Radio System

• IME spa
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Summary

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General description

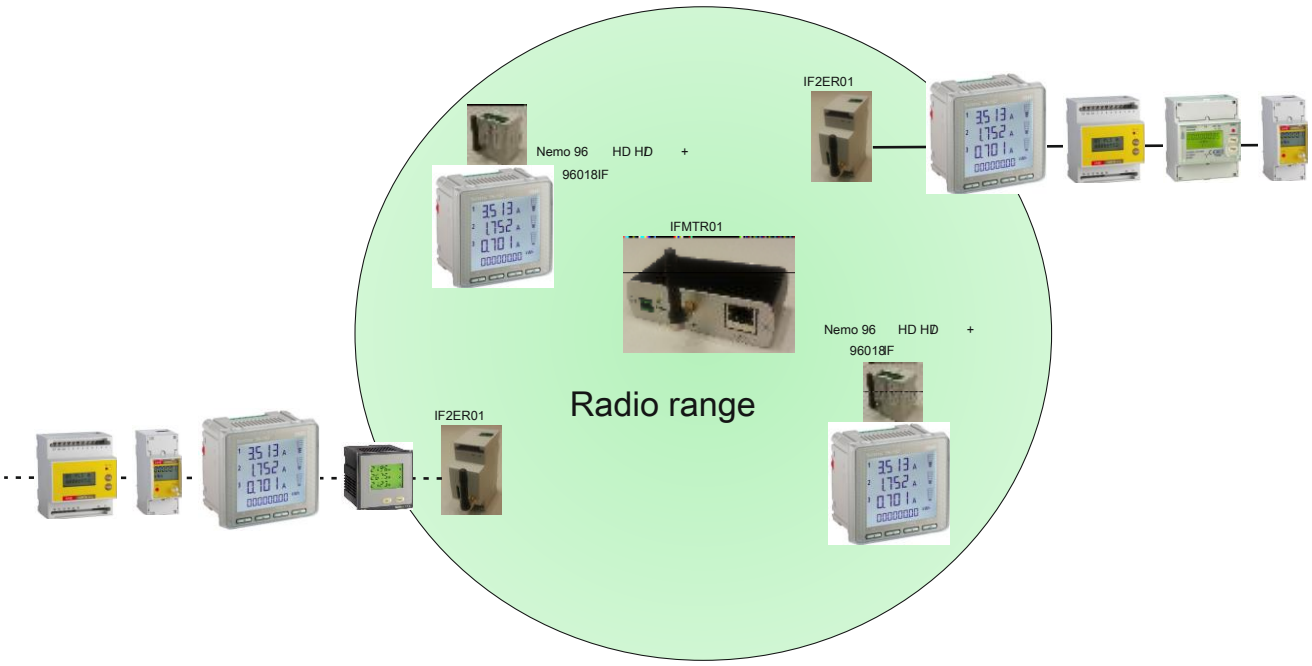
The radio system constituted by the gateway IFMTR01 + IF96018 IF2ER01 module or interface, is a data transceiver system via radio completely transparent to the protocols in transit and allows you to connect to the supervisor up to 255 instruments or more, depending on the configuration. With the antenna supplied the maximum attainable in the open field distance (antennas in view between them) is 100..150 mt. In closed environments, this distance will be strongly influenced by the separation elements such as walls, reinforced concrete walls, metal doors and anything else for which there is not a scientific way to establish the maximum flow rate under these conditions but by the tests carried out, it is it can be established in no less than 50 mt.

The transmission frequency is 868 MHz and the power is 10 mW (LPD) at the final stage for all the apparatuses described in this manual.

