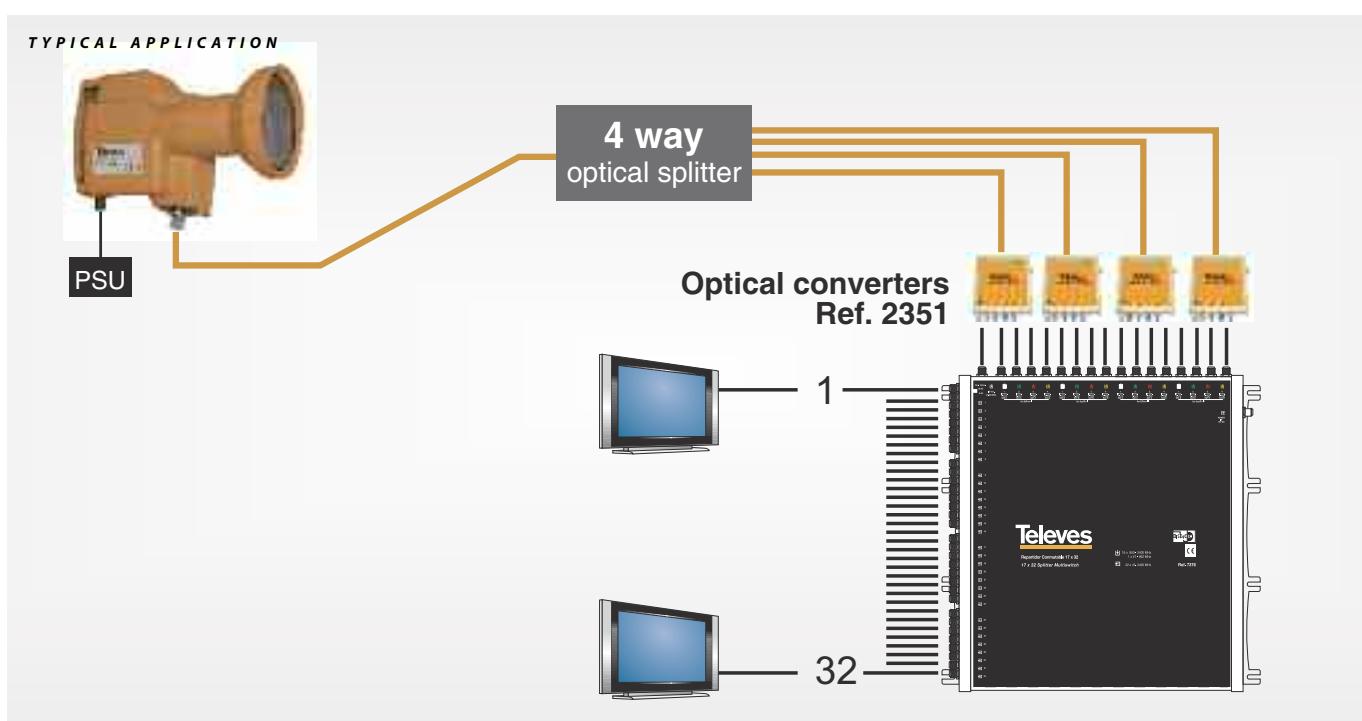
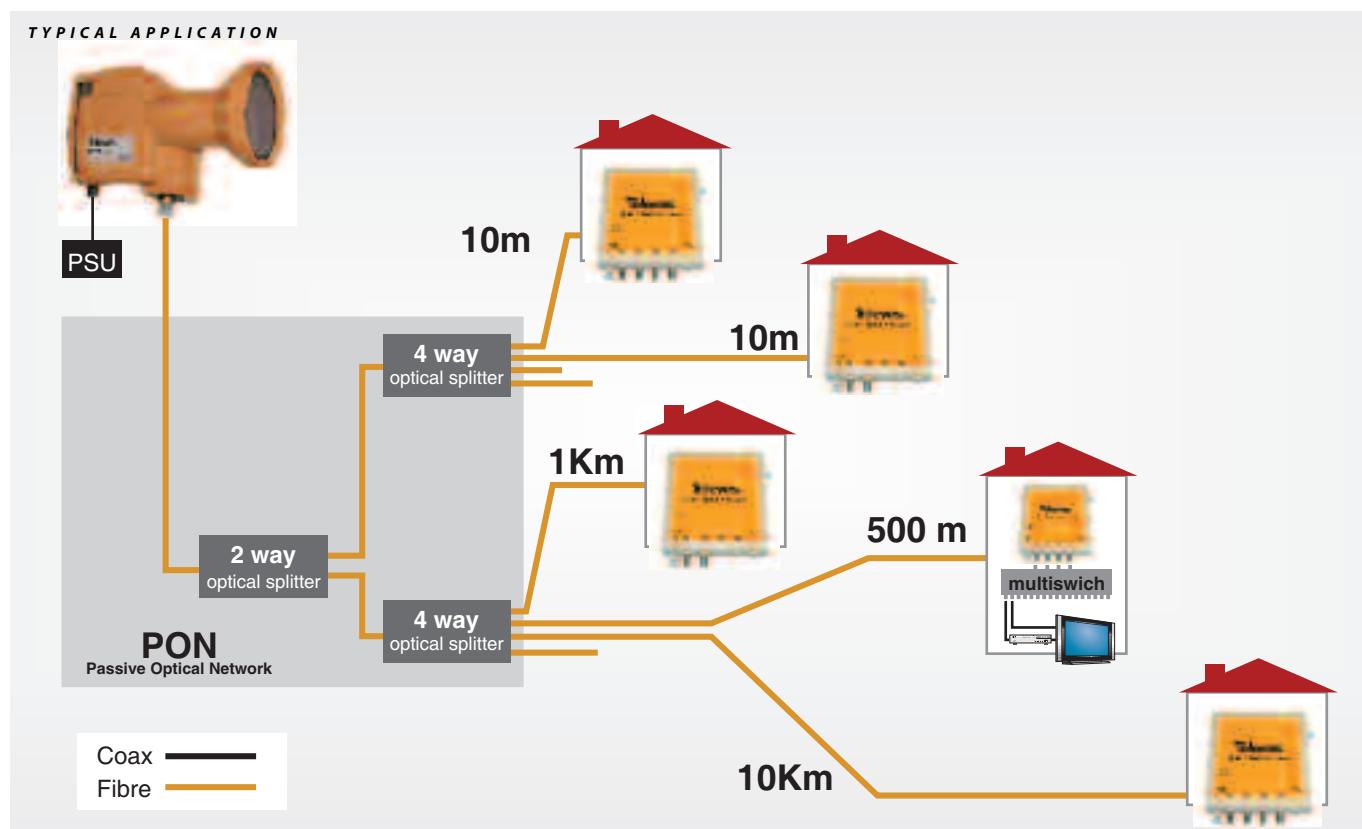
Reference	2353
Output frequency	GHz 10,7-12,75
Optical output power	dBm 0,950-5,45
Gain	dB 7
Cross polar rejection	dB 0,5 typ
Powering	Vdc 72 max.
Current consumption	mA 30 typ
Operating temperature	°C 12
Optical output connector	type F Female
	FC/PC

Reference	2363
Output frequency	GHz 10,7-12,75
L.O. Frequency vertical	GHz 0,950-5,45
L.O. Frequency horizontal	GHz 9,75
Modulated laser output	nm 7,30
Optical Output Power at 25°C	dBm 1310
Gain	dB 7
Phase Noise	dB 0,5
Local Oscillator Stability	MHz 72
Cross Polar Isolation	dB Offset frequency - Maximum limit
Operating temperature	°C 1KHz -55 dBc/Hz 10KHz -80 dBc/Hz 100KHz -100 dBc/Hz 1MHz -110 dBc/Hz
Connectors	DC Input type F Female Optical output type FC/PC

Reference	2350/2351
<b>Input parameters</b>	
Frequency range	GHz 0,950-5,45
Optical RLR	dB 20
Optical power	dBm - 13 min./0 max
	SML 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 MHz 1100-2150
	Horizontal low band MHz 950-1950
	Vertical low band MHz 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	voltage Vdc 12
(only for Quattro version, Twin & Quad to be powered from STB)	consumption mA 330 max.
Operating temperature	°C 0 to 50
Connectors	DC Input type F Female Optical output type FC/PC

## OPTICAL FIBER

## 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 TOX

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
		Powering	Vdc	12-24
		Consumption	mA	105 (ref. 2333) / 160 (ref. 2334)
<b>General</b>		Protection index	IP	20

## OPTICAL FIBER

## Optical transmitter

PRODUCT RANGE	
REF.	DESCRIPTION
234304	Optical transmitter 1550 nm " SC/APC " 4dBm
234310	Optical transmitter 1550 nm " SC/APC " 10dBm
233310	Optical transmitter 1310 nm 10dBm
233410	Optical transmitter 1310 nm 10dBm with Return Path

Reference			234304
<b>Radiofrequency input</b>			
Frequency range	MHz	87-2150	
Flatness	MHz	87-865 ± 0,5, 950-2150 ± 1	
Impedance	Ohm	75	
Return losses	dB	10	
Test output attenuator (typ.)	dB	-16	
Input attenuator	dB	0-18 (2 dB steps)	
Max. Input level (41 channels TV) according to CENELEC and one SAT transponder	dB $\mu$ V	80	
Normalized equivalent input noise 800 MHz / 2GHz	Vdc	-148,5/-146	
<b>Optical output</b>			
Laser		MQW-DFB	
Wave length	nm	1550 ± 20	
Optical output power	mW	2,5 (4dBm)	
Output optical connector	type	SC/APC	
Consumption		12Vdc-265mA 24 Vdc-140mA	
Operating temperature	°C	-5 ... +45	



## Optical Amplifier

PRODUCT RANGE	
REF.	DESCRIPTION
234220	Optical amplifier 1550 nm 20dBm

Reference			234220
Wave length	nm	1535-1565	
Optical input power	dBm	-3 ... +10	
Optical output power		20+/-0,8	
Noise figure		<5	
Return losses	dB	>50	
C/N		>53	
CSO CENELEC 42	dBc	>61	
CTB CENELEC 42		>61	
Powering	Vdc	24	
Consumption (max.)	mA	410	
Optical connectors	type	SC/APC	
Operating temperature	°C	-5 ... +50	



## 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 dB $\mu$ V MATV, 117 dB $\mu$ V 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
<b>Output</b>	RF C. Ret. (only ref. 2336)	Input frequency range	MHz	1-65
		Input level return path DIN 45004B	dB $\mu$ V	95
		Normalized equivalent input noise (EINn) in 30 Mhz	dBm/Hz	152,5
		Return losses	dB	>12
		Impedance	ohm	75
<b>General</b>	RF Direct channel	Output frequency range	MHz	87-2150
		Max. Output level MATV DIN 45004B	dB $\mu$ V	114
		Max. Output level FI DIN VDE0885/12		117
		Regulation margin	dB	0-18
		Return losses		>10
	F.O. C. Ret. (only ref. 2336)	Impedance	ohm	75
		Wave length	nm	1310
		Max. emitted optical power	dBm	3
		Optical connector		SC/APC
		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

new



▲ 2310



▲ 2311

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

References			2311	
RF Output				
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			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	
Optical Input				
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	
General				
Mains voltage	Vac		196-264	
Consumption	VA		35	
Temperature range	°C		0-45	

