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CONFIG RFM-RPT3

User Manual_v2.0

1. Introduction

The software described in this manual is needed for the configuration and commissioning of the signal repeater **mod.RFM-RPT-3**.

The configuration of the repeater is a necessary procedure that must be carried out before the installation, because in this phase all functioning parameters are set.


A **Debug mode** is also available and it allows to check in real time what is received by the repeater.

All **B METERS** radio modules received by the repeater, along with the related information, are shown during debug mode. It is then an operational mode that should be used during the commissioning process in order to verify the correct data reception from the modules and every time you need to check whether the device is working correctly.

The software does require an installation procedure. See chapter 2 of this manual.

System requirements

Operating System

 From Windows XP SP3 to Windows 10

Hardware

CPU x86/x64 bit - 1,5GHz (↑ 1,6 GHz recommended)
RAM 1GB (recommended 2GB)
HDD 3 MB HD free space (recommended 2GB)

Software

 Microsoft .NET Framework 4.0

2. Software Installation

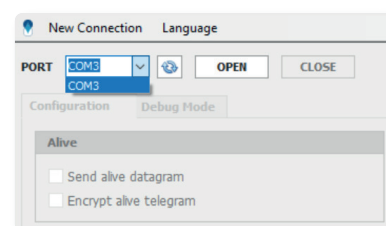
To install the **Config RFM-RPT3 Software** on your computer, [click here](#) to download the compressed archive to a local folder on your computer, select the file and decompress it ([right button](#) → [Extract file](#), set the destination folder and then click [OK](#)).

After unzipping all the files in the archive, enter in the folder just created and double click on the 'setup' file. Follow the instructions to install the software.

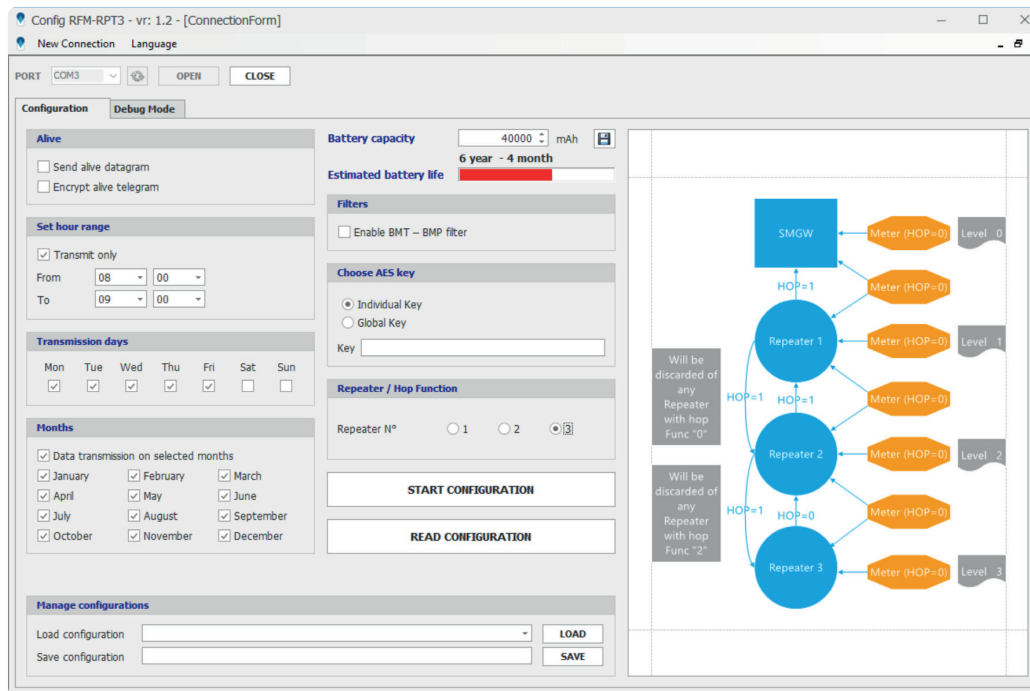
3. Software UI description

3.1 New Connection

When you start the software you'll be asked to select the COM port where the RFM-RX2 radio receiver is installed. To find out which port is linked to the receiver, please check the Device Manager ([This PC](#) → [right click](#) → [Manage](#) → [Device manager](#) → [Ports \(COM and LPT\)](#)). Please refer to the RFM-RX2 product manual how to install the device. Once the correct COM port is selected, push the **OPEN** button. The port number will be saved by the program and loaded as default value for future launches.



3.2 Configuration menu



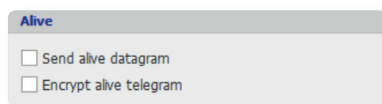
The **Configuration** tab is used to set all working parameters of the repeater. The device configuration is necessary for its correct functioning. This configuration consist in the setting of working hours, days of the week, months, transmission power, encryption key for the alive telegram, number of repeaters (depending on the

signal repetition system: single, double or triple hop).

It is also possible to save the current configuration and load saved configurations.

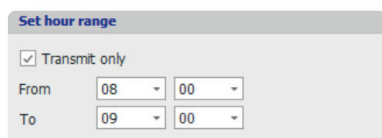
On the right side of the panel a picture shows a schematic view of the chain of repeaters, based on the number of configured devices.

Description of selectable parameters



Alive: allows to enable/disable the periodic sending (roughly every 15 min) of a datagram from the repeater containing information about the battery status, date and time (Alive telegram). To obtain the alive telegram format description, please contact **B METERS**. The selectable options are:

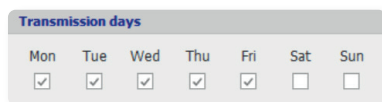
- › **Send alive datagram:** tick/untick;
- › **Encrypt alive datagram:** tick/untick.



Set hour range: tick the checkbox to use this parameter. If the checkbox isn't ticked, the device will transmit 24/24h (in case of non-electrical power supplied device, this setting is not recommended due to excessive battery consumption).

WARNING: the battery lifetime depends directly on the hour span that will be set.

The time configured on the repeater is set depending on your laptop clock. Make sure you laptop is correctly synchronized.



Transmission days: allows to select the week days in which the repeater will be active.

Months: allows to set the working months during the year. Tick the “Data transmission on the select months” checkbox, to select the working months.

Battery capacity: allows to set the total installed battery capacity, which is by default 40000mAh. Changing the capacity affect the estimated battery life calculation. To save the value, use the button on the right. This saving function is protected by password. If it is necessary to change this setting, contact **B METERS**.

Estimated battery life: shows the estimation of the battery lifetime, basing on the previous settings. A value lower than 7 years is indicated with a red bar. Even in this case it is still possible to configure the device.

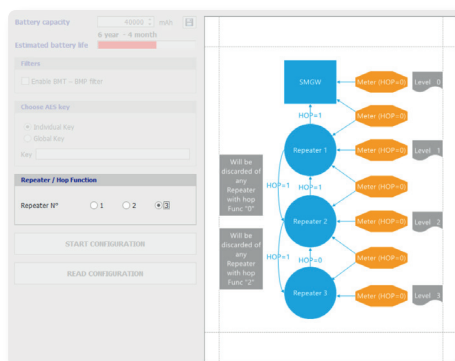
Filters: this option allows to set a filter on the repeated telegrams, basing on the manufacturer code (M field of the telegram). If checked, the filter is enabled and only the devices with BMT and BMP manufacturer code (**B METERS** devices only) will be repeated. If not ticked all the devices (even **non-B METERS**) will be repeated, without any filter.

Choose AES Key: allows to select the encryption key type for the alive telegram sent by the repeater. It is possible to choose between a global AES key or an individual AES key (compliant).

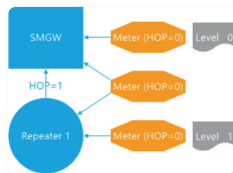
- › **Individual Key:** will generate a unique key for each repeater;
- › **Global Key:** it must be specified by the user as a hexadecimal number with 16 digit.

NOTE: the loss of the global key will cause the impossibility of reading the data of the alive telegram transmitted by the repeater. It is recommended to keep the encryption key carefully.

Manage Configurations: when all the parameters has been set, it is possible to save the configuration by typing a valid name in the “Save configuration” text box, thus pressing the **SAVE** button. A saved configuration can then be loaded by selecting it from the drop down menu “Load configuration”, thus pressing the **LOAD** button.



Repeater / Hop Function: the **RFM- RPT3** repeater allows to create a chain of repeaters of up to three units. It is possible to use the device as single repeater (WM-BUS standard) or it is possible to create a chain of devices when the installation of devices is distributed among different floors, or the concentrator is placed far away from the devices. Up to three hops are possible. First all, it is necessary to plan the chain system, deciding the number of repeaters and where to install them, in order to evenly cover the area in which the meters are installed. Then, configure them from the furthestmost device to the closest one (compared to the concentrator). The picture on the right side shows the number of levels basing on the number of repeaters, with the hop functions and the way the repeaters operate inside the chain system.

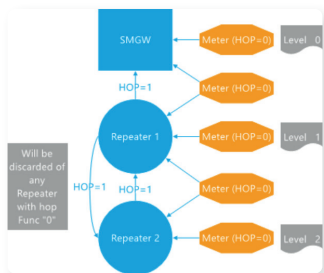


Repeater / Hop Function

Repeater N° ☒ 1 ☐ 2 ☐ 3

N° repeater = 1

A single repeater with hop function = 1 transmit the telegram with the hop function of the meters (with hop = 0) switched to 1. This is the standard function planned for the standard wireless MBUS systems. To set up a completely standard network, it is necessary to choose this option.

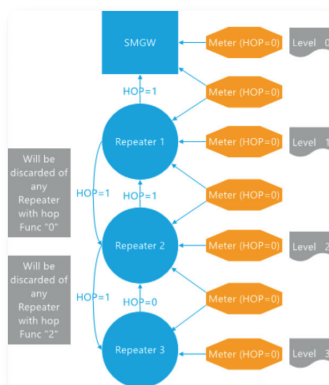


Repeater / Hop Function

Repeater N° ☐ 1 ☒ 2 ☐ 3

N° repeater = 2 (with two repeaters)

- › The hop function 0 repeater receive hop = 0 from the meters and switch it to 1, discard the hop = 1 transmissions.
- › The hop function 1 repeater receive hop = 0 from the meters and switch to 1 and receive hop function 1 from the previous repeater and keep it to 1.



Repeater / Hop Function

Repeater N° ☐ 1 ☐ 2 ☒ 3

N° repeater = 3 (with three repeaters)

- › The hop function 2 repeater receive hop = 0 from the meters and keep it 0, while discard the hop = 1 transmissions.
- › The hop function 0 repeater receive hop = 0 from the meters or previous repeater and switch it to 1, while discard the hop = 1 transmissions.
- › The hop function 1 repeater receive hop = 0 from the meters and switch to 1 and receive hop = 1 from the repeater and keep it to 1.

Battery capacity 40000 mAh

Estimated battery life 6 year - 4 month

Filters

☐ Enable BMT - BMP filter

Choose AES key

☐ Individual Key

☐ Global Key

Key

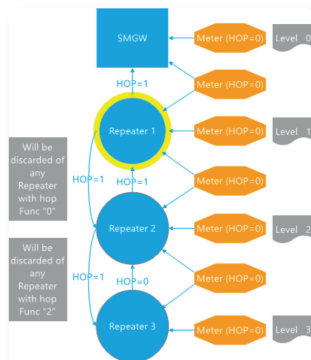
Repeater / Hop Function

Repeater N° ☐ 1 ☐ 2 ☒ 3

STOP CONFIGURATION

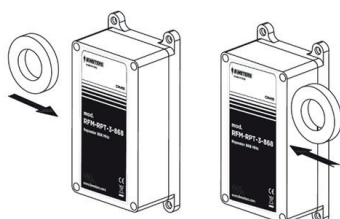
READ CONFIGURATION

Pass the magnet to configure



Once the number of repeaters is set, push the button **START CONFIGURATION**. In the drawing on the right, the repeater that should be about to be configured will be highlighted with a yellow circle.

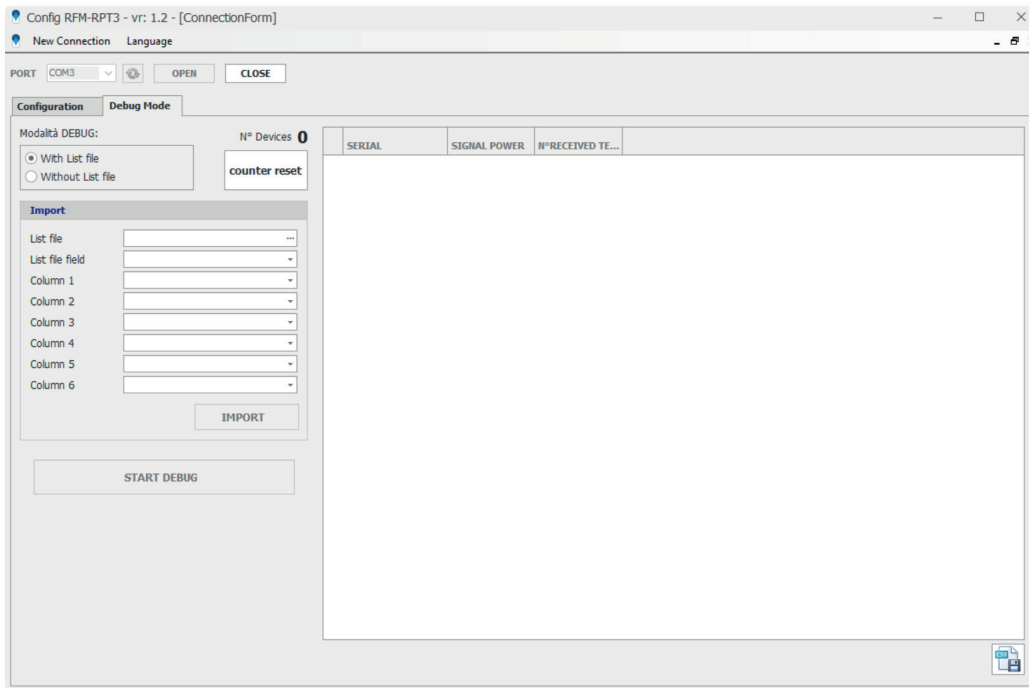
As pointed out in the indication below the button, to configure the repeater it is necessary to pass a magnet on the device. The magnet should be slid on the **B METERS** logo on the left-upper side of the repeater label.



Once the repeaters have been configured, the previously set configuration can be read by pressing the **READ CONFIGURATION** button.

After passing the magnet, a screen will be shown with all the parameters set which can be saved using the **SAVE** button.

3.3 Debug mode



The debug mode sets the repeater to an operative mode that shows the received telegrams with the corresponding information (receiving signal power, device serial number, etc.).

In general you can choose to visualize all the information that has been set during the configuration process of the radio modules. The **RFM-RPT-3** repeater can be set in debug mode both before and after its configuration.

Enter and exit from debug mode: to enter the debug mode press the Start debug button. You will be asked to pass a magnet on the repeater. Then pass the magnet on the repeater, near the **B METERS** logo on the left-upper part of the box. As the command will be accepted, the message of "Debug mode On" will be shown.

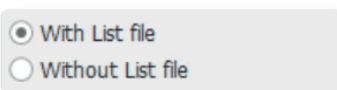
If you choose With list option you must load a list file (*.15t) to enable the START DEBUG BUTTON.

To exit the debug mode press the button Stop debug.


You will be asked to pass a magnet on the repeater.

If accepted, the message of "Debug mode OFF" will be shown.

List: this allows to select the test option for the debug mode (with or without list).



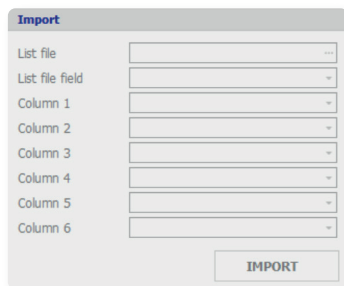
- › **With list file:** select this option if you want to visualize a list while performing the test in debug mode. A list file is useful to verify whether all the modules in list are properly received by the repeater.
- › **Without list file:** select this option if you want to visualize all the modules received by the repeater.

Import: this panel is available only if the option With list file is selected. Here it is possible to load a list file (*.csv or *.15t format). Use the "browse" function  on the first List file field to load the file.

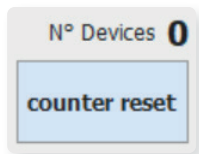
In the Radio Nr drop down it is necessary to select the column in which the serial number of the radio module, allocator etc. is located. This is the only compulsory field in order to correctly perform the test in debug mode with list file.

It is anyway possible to load other optional fields by using the drop down menus below.

Once the desired fields are selected, press the Import button.



SERIAL	SIGNAL POWER	N° RECEIVED TELEGRAMS	Meter Nr	ID	Surname	Forename
14141257	-38	2	000111254	1	Ross	Mario
15806002	0	0	884511642	2	Verdi	Giuseppe
14141309	-38	1	215876951	3	Volta	Alessandro
16866701	0	0	841238674	4	Ohm	Georg Simon Alfred
15061400	-46	1	648432244	5	Copernico	Nicola
11309901	-53	1	945486126	6	Da Vinci	Leonardo
17025488	-48	1	897423124	7	Tesla	Nikola



Next to the selected fields, two additional columns are added:

- › **Signal power:** it shows the signal quality of the radio reception of the radio module (shown in dBm);
- › **N° received telegrams:** it shows the number of radio packets received from the module.

Counter reset: by pushing the counter reset button, all the totalizers in the N° of received telegrams column will be reset.

Along with the counter reset button you can find the indication of the devices received. This counter is reset only when the debug mode is ended.

During the initial commissioning process, you can move the repeater and check whether the telegrams are received with better quality or not. This allows to identify the best installation point for the device.

4. Configuration procedure

Here below you can see a step by step guide for the configuration of the **RFM-RPT-3** repeater.

Tools needed:

- › A Windows PC or tablet with an USB port available.
- › A receiver **mod. RFM-RX2**.
- › The Config **RFM-RPT-3** software, distributed by **B METERS**, downloadable from the website
- › A magnet

Configuration:

- › Connect the **RFM-RX2** transceiver into an USB port of the PC or tablet.

Once the key is connected, verify that the driver is installed correctly.

- › Launch the **Config RFM-RPT-3** software, previously installed in your PC or tablet.

Then, set the following parameters:

- › the number of repeaters of the chain (they can be chained together in a multi-hop configuration up to three repeaters).
- › the hours in a day (with a resolution of ten minutes), the days in the week, the months in the year in which the repeater will be active.
- › the optional filter for the telegrams that should be received.
- › the encryption option.

See the previous sections of this software manual guide for a detail description of each option.

- › Once the desired options are set, click on the START CONFIGURATION button and pass the magnet on the repeater. This will send the configuration telegram to the repeater.

A message of configuration success will be showed by the software. In case you won't see this message, pass the magnet again on the repeater.

- › Repeat the previous steps for all the repeaters.

From now on the repeaters are operative. You can check which radio modules are received by the repeater by using the debug mode.

- › To enter the debug mode press the START DEBUG BUTTON. You will be asked to pass a magnet on the repeater. Then pass the magnet on the repeater, near the **B METERS** logo on the left-upper part of the box. As the command will be accepted, the message of "Debug mode On" will be shown.
- › Check that all the radio modules are properly received.
- › To exit debug mode press the button Stop debug. You will be asked to pass a magnet on the repeater. If accepted, the message of "Debug mode OFF" will be shown.

It is now possible to mount the repeater on the wall, in the point identified as most ideal.