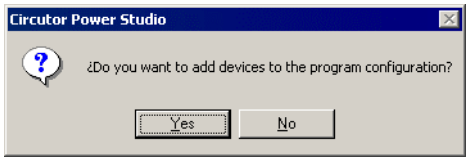
1 Execute the program for first time

When the program executes for first time, it will request you if you want to add new devices.



Selected ‘Yes’, it will add new devices just as we will explain in next part 2.1.2.1 Add a device.

Once added it will request you again if you want to add more devices

If the selection is ‘Yes’ a new one will added, otherwise it will execute the normal program execution.

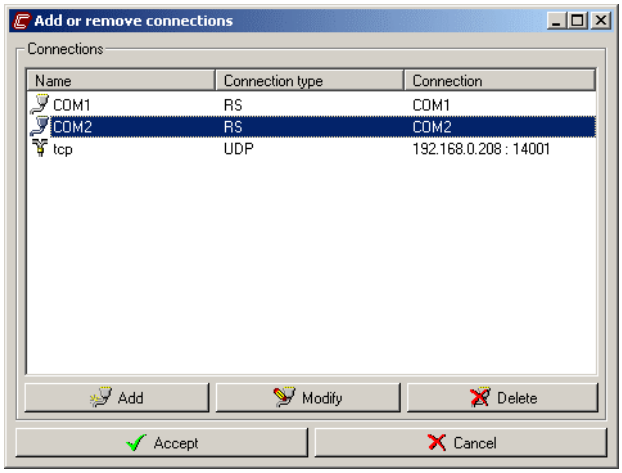
2 Tool bar

2.1 General menu

With this menu you will be able to configure software main parameters.

2.1.1 Add or delete connections

With this option you will configure communications ports that the software will communicate the different configured devices.



It will be able to configure two types of connections:

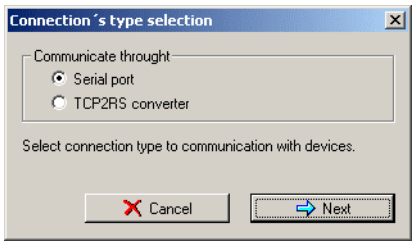
- Serial port. It will identificate by COMX, where X will indicate communications port.

- Net communication. It will identificate by XXX.XXX.XXX.XXX:YYYYY where XXX.XXX.XXX.XXX will indicate IP address and YYYYY communication port.

2.1.1.1 Add a connection

To click on 

button will appear next dialog



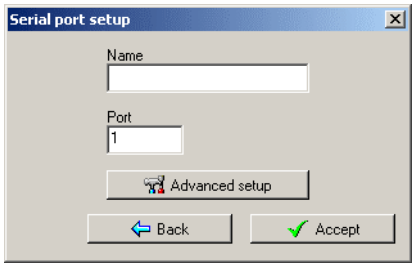
from which you will select the type of connection that you want to use for devices communication.

- ***Communications serial port***: Will correspond a PC physical port.
- ***TCP2RS converter***: the software will communicate with the devices through Ethernet connection using a TCP2RS converter for the Ethernet communication conversion to RS-232 or RS-485 communication.

To click on *'Next'* button will appear the configuration dialog corresponding to the type of connection selected.

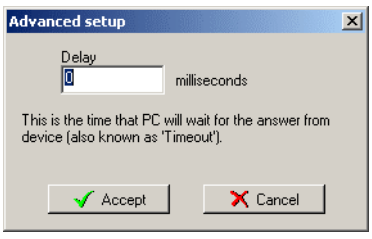
2.1.1.1.1 Communications serial port

Next dialog corresponds at the configuration communications serial port



where

- ***Name:*** Alphanumerical number that will identify only to the connection in the entire program. Will not exist in the configuration two connections with the same name.
- ***Port:*** Serial port number that the software will use for devices communication.
- ***Advanced configuration***: Will allow configuring a parameters serial additional in the connection.

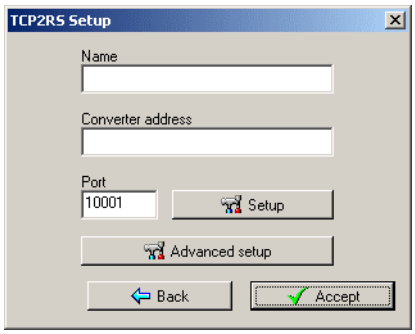


where

- *Delay:* Milliseconds. This value, known like timeout, will be used to control the time that the PC will wait the device answer. The introduced value will be added to the time for fault that the PC will wait the device answer.

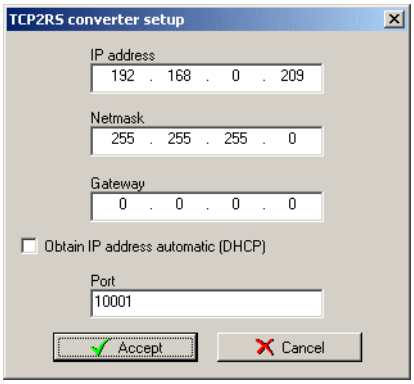
2.1.1.1.2 TCP2RS converter

Next dialog corresponds to the configuration of one connection using TCP2RS converter



where

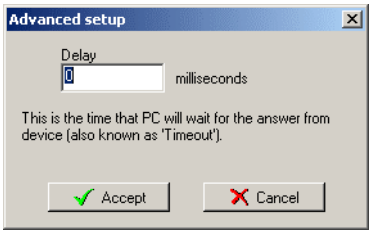
- ***Name***: Alphanumerical field that will identify only the connection in the entire program. Will not exist in the configuration two one with the same name.
- ***Converter address***: It corresponds the converter address. This parameter could be an IP address or a name.
- ***Port***: Corresponds at the communications port.
- ***Parameters***: To click on the button will appear a dialog where you could configure a converter parameters serial.



when:

- *IP address*. Corresponds the IP address through which we could communicate the converter.
- *Subnet mask*. Corresponds at subnet mask used in the net where the converter is connected.
- *Gateway*. Corresponds at gateway address in case that the converter doesn't be in the same net where the PC has the software.
- *Obtain IP address automatic (DHCP).* Will activate this option when you wish that the converter had the IP address automatically through DHCP server.
- *Port*. Corresponds at the converter communications port.

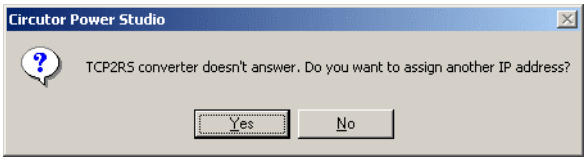
- ***Advanced configuration***. Will allow configuring an additional parameters serial in the connection.



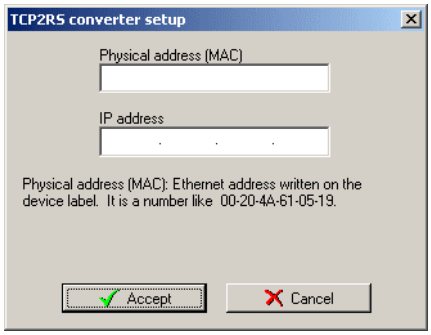
where

- *Delay*. Milliseconds value. This value, knowed like timeout, will be used to control the time that the PC will wait the device answer. The introduced value will be added at the time by fault that the PC will wait the device answer.

To click on *'Ok'*, the software will try to detect the TCP2RS converter. In case of not detection, the converter is new and it hasn't assigned any IP address or it has an IP address different at the introduced one before *'Converter address'*, will request if you want to assign a new IP address to the converter.



If the answer is *'Yes'*, will appear next dialog, which will allow to assign an IP address to a converter.

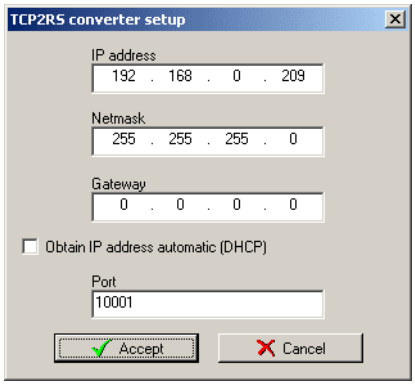


where

- ***Physical address (MAC).*** Ethernet connection found in every device label, it is different in all net devices. It is the hardware address that all net interface has. Will be like 00-20-4A-61-05-19.

- ***IP address***. IP address that will assign the converter that has the physical address introduced before.

If it has been possible to assign IP address to the converter, will appear next dialog



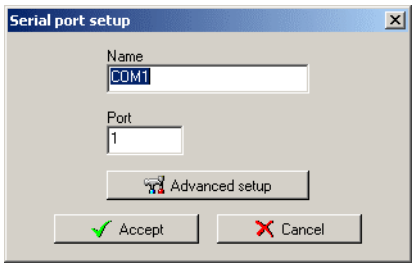
to finish the configuration of other parameters to communicate the converter.

2.1.1.2 Modify a connection

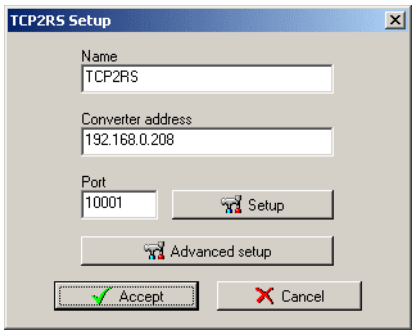
To click on 

button, depending on the type of connection will appear the corresponding dialog.

For a serial connection, the dialog will be next:



and for a Ethernet connection



Those dialogs are explained in 2.1.1.1 Add a connection.

2.1.1.3 Delete connections

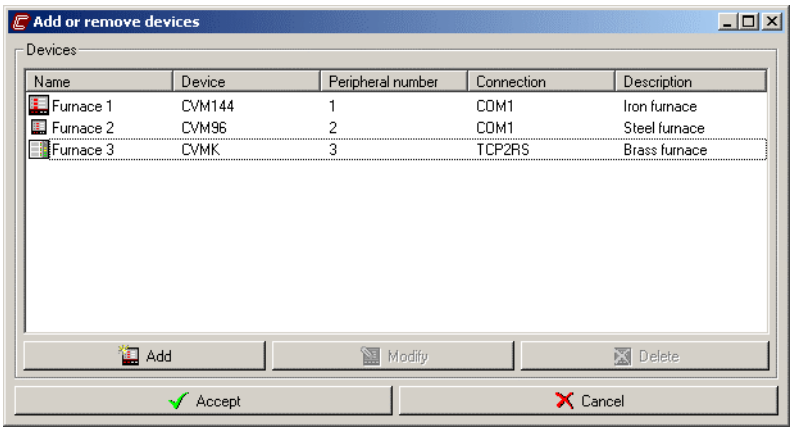
Delete button it is only actived if you select one or more connections from the list.

If you click on next dialog will appear:

If you click “Yes” will eliminate selected connections from connections list.

2.1.2 Add or remove devices

To click on this option next dialog will appear:

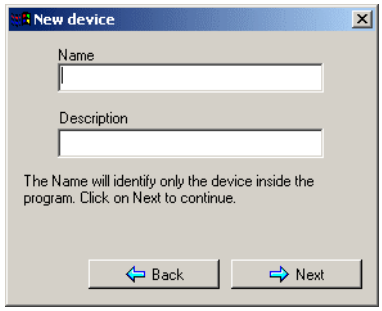


you could view configured devices list.

2.1.2.1 Add a device

To click on Add button will appear a dialog where you should select the type of device that you wish to add.

Clicking on Next button next dialog will appear

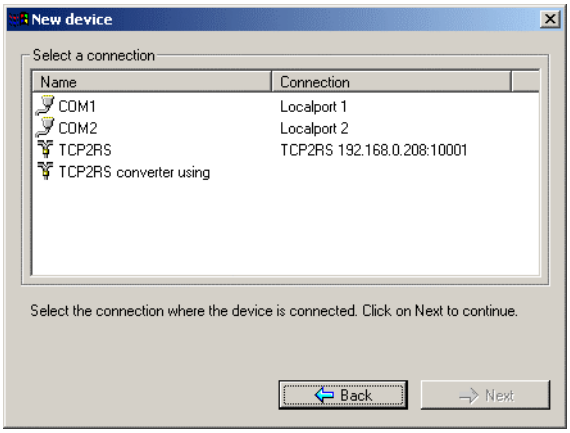


where

- **Name**: Will be an alphanumerical type data, which will allow to identify only the device inside the program. In the configuration will not exist two devices with the same name.

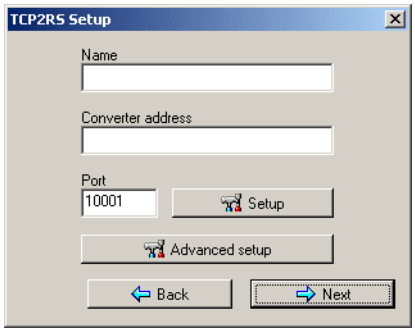
- **Description**: Alphanumerical type data for the introduction of a brief device description.

Next, will appear next dialog where you should to select the connection where the device is.



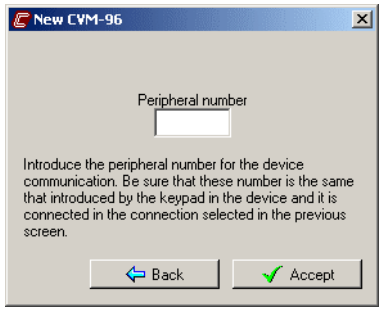
In connections list will appear all local PC ports and all configured connections.

If you select *'Using TCP2RS converter'* option you should to configure TCP connection with the next dialog

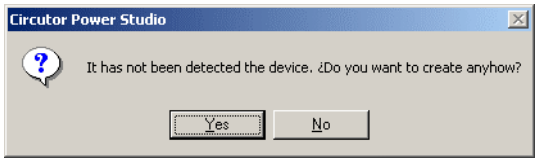


That dialog has been explained in 2.1.1.1.2 TCP2RS converter

At least, will appear the device configuration dialog. This dialog will depend on the chose device and will be explained in next part. In that case shows the CVM-96 dialog.



To click on Accept the software will find the device, if it has not be found it will show next message



where, if the answer is 'Yes', the device will be create, although it hasn't be detected.

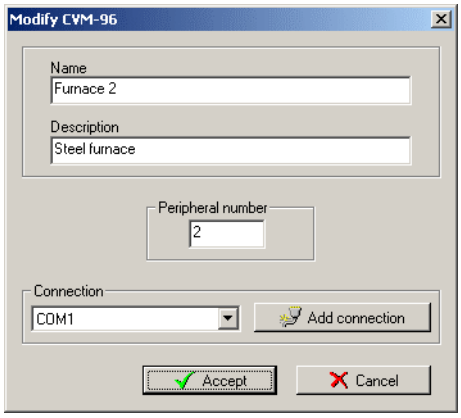
If the device speed detected is different to 19200 bps, the software will change this speed to 19200 bps.

2.1.2.2 Modify a device

This button will be on when you select only one device from the list.

To click on Modify button, will appear next dialog to modify device parameters. This dialog will depend on the type of the selected device. This section will be explained in the corresponding part.

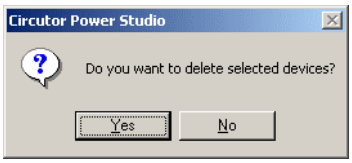
As an example you could see next dialog.



2.1.2.3 Delete devices

button will be only actived when you select one more devices from the list.

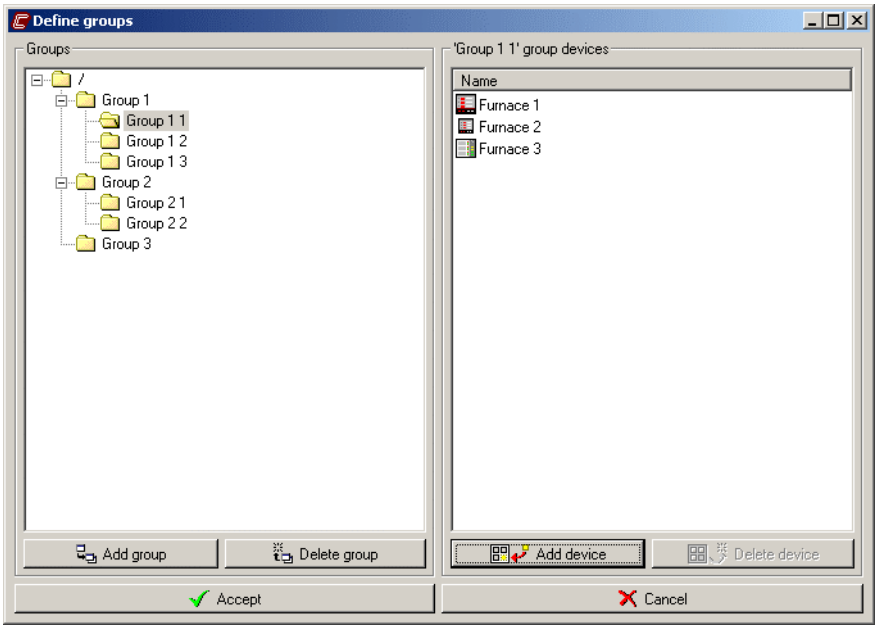
To click on will appear next dialog:



If you click on “Yes”, will be deleted all selected devices.

2.1.3 Define devices group

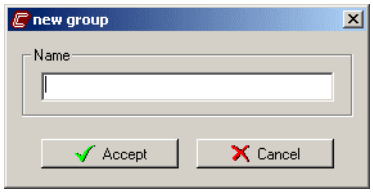
With this option you could do devices group. Will be possible to have the same device in different groups, even as could have groups gathering.



Left dialog side will correspond to defined groups. Tree representation (with nodes soons and fathers) will make easy the dependency visualization between groups.

/ Root group. When new devices are added, these will be automatically added to this root group.

To click on this will be added the group likes soon of the selected group (father). To add you should only introduce the group name in the dialog



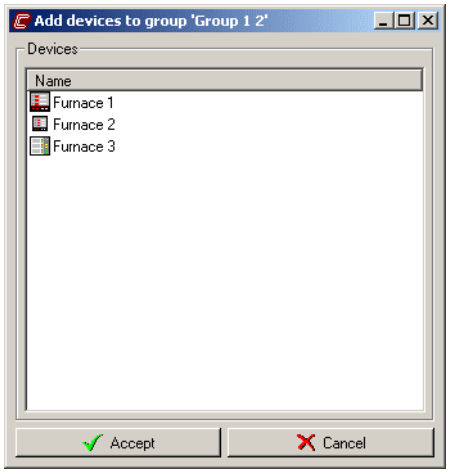
Inside the same father group you couldn’t repeat names of the soons groups, but will be possible to repeat group names in different father groups.

Delete group To click on will delete the selected group, even as all soons groups. Will be possible to delete any group except the group / (root group).

Right side dialog is composed by devices list that belongs to the selected group.

For a best identification, it will indicate the name of the group in the list description 'Group 1 2' group devices.

Add device To click on the button it will appear the next dialog

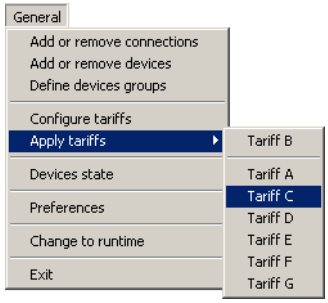


where it will appear the configured devices list and that don't belong to any group. To click on "Accept" button will be added to the group selected devices from the list.

Delete device It will be only actived if there are selected devices in the devices list. To click on the button will be deleted selected devices of the corresponding group.

2.1.4 Tariff apply

To put the pointer on this option it will show the submenu with the configured tariffs



On the line you will fine the applied tariff, 'Tariff B' in that case, and below the line next configured tariffs.

To apply on of them you should to put the pointer on the wished tariff, and click on the left mouse button.

Tariffs application will be explained in another part of this manual.

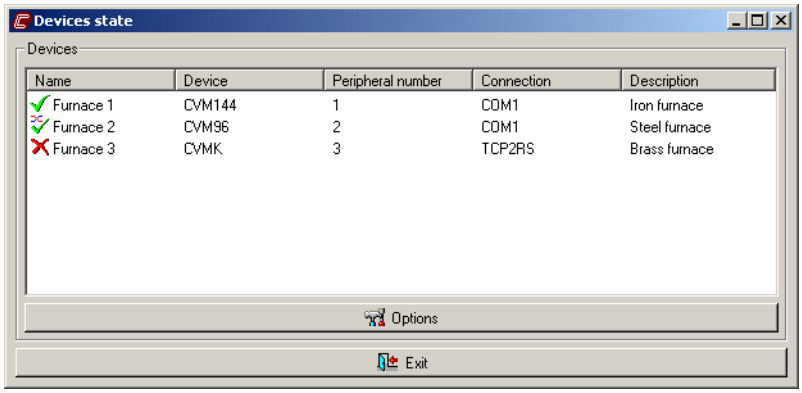
2.1.5 Tariffs configuration

Will allow to add, modify or delete tariffs.

Tariffs configuration will be explained in another part on this manual.

2.1.6 Devices statement

To click on this option will appear next dialog



Where it shows the present statement of all the configured devices.

6 possible statements exists:

The device communicates correctly

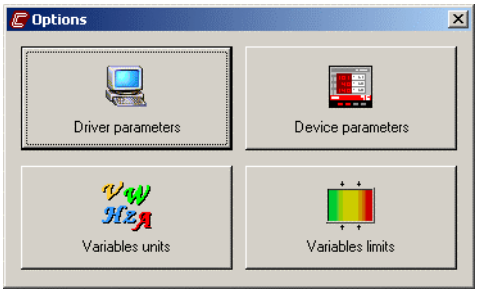
The device communicates correctly, but any phase connection in the device is incorrect.

The device doesn't communicate

It hasn't initialized the device yet. At he beginning of the software you should to read different device parameters to start the statement.

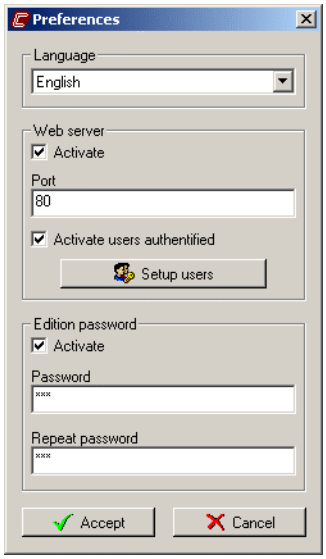
It hasn't been possible to open the communications port to be able to stablish device communication.

This button will be only on when you select a device from the list. To click on, will appear a dialog where you could configure device parameters, view parameters in the screen of the different variables. Options dialog will depend on the type of the selected device. As an example you could see next dialog of a CVM-96 III.



2.1.7 Preferences

With this option you could configure different application parameters.

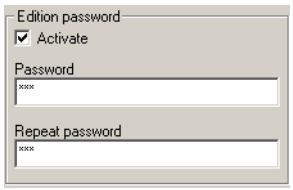


With this selector, you could select the language

You could activate 

or deactivate 

, the possibility to use the application like a web server. If the web server option is actived, you could see in a remote PC, using the Internet navigator, measure parameters of the devices connected to the local PC. With *'Activate user authentication'* option, you could ask for a name and a password to the user that try to access to the application with a remote PC, allowing to access in some application resources and to deny other ones. '*Users configuration*' button will allow to configure in which resources will access any one of the authorized users. User configuration will be explained in 2.1.7.1 Users authentication.