## OPTICAL FIBER

## Optical splitter

PRODUCT RANGE	
REF.	DESCRIPTION
2337	Optical splitter, 2 ways
2339	Optical splitter, 4 ways
234401	Optical splitter, 8 ways
234501	Optical splitter, 16 ways
234601	Optical splitter, 32 ways
Power supply	
5629	PSU for TOX



References	2337	2339	234401	234501	234601
Outputs	2	4	8	16	32
Input & output connectors	type	SC/APC			
Working wavelength	nm	1310/1550			
Insertion losses for 1310 nm		<4,1	<7,5	<11	<13,7
Insertion losses for 1550 nm	dB	<4,1	<7,5	<11	<13,7
Return losses		<17,5			
Directivity		>55			
Uniformity	IP	<0,6	<0,8	<0,8	<1,2
PDL	dB	<0,2	<0,2	<0,2	<0,25
Operating temperature	°C	-5 ... +45			

## OPTICAL FIBER

## Optical Accesories

## PRODUCT RANGE

REF. DESCRIPTION

2329 SC/APC Connectors (mounting kit included)

2321 Fusion splicer

2322 Mechanical Splicer

2323 High Precision Cleaver

2324 Precision Stripper

2325 Multifibre Cable Stripper

2327 Protection Sleeve

2328 Mechanical Splice



▲ 2321



▲ 2322



▲ 2323



▲ 2329



▲ 2325



▲ 2324



▲ 2328



▲ 2327

# 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

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

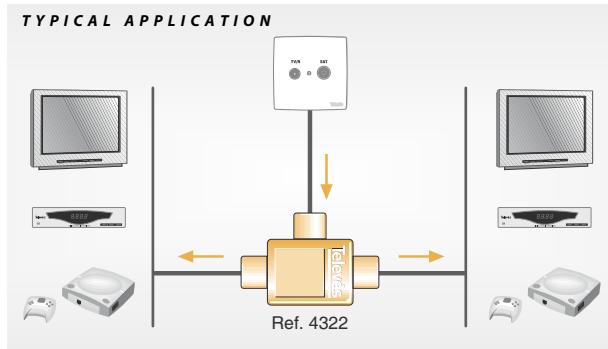
References	4322	4320
Band	V/U	
Th <i>l</i>	4.5	4.5
Rejection between outputs	>20	
Outputs with DC bypass	1	1
Output connectors	mm	2M 9.5
Input connectors	mm	1F 9.5
		2F 9.5



▲ 4320



▲ 4322



## SAT-MATV Mixers

PRODUCT RANGE	
REF.	DESCRIPTION
<b>Terrestrial-Satellite</b>	
7452	RF+IF Mixer
7407	Double mixer (2 outputs) 2FI-2D



▲ 7452

Combiners/splitters for MATV and IF signals.

DC bypass in the IF line.



▲ 7407

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

## 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

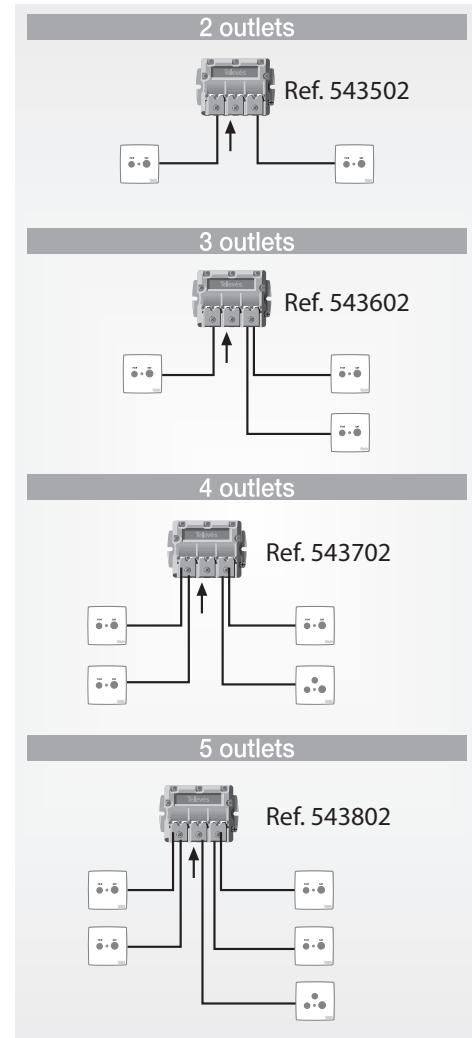
System accessories	
545501	Face plate
4177	Black plastic case (small)
4163	Black plastic case (big)
4087	Terminal load DC-blocked



▲ 543802



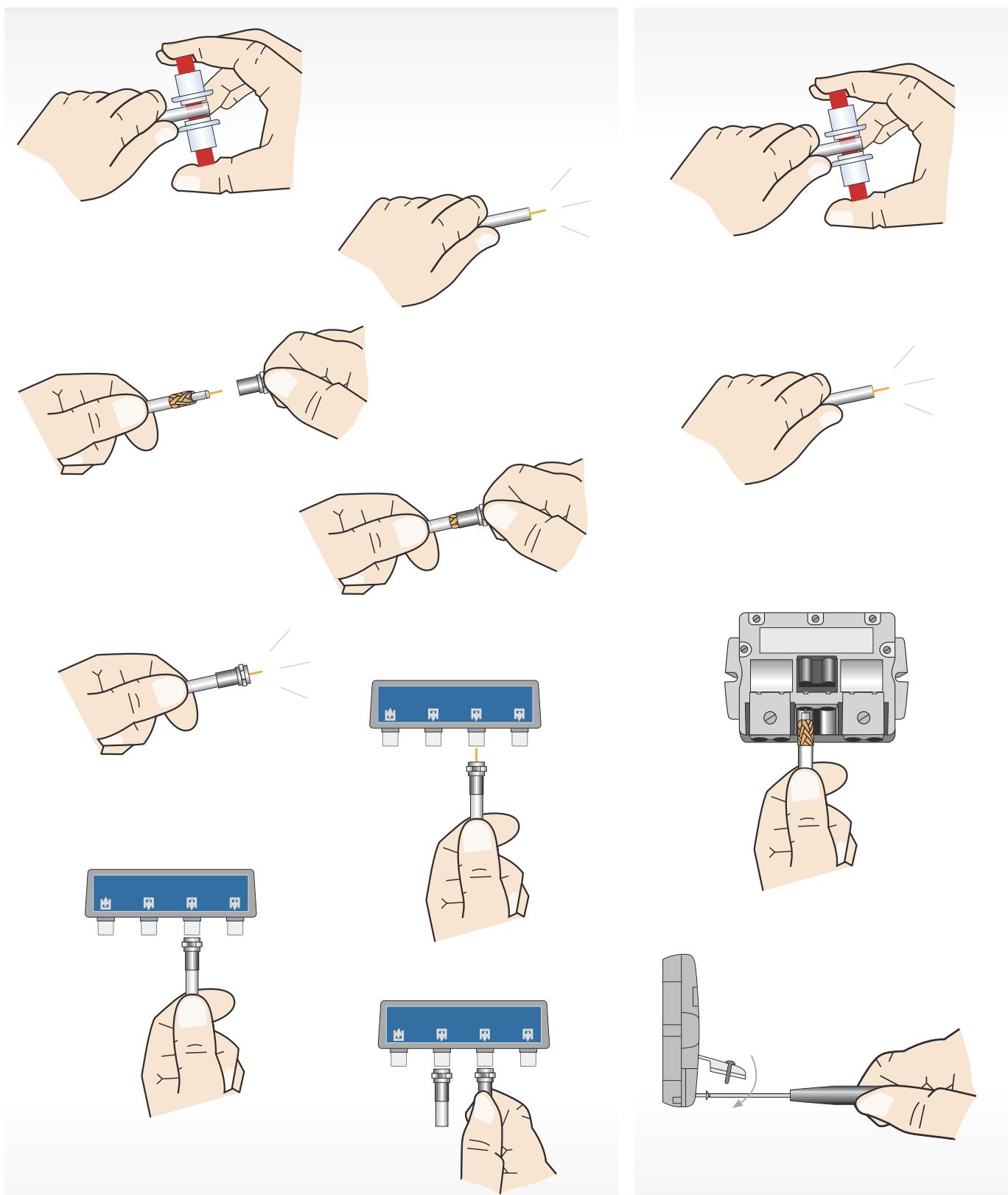
References	543502	543602	543702	543802	5469	5489			
Band	MHz	5-2400							
Number of outputs		2	3	4	5	6			
Through losses IN-OUT S1...S8	5-47	3.5 S1,2	6.5 S1,2,3	8 S1,2,3,4	10 S1,2,3,4,5	12 S1,2,3,4	14 (S1,2) 17 (S3,4) 18 (S5,6) 20 (S7,8)		
	47-862	4.5 S1,2	7 S1,2,3	7.5 S1,2,3,4		14 (S1,2) 12 (S3,4) 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	dB	>15	>17		>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

<b>5-2400MHz</b>	
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**

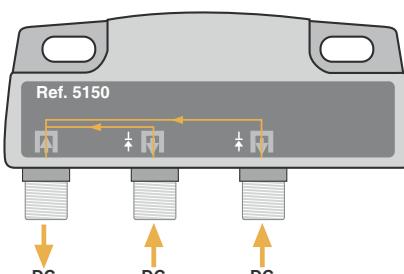
7402	8 Ways active
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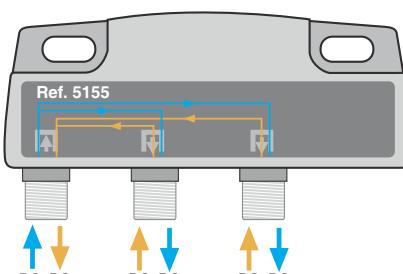
▲ 4534

**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	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										
Number of outputs		2	3	4	5	6	8	2	4	5	6	8
Through losses		4	7	7.5	10	12	14	4	7.5	10	10	11
dB	5	9	10	12	16	19	5	10	10	11.7	13.6	
Rejection between outputs		MATV	> 20				> 17	> 19	> 20			> 28
		FI										> 34
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

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



▲ 2W/4W



▲ 6W/8W

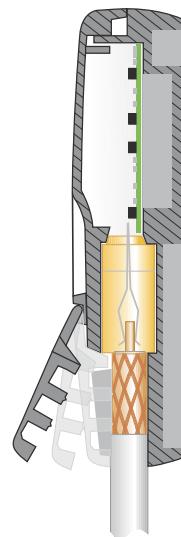
The innovative easy fast F-connector provides the advantages of the S&C connector and the F-connector.

