



TRDS4002-LUXOR-B

USER MANUAL



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TRDS4002-LUXOR-B - User Manual
Version 1.0

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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.



Table of Contents

1.	Preliminary Instructions	1
2.	Warranty	1
3.	First Aid	2
3.1	Electric shock treatment	2
3.2	Treatment of electric burns	2
4.	General Description	3
4.1	Unpacking	3
4.2	Features	3
4.3	Frontal Panel Description	6
4.4	Rear Panel Description	6
4.5	Connectors Description	7
4.6	Technical Description	8
5.	Identification of the Modules	10
5.1	Upper View	10

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IMPORTANT


The symbol of lightning inside a triangle placed on the product, evidences the operations for which is necessary gave it full attention to avoid risk of electric shocks.



The symbol of exclamation mark inside a triangle placed on the product, informs the user about the presence of instructions inside the manual that accompanies the equipment, important for the efficacy and the maintenance (repairs).

1. Preliminary Instructions

• General Warnings

This equipment should only be operated, installed and maintained by "trained" or "qualified" personnel who are familiar with risks involved in working on electric and electronic circuits. "Trained" means personnel who have technical knowledge of equipment operation and who are responsible for their own safety and that of other unqualified personnel placed under their supervision when working on the equipment. "Qualified" means personnel who are trained in and experienced with equipment operation and who are responsible for their own safety and that of other unqualified personnel placed under their supervision when working on the equipment.

 **WARNING: Residual voltage may be present inside the equipment even when the ON/OFF switch is set to Off. Before servicing the equipment, disconnect the power cord or switch off the main power panel and make sure the safety earth connection is connected. Some service situations may require inspecting the equipment with live circuits. Only trained and qualified personnel may work on the equipment live and shall be assisted by a trained person who shall keep ready to disconnect power supply at need.**

R.V.R. Elettronica S.p.A. shall not be liable for injury to persons or damage to property resulting from improper use or operation by trained/untrained and qualified/unqualified persons.

 **WARNING: The equipment is not water resistant. Any water entering the enclosure might impair proper operation. To prevent the risk of electrical shock or fire, do not expose this equipment to rain, dripping or moisture.**

Please observe local codes and fire prevention rules when installing and operating this equipment.

 **WARNING: This equipment contains exposed live parts involving an electrical shock hazard. Always disconnect power supply before removing any covers or other parts of the equipment.**

Ventilation slits and holes are provided to ensure reliable operation and prevent overheating; do not obstruct or cover these slits. Do not obstruct the ventilation slits under any circumstances. The product must not be incorporated in a rack unless adequate ventilation is provided or the manufacturer's instructions are followed closely.

 **WARNING: This equipment can radiate radiofrequency energy and, if not installed in compliance with manual instructions and applicable regulations, may cause interference with radio communications.**

 **WARNING: This equipment is fitted with earth connections both in the power cord and for the chassis.**

Make sure both are properly connected.

Operation of this equipment in a residential area may cause radio interference, in which case the user may be required to take adequate measures.

The specifications and data contained herein are provided for information only and are subject to changes without prior notice. R.V.R. Elettronica S.p.A. disclaims all warranties, express or implied. While R.V.R. Elettronica S.p.A. attempts to provide accurate information, it cannot accept responsibility or liability for any errors or inaccuracies in this manual, including the products and the software described herein. R.V.R. Elettronica S.p.A. reserves the right to make changes to equipment design and/or specifications and to this manual at any time without prior notice.

• Notice concerning product intended purpose and use limitations.

This product is a radio transmitter suitable for frequency-modulation audio radio broadcasting. Its operating frequencies are not harmonised in designated user countries. Before operating this equipment, user must obtain a licence to use radio spectrum from the competent authority in the designated user country. Operating frequency, transmitter power and other characteristics of the transmission system are subject to restrictions as specified in the licence.

2. Warranty

La R.V.R. Elettronica S.p.A. warrants this product to be free from defects in workmanship and its proper operation subject to the limitations set forth in the supplied Terms and Conditions. Please read the Terms and Conditions carefully, as purchase of the product or acceptance of the order acknowledgement imply acceptance of the Terms and Conditions. For the latest updated terms and conditions, please visit our web site at WWW.RVR.IT. The web site may be modified, removed or updated for any reason whatsoever without prior notice. The warranty will become null and void in the event the product enclosure is opened, the product is physically damaged, is repaired by unauthorised persons or is used for purposes other than its intended use, as well as in the event of improper use, unauthorised changes or neglect. In the event a defect is found, follow this procedure:

- 1 Contact the seller or distributor who sold the equipment; provide a description of the problem or malfunction for the event a quick fix is available.

