Televes®

T.0X SERIES

EN DUAL A/D CHANNEL PROCESSOR

User manual

Contents

1. Technical specifications

1.1. DUAL A/D CHANNEL PROCESSOR ref. 564980

Down-Converter	Input frequency (selec.)		MHz	46 - 862	IN/OUT Connectors	type	female "F"
	Input level		dBmV	-10 to 20*	Input impedance	ohm	75
	Frequency steps (selec.)	Analog	KHz	250	Input line powering for preamps (< 50 mA)	Vdc	12 / 24 / OFF
		Digital		166.66 / 125 / 25	Input loop-through gain	dB	0 ± 3
Intermediate freq.	Bandwidth		MHz	6			
UP-Converter	Output frequency (selec.)		MHz	46 - 862	Output loop-through losses (typ.)	dB	< 1.5
	Frequency steps (selec.)	Analog	KHz	250	Return losses (typ.)	dB	> 12
		Digital		166.66 / 125 / 25	IN/OUT Connectors	type	female "F"
	Phase noise (typ.)		dBc/Hz	80 @10KHz	Output impedance	ohm	75
	Output level		dBmV	20 ±5	Spurious level (min.)	dBc	55
	Output level regulation		dB	> 15			
General	Consumption (typ.)		mA	400 @ 24V⎓ (LNB power OFF) 450 @ 24V⎓ (LNB power ON)			
	Protection level		IP	20			

* Automatic gain for high level input signals.
These technical specifications are defined for a maximum ambient temperature of 113 °F (45 ° C). For higher temperatures forced ventilation is required.

1.2. Broaband Amplifier Technical Specifications

| Amplifier ref. 5575	Frequency range	MHz	46 ⋯ 862	Connector	type	female "F"
	Gain	dB	44 ± 2.5	Powering voltage	V===	24
	Regulation margin	dB	20	Consumption at 24 V===	mA	450
	Output level	dBmV	45	Test output attenuation	dB	-30

1.3. Power Supply Unit Technical Specifications

PSU ref. 563901	Mains voltage	V~	102 - 138 / 50-60	Output voltage	V=	24±1 [1]
	Mains frequency	Hz	50 / 60	Output current (max.)	A=	5[2]
	Current consumption (max.)	A~	1.5	Output power	W	120
	Working temperature (max.)	ºF	113	Protection level	IP	20

(1) Provides protection voltage variation from 21 to 27 V=   (2) Maximum current limited to 4A=

1.4. Block diagram
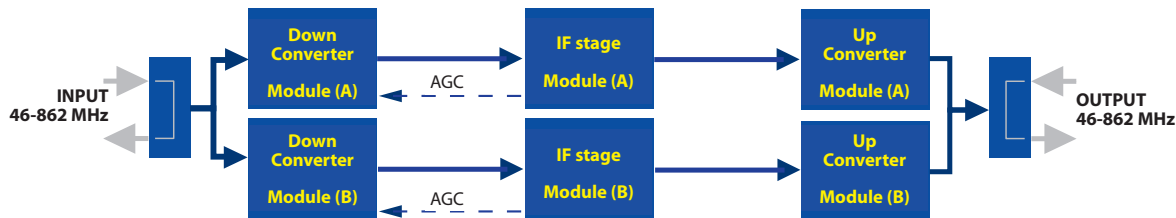
2. Ordering information

When ordering, please, specify reference number as per table below.

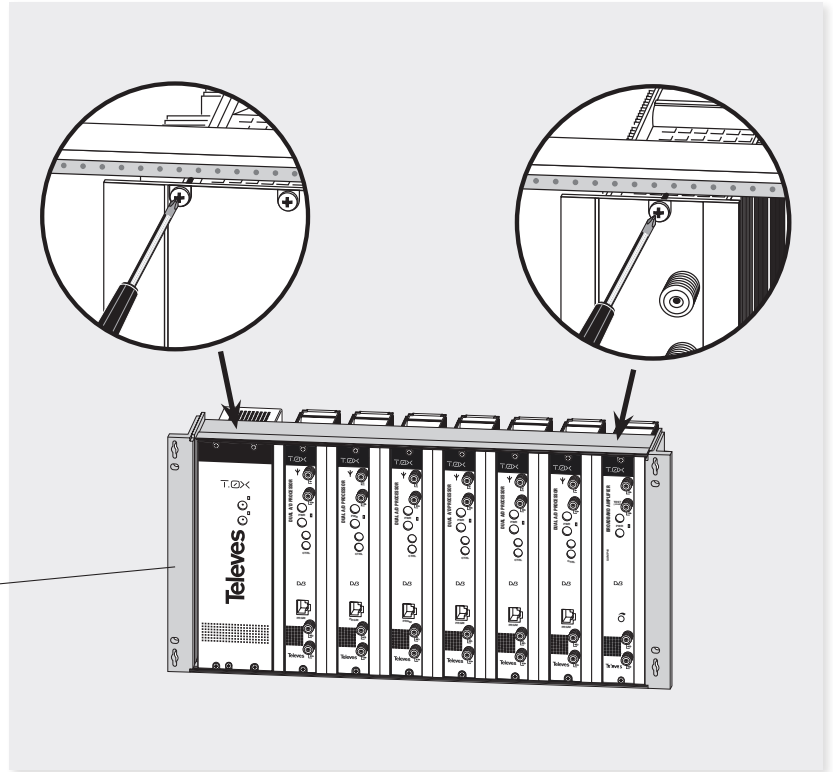| Ref #	Description
SMATV	
563901	T.0X Power Supply Unit (110 Vac/UL)
564980	T.0X DUAL A/D CHANNEL PROCESSOR
563701	T.0X 8PSK/QAM TWIN Transmodulator
555902	T.0X CDC IP Headend Manager
580602	T.0X Universal TWIN Modulator NTSC
5575	Broadband amplifier
FIBER OPTICS	
233311	T.0X Optical Transmitter (1310nm / 10dBm)
233411	T.0X Optical Transmitter (1310nm / 10dBm) / Return Path Receiver
234305	T.0X Optical Transmitter (1550nm / 4dBm)
234311	T.0X Optical Transmitter (1550nm / 10dBm)
234220	T.0X EDFA Optical Amplifier (20dBm)
2337	T.0X Optical Splitter, 2 ways
2339	T.0X Optical Splitter, 4 ways

Ref #	Description
234401	T.0X Optical Splitter, 8 ways
234501	T.0X Optical Splitter, 16 ways
234601	T.0X Optical Splitter, 32 ways
233501	T.0X Optical Receiver
233601	T.0X Optical Receiver / Return Path Transmitter (1310nm / 6dBm)
2310	Outdoor Optical Receiver/Amplifer w/ Return Path Transmitter (1310nm / 3dBm)
2311	FTTU Mini Optical Receiver
ACCESSORIES	
7234	Handheld Programming Unit
5301	19in Chassis, 7 modules+1PSU
422603	Control Bus Jumper (40 inches)
140057	Power Bus Jumper (15 inches)