It will be able to activate 

or deactivate 

the possibility to blockade with the password the edition mode. This password should be a word of 8 characters as a maximum.

2.1.7.1 Users authentication

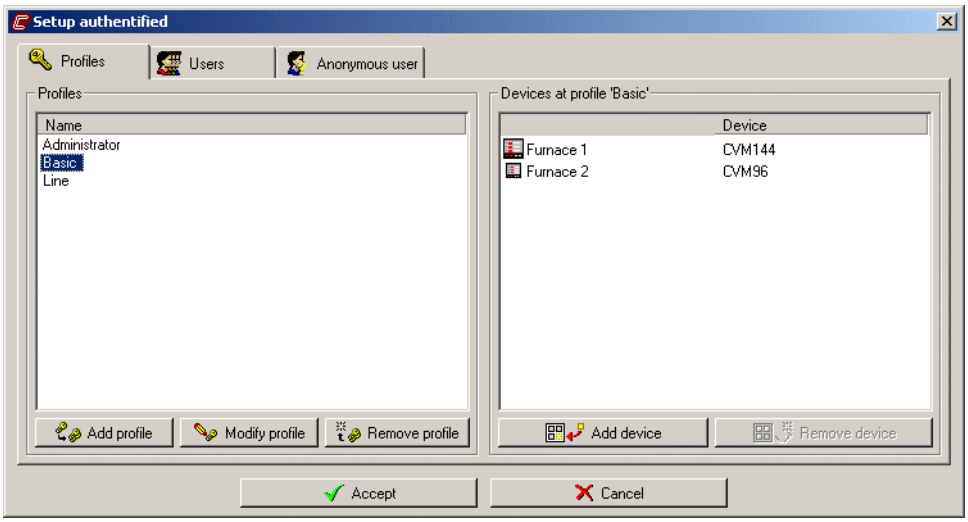
In this part we will explain how you could configure remote users access.

Some profiles will be defined. Those profiles will have resources that will allow to have access, being possible to assign one resource to more than one profile.

Will be defined users that are allowed to access to the application resources. Any one of the users will have a name and a password, which will be for the application to authenticate, avoiding not allowed users. Any of the authorized users will have one or more profiles, allowing the access in all profiles resources. One profile could be assigned to more than one user.

At last, it could be possible to active the access to an anonymous user. This anonymous user will not have the name nor the password, allowing the access to any remote user without authenticate. The rest of users will be assigned one or more profiles to allow the access to different application resources.

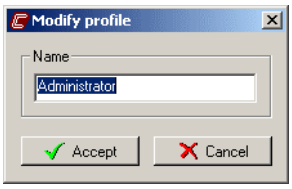
2.1.7.1.1 Profiles



With that option will be defined different profile parameters to access to application resources.

The list situated at the left of the dialog contains profiles, while the list on the right will show associated resources to the selected profile.

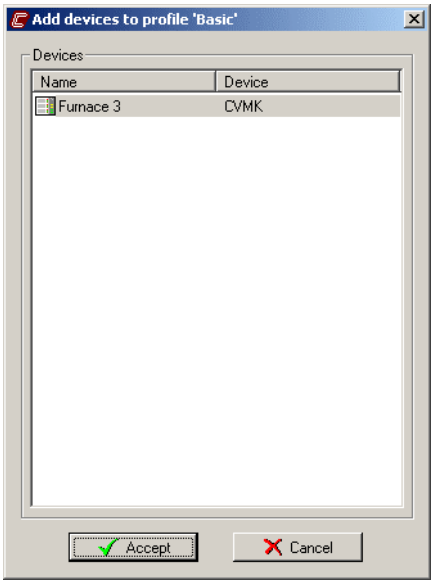
To click on *'Add profile'* or *'Modify profile'* will appear next dialog



In this dialog add or modify, depending on the clicked button, the profile name. This name will be used to profile identification, and will be only, being impossible to exist two profiles with the same name.

To click on *'Delete profile',* will delete selected profiles from profiles list.

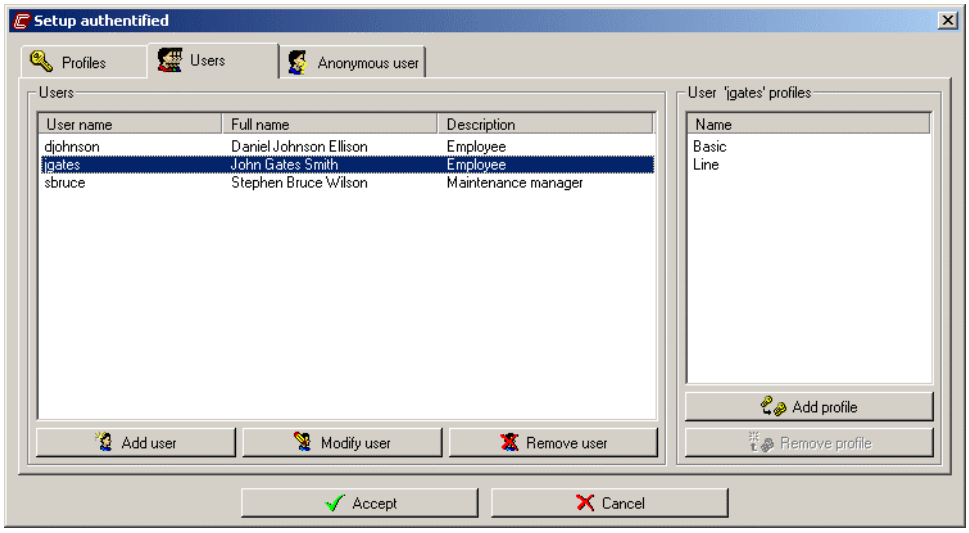
To add resources, you will click on *'Add devices'* button. To click on you will find next dialog



Where the resources will be selected that are wished to add to the profile. Remember that in this list, it will only appear those resources that are not assigned to the profile, in this case it doesn't appear resources 'Furnace 1' and 'Furnace 2' that have been assigned before to 'Basic' profile. At *'Accept'* the selected resources from the list will be added.

If you wish to delete profile resources, you should to select resources from the list and click on *'Remove device'* button. It is necessary to consider, that those resources will be only deleted from the profile, and in any case they will be deleted from the main application.

2.1.7.1.2 Users



With this dialog it will define users that will have access to the application resources.

The list on the left side will show configured users, while the list from the right side shows assigned profiles to the selected user from the users list.

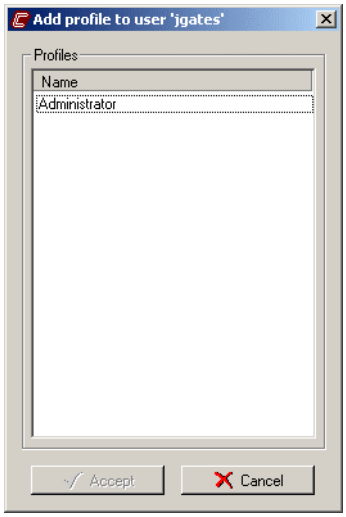
To add or modify any user click on *'Add user´* or *'Modify user*' button.

where

- **User name:** Will be an alphanumerical type field that will identify the user. This field will be used to authenticate the user when it will be necessary.
- **Full name:** Will correspond at the complete user name.
- **Description:** Field that allows to introduce a brief user description.
- **Password:** Password to avoid not wished users to access to the application resources.
- **Repeat password:** Field to validate the introduced password in the previous field, Introduces values in 'Password' and 'Repeat password' have to be the same to validate the password.

If you want to delete one or more users, you should to select, from users list, those users that you wish to delete and click on *'Remove user'*.

Clicking on *'Add profiles*', will be possible to assign new profiles to the selected user from the users list.

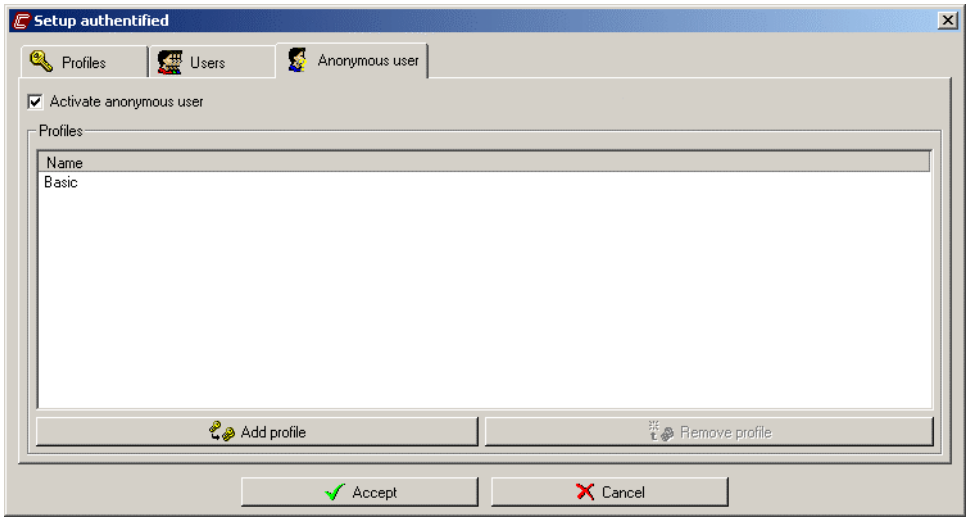


The dialog will show those profiles that haven't been assigned before to the user. In that case, the user 'jgates' will only show the profile 'Administrator' to be the only one that hasn't been assigned to the user. At *'Accept'* it will assign selected profiles from the user's list.

To delete user's profiles, you should to select from profile's list those that you wish to delete and click on *'Remove profiles'* button. Those profiles will only deleted from the users profiles and not from the application.

2.1.7.1.3 Anonymous user

One special user exists that we call from now anonymous user. The main difference of this user is that he hasn't got neither name nor password. The anonymous user could access to the application resources without introduce password and name. To avoid not wished access, exists the possibility to deactivate this user and to control who could access to resources or not.



Activating or deactivating the option *'Activate anonymous user'*, will activate or not the option of allow an anonymous user through a remote access via web.

The list will show profiles assigned to the anonymous user, with 'Add profile' and 'Remove profile' buttons the same like another user (see part 2.1.7.1.2 Users)

2.1.8 Change to edition / runtime

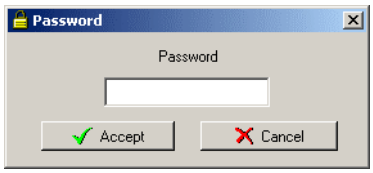
Two possible working modes exist: runtime and edition.

In runtime mode you could see devices values, graphs and tables, apply tariffs and any other function that doesn't change any configuration parameter software working, even the software as any device configuration.

In edition mode, moreover runtime mode, will be allowed the parameters software modification and devices configured.

Will be possible, with password, blockade edition mode, avoiding possible modifications in the configuration, by mistake or by not allowed people. To enable the edition password you should to select the correct option in the preferences dialog (see 2.1.7 Preferences).

When you pass from runtime mode to edition mode, and being on the edition password, you should to introduce the correct password in next dialog



if you don't do that, you couldn't be in edition mode.

2.1.9 Exit

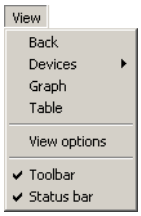
To click on this option the program will close.

2.2 Edit menu

2.2.1 Copy

With this option you could copy the graph or table viewed in the screen to the clipboard.

2.3 View menu

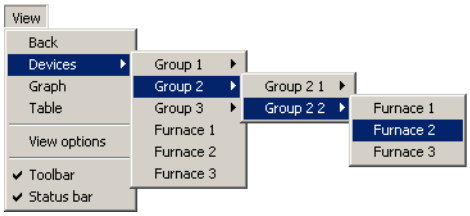


2.3.1 Back

This option allows to go to the previous screen.

2.3.2 Devices

To click on the devices you could see the menu, with groups and configured devices, like next



from which you could choose the device that you want to see the variables to measure.

The menu could has two type of different elements:

Group 1 ▸ where the symbol ▸ will indicate that it is a group, and another menu will appear with its group elements.

Furnace 1 will be the name of configured devices. To click on one of them you could see variables that measure this device.

2.3.3 Graph

To click on “Graph” will show graphs of selected device variables.

Graphs will be explained in another part of this manual.

2.3.4 Table

To click on “Table” will show tables of the selected device values.

Tables will be explained in another part of this manual.

2.3.5 View options

Contains parameters to modify the screen visualization of devices values, graphs o tables.

This menu option will depend screen option, and will be explained in the corresponding part.

2.3.6 Tool bar

With this option you could see or hide the tool bar.

This bar contains the main elements of the View menu.

- Back: see part 2.3.1
- Devices: see part 2.3.2
- Graph: see part 2.3.3
- Table: see part 2.3.4
- Options: see part 2.3.5
- Print: Will be only on when you are viewing a graph or a table.

2.3.7 Statement bar

With this option you could see or hide the statement bar.

2.4 Help bar

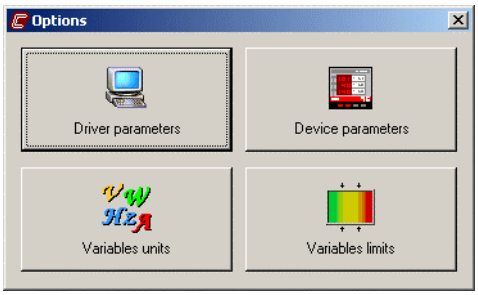
Shows software information.

3 Devices configuration

You could access to devices options from

- Screen options of devices statement button. See part 2.1.6 Devices statement.
- View menu. See part 2.3.5 View options.
- Tool bar. See part 2.3.6 Tool bar.

Options menu for CVM-96 device will be next



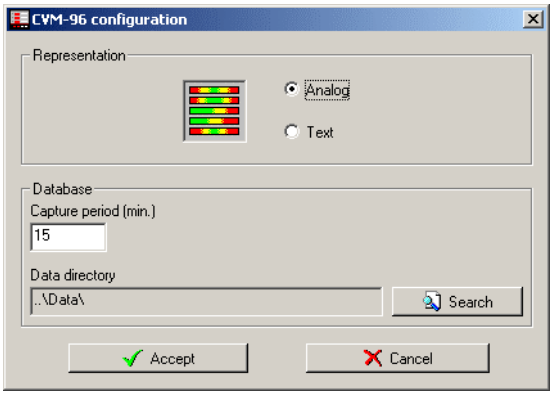
Between options exist some of them very similar. These options will be explained in 3.1 Drivers options configurations.

3.1 Drivers options configurations

In this part will be described those options that will be common to all or more drivers.

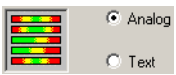
Will be described these options using as an example CVM-96. It is possible that other devices need to configure another type of options, not detailed in this part, in that case will be explained in the corresponding part.

3.1.1 Driver parameters

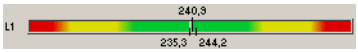


From this screen you could configure the type of variables view and configure where to keep data files.

Two representing data type exists.



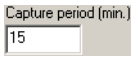
Analogycal representation, variables will be represented graphically with bars like



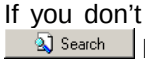
Where you could see instantaneous value, maximum and minimum.

Text mode representation, variables will be like

Phase-neutral (V)	202,4	202,4	202,4

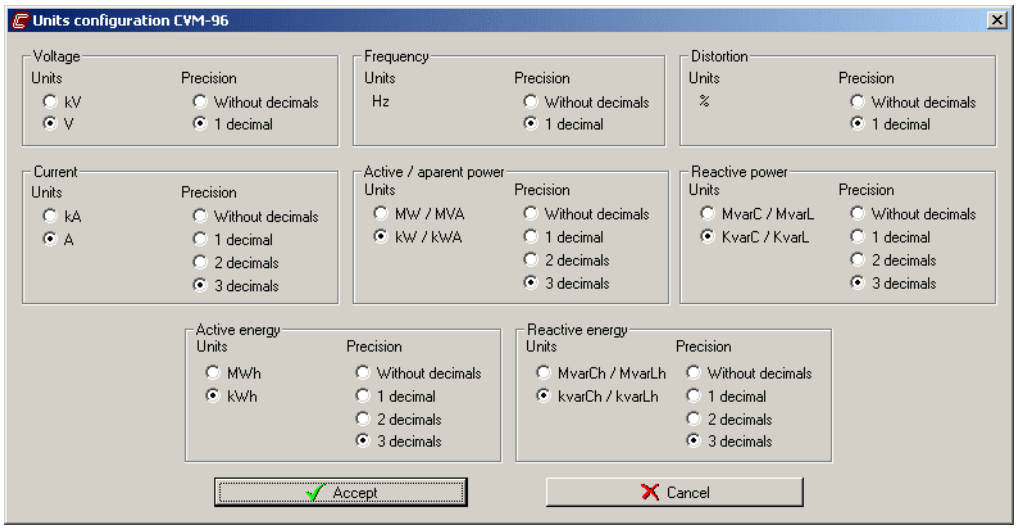


Use this filed to set the capture period in minutes. This time defines the interval between the records saved in the computer hard disk.

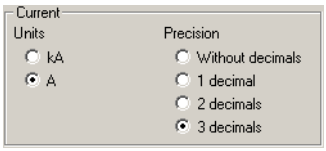
This field shows the directory, which will be, recorded data files, this directory could be every one and could not have any connection with work directory. If you don't select any directory, data base files will be kept in work directory. Clicking on 

button you could change data directory. Variables that will be kept in data files will be described in the corresponding part.

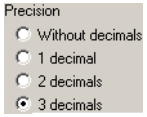
3.1.2 Variables units



With this dialog you could configure the units and the decimals number which you will go to see the variables. This type of configuration doesn't affect the device, being only used for view the values.

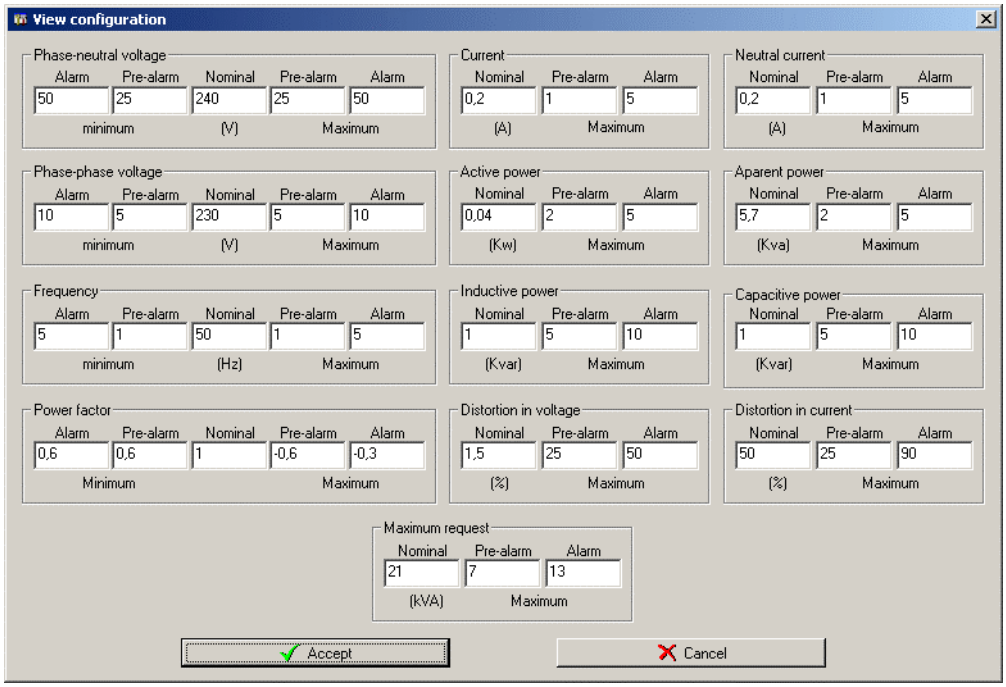


You should to select variables units. In this case all current variables will show A.

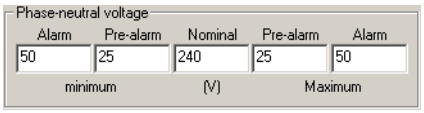


You should to select variables precision. In this case all current variables will be showed with 3 decimals.

3.1.3 Variables limit



With this dialog you could configure nominal variable values, as well as different margins to show by screen when a variable is too big.



Nominal variable value. Between parenthesis indicates value units. If the nominal value is 0, the alarm will be deactivate. For power factor, the nominal value should be 1 to activate the alarm and 0 to deactivate.

Nominal value percentage that will give an alarm or pre-alarm signal. In this case when the variable value will be between 25% and 50 % below the nominal value, will appear a pre-alarm signal, if it is below 50 % the signal will be the alarm. For the power factor, you should to introduce directly the wished alarm and pre-alarm value between +0.0 and -0.0.

Nominal value percentage that will give an alarm or pre-alarm signal. In this case when the variable value will be between 25 and 50% over the nominal value, will appear a pre-alarm signal, if it is over the 50% the signal will the alarm. For the power factor, you should to introduce directly the wished alarm and pre-alarm value between +0.0 y –0.0.

If the pre-alarm value is the same at the alarm value, the pre-alarm zone will be deactivated thinking directly of the normal statement or alarm statement.

The way to view the pre-alarm and alarm signals will be showed then, when explains the different values screens.

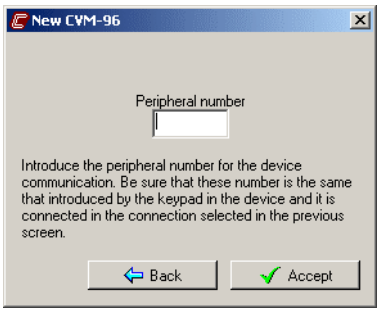
3.2 CVM-96

3.2.1 Add a new CVM-96

To see how add new devices see part 2.1.2.1 Add a device.

Select the option  to add a new CVM-96 three-phase device.

After introduce the name, description and connection selection, will appear next dialog

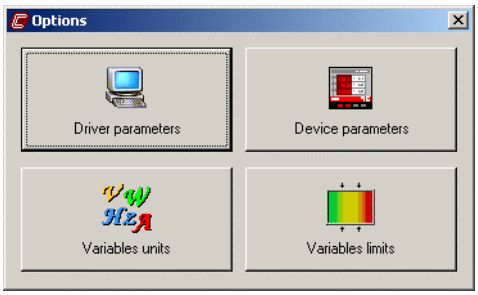


where

- **Peripheral number**: corresponds the number that the device has to its identification. Could be between 1 and 255. To obtain more information about change this device number, consult the manual supplied with the device.

3.2.2 Driver options CVM-96

Options menu will be next



'Variables units' and 'Variables limits' options are detailed in 3.1.2 Variables units and 3.1.3 Variables limit

3.2.2.1 Driver parameters

This driver option is detailed in 3.1.1 Driver parameters.

Variables that will be kept in data files are

Variable	Instantaneous	Maximum	Minimum
Voltage phase 1	VI1	VMX1	VMN2
Voltage phase 2	VI2	VMX2	VMN2
Voltage phase 3	VI3	VMX3	VMN3
Voltage phase 12	VI12	VMX12	VMN12
Voltage phase 23	VI23	VMX23	VMN23
Voltage phase 31	VI31	VMX31	VMN31
Distortion in voltage phase 1	DVI1	DVMX1	DVMN1
Distortion in voltage phase 2	DVI2	DVMX2	DVMN2
Distortion in voltage phase 3	DVI3	DVMX3	DVMN3
Current phase 1	AI1	AMX1	AMN1
Current phase 2	AI2	AMX2	AMN2
Current phase 3	AI3	AMX3	AMN3
Neutral current [1]	ANI	ANMX	ANMN
Distortion in current phase 1	DAI1	DAMX1	DAMN1
Distortion in current phase 2	DAI2	DAMX2	DAMN2
Distortion in current phase 3	DAI3	DAMX3	DAMN3
Frequency	HZI	HZMX	HZMN
Apparent power phase 1	VAI1	VAMX1	VAMN1
Apparent power phase 2	VAI2	VAMX2	VAMN2
Apparent power phase 3	VAI3	VAMX3	VAMN3
Apparent power three phase	VAI	VAMX	VAMN
Active power phase 1	API1	APMX1	APMN1
Active power phase 2	API2	APMX2	APMN2
Active power phase 3	API3	APMX3	APMN3
Active power three phase	API	APMX	APMN
Capacitive power phase 1	CPI1	CPMX1	CPMN1
Capacitive power phase 2	CPI2	CPMX2	CPMN2
Capacitive power phase 3	CPI3	CPMX3	CPMN3
Capacitive power three phase	CPI	CPMX	CPMN
Inductive power phase 1	IPI1	IPMX1	IPMN1
Inductive power phase 2	IPI2	IPMX2	IPMN2
Inductive power phase 3	IPI3	IPMX3	IPMN3
Inductive power three phase	IPI	IPMX	IPMN
Power factor phase 1	PFI1	PFMX1	PFMN1
Power factor phase 2	PFI2	PFMX2	PFMN2
Power factor phase 3	PFI3	PFMX3	PFMN3
Power factor three phase	PFI	PFMX	PFMN
Active energy	AE	-	-
Capacitive energy	CE	-	-
Inductive energy	IE	-	-
Maximum demand [2]	MDI	MDMX	-
Maximum demand phase 2 [3]	MDI2	MDMX2	-
Maximum demand phase 3 [3]	MDI3	MDMX3	-
Digital output1 [4]	DO1	-	-
Digital output2 [4]	DO2	-	-

[1] Only in neutral current devices

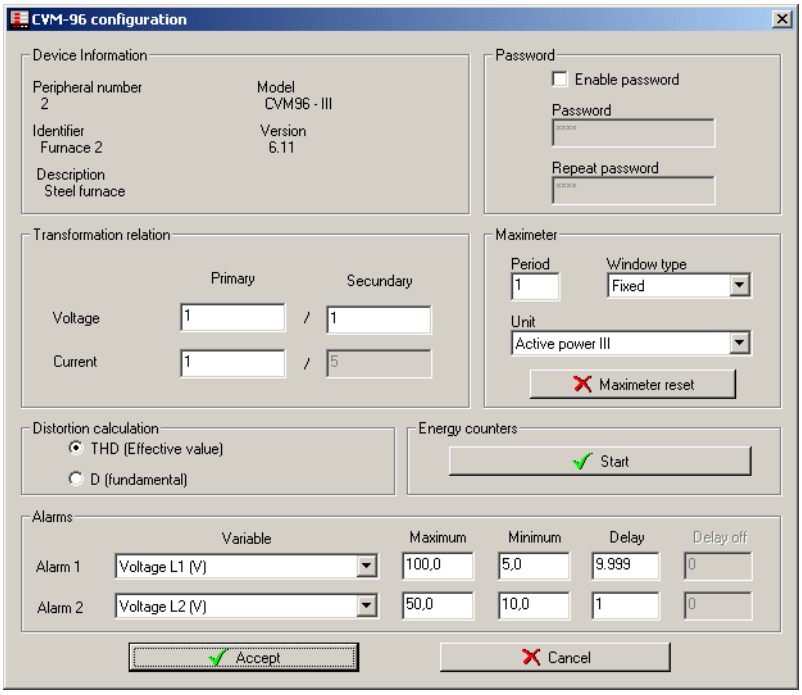
[2] Only in maximum demand devices.

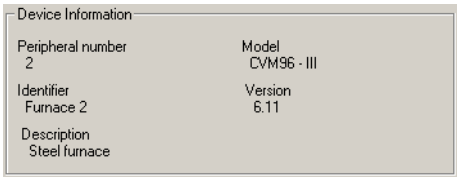
[3] Only in maximum demand devices of current by phase

[4] Only in digital output devices.

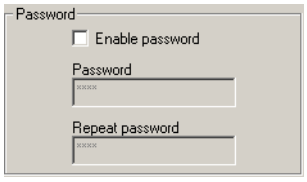
3.2.2.2 Devices parameters

This screen will allow to configure internal device parameters. When you open the dialog the software will read the device configuration, at the end, if you click on 'Accept' and there had been changes, the software will send the information to the device. In any case this information will be kept in the hard disk.

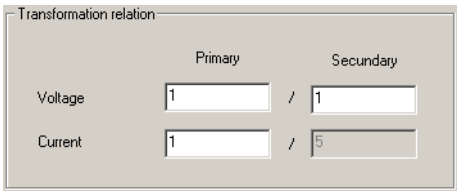




Show device information.



Allows to activate or deactivate the password to blockade the configuration by the device keypad.



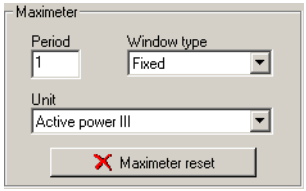
Depending on the device, transformation relation in voltage will be disabled.

- **Transformation relation in voltage**: Voltage primary and secondary value programmation. The product of primary value and current primary value must be less

or equal than 20.000.000. Primary value, depend on device's full scale, must be between 1 and corresponding value on next table:

Full scale	Maximum value
110v	99.999
275v	70.000
300v	70.000
500v	40.000

- **Transformation relation in current**: Current primary value programmation, the value must be between 1 and 10.000 A. Secondary value is fix to 5 A.

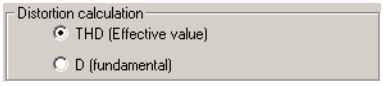


- **Period**: Is the integration period of the maximeter that could be between 1 and 60 minutes

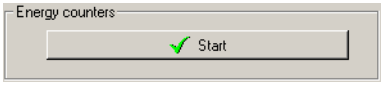
- **Window type**: Window type used to keep the maximeter value, could be fix or slicing.

- **Unit**: The maximum demand could be calculated with active power III, apparent power III, current III or current by phase depending on the device.

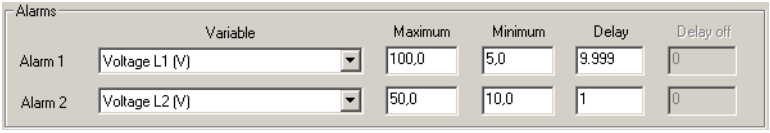
- **Maximeter reset**: When you click on this button, the device maximeter will be in zero.



With this selector you could configure the type of distortion that the device will calculate.



To click on the button all energy device counters will be in zero.



In this part it shows the configuration on output device relays and you could configure them with wished values.

- **Variable**: In this field indicates the parameter that associates the relay. The output is configured as an alarm, being possible to control the parameters measured by the CVM-96. Between bracket indicates the units that maximum and minimum alarm values are expressed.

- **Maximum**: In this box indicates the maximum value to control.

- **Minimum**: In this box indicates the minimum value to control.

- **Delay**: Delay in alarm seconds. The maximum value is 9999 seconds

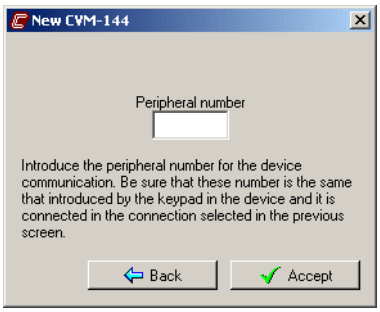
3.3 CVM-144

3.3.1 Add a new CVM-144

To see how add a device, see part 2.1.2.1 Add a device.

Select CVM 144 III option to add a CVM-144 three-phase device.

After introduce the name, the description and have selected the connection, will appear next dialog

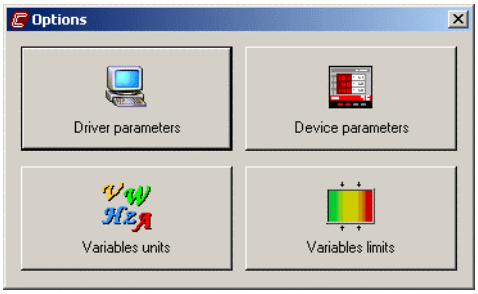


where

- **Peripheral number**: corresponds the number that has the device to its identification. Could be between 1 and 255. To obtain more information about how to change this number, please visit the manual supplied with the device.

3.3.2 Driver options CVM-144

Options menu will be next



'Variables units' and 'Variables limits' options are detailed in 3.1.2 Variables units and 3.1.3 Variables limit respectively.

3.3.2.1 Driver parameters

This driver option has been detailed in 3.1.1 Driver parameters.

Variables that will be kept in datafiles are:

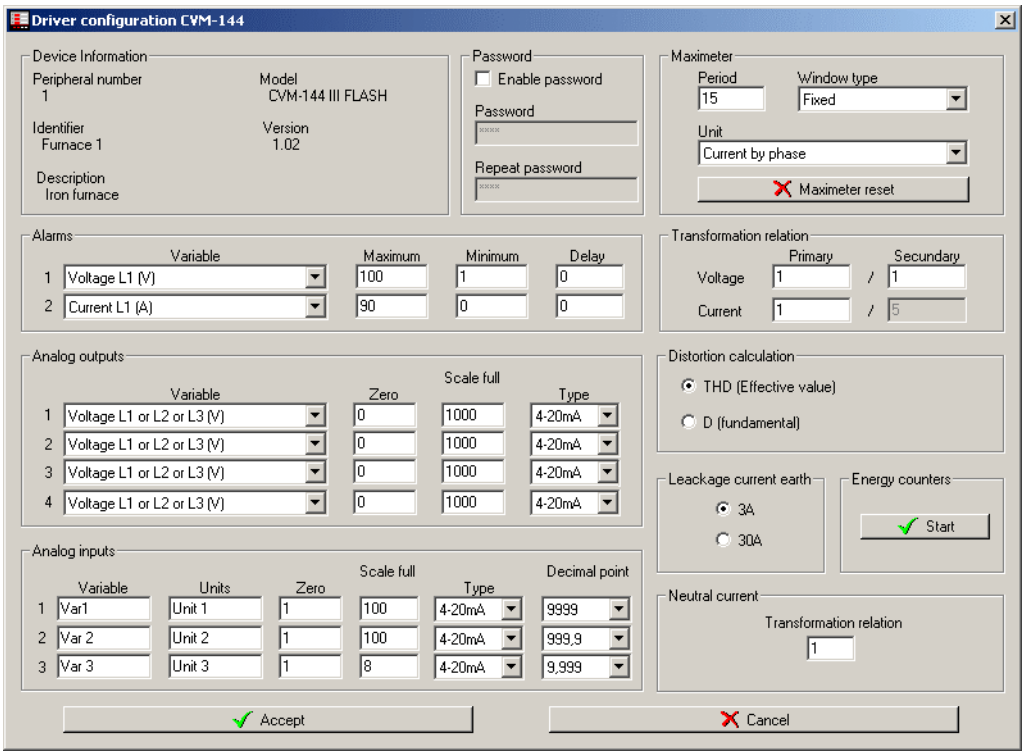
Variable	Instantaneous	Maximum	Minimum
Voltage phase 1	VI1	VMX1	VMN2
Voltage phase 2	VI2	VMX2	VMN2
Voltage phase 3	VI3	VMX3	VMN3
Voltage phase 12	VI12	VMX12	VMN12
Voltage phase 23	VI23	VMX23	VMN23
Voltage phase 31	VI31	VMN31	VMN31
Distortion in voltage phase 1	DVI1	DVMX1	DVMN1
Distortion in voltage phase 2	DVI2	DVMX2	DVMN2
Distortion in voltage phase 3	DVI3	DVMX3	DVMN3
Current phase 1	AI1	AMX1	AMN1
Current phase 2	AI2	AMX2	AMN2
Current phase 3	AI3	AMX3	AMN3
Neutral current [1]	ANI	ANMX	ANMN
Leakage current earth [2]	AELI	AELMX	AELMN
Distortion in current phase 1	DAI1	DAMX1	DAMN1
Distortion in current phase 2	DAI2	DAMX2	DAMN2
Distortion in current phase 3	DAI3	DAMX3	DAMN3
Frequency	HZI	HZMX	HZMN
Apparent power phase 1	VAI1	VAMX1	VAMN1
Apparent power phase 2	VAI2	VAMX2	VAMN2
Apparent power phase 3	VAI3	VAMX3	VAMN3
Apparent power three phase	VAI	VAMX	VAMN
Active power phase 1	API1	APMX1	APMN1
Active power phase 2	API2	APMX2	APMN2
Active power phase 3	API3	APMX3	APMN3
Active power three phase	API	APMX	APMN
Capacitive power phase 1	CPI1	CPMX1	CPMN1
Capacitive power phase 2	CPI2	CPMX2	CPMN2
Capacitive power phase 3	CPI3	CPMX3	CPMN3
Capacitive power three phase	CPI	CPMX	CPMN
Inductive power phase 1	IPI1	IPMX1	IPMN1
Inductive power phase 2	IPI2	IPMX2	IPMN2
Inductive power phase 3	IPI3	IPMX3	IPMN3
Inductive power three phase	IPI	IPMX	IPMN
Power factor phase 1	PFI1	PFMX1	PFMN1
Power factor phase 2	PFI2	PFMX2	PFMN2
Power factor phase 3	PFI3	PFMX3	PFMN3
Power factor three phase	PFI	PFMX	PFMN
Active energy	AE	-	-
Capacitive energy	CE	-	-
Inductive energy	IE	-	-
Maximum demand [3]	MDI	MDMX	-
Maximum demand phase 2 [4]	MDI2	MDMX2	-
Maximum demand phase 3 [4]	MDI3	MDMX3	-
Current harmonic xx phase yy [5] ($1 \le xx \le 15$) , ($1 \le yy \le 3$)	ARMxxAyy	-	-
Analog input 1 [6]	INI1	INMX1	INMN1
Analog input 2 [6]	INI2	INMX2	INMN2
Analog input 3 [6]	INI3	INMX3	INMN3
Digital input 1 [7]	DI1	-	-
Digital input 2 [7]	DI2	-	-
Digital input 3 [7]	DI3	-	-
Digital input 4 [7]	DI4	-	-

Variable	Instantaneous	Maximum	Minimum
Digital output 1 [8]	DO1	-	-
Digital output 2 [8]	DO2	-	-

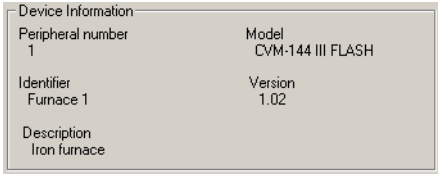
[1] Only in neutral current devices.
[2] Only in leakage current earth devices.
[3] Only in maximum demand devices.
[4] Only in maximum demand devices of current by phase
[5] Only in current harmonic devices
[6] Only in analog inputs devices
[7] Only in digital inputs devices
[8] Onlyl in digital output devices

3.3.2.2 Device parameters

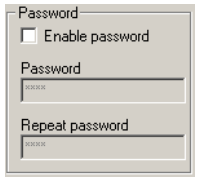
This screen will allow to configure internal device parameters. When you open the dialog the software will read the device configuration, at the end, if you click on 'Accept' and there had been changes, the software will send the information to the device. In any case this information will be kept in the hard disk.



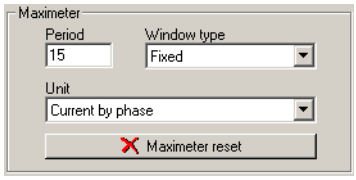
Depending on the connected device, any of the fields will be deactivated.



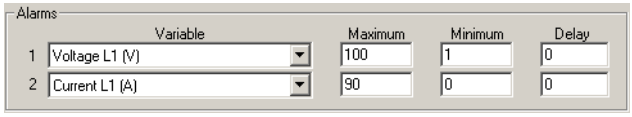
General information shows.



Allows to activate or deactivate the password to blockade the configuration by the device keypad.

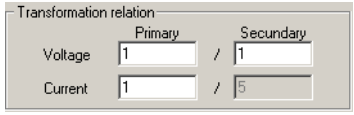


- **Period**: Is the integration maximeter period that could be between 1 and 60 minutes
- **Window type**: Window type used to keep the maximeter value, could be fix or slicing.
- **Unit**: The maximum demand could be calculated with active power III, apparent power III, current III or current by phase depending on the device.
- **Maximeter reset**: When you click on this button, the device maximeter will be in zero.



In this part shows the output relays device configurations and you could configured them with wished values.

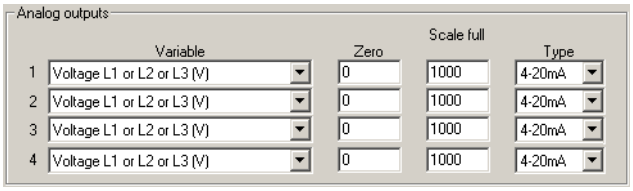
- **Variable**: In this field indicates the parameter associated to the relay. The output is programmed as an alarm, being possible to control any of the measured parameters with the CVM-144. Between bracket indicates units that maximum and minimum alarm values are expressed.
- **Max**: In this box indicates the maximum value to control.
- **Min**: In this box indicates the minimum value to control.
- **Delay**: Delay in alarm seconds. The maximum value is 9999 seconds.



- **Transformation relation in voltage**: Voltage primary and secondary value programmation. The product of primary value and current primary value must be less or equal than 20.000.000. Primary value, depend on device's full scale, must be between 1 and corresponding value on next table:

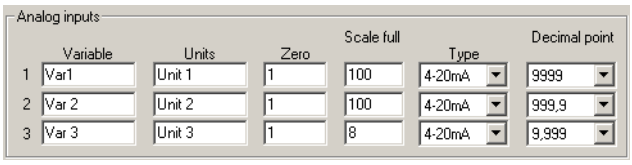
Full scale	Maximum value
110v	99.999
275v	70.000
300v	70.000
500v	40.000

- **Transformation relation in current**: Current primary value programmation, the value must be between 1 and 10.000 A. Secondary value is fix to 5 A.

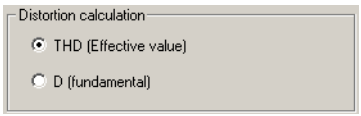


In this part it shows the device analog output configuration and you could configure them with wished values.

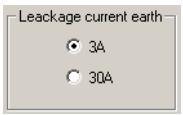
- **Variable:** Allows to select any parameter that the CVM-144 measures except the energy corresponding parameters.
- **Zero:** Parameter value
- **Full scale:** Parameter value assigned to the maximum scale value.
- **Type:** Type of input, allows to choose the input 0 – 20 mA, 4 – 20 mA ó 0 – 10 V, depending on the device.



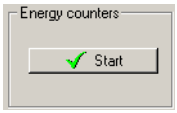
- **Variable:** Indicates the associated name to the analog input.
- **Units:** Indicates the type of units that the variable represents.
- **Zero:** Parameter value.
- **Full scale:** Parameter value assigned to the maximum scale value.
- **Type:** Type of input, allows to choose the input 0 – 20 mA, 4 – 20 mA ó 0 – 10V, depending on the device.
- **Decimal point:** Decimal point position. Only if the device allows to view analog inputs with real measured values.



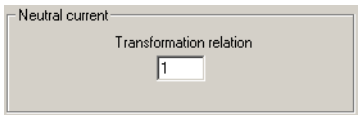
With this selector you could configure the type of distortion that the device will calculate.



With this selector you could configure the device leakage current earth. Only for those device that allows to measure leakage current earth.



To click on the button device energy counters will be in zero.



Neutral current relationship configuration. Only for those devices that allows to measure neutral current.

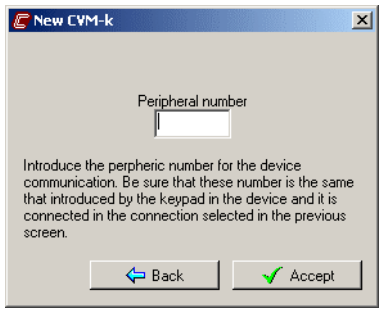
3.4 CVM-K

3.4.1 Add a new CVM-K

To detail how to add a device see part 2.1.2.1 Add a device.

Select  option to add a device CVM-K.

After introduced the name, description and connection selection, will appear next dialog

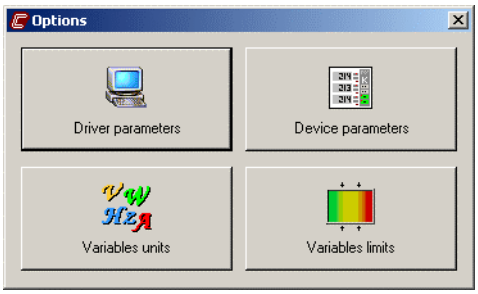


where

- **Peripheral number**: it corresponds the number that the device has to its identification. Could be between 1 and 99. To obtain more information about how to change this device number, consult the manual that is supplied with the device.

3.4.2 Driver options CVM-K

Options menu will be next



'Variables units' and 'Variables limits' has been detailed in parts 3.1.2 Variables units and 3.1.3 Variables limit.

3.4.2.1 Driver parameters

This driver option has been detailed in part 3.1.1 Driver parameters.