Sellers and Distributors can provide the necessary information to troubleshoot the most frequently encountered problems. Normally, Sellers and Distributors can offer a faster repair service than the Manufacturer would. Please note that Sellers can pinpoint problems due to wrong installation.

- 2 If your Seller cannot help you, contact R.V.R. Elettronica S.p.A. and describe the problem; if our staff deems it appropriate, you will receive an authorisation to return the equipment along with suitable instructions;

- 3 When you have received the authorisation, you may return the unit. Pack the unit carefully before shipment; use the original packaging whenever possible and seal the package perfectly. The customer bears all risks of loss (i.e., R.V.R. shall not be liable for loss or damage) until the package reaches the R.V.R. factory. For this reason, we recommend insuring the goods for their full value. Returns must be sent on a C.I.F. basis (PREPAID) to the address stated on the authorisation as specified by the R.V.R. Service Manager.



Units returned without a return authorisation may be rejected and sent back to the sender.

- 4 Be sure to include a detailed report mentioning all problems you have found and copy of your original invoice (to show when the warranty period began) with the shipment.

Please send spare and warranty replacement parts orders to the address provided below. Make sure to specify equipment model and serial number, as well as part description and quantity.



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3. First Aid

All personnel engaged in equipment installation, operation and maintenance must be familiar with first aid procedures and routines.

3.1 Electric shock treatment

3.1.1 If the victim is unconscious

Follow the first aid procedures outlined below.

- Lay the victim down on his/her back on a firm surface.
- the neck and tilt the head backwards to free the airway system (**Figure 1**).

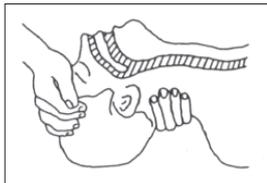


Figure 1

- If needed, open the victim's mouth and check for breathing.
- If there is no breathing, start artificial respiration without delay (**Figure 2**) as follows: tilt the head backwards, pinch the nostrils, seal your mouth around the victim's mouth and give four fast rescue breaths.



Figure 2

- Check for heartbeat (**Figure 3**); if there is no heartbeat, begin chest compressions immediately (**Figure 4**) placing your hands in the centre of the victim's chest (**Figure 5**).

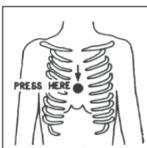
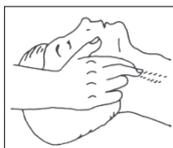


Figure 3

Figure 4

Figure 5

- One rescuer: give 2 quick rescue breaths after each 15 compressions.
- Two rescuers: one rescue breath after each 5 compressions.

- Do not stop chest compressions while giving artificial breathing.
- Call for medical help as soon as possible.

3.1.2 If the victim is conscious

- Cover victim with a blanket.
- Try to reassure the victim.
- Loosen the victim's clothing and have him/her lie down.
- Call for medical help as soon as possible.

3.2 Treatment of electric burns

3.2.1 Large burns and broken skin

- Cover affected area with a clean cloth or linen.
- Do not break any blisters that have formed; remove any clothing or fabric that is stuck to the skin; apply adequate ointment.
- Administer adequate treatment for the type of accident.
- Get the victim to a hospital as quickly as possible.
- Elevate arms and legs if injured.

If medical help is not available within an hour, the victim is conscious and is not retching, administer a solution of table salt and baking soda (one teaspoon of table salt to half teaspoon of baking soda every 250 ml of water).

Have the victim slowly drink half a glass of solution for four times during a period of 15 minutes.

Stop at the first sign of retching.

Do not administer alcoholic beverages.

3.2.2 Minor burns

- Apply cold (not ice cold) strips of gauze or dress wound with clean cloth.
- Do not break any blisters that have formed; remove any clothing or fabric that is stuck to the skin; apply adequate ointment.
- If needed, have the victim change into clean, dry clothing.
- Administer adequate treatment for the type of accident.
- Get the victim to a hospital as quickly as possible.
- Elevate arms and legs if injured.

4. General Description

The **TRDS4002-LUXOR-B**, manufactured by **R.V.R. Elettronica SpA**, is a **RDS Coder basic model without display**.

The **TRDS4002-LUXOR-B** are designed to being contained into a 19" rack box of 1HE.

4.1 Unpacking

The package contains:

- 1 **TRDS4002-LUXOR-B**
- 1 User Manual
- 1 Mains power cable

The following accessories are also available from Your R.V.R. Dealer:

- **Accessories, spare parts and cables**

4.2 Features

II **TRDS4002-LUXOR-B** is fully digital, it use only high quality components like A/D and D/A 24 bit converters and numerical processing (DSP) at 32 bit.