Fully shielded.

They allow an IN-OUT current bypass.

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

Referencias		5492	5493	5494	5610	5611	
Number of outputs		6				8	
Floor		1	2-3	4-5	1	2	
Through losses IN - OUT	C. ret.	<11	<6	<6	14	4	
	MATV	5	3	3	7	2	
	FI	5	3,5	4	8	5	
Tap losses IN-D1/D2/D3/D4	C. ret.	<18	<20	<26	<18	<24	
	MATV	16	20	24	16	23	
	FI	16	20	24	16	23	
Rejection bet. taps	C. ret.	>30	>30	>35	>30	>30	
	MATV	>30	>30	>30	>30	>30	
	FI	>30	>25	>25	>20	>20	
Rejection bet. taps	C. ret.	>30	>40	>45	>35	>40	
	MATV	>30	>40	>45	>35	>40	
	FI	>30	>40	>45	>35	>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	dB	2.5	1.2	1.5	1
	IF		2.6	2	1.5	1.5
Tap losses	MATV		12	15	18	23
	IF		12	15	19	23
Rejection output-tap	MATV		> 32	> 27	> 35	> 42
	IF		> 25	> 24	> 30	> 35
Rejection bet. taps	MATV		> 30			
	IF					
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	dB	4.5	2.3	1.5	1
	IF		5	3.4	2.5	2
Tap losses	MATV		12	16	19	24
	IF		12	16	20	24
Rejection output-tap	MATV		> 50	> 35		
	IF		> 30			
Rejection bet. taps	MATV	dB	> 25		> 20	
Max. bypass current		A	1			

## 8 Ways

PRODUCT RANGE	
REF.	DESCRIPTION
5146	18 dB
5147	20 dB
5148	23 dB

References		5135	5136	5137	5146	5147	5148
Frequency range		MHz	5-2400				
Through losses	Ret. Path	dB	3	1.7	1.5	3	1.7
	VHF		3.3	2	1.5	3.3	2
	UHF		5	4	2.5	5	4
	IF						
Tap losses	Ret. Path		18	20	24	18	20
	VHF						
	UHF						
	IF		19	21	25	19	20
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		8	11	14	17
Through losses	dB	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		4.5	8	11	14	17	20	23	26
Through losses	dB	-	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		8	11	14	17	20	23	26
Through losses	dB	-	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		12	20
Through losses	dB	-	<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	Tap losses (dB)												DC bypass (350mA)	Through losses loss (dB)				
		Bands	Return	Bl	Subband	FM	Low S	BIII/DAB	High S Hyperb.	UHF	IF - SAT				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→IN	-	-	-				
		SAT	1	4				5	6.5		-								
5228	 	TV/R	6	7.5				10.5	13		IN→OUT SAT→IN	3.5	5						
		SAT	11	8.5				9	10										
5227	 	TV/R	10.5	13				13.5	14		IN→OUT SAT→IN	1.2	2						
		SAT	10.5	13				14	14.5										
5236	 	TV/R	20	20				24	23		IN→OUT SAT→IN	0.6	1						
		SAT	18	20				24	24.5										
<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*				<5*				-	-	Yes	-	-				
		SAT	<5*				<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				-				1.5 ± 0.2	SAT→IN	-	-				
		R	<8	4.5				-											
<b>End outlet</b>																			
		Through outlet			Female IEC connector			Male IEC connector			F Female								
		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

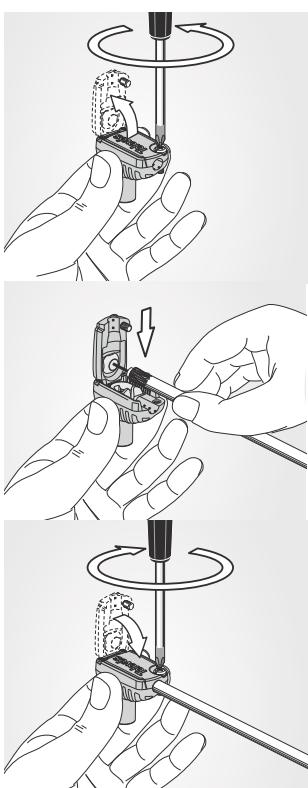


## CONNECTORS

## IEC Elbowed shielded



PRODUCT RANGE	
REF.	DESCRIPTION
<b>IEC Shielded</b>	
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)



▲ 4130/4131



▲ 413201/413301

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 connecto- rize the cable in difficult locations, where the elements han- dling 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 to be 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



▲ 4121



▲ 4122

## CONNECTORS

## LTE's shielded extender cords

PRODUCT RANGE	
REF.	DESCRIPTION
431001	LTE extender cord 1,5m
431002	LTE extender cord 2,5m

## Shield your TV against LTE's interferences

Beyond the necessary adaptation of facilities and for good reception of the TV for the future deployment of LTE, the weakest point will be the coaxial extender cord, which carries the signal from the outlet to either the TV or the DTT adapter. The quality of this component, traditionally ignored, is now crucial and can not be left committed to imported products of dubious quality, "monoshield", unshielded and without a shielding foil.

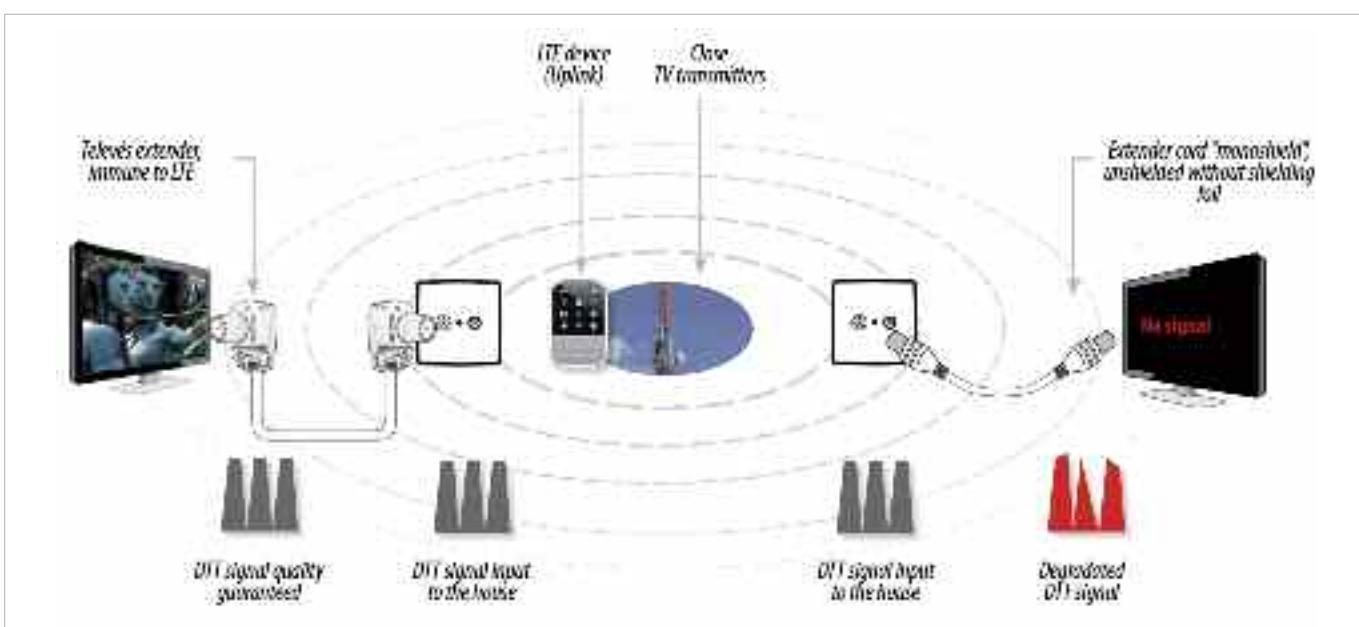
Even though they are necessary in any field, they are particularly suitable in singular facilities as the ones for Hotel Industry. In such installations, there is nothing more valuable than a quality customer service: the coaxial extenders from Televés provide a television service "LTE Ready".

- They are manufactured using T200 Cable, Class A, with 75% coverage, high shielding and low losses.
- They feature shielded connectors Pro Easy-F class A; specifically designed to provide these extenders with a special shielding. In addition, these connectors also allow to construct extender cords with different lengths than those supplied by means of these two references.
- Suitable for cable operators' networks, which use channels that can be affected by the LTE.



The signal generated by LTE mobile devices (signal "Uplink") or proximity to TV transmitters, can affect the quality of reception either on the TV itself or on the DTT adapter.

Only with a well shielded extension cord, as are our ref. 431001 or ref. 431002, can be achieved the quality parameters of a DTT signal avoiding the ingress of any kind of interferent signals.



## 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
410801	F compress T200
4106	F compress
4306	F type + weatherproof over
2163	Compressing tool



## Connection accessories

PRODUCT RANGE	
REF.	DESCRIPTION
<b>Join connectors</b>	
4006	Coaxial joint
4173	F female - F female
<b>Adapters</b>	
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
<b>SCART leads</b>	
7352	2 SCART 21 pin
<b>HDMI/HDMI</b>	
494501	cable extender 1,5 m Black
494502	cable extender 3 m Black
494503	cable extender 5 m Black



## Cases for Easy F splitters and taps

PRODUCT RANGE	
REF.	DESCRIPTION
545501	Face plate
4177	Black plastic case (small)
4163	Black plastic case (big)



## CONNECTORS

PRODUCT RANGE	
REF.	DESCRIPTION

Copper braid		
210603	CXT5 PVC	100 m
2138/02	CXT PVC	100/250 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
213001	T200	100 m



