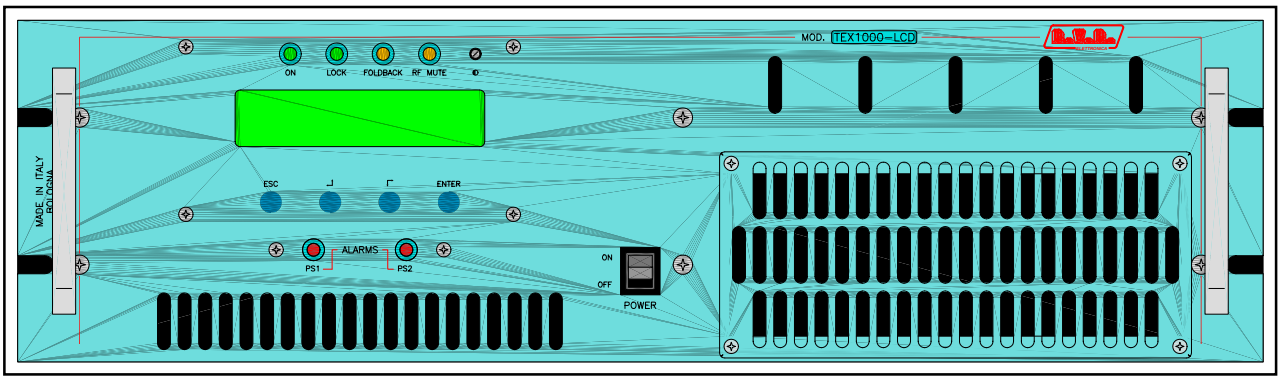
TEX1000



User Manual

Volume 1

Manufactured by R.V.R. ELETTRONICA **Italy**

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09/09/03	1.0	First Version	G. De Donno

TEX1000 - User Manual
Version 1.0

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Notification of intended purpose and limitations of product use
This product is a FM transmitter intended for FM audio broadcasting. It utilises operating frequencies not harmonised in the intended countries of use.
The user must obtain a license before using the product in intended country of use. Ensure respective country licensing requirements are complied with.
Limitations of use can apply in respect of operating freuency, transmitter power and/or channel spacing.

Declaration of Conformity
Hereby, R.V.R. Elettronica SpA, declares that this FM transmitter is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.

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Table of Contents

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1. Preliminary Instructions

This manual is written as a general guide for those having previous knowledge and experience with this kind of equipment, well conscious of the risks connected with the operation of electrical equipment.

It is not intended to contain a complete statement of all safety rules which should be observed by personnel in using this or other electronic equipment.

The installation, use and maintenance of this piece of equipment involve risks both for the personnel performing them and for the device itself, that shall be used only by trained personnel.

R.V.R. Elettronica SpA doesn't assume responsibility for injury or damage resulting from improper procedures or practices by untrained/unqualified personnel in the handling of this unit.

Please observe all local codes and fire protection standards in the operations of this unit.

WARNING: always disconnect power before opening covers or removing any part of this unit.
Use appropriate grounding procedures to short out capacitors and high voltage points before servicing.

WARNING: this device can irradiate radio frequency waves, and if it's not installed following the instructions contained in the manual and local regulations it could generate interferences in radio communications.
This is a "CLASS A" equipment. In a residential place this equipment can cause hash. In this case can be requested to user to take the necessary measures.

R.V.R. Elettronica SpA reserves the right to modify the design and/or the technical specifications of the product and this manual without notice.

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2. Warranty

Any product of **R.V.R. Elettronica** is covered by a 24 (twenty-four) month warranty.

For components like tubes for power amplifiers, the original manufacturer's warranty applies.
R.V.R. Elettronica SpA extends to the original end-user purchaser all manufacturers warranties which are transferrable and all claims are to be made directly to R.V.R. per indicated procedures.

Warranty shall not include:

1 Damage while the equipment is being shipped to R.V.R. for repairs;

2 Any unauthorized repair/modification;

3 Incidental/consequential damages as a result of any defect

4 Nominal non-incidental defects

5 Re-shipment costs or insurance of the unit or replacement units/parts

Any damage to the goods must be reported to the carrier in writing on the shipment receipt.

Any discrepancy or damage discovered subsequent to delivery, shall be reported to **R.V.R. Elettronica** within **5** (five) days from delivery date.

To claim your rights under this warranty, you shold follow this procedure:

1 Contact the dealer or distributor where you purchased the unit. Describe the problem and, so that a possible easy solution can be detected.

Dealers and Distributors are supplied with all the information about problems that may occur and usually they can repair the unit quicker than what the manufacturer could do. Very often installing errors are discovered by dealers.

2 If your dealer cannot help you, contact **R.V.R. Elettronica** and explain the problem. If it is decided to return the unit to the factory, **R.V.R. Elettronica** will mail you a regular authorization with all the necessary instructions to send back the goods.

3 When you receive the authorization, you can return the unit. Pack it carefully for the shipment, preferably using the original packing and seal the package perfectly. The customer always assumes the risks of loss (i.e., R.V.R. is never responsible for damage or loss), until the package reaches R.V.R. premises. For this reason, we suggest you to insure the goods for the whole value. Shipment must be effected C.I.F. (PREPAID) to the address specified by R.V.R.'s service manager on the authorization

DO NOT RETURN UNITS WITHOUT OUR AUTHORIZATION AS THEY WILL BE REFUSED

4 Be sure to enclose a written technical report where mention all the problems found and a copy of your original invoice establishing the starting date of the warranty.

Replacement and warranty parts may be ordered from the following address. Be sure to include the equipment model and serial number as well as part description and part number.

R.V.R. Elettronica SpA
Via del Fonditore, 2/2c
40138 BOLOGNA
ITALY
Tel. +39 051 6010506

3. First Aid

The personnel employed in the installation, use and maintenance of the device, shall be familiar with theory and practice of first aid..