The connection to the gateway IFMTR01 can be done in 3 ways

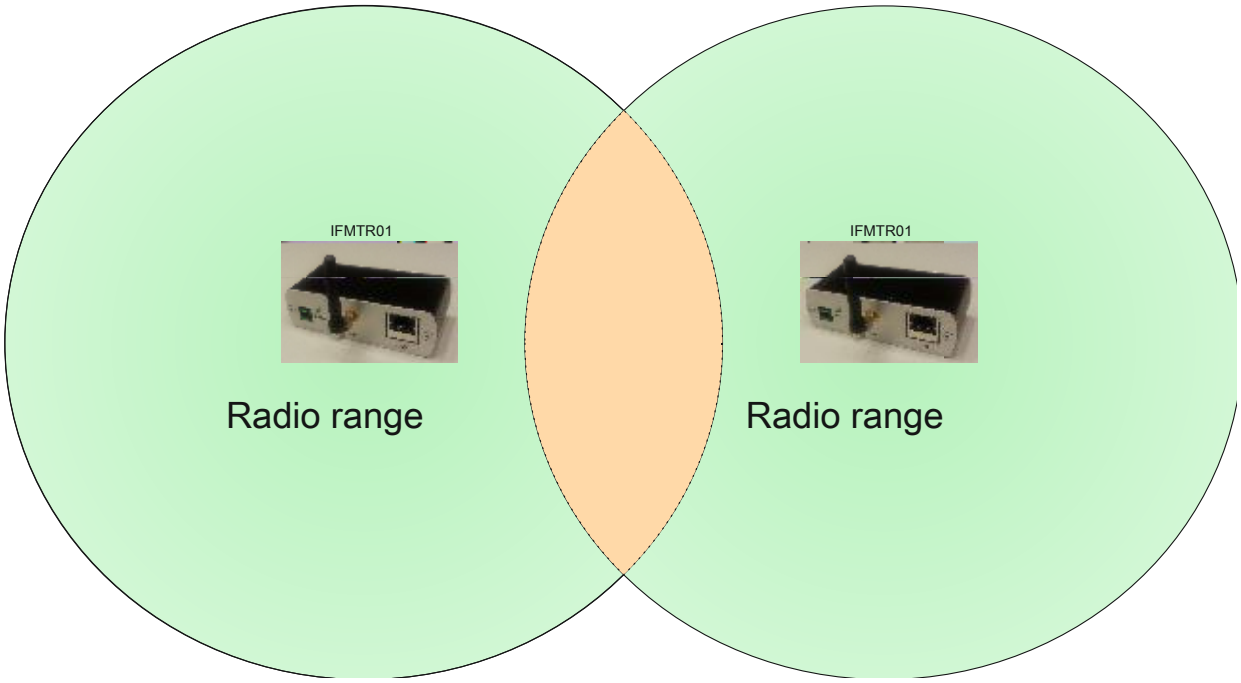
1) Point to point, via IF96018 modules.
2) Multi point, through the IF2ER01 interface.
3) Hybrid, via the IF2ER01 eo IFMTR01 gateway interfaces.

The IFMTR01 gateway will connect to the "master" via an Ethernet network and communicate with IF96018 units and IF2ER01 in fully automatic mode without any changes required. The only requirement is that the radio unit, prove to be positioned within the radio range of the gateway according to the diagram shown below and positioned on channel 1 of communication. All interfaces and modules are equipped with microswitch which selects the baud rate and the radio transmission channel. The number 1 Off position (default) channel 1. The number 1 position On channel 2.



All interfaces or modules of a network, must belong to the radio range of the same lobe gateway and on the same radio channel, 1 (default). They can not be placed close together gateway 2 in order to avoid the overlap of the respective transmission lobes.

The following configuration **It is not allowed** if the units operate on the same channel while it is **possible** If gateways are setup on different channels.



The gateway IFMTR01

This element must be at the center of the radio network to ensure maximum extension in all directions.
The "data" of the gateway connection is made via ethernet and thus the protocol used must be of "Over TCP type". In our case the protocols are used and 2 respectively

1) ModBus RTU (TCP)
2) Over ModBus TCP

At the time of writing this manual, there are no other types of protocols even if the interface can also transfer only one byte at a time.

To configure the gateway adapting to an existing corporate network or simply to connect it to your PC that will act as the master, you will need to properly set the network parameters and the membership radio channel.

In order to do this, the spa IME has realized a simple configuration software consists of a single executable file called Device Wizard IME.

