Vigintos Elektronika

Ozo g. 4, 08200 Vilnius, Lithuania
tel.: +370 52477465; fax: +370 52477466
e-mail: oleg@vigintos.com
www.vigintos.com

FM TRANSMITTERS
RT-FMS-251
RT-FMS-501
RT-FMS-1001

USER MANUAL

2015

WARNING!!!

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.

Only qualified technical personnel should service the present equipment.

Before making any action towards the equipment, please read carefully user manual.

TABLE OF CONTENTS:

1.GENERAL INFORMATION

FM Transmitter with built-in stereo encoder and band-pass filter is designed to provide high quality professional audio broadcasting in a frequency range 87.5 - 108 MHz, with an RF output power up to 250/500/1000W.

FM Transmitter is in compliance with the essential requirements and other relevant provisions of the Directive 1999/5/EC.

Standard Compliance:

Radio spectrum
EMC
Safety

Options:

- AES/EBU Input
- IP Remote Device Controle
- RDS coder

2. TECHNICAL DATA

Specifications

Operating frequency range		87,5 - 108 MHz setting in 10 kHz steps
Frequency stability		≤ ±50 Hz
Nominal RF output power		250/500/1000 W ± 1 dB adjustable, ALC mode
Output impedance		50 ohm
Output connector		N female
Probe		-30dB, directional coupler
Probe connector		BNC female
Hamonics supperession		≤ -70 dB*, *with band-pass filter (option)
Spurious emission		≤ -70 dB
Residual AM		≤ 0,10% , synchronous ≤ 0,15% , asynchronous
S/N ratio	mono	≤ -80 dB
	stereo	≤ -75 dB
Pre-emphasis		50 µs ± 0,1 dB
Amplitude frequency response:	stereo L-R	± 0,2 dB, 30 Hz – 15 kHz
	AUX/RDS	± 0,1 dB, 30 Hz – 100 kHz
Total harmonic distortion (THD)		≤ 0,05%
Stereo separations		≤ -56 dB, 30 Hz – 15 kHz ≤ -65 dB @ 1 kHz
Pilot tone		19 kHz ± 0,5 Hz
Audio inputs L,R		0 ± 6 dB
Input connectors		XLR male, balanced , 600 ohm ± 10%
AUX/RDS input		0 ± 12 dB, > 2 kohm, BNC female
19 kHz output		1 Vpp, ≥ 2 kohm, BNC female

Control and settings:	Mono / stereo operation Input levels: Left, Right, AUX/RDS Operating frequency Deviation Forward (RF Output) and reflected power Standby mode Power supply control Temperature Protection settings and control Alarm name
Protection	automatically reduce RF output power if VSWR ≥ 2 standby RF Output if: • the PLL frequency synthesizer is unlocked • heatsink temperature ≥ 70 °C • DC current ≥ 8/15/30 A recover automatically after fault condition is removed
Operating condition:	
Temperature range	+5 ... +45 °C
Humidity	80% non condesing
AC power supply	~220 V +10/-15% ; 50 ± 2 Hz
Power consumption	450/750/1500 VA max 20 VA Standby mode
Cooling	forced air
Dimension	2U 19” (88.1x482.6x405mm)
Weight	10.5 kg

Standard AES/EBU digital stereo audio interface available as an option.

Input connector	XLR male, balanced, 110 ohm automatic switching between analogue and digital input
Audio data	24 bits
Sampling frequency	32, 44.1, 48, 96 kHz
Dynamic range	120 dB

Integrated IP RDC (Remote Device Control) unit provides full control over equipment (or group of equipment) and additional features: control of all parameters related to operation, password protection, remote turn on/of, management of device history. The IP RDC unit allows integration into telemetry system or other supervisory systems.

Local network	RS-485 interface, up to 14 devises
Ethernet connector	RJ-45
Internet Protocol	SNMP
Data communication	HTTP

Web page contains the name of facility installation, description of the transmitters, device names and main parameters, device history.

Please, download Device Manager software at www.vigintos.com/downloads.

RDS coder (Radio Data System) generates a high quality signal to full EBU/Cenelec specifications. The data signals are carried on a sub-carrier which is added to the stereo pilot-tone system.

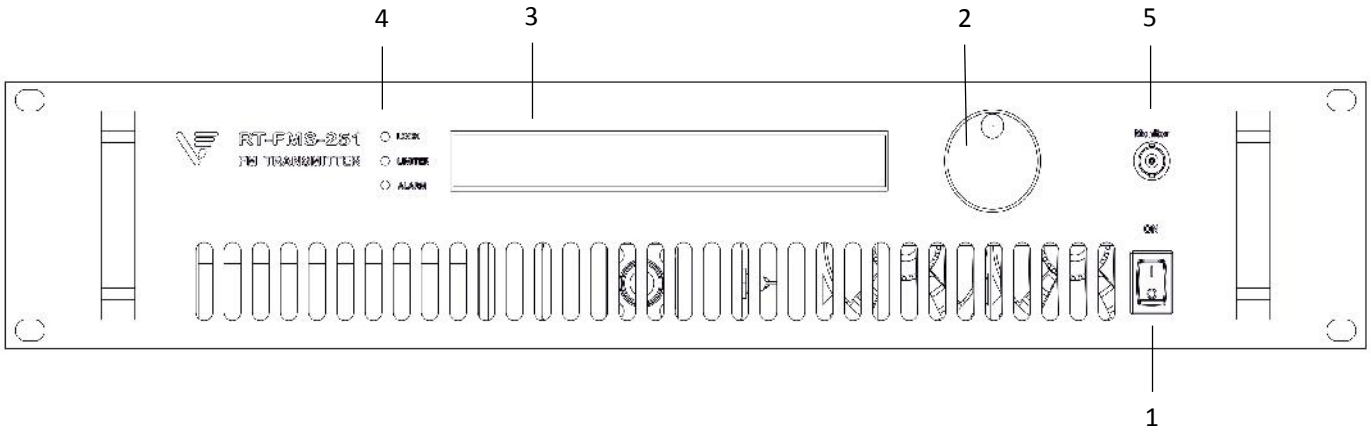
RDS sub-carrier	57 kHz ± 2 Hz
Modulation	DSB with supperessed carriers
Bandwidth	± 2.4 kHz
Carrier suppression	≤ -50dB
RDS data input	RS-232 interface
Standard supported	EBU/CENELEC Dpecification EN 50067

Please, download Software and User manual at www.vigintos.com/downloads.

Software includes:
FM Manager generates detailed information about the transmitting station.
FORA Server , **Init Coder -** helper programs and data initialization.
Documentation provides with detailed user manual. Please, carefully read this manual before connecting the RDS encoder.

Dynamic PS automatically generates dynamic data, scrolls song tittle and any other information.
RDS Manager support remote control and settings.

3. EXTERNAL DESCRIPTION



Front view

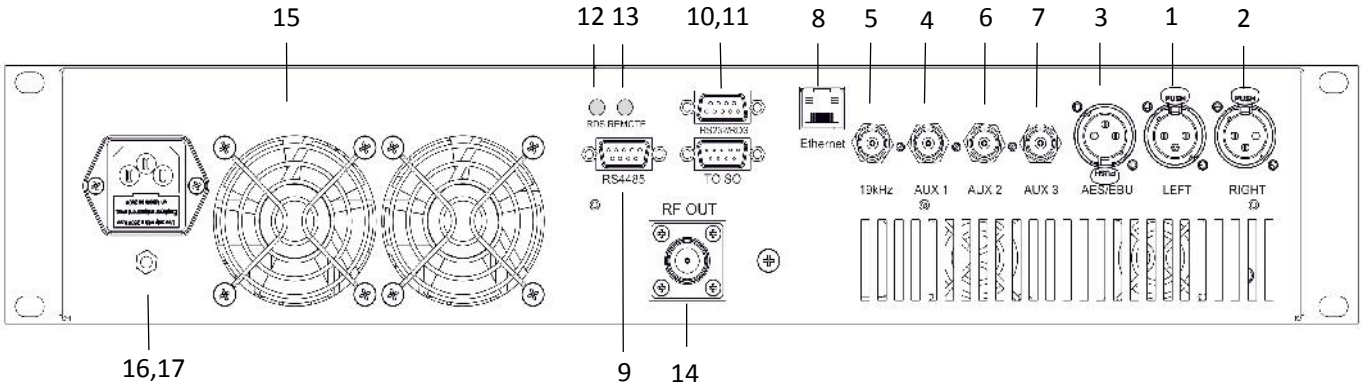
1 - Mains power switch

2 - Encoder (control knob and button)

3 - LCD display

4 - Lock ● green led, lit when the PLL is locked on the operating frequency
Limit ● yellow led, overmodulation indicator
Alarm ● red led, protection indicator - alarm name displayed on the LCD

5 - RF Prob



Rear view

1 - Left/Mono channel input
2 - Right channel input

3 - AES/EBU digital input (option)

4 - AUX/RDS input for external RDS coder
5 - 19 kHz output

6,7 - SCA 1,2 inputs

8 - RJ-45 Ethernet connector (IP RDC option)
9 - RS-485 interface

10 - RS-232 interface for built-in RDS coder control and settings

11 - Remote control connector for dual drive or N+1 systems

12 - Green led - RDS option installed
13 - Green led - IP RDC option installed

14 - RF output
15 - RF probe

16 - Mains supply connector with fuse
17 - Grounding

4. STARTUP AND OPERATION

Upon receipt of cargo make sure that all supplied items are delivered and there is no lading damage.
Check that all the necessary parts are available to continue.

The qualified personnel, who has thoroughly studied this user manual, technical description of the transmitter and above mentioned equipment exploitation safety requirements is allowed to use this equipment.

Operating condition:

Temperature range	+5 ... +45 °C
Humidity	80% non condesing
AC power supply	~220 V +10/-15% ; 50 ± 2 Hz

Connection:

1. Please, connect RF output to dummy load (50 ohm, VSWR ≤ 1,11) or transmitting antenna.
2. Connect audio input cables Left, Right (AES/EBU).
3. Connect additional devices, if necessary: AUX/RDS, RS-485, Ethernet.

All connections are made with the power off.

4. Connect the AC power cable to the AC power plug.
   Turn the power switch ON.

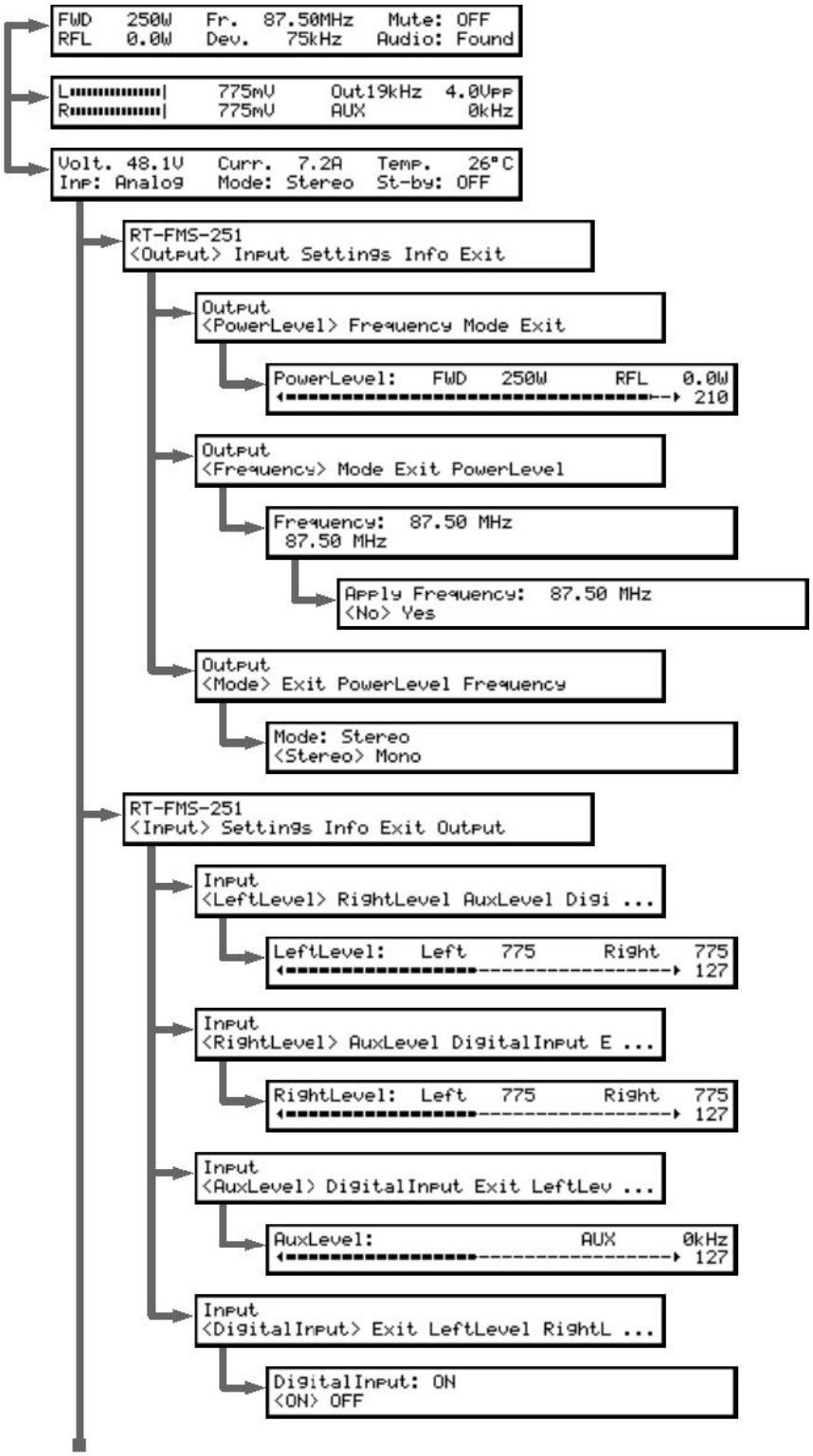
   Status indication:

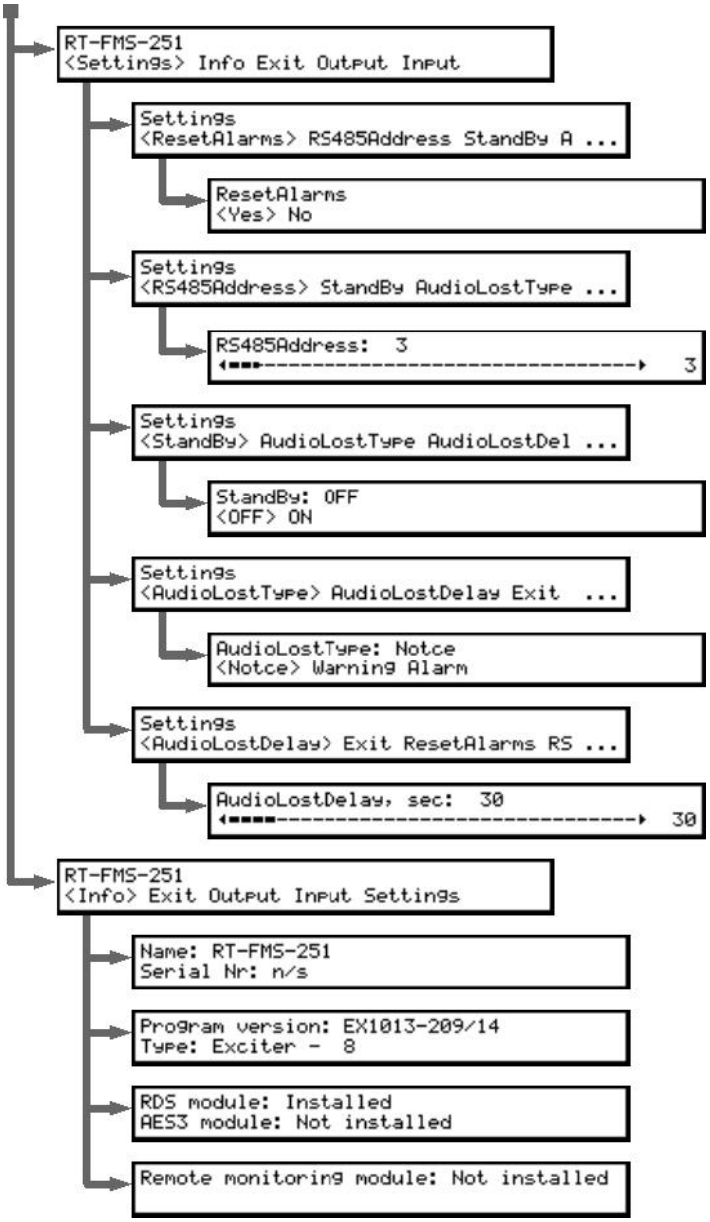
   - Lock ● green light for 0- 60 seconds after switch ON reports when the PLL is locked on the operating frequency
   - Limit ● yellow overmodulation indicator
   - Alarm ● red led, protection and alarm name displayed on the LCD

5. Set the desired operating frequency and the characteristics — see section 5. **USER INTERFACE**.

5. USER INTERFACE

Complete set of the equipment menus.





To change a menu item and parameter value and to select a type of settings **rotate the multipole control clockwise or counterclockwise.** To enter into the selected menu item or to save the changes **press the multipole control.**

To exit other menu items **select «Exit» and press the control**.

To exit the «Info» menu item **press the control**.

The display illumination is lit off if there is no activity for 5 min. In this state the control rotation is not responding. The display returns to the main menu. Any settings are not saved.

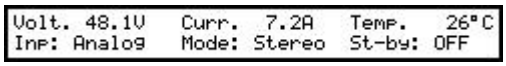
After the instrument was turned off and then is turned on again all values return to previous. To restore the display menu control press the multipole control again.

Main menu contains 3 items:

1. The output power, frequency and standby indication are shown at the top line.
The reflected power, frequency deviation and input audio signal availability are shown at the bottom line.

2. The left channel level and pilot-ton — at the top line.
The right channel level and additional frequecy — at the bottom line.

3. The supply voltage, current and temperature — at the top line.
The current audio input signal type (stereo/mono) and standby indicator — at the bottom line.



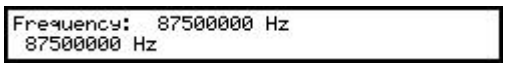
When press the control — the menu goes into the submenu item selection and information mode.
The modulator name appears at the top line, the menu options appear at the bottom.

Menu «Output».

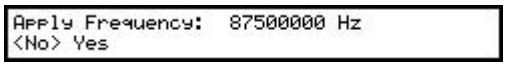
This menu option contains the following settings: power level, frequency, operating mode(stereo/mono).

The submenu item «PowerLevel» directs to forward power level adjustment. The menu title and the forward and the reflected power current value are at the top display line. The current state of the power slidebar and its digital value is at the bottom line. The adjustment range is from 0 to 2046 points. Push the control to exit this menu option. The adjustment setting will be saved.

The submenu item «Frequency» direct to a frequency tuning. The menu title and current frequency modulator value is at the top display line. The changing frequency value is at the bottom line. The frequency tuning range is from 87500000 to 108000000 Hz with the 10000Hz step.



When the control is pushed the request to acknowledge the current frequency appears.
The frequency value is at the top line. The choise set is at the bottom. In the «Yes» case , the modulator frequency will be set to this value and saved. Then this submenu is exited.
In the «No» case the submenu exits without the settings saved.

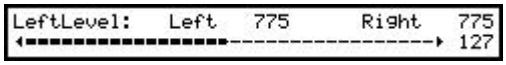


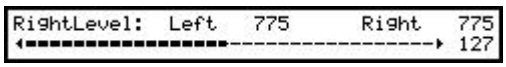
The submenu «Mode» is for selection the stereo or mono mode. The current mode is at the top line. The available modes are at the bottom line. When push the control and exit submenu the mode will be saved.

Menu «Input».

This menu option contains the following settings:
left and right channel's tuning, additional subcarrier level and digital input triggering.

The «LeftLevel», «RightLevel» и «AuxLevel» items provide an adjustment of the left, right channel levels and the additional subcarrier level control. The left and right channels level is at the top line. The current level setting is at the bottom line. The adjustment range is from 0 to 255 points.





For an additional subcarrier the current level is at the top line. The tuning slider position is at the bottom line. The tuning range is from 0 to 255 points.

The « DigitalInput" submenu provides control of the AES3 module. If the AES3 module is turned-off, only analog input is available. When the module is turned-on, the digital input has priority. If there is a signal at the digital input, this input becomes active regardless of the analog input. If the AES3 module is not present this submenu does not matter. In this case analog input is active only.

To exit the «Input» submenu options push the control. In this the set value will be saved permanently.

Menu «Settings».

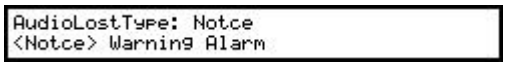
The «Settings» menu provides the alarm reset, RS485 address setting, standby control, setting of the «audio loss» event and its occurrence time.

The «ResetAlarms» submenu provides the full alarms reset. When power is locked by reason of alarms, full alarm reset allows to unlock the power. The power is not unlocked if there is an active alarm, standby mode or external power locking.
If «YES» is selected, alarms reset and exit from menu takes place. In another exit from submenu takes place only.

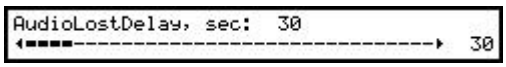
The «RS485Address» item provides the instrument address changing in the RS485 network.
The current address is shown at the top line. The changing address is shown at the bottom. The addresses are available from 2 to 15. If the control is pushed, address will be saved.

The «StandBy» submenu provides with the standby mode control. The current standby state is shown at the top line. To change the mode select OFF or ON options and push the control.

The «AudioLostType» submenu provides with the “audio signal lost” event . The “Alarm” means the power turn-off when alarm occurs. To change the event select the options at the bottom and push the control.



The «AudioLostDelay» submenu sets the delay for the “AudioLostDelay” event.
When the signal is missing the event is delayed for the seconds shown at the top line. The critical signal level depends on the minimal levels for left and right channels. The delay range is from 1 to 240 seconds.



Menu «Info» contains 4 items:

1. Top line is the instrument name, bottom — the instrument serial number.
2. Top line is the software version, bottom — the instrument type.
3. Top line shows the RDS module presence, bottom — the AES3 module presence.
4. Top line shows the remote control module presence.