3.1 Treatment of electrical shocks

3.1.1 If the victim is not responsive

Follow the A-B-C's of basic life support

- Place victim flat on his backon a hard surface.
- Open airway: lift up neck, push forehead back (Fig. 3-1).
- clear out mouth if necessary and observe for breathing
- if not breathing, begin artificial breathing (Figure 3-2): tilt head, pinch nostrils, make airtight seal, four quick full breaths. Remember mouth to mouth resuscitation must be commenced as soon as possible

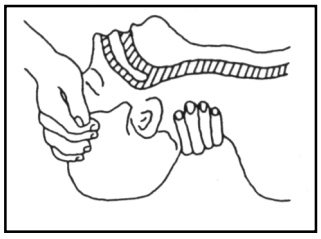


Figure 3-1

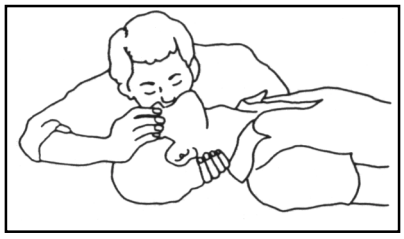


Figure 3-2

- Check carotid pulse (Fig 3-3); if pulse is absent, begin artificial circulation (Fig. 3-4) depressing sternum (Fig. 3-5)

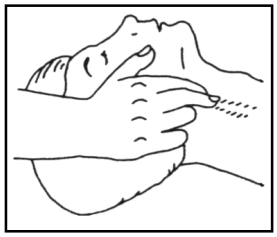


Figure 3-3

Figure 3-4

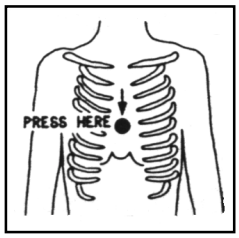


Figure 3-5

- In case of only one rescuer, 15 compressions alternated to two breaths.
- If there are two rescuers, the rythm shall be of one brath each 5 compressions.
- Do not interrupt the rythm of compressions when the second person is giving breath.
- Call for medical assistance as soon as possible.

3.1.2 If victim is responsive

- Keep them warm
- Keep them as quiet as possible
- Loosen their clothing (a reclining position is recommended)
- Call for medical help as soon as possible

3.2 Treatment of electrical Burns

3.2.1 Extensive burned and broken skin

- Cover area with clean sheet or cloth
- Do not break blisters, remove tissue, remove adhered particles of clothing, or apply any salve or ointment.
- Treat victim for shock as required.
- Arrange transportation to a hospital as quickly as possible.
- If arms or legs are affected keep them elevated

If medical help will not be available within an hour and the victim is conscious and not vomiting, give him a weak solution of salt and soda: 1 level teaspoonful of salt and 1/2 level teaspoonful of baking soda to each quart of water (neither hot or cold). Allow victim to sip slowly about 4 ounces (half a glass) over a period of 15 minutes. Discontinue fluid if vomiting occurs

DO NOT give alcohol

3.2.2 Less severe burns

- Apply cool (not ice cold) compresses using the cleansed available cloth article.
- Do not break blisters, remove tissue, remove adhered particles of clothing, or apply salve or ointment.
- Apply clean dry dressing if necessary.
- Treat victim for shock as required.
- Arrange transportation to a hospital as quickly as possible
- If arms or legs are affected keep them elevated.

4. General Description

The **TEX1000**, made by R.V.R. Elettronica SpA, is an **exciter for Frequency Modulated audio broadcasting** in a frequency modulation able to transmit in the band between 87.5 and 108 MHz in 10kHz step, with an output RF power adjustable up to a maximum of 1000 W into a 50 Ohm standard load.

TEX1000 is available in version with Integrarted Stereo Coder (indicated with "/S" code) or in Mono/MPX version. The Mono/MPX model can be used for Mono transmission or for Stereo transmission through External Stereo Coder use.

This exciter contains a low-pass filter that reduces the harmonic emissions to below the limits allowed by international regulations (CCIR or FCC), and can therefore be used as a **transmitter** connected directly to the antenna.

Outstanding audio features this device has are low distortion and intermodulation values (typically 0.03%) and the high signal to noise ratio (typically 80 dB).

Important TEX1000 features are compactness and great use simplicity. The machine, infact, was designed to be modular: its various functions are run from modules nearly all connected to each other with male and female connectors or with flat cables ending in connectors. This type of design makes maintenance operations and any required module replacement easier.

The RF power section makes use of four MOSFET modules, able to deliver more than 300W each.

The operating frequency is governed by a thermally-compensated, reference oscillator working within a phase-locked loop (PLL). The TEX1000 reaches frequency lock within a maximum of 30 seconds.

TEX1000 is able to work in all range frequency without calibration and setting operations.

The microprocessor system includes an LCD display on front panel and push-button panel for interaction with the user, and implements the following functions:

- Setting the output power
- Setting the operating frequency
- Activation and deactivation of power delivery
- Measurement and display of the working parameters of the exciter
- Communications with outside devices

Four LEDs indicate the machine status and are found on the front panel: ON, LOCK, FOLDBACK and RF MUTE, moreover two red LEDs indicate eventual Power Supply breakdowns.

The exciter's management software is based on a menu system. The user can navigate between the various submenus by using four push buttons: ESC, LEFT/UP, RIGHT/DOWN and ENTER.

On rear panel there are Mains connectors, with a voltage selector that allow to use different mains voltage (Full Range version), audio input and RF output connectors, telemetry connector, protection fuses, two inputs for modulated signals on subcarriers from special external encoders normally used in Europe for RDS (Radio Data System) transmission.

5. Quick guide for installation and use

This chapter contains the necessary information for installing and using the machine. In the event any aspects are not completely clear, for example when using the machine for the first time, we recommend you carefully read the entire description contained in this manual.

5.1 Preparation

Unpack the exciter and before doing any other operation, be sure it has not been damaged during transport. In particular check that all the connectors are in perfect condition.

Check that the voltage selected coincide with mains voltage. The protection fuses can be accessed from the outside on the rear panel (see figures 6.2). Extract the fuse carrier with a screwdriver to check its integrity or for replacement, if necessary. The fuses to be used are different and depends from the mains voltage selected:

Mains Voltage: 115 V
Mains Fuse: 25 A 10x38
Service Fuse: 2 A 5x20

Mains Voltage: 230 V
Mains Fuse: 16 A 10x38
Service Fuse: 1 A 5x20

Check that the TEX1000 switch is in the "off" position. POWER button is on the front panel (see figure 6.1) and inhibits “Surge Protection” machine’s card.