References		2141 05/07	2155/03	210603	2138 02 2139	2140	213001	
Model		T100		CXT5	CXT	1/2"	T200	
Inner cond.	Ø (mm)	1,13	1,13	0,8	1	2,7	1,20	
	Material	Cu	Cu	Cu	Cu	Cu	Cu	
	Resist. (Ω/Km)	20	20	37	23	3,2	<16	
Dielectric	Ø (mm)	4,8	4,8	3,4	4,8	11,5	5	
	Material	PEE	PEE	PEE	PEE	PEE	PEE	
Overlapping shielding foil		B	B	A	B	B	C	
Braid	Resist. (Ω/Km)	20	20	35	35	7	<12	
	Material	Cu	Cu	CuAl	Cu	Cu	Cu	
Antimigration film		Yes	Yes	No	No	No	Yes	
Petrol jelly		No	No	No	No	Yes	No	
Outer sheath	Ø (mm)	6,6	6,6	5	6,6	15	6,9	
	Colour	W/B/W	Black	White	W/W/B	Black	W	
	Material	PVC	PE	PVC	PVC	PE	PVC	
Minimum bending radio (mm)		33	33	25	33	75	33	
Shielding (dB)		>75	>75	>75	>75	>75	>75	
Capacitance (pF/m)		55	55	53	55	55	55	
Impedance (Ω)		75	75	75	75	75	75	
Meters / reel (m)		100/100/250	100/250	100	100/250/100	500	100	
Attenuations								
Freq. (MHz)	200	dB/m	0,08	0,08	0,11	0,09	0,03	0,07
	500		0,12	0,12	0,17	0,14	0,06	0,12
	800		0,15	0,15	0,23	0,18	0,07	0,15
	1000		0,18	0,18	0,25	0,20	0,08	0,17
	1350		0,21	0,21	0,30	0,23	0,10	0,20
	1750		0,24	0,24	0,34	0,27	0,11	0,23
	2050		0,27	0,27	0,37	0,29	0,12	0,25
	2150		0,27	0,27	0,38	0,30	0,13	0,25
	2300		0,28	0,28	0,40	0,31	0,14	0,27
Sheath		Cu + Fe: Copper clad steel	PE: Polyethylene	Overlapped foil				
PVC	Indoor	Al: Aluminium	PEE: Foam polyethylene	A Al + Polyester + Al				
PE	Outdoor	Cu: Copper	LSFH: Low Smoke Free Halogen	B Cu + Polyester				
LSFH	Special							

## 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
214901	TR165 PE	250 m



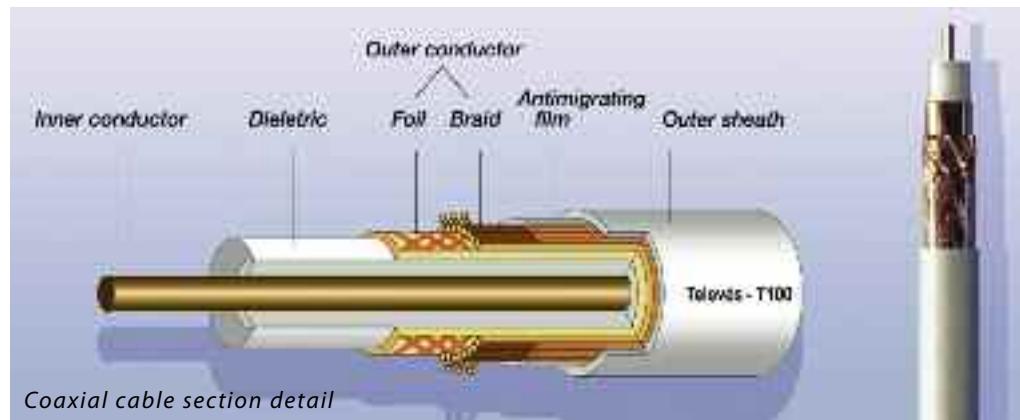
References		2126 01/02/03	214102 /04/08	214901	215101	2128/01	2127 01/02/03/04	215501/02	
Inner conductor	Ø mm	1,12	1,13	1,63	1,12	1	1	1,13	
	Material	Cu	Cu	Cu	Cu	Cu	CCS	Cu	
	Resistance (Ω/Km)	18	16	9	18	20	97	18	
Dielectric	Ø mm	4,8	4,8	7,2	4,7	4,5	4,7	4,8	
	Material	PEE	PEE	PEE	PEE	PEE	PEE	PEE	
Overlapping 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	Al	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									
Frequence (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		Overlapping foil composition					
PVC	Indoor	Al: Aluminium		A Al + Polyester + Al					
PE	Outdoor	Cu: Copper		B Cu + Polyester					
LSFH	Special	PVC: Polyvinyle Chlorhidre		C Cu + Polyester					
LSFH: Low Smoke Free Halogen									

## COAXIAL CABLE

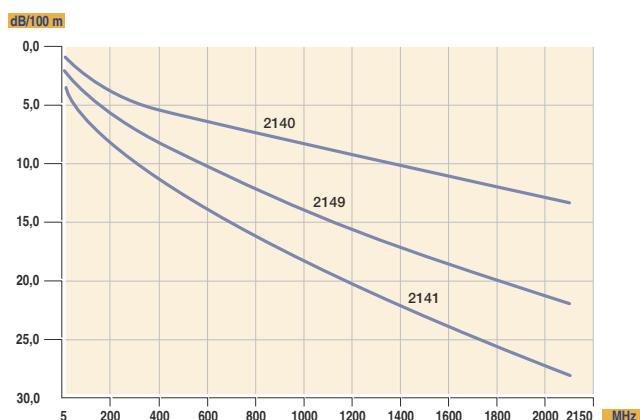
## Remark:

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

The PVC cables are used for indoor applications.



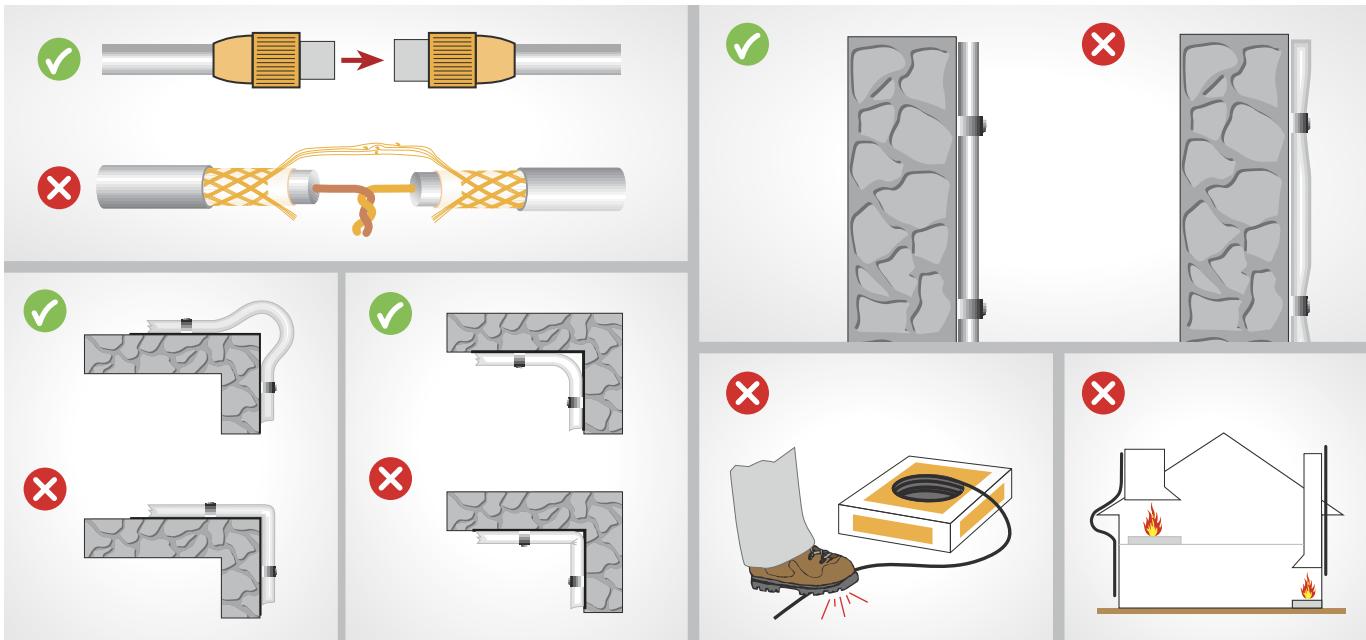
## Cable losses



## 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

PRODUCT LICENSEE BY...



## 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

General	
Channels	198 (99TV + 99 Radio)
EPG	yes
Through output	MHz 47-862
Demodulator	
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
Video	
Input format and decod.	MPEG-2 MP @ ML
Max. video rate	Mbps 15
Screen format	4:3 / 16:9
Video resolution	720 x 576

Audio		
Audio decoder		MPEG/MusiCam Layer I & II
INPUT/OUTPUT Port		
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
Powering		
Consumption	mA(V)	0.40 (12)
Consumption (Stand-by)	W	< 2,5
Mains voltage	220-240 Vac, 50/60 Hz	
Physical characteristics		
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

General		
Number of channels		4000
Number of channels		various
Channels block		yes
Teletext		no
Subtitles		no
Timer		yes
Tuner / LNB input		
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

7118		
Video / Audio decodification mode		
Video		MPEG-2
Video format		4:3, 16:9
Audio		MPEG-1
Audio modes		Mono; Dual; Stereo; "Joint stereo"
Output signal		
Output signal mode		(A/ V) RGB, CVBS, Audio L/R
Input connector		1 SCART
INPUT/OUTPUT Ports		
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)
Powering and physical characteristics		
Mains voltage		90 - 260 V, 50/60 Hz
Consumption	W	15
Dimensions	mm	280 x 165 x 43
Weight	Kg	1.3





# FIELD STRENGHT 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 precision.



## 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 Televes 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 precision
- Unthinkable versatility.

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

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

## FIELD STRENGHT METERS

**H45 meter**

Televes 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
<b>Optical Meter</b>	
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 Televes 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

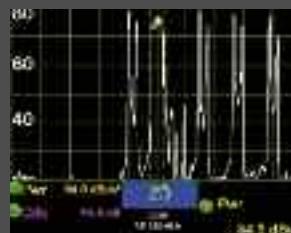


Pictures, Spectrum and Measurements (with Quality Check Marks) in 1 screen.

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.

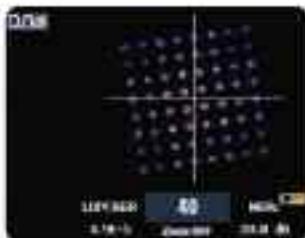


## LINK MARGIN



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

**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.

▲ 5990

## FIELD STRENGHT METERS

MODEL		COMPACT					ADVANCE				
References		5990	599001	599002	599003	599004	5992	599201	599202	599203	599204
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 Capacitive 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	✓					✓			
PROGRAMMED Measurements	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		✓					✓			
HSuite PC applications	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		✓					✓			
HSuite PC applications	Instant Log		✓					✓			
	Graphs Logger		-					✓			
	Data Logger		✓					✓			
HSuite PC applications	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										
	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	HD Option ref. 5991	✓	DVB S2 HD Option ref. 5991	DVB S2 HD Option ref. 5991						
ANALOG Signal Measurements	WIFI (2220-2500 MHz) Measurements in Spectrum Mode					—					Option 598902
	Extended Spectrum (2500 - 3300 MHz)					—					
	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					—					✓
DIGITAL Signal Measurements	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
	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	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				
		Symbol Rate					AUTO, (700 - 7200 Kbaud)				
	COFDM	cBER					9.9E - 2 to 1.0E - 6				
		vBER					1.0E - 4 to 1.0E - 8				
		MER		✓							✓
		PWR					40 - 125 dBµV				
		Auto Offset Detection		✓							✓
	QPSK (with Q.A.L.technology)	cBER					1.0E - 2 to 1.0E - 6				
		vBER					1.0E - 4 to 1.0E - 8				
		MER		✓							✓
		PWR					40-120 dBµV				
		Symbol Rate					AUTO, from 1 to 45 Mbaud				
	8PSK - DVB S2	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									✓
	MPEG	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)
LNBS Powering	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	✓	✓	Option 5997	✓
	Number of Services, Service Selected, Service Audios					✓					✓
	NID, VPID, APID, SID (with Network Descriptor)					✓					✓
Battery	Video Resolution, Audio Type and Language					✓					✓
	HD Identification					✓					✓
	Conditional Access Module (only MPEG-2)	Option 5998	✓	Option 5998	✓	Option 5998	✓	Option 5998	✓	Option 5998	✓
	Voltage, Extra burst (14 V, 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					—					✓
	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 STRENGHT METERS

## PRODUCT RANGE

REF. DESCRIPTION

## Options

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

## Accessories

5930	Noise generator
2340	OPS 3L Triple light source
5995	Weatherproof bag



## 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.



▲ 5930



▲ 2340



▲ 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.

