



POWERSOFT

THE CONFIGURATOR

**Instructions for the system configuration
and synoptic setup**

Version 09/09
Rel. 2.1.0.4

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1 THE CONFIGURATOR

1.1 WHAT THE CONFIGURATOR IS

The configurator is a software, independent of PowerSoft, whose purpose is simplifying and automating the configuration process which allows PowerSoft to fit the specific system to be interfaced and monitored. Its use is limited to the configuration process only.

To carry out the automatic configuration procedure, both the communication networks and the instrumentation are to be correctly installed and set by the user. It is always possible to perform a manual configuration or to modify the automatically-set parameters.

1.2

THE CONFIGURATOR FUNCTIONS

PowerSoft configurator is a tool which allows to configure the system, from the instrument networks to the synoptic generation. Particularly, the configurator allows to:

- automatically locate the installed communication network/s;
- search for the instrument/s connected to the located network/s;
- configure and test all the found instruments;
- automatically generate and/or manually modify the synoptics relevant to the system.
- Activation of the “Service-Maker” function to use PowerSoft as a windows service.

1.3 STRUCTURE

The configurator is divided in 4 different sections named *System*, *Communication ports*, *Meters* and *Synoptic pages*. Opening the software, the default section is *System*. Carrying out the proper operations in each section, the software generates all the configuration files required to adapt PowerSoft to the system to be monitored. The section order is not random, but each section needs and uses the information set in the previous one. It is important to follow the given order when programming the software the first time. In case of parameter modifications it is possible to act directly in the relevant section.

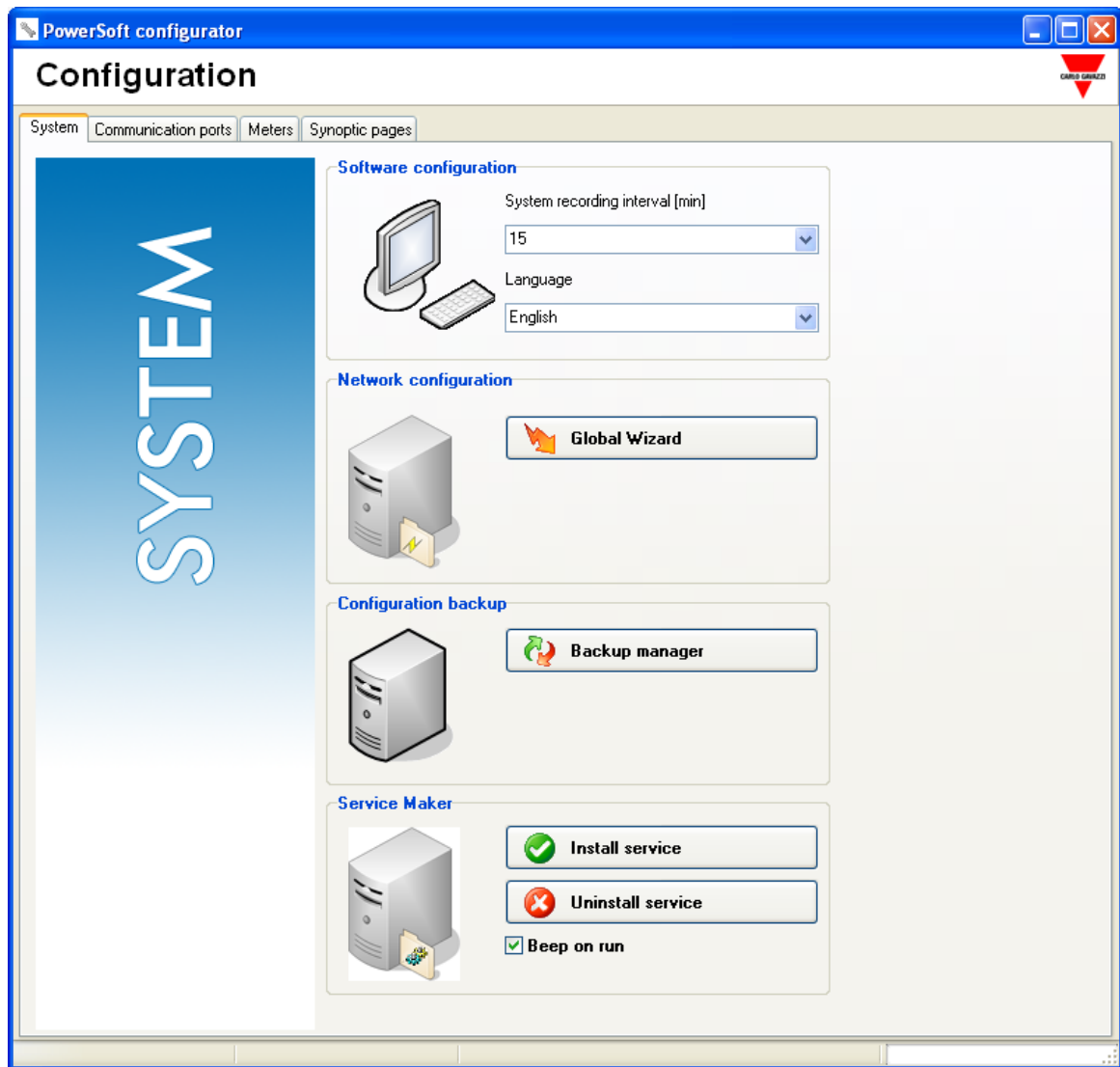
1.3.1 SYSTEM

In this section it is possible to set some essential parameters, carry out the global automatic configuration and save a backup copy of the current configuration or reload a previously-stored situation.

A very important parameter is the “system recording interval” which is the period considered by the utility supplier to calculate the demanded power of the monitored system. In Europe it is generally 15 minutes. It is based on the PC clock and, in the 15 minutes example, it begins at minutes 00, 15, 30 and 45. To synchronise the PC (and therefore PowerSoft) with the utility supplier integration periods, it is possible to use the digital inputs of one of the connected instruments. These inputs are to be connected to the digital output (synchronisation output or current tariff outputs) if available on the official watthourmeter installed by the utility supplier.

The language selection is only relevant to the configurator.

Now it is possible to carry out the automatic configuration (Global wizard) or to manually set all the parameters. step by step following the proposed order. The best suggestion is to carry out the automatic procedure and then manually intervene, if necessary, on the generated parameters.



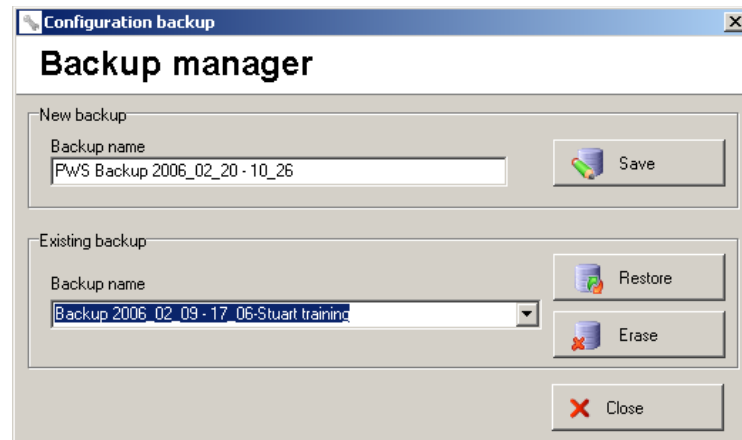
From this section, the backup archive can be managed. This archive allows to:

- store a backup copy of the current configuration (network/s, meter/s and synoptic/s configuration);
- properly manage temporary situations during which the system works in a different configuration.