Connect the RF output of the exciter to the antenna cable or to a fictitious cargo able to dissipate the power generated by the TEX1000.

ATTENTION: without load, when machine is working, don’t touch RF output connector to avoid electrical shocks and burns.

Connect the mains cable to the MAINS connector on rear panel (see figure 6.2).

ATTENTION: mains connector is a bare terminals, attention that line is not under voltage when you are connecting it.

ATTENTION: It is crucial that the mains system be provided with earthing to ensure both the operators' safety and correct operation of the device.

Connect the audio cables and RDS/SCA of the signal source to the proper connectors on the back of the exciter, help yourself with figure 6.2.

5.2 Use

Energize the exciter by putting the switch found on the front panel in the "ON" position.

Enter the "Set" menu and set the desired operating frequency. See chapter 5.4 for a description of the various menus..

By using the switches and trimmer found on the rear panel, set the characteristics (impedance, preemphasis and, if it's necessary, stereo/mono) and the levels of the audio and RDS inputs (if used).

NOTE: When the device leaves the factory, it is delivery with the output power adjustment at minimum and in the OFF position. It is however recommended that you always check the set level before activating power supply, especially if the machine is used as a modulator for a power amplifier.

Set the desired power level from the predefined menu.

Activate the RF power output from the "Fnc" menu.

5.3 Settings and calibration

The only adjustments to be manually made on the TEX1000 are those relating to the audio operation levels and modes.

A trimmer for each one of the exciter's inputs is on the rear panel of the device. The printing on the panel indicates which input each trimmer refers to. The sensitivity of the various inputs can be adjusted using the trimmers within the limits described in the following tables:

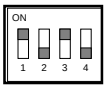
Ingresso	Figura 6.2	Trimmer	Sensibilità	Note
RDS	[9]	[11]	-20 ÷ +13 dBm	Input level for 2,0 kHz deviation (-30 dB)
SCA1	[8]	[12]	- 8 ÷ +13 dBm	Input level for 7,5 kHz deviation (-20 dB)
SCA2	[7]	[10]	- 8 ÷ +13 dBm	
Left	[28]	[25]	-13 ÷ +13 dBm	Input level for 75 kHz deviation (0 dB)
Right	[14]	[13]	-13 ÷ +13 dBm	

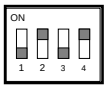
When adjusting the sensitivity level of the inputs, keep in mind that the instantaneous modulation level is given in the predefined menu and that an indicator signals the 75 kHz level. To get a proper adjustment, we recommend you put a level signal on the machine's output equivalent to the level of its own audio program and adjust the relative trimmer until the instantaneous deviation coincides with the indication of 75 kHz.

To adjust the levels of the inputs of the subcarriers, you can use a similar procedure while getting help from the "x10" option that can be selected from the Fnc menu. With this option, the modulation level indicated is multiplied by a factor 10 so the drawn indication of the predefined menu coincides with a deviation value of 7.5 kHz.

For the stereophonic version, there is a special menu in which the levels of the Right and Left channels are indicated separately with the relative indicators of the nominal levels for the maximum deviation of 75 kHz.

- Preemphasis (switch [5] Figure 6.2):



50 µs


75 µs

- L and R input impedance (type XLR) (switch [15] Figure 6.2):

Switch 1: R XLR input impedance, ON = 600 Ω, OFF = 10 kΩ

Switch 2: L XLR input impedance, ON = 600 Ω, OFF = 10 kΩ

- Operation mode/input impedance MPX ([6] Figure 6.2) (switch [6] Figure 6.2):

Switch 1: Operation mode ON = Mono, OFF = Stereo

Switch 2: MPX input impedance, ON = 50 Ω, OFF = 10 kΩ

5.4 Software

The machine is provided with a two-line LCD display where a set of menus is shown. An overall view of the machine's menus is given in figure 5.1.

One of the following symbols may be present on the left side of the display, depending on the case:

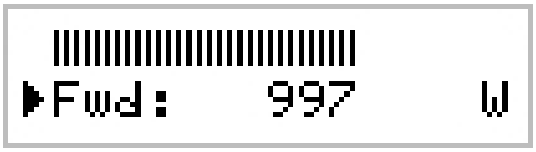
- The parameter highlighted by the arrow can be modified
- The arrow points out the current line, the parameter of which cannot be modified. This symbol is present in the menus made up of more than two lines to help scroll the menu.

When turned on, the LCD display shows the predefined screen with the graphic representation of the instantaneous modulation level and indication of the direct power supplied:

The bar on right of "Mod" indicate the progress of the modulation in real time; the hatched bar signals the maximum nominal modulation level of 75 kHz (100%).

To **change the set power leve**l, select the line relating to the power with the DOWN push button and keep the ENTER push button pressed until it enters the modification mode.

The screen that is shown in the modification mode is similar to the following:



The bottom line gives the instantaneous reading of the power (997W in this example), whereas the bar indicates the set level. To increase the level, press the RIGHT/ DOWN push button and to reduce it, press LEFT/UP. As the set level increases or decreases, the bar becomes longer or shorter to display the current setting. When the desired level is reached, press ENTER to confirm and exit the predefined menu. Note that the set value is stored anyway, so if you press ESC or let the timeout go by without pressing a key, the power will remain at the last set level.

If you press the ESC push button while you are in the predefined menu, you will be shown the following **selection screen** from which you can access all the other menus:

To enter one of the submenus, select its name (which will be underlined by a blinking cursor) with the RIGHT or LEFT push buttons and then press the ENTER push button.

If you instead want to go back to the predefined menu, all you have to do is press the ESC push button again..

Figure 5.1 shows the complete set of the machine's menus.

