

# Televés®

T.OX SERIES

EN COFDM - COFDM CI



Ref. 563401

User manual



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## 1. Technical specifications

### 1.1. COFDM-COFDM CI ref. 563401

COFDM input	Input frequency	MHz	177,5 - 226,5 (VHF) (Select.) 474 - 858 (UHF)	Input VSWR	dB typ.	>10
	Input connectors	type	"F" female	Bandwidth	MHz	7, 8
	Frequency steps	KHz	125, 166 (Select.)	Through loss	dB typ.	< 1,5
	Input level	dBm	-60 to -20	Input line powering	Vdc	0, 12, 24 (Select.)
	Input impedance	ohm.	75			
COFDM * Modulator	Constellation		QPSK, 16QAM, 64QAM	Interleaving	DVB ET300744	
	Guard interval		1/4, 1/8, 1/16, 1/32	Cell_id	Auto	
	FEC		1/2, 2/3, 3/4, 5/6, 7/8	Spectral inversion	Normal / Inverted	
	Scrambling		DVB ET300744			
COFDM output	Output frequency	MHz	177,5 - 226,5 (VHF) (Select.) 474 - 858 (UHF)	Through loss	dB typ.	< 1,5
	Frequency steps	KHz	125, 166 (Select.)	Return loss	dB typ.	> 12
	Bandwidth	MHz	7, 8	Output connectors	type	"F" female.
	Maximum output level	dBμV	80 ±5	Output impedance	ohm.	75
	Attenuation	dB	>15 (Select.)			
General	Consumption**	mA typ.	24V== 250 (no CAM module inserted and without powering preamplifiers) 24V== 300 (with CAM module inserted and without powering preamplifiers) 24V== 300 (no CAM module inserted and powering preamplifiers) 24V== 340 (with CAM module inserted and powering preamplifiers)			
	Index of protection		IP20			

\*The transmodulator is completely transparent to the COFDM input modulation, and therefore it keeps its parameters at the output.

\*\*Consumption of the CAM unit depends on the type of CAM used. It is considered a consumption of 50 mA for the preamplifier.

The technical characteristics described are defined for a maximum ambient temperature of 45°C (113°F). Forced ventilation is used for higher temperatures.

1.2. Technical specs. Broadband Amplifiers

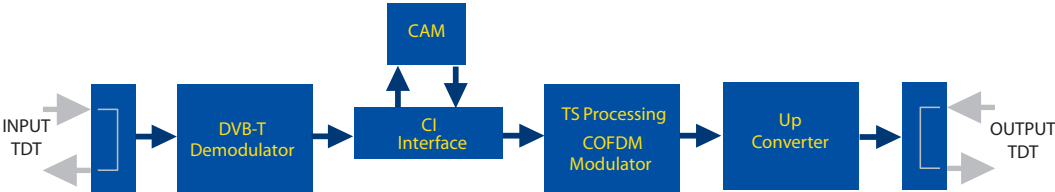
Amplifier 5575	Frequency range	46 ... 862 MHz	Connector	"F"
	Gain	44 ± 2,5 dB	Powering voltage	24 V---
	Regulation margin	20 dB	Consumption at 24 V---	450 mA
	Output level (60 dB)	105 dBμV (42 CH CENELEC)	Test socket	-30 dB
Amplifier 451202	Frequency range <sup>(1)</sup>	47 ... 862 MHz	Connector	"F"
	Gain <sup>(1)</sup>	40 - 53 dB (selec.)	Mains voltage	196 - 264 V~ 50/60 Hz
	Maximum output level <sup>(1)</sup>	129 dBμV (typ.) (DIN 45004B)	Max. Power	16 W
	Frequency range <sup>(2)</sup>	5 ... 30 MHz	Test socket	-20 dB
	Gain <sup>(2)</sup>	20/ -3 dB (typ.)		
	Maximum output level <sup>(2)</sup>	129/ --- dBμV (typ.) (DIN 45004B)		

(1) Forward channel    (2) Return channel (active/passive)

1.3. Technical specs. Power Supply Unit

Power supply unit 5629	Mains voltage	196 - 264 V~ 50/60 Hz	Total max. current (output 1 + output 2)	5 A    (24V---
	Output voltage	24V---	Max voltage per output	4 A    (24V---

1.4. Blocks diagram

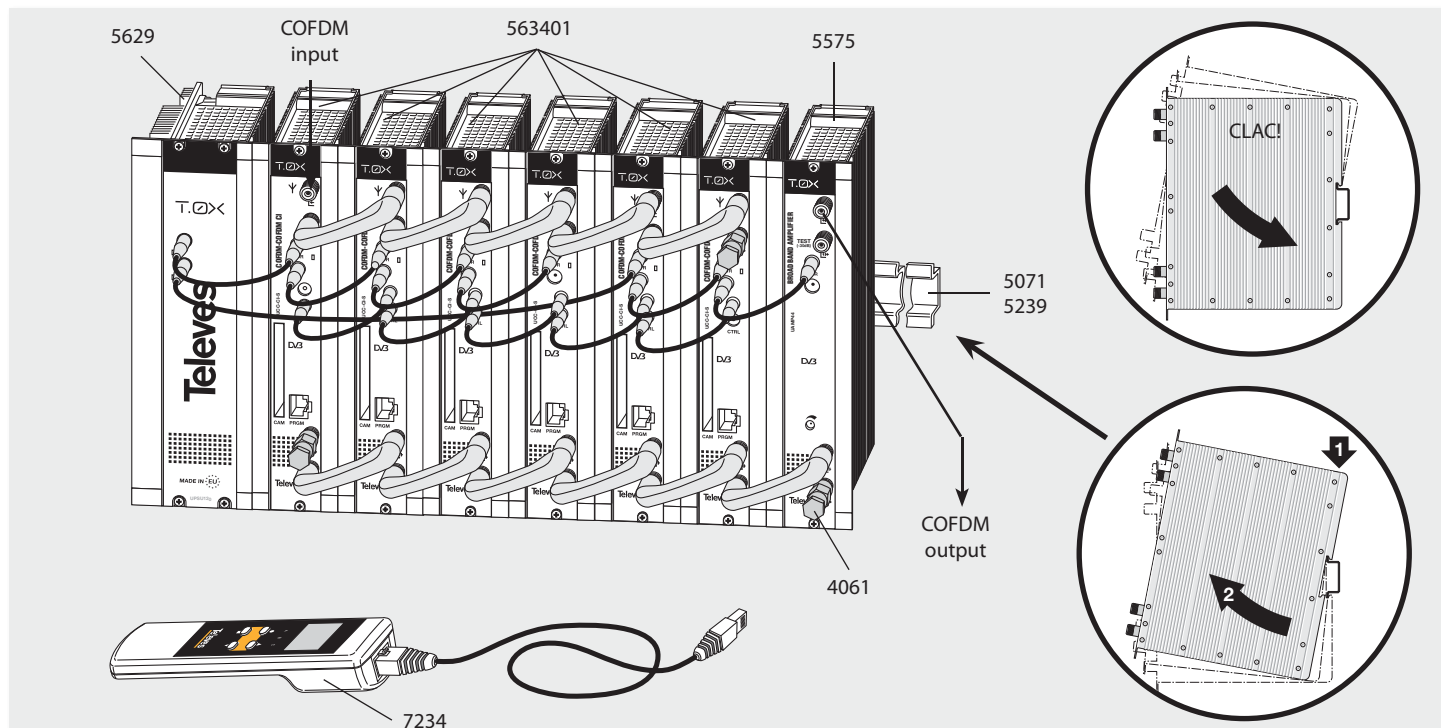


## 2. Description of references

Product range		Accessories	
563401	COFDM-COFDM CIT-0X	7234	Universal Programmer
5575	Broadband Amplifier 44dB 120dBμV T-0X	5071	T03-T05-T-0X Mounting rail (50 cm)
451202	Amplifier DTKom (47 - 862 MHz)	5239	T03-T05-T-0X Mounting rail.12 Modules+PSU (56 cm)
5559	Headend Manager CDC-IP T-0X	5301	19" Subrack frame
555901	Headend Manager CDC-IP GSM T-0X	507202	T-0X Lockable cabinet with Ventilation Unit (7 Modules + PSU)
5629	Power supply unit 24VDC/5A T-0X	4061	75 Ohm DC-Block load
		4058	75 Ohm Load
		422601	T05 to T-0X Power connection lead (40 cm)
		422602	T05 to T-0X Management connection lead (40 cm)
		422603	T-0X Management connection lead (1m)
		5673	Blank plate 50 mm

## 3. Mounting

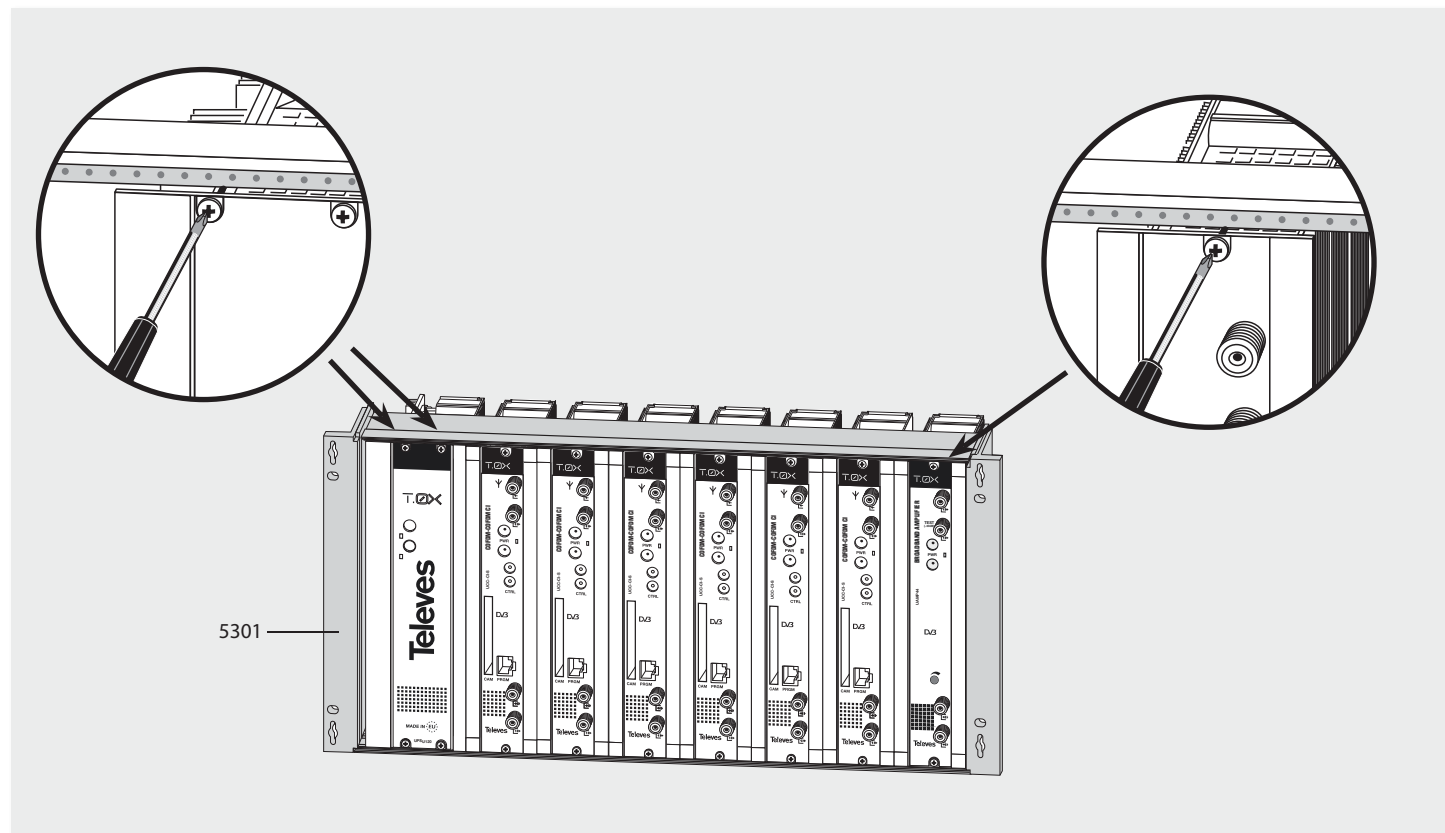
### 3.1. Wall mounting



**NOTE:** The use of both source outputs is recommended, balancing the consumption. For example, 4+3 or 3+4 modules

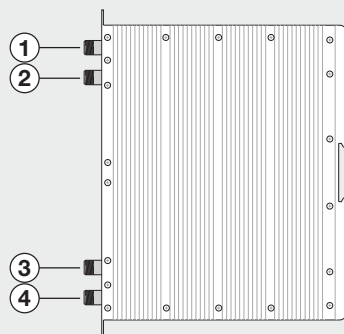


### 3.2. 19" rack mounting

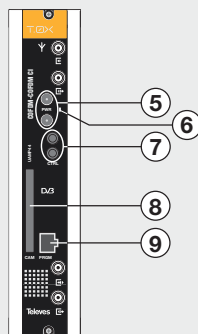


## 4. Identification of the system elements

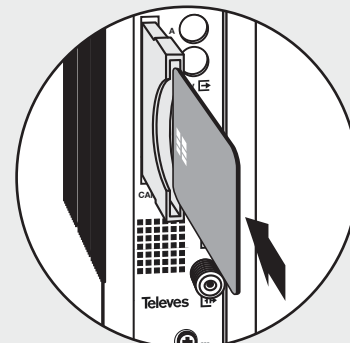
### 4.1. Introduction



1. COFDM input
2. COFDM output
3. RF input
4. RF output + 1Ch COFDM
5. Powering BUS connectors



6. Status LED
7. Control BUS connectors
8. Input to insert CAM
9. Programmer / PC connector



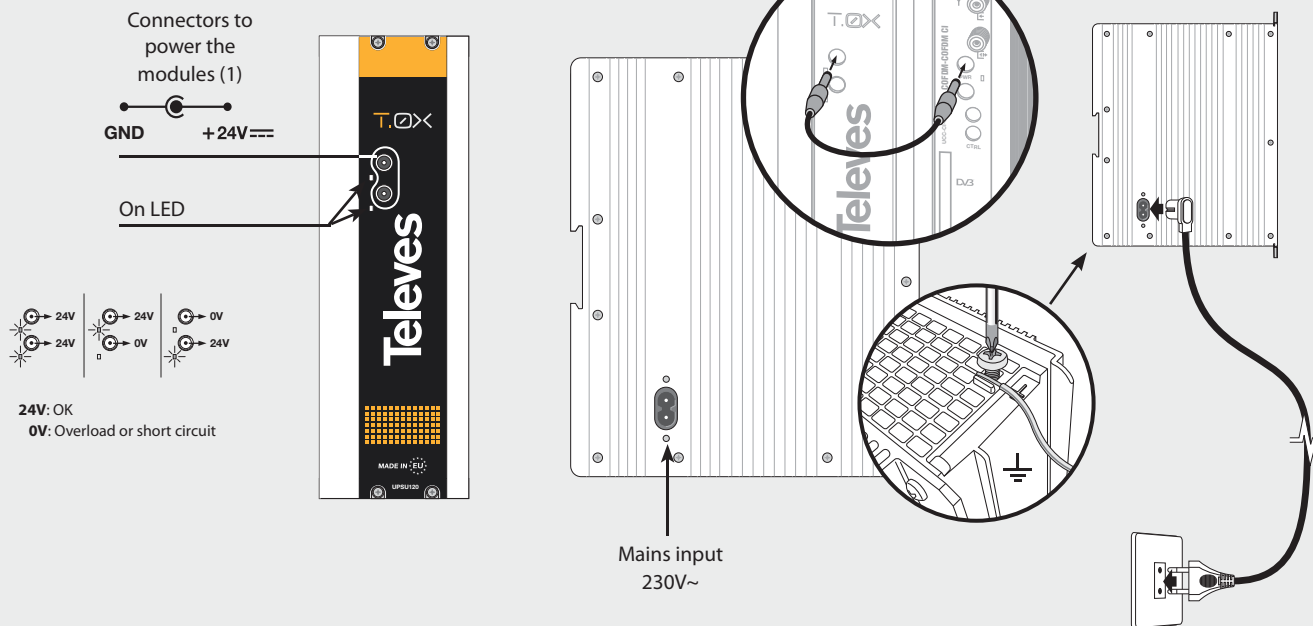
Insert the smart card completely into the CAM slot before powering modules. Card contacts looking left and forwards when it is being inserted.