Through the proper button, the Backup manager access can be gained. It is then possible to:

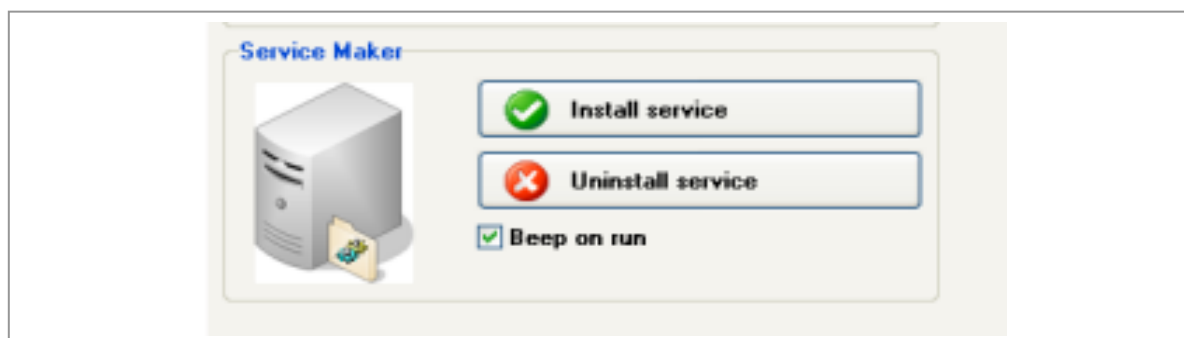
- save the current configuration (a default name is proposed);

- reload a stored configuration;
- delete a stored configuration.



From the section “Service Maker” Powersoft can be run as a windows service, i.e. can be launched automatically without login or manual launch. Service Maker is the Powersoft module which deals with these features.

If the Service Maker module is active, Powersoft is launched before the login and begins to behave in a standard way: the recording file is active, the errors detection as well as all the server modules and the modules that access to the internet are active. When a user performs a login into the operating system, Powersoft acquires a graphical interface and the user can interact with the software according to normal modes of operation.



To activate the Service Maker features you have to use the Powersoft configurator:

Clicking on the button “Install service” you can activate the Service Maker features; on the contrary, clicking on “Uninstall service” you can disable these features. The activation or deactivation of Service Maker will have no influence on normal activities of Powersoft configuration.

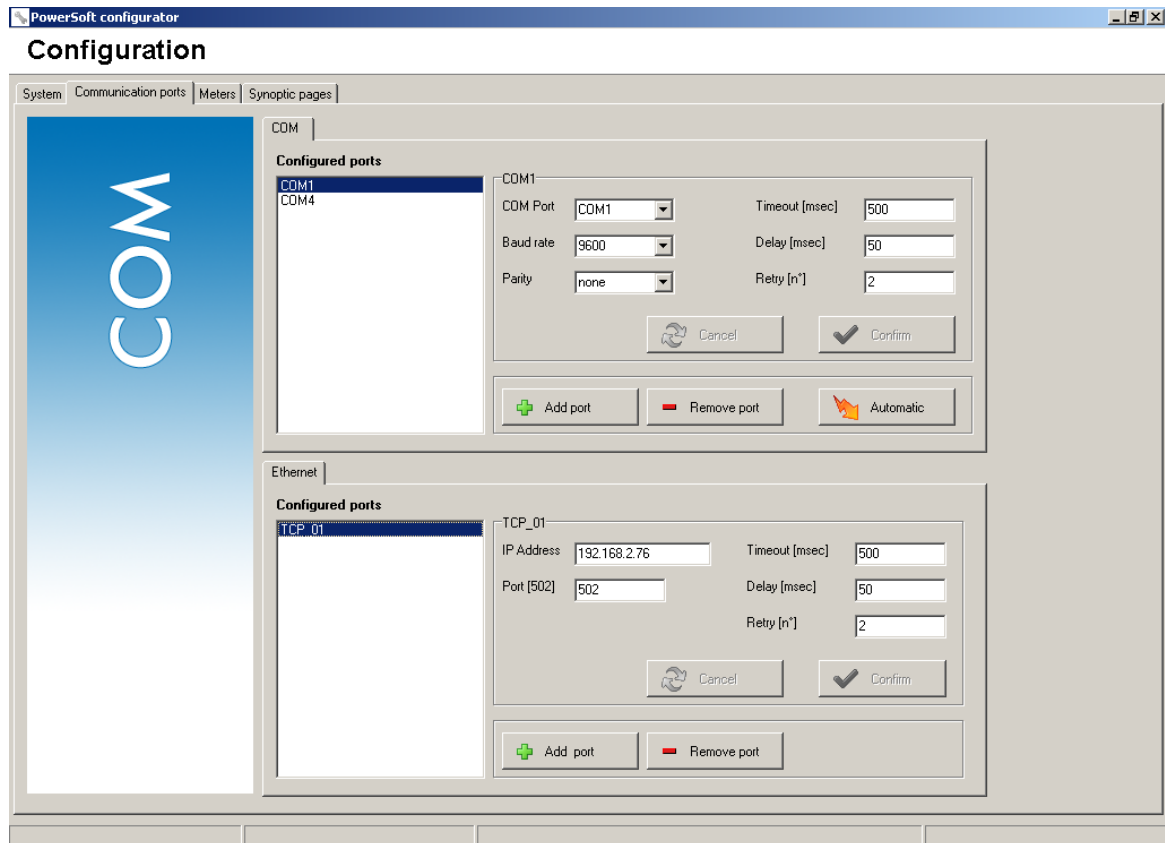
The check box “Beep on run” requires the system to perform a sound signal whenever service Maker becomes operative. The sound is generated using the computer speaker, not the system speaker. The purpose of this configuration is to do a test, i.e. to verify if the system has become operative automatically.

N.B.: to activate Service Maker you need administrator rights.

NOTE: Service Maker doesn't work with VISTA

1.3.2 COMMUNICATION PORTS

This section is dedicated to the configuration of the communication network/s which link/s PowerSoft and the instruments. The connected networks can be linked to the PC via serial ports (RS232, real or virtual) or via Ethernet connection (TCP/IP). Two different areas in this section manage the two different network typology.

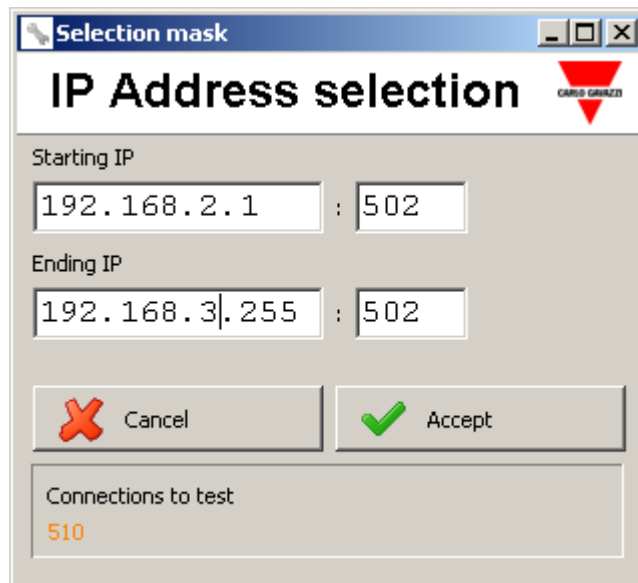


1.3.2.1 ETHERNET COMMUNICATION NETWORKS

The communication networks using the TCP/IP protocol require the configuration of an IP address and of the relevant port. The IP address can be any address accessible from the PC, while the port is an integer between 1 and 5000. The default port used by the Modbus instrumentation or converters is generally the 502nd, unless a different indication is given.

NOTE: there isn't any limit to the number of Ethernet communication networks that can be configured.