Variables that will kept data files are

Variable	Phase 1	Phase 2	Phase 3	Three phase
Voltage phase-neutral	VI1	VI2	VI3	VI
Voltage phase-phase	VI12	VI23	VI31	VI123
Distortion in voltage [1]	DVI1	DVI2	DVI3	-
Current	AI1	AI2	AI3	AI
Neutral current [2]	-	-	-	ANI
Distortion in current [1]	DAI1	DAI2	DAI3	-
Frequency	-	-	-	HZI
Apparent power	VAI1	VAI2	VAI3	VAI
Active power	API1	API2	API3	API
Capacitive power	CPI1	CPI2	CPI3	CPI
Inductive power	IPI1	IPI2	IPI3	IPI
Power factor	PFI1	PFI2	PFI3	PFI

[1] Only in distortion devices

[2] Only in neutral current devices

Variable	Tariff 1	Tariff 2 [3]	Tariff 3 [3]
Positive active energy [1]	AET1	AET2	AET3
Negative active energy [1 2]	NAET1	NAET2	NAET3
Positive capacitive energy [1]	CET1	CET2	CET3
Negative capacitive energy [1 2]	NCET2	NCET2	NCET3
Positive inductive energy [1]	IET1	IET2	IET3
Negative inductive energy [1 2]	NIET1	NIET2	NIET3
Maximum demand period	MDIT1	MDIT2	MDIT3
Maximum demand	MDIMXT1	MDIMXT2	MDIMXT3

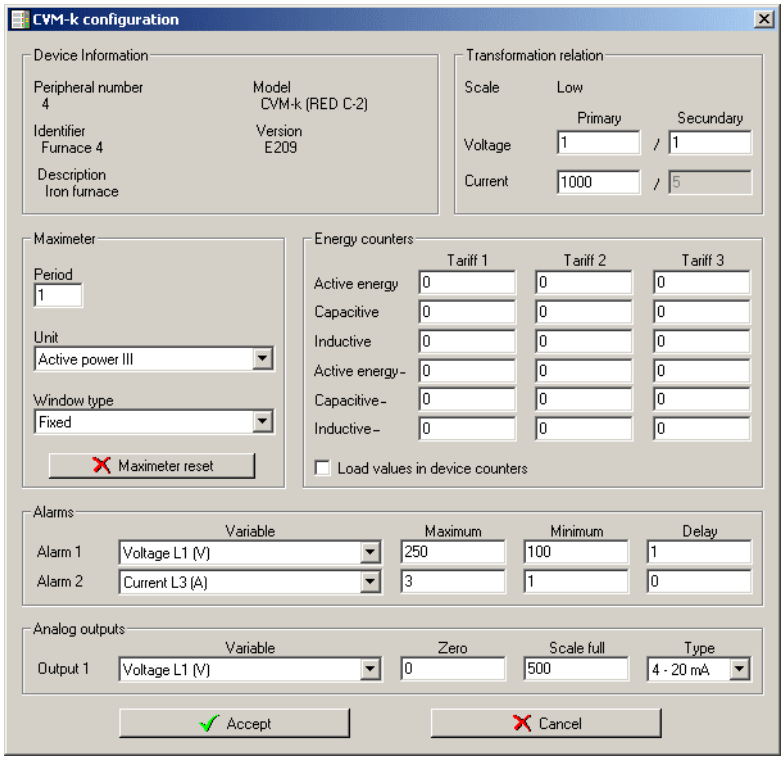
[1] Only in energy devices

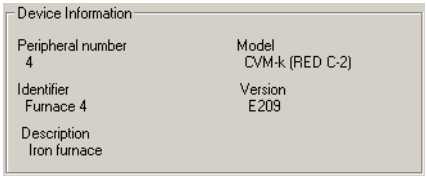
[2] Only in four quadrants devices

[3] Only in three tariff devices

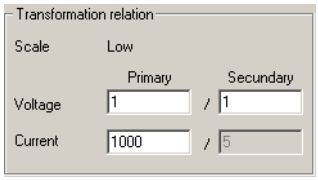
3.4.2.2 Device parameters

This screen will allow to configure internal device parameters. To open the dialog the software will read the device, at the end, if you click on 'Accept' and there have been changes the software will send the information to the device. In any case will be kept the information in the hard disk.



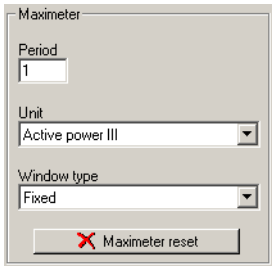


General information shows.

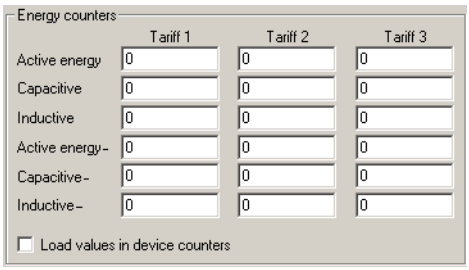


- **Transformation relation in voltage**: Voltage primary and secondary value programmation. The primary voltage value must be between 1 and 500.000V, and secondary value must be between 1 and 999. The primary divided by secondary must be less than 9090.

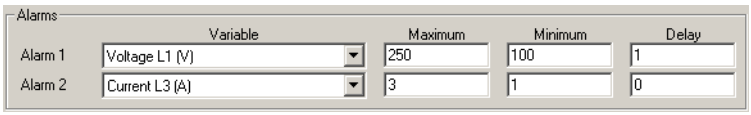
- **Transformation relation in current**: Current primary value programmation, the value must be between 1 and 10.000 A. Secondary value is fix to 5 A.



- **Period**: Is the integration maximeter period that could be between 1 and 60 minutes
- **Window type**: Window type used o keep the maximeter value, could be fix or slicing.
- **Unit**: The maximum demand could be calculated with active power III, apparent power III or current III.
- **Maximeter reset**: When you click on this button, the device maximeter will be in zero.



This part of configuration corresponds the device energies. Depending on the type of device any or all fields could be deactivated. If you click on the selector ☑, when the configuration is sent, will be charge to the energy counter the introduced values in the corresponding boxes.



Depending on the connected device, if this has a relay, you could configure wished values.

- **Variable**: Parameter associated to an output relay. The output is programmed like an alarm, being possible to control any of parameter measured by the CVM-K. Between bracket indicates the units that maximum and minimum alarm values are expressed.
- **Maximum**: In this box indicates the maximum value to control.
- **Minimum**: In this box indicates the minimum value to control.
- **Delay**: Alarm seconds delay. The maximum value is 9999 seconds.

Depending on the connected device, if this has an analog output, you could configure with wished values.

- **Variable**: Parameter associated to an analog output. It could be selected like an analog output any parameter measured by the CVM-K.

- **Zero**: Parameter value.

- **Full scale:** Parameter value that has the maximum scale value
- **Type**: Type of input, allows to choose between 0-20 mA or 4-20 mA.

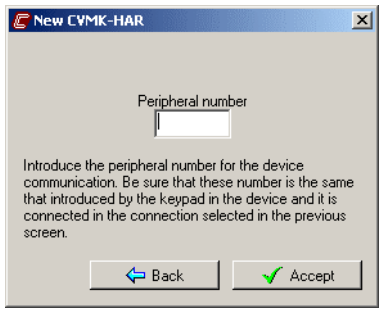
3.5 CVM-K HAR

3.5.1 Add a new CVM-K HAR

To see how to add a device see part 2.1.2.1 Add a device.

Select CVMK HAR option to add a device CVM-K HAR

After introduced the name, the description and connection selection, will appear the next dialog

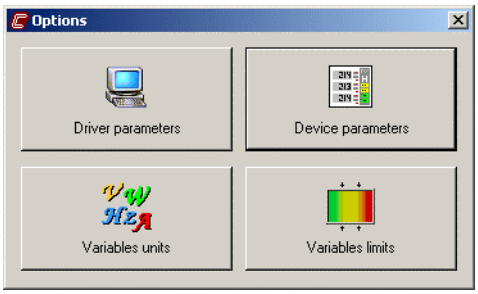


where

- **Peripheral number**: corresponds the number that the device has to its identification. Could be between 1 and 99. To obtain more information how to change the device number, consult the manual supplied by the device.

3.5.2 Driver options CVM-K HAR

Options menu is next



'Variables units' and 'Variables limits' options have been detailed in 3.1.2 Variables units and 3.1.3 Variables limit respectively.

3.5.2.1 Driver parameters

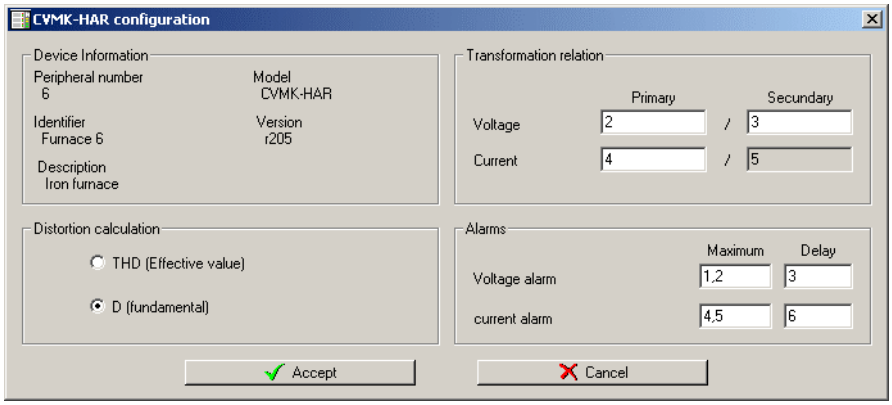
This driver option has been detailed in part 3.1.1 Driver parameters.

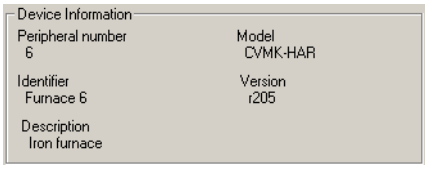
Variables that will be kept in files are

Variable	Phase 1	Phase 2	Phase 3	Three phase
Voltage phase-neutral	VI1	VI2	VI3	-
Voltage phase-phase	VI12	VI23	VI31	-
Distortion in voltage	DVI1	DVI2	DVI3	-
Current	AI1	AI2	AI3	-
Distortion in current	DAI1	DAI2	DAI3	-
Frequency	-	-	-	HZI
Voltage harmonic xx (1 ≤ xx ≤ 50)	ARMxxV1	ARMxxV2	ARMxxV3	-
Current harmonic xx (1 ≤ xx ≤ 50)	ARMxxA1	ARMxxA2	ARMxxA3	-

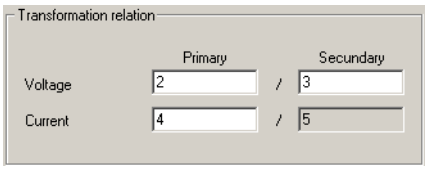
3.5.2.2 Device parameters

This screen will allow to configure internal device parameters. To open the dialog the software will read the device configuration, at the end, if you click on 'Accept' and there had been changes the software will send the information to the device. In any case will be kept the information in the hard disk.



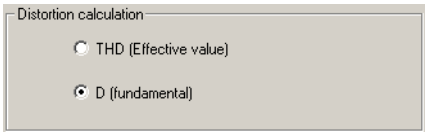


General information shows.

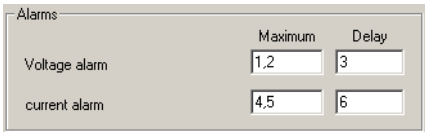


- **Transformation relation in voltage**: Voltage primary and secondary value programmation. Primary value must be between 1 and 999999 and secondary value must be between 1 and 999. The product of primary value and current primary value must be less or equal than 20.000.000.

- **Transformation relation in current**: Current primary value programmation, the value must be between 1 and 10000 A. Secondary value is fix to 5 A.



With this selector you could configure the type of distortion that the device will calculate.



In case to have an additional module with two outputs relays, you could configure the alarm mode with THD or D variables in voltage and current.

Maximum value. When the value that read the device CVM-K HAR is higher than the programmed value, the device will close the corresponding programmed alarm. This maximum value will program a % of the THD or D.

Delay, even in the connection as in the relay alarm disconnection. This value will be expressed in seconds.

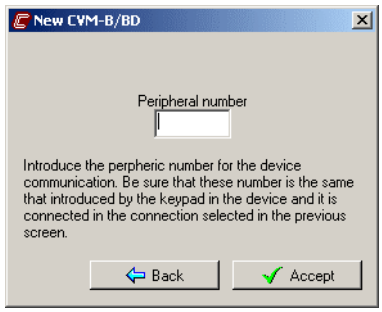
3.6 CVM-B/BD

3.6.1 Add a new CVM-B/BD

To see in detail how to add devices see part 2.1.2.1 Add a device.

Select CVM B/BD option to add a device CVM-B/BD.

After introduced the name, description and connection selection, will appear next dialog

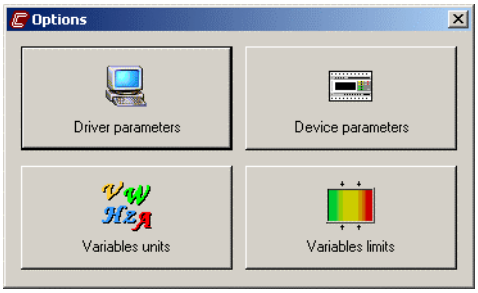


where

- **Peripheral number**: corresponds the number that the device has to its identification. Could be between 1 and 99. To obtain more information about how to change this device number, consult the manual supplied by the device.

3.6.2 Driver options CVM-B/BD

Options menu will be next



'Variables units' and 'Variables limits' option has been detailed in parts 3.1.2 Variables units and 3.1.3 Variables limit respectively.

3.6.2.1 Driver parameters

This driver option has been detailed in part 3.1.1 Driver parameters.

Variables that will kept in files are

Variable	Phase 1	Phase 2	Phase 3	Three phase
Voltage phase-neutral	VI1	VI2	VI3	VI
Voltage phase-phase	VI12	VI23	VI31	VI123
Distortion in voltage [1]	DVI1	DVI2	DVI3	-
Current	AI1	AI2	AI3	AI
Neutral current [2]	-	-	-	ANI
Distortion in current [1]	DAI1	DAI2	DAI3	-
Frequency	-	-	-	HZI
Apparent power	VAI1	VAI2	VAI3	VAI
Active power	API1	API2	API3	API
Capacitive power	CPI1	CPI2	CPI3	CPI
Inductive power	IPI1	IPI2	IPI3	IPI
Power factor	PFI1	PFI2	PFI3	PFI

[1] Only in distortion devices

[2] Only in neutral current devices

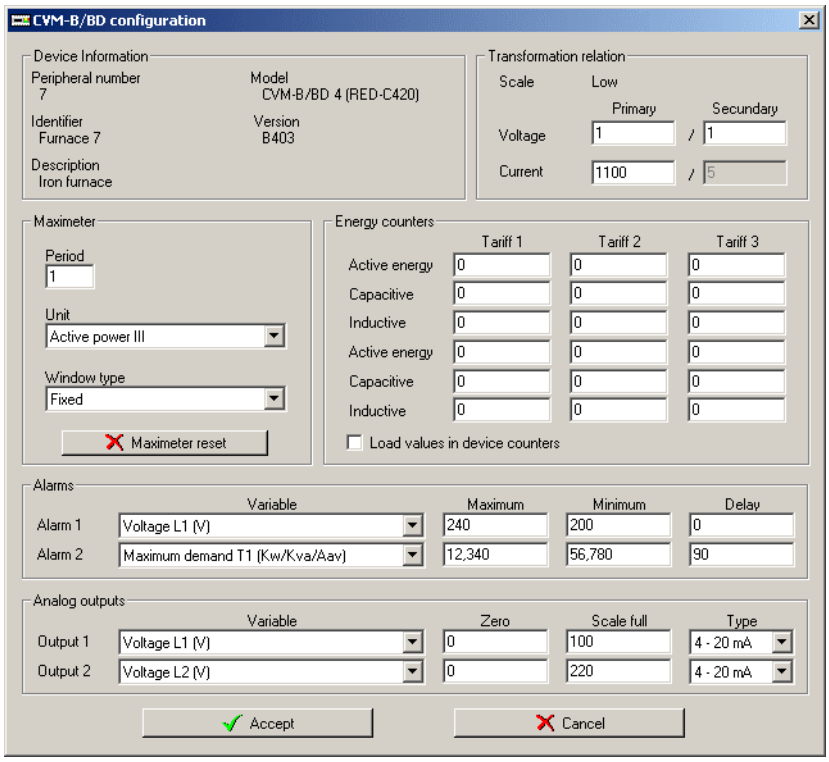
Variable	Tariff 1	Tariff 2 [2]	Tariff 3 [2]
Positive active energy	AET1	AET2	AET3
Negative active energy [1]	NAET1	NAET2	NAET3
Positive capacitive energy	CET1	CET2	CET3
Negative capacitive energy [1]	NCET2	NCET2	NCET3
Positive inductive energy	IET1	IET2	IET3
Negative inductive energy [1]	NIET1	NIET2	NIET3
Maximum demand period	MDIT1	MDIT2	MDIT3
Maximum demand	MDIMXT1	MDIMXT2	MDIMXT3

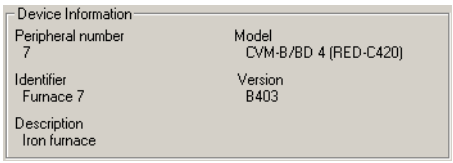
[1] Only in four quadrants devices

[2] Only in three tariff devices

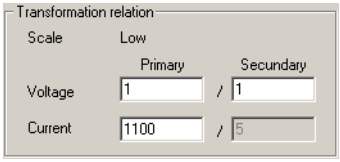
3.6.2.2 Device parameters

This screen will allow to configure internal device parameters. To open the dialog the software will read the device configuration, at the end, if you click on 'Accept' and there had been changes the software will send the information to the device. In any case will be kept the information in the hard disk



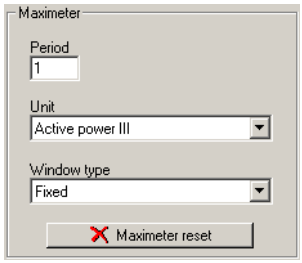


General information shows.

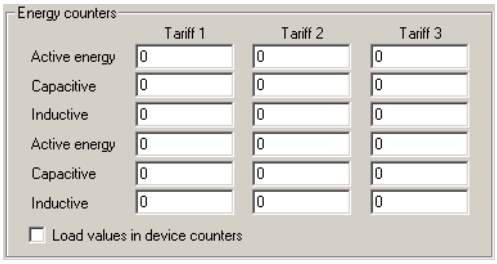


- **Transformation relation in voltage**: Voltage primary and secondary value programmation. Primary value must be between 1 and 5000000V and secondary value must be between 1 and 999. Primary value divided by secondary value must be less than 9090.

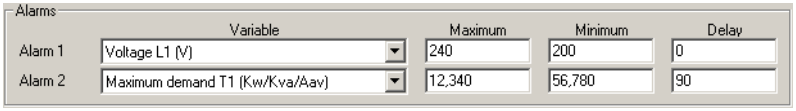
- **Transformation relation in current**: Current primary value programmation, the value must be between 1 and 10.000 A. Secondary value is fix to 5 A.



- **Period**: Is the maximeter integration period that could be between 1 and 60 minutes
- **Window type**: Window type used to keep maximeter value, could be fix or slicing.
- **Unit**: The maximum demand could be calculate with active power III, apparent power III or current III.
- **Maximeter reset**: When you click on this button, the maximeter will be in zero.



This part of configuration corresponds the device energies. Depending on the type of device any or all fields could be deactivated. If you click on the selector ☑, when the configuration is sent, will be charge to the energy counter the introduced values in the corresponding boxes.



Depending on the connected device, if this has an output relay, you could configure wished values.

- **Variable**: Parameter associated to an output relay. The output is programmed like an alarm, being possible to control any of the measured parameters by the CVM-B/BD. Between bracket indicates Units that the maximum and minimum alarm values are expressed.
- **Max**: Indicates the maximum value to control.
- **Min**: Indicates the minimum value to control.
- **Delay**: Delay in alarm seconds. The maximum value is 9999 seconds.

Depending on the connected device, if this has an analog output, you could configure with wished values.

- **Variable**: Parameter associated to the analog output. You could select like an analog output any parameter measured by CVM-B/BD.

- **Zero**: Parameter value
- **Full scale:** Parameter value assigned to the maximum scale value
- **Type**: Type of input, allows to choose between 0-20 mA or 4-20 mA.

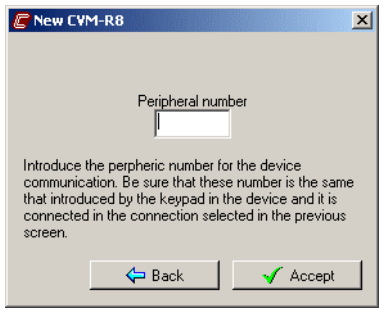
3.7 CVM-R8

3.7.1 Add a new CVM-R8

To detail how to add devices see part 2.1.2.1 Add a device.

Select CVM R8 option to add a device CVM-R8.

After introduced the name, the description and connection selection, will appear next dialog

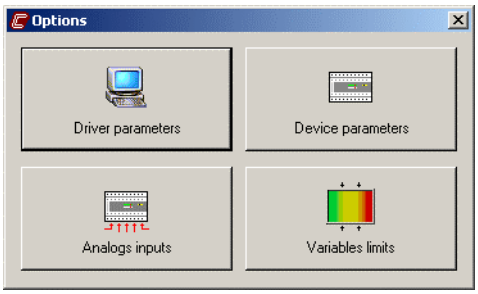


where

- **Peripheral number**: corresponds the number that the device has to its identification. Could be between 1 and 99. To obtain more information about how to change the device number, consult the manual supplied with the device.

3.7.2 Driver options CVM-R8

Options menu will be next



3.7.2.1 Driver parameters

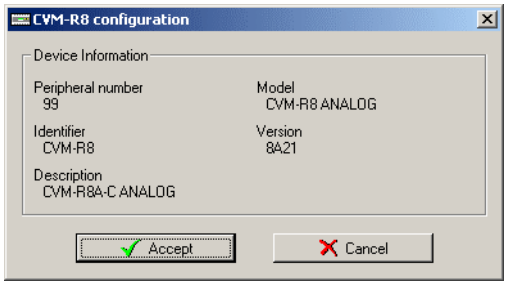
This driver option has been detailed in part 3.1.1 Driver parameters.

Variables will be kept in data files, depending on the CVM-R8 connected type, are

Variable	Parameter
Analog inputxx (1 ≤ xx ≤ 8)	AIIxx
Digital input xx (1 ≤ xx ≤ 18)	DIxx
Digital output xx (1 ≤ xx ≤ 18)	DOxx

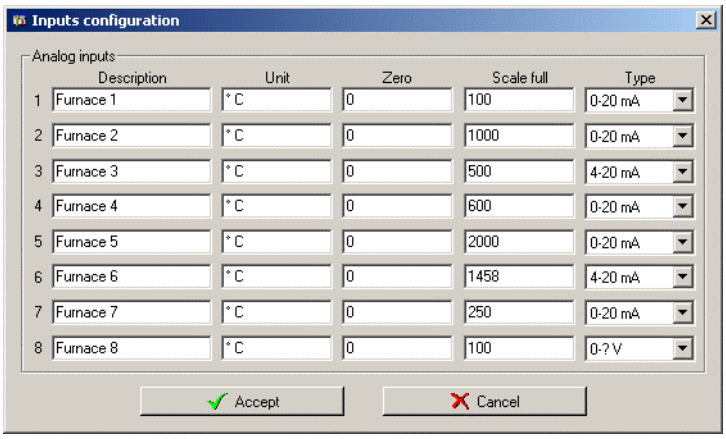
3.7.2.2 Device parameters

For CVM-R8 it will not be possible to configure any device parameter, showing only information about it.



3.7.2.3 Analog inputs

From this dialog you could to configure analog inputs in CVM-R8 devices that have analog inputs.



- **Description:** Alphanumerical data that allows to enter a brief description of the analog input to its better identification.
- **Unit:** Alphanumerical data that allows to enter a brief description of analog inputs units
- **Zero**: Parameter value
- **Full scale:** Parameter value that assign the maximum scale value
- **Type**: Type of input, allows to choose between 0-20 mA, 4-20 mA or 0-?V.

3.7.2.4 Variables limits

Only for CVM-R8 devices with analog inputs.

This option has been detailed in part 3.1.3 Variables limit.

3.8 LM-24 M

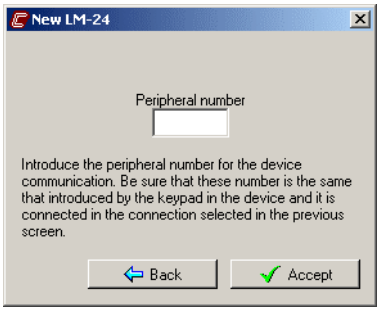
This software will only communicate with LM-24 M devices.

3.8.1 Add a new LM-24 M

To see in detail how to add devices see part 2.1.2.1 Add a device.

Select LM 24 M option to add a device LM-24 M.