3. Installation

3.1. 19" rack mount
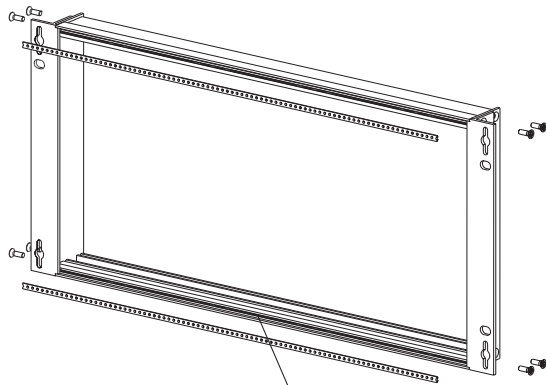
5301

4. Product description

4.1. Introduction

The DUAL A/D CHANNEL PROCESSOR contains two processors, herein known as **module A and module B**. Each one of them can be used independently either as a channel **converter** (output channel different of input channel) or as an **amplifier** (output channel equal to input channel).

When used as a converter, it allows to select any channel in the VHF or UHF band (46-862MHz) and translate it in frequency to any position within these bands.

Both modules A and B feature its own Up-converter, thus enabling to allocate independently the two output channels to any position within the TV band.

The parameters are selected by the programmer ref. 7234, which is connected to the front of the unit.

By using the universal programmer, both modules can be programmed with the operating parameters required by the premises: input and output frequencies, output levels and bandwidth, mainly.

Both modules A and B share the same input port (loop-through).

The input loop-through allows the input signal be available to a number of units interconnected. At the same time it allows to power a preamplifier through the signal input cable (12 / 24 Vdc).

If a shortcircuit occurs at the input port, a LED on the front panel of the unit will start to flash and the input power will be switched-off. The programmed voltage at the input will be reset once repaired the shortcircuit.
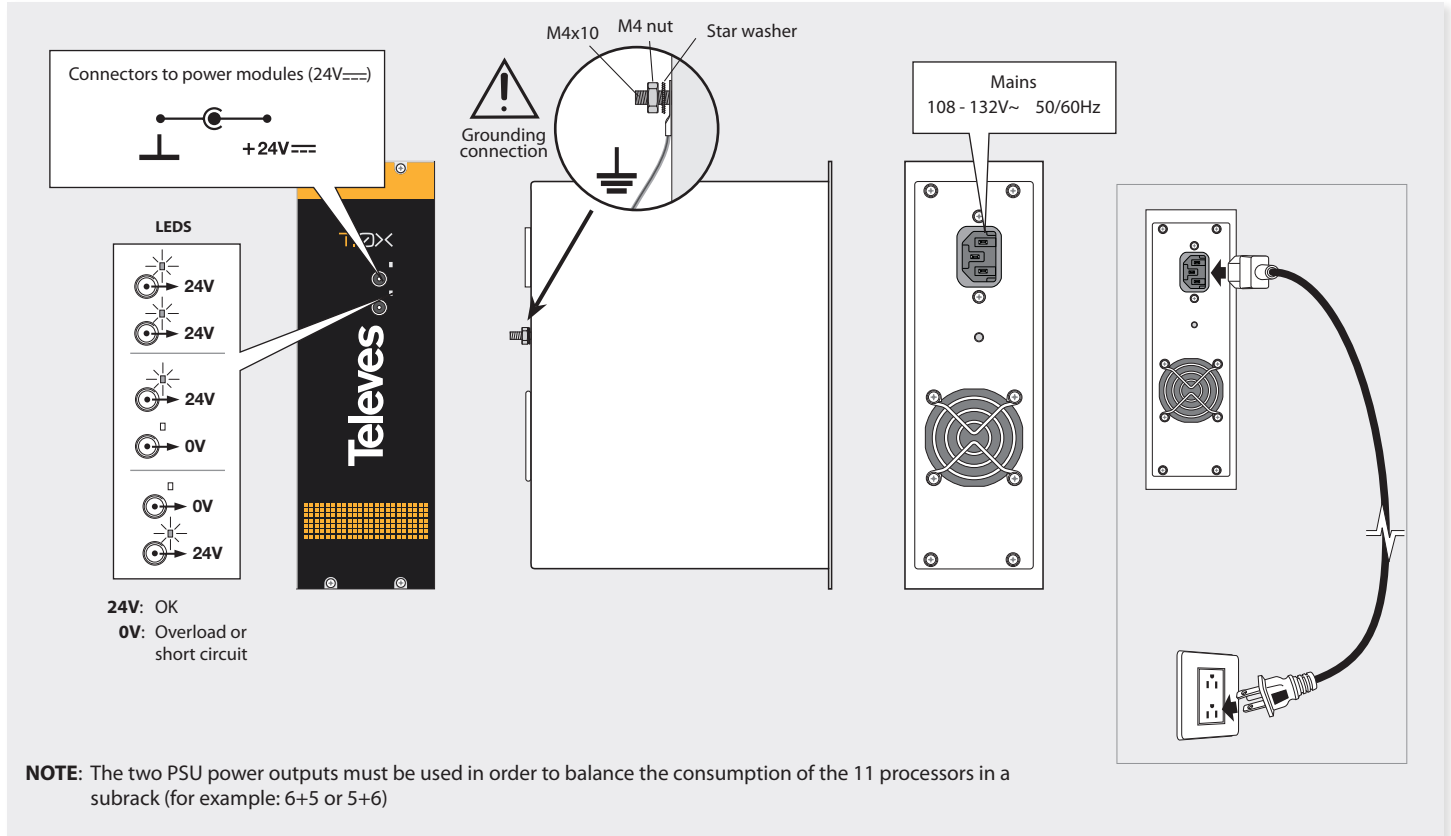It features also an input RF connector and an output RF connector in loop-through in order to mix the channels for subsequent amplification.

4.2. DUAL A/D Channel Processor
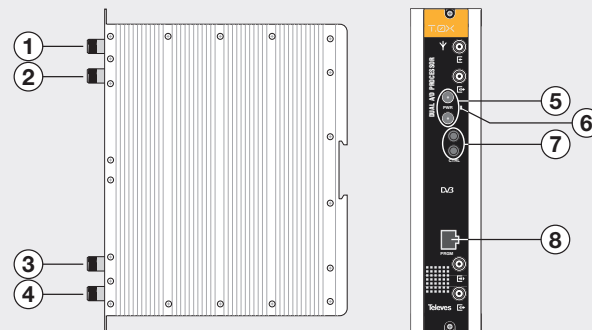
1. RF Input (12V/24V/Off)
2. RF Output (input loop-through)
3. RF Input (output loop-through)
4. RF Output
5. Power BUS connectors
6. Status LED
7. Control BUS connectors
8. Programmer / PC socket

4.3. Power Supply Unit

Connectors to power modules (24V===)

$+24V$ ===

LEDS

24V
24V
24V
0V
0V
24V

24V: OK
0V: Overload or short circuit

M4x10   M4 nut   Star washer

Grounding connection

Mains
108 - 132V~   50/60Hz

NOTE: The two PSU power outputs must be used in order to balance the consumption of the 11 processors in a subrack (for example: 6+5 or 5+6)

4.4. Broadband Amplifier
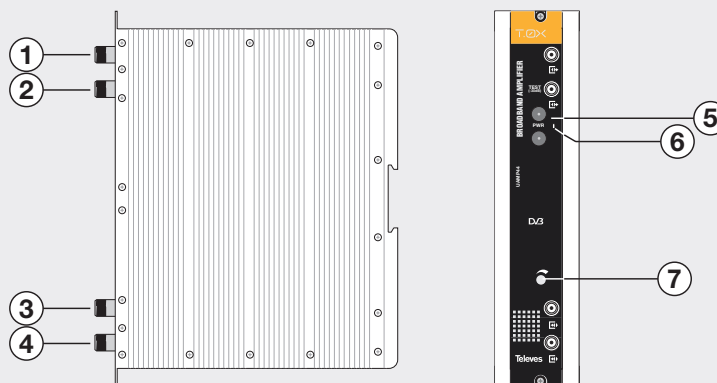
1. RF Output
2. Test Output
3. RF Input
4. RF Input

5. Powering connectors
6. Status LED
7. Attenuator

It features two signal input connectors, to allow mixing of the channels provided by two systems. Whenever is only used one input, please remember to terminate the non used port with the corresponding 75 ohm load, ref. 4061.

On its upper part the unit features one signal output connector and a test output connector (-30 dB)

The unit is powered via a power BUS made by independent power leads, which interconnect all the units each other.

4.5. Universal Programmer PCT 5.0
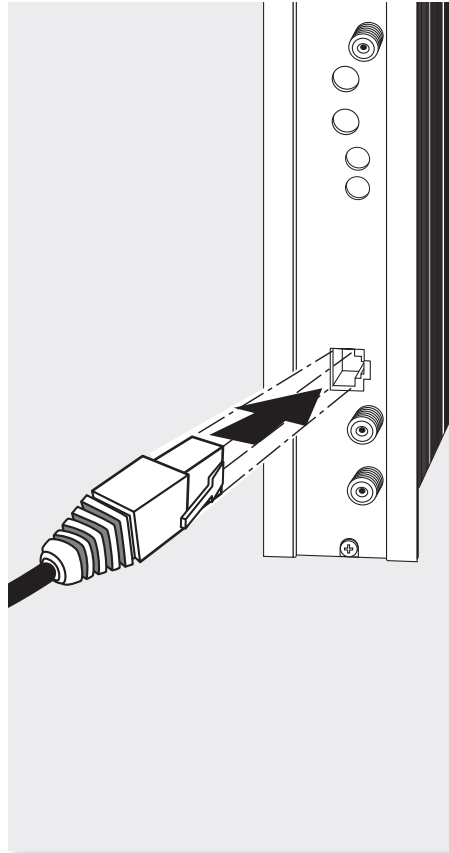
The programmer features 1 display. 3 LEDs and 4 buttons:

Programmer button function		
Button	Press mode	Function description
●	short	Enables parameter selection by shifting the cursor
●	long	Allows to swap between main and extended menus
▲ ▼	short	Change the parameter value selected by the flashing cursor
■	short	Changes menu
■	long	Save parameters to memory
■+●+▲	long	Increase screen contrast
■+●+▼	long	Decrease screen contrast
●+▲	long	Selects cloning menu

5. - Instructions for use

Insert the programmer into the corresponding connector ("PRGM socket") of the unit. Then the unit sends the parameters with what it was previously configured (frequency, output channels, input channels, output levels, ...) and a new configuration process can be carried out.

The first item displayed is the version of the Programmer firmware:

```
PCT firmware
version
_____
X.XX
```

Next it shows the firmware version of the DUAL A/D CHANNEL PROCESSOR unit:

```
Unit
firmware
version:
U:X.XX
```

Finally, it will be displayed the first device configuration menu, that is the one corresponding with its output menu.

5.1. Main Menu

To switch between A and B modules of the DUAL unit, keep pressed the button ● until the A/B indication stars to flash in the upper left corner of the display. Then use buttons ▲ and ▼ to select de desired module.

In both modules A and B, parameters changed are updated instantly; but in order to keep these operating parameters it will be necessary to save them before elapse 30 sec from the last change.

By short presses on the button ■, you can move through the available menus.

If it has been chosen **converter mode**, it will be displayed the sequence Output menu => Input menu, and so on.

In the case of being chosen **amplifier mode**, there is only one menu since both input and output channels are the same.

Remark 1: *Depending on how the processor is programmed (this is done accessing the extended menu, press button* ■ *twice and then, using buttons* ▲ *or* ▼*, select mode of operation) may function as amplifier (input frequency equal to output frequency) or converter (input frequency is not equal to output frequency).*

If the processor is programmed to operate as an **Amplifier** *there is only one setup menu; and if it is programmed to operate as a* **Converter**, *there will be two setup menus: output and input.*

Remark 2: *To change the menu language before starting the device configuration, you must access the "Language" menu.*

To do so, press button ● *(long press) to access the Extended menu, press button* ■ *six times in a row, and then, using buttons* ▲ *or* ▼, *select the language. Finally press button* ■ *(long press) to save changes. For more information, see paragraph "Extended Menu" => "Language Selection Menu".*

a. Output menu

This menu allows to select:

- **Output channel**, in both channel and frequency modes.
- **Output frequency offset** (in case of digital channel mode).
- **Output level**.

The contents of the output menu depends on how the unit has been programmed the last time (frequency or channel mode, analog or digital mode; options available in the extended menu).

```
A▶OUTPUT
Ch: C21 Of:0
(474.00 Mhz)
Level:    99
```

Channel mode operation for digital signals

If the digital signal option has been selected, it is displayed the number of the **output channe**l as well as its **central frequency**.

The **offset option** shifts the central frequency of the output channel an amount which can be configured by selecting one of the following values: +4, +3, +2, +1, 0, -1, -2, -3, -4.

Frequency steps for this option can also be configured in the corresponding extended menu. There are three choices: 25 KHz, 125 KHz and 166.66 KHz.

Finally, it will be displayed the **output level**, which can be changed using a scale of selectable values from 00 to 99:

- By selecting 99, the output level is the maximum that the unit can deliver (25 dBmV approx.).

- As soon as it is selected a lower value than 99, the output level will decrease all the way down till select 00, which is an output level 15 dB less than its maximum output level.

```
A▸OUTPUT
Ch: C21
<471.250Mhz>
Level:     99
```

Channel mode operation for analog signals

The display will show the number of the **output channe**l as well as its **Video Carrier** frequency.

This operating mode has not available the offset option.

Concerning the output level, it follows the same rules as above, and the display shows:

```
A▸OUTPUT
Frequency:
474.00 Mhz
Level:     99
```

Frequency mode operation

The display will show, either the Video Carrier frequency (for analog signals) or the central frequency of the channel (for digital signals).

Output frequency values range from 47 to 862 MHz.

The output level follows the same rules as above.

To modify parameters, scroll through the menu by pressing button ● (short press) until the required parameter flashes; then change it with buttons ▲ or ▼.

b. Input Menu

Allows selection of the **input channel**, in either channel mode or frequency mode, and the **input frequency offset** for digital channels.

The contents of the input menu depends on how the unit has been programmed the last time (frequency mode/channel mode; digital mode/analog mode) as can be done in the extended menu.

```
A▸INPUT
Ch: C21 Of:0
<474.00 MHz>
```

Channel mode operation for digital signals

The display will show the **input channel** as well as its **central frequency**.

Additionally, the **offset option** shifts the central frequency of the input channel an amount which can be configured by selecting one of the following values: +4, +3, +2, +1, 0, -1, -2, -3, -4.

Frequency steps for this option can also be configured in the corresponding extended menu. There are three choices: 25 KHz, 125 KHz and 166.66 KHz.

```
A▸INPUT
Ch: C21
<471.250MHz>
```

Channel mode operation for analog signals

The display will show the number of the **output channel** as well as its **Video Carrier** frequency.

This operating mode has not available the offset option.

```
A▸INPUT
Frequency:
474.00 MHz
```

Frequency mode operation

The display will show, either the Video Carrier frequency (for analog signals) or the central frequency of the channel (for digital signals).

Output frequency values range from 47 to 862 MHz.

To modify parameters, scroll through the menu by pressing button ● (short press) until the required parameter flashes; then change it with buttons ▲ or ▼.

5.2. Extended Menu

By keeping pressed the button ● for more than 3 sec. the programmer displays a number of menus less frequently used, which are called *extended menus*.

a. Menú de Configuración 1

This menu allows the selection of the **processor' address**, for the remote management of the headend by means of a CDC unit, as well as the **powering voltage for preamplifiers**.

> **Warning**:
> All devices controllable by the CDC (headend management system) are linked by a common control BUS (connectors labeled "CTRL"), and each device must have a unique address selected among 1 and 254, inside the bus (0 and 255 are values reserved for other purposes).

To change on address, you must press the ● key until the desired digit flashes. Then you can modify that digit by using buttons ▲ and ▼.

The next parameter in this menu is the **voltage** to be available on the input port of the unit, intended to power preamplifiers.

To select powering voltage for preamplifiers, use also buttons ▲ and ▼.

Choices are:

Off	No voltage on the input port

12V	12 Vdc on the input port

24V	24 Vdc on the input port

Save parameters as usually by pressing button ■ (long press).

```
▸CONFIG >>
Adr CDC: 123
Preamp:  off
```

b. Configuration Menu 2

This menu allows to select one of the two possible processor operating modes: **Amplifier or Converter**.

In the **Amplifier** option, output frequency is equal to input frequency, as well as the offset, and therefore is shown only the output menu.

In the **Converter** option, output frequency is not equal to input frequency, and therefore are shown both output and input menus

```
A▸CONFIG >>
Amplifier
Channel tab.
CCIR N.Z.Ind
```

In the case of converter mode operation, use buttons ▲ and ▼ to choose how to select the input and output frequencies for:

- frequency mode, or
- channel mode.

In channel mode (Tables of Channels) there are the following choices:

- EIA
- Broadcast
- EIA (IRC)
- EIA (HRC)

c. Configuration Menu 3

```
A▶CONFIG  >>

Slope:  0
```

The next parameter is the **Slope**. Choices are 0, 1, 2, 3 and 4.

The slope balances the signal within the channel.

When the signal is analog, it changes the level difference between video carrier and audio carrier.

d. Configuration Menu 4

```
A▶CONFIG  >>
Mode:Digital
In: 125MHz
Out: 125MHz
```

This menu allows to choose between **analog or digital signals**, for both input and output ports.

- **Digital signals**

  There are three possible choices for frequency steps: 25, 125 and 166.66 KHz.

- **Analog signals**

  The frequency step is 250 KHz only.

In any of the extended menus 1, 2 and 3, the first press on button ● (short press) allows accessing to the selection of module A or B within the processor, by highlighting one of the two letters. Then use buttons ▲ and ▼ to select one of both modules.

The next press on button ● (short press) makes flash the name of the parameter to be modified.

Then use buttons ▲ and ▼ to change its value.

e. Configuration Menu 5

```
A▶FINE ADJ
Freq: AUTO
Gain: AUTO
Filter:AUTO
```

Each time you save a new configuration, processor adjusts automatically the SAT stage, both gain and frequency, to get the best possible quality parameters of the output signal.

This menu allows you to modify slightly the automatic adjustment made by processor to optimize the characteristics of a specific input signal, if necessary.

The first parameter of this menu adjusts the **SAT frequency** of the processor.

The possible values are –4, -3, -2, -1, AUTO, +1, +2, +3, +4.

Positive values force the processor to increase slightly the central frequency of internal filters; a higher value means a higher increase.

On the contrary, negative values decrease this frequency.

The second parameter of this menu adjusts the **SAT gain** of the processor.

The possible values are AUTO, +1, +2, +3.

Positive values force the processor to increase slightly the SAT gain; a higher value means a higher increase.

The third and last parameter in this menu sets the degree of selectivity in the adjustment of SAT internal filters.

f. Temperature Menu

This menu shows the current measured temperature, and the peak in º F.

The maximum value is stored in nonvolatile memory and may also be reset by pressing and holding the button ● for a few seconds.

```
▶TEMPERATURE
Now:  103
Max:  118
      ●reset
```

The working temperature ranges displayed are the following:

- Optimum temperature: 25 to 149 ºF
- Temperature is high: 150 to 184 ºF
- Temperature is excessive: > 185 ºF

The temperature accuracy is ± 1ºF.

In the event that the maximum temperature recorded is outside the optimal range, the headend installation should be modified to try to reduce its ambient temperature, e.g. by mounting the units inside a ventilated T.0X cabinet ref. 507202.

To check whether this change is effective, reset the maximum temperature recorded and check again its value after some working time has elapsed.

g. Version menu

This menu shows to the user the firmware versions loaded in the processor.

```
FW. Vers.
Vx.xx.xxxxx
Boot Vers
Vx.xx.xxxxx
```

h. Language menu

This menu allows to select the language used to program the processor (Spanish / English / German):

```
▶ LANGUAGE

    English
```

Select one of them by pressing buttons ▲ and ▼.

5.3. Saving parameters

After setting up the unit by means of the two menus available, main and extended, all data will be saved by pressing the button ■ for about 3 seconds.

The display shows:

```
Saving
settings and
restarting
...
```

Do not remove the programmer before the message disappears from the screen.

If configuration data are changed but not saved, previous settings will be restored after about 30 seconds. Therefore all changes made would be cancelled.

6. - Device control

This version of the DUAL A/D CHANNEL PROCESSOR allows configuration and monitoring via a PC, both locally and remotely.
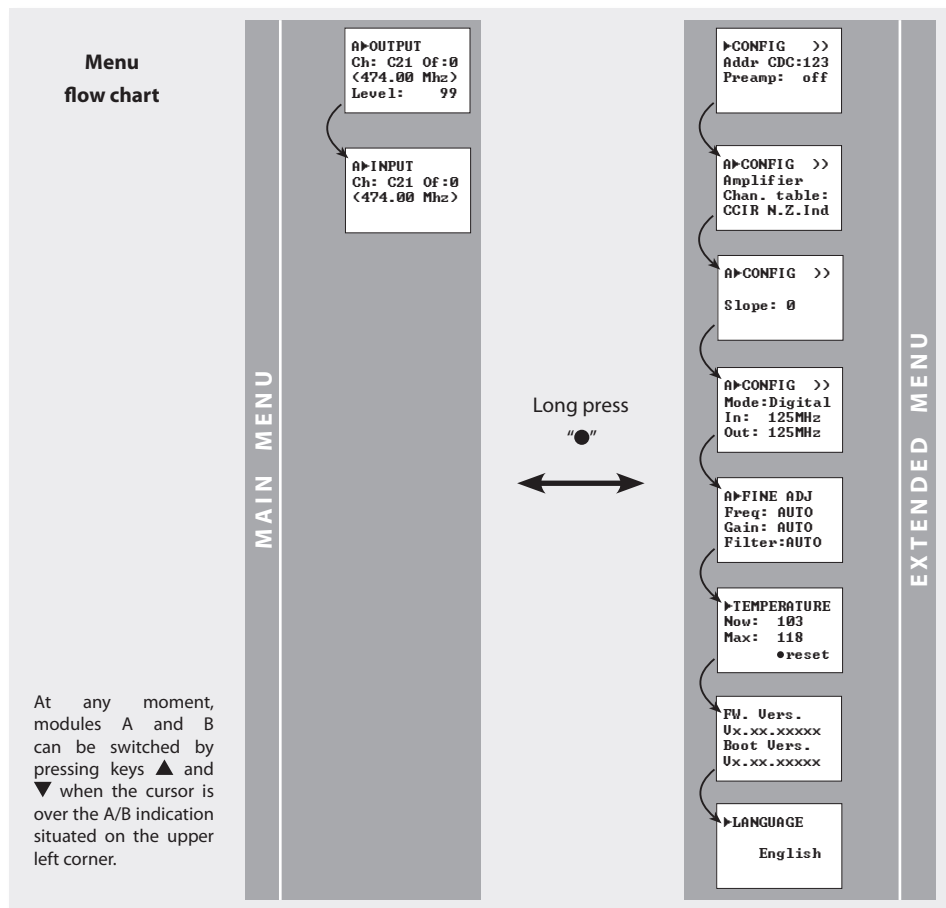
a. Local control

The "Headend Management" programme (v2.1.4.59 or higher) is required, as well as a special lead (provided with the programme) that connects a PC serial port to the "PRGM" socket of the DUAL A/D CHANNEL PROCESSOR.
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. 555902) 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 imperative that each module is programmed with a different device address selected between 1 and 254.

Menu flow chart

MAIN MENU

```
A▶OUTPUT
Ch: C21 Of:0
<474.00 Mhz>
Level:    99
```

```
A▶INPUT
Ch: C21 Of:0
<474.00 Mhz>
```

Long press "●"

At any moment, modules A and B can be switched by pressing keys ▲ and ▼ when the cursor is over the A/B indication situated on the upper left corner.

EXTENDED MENU

```
▶CONFIG    >>
Addr CDC:123
Preamp:  off
```

```
A▶CONFIG  >>
Amplifier
Chan. table:
CCIR N.Z.Ind
```

```
A▶CONFIG  >>

Slope: 0
```

```
A▶CONFIG  >>
Mode:Digital
In:  125MHz
Out: 125MHz
```

```
A▶FINE ADJ
Freq: AUTO
Gain: AUTO
Filter:AUTO
```

```
▶TEMPERATURE
Now:  103
Max:  118
     ●reset
```

```
FW. Vers.
Vx.xx.xxxxx
Boot Vers.
Vx.xx.xxxxx
```

```
▶LANGUAGE

    English
```

7. Example of application

Distribution of 20 channels
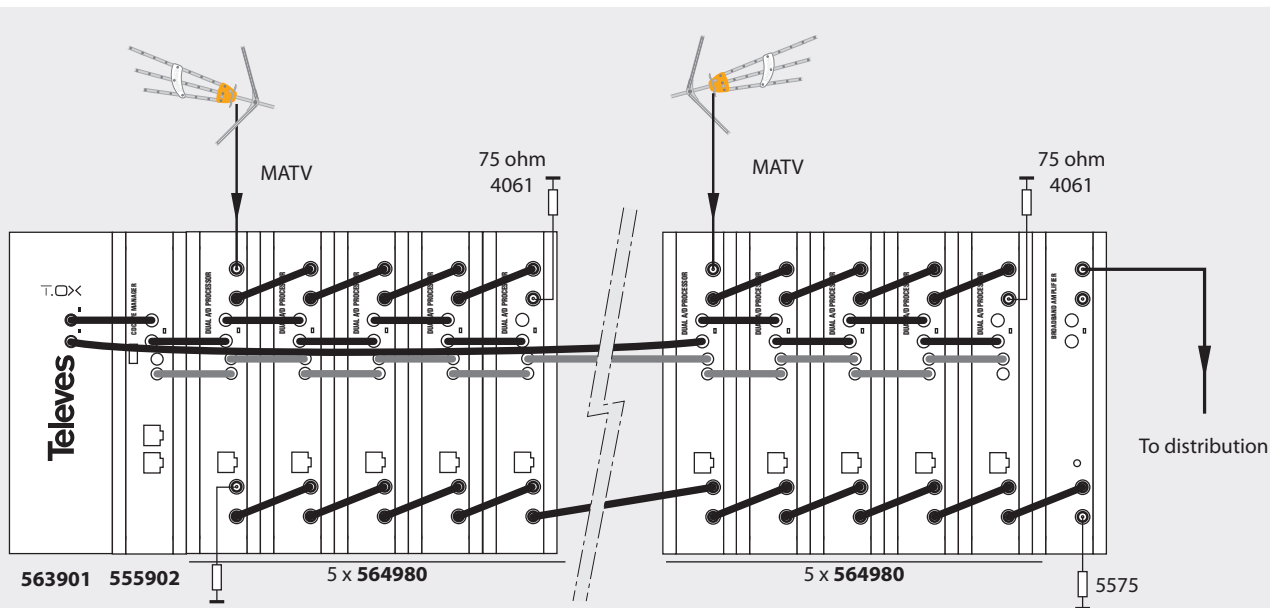
This figure depicts a headend configured for distributing 10x2 channels processed.
It is necessary to take into account the constraint of 4 A per each one of the outputs of the PSU.

8. 19" Rackmount standards (max. 56 units - 7 subracks with 5U height - 8'7")

8.1. Installation of the rack with ventilation facilities

To aid in cooling for proper operation, especially in warm locations (>113ºF ambient), installation of 2 25W or greater fans is recommended at the top of the rack. See fig 1 and 2.

Be sure to leave approximately 3-5 cm of ventilation slots at the top for proper air flow. See fig 2 and 3.

fig. 1

fig. 2

fig. 3
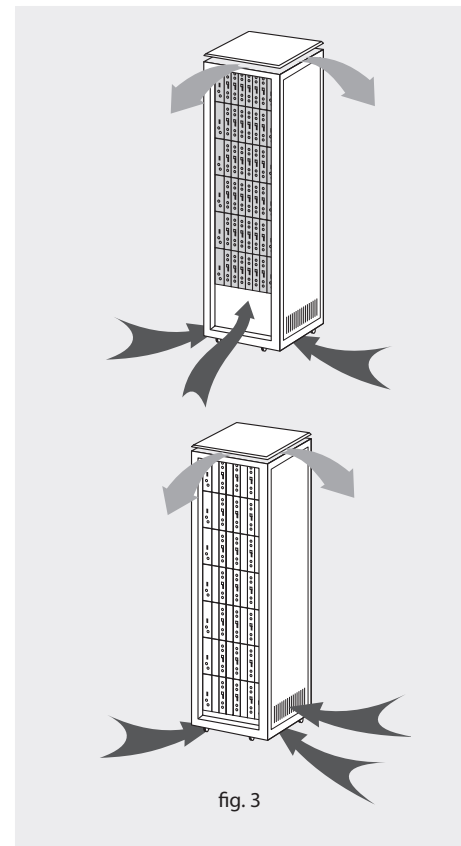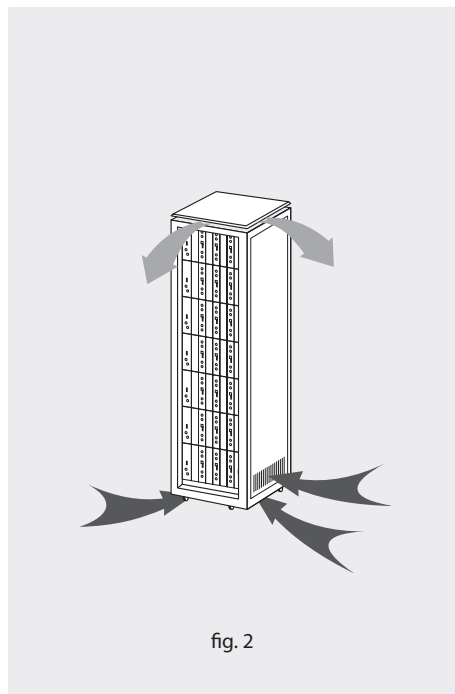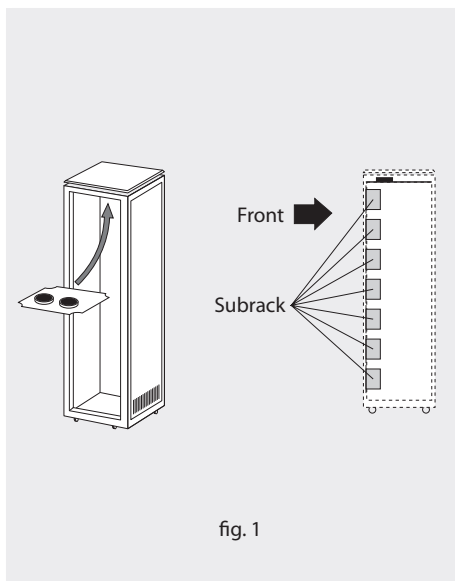
In order to provide adequate cooling, proper air-flow must be established. As such, the following items must be observed:

- Do not open the side doors. This could cause fans to move air from outside rather than through the rack.
- Do not place objects near the rack that could clog the ventilation inlets and outlets.
- If the rack is not complete, the subracks must be placed from the top downwards without leaving large gaps in between, fig. 4.

fig. 4
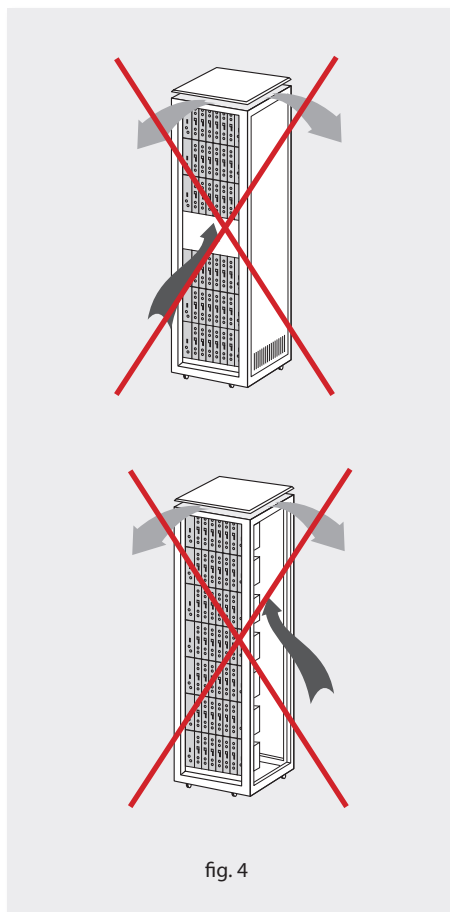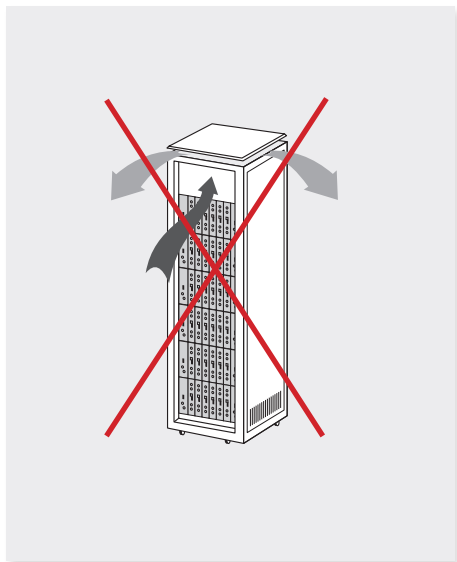
8.2. Installation of the rack without fans

If fans are not available and the rack is installed in ambient temperatures near 113 ºF, it is advisable to leave the rack sides completely open. See fig 5.

EN

fig. 5
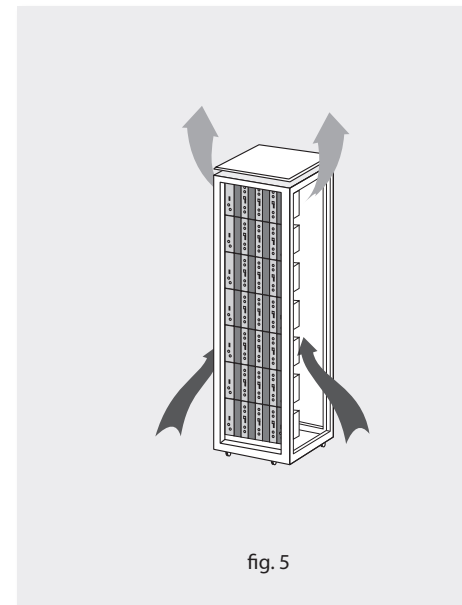
A. Table of channels

Table1				Table2		Table3				Table4			
EIA				Broadcast		EIA (IRC)				EIA (HRC)			
2	55.2500	73	517.2500	2	55.25	2	55.2625	72	511.2625	2	54.0027	72	510.0255
3	61.2500	74	523.2500	3	61.25	3	61.2625	73	517.2625	3	60.0030	73	516.0258
4	67.2500	75	529.2500	4	67.25	4	67.2625	74	523.2625	4	66.0033	74	522.0261
5	77.2500	76	535.2500	5	77.25	1	73.2625	75	529.2625	1	72.0036	75	528.0264
6	83.2500	77	541.2500	6	83.25	5	79.2625	76	535.2625	5	78.0039	76	534.0267
95	91.2500	78	547.2500	7	175.25	6	85.2625	77	541.2625	6	84.0042	77	540.0270
96	97.2500	79	553.2500	8	181.25	95	91.2625	78	547.2625	95	90.0045	78	546.0273
97	103.2500	80	559.2500	9	187.25	96	97.2625	79	553.2625	96	96.0048	79	552.0276
98	109.2750	81	565.2500	10	193.25	97	103.2625	80	559.2625	97	102.0051	80	558.0279
99	115.2750	82	571.2500	11	199.25	98	109.2750	81	565.2625	98	108.025	81	564.0282
14	121.2625	83	577.2500	12	205.25	99	115.2750	82	571.2625	99	114.025	82	570.0285
15	127.2625	84	583.2500	13	211.25	14	121.2625	83	577.2625	14	120.0060	83	576.0288
16	133.2625	85	589.2500	14	471.25	15	127.2625	84	583.2625	15	126.0063	84	582.0291
17	139.2500	86	595.2500	15	477.25	16	133.2625	85	589.2625	16	132.0066	85	588.0294
18	145.2500	87	601.2500	16	483.25	17	139.2625	86	595.2625	17	138.0069	86	594.0297
19	151.2500	88	607.2500	17	489.25	18	145.2625	87	601.2625	18	144.0072	87	600.0300
20	157.2500	89	613.2500	18	495.25	19	151.2625	88	607.2625	19	150.0075	88	606.0303
21	163.2500	90	619.2500	19	501.25	20	157.2625	89	613.2625	20	156.0078	89	612.0306
22	169.2500	91	625.2500	20	507.25	21	163.2625	90	619.2625	21	162.0081	90	618.0309
7	175.2500	92	631.2500	21	513.25	22	169.2625	91	625.2625	22	168.0084	91	624.0312
8	181.2500	93	637.2500	22	519.25	7	175.2625	92	631.2625	7	174.0087	92	630.0315
9	187.2500	94	643.2500	23	525.25	8	181.2625	93	637.2625	8	180.0090	93	636.0318
10	193.2500	100	649.2500	24	531.25	9	187.2625	94	643.2625	9	186.0093	94	642.0321
11	199.2500	101	655.2500	25	537.25	10	193.2625	100	649.2625	10	192.0096	100	648.0324
12	205.2500	102	661.2500	26	543.25	11	199.2625	101	655.2625	11	198.0099	101	654.0327
13	211.2500	103	667.2500	27	549.25	12	205.2625	102	661.2625	12	204.0102	102	660.0330
23	217.2500	104	673.2500	28	555.25	13	211.2625	103	667.2625	13	210.0105	103	666.0333
24	223.2500	105	679.2500	29	561.25	23	217.2625	104	673.2625	23	216.0108	104	672.0336
25	229.2625	106	685.2500	30	567.25	24	223.2625	105	679.2625	24	222.0111	105	678.0339
26	235.2625	107	691.2500	31	573.25	25	229.2625	106	685.2625	25	228.0114	106	684.0342
27	241.2625	108	697.2500	32	579.25	26	235.2625	107	691.2625	26	234.0117	107	690.0345
28	247.2625	109	703.2500	33	585.25	27	241.2625	108	697.2625	27	240.0120	108	696.0348
29	253.2625	110	709.2500	34	591.25	28	247.2625	109	703.2625	28	246.0123	109	702.0351
30	259.2625	111	715.2500	35	597.25	29	253.2625	110	709.2625	29	252.0126	110	708.0354
31	265.2625	112	721.2500	36	603.25	30	259.2625	111	715.2625	30	258.0129	111	714.0357