The Ethernet communication networks can be automatically configured. By means of the relevant button ("*Automatic*"), an IP address range is asked and the indication of the total number of the addresses to be scanned is highlighted.



The system tries to ping each IP address in the selected range, and then to open a direct connection with the instrument.

These operations could require several minutes to be carried out, depending on the operative system, on the Ethernet network properties, on any active protection system in the network.

Because of the wide range of possible combinations, it is not possible to automatically search for the connected TCP/IP ports. Therefore this configuration can be carried out only manually.

1.3.2.2 SERIAL NETWORKS

The serial ports, usually named as COM1, COM2 etc, are characterised by a baud rate and a parity typology. Baud rate and parity are to be common to all the meters in the same network (refer to the meter instruction manuals to properly set these parameters in every instrument).

NOTE: no limit to the number of serial networks (real or virtual) that can be configured.

NOTE: the serial ports are used by the PC in exclusive mode: a port can be used only by an application at a time.

Serial ports can be automatically configured. Pressing the proper button, the system asks what COM ports among the installed ones are to be

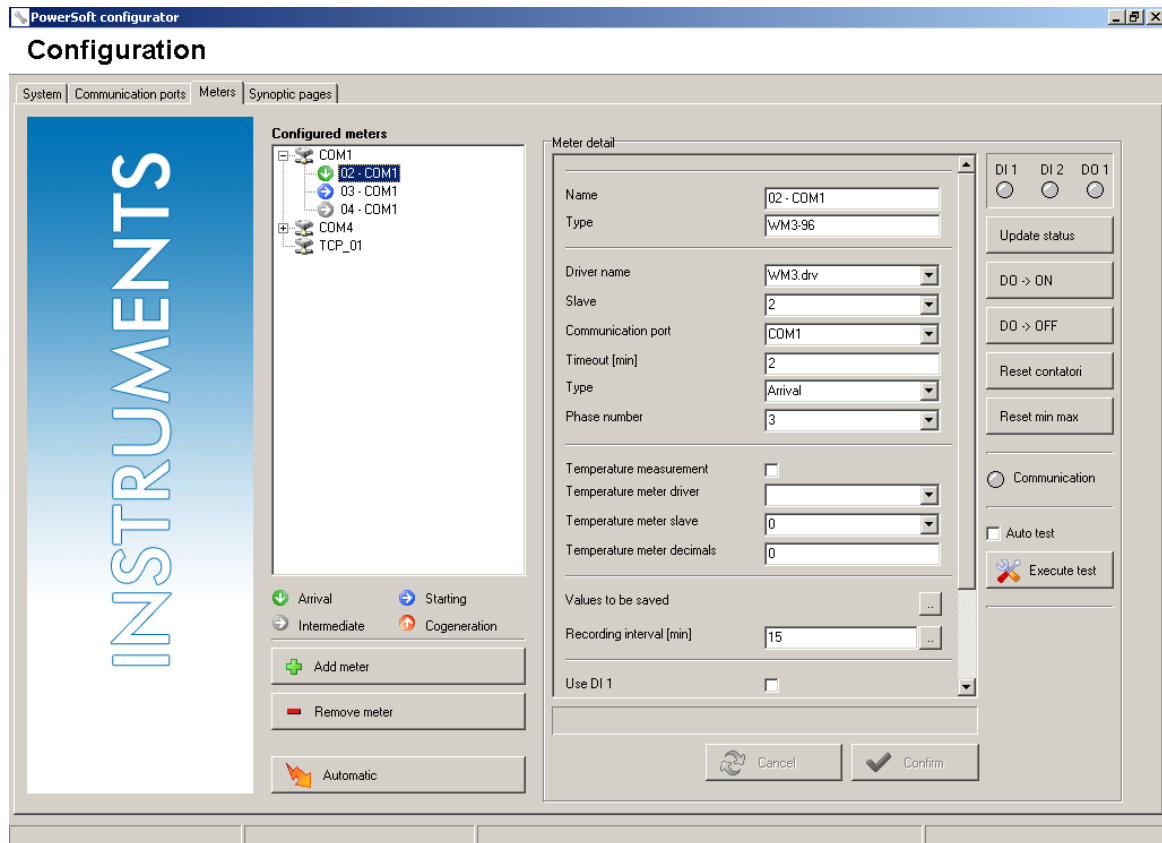
scanned; afterwards it tries to open every port to check if any instrument is connected. All the different possible combinations of baud rate and parity will be consecutively tested. During this process, a window advises the user about the possible long length of the process itself; a Stop button allows the process interruption.

Any communication port, realised through a virtual communication port, has to be set exactly as a real COM port installed on the PC (avoiding to consider it as a remote network connected via Ethernet). The configuration of each virtual communication port has to be carried out using the two configuration software supplied in the converter's (SIUTCP2) box (see the "Advanced" PowerSoft manual for the details).

1.3.3 METERS

This section lists all the instruments connected to the system, grouping them together according to the communication line they belong to. It allows to set all the parameters of all the instruments, in order to correctly represent the real system in the software. Even after an automatic configuration, the operator can add or delete an instrument using the proper buttons.

The software can automatically scan the installed communication lines to detect all the connected instruments by pressing the "Automatic" button. When a new instrument is found by the automatic procedure, a default name is automatically assigned: the name is the Modbus address followed by "--" and by the communication line name. To set or modify the instrument characteristics, the "Meter detail" box is to be used.



1.3.3.1 CONFIGURATION

In the “Meter detail” box, all the parameters relevant to the selected instrument are listed. Some parameters, like the instrument name, have a free text box, others allow a choice among a limited options range through a drop-down menu, others allow a choice between two alternatives (enable/disable).

The parameters to be set are:

- **Name:** it is the instrument name which allows an easy and intuitive identification of its function in the system (e.g., Offices, factory lighting, Department B, etc.)
- **Type:** it is the type of the instrument (e.g., WM3, WM4, etc.). Once set, this parameter cannot be modified: the instrument is to be deleted and created again.
- **Driver name:** it is the name of the file including all the information PowerSoft requires to communicate with the selected

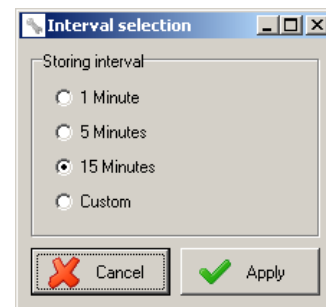
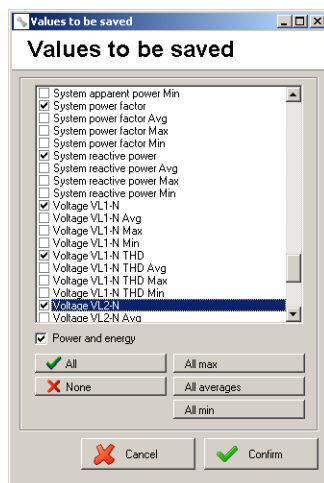
instrument. Generally the driver name is the instrument type followed by “.drv” extension (e.g., WM3.drv). The correspondence between type and driver name is not biunivocal; different drivers can be associated to the same type (e.g., when special versions of an instrument exist).

- **Slave:** it is the Modbus address of the instrument.
- **Communication port:** it is the communication port which connects the instrument.
- **Timeout [min]:** it is the period (in minutes) after which the instrument is considered off-line (i.e., a communication error appears) if there are no replies to the software request frames.
- **Typology:** it indicates the position of the instrument in the system to be monitored. The instrument can monitor: a main distribution, a sub-distribution, or a cogeneration gear; a department, a particular load, or a single machine (sub-metering). This parameter does not affect the instrument configuration, but allows the software to assign it a pre-defined position on the automatically-generated synoptic.
- **System:** it is the system (i.e., single-phase, 3-phase, etc.) set in the instrument. Running the automatic configuration, this parameter is read from the instrument memory and automatically set.
- **Temperature measurement:** enables or disables the temperature measurement which can be associated to the selected instrument. To have it, a proper instrument (UDM35, UDM40 or USC-DIN) is to be connected to the same network of the selected instrument with a proper Modbus address.