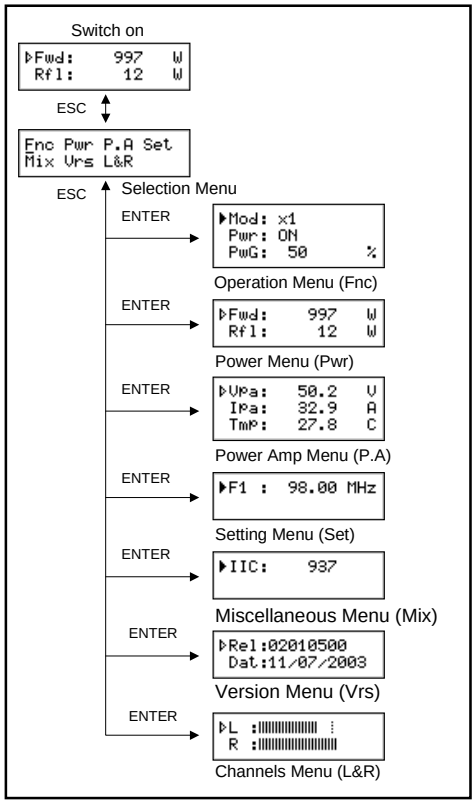
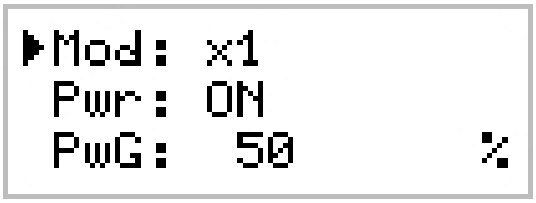


Figure 5.1

5.4.1 Operation Menu (Fnc)



The user can set the **deviation display mode**, activate or deactivate the **supply of power** from the exciter and set percentage power of **Power Good** from this menu.

To work with one of the two functions, select the relative line with the UP and DOWN push buttons and then press and continue pressing the ENTER push button until the command is accepted. So, the Pwr setting will become from On to Off or inverse and the Mod setting will become from "x1" to "x10" or inverse. To change the percentage value of Power Good, after selected PWG voice you must change its value with UP and DOWN push button and then confirm with ENTER.

The indication of the instantaneous deviation is multiplied by a factor 10 in the "x10" mode, so the hatched indicator on the predefined menu will coincide with the 7.5 kHz value instead of 75 kHz. This display mode is useful when you want to view low deviation levels such as, for example, those due to the pilot tone or to the subcarriers.

The Power Good function is a distributed power check and alarm function.
When output power is under Power Good threshold value, machine changes DB15 “Remote” connector’s pin state on rear panel (see figure 6.2 note [24]).

Percentage Power Good value is refered to nominal machine power, that is 1000 W, and is not refered to distributed power. So, if you set 80% value, it will correspond to 800 W, indifferently from set up power.

5.4.2 Power Menu (Pwr)

This screen shows the user the measures relating to the exciter's RF power output:

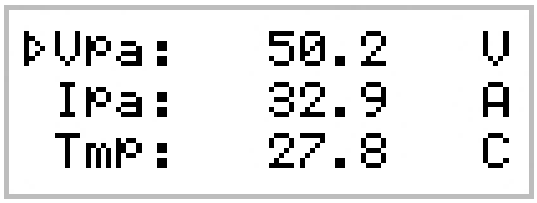
- Forward Power (Fwd)
- Reflected Power (Rfl)

The values shown are "readings", and therefore cannot be modified (note the empty triangle). To modify the power setting, use the predefined menu as described above.

5.4.3 Power Amplifier Menu (PA)

This screen, consisting of three lines that can be scrolled with the UP and DOWN push buttons, shows the user the measures relating to the device's final power amplifier:

- Voltage (VPA)
- Current consumption (IPA)
- Temperature (TMP)



5.4.4 Settings Menu (Set)

This menu lets you read and set the operating frequency.

By a long press on the ENTER push button, you can modify the set frequency using the UP (the frequency increases) and DOWN push buttons.

After having set a new frequency value, press the ENTER push button to confirm the choice. The exciter will release from the current frequency (the LOCK LED turns off) and it will latch onto the new operating frequency (LOCK turns back on). Instead, if you press ESC or let the timeout go by, the frequency will remain set at the previous value.

5.4.5 Miscellaneous Menu (Mix)

This menu allows you to set the machine's address in a o I^2C type of serial bus connection:

The I^2C network address is important when the exciter is connected to an RVR transmission system that envisages use of this protocol. We recommend you do not modify it without a good reason.

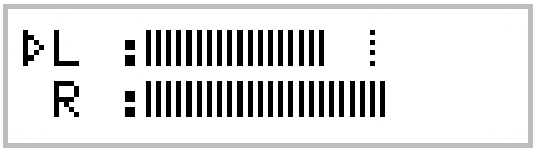
5.4.6 Versions Menu(Vrs)

This screen shows the version and the release date of the software.

5.4.7 Channels Menu (L&R)

This menu is active in the machine stereo version. When machine works in mono version, menu doesn't have any meaning.

The right and left channel input levels are depicted with horizontal bars, as shown in the following figure.



The hatched pointer indicates the level that corresponds with the total deviation at 100%, and is useful to regulate the input levels of the audio channels.