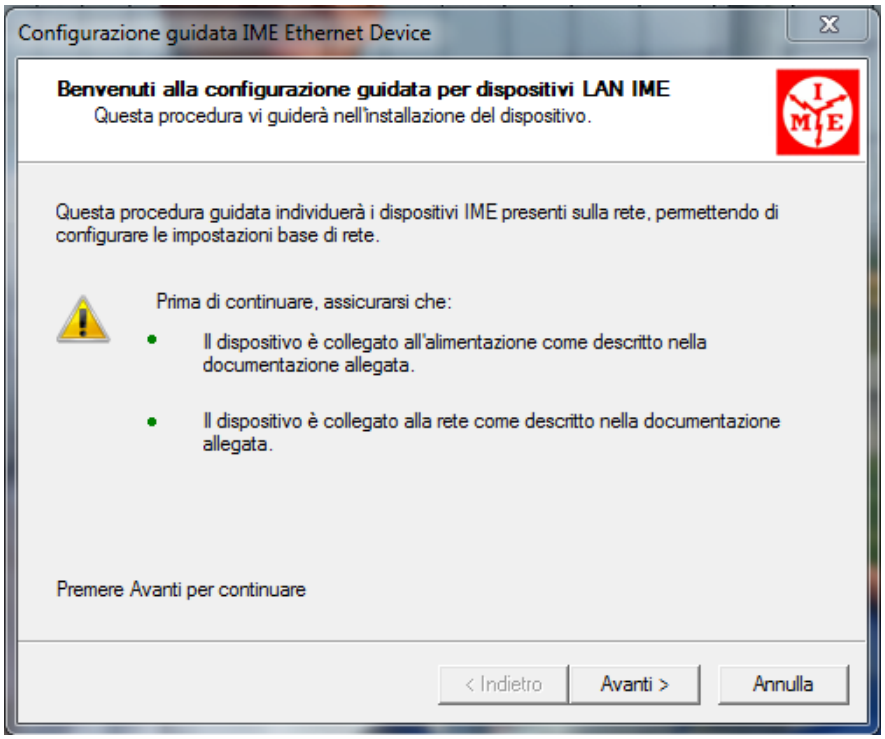
Regarding the dip switches, only the number 1 is active while all others have no associated function.
By default, this switch is positioned on the equivalent position "0" to the communication channel 1. If set to "On", the gateway ricetrasmetterà on channel 2 isolating it from all other objects placed on channel 1. To operate such a switch, it will be necessary open the front bezel using the two frontal screws, slightly pull out the printed circuit board

and localized as in the photo the selector switch position 1 in the desired position.
(See attached image)

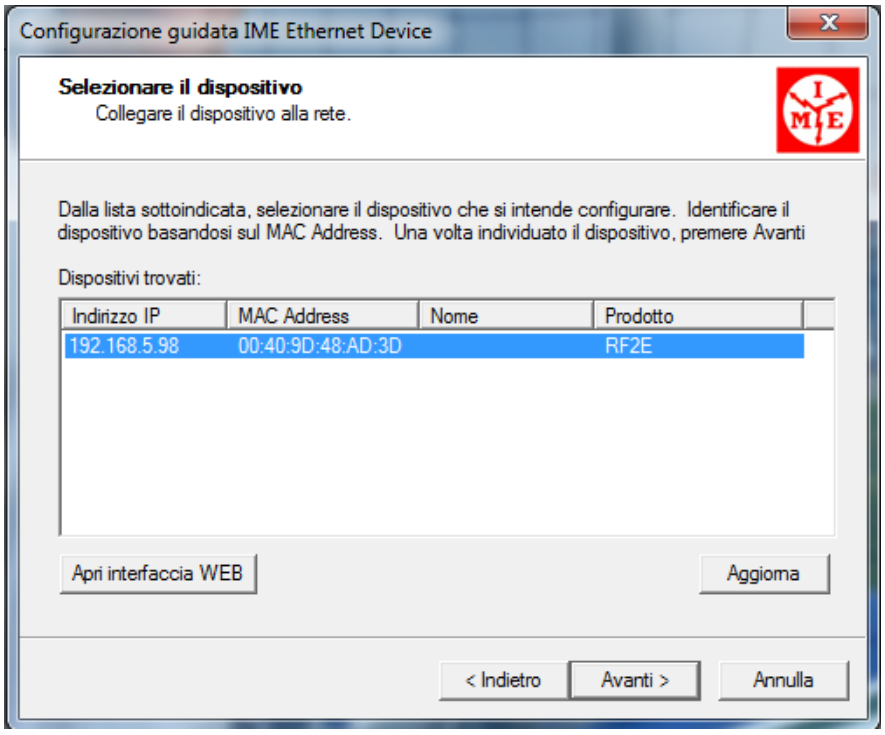
Dip 1	Channel radio
Off	1
on	2

Configuration software via the Device Wizard IME

The configuration of the gateway and consequently of the whole network is via the program provided with the interface. Launched the program you are in this screen:



Follow the instructions in the program screen and press the "Next" button. You will see this other window:

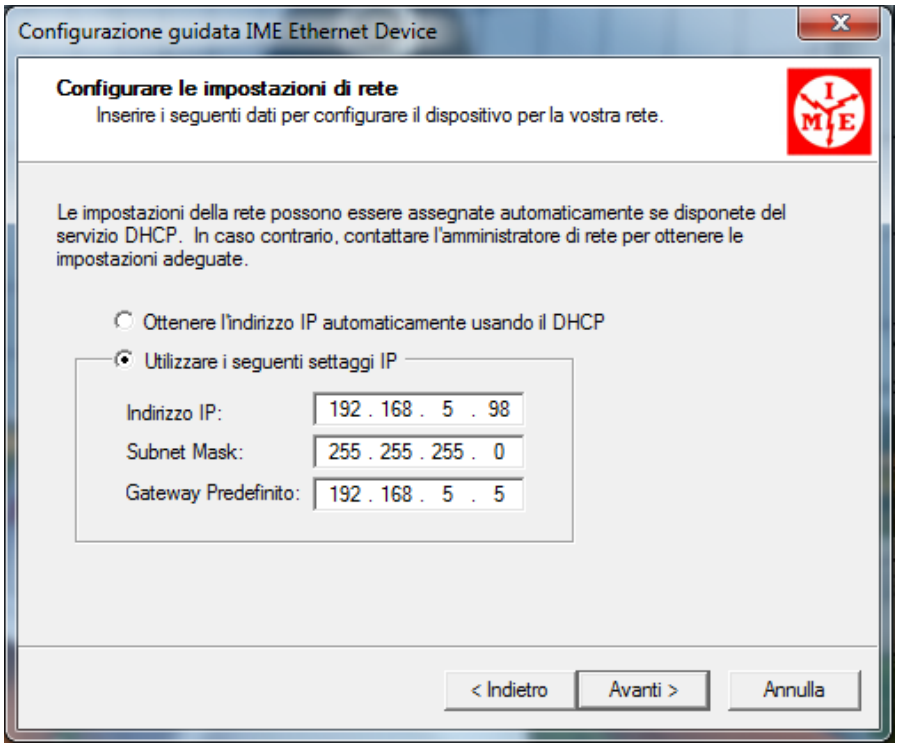


At this point the program will have already identified the gateway and will have got his address and mac address. At this point we can take two roads

1) Configuration via Program (Next)
2) via Browser Configuration (Open web interface)

Configuration via program

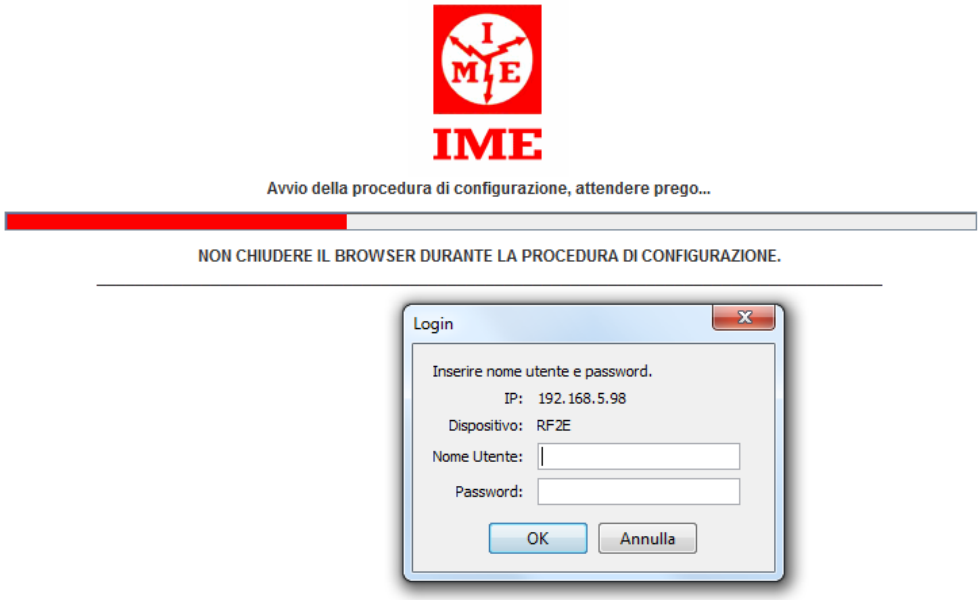
Pressing the "Next" button you will find in the real configuration window as shown below:



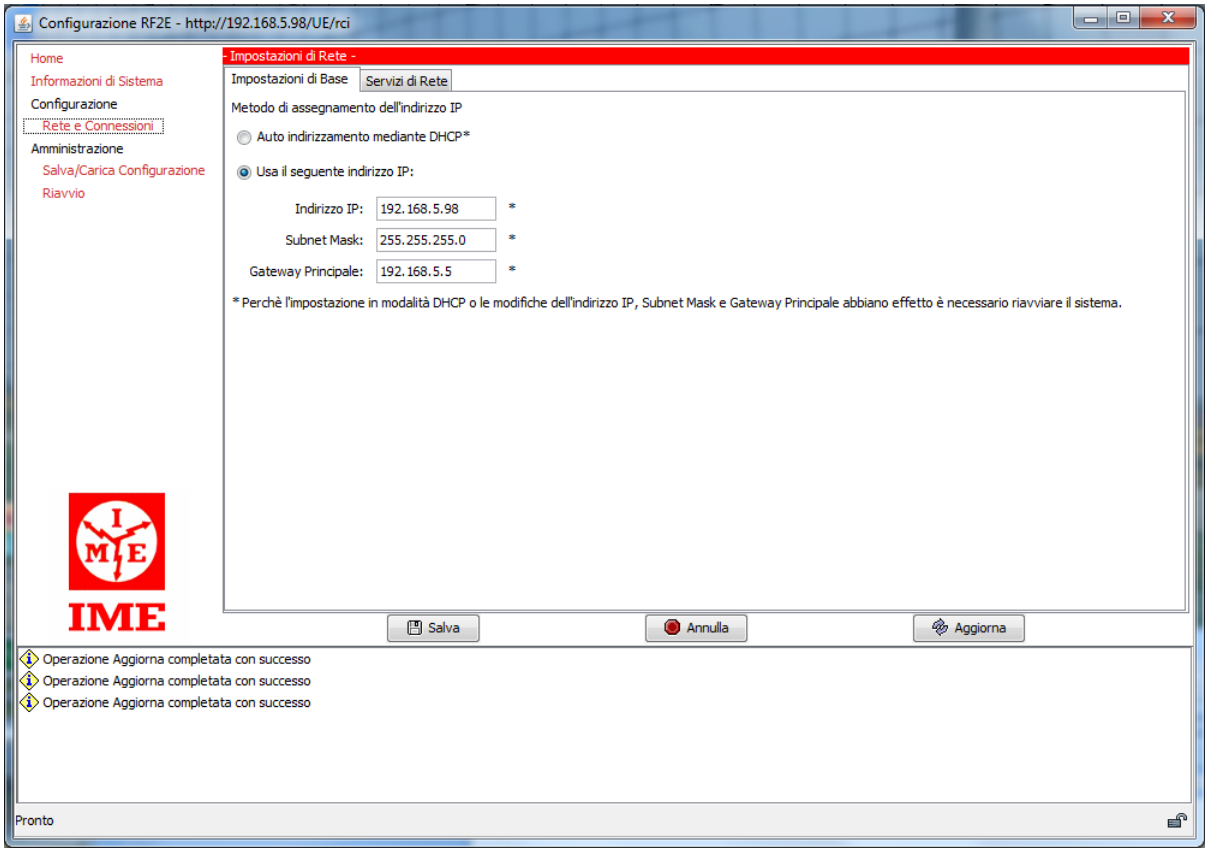
Enter the correct parameters and finish the procedure by pressing the "Next" button 2 times. Pressing the end key, the interface will be restarted with the new parameters entered. With this procedure, you can not change the "communication port" which by default is set to "502".