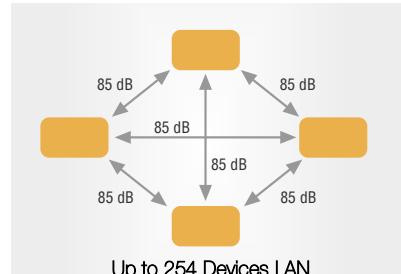
The new Ethernet Hybrid Adapter 200Mbps brings advantages to the installations, thanks to several improvements in design, as well as in functionality.



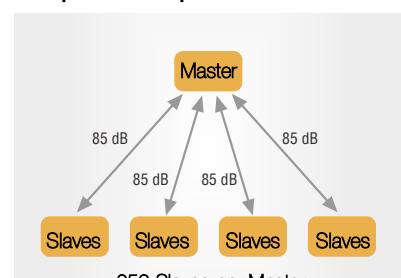
▲ 7689

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 dB $\mu$ V
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.

## COAXDATA

## LEDs indicators of the channel quality



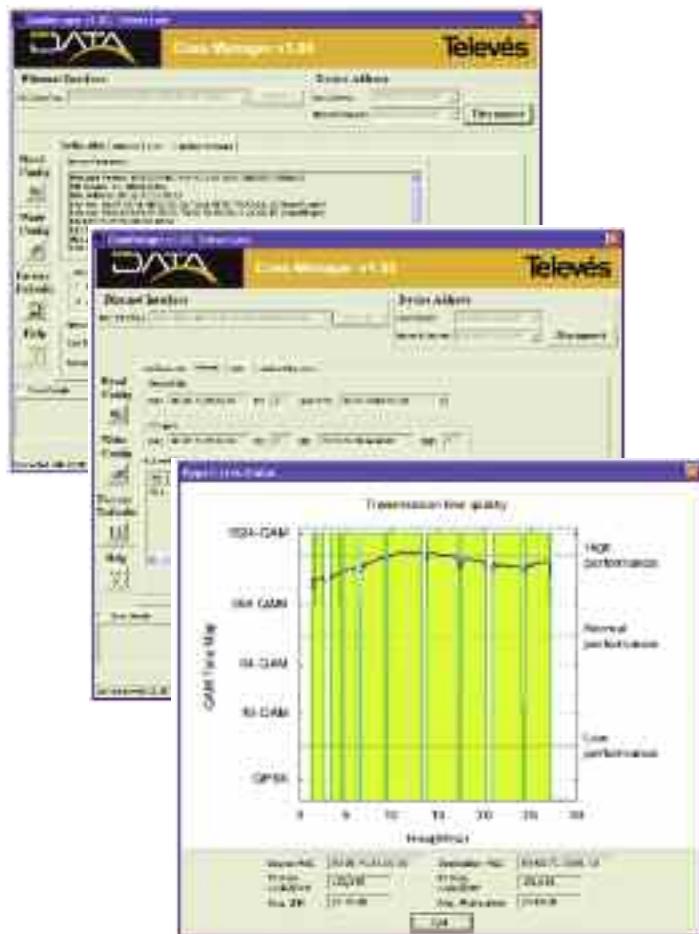
## Coax Link Status

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

120 Mbps < Throghput < 150 Mbps

70 Mbps < Throghput < 120 Mbps

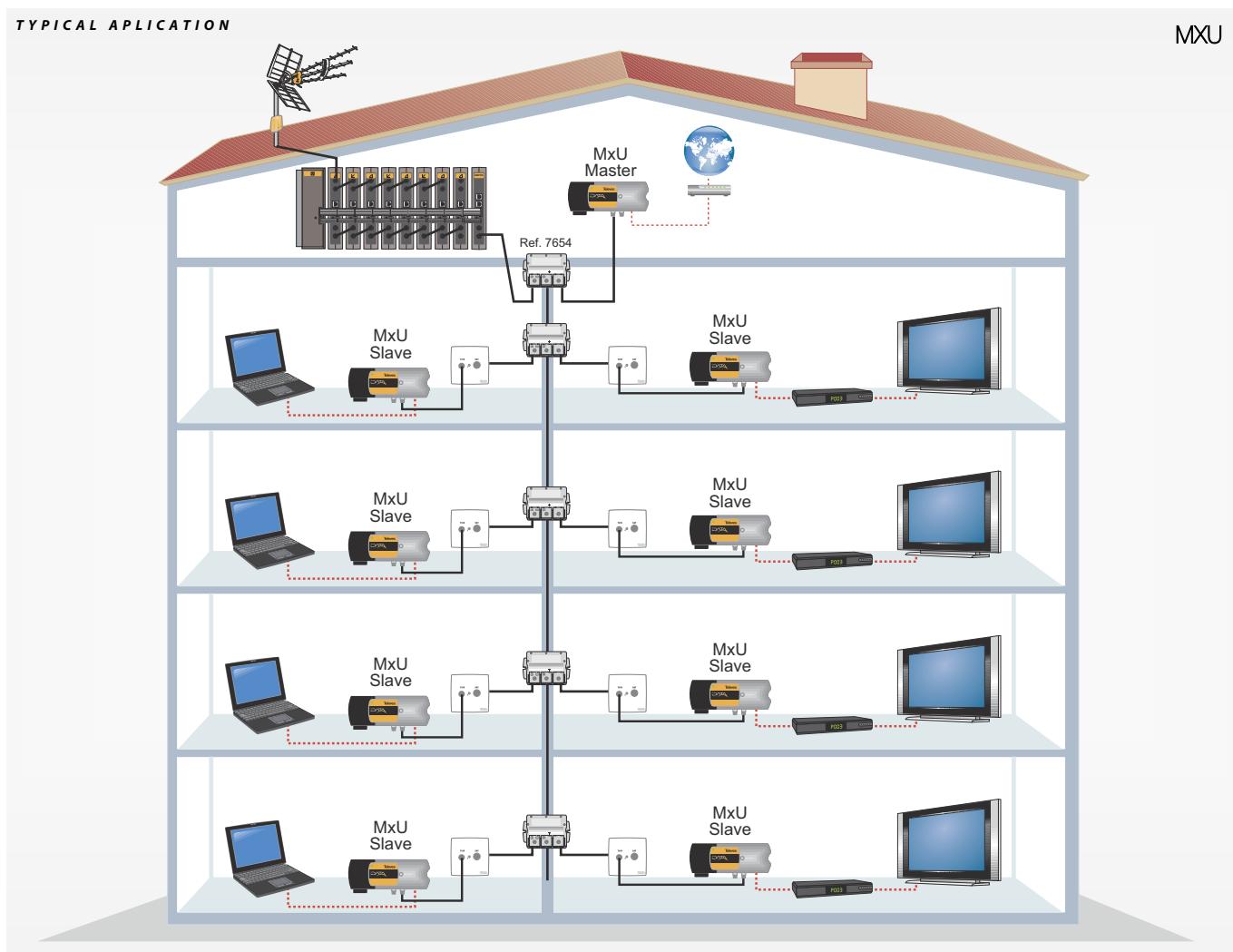
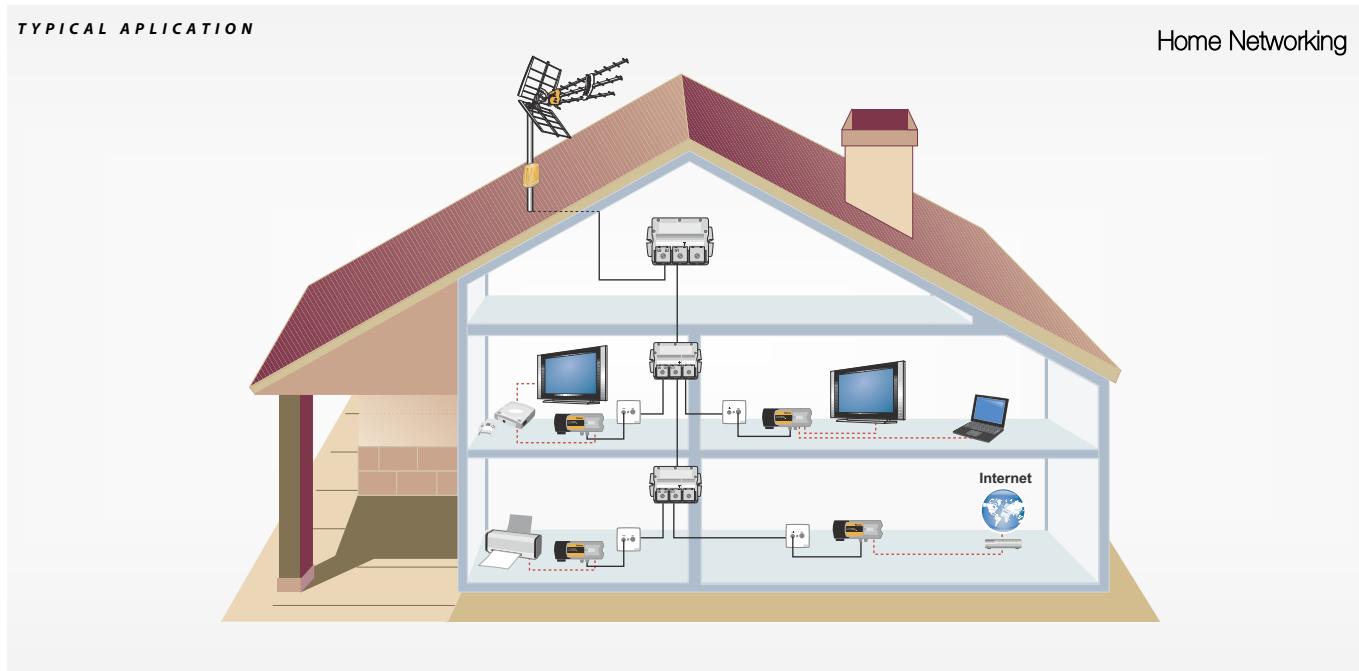
0 Mbps < Throghput < 80 Mbps