After introduces the name, the description and connection selection, will appear next dialog



where

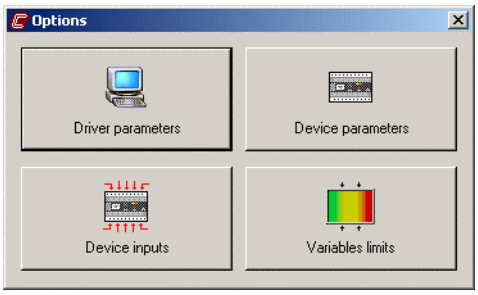
- **Peripheral number**: corresponds the number that the device has to its identification. Could be between 1 and 255. To obtain more information about how to change this number, consult the manual supplied by the device.

3.8.2 Driver options LM-24 M

You could to access to LM-24 M option from

- Devices statement screen button options. See part 2.1.6 Devices statement.
- View menu. See part 2.3.5 View options.
- Tool bar. See part 2.3.6 Tool bar.

Options menu will be next



3.8.2.1 Driver parameters

Driver option has been detailed in part 3.1.1 Driver parameters.

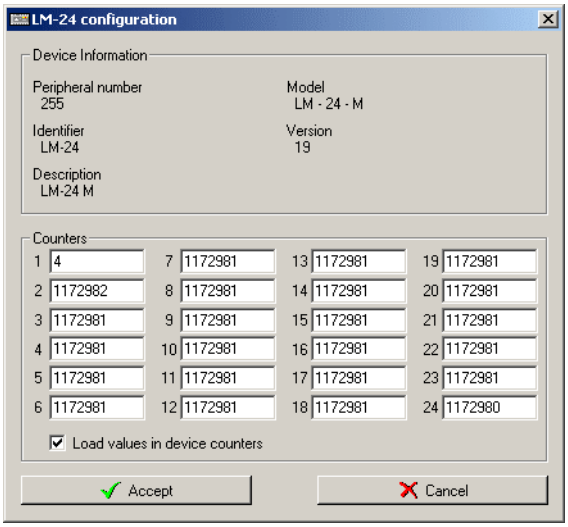
Variables that will be read from device are

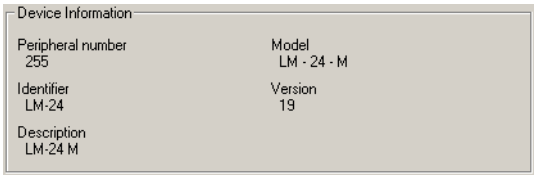
Variable	Parameter
Counter xx (1 ≤ xx ≤ 24)	Cxx
Digital input xx (1 ≤ xx ≤ 24)	DIxx

Only counters will be kept in data files.

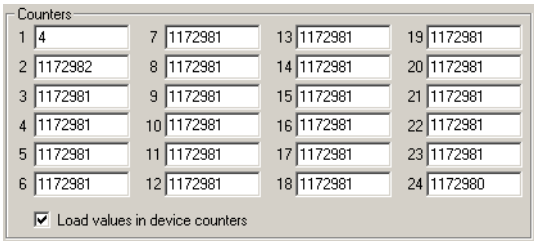
3.8.2.2 Device parameters

This screen will allow to configure internal device parameters. To open the dialog the software will read the device configuration, at the end, if you click on 'Accept' and there had been changes the software will send the information to the device. In any case will be kept the information in the hard disk.





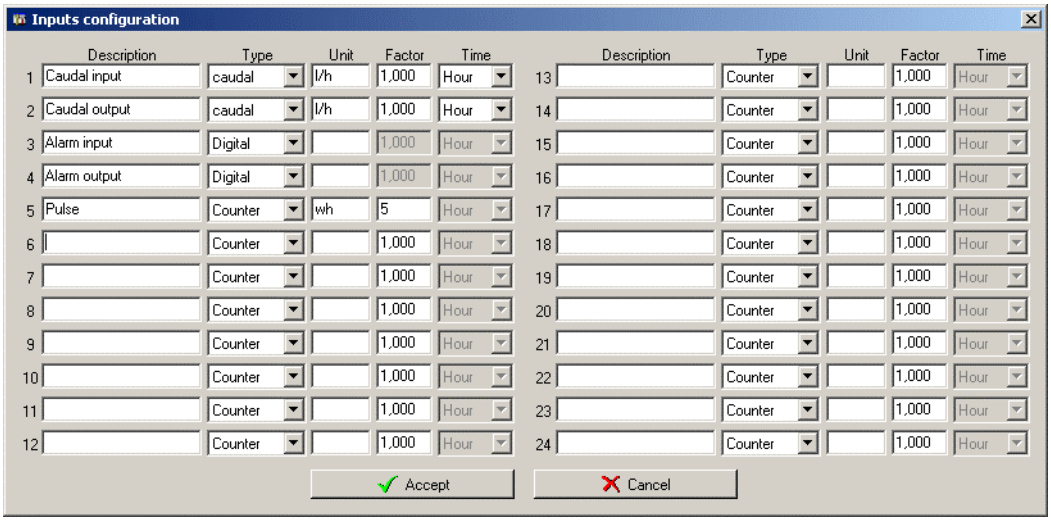
Shows general information.



This part of configuration corresponds the device counters. Depending on the type of device any or all fields could be deactivated. If you click on the selector ☑, when the configuration is sent, will be charge to the energy counter the introduced values in the corresponding boxes.

3.8.2.3 Inputs

From this dialog you could configure how will be LM-24 M inputs.



- **Description:** Alphanumerical data that allows to enter a brief description to its better identification.

- **Type:** Type that will define how will be the input. Types will be caudal, counter or digital:

    - **Caudal:** Inputs will be as a caudalimeter.
    - **Counter:** Viewed values will be the LM-24 M counter value.
    - **Digital:** You could see the input LM-24 M statement, opened or closed.

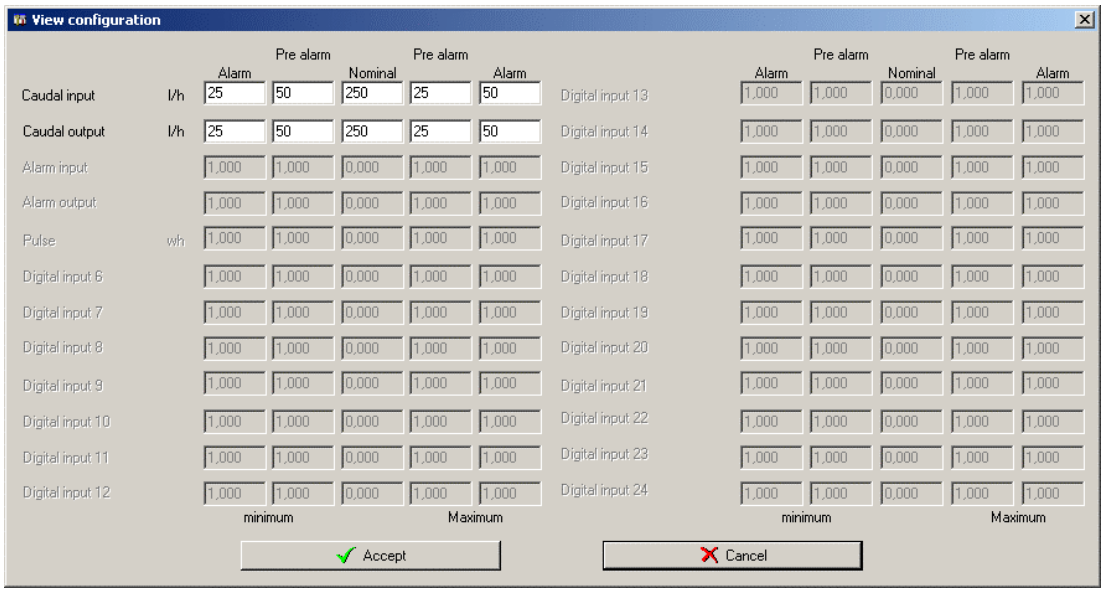
- **Unit:** Alphanumerical data that allows to enter a brief description of analog input units

- **Factor**: Only when is type of caudal or counter. Value to consider to generate a pulse.

- **Time**: Only when is type of caudal. Parameter calculates the caudal value. Possible values are hour and minutes.

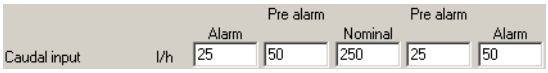
- **Type**: Type of input, allows to choose between 0-20 mA, 4-20 mA or 0-?V.

3.8.2.4 Variables limits



You could only define caudal type counters.

With this dialog you will configure nominal values of caudal type counters, even a margins serial to show when a variable measures another strange values.



'Caudal input' name corresponds the input description introduced in inputs dialog see part 3.8.2.3 Inputs

'Variables limits' option has been detailed in part 3.1.3 Variables limit.

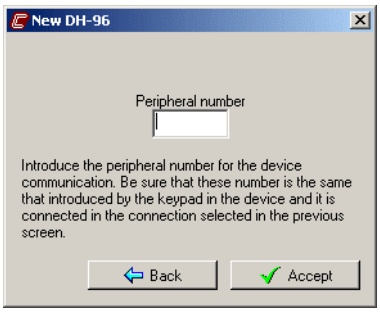
3.9 DH-96

3.9.1 Add a new DH-96

To see how to add new devices see part 2.1.2.1 Add a device.

Select DH 96 option to add a device DH 96.

After introduced the name, description and connection selection, will appear next dialog

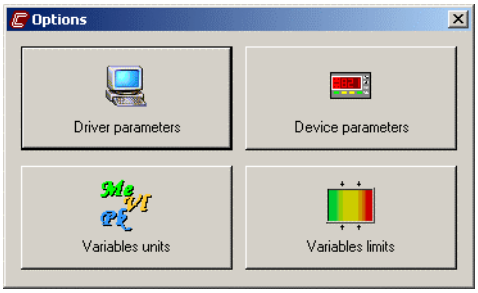


where

- **Peripheral number**: corresponds the number that the device has to its identification. Could be between 1 and 255. To obtain more information about how to change this number, consult the manual supplied by the device.

3.9.2 Driver options DH-96

Options menu will be next



'Variables units' and 'Variables limits' have been detailed in parts 3.1.2 Variables units and 3.1.3 Variables limit respectively.

3.9.2.1 Driver parameters

This driver option has been detailed in part 3.1.1 Driver parameters.

Depending on the connected device, variables that will be kept are:

- DH-96 CPM

Variable	Instantaneous	Maximum	Minimum
Voltage	VI	VMX	VMN
Current	AI	AMX	AMN
Active power	API	APMX	APMN
Active energy	AE	-	-

- DH-96 TMP, DH-96 SG, DH-96 FT, DH-96 AC, DH-96 DC, DH-96 WG

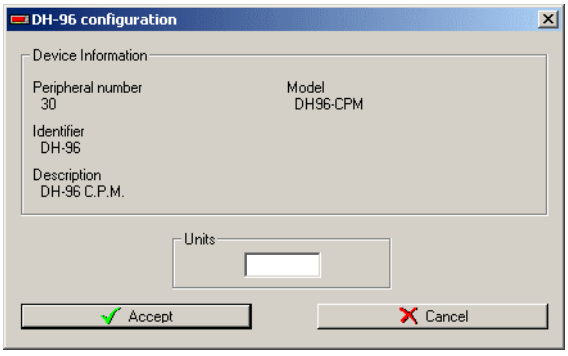
Variable	Parameter
Measure	ME
Peak	PK
Valley	VL

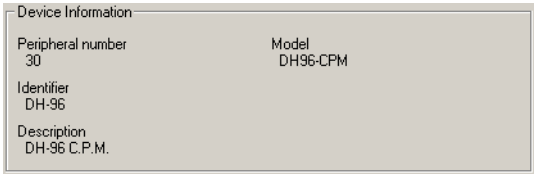
- DH-96 CT

Variable	Parameter
Measure	ME

3.9.2.2 Device parameters

In DH-96 devices will no be possible to modify internal parameters, being necessary to modify them manually from the device keypad. To obtain more information about how to modify them see the manual supplied by the device.





Shows general information.

Alphanumerical data that allows to entry a brief description of DH-96 measured units. These units are showed in the data view, never will be sent to the device.

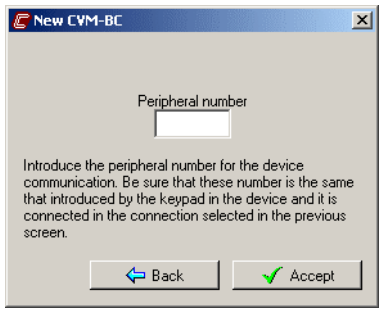
3.10 CVM-BC

3.10.1 Add a new CVM-BC

To see how to add devices see part 2.1.2.1 Add a device.

Select  option to add a device CVM-BC.

After introduced the name, description and connection selection, will appear next dialog

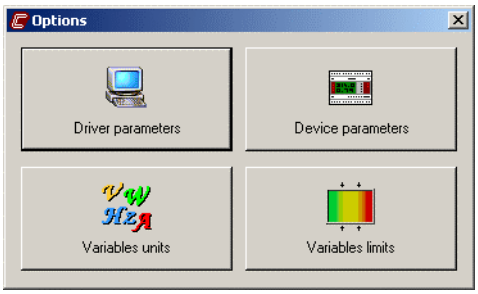


where

- **Peripheral number**: corresponds the number that the device has to its identification. Could be between 1 and 255. To obtain more information about how to change this number, consult the manual supplied by the device.

3.10.2 Driver options CVM-BC

Options menu will be next



'Variables units' and 'Variables limits' have been detailed in parts 3.1.2 Variables units and 3.1.3 Variables limit respectively.

3.10.2.1 Driver parameters

This driver option has been detailed in part 3.1.1 Driver parameters.

Variables that will be kept are

Variable	Instantaneous	Maximum	Minimum
Voltage phase 1	VI1	VMX1	VMN2
Voltage phase 2	VI2	VMX2	VMN2
Voltage phase 3	VI3	VMX3	VMN3
Voltage phase 12	VI12	VMX12	VMN12
Voltage phase 23	VI23	VMX23	VMN23
Voltage phase 31	VI31	VMX31	VMN31
Distortion in voltage phase 1	DVI1	DVMX1	DVMN1
Distortion in voltage phase 2	DVI2	DVMX2	DVMN2
Distortion in voltage phase 3	DVI3	DVMX3	DVMN3
Current phase 1	AI1	AMX1	AMN1
Current phase 2	AI2	AMX2	AMN2
Current phase 3	AI3	AMX3	AMN3
Neutral current [1]	ANI	ANMX	ANMN
Distortion in current phase 1	DAI1	DAMX1	DAMN1
Distortion in current phase 2	DAI2	DAMX2	DAMN2
Distortion in current phase 3	DAI3	DAMX3	DAMN3
Frequency	HZI	HZMX	HZMN
Apparent power phase 1	VAI1	VAMX1	VAMN1
Apparent power phase 2	VAI2	VAMX2	VAMN2
Apparent power phase 3	VAI3	VAMX3	VAMN3
Apparent power three phase	VAI	VAMX	VAMN
Active power phase 1	API1	APMX1	APMN1
Active power phase 2	API2	APMX2	APMN2
Active power phase 3	API3	APMX3	APMN3
Active power three phase	API	APMX	APMN
Capacitive power phase 1	CPI1	CPMX1	CPMN1
Capacitive power phase 2	CPI2	CPMX2	CPMN2
Capacitive power phase 3	CPI3	CPMX3	CPMN3
Capacitive power three phase	CPI	CPMX	CPMN
Inductive power phase 1	IPI1	IPMX1	IPMN1
Inductive power phase 2	IPI2	IPMX2	IPMN2
Inductive power phase 3	IPI3	IPMX3	IPMN3
Inductive power three phase	IPI	IPMX	IPMN
Power factor phase 1	PFI1	PFMX1	PFMN1

Variable	Instantaneous	Maximum	Minimum
Power factor phase 2	PFI2	PFMX2	PFMN2
Power factor phase 3	PFI3	PFMX3	PFMN3
Power factor three phase	PFI	PFMX	PFMN
Active energy	AE	-	-
Capacitive energy	CE	-	-
Inductive energy	IE	-	-
Maximum demand [2]	MDI	MDMX	-
Maximum demand phase 2 [3]	MDI2	MDMX2	-
Maximum demand phase 3 [3]	MDI3	MDMX3	-
Digital output 1 [4]	DO1	-	-
Digital output 2 [4]	DO2	-	-

[1] Only in neutral current devices

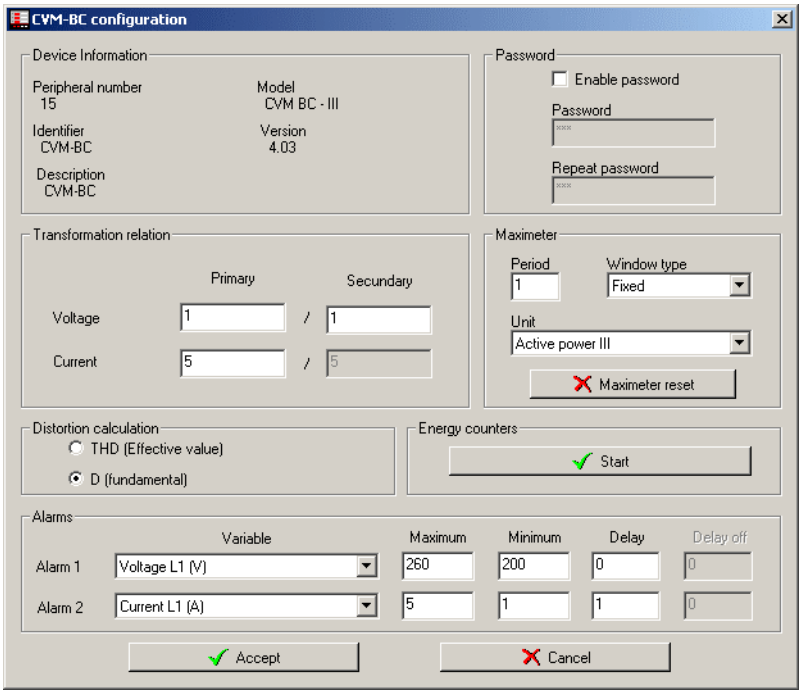
[2] Only in maximum demand devices.

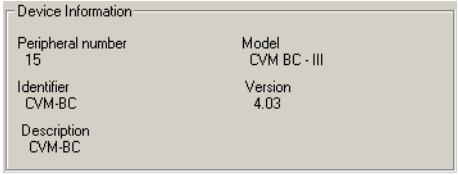
[3] Only in maximum demand devices of current by phase

[4] Only in digital output devices.

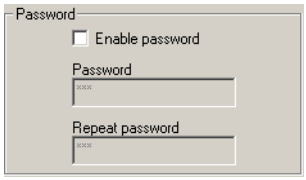
3.10.2.2 Device parameters

This screen will allow to configure internal device parameters. To open the dialog the software will read the device configuration, at the end, if you click on 'Accept' and there had been changes the software will send the information to the device. In any case will be kept the information in the hard disk.

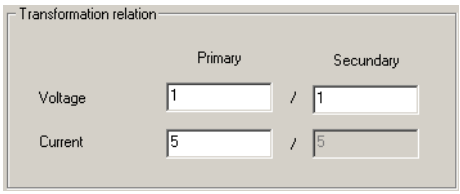




Shows general information.



Allows to activate or deactivate the password to blockade the configuration by the device keypad.

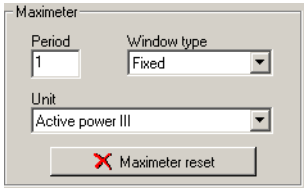


Depending on the device version, the voltage transforming relation program could be deactivated.

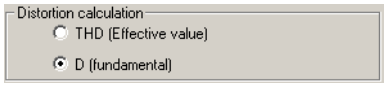
- **Transformation relation in voltage**: Voltage primary and secondary value programmation. The product of primary value and current primary value must be less or equal than 20.000.000. Primary value, depend on device's full scale, must be between 1 and corresponding value on next table:

Full scale	Maximum value
110v	99.999
275v	70.000
300v	70.000
500v	40.000

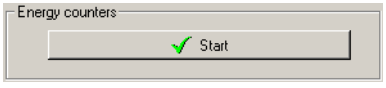
- **Transformation relation in current**: Current primary value programmation, the value must be between 1 and 10.000 A. Secondary value is fix to 5 A.



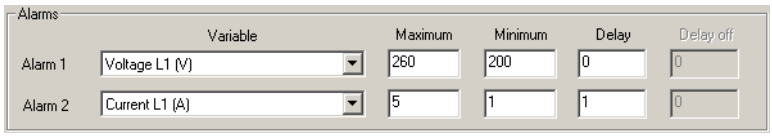
- **Period**: Is the integration maximeter period that could be between 1 and 60 minutes
- **Window type**: Window type used to keep the maximeter value, could be fix or slicing.
- **Unit**: The maximum demand could be calculated with active power III, apparent power III, current III or current by phase depending on the device.
- **Maximeter reset**: When you click on this button, the device maximeter will be in zero.



With this selector you could configure the type of distortion that the device will calculate.



To click this button energy device counters will be in zero.



In this part you could see output relays connection and you could configure them with wished values.

- **Variable**: In this field you could see the parameter associated to the relay. The output is programmed like an alarm, being possible to control any of parameters measured by the CVM-BC. Between bracket you could see units that the maximum and minimum alarm values are expressed.

- **Maximum**: This box indicates the maximum value to control.

- **Minimum**: This box indicates minimum value to control.

- **Delay**: Delay in alarm seconds. The maximum value is 9999 seconds.

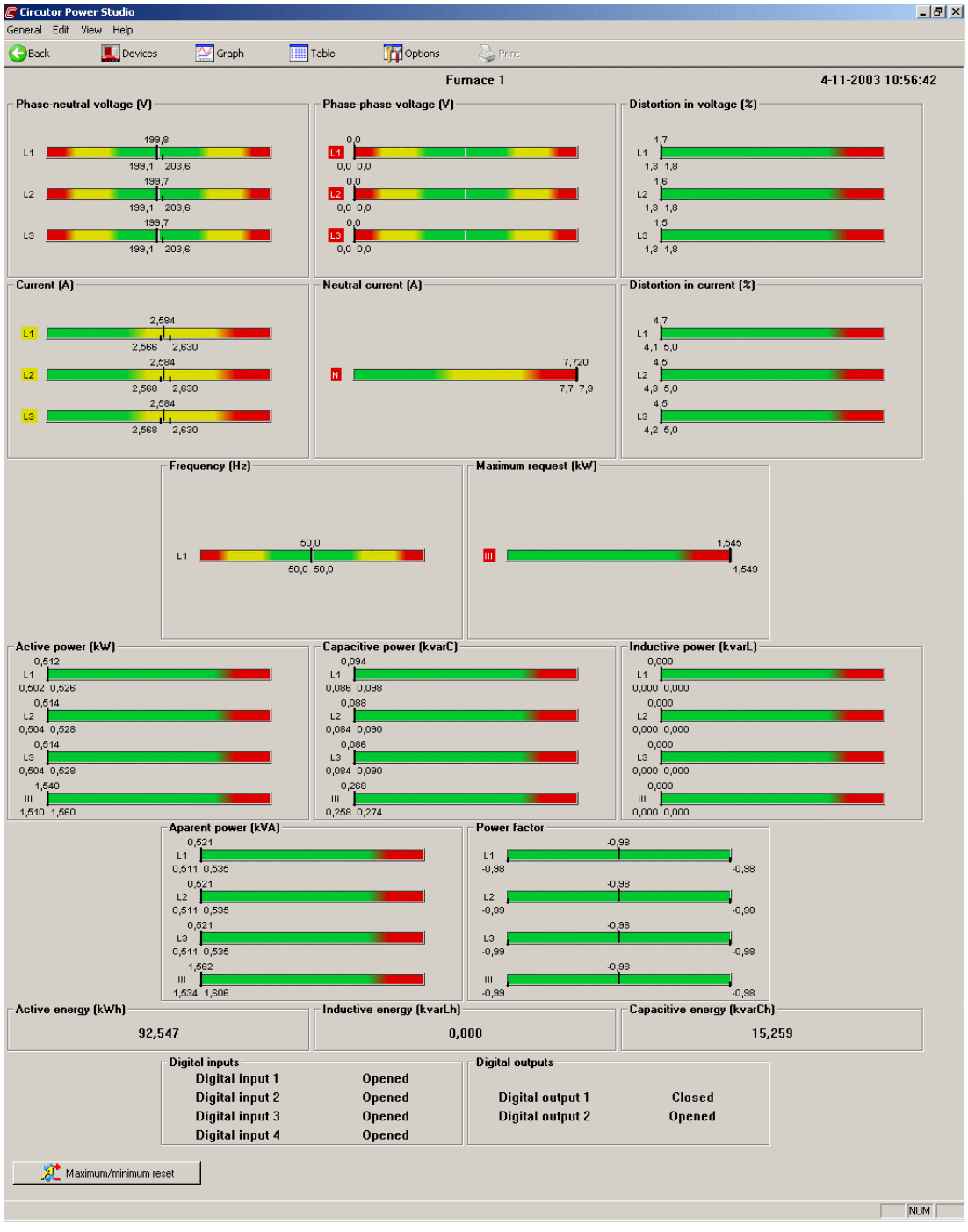
4 Values visualization

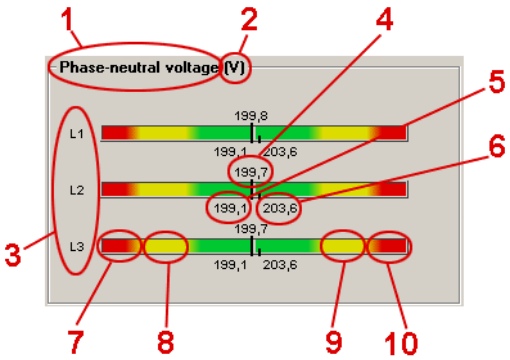
Values view that measure every one of the devices could be represented in two ways: analog mode and text mode.

Views showed in this section will depend on the type of device connection, using in that case the CVM-96.

4.1 Analog mode

This view shows in graph way the maximum and minimum values and variables instantaneously.





Every one of the variables are composed by:

1. Variable name
2. Units that variables values are expressed
3. Phase labels
4. Instantaneous value
5. Minimum value
6. Maximum value
7. Dangerous range below the nominal value.
8. Warning range below the nominal value
9. Warning range over the nominal value
10. Dangerous range over the nominal value

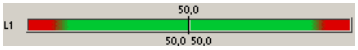
When the instantaneous value of a variable will be in warning range will be like this

marking the label phase ground in yellow.

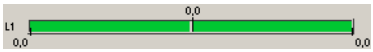
And when will be in dangerous range will be like this

marking the label phase ground in red.

When the warning value and dangerous value will be the same, you will not see the warning range, being like this



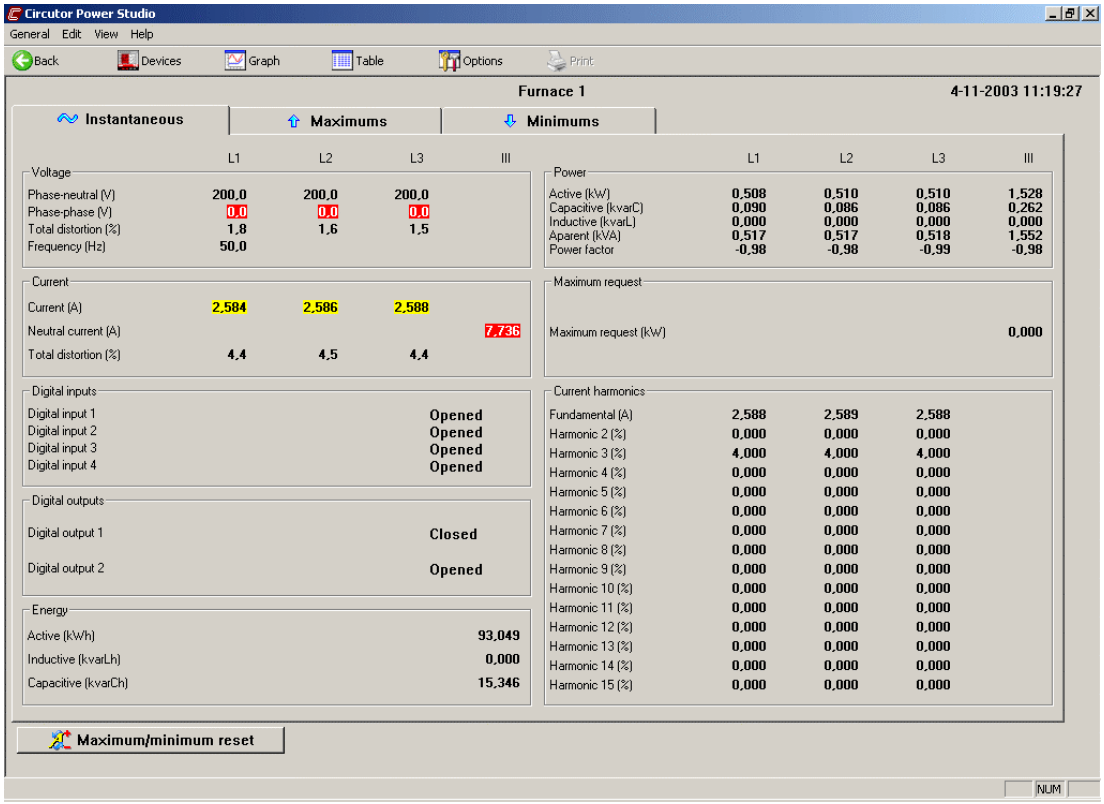
At last, when the alarm is deactivated will be showed a bar like this



In those devices that it is possible to do a reset of maximum and minimum values will appear in the bottom side next button 

(See part 4.3 Maximum and minimum value reset).

4.2 Text mode



This view shows in text mode variables values.

With this labels you could to select instantaneous, maximum and minimum values.

Text mode view will be composed by:

1. Variables name.
2. Phase labels.
3. Variables value.

When the instantaneous value of a variable is in the warning range will be like this

showing the variable value in yellow.

And when it will be in dangerous range will be like this

showing the variable value in white with red ground.

In those devices where it is possible to do a reset of maximum and minimum values will appear in the bottom side next button 

(See part 4.3 Maximum and minimum value reset).

4.3 Maximum and minimum value reset

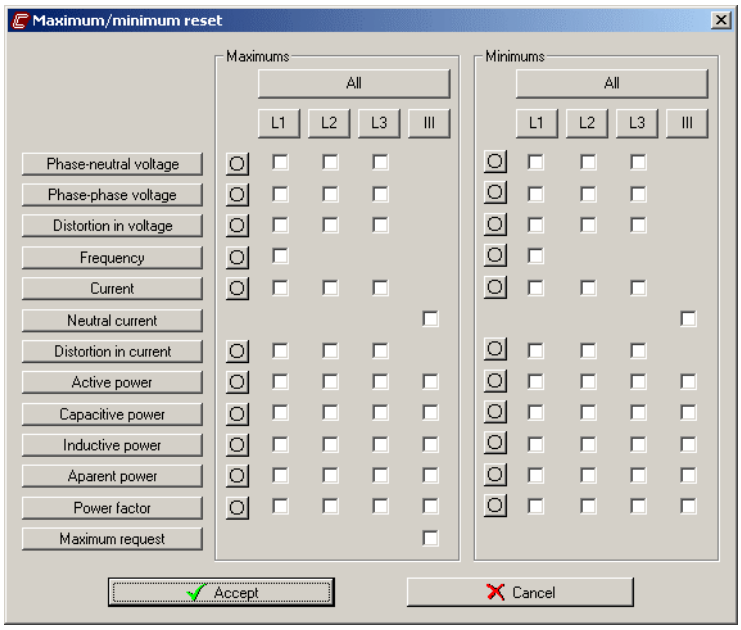
In those device that measure maximum and minimum variables values, will be possible to do a reset of those values, being possible to choose the values. Depending on the connected device, like DH96, instead to do the reset of the maximum and minimum, you could do the reset about other variables, valley and peak in the DH96, then the button will be, 

in DH96, although the working mode will be the same.

Showed dialogs in this section will depend on the selected device, using in that case the CVM-96 III device.

You could do a reset in maximum and minimum variables values clicking on 

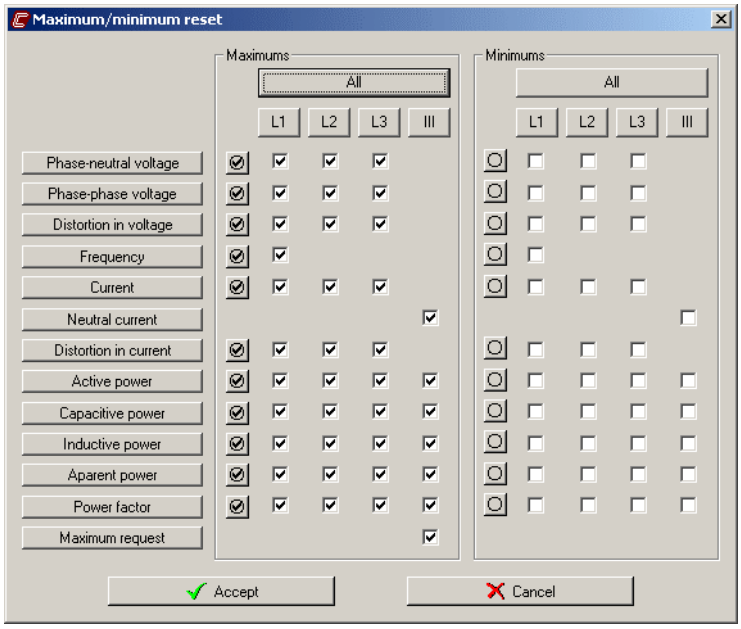
. Will appear next dialog



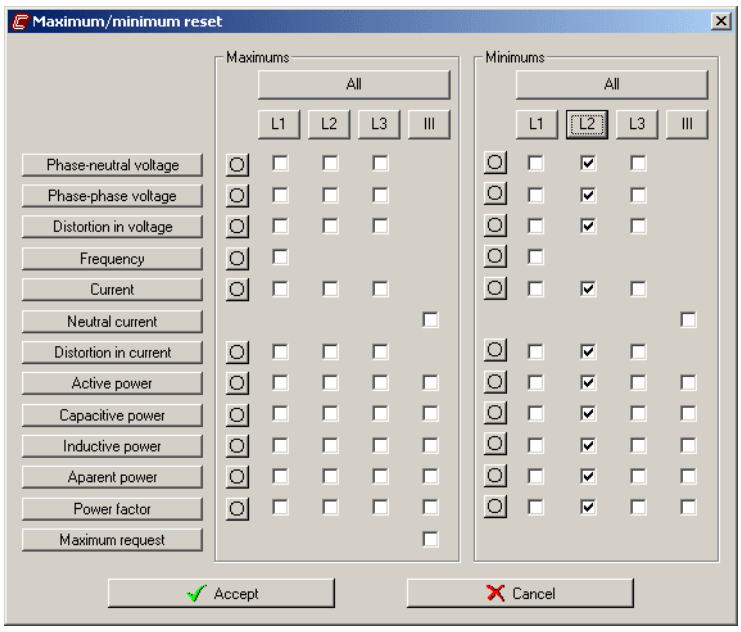
Where variables will be selected about maximum and minimum.

If you click on 

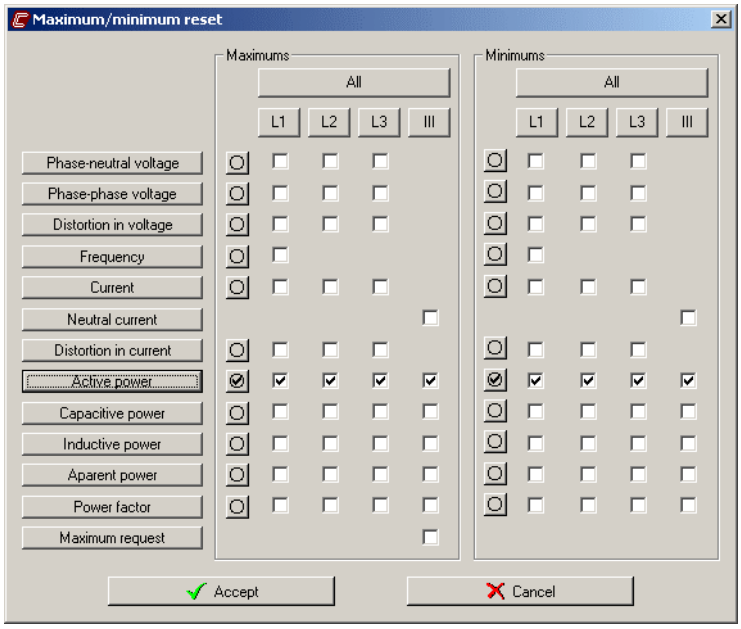
button, you select or unselected all maximum and minimum variables, depending on the button clicked.



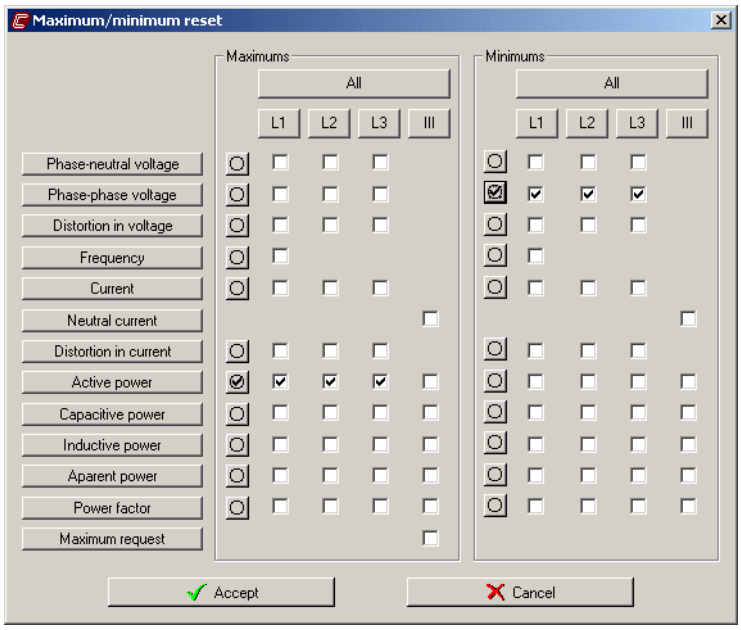
If you click one of these buttons L1 L2 L3 III, are selected or unselected only these phase variables.



If you click one of these variables, for example Active power, are selected or unselected only maximum and minimum of this variable.

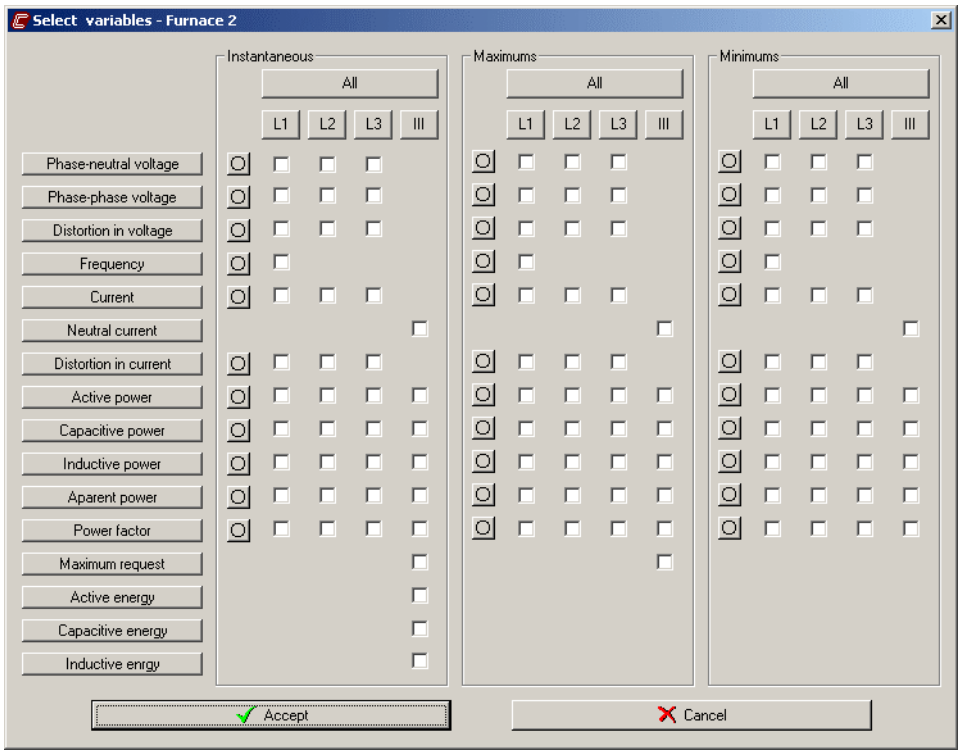


At last, clicking on ○ selects 1, 2 and 3 phases, maximum and minimum, even the button clicked. If these three are selected the button will change to ◉, and to click here will be unselected the three ones.



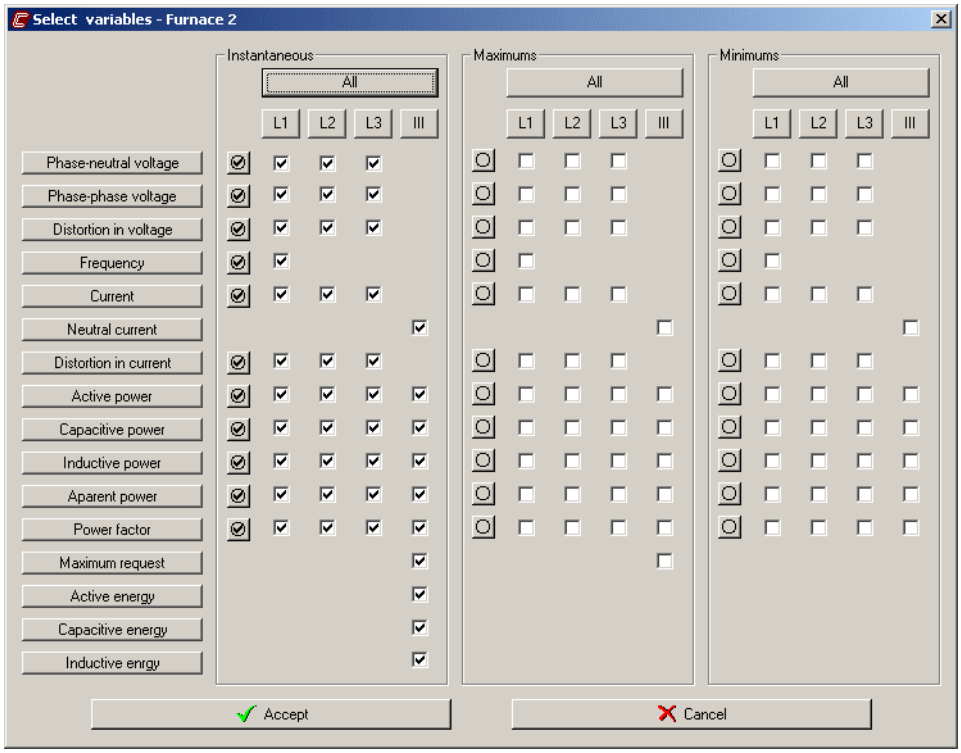
5 Variables selection

When it will be necessary the selection of one or more devices variables, will appear the variables selection dialog. This dialog will depend on the connected device, using to explain this part the CVM-96.

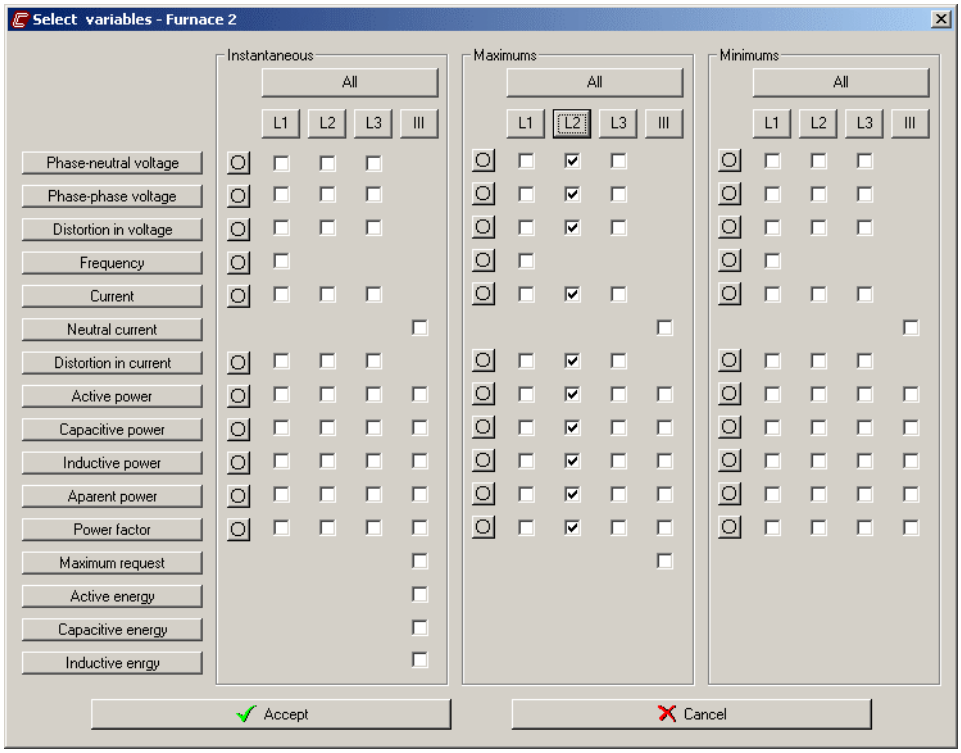


Where you will mark variables to select. If one of them it is selected before, will appear marked like ☑, being impossible to unselected it.

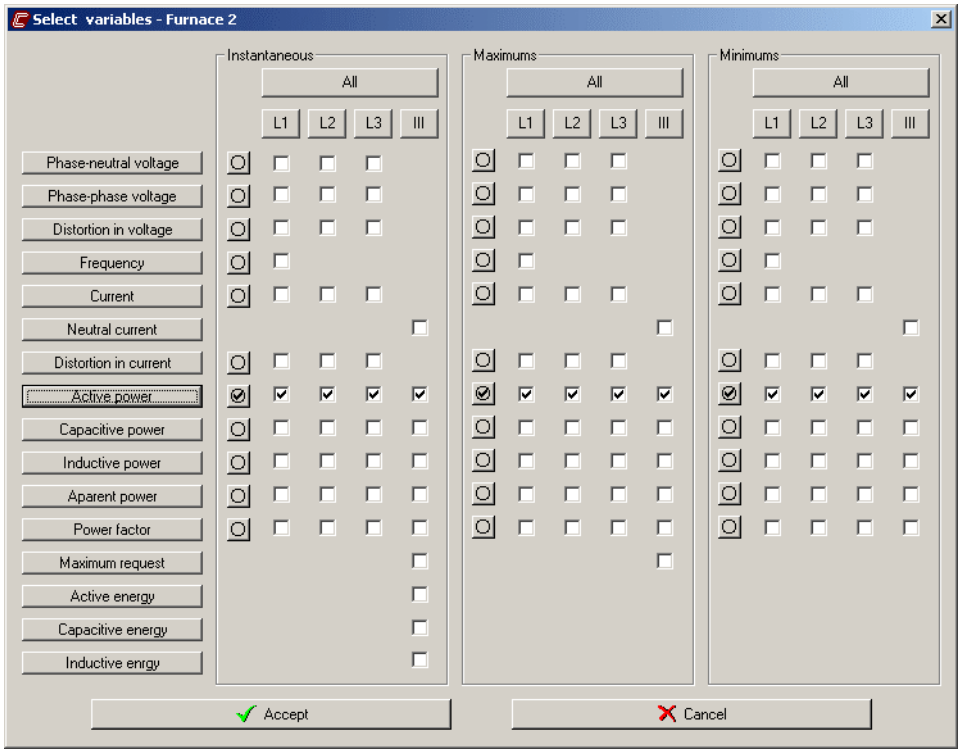
If you click the button All, will be selected or unselected all variables.



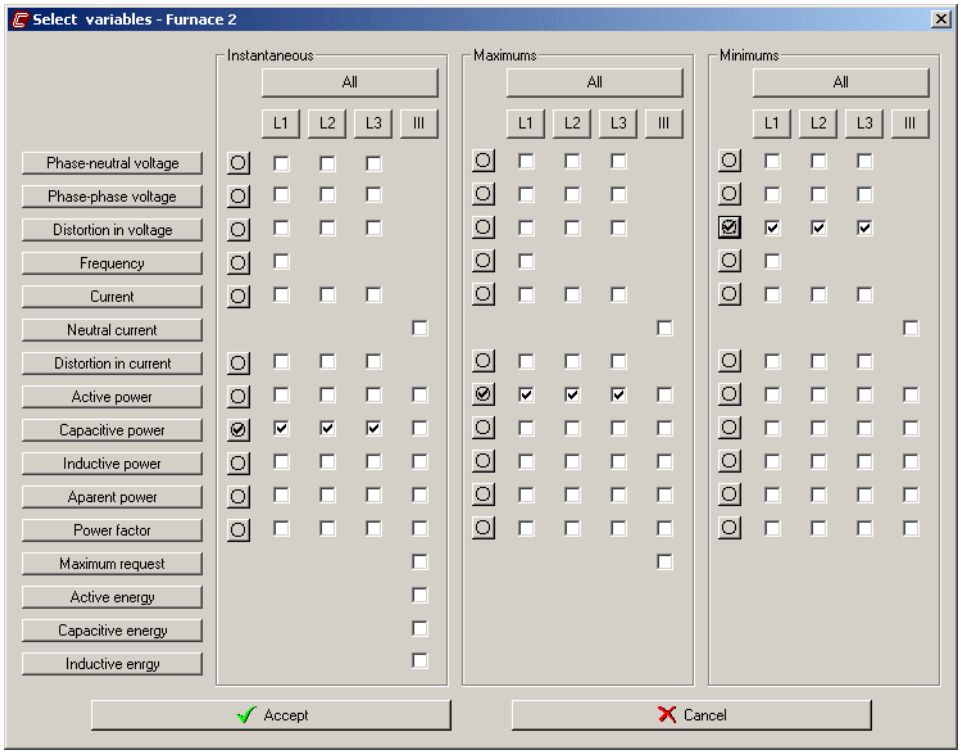
If you click on these buttons L1 L2 L3 III, will be selected or unselected only these phase variables.



If you click one of this variables, for example Active power, are selected or unselected all boxes of this variables.



At last, clicking on ○ you select 1, 2 y 3 phases, of instantaneous, maximum and minimum, even the button clicked. If three variables are selected the button change to ☑, and at click here will unselected the three phases.



6 Graphic and table

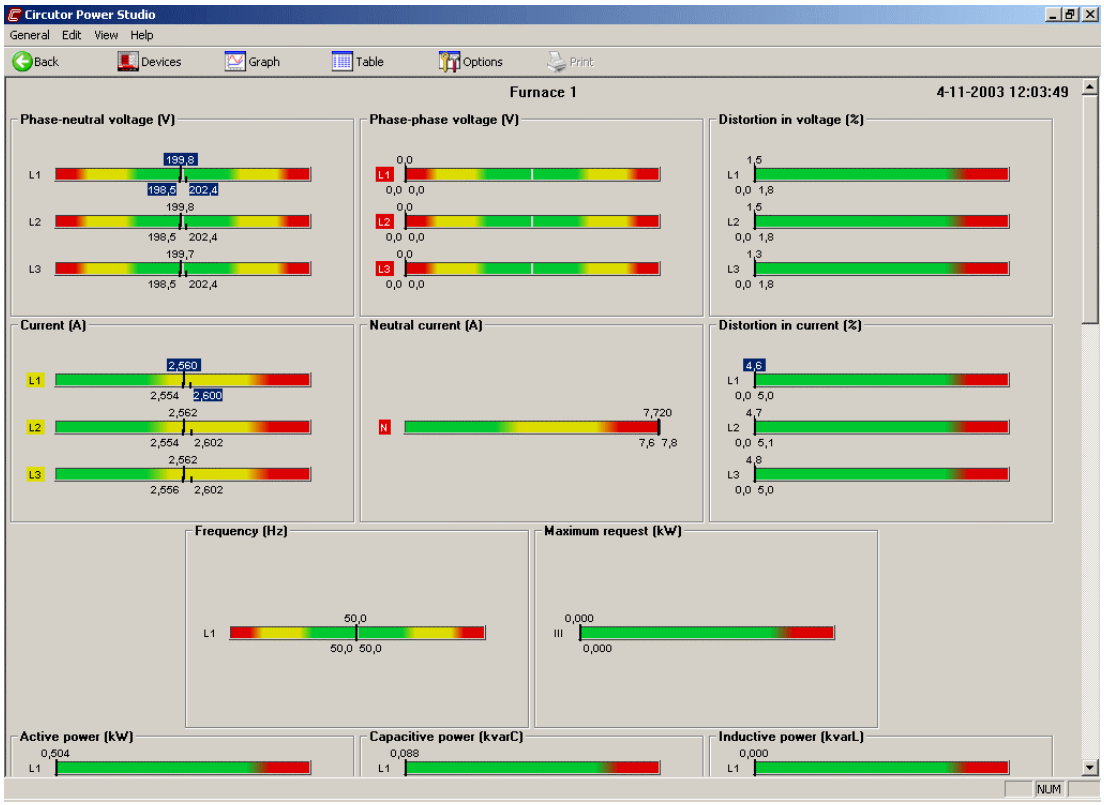
You could see a graph or a table from:

- View menu. See part 2.3 View menu.
- Tool bar. See part 2.3.6 Tool bar.

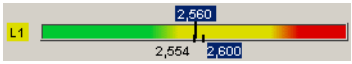
6.1 Variable selection

To select variables that you wish to view in graphs or tables, two different ways to do:

- Through window of driver variables selection. If there is not any variable selected will appear in the view screen.
- Selecting first variables through view screen. To select one you should to click with the left mouse button on the selected variable. Moreover, if you maintain clicked the shift key while you are on the variable, will be selected the instantaneous, maximum and minimum variable at the same time.



Variables marked will be like next



in this case has been selected instantaneous and maximum variable of phase 1.

6.2 Graphic

In the graph you could see selected variables historical.

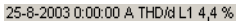
When you view a graph, if you click on '*Table*' button, you will see variables values.

The program will divide variables depending the type, in that case you could see that are divided voltage and current, but this distribution could be modified.

Corresponding voltage legend, where indicates the color and the corresponding name of each variable.

In case to view variables of one device, the device name will appear as a title in the graph, in that case '**Furnace 1**'. However, if you see variables of different devices, the device name will appear in the variables name side, for example:

If you put the pointer on the graph, you could see in the bottom side the legend with date, time and variable value.



To change the variable that you want to see the value, you should to put the pointer on the variable legend and click on the left mouse button.

6.2.1 Graphic tool bar

This tool bar will allow to do value groups, view different period time and go to a particular date, etc.

6.2.1.1 Previous

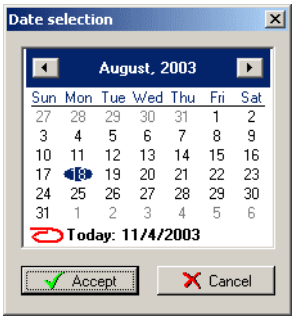
Graph will view previous Period values. For example if you view weekly values, you will see the previous weekly values.

6.2.1.2 Next

Graph will view next Period values. For example if you view weekly values, you will see the next weekly values

6.2.1.3 Go to

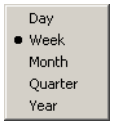
To click on this option will appear next dialog



where you could select the day to view. If for example you see weekly values, you will see the week that contains the selected day.

6.2.1.4 Grouped by

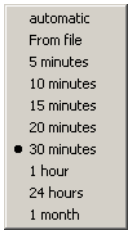
To click on this option, will appear next menu



where you could choose the time Period. If for example you select '*Month*', the graph will show the month corresponding values.

6.2.1.5 Period

To click on this option will appear next menu



where you could to choose the values groups showed.

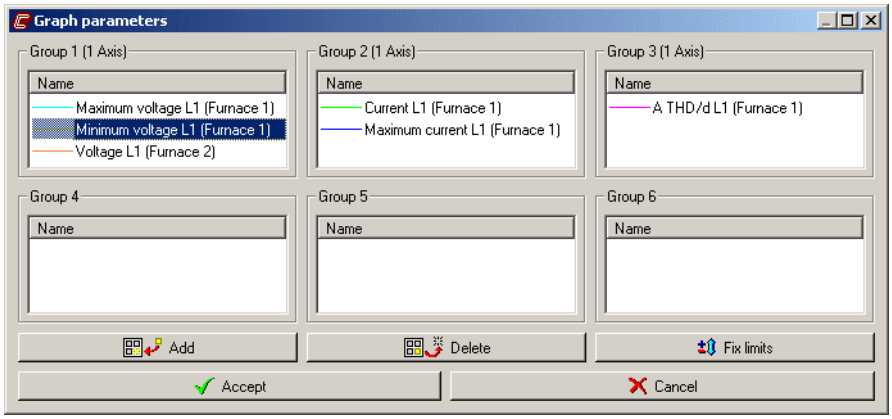
6.2.2 Graphic options

You could see graph options from:

- See menu. See part 2.3.5 View options.
- Tool bar. See part 2.3.6 Tool bar.

Graphs options will allow to add or delete graph variables, even about different devices. Modify the color and values looks, change the distribution, etc.

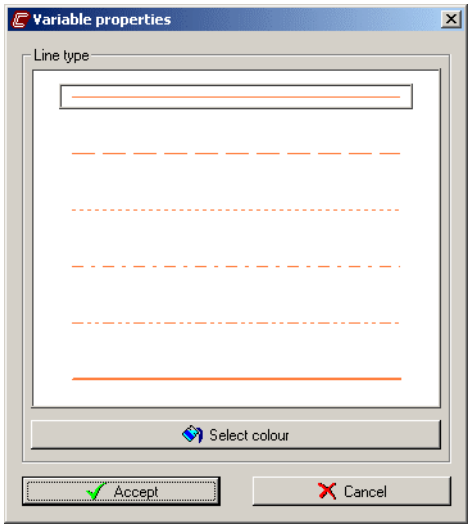
Graph options screen will be next



Where will appear six subgroups that as a maximum the graph could has.

Group 1 (1 Axis) At side of any group will appear the axis number that configures the group variables. The axis total number should be higher than 6.

Voltage L1 (Furnace 2) Indicates the color, line type, the name and the device that the variables belong. Clicking twice with the left mouse button on this variable, will appear next dialog



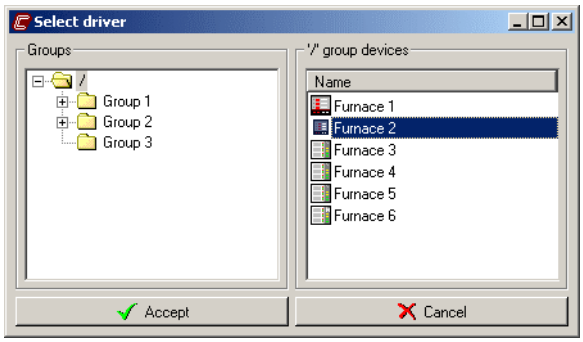
where you could modify the line type and the graph variable color. The type of line will appear with a rectangle and clicking on *'Select color'* button you could choose another color to see the variable.

To move one or more variables of one or another group you should to follow:

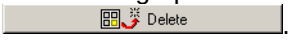
1. Variables selection that you want to move from the origin group.
2. Click with the left mouse button on the selected variables.
3. Without loosen the mouse button, move the pointer unit the destiny group.
4. Drop the mouse, and the variables will be moved to their destiny.

To add graph variables, you should to click the button 

, and will appear



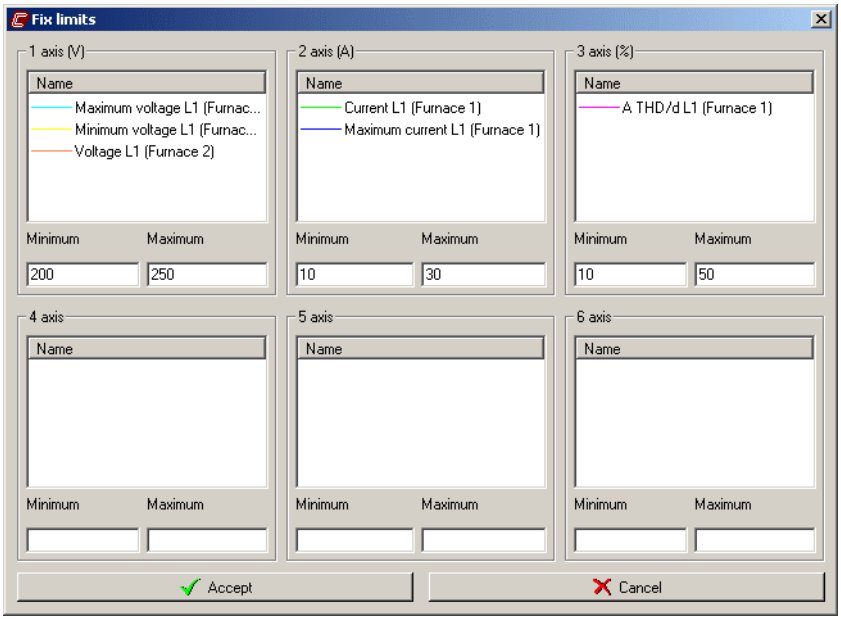
where are the configured groups and devices. Once selected the device that you want to select variables, will appear the dialog of the corresponding device. To see how to select variables depending on the device, see the corresponding part.

To delete graph variables, you should to select those variables to delete and click on 

.

At last, clicking on 

you could fix extrems od different axis in the graph.

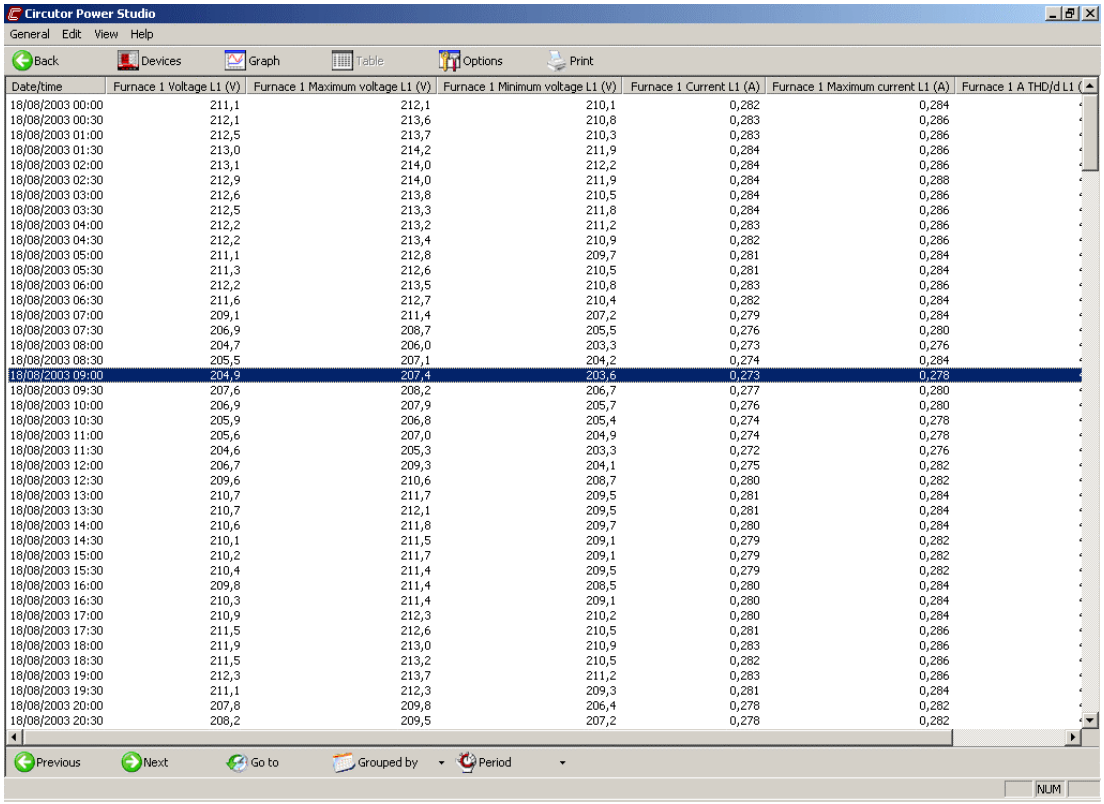


1 axis (V) At every axis side, will appear units that the graph will show the values.

Minimum
200 With that value, will indicate the minimum value of axis graph values.

Maximum
250 With that value, will indicate the maximum value of axis graph values.

6.3 Table



Date/time	Furnace 1 Voltage L1 (V)	Furnace 1 Maximum voltage L1 (V)	Furnace 1 Minimum voltage L1 (V)	Furnace 1 Current L1 (A)	Furnace 1 Maximum current L1 (A)	Furnace 1 A THD/d L1 (
18/08/2003 00:00	211,1	212,1	210,1	0,282	0,284	
18/08/2003 00:30	212,1	213,6	210,8	0,283	0,286	
18/08/2003 01:00	212,5	213,7	210,3	0,283	0,286	
18/08/2003 01:30	213,0	214,2	211,9	0,284	0,286	
18/08/2003 02:00	213,1	214,0	212,2	0,284	0,286	
18/08/2003 02:30	212,9	214,0	211,9	0,284	0,288	
18/08/2003 03:00	212,6	213,8	210,5	0,284	0,286	
18/08/2003 03:30	212,5	213,3	211,8	0,284	0,286	
18/08/2003 04:00	212,2	213,2	211,2	0,283	0,286	
18/08/2003 04:30	212,2	213,4	210,9	0,282	0,286	
18/08/2003 05:00	211,1	212,8	209,7	0,281	0,284	
18/08/2003 05:30	211,3	212,6	210,5	0,281	0,284	
18/08/2003 06:00	212,2	213,5	210,8	0,283	0,286	
18/08/2003 06:30	211,6	212,7	210,4	0,282	0,284	
18/08/2003 07:00	209,1	211,4	207,2	0,279	0,284	
18/08/2003 07:30	206,9	208,7	205,5	0,276	0,280	
18/08/2003 08:00	204,7	206,0	203,3	0,273	0,276	
18/08/2003 08:30	205,5	207,1	204,2	0,274	0,284	
18/08/2003 09:00	204,9	207,4	203,6	0,273	0,278	
18/08/2003 09:30	207,6	208,2	206,7	0,277	0,280	
18/08/2003 10:00	206,9	207,9	205,7	0,276	0,280	
18/08/2003 10:30	205,9	206,8	205,4	0,274	0,278	
18/08/2003 11:00	205,6	207,0	204,9	0,274	0,278	
18/08/2003 11:30	204,6	205,3	203,3	0,272	0,276	
18/08/2003 12:00	206,7	209,3	204,1	0,275	0,282	
18/08/2003 12:30	209,6	210,6	208,7	0,280	0,282	
18/08/2003 13:00	210,7	211,7	209,5	0,281	0,284	
18/08/2003 13:30	210,7	212,1	209,5	0,281	0,284	
18/08/2003 14:00	210,6	211,8	209,7	0,280	0,284	
18/08/2003 14:30	210,1	211,5	209,1	0,279	0,282	
18/08/2003 15:00	210,2	211,7	209,1	0,279	0,282	
18/08/2003 15:30	210,4	211,4	209,5	0,279	0,282	
18/08/2003 16:00	209,8	211,4	208,5	0,280	0,284	
18/08/2003 16:30	210,3	211,4	209,1	0,280	0,284	
18/08/2003 17:00	210,9	212,3	210,2	0,280	0,284	
18/08/2003 17:30	211,5	212,6	210,5	0,281	0,286	
18/08/2003 18:00	211,9	213,0	210,9	0,283	0,286	
18/08/2003 18:30	211,5	213,2	210,5	0,282	0,286	
18/08/2003 19:00	212,3	213,7	211,2	0,283	0,286	
18/08/2003 19:30	211,1	212,3	209,3	0,281	0,284	
18/08/2003 20:00	207,8	209,8	206,4	0,278	0,282	
18/08/2003 20:30	208,2	209,5	207,2	0,278	0,282	

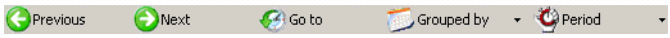
In this table you could see the selected variables historical.

When you see the table, if you click on '*Graph*' option, you will see the graph.

In the first column you will see the date and time, in next columns, the selected variables values. Each column title will correspond the variable name and units.

6.3.1 Table tool bar

This tool bar will allow to do values group, view different time Periods, and go to a particular time period, etc.



6.3.1.1 Previous

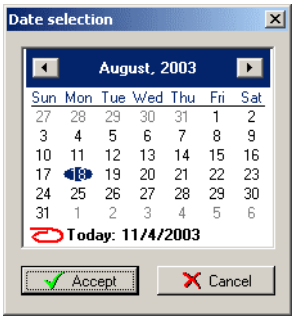
The table will show the previous Period values. For example if you see weekly values, you will see the previous weekly values.

6.3.1.2 Next

The table will show the next Period values. For example if you see weekly values, you will see the next weekly values

6.3.1.3 Go to

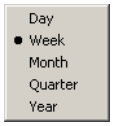
To click here will appear next dialog



where you could select the day to view. If for example you see weekly values, you will see the week that contains that selected day.

6.3.1.4 Group by

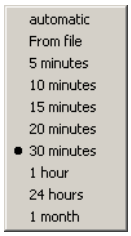
To click on this option, will appear next menu



where you could choose which time Period shows the graph. If for example you select a '*Month*', the graph will show the corresponding values of this month.

6.3.1.5 Period

To click on this option, will appear next menu



where you could choose the values group to show.