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6 External Description

This chapter reports the elements of the front and rear panels of the TEX 1000

6.1 Front Panel

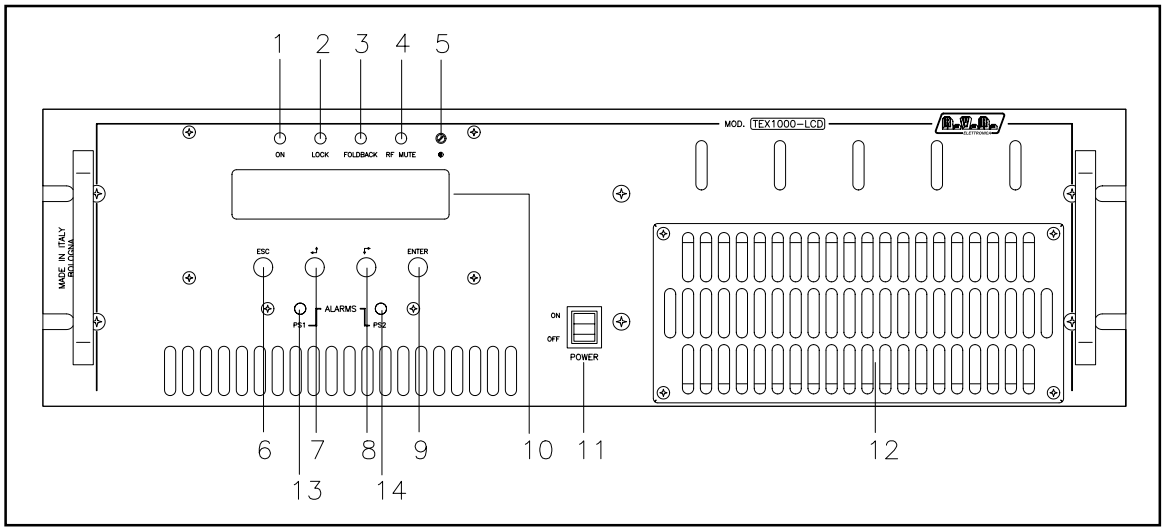


Figure 6.1

[1]	ON	Green LED, lit when the exciter is working.
[2]	LOCK	Green LED, lit when the PLL is locked on the working frequency.
[3]	FOLDBACK	Yellow LED, lit when the foldback function is operating (automatic reduction of the delivered RF power).
[4]	R.F. MUTE	Yellow LED, lit when the exciter's power output is inhibited by an external interlock command.
[5]	CONTRAST	Display contrast adjusting trimmer.
[6]	ESC	Push button to exit from a menu.
[7]	LEFT/UP	Push button to move in the menu system and to modify the parameters.
[8]	RIGHT/DOWN	Push button to move in the menu system and to modify the parameters.
[9]	ENTER	Push button to confirm a parameter and to enter in a menu.
[10]	DISPLAY	Liquid crystals display.
[11]	POWER	ON/OFF switch.
[12]	AIR FLOW	Grid for the intake of the air flow of the forced ventilation.
[13]	ALARMS PS1	Red LED, lit when the Power Supply 1 doesn't work correctly.
[14]	ALARMS PS2	Red LED, lit when the Power Supply 2 doesn't work correctly.

6.2 Rear Pannel

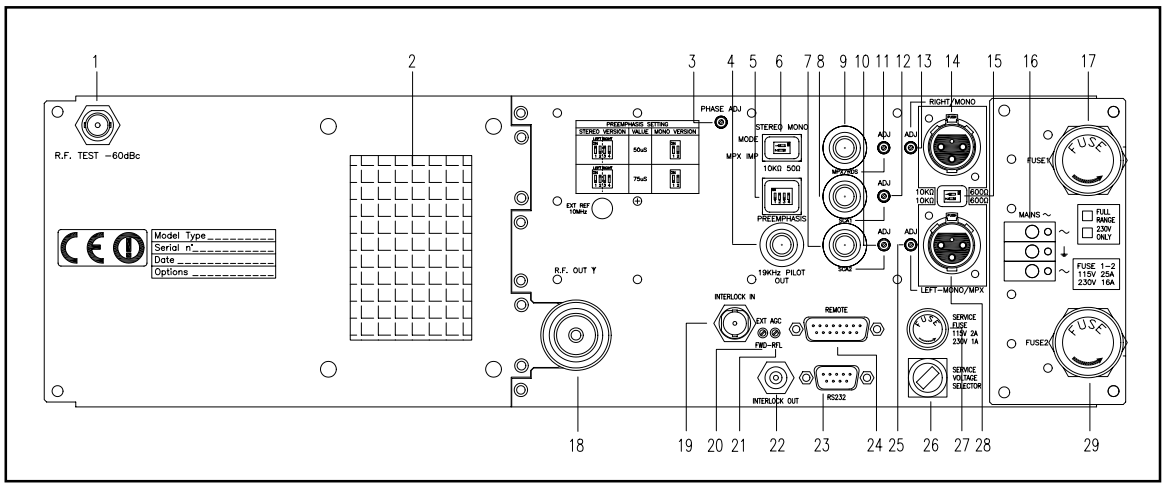


Figure 6.2

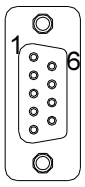
[1] R.F. TEST	Output at -60 dB refered to output power level, adapted to modulation monitoring. Do not use it for spectral analysis.
[2] AIR FLOW	Grid for the intake of the air flow ventilation.
[3] PHASE ADJ	Pilot tone phase adjustment trimmer.
[4] 19 KHZ PILOT	BNC output for the 19 kHz pilot tone. This can be used for external devices (e.g. RDS coder) synchronization.
[5] PREENPHASIS	Dip-switch to set the preenphasys at 50 or 75 μs. The preenphasys setting is only relevant for the Left and Right inputs in stereo mode and for the mono input in mono mode, while MPX input is unaffected by this setting.
[6] MODE/MPX IMP	Dip-switch to set the operation mode (STEREO or MONO) and the MPX input impedance, 50 Ω or 10 kΩ.
[7] SCA 2	BNC connector, SCA2 input.
[8] SCA 1	BNC connector, SCA1 input.
[9] MPX/RDS	BNC connector, MPX unbalanced input.
[10] SCA2 ADJ	Adjustment trimmer for SCA2 input.
[11] MPX/RDS ADJ	Adjustment trimmer for MPX input.
[12] SCA1 ADJ	Adjustment trimmer for SCA1 input.
[13] RIGHT/MONO ADJ	Adjustment trimmer for the Right channel input in Stereo version, or Mono input in Mono Version.
[14] RIGHT/MONO	XLR connector, Right channel audio input in Stereo version, or Mono input in Mono version.
[15] IMPEDANCE	Dip-switch to set the balanced input impedance, 600 Ω or 10 kΩ.
[16] MAINS	Mains supply connectors, 115 - 230 V 50-60 Hz.
[17] FUSE 1	Mains supply fuse.
[18] R.F. OUT	RF output connector, 7/16" type.
[19] INTERLOCK IN	BNC interlock in connector: the exciter is forced in stand-by mode when the inner conductor is grounded.
[20] FWD EXT. AGC	Trimmer for the control of the delivered power in function of the income FWD fold (REMOTE connector).
[21] RFL EXT. AGC	Trimmer for the control of the delivered power in function of the income RFL fold (REMOTE connector).
[22] INTERLOCK OUT	BNC interlock out connector: when exciter is in stand-by mode, the inner conductor, usually floating, become grounded.
[23] RS232	DB9 connector for interconnection with other devices and for factory parameters programming.
[24] REMOTE	DB15 connector for telemetry of the machine.