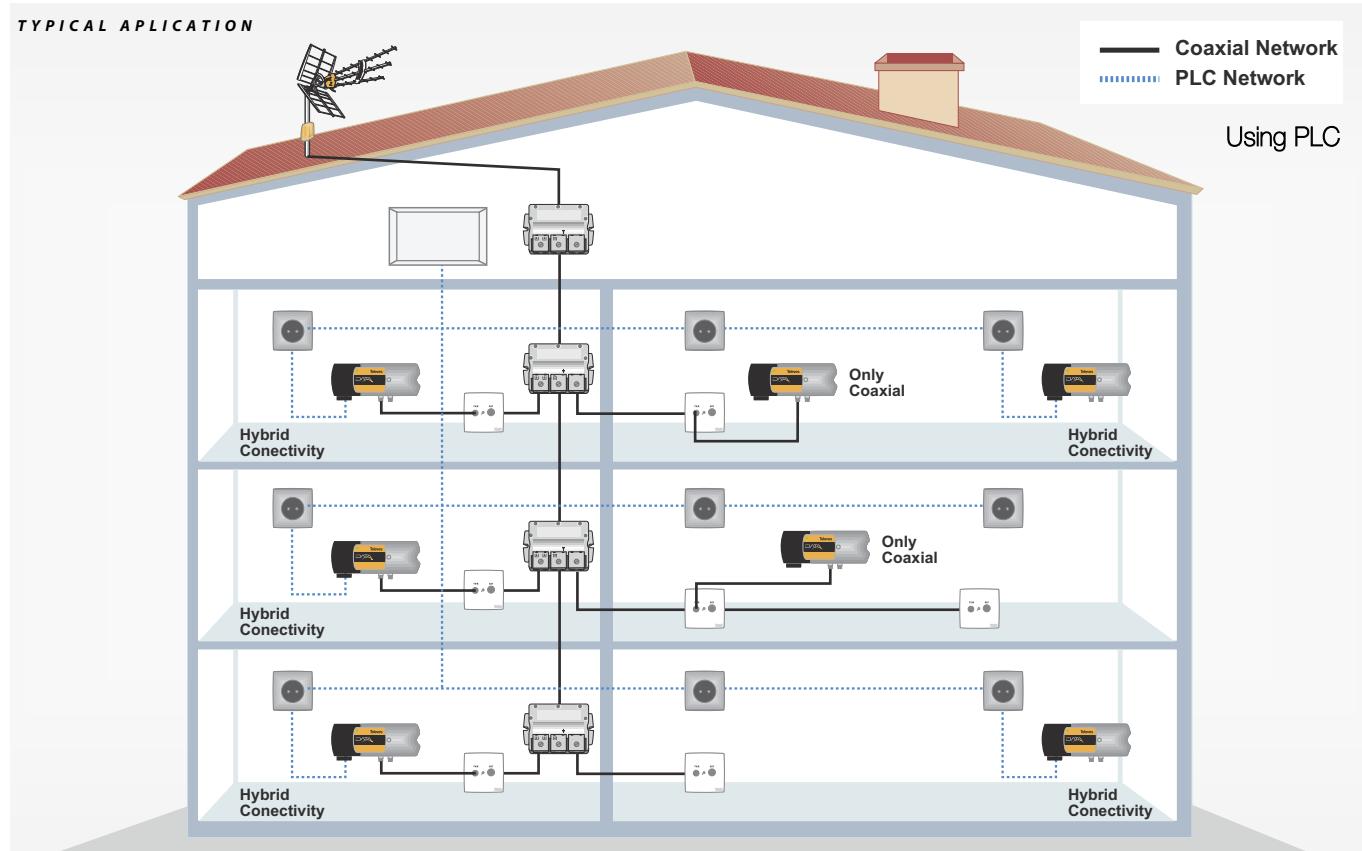
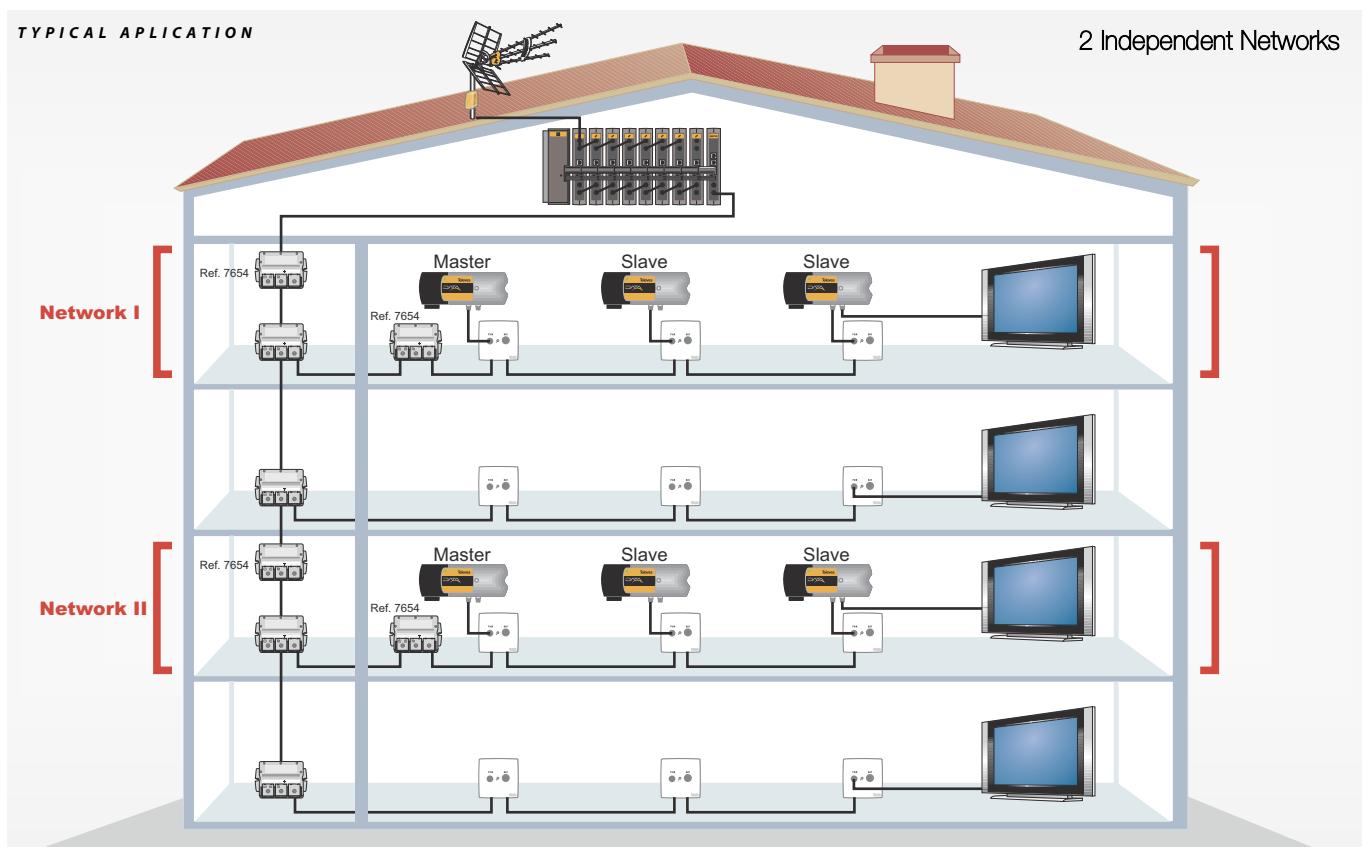
CoaxManager Software tool allows setting the installation parameters. Ad-hoc software development option i.e, Management and Invoicing applications.

- 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



## COAXDATA



# HOME ACCESSORIES

Complete range of product for domestic use.



## DIGIDOM

## A/V and infrared transmitters

## PRODUCT RANGE

## REF. DESCRIPTION

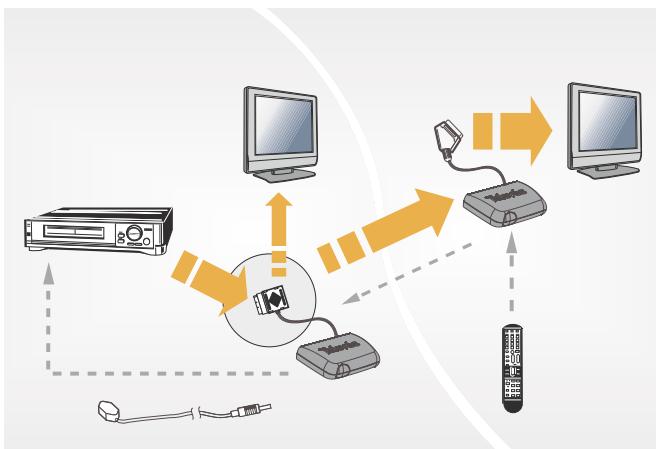
7167	Digidom AV 5.8 GHz	(Trans.+Receiver)
7307	Digidom AV	(Trans.+Receiver)
7604	Digidom AV	(Receiver)
7237	Digidom I/R disc shape	(Trans.+Receiver)
7219	Digidom IR disc shape	(Transmitter)



▲ 7237



▲ 7307



▲ 7167

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

References		7167
Transmitter (TX)		
Channel / Frequency	(Nº / MHz)	1 / 5733
		2 / 5752
		3 / 5771
		4 / 5790
		5 / 5809
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
Receiver (RX)		
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

## A/V and infra-red transmitters

## PRODUCT RANGE

REF. DESCRIPTION

7605 IR extensor with coaxial link (Transmitter + Receiver)

7606 IR extensor with coaxial link (Receiver)

- IR Remote control extensor, using coaxial cable link.

- Interference free.