NOTE: to save the temperature value (see paragraph “Values to be saved”) the enabling of the temperature measurements is to be acquired by the system, pressing “Confirm” in the bottom of the parameter box. Until “Confirm” is not selected, the temperature value is not available in the “Values to be saved” list.

- **Temperature meter driver:** it is the name of the driver of the temperature meter (UDM.drv or USC.drv) associated to the selected instrument.

- **Temperature meter slave:** it is the Modbus address of the temperature meter (UDM35, UDM40 or USC) associated to the selected instrument.
- **Temperature meter decimals:** it is the number of decimals to be used displaying the temperature measured by the meter.
- **Values to be saved:** it is the list of the variables which are logged by the software according to the relevant recording interval (see next parameter). Left-clicking on the button relevant to this parameter, the below window appears. For each variable it is possible to store the real-time value, the minimum, maximum, and/or average values calculated in the period of time between two consecutive recordings. Independently of any previous setting, for each instrument the variable necessary to the consumptions analysis (active and reactive energy, system active power and power factor) are stored according to the system integration time (see paragraph 1.3.1).



- **Recording interval [min]:** it is the period of time after which the variables set in the previous window are stored in the software database. The recording occurs at the minutes that are integer multiple of the recording time. For example if it is 10 minutes, the recordings occur at minutes 00, 10, 20, 30, 40, 50. The minimum interval is 1 minute, so that it is possible to store 1440 records per day.

These recordings are in addition to the system recordings. If the system integration time (see paragraph 1.3.1) is 15 minutes, the recordings occur at minutes 00, 10, 15, 20, 30, 40, 45, 50. The Recording interval cannot be lower than the Timeout.

- **Enable DI0:** it enables the reading of the first digital input status, if present on the instrument.
- **Enable DI1:** it enables the reading of the second digital input status, if present on the instrument.

Synchronize PC from Digital Input 1: it associates the clock synchronisation function to the status change of digital input 1. The clock is automatically set to the closest multiple of the “system recording interval”. If, for example, the system interval is 15 minutes, and input 1 status changes at 10.39.12 the clock is automatically updated to 1.30.00.

- **Synchronize PC from Digital Input 2:** it associates the clock synchronisation function to the status change of digital input 2. This function can be set only in input 1, only in input 2 or in both of them.
- **Enable DO1:** it enables PowerSoft to control the first digital output (or output 0 of slot D in the 96x96 modular instruments). The output activation can be carried out manually or follow a setpoint alarm. The digital output is to be set as “REM” (remote control) in the instrument.
- **Enable gas:** it enables the reading of the gas meter (only in the instruments supplied with this function).
- **Enable water:** it enables the reading of the water meter (only in the instruments supplied with this function).
- **Enable 4 quadrants:** it enables the displaying of the 4-quadrant reactive energy meters (WM24 only).

NOTE for EM24 and EM26: in these instruments, the first digital input is to be associated to the water meter, while the second one to the gas meter.

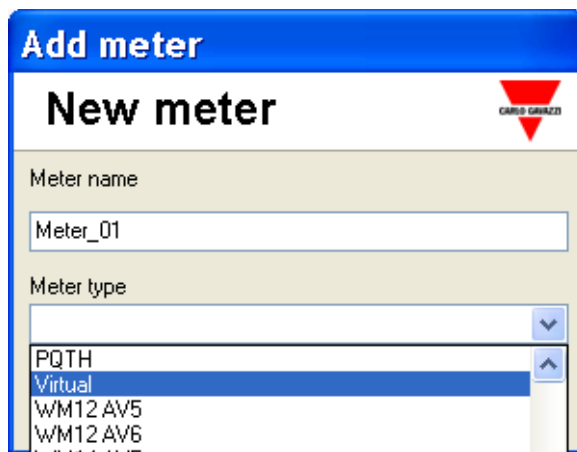
When at least one of these parameters is modified, the modification/s is accepted and stored after pressing the “Confirm” button.

1.3.3.2 CONFIGURATION OF THE VIRTUAL METERS

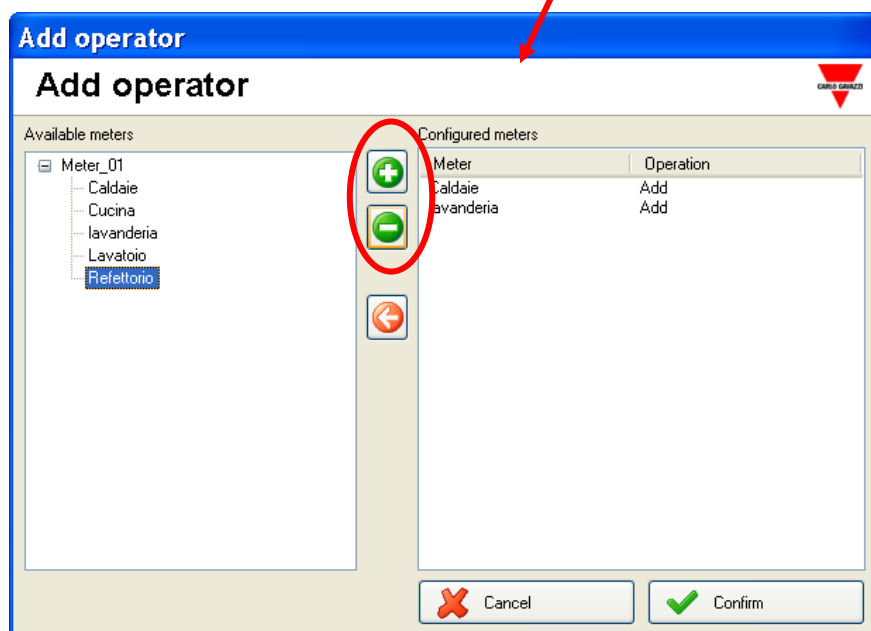
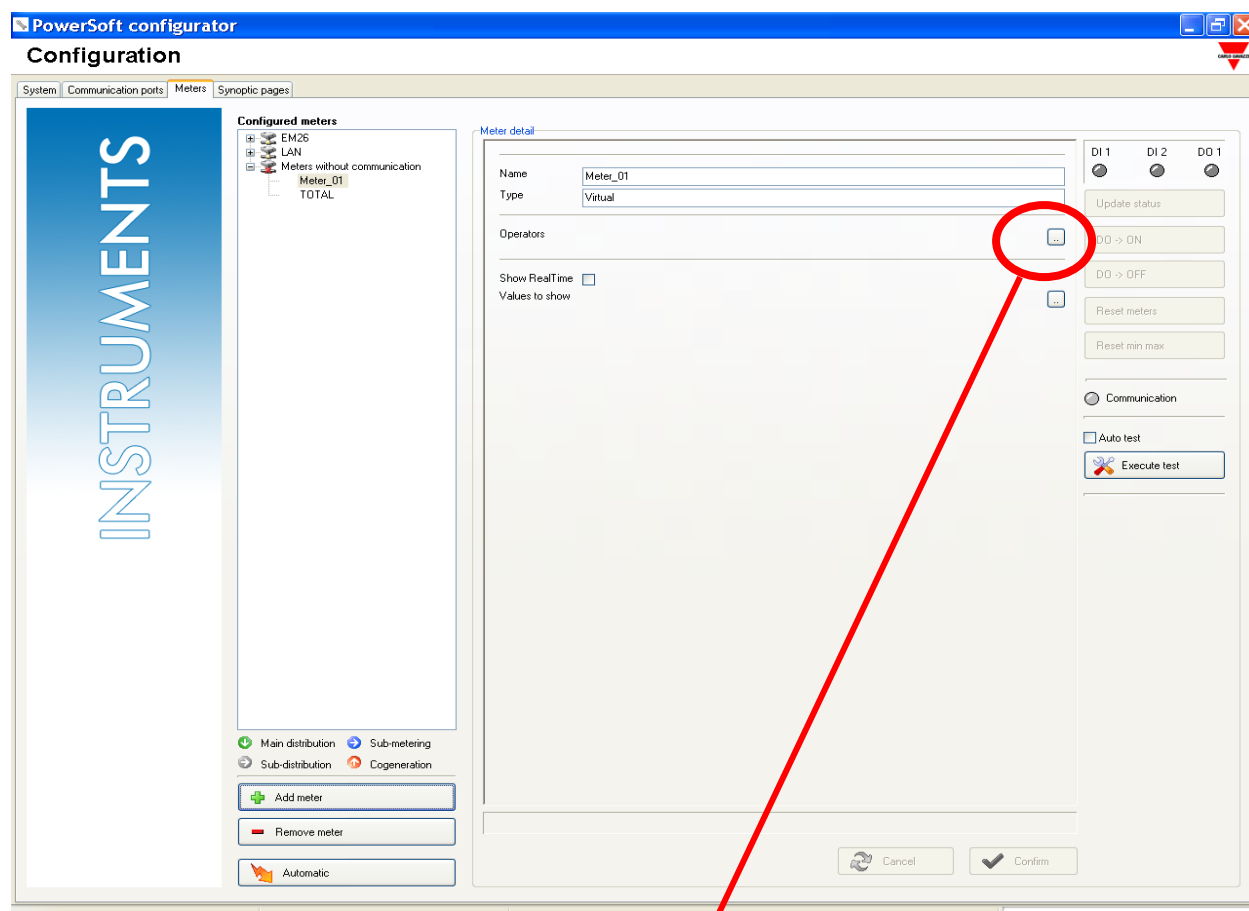
It's possible to define an unlimited number of virtual instruments each of them formed in its turn by an unlimited numbers of real meters.