[25] LEFT-MONO/MPX ADJ	Adjustment trimmer for Left-Mono channel input in Stereo Version, or MPX input in Mono version.
[26] SERVICE VOLTAGE SEL.	Mains voltage selector 120-240V.
[27] SERVICE FUSE	Service protection fuse.
[28] LEFT-MONO/MPX	XLR connector, Left-Mono channel input in Stereo Version, or MPX input in Mono version.
[29] FUSE 2	Mains supply fuse.

6.3 Connectors description

6.3.1 RS232

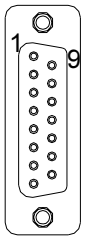
Type: DB9 female



1	NC
2	TX_D
3	RX_D
4	Internally connected with 6
5	GND
6	Internally connected with 4
7	Internally connected with 8
8	Internally connected with 7
9	NC

6.3.2 Remote

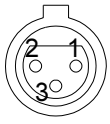
Type: DB15 female



Pin	Name	Type	Meant
1	Interlock	IN	Inhibits power if closed to GND
2	Ext AGC FWD	IN	External signal for power limitation (AGC)
3	GND		Ground
4	SDA IIC	I/O	Seriali data for IIC communications
5	VPA Tlm	OUT anal.	Mains voltage PA: 5 V for 62 V
6	FWD tlm	OUT anal.	Forward power: 3 V for 1245 W
7	Power Good	OUT digit.	Open collector, ON when power is over set up threshold (cap. 5.4.1)
8	GND		Ground
9	GND		Ground
10	Ext AGC RFL	IN	External signal for power limitation (AGC)
11	SCL IIC	I/O	Clock for IIC communications
12	IPA Tlm	OUT anal.	Mains current PA: 5 V for 47 A
13	RFL Tlm	OUT anal.	Reflected power: 3 V for 230 W
14	On cmd	IN digit.	An impulse to ground (500 ms) active power output
15	OFF cmd	IN digit.	An impulse to ground (500 ms) inhibits power output

6.3.3 Left (MONO) / Right

Type: XLR female



1	GND
2	Positive
3	Negative

7. Technical specifications

7.1 Physical specifications

Panel size	483 mm (19") x 132.5 mm (3 HE)
Depth	650 mm (26 1/2")
Weight	33 Kg
Working Temperature	-10 °C ÷ 50 °C

7.2 Electrical specifications

General

RF output power	0 to 1000 W, adjustable with continuity
Frequency range	87.5 MHz ÷ 108 MHz, step 10kHz (you can require different step at the order)
Frequency setting	Direct software programming
Frequency stability	±1ppm from -10°C to 50°C
Modulation type	Direct carrier modulation
Spurious and Harmonics suppression	Respects relevant FCC and CCIR standards (typical -75 dBc)
Modulation capability	Respects relevant FCC and CCIR standards (typical 240kHz MPX o Mono, 210 kHz Stereo)
Asyncronous residual AM	< -65 dB wrt. 100% peak AM, without deemphasis
Syncronous residual AM	< -55 dB wrt. 100% peak AM, with 75 kHz molation at 400Hz, without deemphasis
C.A. power supply	≅ 90 V ÷ 250 V, full-range. Power factor > 0.97 (with PFC)
Power consumption at 1000 W RF	≅1,7 kVA

Input

Left - Mono/MPX Input	Type XLR female balanced or unbalanced
Right/Mono Input	Type XLR female balanced or unbalanced
MPX/SCA/RDS input	Type: BNC, unbalanced
Input impedance	10 kOhm o 600 Ohm, XLR Left/Right/Mono 10 kOhm o 50 Ohm BNC MPX selectable with DIP-switch
Input level	-20 dBm ÷ +13 dBm, continuosly adjustable with trimmer
Preemphasys	Selectable: 0 50 us (CCIR) 75 us (FCC)
SCA1 and SCA2 input	2 BNC unbal connectors
SCA1 and SCA2 input impedance	10 kOhm
SCA1 and SCA2 input level	-20 dBm ÷ +13 dBm for 2.0 kHz continuosly adjustable

Output

RF Out:	Standard connector 7/16”, impedance 50 Ohm
RF Test	BNC connector, -60 dB wrt. carrier level impedance 50 Ohm
19 kHz pilot tone	1 Vpp minimum load 4.7 kOhm

MONO operation

S/N FM	> 75dB wrt. 75 kHz, measured in the band 20 Hz ÷ 20 kHz, 50 us deemph., RMS detect
Amplitude/frequency response	± 0.3 dB, 20Hz ÷ 15Khz (with preemphasis)
Total harmonic distortion (THD)	< 0.08%

MPX operation

Composite S/N FM	> 75dB wrt. 75 kHz, measured in the band 20 Hz ÷ 100 kHz, 50 us deemphasis, RMS detect
MPX amplitude/frequency response	± 0.1 dB, 20 Hz ÷ 53 KHz ± 0.3 dB, 53 KHz ÷ 100 KHz
MPX Total harmonic distortion (THD)	< 0.05 %
Stereo separation	> 55 dB (typical 60dB)

Stereo operation (TEX1000/S model)

S/N FM Stereo	> 72 dB wrt. 75 kHz, measured on decoded channels, in the band 20 Hz ÷ 20 KHz, 50 us deemphasis, RMS detector
Audio amplitude/frequency response	± 0.5 dB, 20 Hz ÷ 15 KHz (with preemphasis)
Total harmonic distortion (THD)	≤ 0.05 %
Stereo separation	> 50 dB (typical 55 dB)

Remote connections

Interlock IN	BNC female: the exciter is forced in stand-by mode when the inner conductor is grounded
Interlock OUT	BNC female: when exciter is in stand-by mode, the inner conductor, usually floating, become grounded
Serial interface	DB9 female RS232
Telemetry card	DB15 female, give indications on the state of the device

8. Working Principles

A schematic view of the modules and connections making up the TEX1000 is shown in figure 8.1.

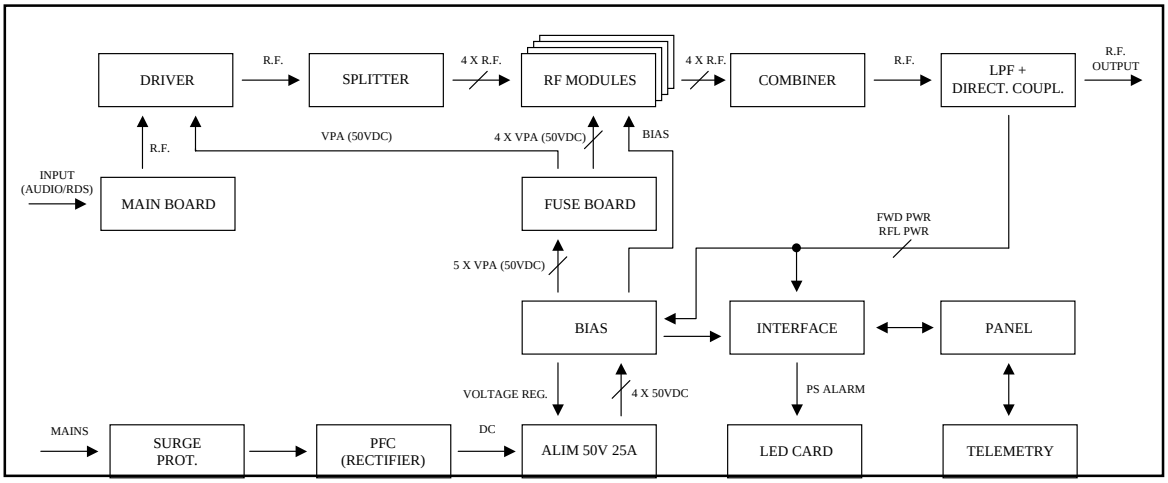


Figure 8.1

Below a brief description of each module's functions is given, whereas the complete diagrams and layout of the cards are given in the “Technical appendix” in vol.2.

8.1 Power Supply

TEX1000 power supply is composed by three important sections:

1. Over range protection. Surge Protection board (see cap. 8.1.1) protects machine from eventual unexpected variations of the mains voltage .
2. Service. This section contains elements that do not regard directly the power supply, they are:
   - Service transformer
   - Power switch
   - Service voltage selector
   - Service fuse
3. Power Supply. Various units supplies an adapted supply to RF power amplifier modules. The units that compose power supply are rectifiers (PFC or traditionals) and switching supply. Machine is available in different configuration for voltage rectify:
   - One PFC (only 230V)
   - Two PFC (115-230V)
   - One rectifier (only 230V)
   - Two rectifiers (115-230V)

8.1.1 Surge Protection

This card contains two mains fuse accessible from outside (figure 6.2 note [17] and [29]) and it contains a MOV battery to protect main supply and machine from over range mains voltage. Then the mains voltage reaches the main Power switch placed on front panel and, if it is on ON state, mains voltage arrives to TR1 service transformer. One of its secondary output generates (through interface card) 24 V voltage that excites power relè placed on Surge card, so PFC or rectifier units, connect to it, will be on voltage.

8.1.2 PFC board (rectifiers)

PFC units are rectifiers that modulates absorbed current so that the wave shape is sinusoide, having so 99% power factor.
PFC can work with input mains voltage from 90 V to 250 V. When you use it with mains voltage of 110 V, is necessary to install two PFC units because there is a lot of absorbed current. In PFC output there are 350 V of rectified voltage.
You can replace PFC units with one or two “traditional” rectifying units (but without power factor protection).

8.1.3 Power supply

There are two power supply switching mode of 50 V 25 A, that have an input voltage check. Output voltage is set from microprocessor in function of RF power required. Two power supply units works in parallel mode and they have a balance current circuit so that the distributed current from every module is approximately the same one.

8.2 Panel board - CPU

The panel card contains the microcontroller (PIC16F877) that implements the machine's control software, the display and the other components needed to interface the user.
The card interfaces with the other machine modules, both for power supply distribution and for the control and measures.

8.3 Telemetry board

This card is the input/output CPU interface with external world. All the available input and output signals are replied on the DB15 “REMOTE” connector (see cap. 6.3.2). On the same board there is also the BNC connector of interlock to disable device. Closing the central pin to ground, the output power is reduced to zero until connection doesn’t removed.

When it is used with a R.V.R. amplifier, this connector is connected, through a BNC-BNC connector, to REMOTE or to INTERLOCK of the power amplifier. In case of breakdowns of the amplifier, the central conductor is place to ground forcing the device to enter in stand-by mode.

8.4 Main board

The main card carries out the following functions:

- Audio and SCA input handling
- Generation of carrying frequency
- Modulation

8.4.1 Audio input section

The audio input section contains the circuits that perform the following functions:

- Input impedance selection
- 15 kHz filtering of the R and L channel
- Stereo coder
- Preemphasis
- Mixing of the mono, MPX and SCA channels
- Clipper (limits the level of the modulating signal so that the frequency deviation does not go past the 75 kHz level)
- Measurement of the modulating signal

8.4.2 PLL/VCO section

This section of the card generates the signal in modulated radiofrequency. It is based on a PLL diagram that uses an MB15E06 type of integrated PLL.

8.5 Driver card

Before going to the final power amplifier, the RF signal is pre-amplified in this section through a BFR 540 transistor. When the exciter is put in stand-by, the driver is inhibited.

8.6 Power amplifier

RF power amplifier section is made with four power amplifier modules combined through a Wilkinson splitter and a Wilkinson combiner in strip-line technology.

The splitter is used to divide input power from driver card and to supply a quarter of it to every RF module. The combiner is used to combine output power from every RF module so as to have total power amplifier.

Splitter, amplifier and combiner are plans so that powers generated from the amplifiers add its in phase, diminishing the loss of balance and therefore the dissipation of useful power.

All RF section is placed on a fin that supplies to the cooling through forced ventilation.
Every RF module supplies 300W and is supplied from a switching supply.
The active device used in amplifier module is a Mosfet (BLF278).

8.7 LPF card

This card is a low-pass filter and its function is to suppress the harmonic components generated by the amplifier below the levels required by regulations.

Moreover, in the end of filter, there is a directional coupler, its function is the measurement of the forward and reflected output power.

On this card there is an RF sample at -60dB compared with the output and it is available on a BNC connector. This sample is useful for checking the characteristics of the carrier, but not of the higher order harmonics.

8.8 BIAS card

Main function, of this card, is to check and to correct the polarization voltage (BIAS) of Mosfet in RF amplifier section.

Moreover it supplies the measure of the absorbed current as sum of the absorbed currents from every module and it contains a circuit for the signalling of the breakdowns in the Power Supply.