The input section includes analogical BNC.

The RDS coder manages n. 6 data set and dynamic services TMC, TDC, IH and EWS.

All functioning and programming parameters are managed through dedicated software.

The equipment firmware can be updated through serial port without the need of hardware settings and without interruption of the service.

Two major features of **TRDS4002-LUXOR-B** are compact design and user-friendliness. Design is based on a modular concept: the different functions are performed by modules that, for the most part, are connected through male and facilitates maintenance and module replacement.

The input/output analog section offers good qualities.

4.2.1 Descrizione Sistema RDS

The RADIO-DATA-SYSTEM is proper for the transmission of information in mono/ stereo programs of VHF/MF (87.5-108 Mhz).

It satisfies the requested requirements to the transmission of supplementary data on radio programs:

- 1) Compatibility with the current mono/stereo transmissions;
- 2) Absence of interferences towards the adjacent programs;
- 3) Compatibility with other identification systems which are already working.

Il sistema, prescelto da un gruppo di lavoro specialistico internazionale, prevede la trasmissione dei dati ad una velocità di 1187.5 bit/sec con modulazione di fase a due livelli, portante 57 KHz e banda ± 2 KHz.

The system, selected by an international specialistic team, allows the data transmission at a speed of 1187.5 bit/sec with phase modulation at two levels , carrier wave 57 Mhz and range ± 2 Khz.

The broadcasted binary signal is in advance put out on a differential codification.

The registry of transmission is at packages of lenght 104 bits (87.6 ms) named GROUPS, each of them composed of 4 blocks of 26 bits.

Every block is composed of 16 bits of information and of 10 bits of protection, which are properly studied to allow the recovery of an erroneous word with a maximum of 5 wrong bits.

They are provided with 16 separete blocks of which 6 are still not defined; every group begins with a PI identification code (Program Identification) which has the double intent to synchronize the receiver and to identify the channel which transmits the signal.

The pourpose of the encoder **TRDS4002-LUXOR-B** is to manage the principal services defined by the standard CENELEC EN 50067 as: PI, PS, PTY, TP, AF, TA, DI, M/S, PIN, RT, EON, TDC, IH, CT.

As follows, we'll mention a short description about the function of each of these services.

PI - PROGRAM IDENTIFICATION: it's the identification code of the radio. Its more important application is to allow the receiver, in case of bad reception, to implement the "Automatic Frequency Change"; this happens when there is a signal with the same PI and of better level than the syntonized one.

PS - PROGRAM SERVICE: it's the visualized text on the receiver display, which has to be of maximum 8 characters, as this is the standard dimension of receivers displays.

The **TRDS4002-LUXOR-B** characteristic is to store up to 8 messages and the time of transmission of each of them. Every message can be composed from 1 to 16 words of 8 characters, and it's possible to select the permanence time on the display of each of the 16 separate words.

PTY - PROGRAM TYPE: it's the identification of the "Program Type" which is on air (example News, Sport, Rock, etc.) It's used to qualify on the receiver the automatical research of the program type desired.

TP - TRAFFIC PROGRAM IDENTIFICATION: this service indicates with a signal on the receiver display that the program we're receiving includes traffic news.

AF - ALTERNATIVE FREQUENCIES: it's the frequencies list of different transmitters which transmit the same program in the adjacent receiving areas. The list is memorized by the receiver and used to reduce the commutation time beetwen the different transmitters of the same program.

TA - TRAFFIC-ANNOUNCEMENT IDENTIFICATION: it' used to indicate to the car-driver that the traffic news are on air. The receiver could use the signal in one of the following modes:

- a) To switch automatically from the Tape (or from the Compact Disk) to the radio;
- b) To automatically switch on the radio when the traffic news begin;
- c) To automatically change over from a station which doesn't transmit traffic news.

M/S - MUSIC/SPEECH SWITCH: it's used to modify the music and the spoken volume one by one.

PIN - PROGRAM- ITEM NUMBER: it's used to plan the receiver to receive certain programs at preselected date and hour.