The basic function of the virtual meter is either to add or to subtract both the power and energy values of a group of meters.

To add a virtual meter, it is sufficient to follow the standard path used to set the real meter: click on the button: “Add a meter” and then select “Virtual” in the window.

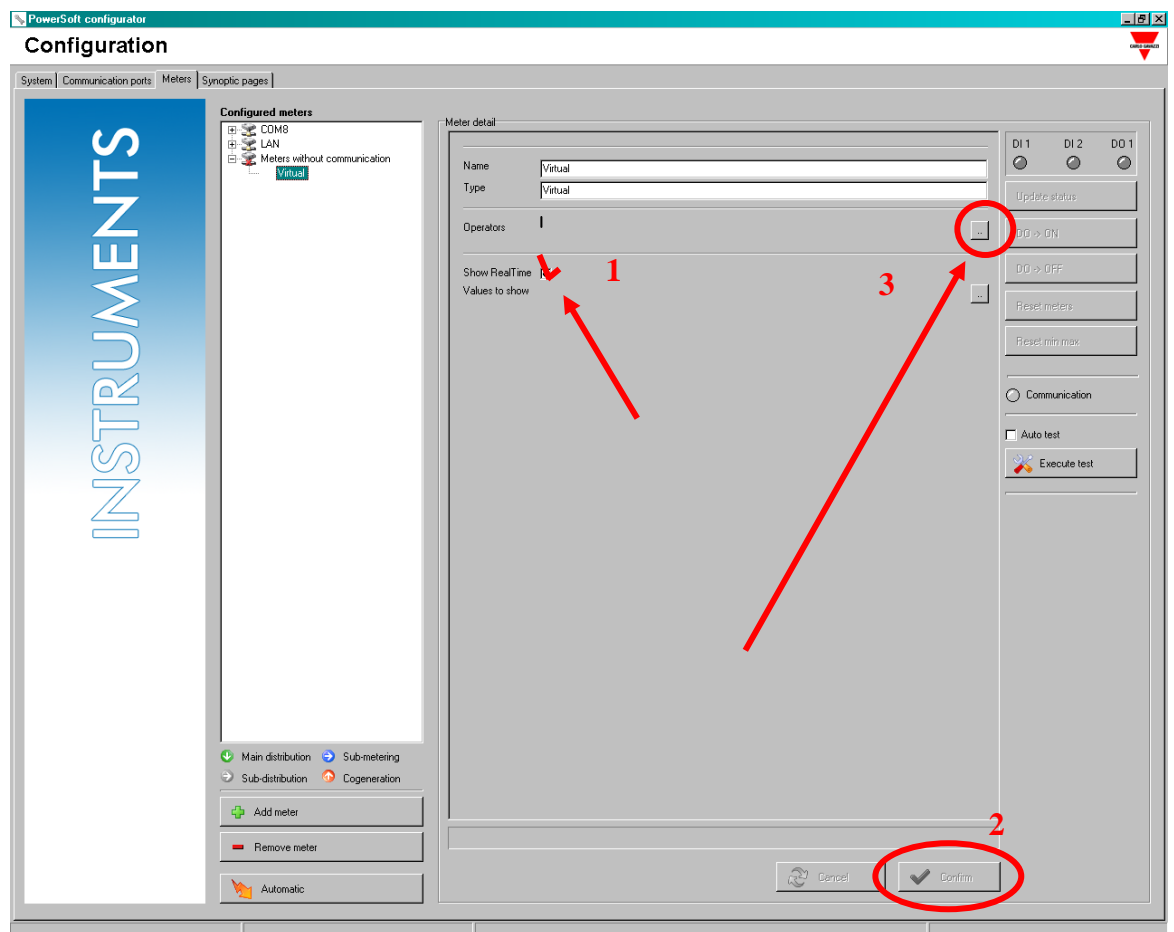


The following window will open. It's possible now to choose all the operations between the meters by clicking on the button pointed out in a red circle:



Once the real meters for each virtual meter have been defined, and once the operations have been defined too, (two buttons are present, one with the addition sign and the other one with the minus one), it's necessary to Confirm the configuration.