Without alarm condition, Bias voltage is regulated only in function of output power set up, with a feedback mechanism based on the reading of the effectively distributed power (AGC).
Bias voltage is also influenced from other factors like:

- Excess of reflected voltage
- External AGC signals (Ext. AGC FWD, Ext. AGC RFL,...)
- Excess of temperature
- Excess of absorbed current from a RF module.

9. Identification of the Modules

The TEX1000 is made up of various modules connected to each other with connectors so as to make maintenance and any required module replacement easy.

9.1 Upper view

The 9.1 figure shows the view from above the machine with the various components pointed out.

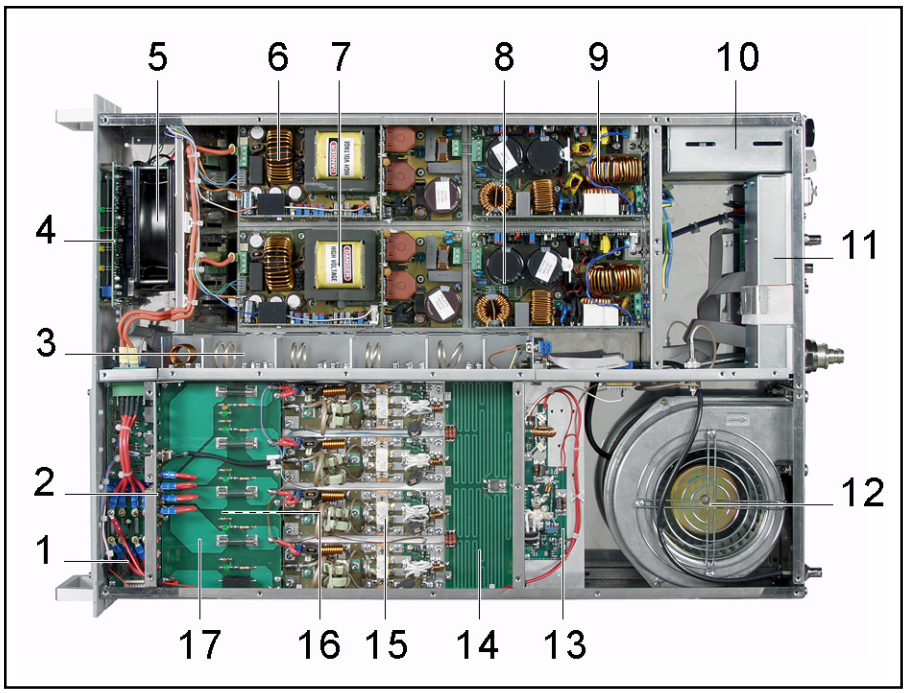


Figure 9.1

[1] Bias Board (SLBIAS1K3U-2)
[2] Pass Thru Board (SLFILPJ1KM)
[3] LPF Board (SLLPFTEX1KL)
[4] Panel Board (SLPANTXLC004)
[5] Impeller FAN1 (VTL4184)
[6] Alim 50V 25A Module 1 (PSL1000_PJ1K)
[7] Alim 50V 25A Module 2 (PSL1000_PJ1K)
[8] Power Factor Module 2 (PFCPSL1000)
[9] Power Factor Module 1 (PFCPSL1000)
[10] Surge Protection Board (SLSRGPRPJ1KM)
[11] Main Board(SLMBDTEXLC02)
[12] Turbine FAN2 (VTLG1E120)
[13] Driver Board (SLDRVTEX500L)
[14] Splitter Card(SLSPLPJ1KC1)
[15] RF Board (SLRFPJKMU44)
[16] Combiner Card(SLCMBPJ1KC1)
[17] Fuse Board(SLFUSRFPJ1KC)

9.2 Bottom view

The 9.2 figure shows the view from under the machine with the various components pointed out.

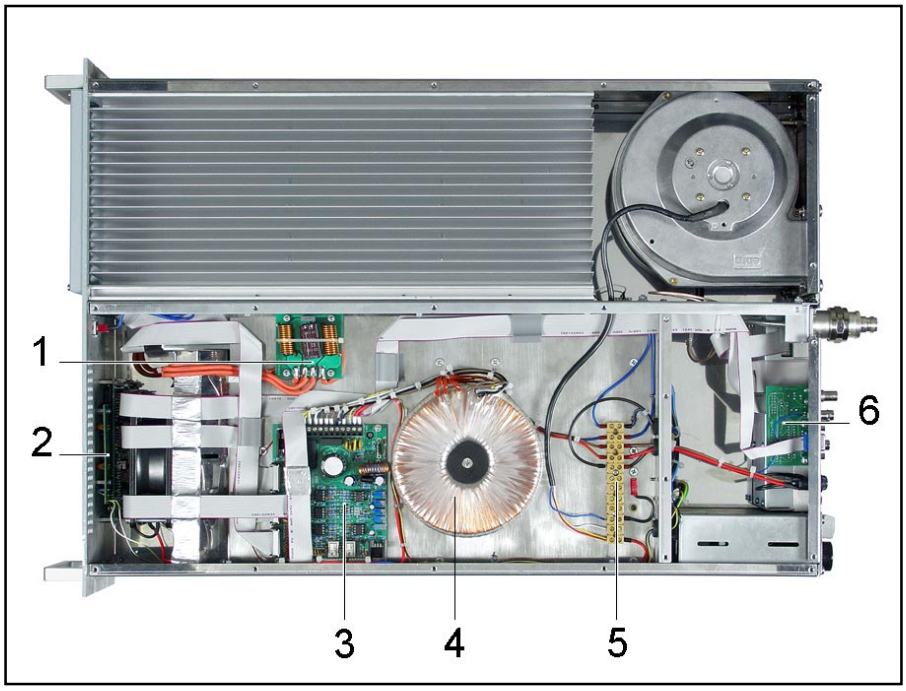


figura 9.2

[1] Filter Card (SLFILPSPJ1KC)
[2] LED PS Board(SLLEDPSTEX1K)
[3] Interface Board (SLINTTX500-2)
[4] Trasformer TR1 (TRFTEX1000T)
[5] Bare Terminals MO1 (MORSWDMK3/12)
[6] Telemetry Board (SLTLMTXLCD02)