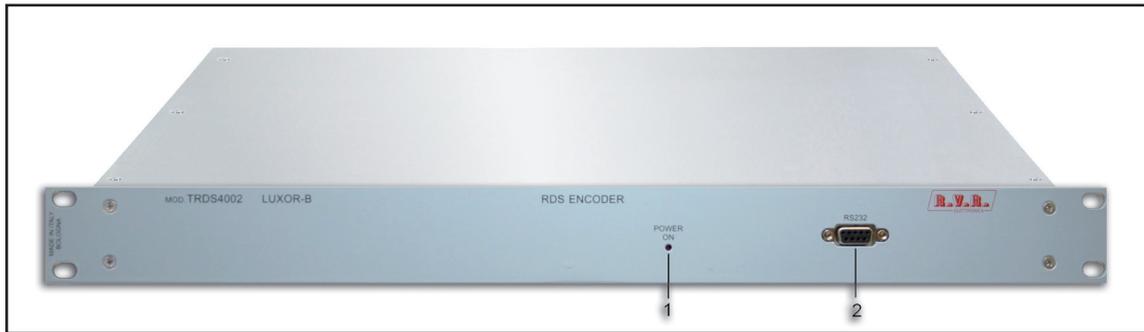
RT - RADIOTEXT: it's used to transmit the text trasmission; this function is mainly for the domestic application (house receivers).

EON - ENHANCED OTHER NETWORKS: it's used to transmit the PI,PS,AF,PTY to the PIN of other radios.

TDC - TRANSPARENT DATA CHANNEL: it's used for the data transmission and it could be free used, for example, to send messages on a brightly sign.

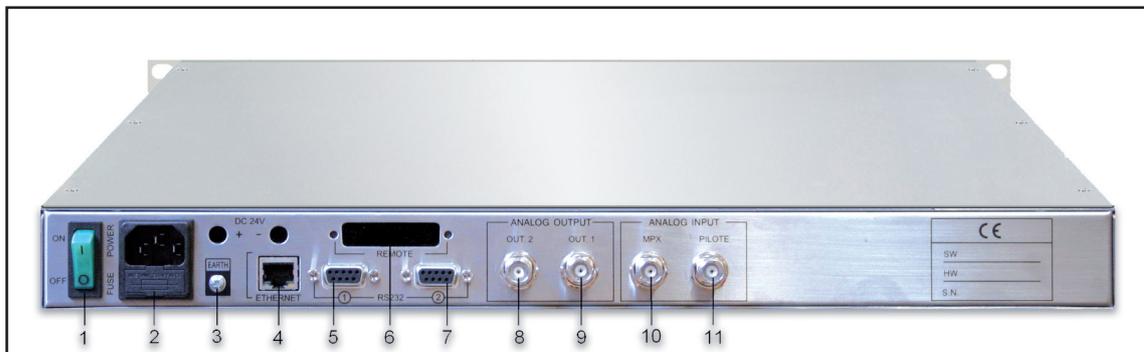
IH - IN HOUSE APPLICATION: it's used to transmit data of exclusive use of the broadcaster and it can be utilized , for example, to send telemetry data, software, etc...

4.3 Frontal Panel Description



- [1] LED LED indicator of equipment's working status.
- [2] RS232 COM3 Serial port.

4.4 Rear Panel Description



- [1] ON / OFF Power Switch.
- [2] NETWORK SOCKET + FUSE Power supply socket, 110-230V 50-60Hz and fuse block.
- [3] GROUND Ground clamp.
- [4] ETHERNET RJ45 socket for ethernet connection (OPTIONAL).
- [5] RS232 COM1 serial port.
- [6] REMOTE DB25 8 inp + 8 out. connector(OPTIONAL).
- [7] RS232 COM2 serial port.
- [8] OUT.2 BNC connector for RDS analogic output.
- [9] OUT1 BNC connector for RDS analogic output.
- [10] MPX MPX analogic input connector, BNC type.
- [11] PILOTE PILITONE TONE analogic input connector, BNC type.

4.5 Connectors Description

4.5.1 RS232

Type: Female DB9



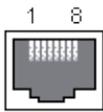
1	NC
2	TX_D
3	RX_D
4	NC
5	GND
6	+12V
7	NC
8	CTS
9	NC



NOTE: Normally, the TRDS4002-LUXOR-B is configured as DCE (Data Communication Equipment) for serial communications.

4.5.2 ETHERNET

Type: Female RJ45



1	TX+
2	TX-
3	RX+
4	NC
5	NC
6	RX-
7	NC
8	NC

4.6 Technical Description

Parameters	TRDS4002-LUXOR-B
GENERALS	
Primary Power	115 - 230 VAC ±10%
Physical Dimensions (W x H x D)	483 x 44 x 280 mm
Weight	3,5 kg
Environmental working temperature	-10 to + 40 °C
PILOTE INPUTS	
Connector	BNC unbalanced
Pilot frequency synch.	19KHz +/- 2Hz
Input level	-30 / +12dBu (Sinusoid. o TTL)
ANALOGUE MPX INPUTS	
Connector	BNC unbalanced
Impedance	10 Kohm
Input level	Gain 0dB / Out.MPX
Maximum input level	+20dBu
OUTPUTS 1 & 2	
D/A converter	24 bit
Connector	BNC unbalanced
Impedance	50 ohm
Output level	-12dBu to +12dBu - step 0,1dB (Adj - Sw) (Gain 0dB / inp.MPX)
Maximum Output level	+20dBu
RDS OPERATION	
Standards	Cenelec 50067 Specification
Command formats	UECP - SPB490 Ver.6.1 / 2003
Static services	DI,PI,M/S,TP,TA,TP,TPY,RT,CT, AF,PIN,EON,PSN
Dynamic service	TMC,TDC,EWS,IH
RDS Groups	0A, 1A, 2A, 3A, 5A, 6A, 8A, 9A, 14A
Data Set	N° 6
RDS MODULATION	
Subcarrier frequency	57 KHz ±1.5 Hz
Bandwidth	+/- 2,4KHz (-50dB)
Synchronisation	Internal / external
RDS phase adjustment	Adjustable up to 360 degrees in 0.33-degree increments
ELABORATION	
A/D conversion	24 bit (Dynamic range 105dB)
D/A conversion	24 bit (Dynamic range 123dB)
DSP elaboration	32 bit, fixed point
OTHER CONNECTORS	
Serial port	3 RS232 DB9 Connector., (1 USB Optional)
Serial connection rate	1200 to 115200 Baud
Ethernet	(1 RJ45 Connector Optional)
REMOTE input	8 Input + 8 Output (Optional)
STANDARD COMPLIANCE	
Safety	EN60215:1997
EMC	EN 301 489-11 V1.4.1

5. Identification of the Modules

The **TRDS4002-LUXOR-B** is made up of various modules linked to each other through connectors so as to make maintenance and any required module replacement easier.

5.1 Upper View

The figure below shows the equipment upper view with the various components pointed out.

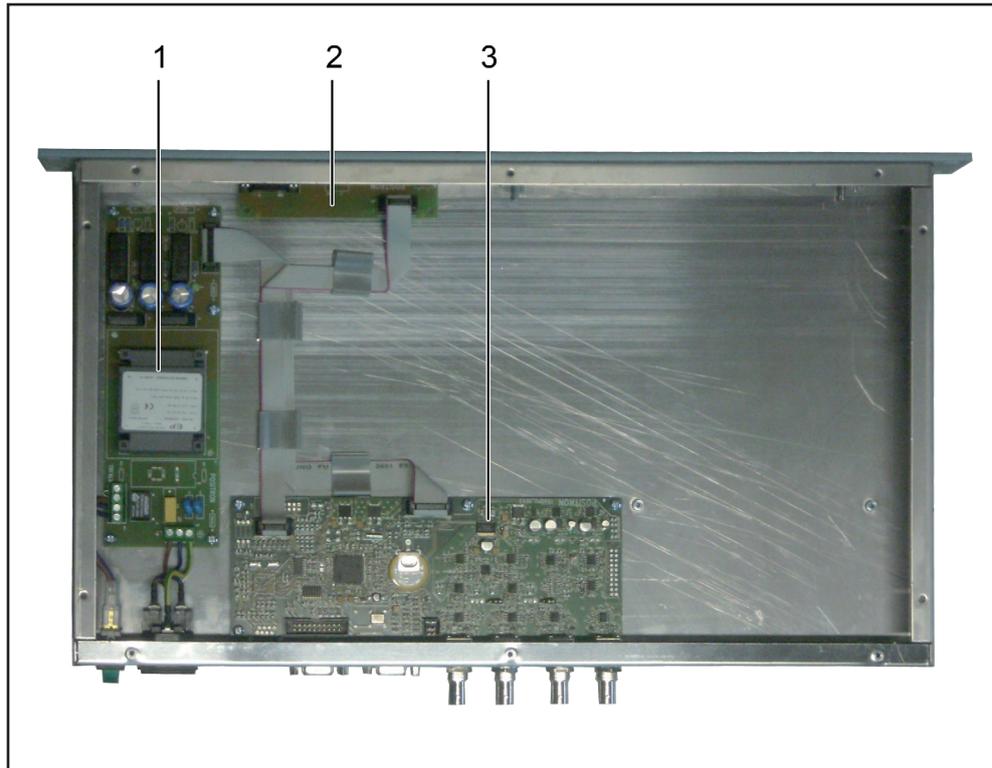


Figure 5.1

- [1] Power Supply
- [2] Panel Card
- [3] CPU & I/O Card

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