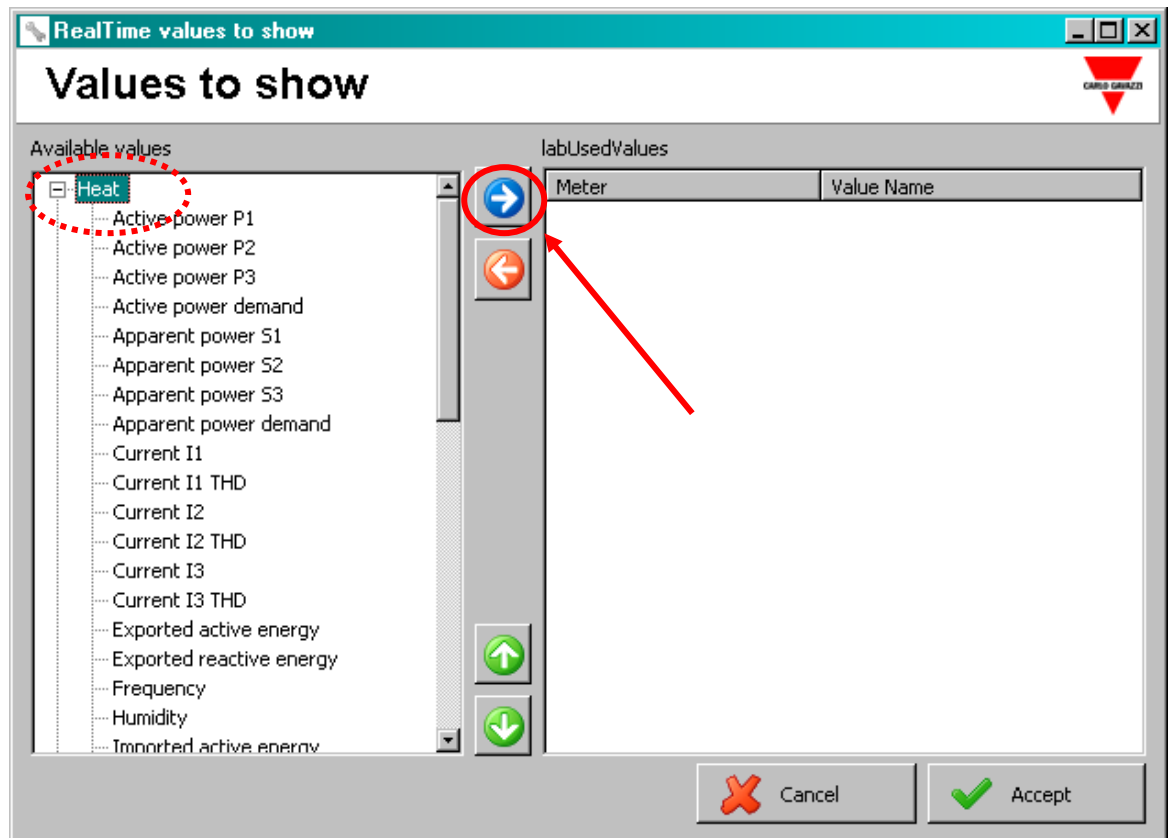
NOTE: It's not possible to define a virtual meter having as addends other



It's possible to tick off the square related to real time displaying of variables. Once the user selected it, the button "Confirm" has to be pressed.

After that, to open the window in which choosing variables the user wants to be displayed, it's necessary to click on the red circle square.

The following window will appear:



In the left area of the window, it is possible to find a list of all variables can be displayed for each real meter whose the virtual instrument is formed by.

Once the variable has been selected, it is necessary to click on the button with a blue arrow on it (as indicated in the figure); in this way the chosen variable and the meter which the variable refer to, are transferred in this section.

After that, click on the “Confirm” button, the virtual meter has now been defined.

Virtual meter’s data are available using the following modules:

- PWS ANALISYS
- PWS BILL
- PWS Trends (both in graphical and analytical format) included in the basic packet
- PWS REPORT

1.3.3.3 TEST

The test area, located in the right side, allows the operator to test the configuration from the communication and digital signals points of view. “Auto test”, if enabled, allows to automatically performing a communication test every time the instrument is selected.

The communication status is shown by the “Communication” LED: it is green in case of correct communication; red when the parameters are wrong or the instrument is not connected; yellow if the selected type is not correspondent to the actual instrument on the network.

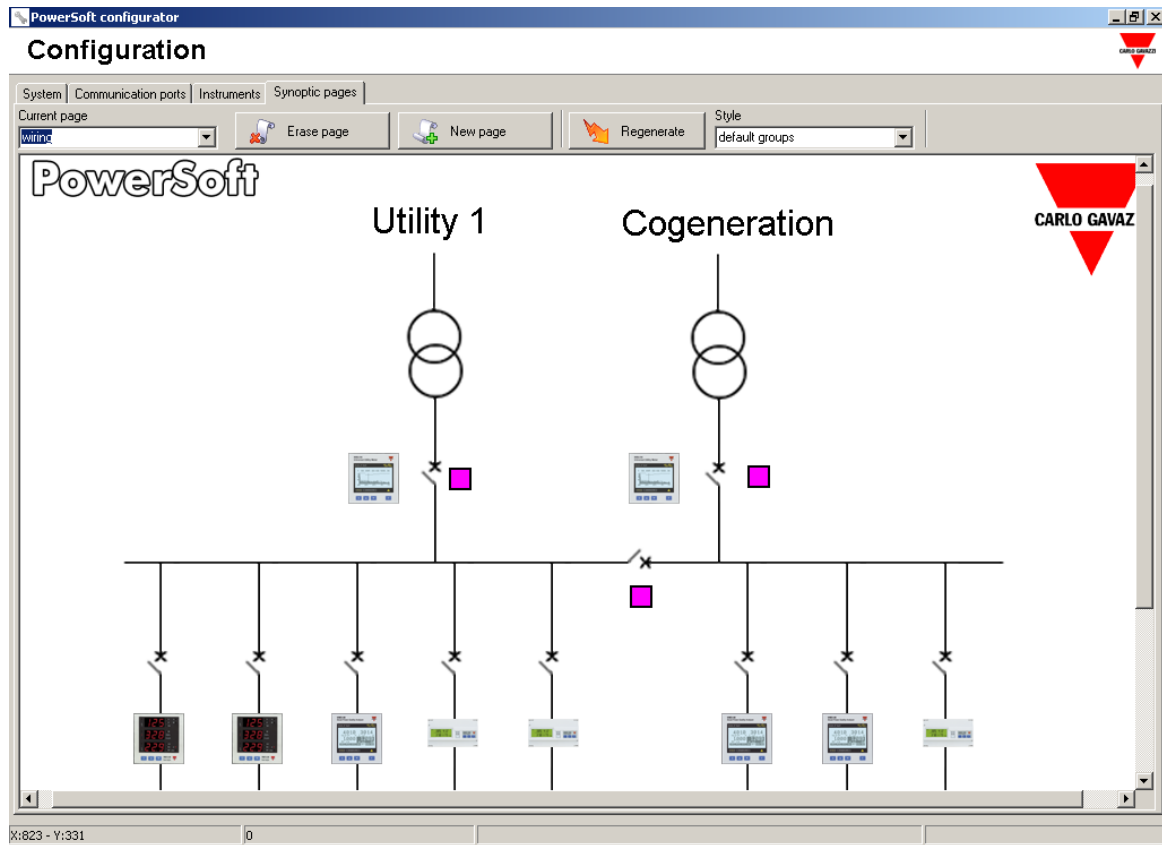
If the instrument is correctly set and later is replaced by another model, PowerSoft is not able to sense the replacement, it will try to establish again the communication with the first instrument, and then it will show the missing communication status (red LED) or the status of right communication (green LED) but in this case all the acquired information is potentially wrong. When replacing an instrument with another model, the suggestion is to delete the old instrument and add a new one.

Concerning the digital inputs, it is possible to check the status by means of 2 LED's in the top right area: red if the status is ON and grey if the status is OFF. The digital output can be switched using the proper buttons (“DO -> ON” and “DO ->OFF”).

Finally the “Meters reset” and the “Reset min max) buttons allow resetting respectively the Energy and utility meters and the minimum/maximum values stored in the instrument memory.

1.3.4 SYNOPSIS

This section allows to customise the PowerSoft synopsis, in order to better adapt them to the system typology and to the operator's needs.



A drop-down menu allows to select the desired synoptic to be modified; after the selection, the synoptic appears on the edit area.

1.3.4.1 SYNOPTIC STRUCTURE

Every synoptic is composed by a number of different graphic objects. The operator can add and position them at will. The available objects are listed in the following paragraphs. To modify them, it is possible to access the synoptic menu, right-clicking in any position of the edit area.

1.3.4.2 SYNOPTIC OBJECTS

In a synoptic the following objects can be added:

- *Ellipse, Line, Rectangle, Triangle, Text*: these are standard graphic objects
- *Image*: any image (.bmp) can be added in the synoptic, e.g., the company logo.
- *Instrument*: this button allows opening the detail pages of the linked instrument; in fact this button is always linked to an instrument belonging to the connected networks.