Configuration via web

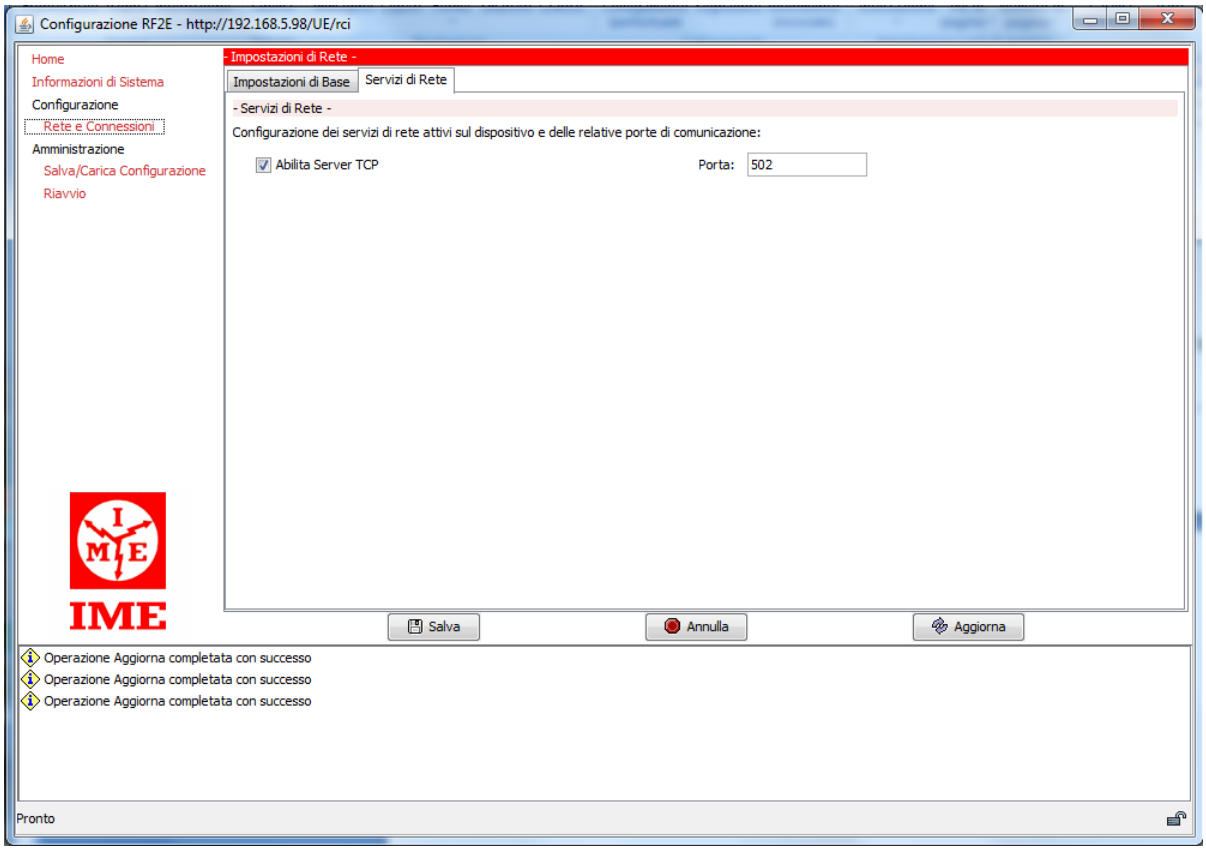
Pressing the "Open web interface" button, the program will launch running, our default browser. After several security alerts to "Java", our browser will show us the following interface in which we ask "Username" and "Password" to access the web server integrated in the interface thus giving us access to the configuration screens.



To login, enter the user name and password " **admin** ". After clicking the "OK" button opens the following configuration dialog:



On the left, click "Network and Connections" and as for the previous case, enter the correct setting values for the network. In the top menu, select the tab "Network Services". On this page you can configure the TCP communications port on the gateway.



After this operation, simply click on "Restart" to save the gateway the newly set operating data. To exit the configuration dialog, click on the upper right side of the "X".