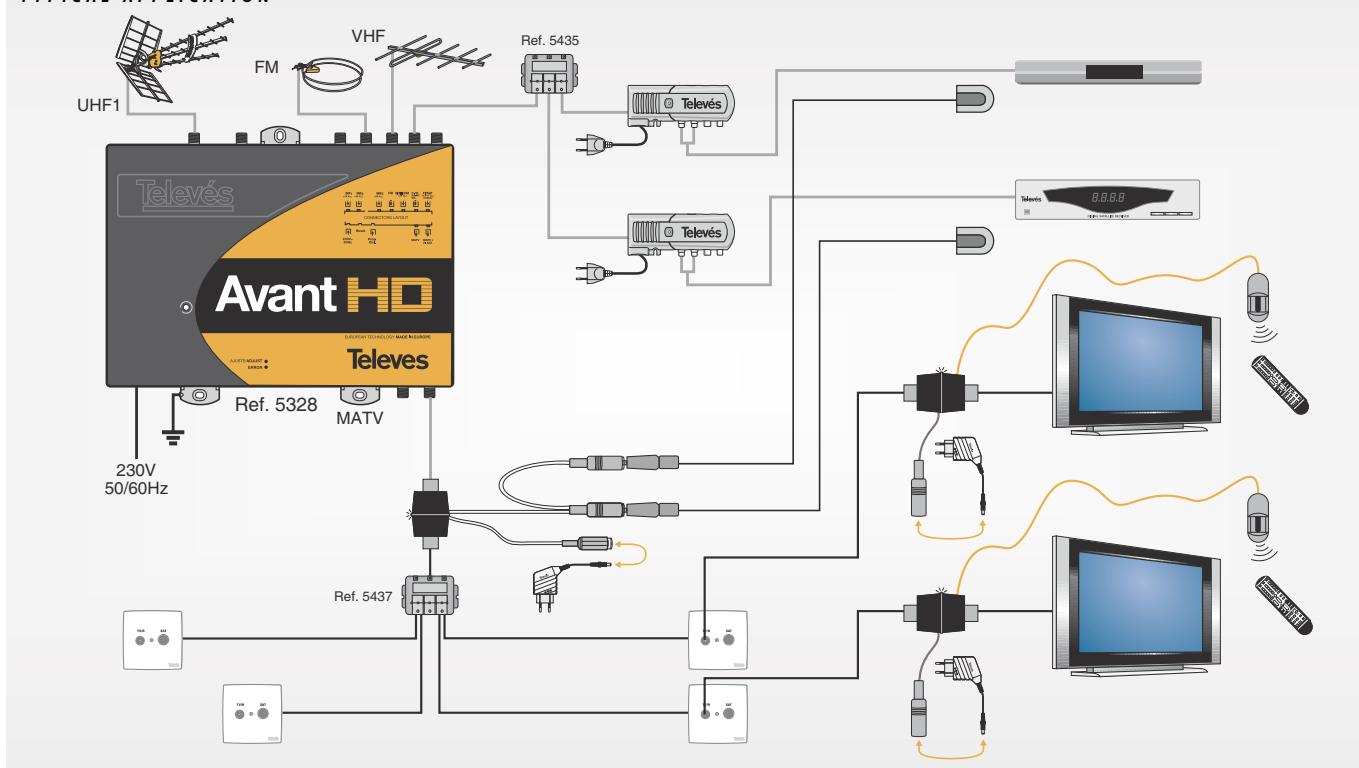


▲ 7605

References		7605 TR+IR
Output frequency	KHz	36 (RC5)
Sensitivity	dBm	< -60
Consumption		12 (12Vdc)
Output powering	mA	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

## TYPICAL APPLICATION

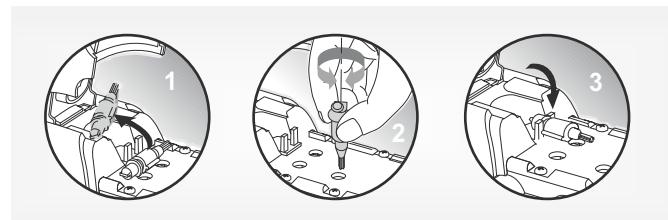


## DOMESTIC MODULATOR

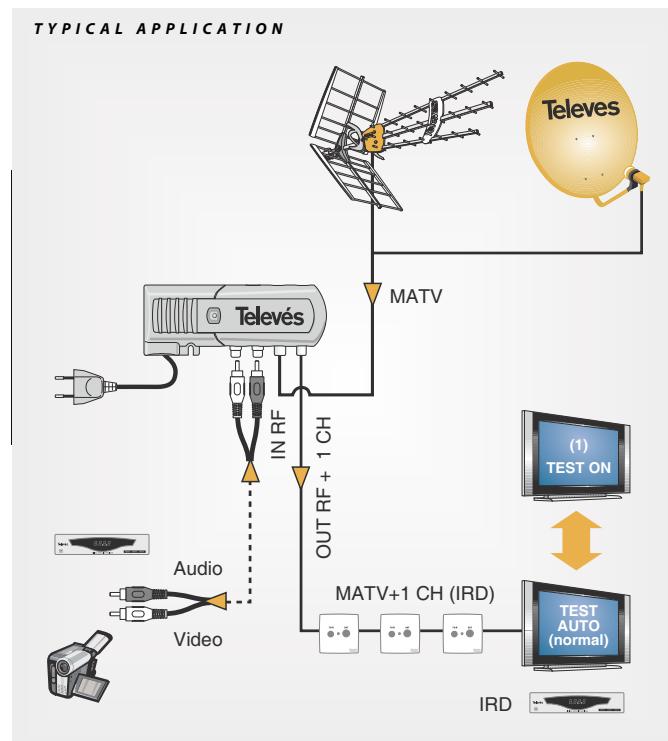
## Domestic modulators

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-Ouput.
- 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	dB $\mu$ V	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
Attenuation	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.





# TECHNICAL DATA



## TECHNICAL DATA

## Conversion table

Levels (measured over 75 Ω impedance)		
µV	dBµV	dBm
1	0	-109
1.5	3.5	-105.5
2	6	-103
2.5	8.0	-101
3	9.5	-99.5
3.5	11	-98
4	12	-97
4.5	13	-96
5	14	-95
6	15.5	-93.5
7	17	-92
8	18	-91
9	19	-90
10	20	-89
15	23.5	-85.5
20	26	-83
25	28	-81
30	29.5	-79.5
35	31	-78
40	32	-77
45	33	-76
50	34	-75
60	35.5	-73.5
70	37	-72
80	38	-71
90	39	-70
100	40	-69
150	43.5	-65.5
200	46	-63
250	48	-61
300	49.5	-59.5
350	51	-58
400	52	-57
450	53	-56
500	54	-55
600	55.5	-53.5
700	57	-52
800	58	-51
900	59	-50
1000	60	-49
15	83.5	-25.5
20	86	-23
25	88	-21
30	89.5	-19.5
35	91	-18
40	92	-17
45	93	-16
50	94	-15
60	95.5	-13.5
70	97	-12
80	98	-11
90	99	-10
100	100	-9
150	103.5	-5.5
200	106	-3
250	108	-1
300	109.5	0.5
350	111	2
400	112	3
450	113	4
500	114	5
600	115.5	6.5
700	117	8
800	118	9
900	119	10
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  $\frac{V_2}{V_1} = 200$

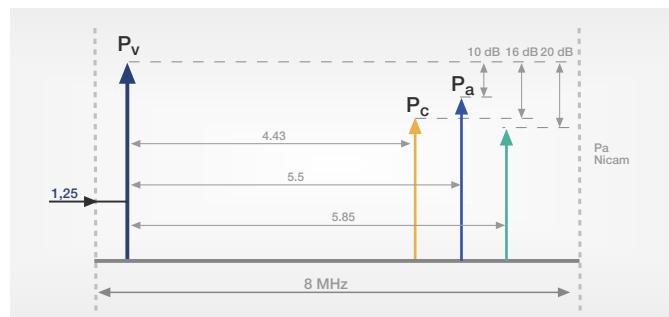
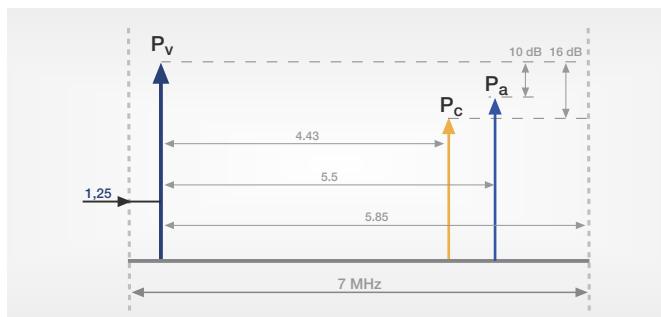
Result:  $40+6= 46$  dB

## 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			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
	H39	603-610	604,25	609,75
	H40	610-617	611,25	616,75
V	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>				

	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>K Standard</b>				
	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>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
	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>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
	R4	84- 92	85,25	91,75
	R5	92-100	93,25	99,75
	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)l	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					
Field frequency	Hz	50				60					
Line frequency		15625				15750					
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				
A/V carrier ratio		10:1 to 20:1 <sup>(4)</sup>	20:1:0.2 <sup>(2)</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	Chann el	Frequency Channel (MHz)	Video carrier (MHz)	Audio carrier (MHz)	Subcarrier colour (MHz)
<b>Channels distribution according to CCIR (B Standard +G Europe)</b>					
<b>I</b>	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
<b>Sub. Band</b>	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
<b>II</b>	FM	88...108			
	S1	104...111	105.25	110.75	109.68
	S2	111...118	112.25	117.75	116.68
<b>S Low Band</b>	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
<b>S High Band</b>	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
<b>III</b>	S9	160...167	161.25	166.75	165.68
	S10	167...174	168.25	173.75	172.68
	5	174...181	175.25	180.75	179.68
<b>IV</b>	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
<b>V</b>	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
<b>Hyperband</b>	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
<b>S High Band</b>	S13	244...251	245.25	250.75	249.68
	S14	251...258	252.25	257.75	256.68
	S15	258...265	259.25	264.75	263.68
<b>Hyperband</b>	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
<b>Hyperband</b>	S19	286...293	287.25	292.75	291.68
	S20	193...300	294.25	299.75	298.68
	S21	302...310	303.25	308.75	307.68
<b>Hyperband</b>	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
<b>Hyperband</b>	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
<b>Hyperband</b>	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
<b>Hyperband</b>	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
<b>Hyperband</b>	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
<b>Hyperband</b>	S37	430...438	431.25	436.75	435.68
	S38	438...446	439.25	444.75	443.68

Bands	Chann el	Frequency Channel (MHz)	Video carrier (MHz)	Audio carrier (MHz)	Subcarrier colour (MHz)
<b>Channels distribution according to CCIR (B Standard +G Europe)</b>					
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	
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)

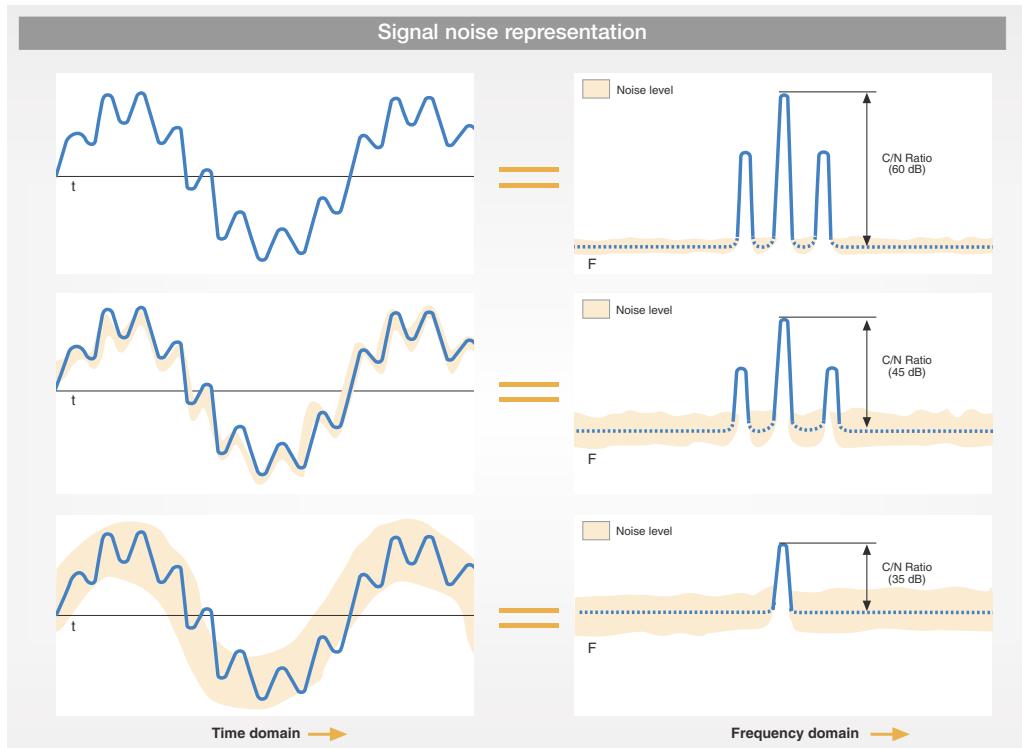
#### **DAB Amplifier:**

Intermodulation distance= 50 dB (2 channels 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 Televés headends are in compliance with the CE regulations.

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## GLOSSARY OF MEASUREMENTS

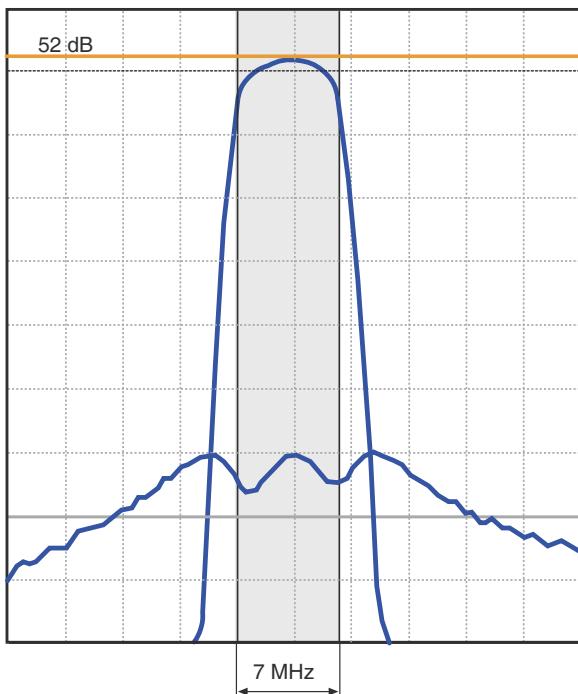


Fig. 1: Gain curve of a monochannel amplifier

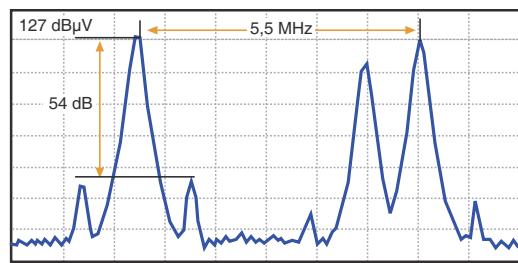


Fig. 2: Max. output volt. measurement for a monochannel amp.

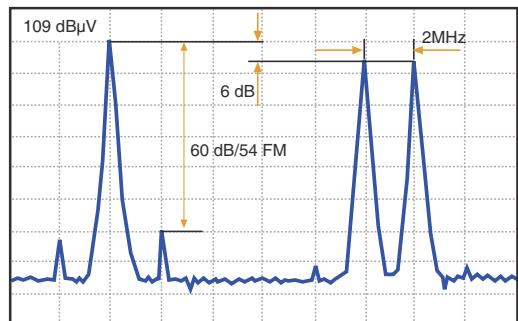


Fig. 3: Max. output volt. measurement for a wide band amp.

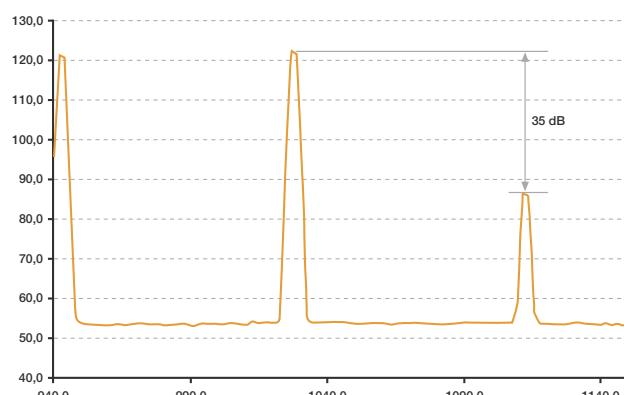


Fig. 4: Max. output volt. measurement for a IF amplifier

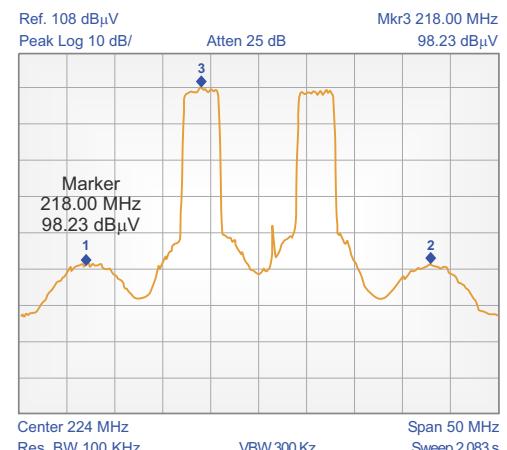


Fig. 5: Max. output volt. measurement for a DAB amp.

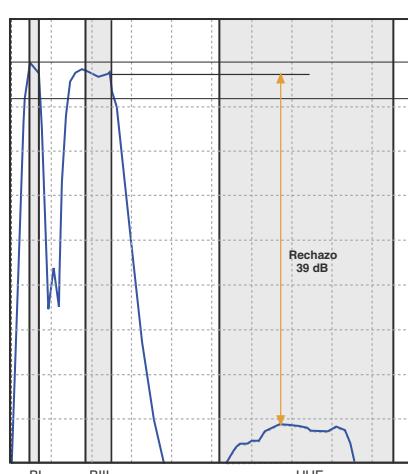


Fig. 6 BIII to UHF rejection

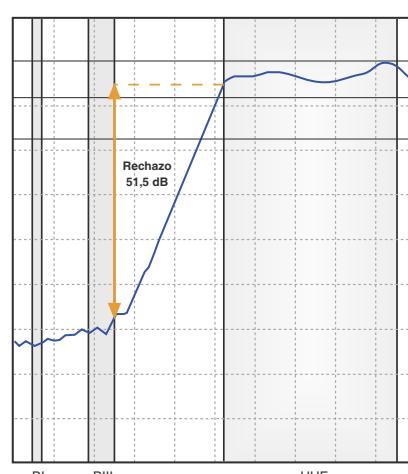


Fig. 7 UHF to BIII rejection

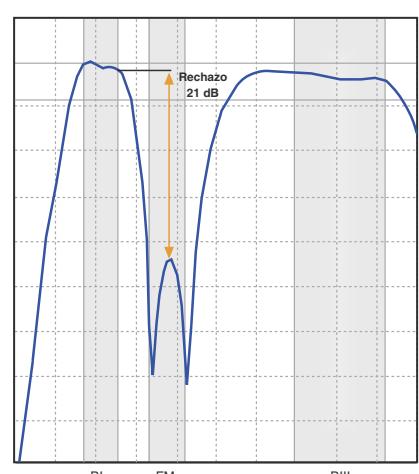


Fig. 8 BI to FM rejection

## 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:

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

**V<sub>O</sub>**: Output level

**N<sub>t</sub>**: 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

$$XMOD=XMOD_{ref}+2\cdot(Noutput - Nref.)$$

b) XMOD for N identical amplifiers

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

c) XMOD for N amplifiers with different XMOD

$$XMOD_{Namps}=-20 \log [10^{XMOD_{1amp}/20} + 10^{XMOD_{2amp}/20} + \dots + 10^{XMOD_{Namp}/20}]$$

### 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

$$CTB=CTB_{ref}+2\cdot(Noutput - Nref.)$$

b) CTB for N identical amplifiers

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

c) CTB for N amplifiers with different CTB

$$CTB_{total}=-20 \log [ 10^{CTB_{1amp}/20} + 10^{CTB_{2amp}/20} + \dots + 10^{CTB_{Namp}/20} ]$$

### 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

$$CSO \text{ (dB)} = CSO_{ref} + (Nout - Nref.)$$

b) For N identical amplifiers.

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

c) CSO for N amplifiers with different CSO

$$CSO_{total}=-15 \log [ 10^{CSO_{1amp}/15} + 10^{CSO_{2amp}/15} + \dots + 10^{CSO_{Namp}/15} ]$$

### 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 dB<sub>µ</sub>V (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: 117 dB<sub>µ</sub>V
- Output level for C2: 109 dB<sub>µ</sub>V

### Step 1

Calculate the specification for a new reference level of 113 dB<sub>µ</sub>V, which is the medium value of the tilt (109+8/2=113)

Because the new output level is lower (117 vs. 113 dB<sub>µ</sub>V), it will improve its value.

General formula:

$$CTB=CTB_{ref} + 2\cdot(Noutput - Nref.)$$

We extract CTB<sub>ref</sub>:

$$CTB_{ref} = CTB + (Nref.- Noutput)$$

Known data:

$$CTB_{117dB\mu V} = 60 \text{ dBc}$$

Reference level: 117 dB<sub>µ</sub>V

Output level: 113 dB<sub>µ</sub>V

Then:

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

### 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 dB<sub>µ</sub>V (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:

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

### Step 3

Substituting values:

$$CTB5 = 68 - 20 \log 5$$

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
22	13,42	20,14	26,85
23	13,62	20,43	27,23
24	13,80	20,70	27,60
25	13,98	20,97	27,96

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# 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 radio/frecuencia (televisión, radio, datos) tanto por vía terrestre como vía satélite.

que se realizan en:

RUA BENIFICA DE CONDO, 17. 15706 - SANTIAGO DE COMPOSTELA (A CORUÑA)

Fecha de emisión: 1994-10-25.  
 Fecha de renovación: 2009-11-04  
 Fecha de expiración: 2012-11-24



**AENOR** Asociación Española de  
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El Director General de AENOR

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