- *Link to page*: this button allows browsing through the different synoptic pages of the system using proper links located in the pages themselves.
- *Status indicator*: this object is a little square whose colour changes according to the digital inputs status of the instrument; it is then possible to graphically represent the status of any device digitally connected to the instrument (e.g., the status of a switch).
- *Main page, next page, previous page*: these buttons allow to access respectively the main synoptic page, or the one that in the page list is immediately after or before the current one.
- *Main distribution*: this object represents a main distribution branch of the system; it includes a button, with the relevant instrument picture, which allows accessing the detail pages of the instrument itself.
- *Sub-metering*: this object represents a branch of the system supplying a department or a single machine; it includes a button, with the relevant instrument picture, which allows accessing the detail pages of the instrument itself.
- *Sub-distribution*: this object represents a sub-distribution branch of the system; it includes a button, with the relevant instrument picture, which allows accessing the detail pages of the instrument itself.
- *Cogeneration*: this object represents a cogeneration branch in the system; it includes a button, with the relevant instrument picture, which allows accessing the detail pages of the instrument itself.
- *Title*: it is the synoptic title

Every object defined as a button is an object whose area allows, when left-clicked, to browse the system, displaying a new page or the detail pages of a particular instrument.

1.3.4.3 SYNOPSIS MODIFICATION

1.3.4.3.1 Modifying of a single object

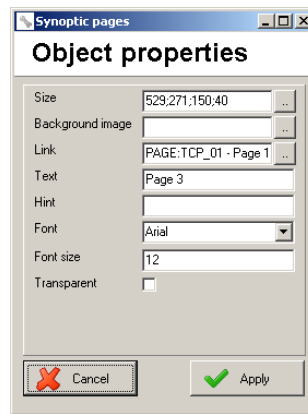
Selecting any object in the edit area, a red edge appears around it.

To move the selected object, it is to be dragged to the desired position. During the dragging, only the red edge is visible; releasing the mouse

button, the synoptic is regenerated and the object is shown in the new position.

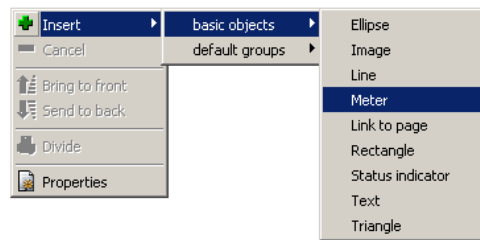
To change the object properties, right-click on the object to display the synoptic menu and select “Properties”. A dialogue box appears where all the properties can be edited or modified. Pressing “Apply” the modifications are stored and the synoptic regenerated; pressing “cancel” the dialogue box disappears without any modifications.

“Size” represents the coordinates (in pixel) of the object top left point and the size (in pixel too) of the same object. “Link” is the synoptic page or the instrument that is opened when the object is left clicked.

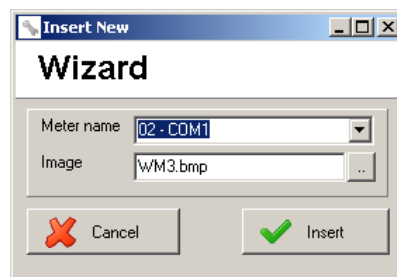


1.3.4.3.2 Adding an object

To add a new object, open the synoptic menu right clicking in the edit area and select “Insert”. A sub-menu, where all the possible objects are listed, appears. The objects are listed in the “basic objects list. It is possible to insert predefined groups of objects (e.g., an instrument with a line, an arrow, and its name). There is a standard list of groups, the “default groups”. The user can define their own groups of objects box (see the “Advanced” PowerSoft manual for the details). If more groups are present, it is possible to choose the desired one using the “Style” selection box in the top middle side of the edit area.



When the new object has been chosen, a “Wizard” window asks for its properties. After the properties definition, the object is shown in the synoptic page.



1.3.4.3 Deleting an object

To delete an object from the synoptic, right click on it and select “Delete”.

1.3.4.3.4 Dividing an object group

The groups (like main distribution meters, sub-metering ones, etc.) are formed by single objects; dividing a group means to break it up in the original objects that are now independent of each other. In this way the properties of a single object is modifiable while it is impossible to modify the single properties in a group.

To divide a group, right click on it and select “Divide”. It is not possible to group (or group again) set of objects.

1.3.4.4 AUTOMATIC GENERATION

The synoptic pages can be automatically created by the configurator, pressing the “Regenerate” button; after a confirmation request, the system asks for what communication lines the associated synoptic are to be regenerated and if the index page (“Main” page, including the links to the communication line pages) is required.

The proposed synoptic topology is fixed and the system arranges every instrument according to its Modbus address, as explained in the following table.

Addresses from 1 to 2: The instruments are considered as “main distribution meters”.

Addresses from 3 to 5: The instruments are considered as “sub-distribution meters”.

Addresses from 6 to 100: The instruments are considered as “sub- meters”, that is they monitor a single load, machine, or department.

Addresses from 101 to 200: the instrument is a temperature meter (see following note).

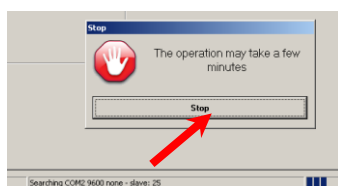
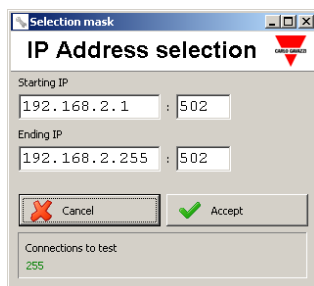
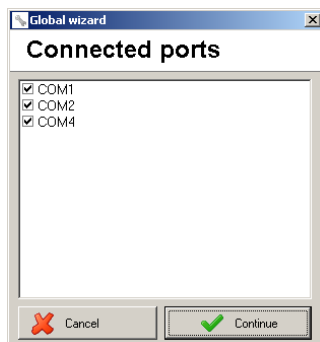
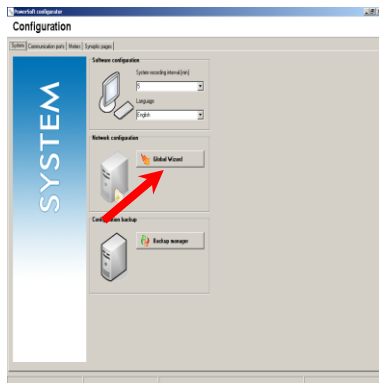
Note: the temperature meter whose address is $100+x$ is automatically associated to the power analyser/energy meter whose address is x (e.g., an UDM35 with address 111 is automatically associated to the power analyser whose address is 11).

Once this information is confirmed, the system generates all the pages which can be freely modified by the operator to better fit his needs.

2 FREQUENTLY ASKED QUESTION

2.1 MY SYSTEM IS BASED ON SERIAL LINES AND ETHERNET LINES. CAN I CONFIGURE IT IN TOTALLY AUTOMATED WAY?

Yes, the procedure is the following:

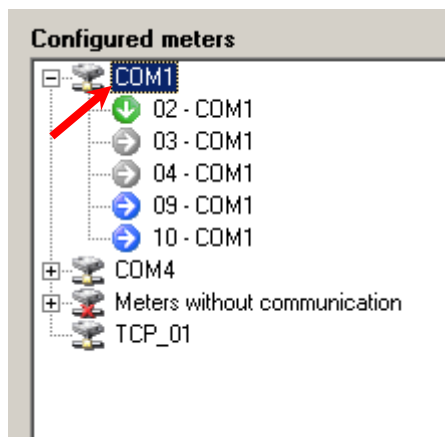


1. Launch the configurator and select the “System” section
2. Press “Global Wizard”
3. Choose in the window the serial COM ports to be scanned: if the instrument port is unknown, choose all the ports and press “Continue”. The scan of each port requires from 2 seconds (if the connected instruments are set to 9600 baud without parity, that is the first combination to be verified) up to some minutes (if the port does not include any working instrument). **The procedure is the same for the virtual COM ports, carried out with the VCP-DIN accessory.**
4. Confirm to proceed.
5. The scan can be interrupted pressing “Stop” in the proper window.
6. A similare window to select the Ethernet ports appears.
7. On the status bar, a text and a bar graph show the status of the process.
8. At the end of the automatic configuration, the system is ready to work. The user can modify (now or in a second time) any detail.