Principle of operation

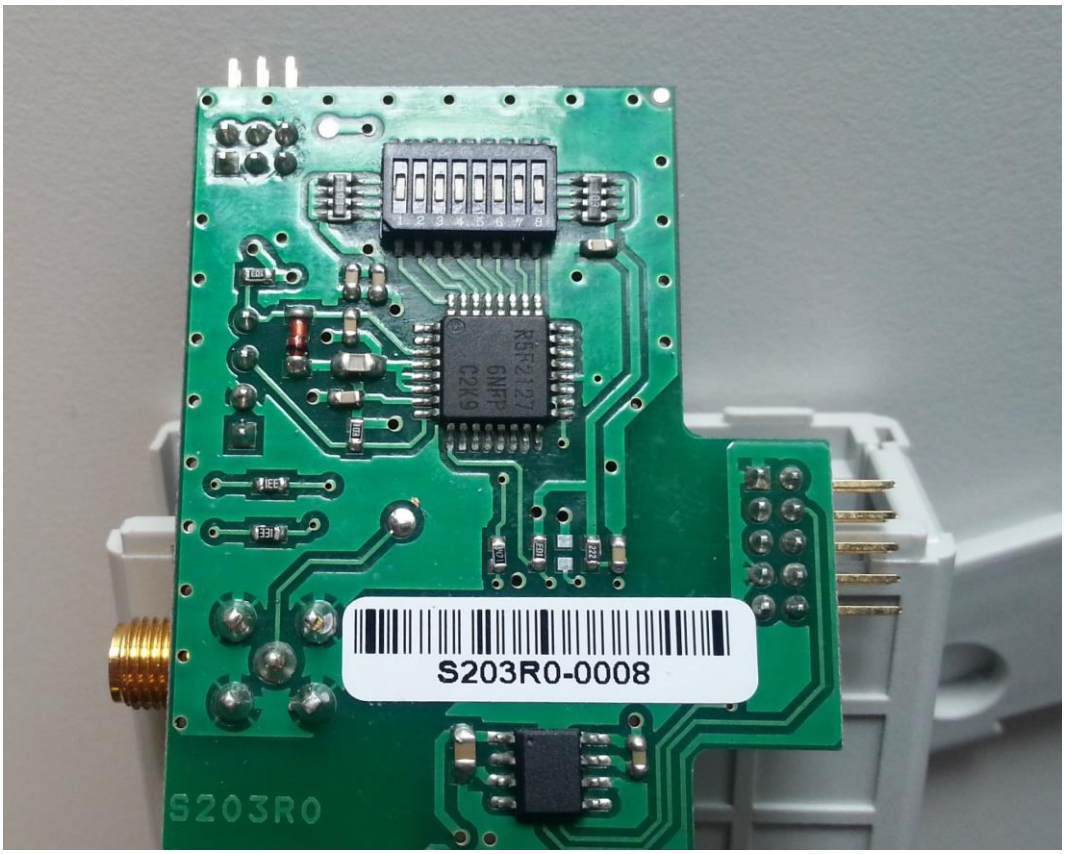
The principle of operation uses a very simple concept. The gateway radiates the request over the air. All interfaces (or IF96018 IF2ER01) in the radio range, decode the request and submit to various tools with the "ModBus" protocol used. Only the affected node to the request, responds. Here then explained why the radio range of the gateway 2 with the same channel, they must not overlap. All instruments connected via radio ***must*** ModBus have a unique node in the network.

IF96018 and IF2ER01 Configuration

The configuration procedure of these two interfaces is very simple since it consists in moving some dip switches selecting the baud rate and the transmission radio channel.

IF96018 form

This module, designed for Nemo 96 HD and HD + instruments from 3:00 software release, can not operate separately but in conjunction with IFMTR01 or IF2ER01 interfaces. The configuration is very simple because identical to a normal communication module RS-232 or RS-485 address and baud rate, will be configured directly from the setup panel of the same instrument. The only operation required, if any, will be to change the radio channel (default "1") or dip switch 1 to "Off" Opening the plastic lid and pulling out the radio circuit from its housing, you will notice the dip switches as shown in the figure:



Dip 1	Channel radio
Off	1
on	2

Interface IF2ER01

This interface was designed to carry the radio communication (cableless), all IME tools cable. Its RS-485 output is compatible with all of our tools. The only setting to consider is the baud rate of the RS-485 line selectable by dip switch see table below:

Dip 5	Dip 6	Baud Rate
Off	Off	4800
on	Off	9600
Off	on	19200
on	on	38400

And the radio channel of belonging 1 (default):

Dip 1	Channel radio
Off	1
on	2

The dip 2,3,4 are not used.

NB Set the correct baud rate and radio channel, before turning on the interface otherwise, any change made to apparatus switched on, do not have any effect. The changes made to lit interface, they only trigger, the next interface restart itself ..

This interface acts as a gateway RS-485 => Radio and converter Radio => RS-485. In practice, it is capable of receiving an RS-485 line from a master and replicate the signal over the air. Another identical unit is able to receive a signal and convert it into a standard RS-485 signal and is therefore a two-wire bidirectional interface.

Followed by a few exemplary diagram of operation: