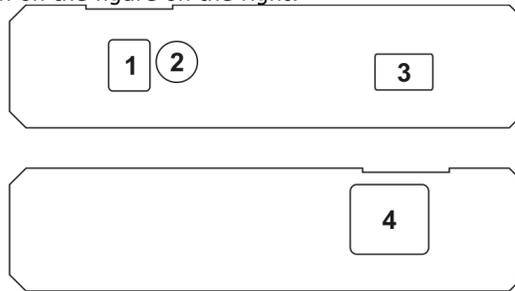


3. Electrical connections

All connectors of WRM-TS are shown on the figure on the right:

- 1 – Power inlet: adapter 6-9 Vac/200 mA or 5-12 Vdc/200 mA (polarity does not matter)
- 2 – SMA antenna connector
- 3 – Wire m-bus slave interface, 2-pin terminal block
- 4 – RJ45 connector (RS-232 interface) - for connection to PC, external controller/converter or m-bus converter (MBRS-xx)



The cable for connecting WRM-TS to external device (PC, controller, etc.) is RS-232 <-> RJ45 and is part of the package. Same cable is used on MBRS-xx type converters. Software for setting WRM-TS can be freely downloaded from Gineers website or contact us.

4. Warranty

The warranty of the device is limited to 2 years from the date of sale. If the device shows any defect or malfunctions during that period, the manufacturer is obligated to repair the device in its own service for manufacturer's expense, or, if the repair is impossible, to replace the device with new one. The transportation costs to the manufacturer's service are due to the client. The warranty voids if this manual's instructions are not met, warranty seals are removed or the device was opened by unauthorized by the manufacturer personnel.

Serial number:.....

Date of sale:.....

Signature:.....

5. The package contains

- WRM-TS - 1 pc.
- Data cable for connection to PC, 1m. – 1 pc.
- Power adapter - 1pc.
- 868MHz RF antenna
- Instruction manual - 1 pc.

6. Manufacturer

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Wireless m-bus receiver **WRM-TS**

WM-BUS Series

Instruction manual

WRM-TS is a wireless m-bus receiver, intended to collect data from various devices, working in modes T or S according to wireless m-bus standard (EN13757-4). WRM-TS have the following main features and characteristics:

- Serial RS-232C interface for communicating with external device (computer, communication device/controller, etc.)
- wired m-bus interface, slave device in a m-bus network
- memory for saving data for up to 450 devices
- real time clock
- several LEDs for work state information
- external power supply (adapter [12V@0.5A](#)), included

1. General technical data

- | | |
|-------------------------------------|---|
| ▪ RF band | - 868Mhz, 12 channels |
| ▪ Wireless m-bus modes | - T1 , T2, S1, S2, C |
| ▪ M-bus slave interface | - 1.5 mA |
| ▪ M-bus interface parameters | - 300/1200/ 2400 /4800 |
| ▪ Maximum devices allowed | - up to 450 |
| ▪ AES-128 encryption/decryption | - Mode 5, individual or one key for all |
| ▪ serial port baud rate | - 0.3/1.2/ 2.4 /4.8/9.6/19.2/38.4 kbps |
| ▪ power supply | - 6-12 Vdc/0.5 A, adapter 2 mm |
| ▪ max. power consumption @ 12Vdc | - < 5W |
| ▪ ambient temperature, operating | - -20÷+50 °C |
| ▪ ambient temperature, storage | - -50÷+85 °C |
| ▪ air humidity, operating & storage | - 40÷90 % |
| ▪ dimensions (L/W/H) | - 125/70/30 mm (without antenna) |
| ▪ protection class | - IP30 |
| ▪ display | - 3 leds (on/RF, RS-232 comm, m-bus) |
| ▪ weight | - 170 g |

2. WRM-TS operation

WRM-TS is powered by external adapter 5-12 Vdc/200mA. The central pin of the power connector is 2mm thick. We recommend adapter with power rating 6-12 Vdc/5W. Power supply voltage should not exceed 20 Vdc/ 15 Vac.

WRM-TS begin operation immediately after power-up. After initialization (about 1s), WRM-TS enters in normal work mode.

This device has simple function – collect data from every wireless meter which is told to, and convert this data to normal m-bus telegram. This telegram can be read both through PC interface and/or m-bus interface by external controller. It is ideal for mixed type networks (wire and wireless m-bus) because it can read wireless devices and send needed data through standard m-bus interface. Supports Primary addressing of attached devices from 1 to 250 (defined by user), but total devices can be up to 450. Addresses above 252 can be read through m-bus only by secondary addressing.

Normally three work scenarios can occur:

- Connect WRM-TS to master m-bus converter/display, like MBM-64/250 – then data will be visualized on display or read through wired m-bus interface
- Connect WRM-TS to communication device like Ethernet/GPRS/phone modem – then data can be read from remote location
- Connect portable computer to RS-232 port and read information manually.

Initial parameters programming is essential. By default WRM-TS works in wireless T1 mode, listening for all incoming messages in the air. If meters for readout are programmed, each received message is processed and if frame header equals to a programmed meter, data is decoded and saved in non-volatile memory. Programming meter in WRM-TS memory means that user must activate particular device, giving information about its Primary and Secondary address. Primary address is defined by the user and generally is a number between 1 and 250. Secondary address is meter ID, which is 8-digit unique code, written on every meter and should be known to the user.

If meters are AES-128 encrypted then use should set individual decryption keys for each meter. Or can use one Master key for all meters.

When desired meters are activated in WRM-TS memory user can also set readout interval in hours (1-240) or minutes (5-240). When asked with standard m-bus telegram REQ-UD2 on m-bus or serial interface, WRM-TS returns last saved value, with or without timestamp.

WRM-TS has internal RTC clock, which has a backup power supply. On power down device does not work, but RTC remains untouched for about a month.

All settings are made through serial PC port. Since all commands are ASCII based this can be done with simple terminal program, although easy setup software is provided for setting and reading.

All commands and parameters are ASCII based with one exception – encryption key command.

Each command consists of three* basic parts:

- command type
- command description
- parameters*

*parameters are optional for some of the commands.

Command types are consisted of 3-letter ASCII and are three main types – 'get', 'set' and 'del'.

Command description is a 4-letter command code.

Command parameters are one or two ASCII sequences, separated with a ',' symbol. When parameters have to be set in WRM-TS memory, after command description is always present symbol '='.

To start reading particular device there are two main steps that must be done:

- activate a device in memory
- **set WRM-TS in desired wireless m-bus mode
- ***set desired interval for memorizing

**by default WRM-TS works in T1 mode

***by default this value is on every 60 minutes

And that's all. Furthermore, some additional parameters like port speed and parity, time and data, timestamps and so on can be set by the user for convenient reading.

Main commands and parameters are these:

#	Command	Description	Default value	Value range	Note
1	get main	Return type, firmware version and ID of WRM-TS	N/A	N/A	
2	get serv	Return main operational parameters	N/A	N/A	
3	get time	Return current time of WRM-TS	N/A	N/A	
4	get date	Return current date of WRM-TS	N/A	N/A	
5	get addr	Return MAX devices and activated meters in HEX-ASCII mask	N/A	N/A	
6	get full	Return all activated primary and corresponding secondary addresses	N/A	N/A	
7	set time=hh:mm:ss	Set time of WRM-TS	00:00:00	hh <0-23> mm <0-59> ss <0-59>	
8	set date=dd/mm/yy	Sets date of WRM-TS	01/01/16	dd <1-31> mm <1-12> yy <00-99>	
9	set minc=0/1	Defines readout interval in minutes (0) or hours (1)	0	0 or 1	
10	set pito=xxx	Defines readout interval	6 (hours)	<0-240>	
11	set wmod=x	Sets working wireless m-bus mode	MODE T1	0 = S1 1 = T1 2 = T2 3 = S2	
12	set trns=0/1	Defines type of WRM-TS readouts – full radio telegram or m-bus telegram due to EN13757-3	0 (transparent mode OFF)	0 or 1	
13	set tmst=0/1	Defines presence of timestamps in readout m-bus telegram	1 (ON)	0 or 1	
14	set entr=x,y	Activates METER in WRM-TS memory	N/A	xxx = PRIMARY yyyyyyyy = ID	Binds user defined primary address to existing wireless meter with ID yyyyyyyy
15	set bind=x,y	Binds a meter in special list, which is used on filtering and AES-128 encryption	N/A	xxx = PRIMARY yyyyyyyy = special	Yyyyyyyy is a HEX sequence, which includes ID, manufacturer code, version and device type
16	set encr=x,y	Sets AES-128 encryption key for a particular meter	N/A	xxx <1-64> Y = 16-byte key	Meter 1-64 should be in BIND list in order decryption to work correctly
17	set rssi=0/1	Sets RSSI byte presence in every wireless telegram	1 (ON)	0 or 1	This is last byte before STOP byte in wired m-bus telegram.
18	set decr=0/1	Turns AES-128 message decryption ON/OFF	1 (ON)	0 or 1	Used only if AES-128 encrypted messages will be received
19	del entr=xxx	Deactivates a device in WRM-TS memory	N/A	xxx <1-250>	
20	del bind=xx	Deletes device from BIND list	N/A	xxx <1-64>	
21	del addr	Deactivates all devices in WRM-TS memory	N/A	N/A	

All commands and parameters are lower case, with no preceding or trailing characters like space, CR, LF, etc.

For full command reference refer to WRM-TS Command reference, which can be downloaded from www.gineers.com/en/products_remote_master_wrm.php