2.2 Is IT POSSIBLE TO DELETE ONE OR MORE INSTRUMENTS?

Yes, it is possible to delete an instrument selecting it and pressing the CANC key.

If all the instrument of a port is to be deleted, it is sufficient to select the port and press the CANC key.



2.3 HOW CAN I ADD THE TEMPERATURE TO THE POWER ANALYSER MEASURED VARIABLES?

The temperature measurements can be only supplied by UDM or USC panel meters/conditioners equipped with the BQTRX input module.

The configurator can recognise the temperature meters **automatically** and associate them to a particular analyser. The automatic procedure is feasible only if the following rules are respected:

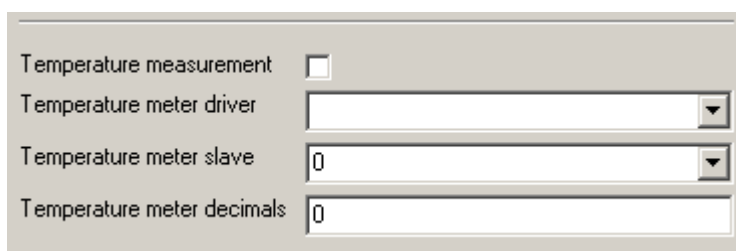
1. Temperature meter and analyser are to be installed in the same communication line
2. The Modbus address of the analyser (for example S) is to be between 1 and 100
3. The Modbus address of the temperature meter is to be S+100

Example: Analyser WM3 =1 → Temp. meter UDM= 100+1 = 101

Manually, it is possible to associate a temperature meter to any instrument setting the following parameters:

1. Enable the temperature measurement
2. Temperature meter driver name
3. Temperature meter Modbus address
4. Number of decimals on the temperature measurement

Note that a temperature meter can be associated to more than one analyser at the same time.

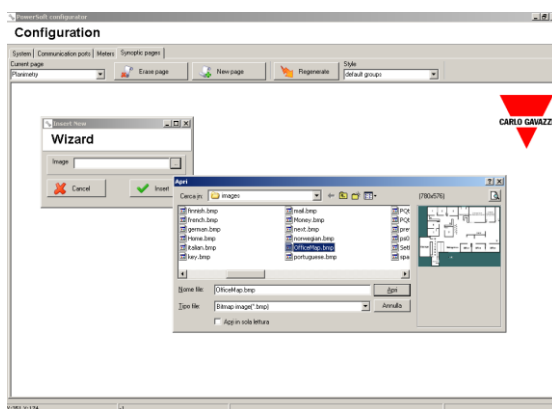
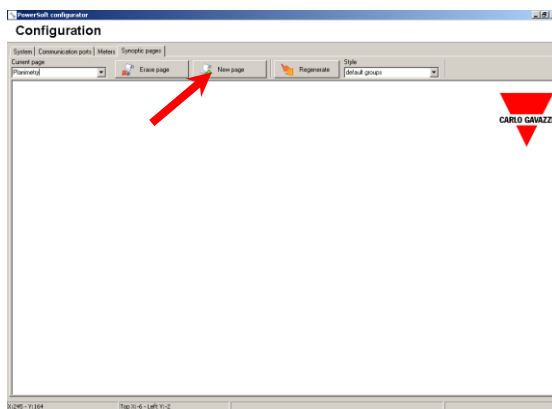


The screenshot shows a configuration window with four rows of controls:

- Temperature measurement:** A checkbox that is currently unchecked.
- Temperature meter driver:** A text input field with a dropdown arrow on the right.
- Temperature meter slave:** A text input field containing the value '0' with a dropdown arrow on the right.
- Temperature meter decimals:** A text input field containing the value '0'.

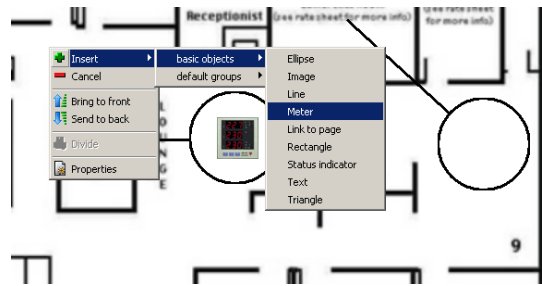
2.4 Is IT POSSIBLE TO INSERT A PLANIMETRIC DIAGRAM IN THE SYNOPTIC PAGES?

Yes, it is possible carrying out the following procedure:



1. Create a bitmap picture whose dimensions are to be equal to the screen resolution
2. Draw the bitmap with the plan metric diagram of the factory or with the factory picture, using a common image editor (Paint, PaintShopPro, Photoshop, PhotoPaint, etc.)
3. Save the image as a 24-bit bitmap in the ...Program files\PowerSoft\images folder
4. The system (communication ports, instruments, parameters) is to be totally configured
5. Select the "Synoptic" section of the configurator
6. Create a new page
7. Right click on the page background and choose "Properties"
8. Select the image saved on point 3
9. The image is now on the background: before adding the instruments, it is possible to create a frame around the instrument

with the available object (a circle in the example)



10. Add the instruments (image with the link to its detail pages), right clicking in the proper position on the synoptic and choosing Insert/Basic objects/Meters
11. Repeat the previous point for all the instruments
12. Add a link to the main page, in order to allow to completely browse the different synoptic pages, right clicking in the proper position and choosing Insert/default groups/main page
13. Right click on the new button and choose “Properties” to modify, if necessary, the text and/or the link
14. On the main page, insert a link to the new plan metric page, in order to grant that every pages can be accessible browsing the system

2.5 HOW MANY METERS CAN BE INCLUDED IN THE SAME NETWORK AND HOW IS THE TIMEOUT PARAMETER TO BE CONFIGURED?

Even if the theoretical limit is 247 meters per each Modbus network, the suggestion is not to exceed 100 meters per network.

A further suggestion is to split the instruments in the highest possible number of different networks (within the maximum limit which is 8 when considering serial lines and 100 with the Ethernet ports). This implies a higher speed in polling the whole network, a simplification in setting up the networks and in troubleshooting, and a lower number of off-line instruments in case one of the networks is faulty.

The Timeout parameter, described in paragraph 1.3.3.1, is to be set in order to avoid recurring communication errors due to the high number of instruments installed in the same network.

The following table recommends the value to be set in function of the total number of instruments in the relevant network, even if some local factors (disturbances, cables, length of the network) can require some modifications of the proposed values.

Number of instruments	Suggested Timeout [min]
from 1 to 20	1
from 20 to 30	2
from 30 to 40	3
from 40 to 80	4
from 80 to 100	5

2.6 THE NAME OF PORTS AND OF INSTRUMENTS CAN INCLUDE ANY CHARACTER?

The following characters cannot be used in the instrument names nor in the port names.

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Non-ASCII characters

Non-printable characters (tab, carriage return, etc.)

Blank is not allowed in the port names, a double blank is not allowed in the instrument names.