The COFDM-COFDM CI transmodulator receives a digital terrestrial television (DTT) multiplex (DVB-T standard) and demodulates it to get a transport stream packet, which is processed to remove and/or unscramble services. To unscramble, the transmodulator has a Common Interface slot for the insertion of a conditional access module (CAM).

Subsequently, the TS packet is modulated in the same COFDM modulation format of its input (DVB-T standard), and converted to the output channel (UHF or VHF with a maximum bandwidth of 8 MHz) using an agile up-converter.

The programming of the transmodulator operating parameters (input frequency, output channel and adaptation of services mainly) is performed through the universal programmer (ref. 7234).

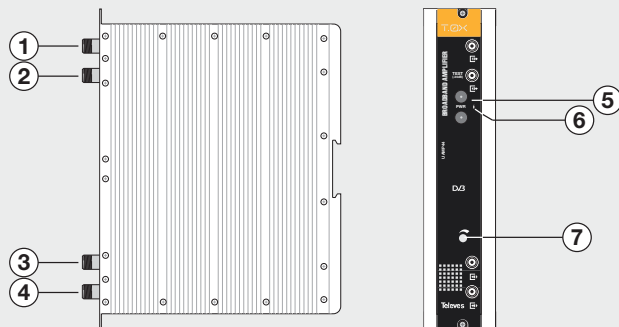
## 4.2. Power supply unit



- NOTES:**
- The PSU can power a maximum of **fourteen** COFDM-COFDM CI modules.
  - Whenever the demand of power exceeds 4A (max. current for each output), it is necessary to distribute it between the two powering outputs of the PSU.

### 4.3. Broadband amplifier

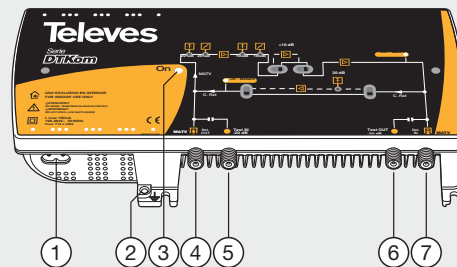
#### OPTION "A" - 5575



- 1. RF output
- 2. Test socket
- 3. RF input
- 4. RF input
- 5. Powering BUS connectors
- 6. Status LED
- 7. Gain attenuator

It features two input connectors, to allow mixing of channels coming out from two different systems. If only one of the inputs is used, it is recommended to load the unused input with a 75 ohm terminator, ref 4061. As the rest of T-0X units, this amplifier is powered via the 24 Vdc power BUS.

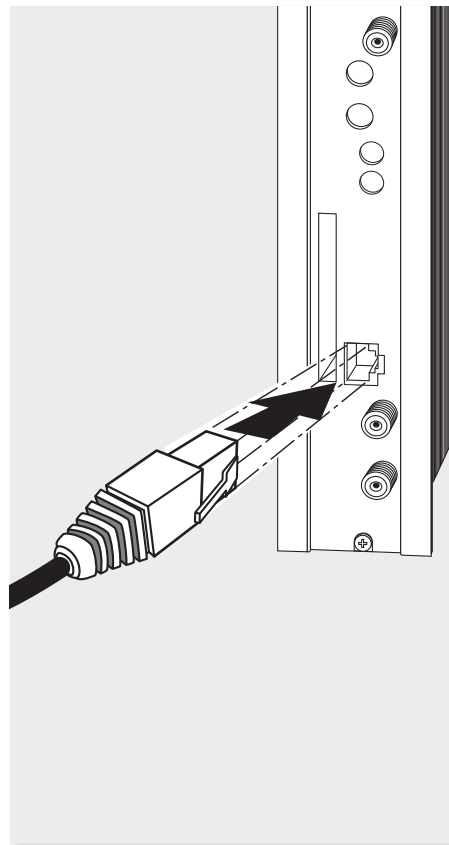
#### OPTION "B" - 451202



- 1. Mains power supply input (196-264 V~ 50/60 Hz)
- 2. Ground connection
- 3. Power LED
- 4. MATV input
- Return channel output
- 5. MATV input test
- 6. MATV output test
- 7. MATV output
- Return channel input

Input signals through connectors 3 & 4 are combined and amplified in the frequency band 47-862 MHz

## 4.4. Universal Programmer PCT 5.0



The programmer features 4 buttons:

- (short press) - Selection of parameter (positioning of the cursor).
- ▲-▼ Modification of the parameter chosen by the cursor (flashing)
- (short press) - Change menu
- (long press) - Change between Principal and Extended menus
- (long press) - Save changes to memory
- +▲ Cloning menu
- +●+▲ Increases the contrast of the screen.
- +●+▼ Decreases the contrast of the screen.

## 5. - Instructions for use

Insert the programmer in the front connector of the module ("PRGM"). First, the programmer's firmware version will appear:

```
PCT firmware
version
-----
V:5.03
```

The firmware version of the COFDM – COFDM CI module is shown below:

```
Unit
Firmware
version:
1.01
```

### 5.1. Normal menu

#### a. Input menu

The first main menu allows you to select for the input signal: the **frequency** or **channel**, the **offset** (channel mode only), the **bandwidth** and the **preamplifiers powering**.

```
►INPUT
Freq:666.000
Bw:      8MHz
Preamp:  12V
```

```
►INPUT
Ch:C45 Of: 0
Bw:      8MHz
Preamp:  00V
```

To make a change press the key ● until the desired parameter flashes. Then, this field can be changed by means of the keys ▲ and ▼.

You can select any output frequency value between 177,5 - 226,5 MHz (VHF) and 474-858 MHz (UHF).

The decimal part depends on the frequency step selected (see *extended menu b*). If the frequency step is defined as 125KHz, decimal part values allowed are: 0, 125, 250, 375, 500, 625, 750 and 875 KHz. If it is a 166 KHz step, then the values allowed are: 0, 166, 333, 500, 666 and 833 KHz.

In channel mode you can select the central frequency of the channel.

The offset values allowed depend on the frequency step selected (see *configuration menu*):

- Steps 125KHz:  $\pm 4$  (-500, -375, -250, -125, 0, 125, 250, 375, 500 KHz)
- Steps 166KHz:  $\pm 3$  (-500, -333, -166, 0, 166, 333, 500 KHz).

Possible COFDM Bandwidths are: 7MHz or 8MHz.  
Available voltages to power preamplifiers are: 0, 12 and 24 Vdc

In the case of a shortcircuiting condition in the input connector (line power set to ON) the frontal LED will be blinking until it is fixed.

#### b. Output menu

The next main menu shows the **frequency** or **output channel**, the output offset (only in channel mode), the **level control** and the selection of **output mode**.

```
►OUTPUT
Freq: 474.000
Bw:      8MHz
Lev:99 Norm.
```

```
►OUTPUT
Ch:C21 Of:0
Bw:      8MHz
Lev:99 Norm.
```

To change the frequency press the key ● until the desired parameter flashes. Then, this field can be changed by means of the keys ▲ and ▼.

In **frequency mode** you can select any output

frequency value between 177.5 - 226.5 and 474 - 858 MHz. The decimal part depends on the step of frequency chosen (*see extended menu b*). If you select a steps of 125 KHz the permitted values for the decimal part are: 0, 125, 250, 375, 500, 625, 750 and 875 KHz. With a steps of 166 KHz the possible values are: 0, 166, 333, 500, 666 and 833 KHz.

In **channel mode** you can choose an output channel from the table selected as well as the *offset* regarding the central channel frequency. The permitted offset values depend on the frequency step selected (see configuration menu):

- Steps of 125KHz:  $\pm 4$  (-500, -375, -250, -125, 0, 125, 250, 375, 500 KHz)
- Steps of 166KHz:  $\pm 3$  (-500, -333, -166, 0, 166, 333, 500 KHz).

Bandwidth possible values are 7 and 8 MHz.

The output level control permits values between 00 and 99.

Output modes available are:

**Norm.:** Normal Output Mode.

**Cw:** A continuous carrier is generated on the selected output frequency (it is useful to balance the headend when there is no signal at its input).

**Off:** None output signal is generated.

### c. Service menu

This menu shows the list of input transport stream services. Each time the user selects a new input transport, the unit performs a search for the services.

During that process the unit will display the following message, indicating the number of services found:

►SERVICE  
Scanning: 13

Once the search is complete, it shows the list of services with the following information (see next figure):

►SERVICE  
2/8 18/25  
La 2  
OFF

The service order number as well as the total number of services in the multiplex (the figure indicates that the 2nd service out of 8 services, is available), the statistics (18/25), the name of the service and if the user has selected it to: be removed from the output (OFF), be unscrambled (DCY), or to pass through without modification (ON).

Statistics (xx/yy) indicate the following: the first number indicates the percentage of the output occupied by the service. The second number indicates the percentage of the output that is free. In the example, the service "La 2" will occupy 18% of the output (it is OFF so it is going to be removed) and there is 25% of free space. Therefore, it is easy to see that, this service might be activated (ON or DCY) because there is still sufficient capacity at the output. The free percentage at the output is only updated once the configuration of the services has been recorded.

Additionally, the status (scrambled or clear) of the service, both at the input and output are indicated in the upper right hand corner:

- ! ► ! Scrambled service at input and output.
- ! ► △ Scrambled Service at input and clear at output.
- ! Scrambled service at input.

### d. Measurements menu 1

The following menu provides an indication of the input **signal quality** to the COFDM demodulator by using as estimate of the input CBER (Channel Bit Error Rate).

```
►MONITOR >>
CBER:
9.15E-5
```

## e. Measurements menu 2

This menu indicates the **occupancy rate** of the module's output as well as the maximum achieved. Whenever the maximum occupancy rate is exceeded, it will result an output overflow and this condition is indicated.

In these cases it will be necessary to eliminate some services to cancel this condition.

```
►MONITOR >>
Occupancy:
76%
Max:80%
```

```
►MONITOR >>
Overflow!!
```

Occupancy values higher than 82% are not recommended. This is a read only menu, which disables the keys ▲ and ▼.

## f. Measurements menu 3

The following menu provides an indication of the unit's **current temperature** as well as the maximum recorded. The maximum can be reset by pressing the key ●.

```
►MONITOR
Now: 04
Max: 05
● reset
```

The recommended operating margins are as follows:

- Optimum operation : **0-6**
- High temperature: **7-8**
- Excessive temperature: **9-10**

If the maximum recorded is outside the optimal range the installation should be adjusted in order to reduce the temperature.

If the COFDM-COFDM CI modules have been installed in a housing ref. 5069 and the temperature of one of the modules is outside of the optimal operating range, the ventilation unit ref. 5334 will have to be installed. To check whether this change is effective, the maximum can be reset and its value checked after a given time.

## 5.2. Extended menu

When the ● key is held down for more than 3 seconds the unit shows a series of less frequently used menus called *extended menus*.

### a. Configuration menu

This menu enables the **address** of the unit to be selected (to be controlled through a CDC Headend Control).

It also allows selection of either the **table of channels** to use or the **frequency mode** operation.

```
►CONFIG.
CDC Adr: 001
Ch. table
CCIR N.Z. Ind
```

```
►CONFIG.
CDC Adr: 001
Frequency
mode
```

Selectable are:

- CCIR
- China
- Chile
- Italy
- France
- OIR channels
- Ireland
- South Africa
- Poland
- Australia



## b. Frequency steps menu

This menu lets you select the **frequency steps** that will be applied at the input and output. Possible options are 125 KHz or 166 KHz.

```
►FREQ. STEP
In: 166KHz
Out: 166KHz
```

## c. Identifier menu

Some DVB-T receivers can present problems receiving transmodulated channels which share the same identifier (*transport\_stream\_id*). To avoid these cases the user can change the following DVBT output multiplex identifiers:

- *transport\_stream\_id* (ts\_id)
- *network\_id* (n\_id)
- *original\_network\_id* (on\_id).

You can choose **Auto** mode (the identifiers do not change) or **Manual** mode.

When switching from Auto mode to Manual the identifiers received at the input are displayed and the user can change them.

```
►NIT IDs
Auto
```

```
►IDs Manual
ts_id:0x04fC
n_id: 0x055F
on_id:0x055F
```

## d. Versions menu

In this menu the user is shown the firmware versions for the unit and the COFDM (FPGA) modulator.

```
►VERSION

Fw: 1.00.11
Mod: 1.00.11
```

## e. LCN menu

The next menu allows you to assign a **channel number** (LCN, Logical Channel Number) to the existing services at the output, marked ON or DCY in the services menu. LCN can be useful for compatible receivers.

If the service already has an assigned LCN in the input it is allowed to change or remove the LCN in the output tables, selecting 0000 as the LCN. "NO LCN" will be shown.

```
►LCN      1/3
Teledeporte
N:0001
```

```
►LCN      1/3
Teledeporte
NO LCN
```

To change the LCN press keys ● and ▲ or ▼.

EN

## f. Language menu

The last extended menu enables the menu language to be selected (Spanish / English / German / French):

```
►LANGUAGE

English
```

Pressing keys ▲ and ▼ changes the selected language.

### 5.3. Parameters saving

Once a parameter is modified to the desired value in any menu (normal or extended), to save the settings press **■** for three seconds. The display will show the following indication:

**Saving  
settings and  
restarting  
...**

Do not remove the controller until the message disappears.

If the configuration parameters are modified but not saved, the previous configuration is retrieved after 30 sec. in other words, the changes are discarded.

Finally, the LEDS indicate the following operating conditions:

- Left LED (A) = The level of the input signal is sufficient (for guidance).
- Central LED (B) = Hooking of the COFDM demodulator.
- Right LED (C) = Hooking of the COFDM modulator / Right adjustment.

LEDs ON, indicate correct operation.

If any of them turns OFF is a sign of anomalous behavior.

The LED on the front of the unit indicates whether the COFDM demodulator is hooked: it glows green when hooked, and glows red when not.

## 6. - Controlling the Device

This version of the COFDM-COFDM CI allows configuration and monitoring via a PC, both locally and remotely.

### a. Local control

The "Headend Management" programme (v2.14 or higher) is required, as well as a special cable (provided with the programme) that connects a PC serial port to the COFDM-COFDM CI "PRGM" connector.

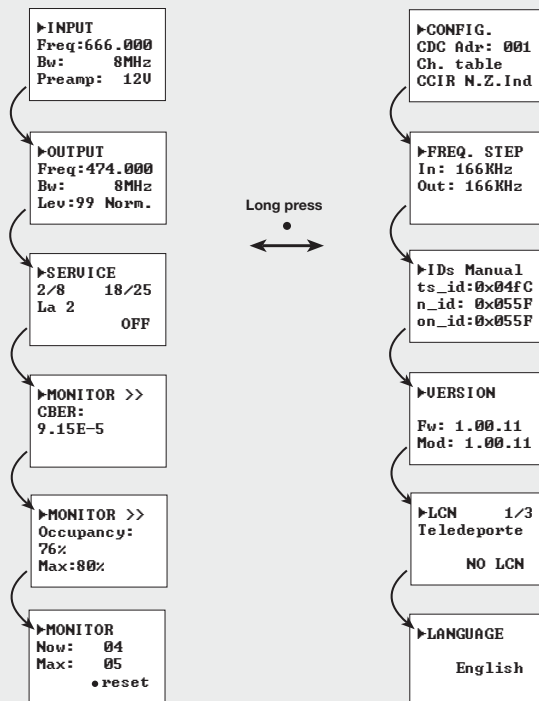
The programme can be used to set up and read all the operating parameters, as well as to monitor the correct operation of the device.

### b. Remote control

It is necessary to have a Headend Control module (ref. 5559 or 555901) that includes the programme mentioned above.

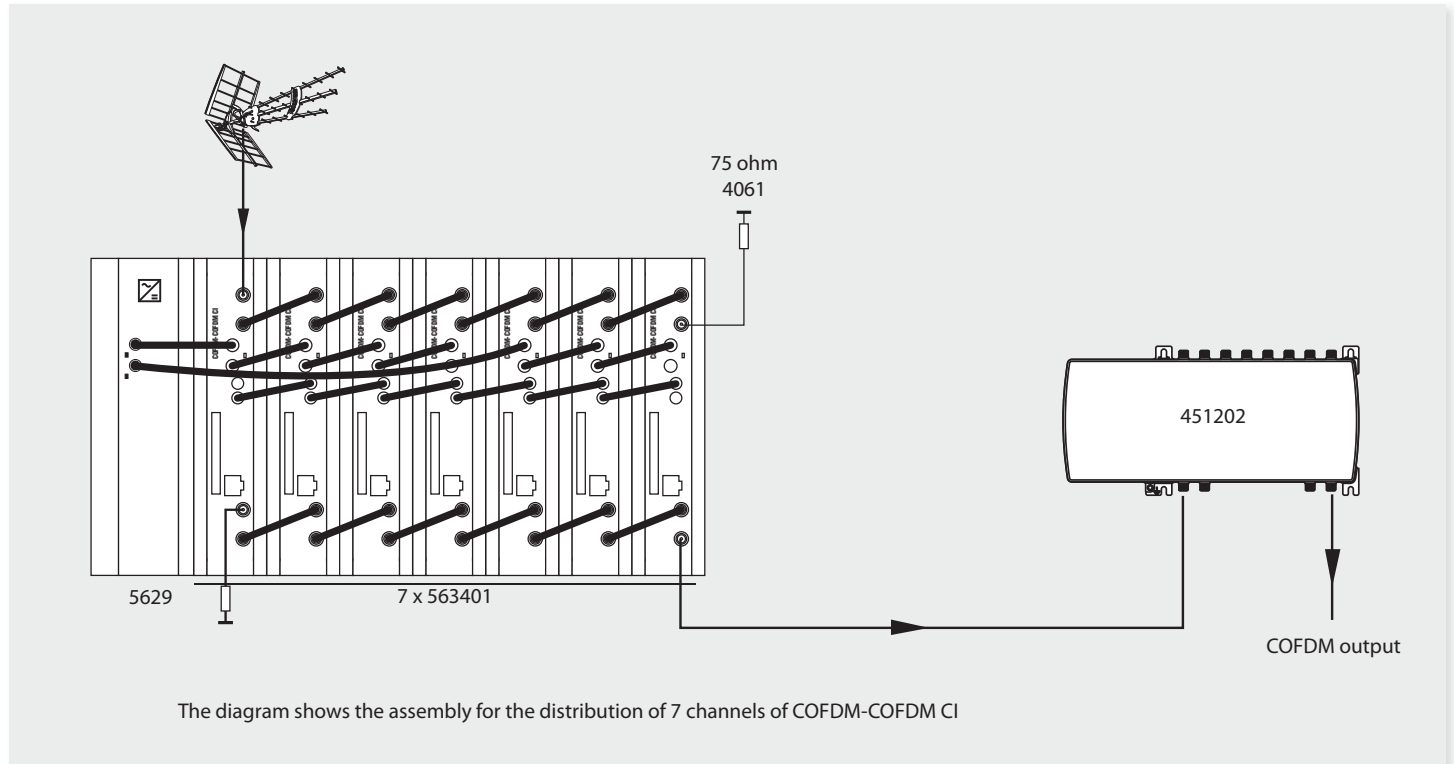
Once the communication with the headend control has been established, all the controllable devices that have been installed in the headend can be accessed. In this case it is essential that each element be programmed with a different device address between 1 and 254.

## Menu structure



## 7. Application example

### Distribution of 7 channels of COFDM-COFDM CI



## 8. Norms for rack mounting (max. 49 COFDM-COFDM CI - 7 subracks with 5 units in height - 8,7")

### 8.1. Installation of the rack with ventilation facilities

To facilitate the renewal and circulation of the air inside the rack, to reduce the temperature of the units and thus improving their characteristics, it is advisable to place 2 ventilation units of 25W, particularly when the rack with the COFDM-COFDM CI is located in warm places, with temperatures higher than 45°C.

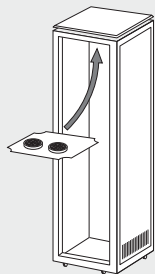


fig. 1

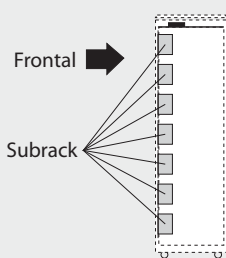
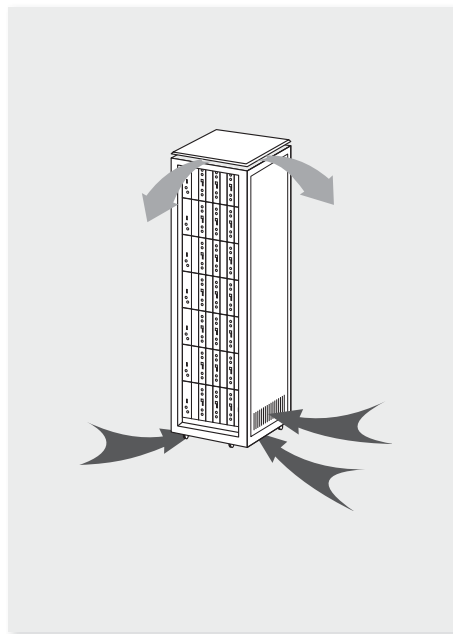


fig. 2



These ventilators will be installed on a tray that is fixed inside the cabinet (fig. 1 & 2). This way, the ventilators will force the fresh air entering from the base of the cabinet, to circulate between the modules and be expelled through a gap on top of the cabinet (3-5 cm approx.). See fig. 3.

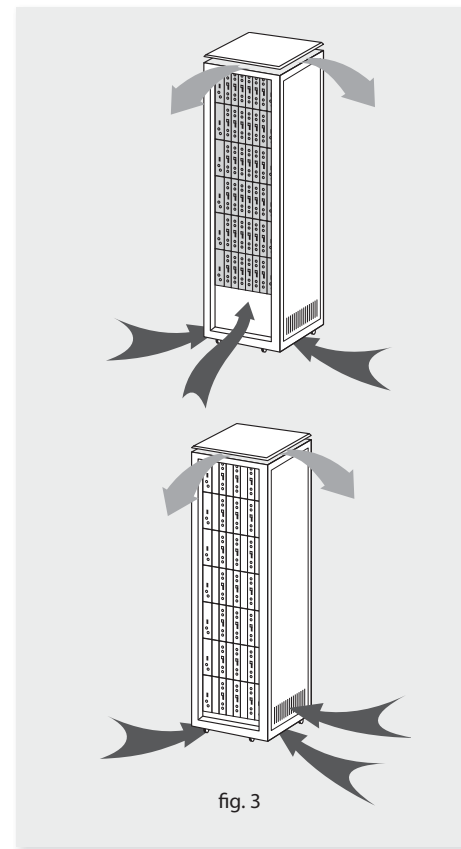


fig. 3

It is very important that this process operates correctly, therefore the following must be observed:

- Do not open the side doors, as this would cause the ventilators to extract the air from the outside rather than the air inside the rack.
- Do not place objects close to the rack that may block the entry and exit openings for the air.
- If the rack is not complete, the subracks must be placed from the top downwards without leaving any gaps in between, fig. 4.

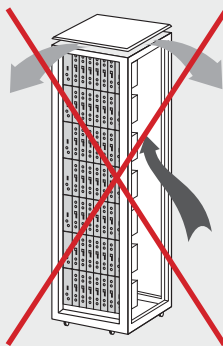
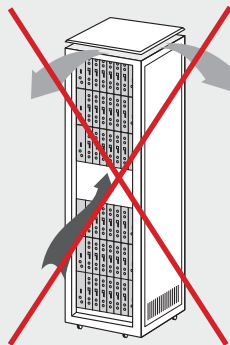
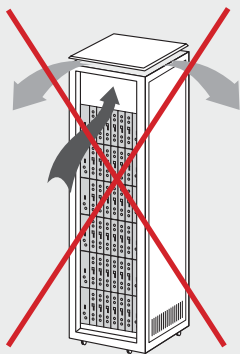


fig. 4

## 8.2. Installation of the rack without ventilation facilities

To install the units in racks without installation facilities, and when the rack is located in a place with a temperature of around 45°C, it is advisable to place the rack completely open, in other words, do not use the side doors. This is to facilitate the ventilation of the units, fig. 5.

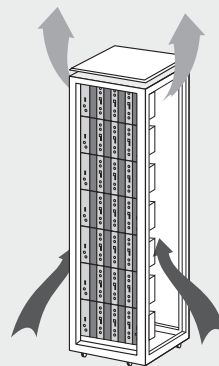


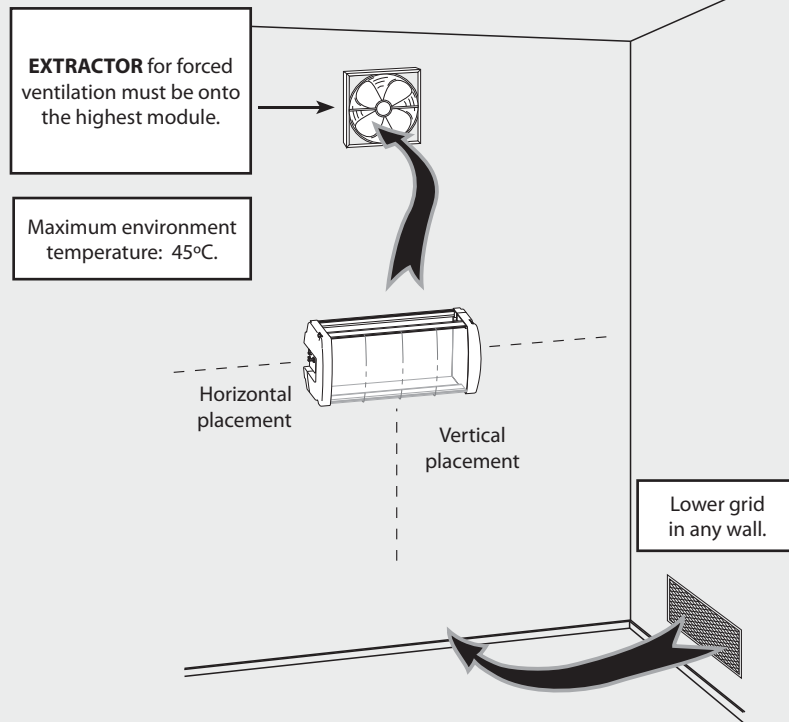
fig. 5

## 9. Norms for cabinet mounting

### IMPORTANT

The scheme of recommended ventilation is the one in the figure in any case of cabinet placement (horizontal or vertical).

The maximum temperature permitted surrounding the highest cabinet is 45°C in both ways of placement, horizontal or vertical way.

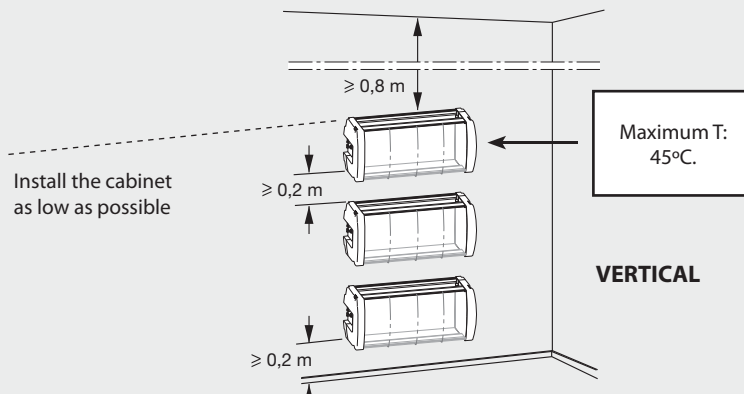
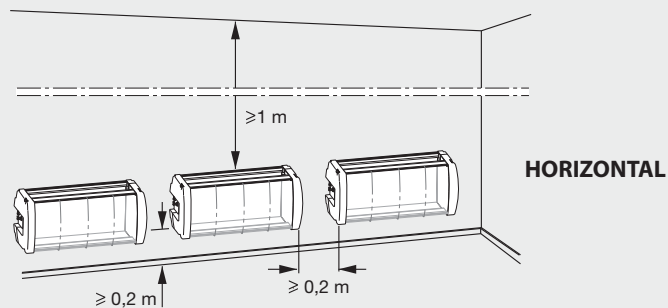


**IMPORTANT**

Horizontal placement of the cabinets is strongly recommended, hanging them as near to the floor as possible.

If the horizontal placement is impossible, then vertical placement is allowed.

Respect the recommended minimum distances in the attached schemes.





## A. Channels table

Tabl. 1		Tabl. 2		Tabl. 3		Tabl. 4		Tabl. 5		Tabl. 6		Tabl. 7		Tabl. 8		Tabl. 9		Tabl. 10	
CCIR		China/Taiwan		Chile		Italy		France		OIR channels		Ireland		South Africa		Poland (OIR)		Australia	
C02	50,50	1	52,50	1	57,00	A	56,00	F01	45,00	R01	52,50	1	48,50	2	56,50	S01	114,00	0	50,50
C03	57,50	2	60,50	2	63,00	B	64,50	L02	53,00	R02	62,00	2	56,50	3	64,50	S02	122,00	1	59,50
C04	64,50	3	68,50	3	69,00	C	84,50	L03	57,75	R03	80,00	3	64,50	4	178,00	S03	130,00	2	66,50
L01	71,50	4	80,00	4	79,00	S01	107,50	L04	61,00	R04	88,00	5	178,00	5	186,00	S04	138,00	3	88,50
L02	78,50	5	88,00	5	85,00	S02	114,50	S01	107,50	R05	96,00	6	186,00	6	194,00	S05	146,00	4	97,50
L03	85,50	6	171,00	6	177,00	S03	121,50	S02	114,50	S01	114,00	7	194,00	7	202,00	S06	154,00	5	104,50
S01	107,50	7	179,00	7	183,00	S04	128,50	S03	121,50	S02	122,00	8	202,00	8	210,00	S07	162,00	S02	114,50
S02	114,50	8	187,00	8	189,00	S05	135,50	S04	128,50	S03	130,00	9	210,00	9	218,00	S08	170,00	S03	121,50
S03	121,50	9	195,00	9	195,00	S06	142,50	S05	135,50	S04	138,00	10	218,00	10	226,00	K06	178,00	S04	128,50
S04	128,50	10	203,00	10	201,00	S07	149,50	S06	142,50	S05	146,00	11	226,00	11	234,00	K07	186,00	S05	135,50
S05	135,50	11	211,00	11	207,00	S08	156,50	S07	149,50	S06	154,00	C21	474,00	12	242,00	K08	194,00	5A	140,50
S06	142,50	12	219,00	12	213,00	S09	163,50	S08	156,50	S07	162,00	C22	482,00	13	250,00	K09	202,00	S06	142,50
S07	149,50	C21	474,00	21	473,00	S10	170,50	S09	163,50	S08	170,00	C23	490,00	C21	474,00	K10	210,00	S07	149,50
S08	156,50	C22	482,00	22	479,00	D	177,50	S10	170,50	R06	178,00	C24	498,00	C22	482,00	K11	218,00	S08	156,50
S09	163,50	C23	490,00	23	485,00	E	186,00	L05	178,75	R07	186,00	C25	506,00	C23	490,00	K12	226,00	S09	163,50
S10	170,50	C24	498,00	24	491,00	F	194,50	L06	186,75	R08	194,00	C26	514,00	C24	498,00	S09	234,00	S10	170,50
C05	177,50	C25	506,00	25	497,00	G	203,50	L07	194,75	R09	202,00	C27	522,00	C25	506,00	S10	242,00	6	177,50
C06	184,50	C26	514,00	26	503,00	H	212,50	L08	202,75	R10	210,00	C28	530,00	C26	514,00	S11	250,00	7	184,50
C07	191,50	C27	522,00	27	509,00	H1	219,50	L09	210,75	R11	218,00	C29	538,00	C27	522,00	S12	258,00	8	191,50
C08	198,50	C28	530,00	28	515,00	H2	226,50	L10	218,75	R12	226,00	C30	546,00	C28	530,00	S13	266,00	9	198,50
C09	205,50	C29	538,00	29	521,00	S11	233,50	S11	233,50	S11	234,00	C31	554,00	C29	538,00	S14	274,00	9A	205,50
C10	212,50	C30	546,00	30	527,00	S12	240,50	S12	240,50	S12	242,00	C32	562,00	C30	546,00	S15	282,00	10-o	211,50
C11	219,50	C31	554,00	31	533,00	S13	247,50	S13	247,50	S13	250,00	C33	570,00	C31	554,00	S16	290,00	10	212,50
C12	226,50	C32	562,00	32	539,00	S14	254,50	S14	254,50	S14	258,00	C34	578,00	C32	562,00	S17	298,00	11-o	218,50
S11	233,50	C33	570,00	33	545,00	S15	261,50	S15	261,50	S15	266,00	C35	586,00	C33	570,00	S18	306,00	11	219,50
S12	240,50	C34	578,00	34	551,00	S16	268,50	S16	268,50	S16	274,00	C36	594,00	C34	578,00	S19	314,00	12	226,50
S13	247,50	C35	586,00	35	557,00	S17	275,50	S17	275,50	S17	282,00	C37	602,00	C35	586,00	S20	322,00	S11	233,50
S14	254,50	C36	594,00	36	563,00	S18	282,50	S18	282,50	S18	290,00	C38	610,00	C36	594,00	S21	330,00	S12	240,50
S15	261,50	C37	602,00	37	569,00	S19	289,50	S19	289,50	S19	298,00	C39	618,00	C37	602,00	S22	338,00	S13	247,50
S16	268,50	C38	610,00	38	575,00	S20	296,50	S20	296,50	S20	306,00	C40	626,00	C38	610,00	S23	346,00	S14	254,50
S17	275,50	C39	618,00	39	581,00	S21	306,00	S21	306,00	S21	314,00	C41	634,00	C39	618,00	S24	354,00	S15	261,50
S18	282,50	C40	626,00	40	587,00	S22	314,00	S22	314,00	S22	322,00	C42	642,00	C40	626,00	S25	362,00	S16	268,50
S19	289,50	C41	634,00	41	593,00	S23	322,00	S23	322,00	S23	330,00	C43	650,00	C41	634,00	S26	370,00	S17	275,50
S20	296,50	C42	642,00	42	599,00	S24	330,00	S24	330,00	S24	338,00	C44	658,00	C42	642,00	S27	378,00	S18	282,50
S21	306,00	C43	650,00	43	605,00	S25	338,00	S25	338,00	S25	346,00	C45	666,00	C43	650,00	S28	386,00	S19	289,50

S22	314,00	C44	658,00	44	611,00	S26	346,00	S26	346,00	S26	354,00	C46	674,00	C44	658,00	S29	394,00	S20	296,50
S23	322,00	C45	666,00	45	617,00	S27	354,00	S27	354,00	S27	362,00	C47	682,00	C45	666,00	S30	402,00	S21	305,50
S24	330,00	C46	674,00	46	623,00	S28	362,00	S28	362,00	S28	370,00	C48	690,00	C46	674,00	S31	410,00	S22	312,50
S25	338,00	C47	682,00	47	629,00	S29	370,00	S29	370,00	S29	378,00	C49	698,00	C47	682,00	S32	418,00	S23	319,50
S26	346,00	C48	690,00	48	635,00	S30	378,00	S30	378,00	S30	386,00	C50	706,00	C48	690,00	S33	426,00	S24	326,50
S27	354,00	C49	698,00	49	641,00	S31	386,00	S31	386,00	S31	394,00	C51	714,00	C49	698,00	S34	434,00	S25	333,50
S28	362,00	C50	706,00	50	647,00	S32	394,00	S32	394,00	S32	402,00	C52	722,00	C50	706,00	S35	442,00	S26	340,50
S29	370,00	C51	714,00	51	653,00	S33	402,00	S33	402,00	S33	410,00	C53	730,00	C51	714,00	S36	450,00	S27	347,50
S30	378,00	C52	722,00	52	659,00	S34	410,00	S34	410,00	S34	418,00	C54	738,00	C52	722,00	S37	458,00	S28	354,50
S31	386,00	C53	730,00	53	665,00	S35	418,00	S35	418,00	S35	426,00	C55	746,00	C53	730,00	S38	466,00	S29	361,50
S32	394,00	C54	738,00	54	671,00	S36	426,00	S36	426,00	S36	434,00	C56	754,00	C54	738,00	C21	474,00	S30	368,50
S33	402,00	C55	746,00	55	677,00	S37	434,00	S37	434,00	S37	442,00	C57	762,00	C55	746,00	C22	482,00	S31	375,50
S34	410,00	C56	754,00	56	683,00	S38	442,00	S38	442,00	S38	450,00	C58	770,00	C56	754,00	C23	490,00	S32	382,50
S35	418,00	C57	762,00	57	689,00	S39	450,00	S39	450,00	S39	458,00	C59	778,00	C57	762,00	C24	498,00	S33	389,50
S36	426,00	C58	770,00	58	695,00	S40	458,00	S40	458,00	S40	466,00	C60	786,00	C58	770,00	C25	506,00	S34	396,50
S37	434,00	C59	778,00	59	701,00	S41	466,00	S41	466,00	C21	474,00	C61	794,00	C59	778,00	C26	514,00	S35	403,50
S38	442,00	C60	786,00	60	707,00	C21	474,00	C21	474,00	C22	482,00	C62	802,00	C60	786,00	C27	522,00	S36	410,50
S39	450,00	C61	794,00	61	713,00	C22	482,00	C22	482,00	C23	490,00	C63	810,00	C61	794,00	C28	530,00	S37	417,50
S40	458,00	C62	802,00	62	719,00	C23	490,00	C23	490,00	C24	498,00	C64	818,00	C62	802,00	C29	538,00	S38	424,50
S41	466,00	C63	810,00	63	725,00	C24	498,00	C24	498,00	C25	506,00	C65	826,00	C63	810,00	C30	546,00	S39	431,50
C21	474,00	C64	818,00	64	731,00	C25	506,00	C25	506,00	C26	514,00	C66	834,00	C64	818,00	C31	554,00	S40	438,50
C22	482,00	C65	826,00	65	737,00	C26	514,00	C26	514,00	C27	522,00	C67	842,00	C65	826,00	C32	562,00	S41	445,50
C23	490,00	C66	834,00	66	743,00	C27	522,00	C27	522,00	C28	530,00	C68	850,00	C66	834,00	C33	570,00	S42	452,50
C24	498,00	C67	842,00	67	749,00	C28	530,00	C28	530,00	C29	538,00	C69	858,00	C67	842,00	C34	578,00	S43	459,50
C25	506,00	C68	850,00	68	755,00	C29	538,00	C29	538,00	C30	546,00			C68	850,00	C35	586,00	S44	466,50
C26	514,00	C69	858,00	69	761,00	C30	546,00	C30	546,00	C31	554,00			C69	858,00	C36	594,00	S45	473,50
C27	522,00			70	767,00	C31	554,00	C31	554,00	C32	562,00					C37	602,00	H21	480,50
C28	530,00			71	773,00	C32	562,00	C32	562,00	C33	570,00					C38	610,00	H22	487,50
C29	538,00			72	779,00	C33	570,00	C33	570,00	C34	578,00					C39	618,00	H23	494,50
C30	546,00			73	785,00	C34	578,00	C34	578,00	C35	586,00					C40	626,00	H24	501,50
C31	554,00			74	791,00	C35	586,00	C35	586,00	C36	594,00					C41	634,00	H25	508,50
C32	562,00			75	797,00	C36	594,00	C36	594,00	C37	602,00					C42	642,00	H26	515,50
C33	570,00			76	803,00	C37	602,00	C37	602,00	C38	610,00					C43	650,00	H27	522,50
C34	578,00			77	809,00	C38	610,00	C38	610,00	C39	618,00					C44	658,00	H28	529,50
C35	586,00			78	815,00	C39	618,00	C39	618,00	C40	626,00					C45	666,00	H29	536,50
C36	594,00			79	821,00	C40	626,00	C40	626,00	C41	634,00					C46	674,00	H30	543,50
C37	602,00			80	827,00	C41	634,00	C41	634,00	C42	642,00					C47	682,00	H31	550,50
C38	610,00			81	833,00	C42	642,00	C42	642,00	C43	650,00					C48	690,00	H32	557,50
C39	618,00			82	839,00	C43	650,00	C43	650,00	C44	658,00					C49	698,00	H33	564,50
C40	626,00			83	845,00	C44	658,00	C44	658,00	C45	666,00					C50	706,00	H34	571,50
C41	634,00			84	851,00	C45	666,00	C45	666,00	C46	674,00					C51	714,00	H35	578,50

[illegible]



## Guarantee

Televes S.A. offers a two year guarantee, beginning from the date of purchase for countries in the EU. For countries that are not part of the EU, the legal guarantee that is in force at the time of purchase is applied. Keep the purchase invoice to determine this date.

During the guarantee period, Televes S.A. complies with the guarantee by repairing or substituting the faulty equipment.

The harm produced by improper usage, wear and tear, manipulation by a third party, catastrophes or any other cause beyond the control of Televes S.A. is not included in the guarantee.

Televes

DECLARATION OF CONFORMITY N° 111024144636

DECLARACIÓN DE CONFORMIDAD  
DECLARAÇÃO DE CONFORMIDADE  
DECLARATION DE CONFORMITE  
DICHLARAZIONE DI CONFORMITA  
DEKLARACJA ZGODNOSCI  
DECLARATION DE CONFORMITE  
KONFORMITÄTSEKKLÄRUNG  
CONFORMITÄTSERKLÄRUNG  
VASTAVUSE SERTIFIKAAT

KONFORMITÄTSERTIFIZIERUNG  
ΠΙΣΤΟΠΟΙΗΤΙΚΟ ΣΥΜΜΟΡΦΟΤΗΤΗΣ  
FORMA KANONIZACIJE EKSPRESSTAMMELSE  
VAATIMUSTENMUKAISUVAKUTUS  
ΑΠΙΤΑΚΤΗΣ ΔΕΚΛΑΡΑCΙΑ  
MEGFELÉLESEGI NYILATKOZAT  
ВЕСЕРТИФИКАCИ  
ДЕКЛАРАЦІЯ ВІДПОВІДНОСТІ

Manufacturer / Fabricante / Fabricator / Fabbricante / Fabrikant / Käsitteleväyritys / Tilveväre / Valmistaja / Producent / Gumiņas /  
Rašotoms / Producent / Ödret / Fabrikant / Producent / Fabrikant / Buprodukt / Valmistaja:

Televes S.A.  
Rua Benficia de Conxo, 17 - 15706 - Santiago de Compostela - Spain

Declare under our own responsibility the conformity of the product / Declaro bajo mi exclusiva responsabilidad la conformidad del producto / Declaro sub ma exclusiv responsabilitate a conformitatei de produs / Declare sous notre propre responsabilit  la conformit  de ce produit / Declaro sotto la mia esclusiva responsabilit  la conformit  del prodotto / Wir  bernehmen die Verantwortung f r die Konformit  des Produktes / Πιστοποι με με δικ  μας ευθ να την συμμορφωτ  του προϊόντος / F r r ker om  verst mmelse enligt tillr korsen eget ansvar f r produkten / V kst mmame yht vastuun omalla vastuullamme tuotteen yht vastuulluutta / Obv l dzony os wlasnym odpowiedzialno ci  zgodno ci wyrobu / Deklarujemy nasz  odpowiedzialno ci , ka  produkt jest at wierdzamy / Διασ τειν   ποιοτ τητ  αποκλειστικ ς μετ ς  ς ευθυν ς μας το προϊόν / Declaram pe propria raspundere cu produsul c te  s conformitate cu cerin ele esen iale  i celelele prevederi aplicabile / S g t j lel ts g ndre kijelent k, hogy a termék megfelel / Eklarer under vores eget ansvar overensv rrelse for produkt / Eklarer under v rt eget ansvar  verensst mmelsen for produkt / Wij nemen de verantwoord ng voor de conformiteit van het product /  somme   nous-m mes responsabilit  nous que le produit est conforme / Konfirmo svoje vlastno:

Reference / Referencia / Refer ncia / Reference / Article / Artikelnummer / Aikym / Referens / Referenca / Numer Katalogowy / Produkt numeris /  
Apwaga / Referinta / Term kzt n / Varenummer / Varenummer / Artikelnummer / Apwaga / Viide:  
5634XX

Description / Descripci n / Descri  o / Description / Descrizione / Beschreibung / Περιγραφή / Beskrivning / Kavusi / Opis / Produkto apr ks / Oms uise /  
Descr ere / Leids / Beskrivelse / Beskrivelse / Beskriv ng / Onus / Kirjel s:

CONF-CORDM CI TOX

Trademark / Marca / Marca / Marchio / Handelsmarke / M rke / Varus merkki / Tavus merkki / Marka / Prek s / S nklas / Toponima marka / Marca /  
M rkens f / Varemarke / Varemarke / Handelsmarke / Toponimaisa marka / Kaubam rk:

Televes

With the requirements of / Con los requerimientos de / Com as especifica  es de / Avec les conditions de / Con i requisiti di / Die Voraussetzungen erf llen /  
Me te at v r ng, con / Edelt f ljande bet tt mster / Seuranvoin m  t rtykset / Zgodno ci z wymogami / At tinka reikalavimus / T rebovania / In conformitate cu /  s at tibe l v r ngsfor rsk / Med bet tt msterne / Med bet tt msterne / In  verensst mmelse med / s bstantibis do masu /  ngimant):

- Low Voltage Directive 2006 / 95 / EC.

- EMC Directive 2004 / 108 / EC.

Following standards / Con las normas / Con as normas / Selon les normes / Con le norme / Folgende Anforderung / At tink ts apr knta / F ljande standard / Seuranvoin standardit / Zastovovanie nast j n ch norm / Pagati standardit / C elnyomas et tt mstaporn / Respects urmat rele standarde / A K veke f szabv nykh / Folgende standarder / F ljende standarder / Volgende richtlijnen en normen / Naucnyomas et tt mstaporn / At tink tsle standardit):

EN 60728-11:2005, EN 50983-2:2006

Santiago de Compostela, 24/10/2011



Jos  L. Fern ndez Carnero  
Technical Director



European technology **Made in**  **EU**rope



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