32	271.2625	113	727.2500	37	609.25	31	265.2625	112	721.2625	31	264.0132	112	720.0360
33	277.2625	114	733.2500	38	615.25	32	271.2625	113	727.2625	32	270.0135	113	726.0363
34	283.2625	115	739.2500	39	621.25	33	277.2625	114	733.2625	33	276.0138	114	732.0366
35	289.2625	116	745.2500	40	627.25	34	283.2625	115	739.2625	34	282.0141	115	738.0369
36	295.2625	117	751.2500	41	633.25	35	289.2625	116	745.2625	35	288.0144	116	744.0372
37	301.2625	118	757.2500	42	639.25	36	295.2625	117	751.2625	36	294.0147	117	750.0375
38	307.2625	119	763.2500	43	645.25	37	301.2625	118	757.2625	37	300.0150	118	756.0378
39	313.2625	120	769.2500	44	651.25	38	307.2625	119	763.2625	38	306.0153	119	762.0381
40	319.2625	121	775.2500	45	657.25	39	313.2625	120	769.2625	39	312.0156	120	768.0384
41	325.2625	122	781.2500	46	663.25	40	319.2625	121	775.2625	40	318.0159	121	774.0387
42	331.2750	123	787.2500	47	669.25	41	325.2625	122	781.2625	41	324.0162	122	780.0390
43	337.2625	124	793.2500	48	675.25	42	331.2750	123	787.2625	42	330.0165	123	786.0393
44	343.2625	125	799.2500	49	681.25	43	337.2625	124	793.2625	43	336.0168	124	792.0396
45	349.2625	126	805.2500	50	687.25	44	343.2625	125	799.2625	44	342.0171	125	798.0399
46	355.2625	127	811.2500	51	693.25	45	349.2625	126	805.2625	45	348.0174	126	804.0402
47	361.2625	128	817.2500	52	699.25	46	355.2625	127	811.2625	46	354.0177	127	810.0405
48	367.2625	129	823.2500	53	705.25	47	361.2625	128	817.2625	47	360.0180	128	816.0408
49	373.2625	130	829.2500	54	711.25	48	367.2625	129	823.2625	48	366.0183	129	822.0411
50	379.2625	131	835.2500	55	717.25	49	373.2625	130	829.2625	49	372.0186	130	828.0414
51	385.2625	132	841.2500	56	723.25	50	379.2625	131	835.2625	50	378.0189	131	834.0417
52	391.2625	133	847.2500	57	729.25	51	385.2625	132	841.2625	51	384.0192	132	840.0420
53	397.2625	134	853.2500	58	735.25	52	391.2625	133	847.2625	52	390.0195	133	846.0423
54	403.2500	135	859.2500	59	741.25	53	397.2625	134	853.2625	53	396.0198	134	852.0426
55	409.2500			60	747.25	54	403.2625	135	859.2625	54	402.0201	135	858.0429
56	415.2500			61	753.25	55	409.2625			55	408.0204		
57	421.2500			62	759.25	56	415.2625			56	414.0207		
58	427.2500			63	765.25	57	421.2625			57	420.0210		
59	433.2500			64	771.25	58	427.2625			58	426.0213		
60	439.2500			65	777.25	59	433.2625			59	432.0216		
61	445.2500			66	783.25	60	439.2625			60	438.0219		
62	451.2500			67	789.25	61	445.2625			61	444.0222		
63	457.2500			68	795.25	62	451.2625			62	450.0225		
64	463.2500			69	801.25	63	457.2625			63	456.0228		
65	469.2500					64	463.2625			64	462.0231		
66	475.2500					65	469.2625			65	468.0234		
67	481.2500					66	475.2625			66	474.0237		
68	487.2500					67	481.2625			67	480.0240		
69	493.2500					68	487.2625			68	486.0243		
70	499.2500					69	493.2625			69	492.0246		
71	505.2500					70	499.2625			70	498.0249		
72	511.2500					71	505.2625			71	504.0252		

Televés Limited Warranty

A. Televés warrants, only to the original Purchaser, all Products be free from any defect in materials or workmanship for a period of two (2) years from the date of original purchase, unless otherwise specified.

B. Televés shall, free of charge and in its sole discretion, either repair, replace with a new or factory reconditioned equivalent, or refund the purchase price of the Product(s), that has been determined by Televés to be defective in material or workmanship, subject to the limits of this warranty.

C. This warranty excludes any damage or inoperability resulting from:

I. Use or installation that is not in strict compliance with the written instructions and specifications;

II. Any modification or alteration performed by any third party not authorized in writing by Televés;

III. Service or repair performed by any third party not authorized in writing by Televés;

IV. Misuse, abuse, intentional harm, or lack of reasonable care;

V. Fire, ice, snow, rain, wind, water, volcano, excessive heat or cold, lightning, flood, power surge, earthquake, or any other acts of God;

VI. War, crime, strike, riot, electro-magnetic pulse, or any other acts beyond the control of Televés;

VII. Shipping.

D. All claims under the terms of this warranty must be made in writing, by the original Purchaser, within fourteen (14) days of the defect being known to the Purchaser. Such claims shall be accompanied by a description of any material facts related to the claimed defect and the invoice or other proof of original purchase date and price. If Televés so requests, the Purchaser shall, at Purchaser's expense, deliver the claimed Product(s) to Televés, within 14 days of the date of the return authorization. Under no circumstances shall the Product(s) be returned to Televés without a return authorization.

E. Any refund to the Purchaser, shall be limited to the purchase price of the Product(s), excluding any applicable taxes, duties, freight costs, removal costs, installation costs, or any other charges incident to the purchase of the product.

F. Any damage caused by shipper shall be claimed with the shipper in accordance with the shipper's policies and procedures.

G. **Televés shall in no event and under no circumstances be liable or responsible for any consequential, indirect, incidental, punitive, direct or special damages based upon breach of warranty, breach of contract, negligence, strict tort liability or otherwise or any other legal theory, arising directly or indirectly from the sale, use, installation or failure of any product acquired by Purchaser from Televés.**

H. This limited warranty extends to the original Purchaser and cannot be assigned or transferred to any other party without the prior express written permission of Televés, which permission Televés may withhold for any reason or for no reason at all.

I. Televés will not assume any liabilities for any other warranties, whether statutory, express or implied, made by any other person.

J. **Televés reserves the right to modify or discontinue this warranty at Televés' sole discretion without notification. No other warrantees are expressed or implied.**

Televés Extended Five (5) Year Warranty

K. Any product in the T.0X family is subject to a five (5) year warranty from the date of original purchase. This three (3) year extension applies only to new Product(s) in its initial installation and only extends the duration of the warranty beyond the original duration subject to the addition of the following terms:

I. The Product(s) shall have been installed in one and only one location and its use shall be in strict compliance with the written instructions and specifications;

II. An approved forced air ventilation system, designed to extend the life of the product, shall be in use during the entire installed life of the Product(s);

III. The Product(s) shall be registered with Televés, at the time of installation;

IV. Photographic evidence of the proper installation of the Product(s) shall be provided at the time of registration;

V. Televés reserves the right to physically inspect the installation of any claimed Product(s);

VI. The registration number, provided by Televés, at the time of registration, shall be provided by the Purchaser at the time of claim;

VII. Photographic evidence of the installation of the claimed Product(s) shall provided at the time of claim documenting the status of the installation at the time the defect is made known to the Purchaser;

VIII. Any cost incurred by Televés, related to a claim under the terms of this extended warranty, for a product that is found to not be defective under the terms of this warranty, may be charged to the Purchaser.

DECLARATION OF CONFORMITY Nº 131029085507

Per FCC Part 2 Section 2.1077(a)

FC

Responsible Party Name:	**Televes S.A.**
Address:	**Rua Benéfica de Conxo, 17**
	15706 - Santiago de Compostela
	Spain
Phone / Fax Nº:	**981522200 / 981522262**

Hereby declares that the product

Product Name:	**T.0X DUAL A/D CHANNEL PROCESSOR**
Model Number:	**564980**

Conforms to the following specifications:

FCC Part 15, Subpart B, Section 15.107(e) and section 15.109(g)

Supplementary Information:

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Representative Person's Name:	**José L. Fernández Carnero**
Signature:	

Date: **29/10/2013**

televes.com

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