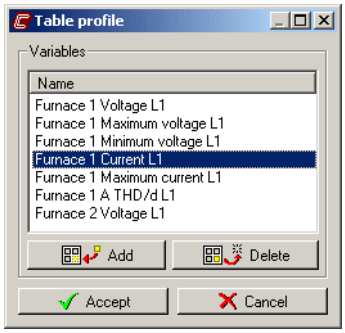
6.3.2 Table options

You could see option from:

- View menu. See part 2.3.5 View options.
- Tool bar. See part 2.3.6 Tool bar.

Table option will allow to add or delete variables.

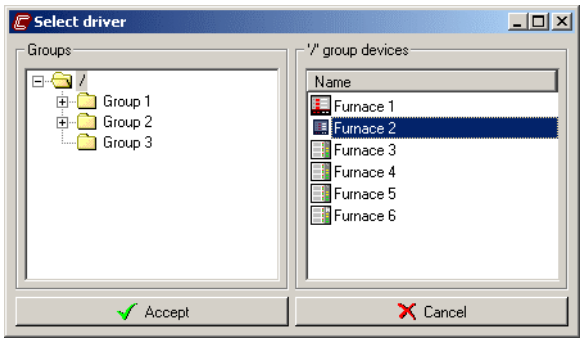
Options screen is next



Where you see the selected variables list, and the device name that belong them.

To add graph variables, you should to click on 

, and it will appear



where it will appear configured groups and devices. Once selected the device, will appear the variables selection dialog of this device. To see how to select variables depending on the device, see the corresponding part.

To delete graph variables, you should to select those variables to delete clicking on 

.

7 Tariff

Power Studio supplies a complete bar that allows to define energetically tariffs even its latter treatment and study of all picked data by devices in a potent and intuitive way.

The aim of these studies is calculate the cost that has a particular consumption (analyzing the active energy, inductive and capacitive and the maximum demand) about the concrete tariff.

The study of one tariff supplies the result in a energetically consumption representation for each type of hour (counter) defined in every moment as well as the result supplied by the application of the corresponding formulas (that normally offers the calculus cost). This representation could be viewed in table or graph forms.

It is possible to study these data viewed in different time intervals and group them in different Periods. So, we could see costs in a year interval and grouped by months or days, etc.

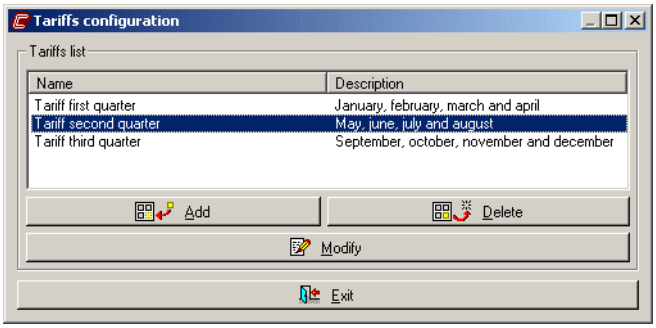
As we could see tariffs studies consist in a tariff definition (typically a calendar or formulas) and apply this tariff to the stored data by a device. Then you will have the study done it and could be configured by the user (and visible in graph or table forms)

7.1 Tariff configuration

The first thing to do is tariffs configuration that we want to apply data to its treatment. The user could be add new tariffs and delete or modify the existents.

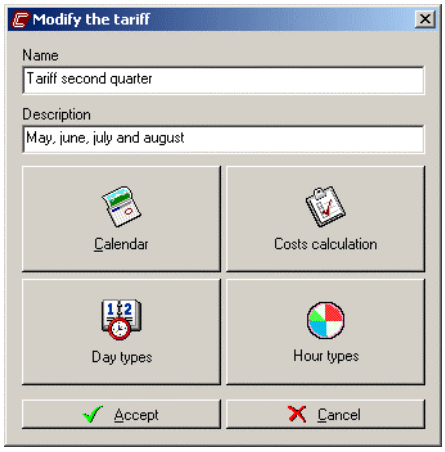
For the management of these actions you should to select the “Configure tariffs” option from the “General” menu.

Will appear next dialog



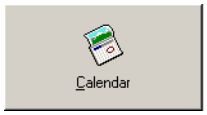
from where you could add, delete or modify tariffs.

To click on “Add” or “Modify” button, appear next dialog



Alphanumerical data that allows to identify the tariff.

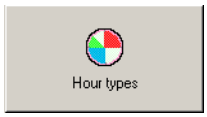
Alphanumerical data that allows to introduce a brief description.



Configures the tariff calendar.

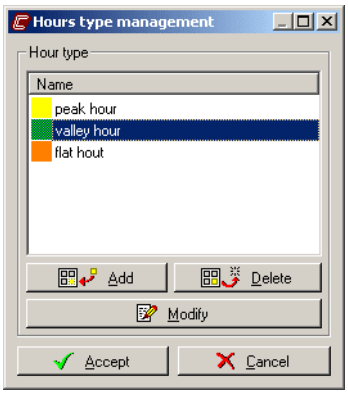
Configures the formulas to calculus the tariff costs.

Configures different types of days defined.



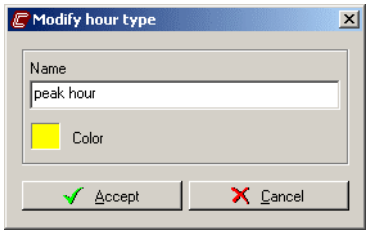
Configures different types of hour defined.

7.1.1 Hours type



With this dialog you could add, delete or modify different type or tariff hours. These types of hours are basic to a tariff definition. In them is where you could deal, even the calendar, registered consumption (energies and maximum demand), to calculate the end results (a monetary cost typically)

Typically type of hours correspond with different prices that you could apply to the consumed energy even the time (or the day that we are). When you add or modify will appear next dialog

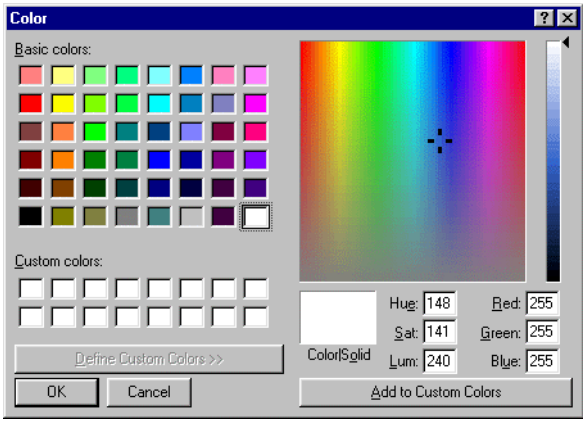


where

Alphanumerical data that allows to identify by an only way the type of hour inside the tariff.

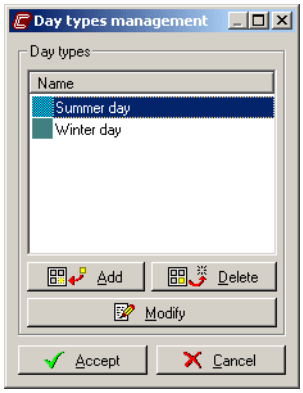
Color that will identify the type of hour inside the tariff and it will be used to make the graph of the results to apply this tariff to stored data by any device (all counters of different energy variables, and maximum demand and final result).

Clicking once with left mouse button on the box, will appear next dialog, where you could configure the color to every type of day.

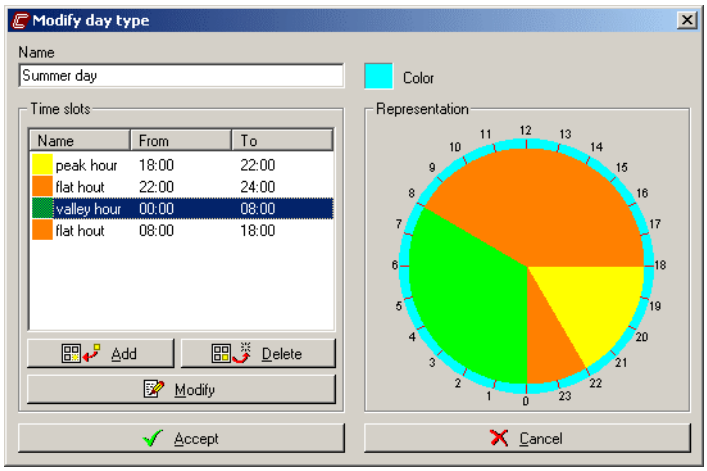


Clicking on “Delete” button, will be deleted all type of hours that there are selected from the list.

7.1.2 Day types



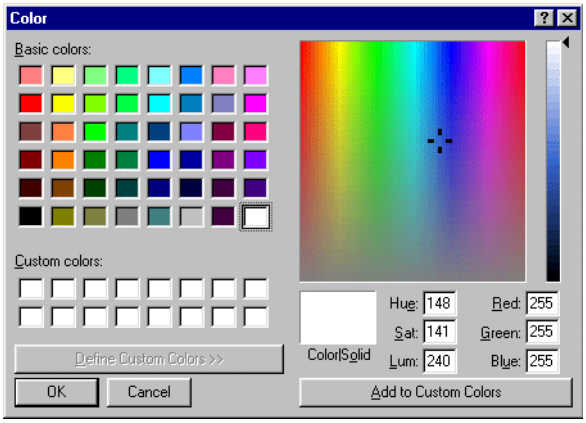
With this dialog you could add, delete or modify different type of days from the tariff. Will be appear next dialog:

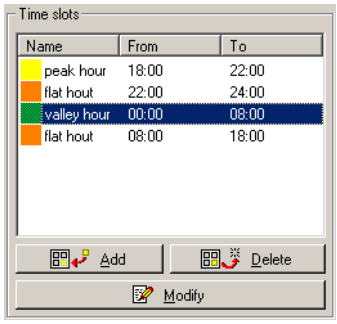


As you could see the definition of one type of day, will implicate type of hour that is divided (for example on Sunday could be defined all the day as a reduced tariff and on a work day could be divided by two tariffs diurnal and nightly)

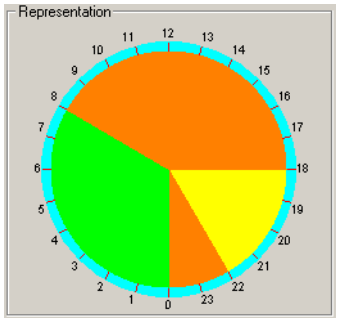
Alphanumerical data that allows to identify the type of day in the tariff.

Color that will identify the type of day in the tariff. Clicking once the left mouse button on the color  , will appear next dialog, where you could configure the color for that type of day.



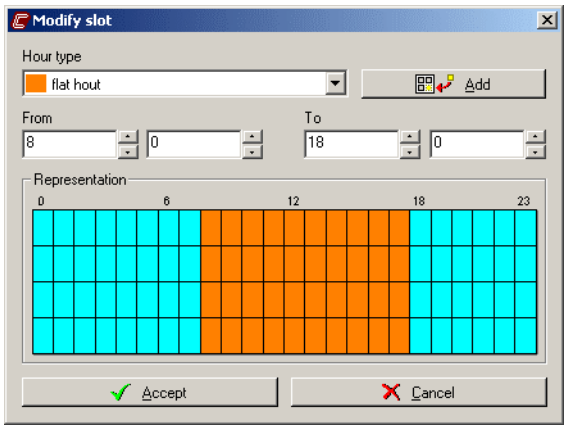


Time range that will configure the type of day. These time ranges should to be the 24 hours a day, but without overlap between them. Different time ranges in a day indicate that the energy is checked different between them, it will depend on the day that we are.



Time ranges graph. That's gives us a view about how we are defining the type of day (and we will see if a day is missing)

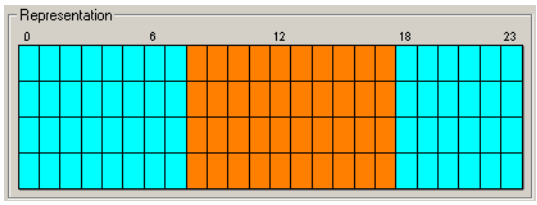
When you add or modify a time range will appear next dialog



It corresponds the type of hour range. These types of hours will be configured in part 7.1.1 Hours type.

With this button you could add new types of hour to the tariff.

Numerical selection of the time range.



Time range graph. Each column will represent one-day hour, being files periods of 15 minutes. For the selection:

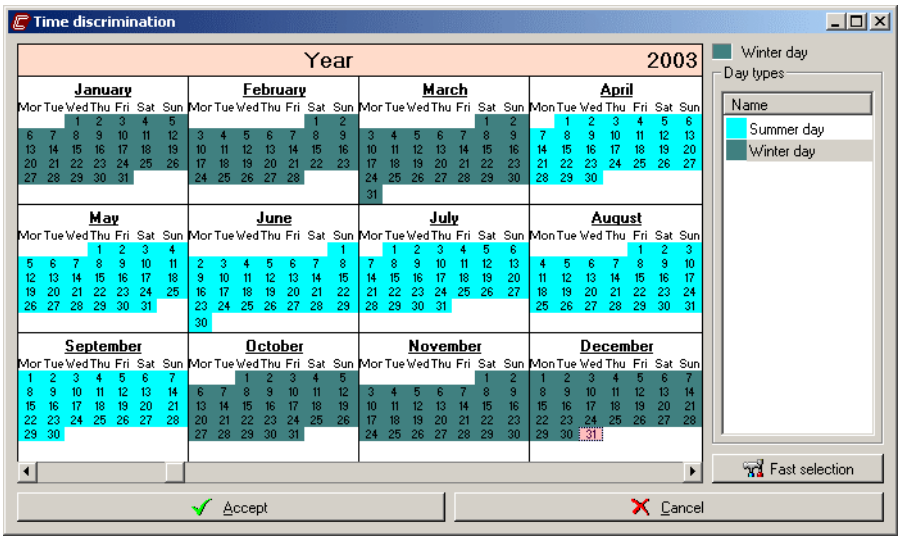
- Click the left mouse button on the initial range.
- Without drop the mouse, drags it until the end of the range .
- Drop the mouse, and the range will be painted with the color of the type of day

It is possible to define manually, it is useful if you want to define it with minutes accuracy (for example a time range from 10:10 to 15:40)

This dialog allows to define only a continuous time range.

7.1.3 Calendar

Once defined the type of days that will be in the tariff, you should to distribute them in the calendar. Once defined the type of days that will belong the tariff, we will distribute them in the global calendar. For that we will deal on those calendars the types of days created before.



We could assign type of days, not only in the present year, otherwise previous and latter years. For a day's selection, you could do it following next:

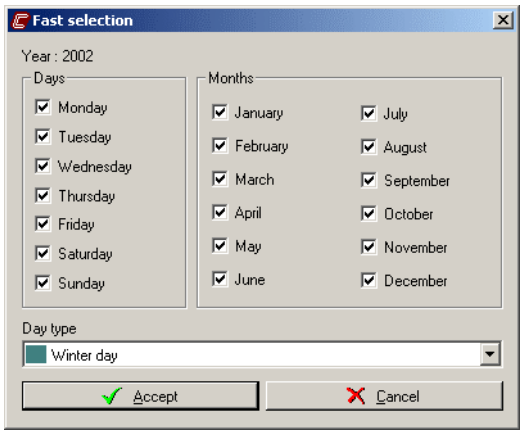
- Clicking twice with left mouse button on a day, clicking only the selected day.
- Clicking once with the left mouse button on the first day and then click on the SHIFT key without drop, click once with the left mouse button on the end day, selecting by this way all the days between them.

- With fast selection option.

List with different type of days configured in the tariff.

Winter day Type of day that will be assigned to the calendar if there are selection about the same, in case that there is not exist any type of a selected day, will appear Deleting..., indicating that instead to select days in the calendar, will be eliminated.

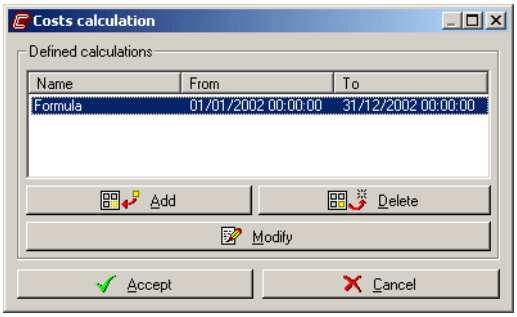
Fast selection With this option you could do automatically selections. The dialog that will appear is next



In this case will be marked 2002 workdays with the type of “Winter Day”.

7.1.4 Calculate the cost

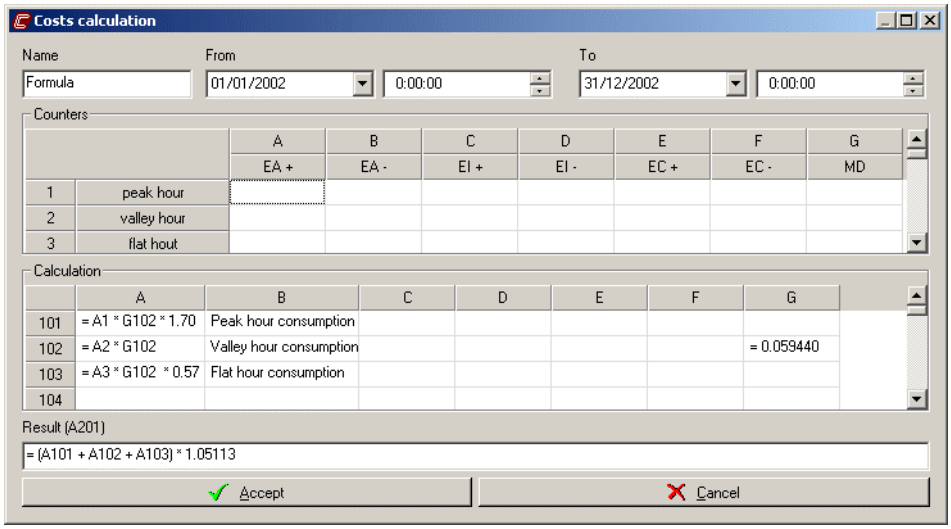
Once made the tariff calendar definition you should to calculate the monetary cost of the stored data by devices even the calendar defined previously.



In this screen you could manage all cost calculation that belongs to the present tariff. Each calculation is identified by a name and has a valid interval that indicates when it is necessary to apply the defined one to obtain the total cost.

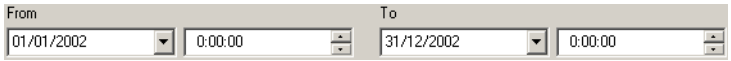
As you could see in this screen allows us to add, modify or delete cost calculation from the present tariff.

When you add or modify a cost calculation will appear next.

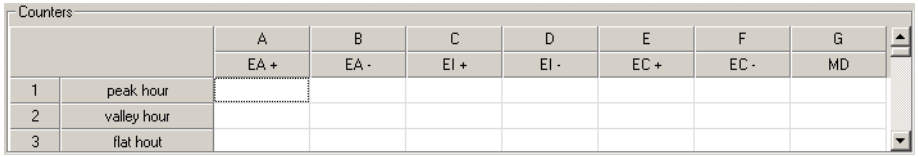


A cost calculation is like a worksheet that allows to define necessary formulas to calculate the total cost of the present tariff in the definite period.

Here indicates costs calculation name that is defined.

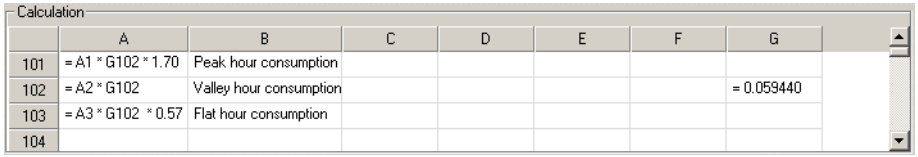


Indicates the period where it should to apply defined calculations to obtain the total cost.



Here you will find variables that we could use to calculate. The number of files depends on the type of hours defined in the present tariff and the number of columns is fix and contains all values involved in the calculation. This table couldn't be edited and indicates variables that we have to use formulas. So, in the image, if you want to use the accrued active energy in "valley hour" you will make reference A2 box.

Variable	Description
EA +	Positive active energy
EA -	Negative active energy
EI +	Positive inductive energy
EI -	Negative inductive energy
EC +	Positive capacitive energy
EC -	Negative capacitive energy
MD	Maximum demand



Here you will find intermediate formulas necessary for the end cost. In each box you could add a text or a

formula. A text is a characters chain and its aim is informative and it will not had calculation consequences. A formula is a text chain that starts with "=" signal and then has an evaluated expression. This evaluated expression could has real numbers (1.34, 45, 0.452, etc), references to other cells like the counters table or calculation table (A2, G102, etc), brackets and operators (*, +, -, /, SQRT, COS, SIN, etc)

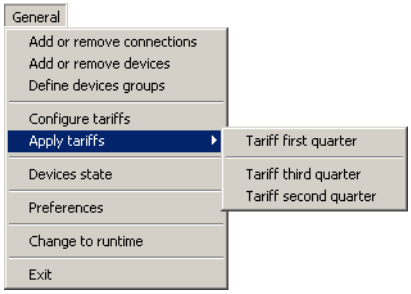
In this field you will add the end formula that represents the total tariff's cost. This last formula calculates the value that then will be represented in the view.

Then are detailed expressions and symbols that could be in formulas:

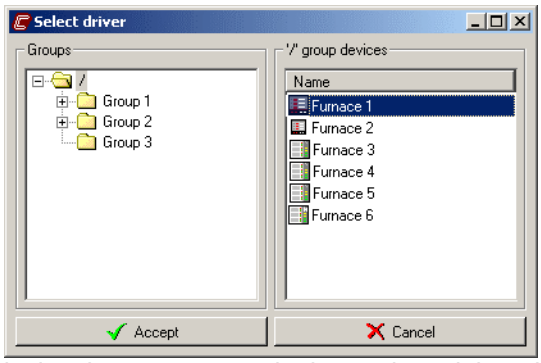
Symbol	Description
=	It should to appear like the first character. Indicates that what there is in the box it is not a text but it is something to evaluate
*****	Multiplication
+	Addition
-	Subtraction
/	Division
SQRT(*expr*)	Square root applied to evaluated expression '*expr*'.
COS(*expr*)	Cosines of the evaluated expression 'expr'.
SIN(*expr*)	Sinus of the evaluated expression '*expr*'.
ATAN(*exp1, exp2*)	Arctangent of the expression 'exp2/exp1'.
(*cond*) ? *expr1* : *expr2*	Conditional operator. If the condition '*cond*' evaluates true, then the '*expr1*' is evaluated, else the '*expr2*' is evaluated.
==	Equal. Is used to compare two expressions in a conditional operator.
!=	Different. Is used to compare two expressions in a conditional operator.
<	Less. Is used to compare two expressions in a conditional operator.
<=	Less or equal. Is used to compare two expressions in a conditional operator.
>	Greater. Is used to compare two expressions in a conditional operator.
>=	Greater or equal. Is used to compare two expressions in a conditional operator.
||	Or. Is used the condition to build the Boolean expression to evaluate.
&&	And. Is used the condition to build the Boolean expression to evaluate.
!	NOT. Is used the condition to build the Boolean expression to evaluate.
(	Opened bracket.
)	Closed bracket.
num	Integer or real number (it uses the point as decimal separator)
Cell	Cell identificator.Used to name a cell. Its syntax consists in a letter from A to G followed by a number from 1 to 200.

7.2 Apply tariff

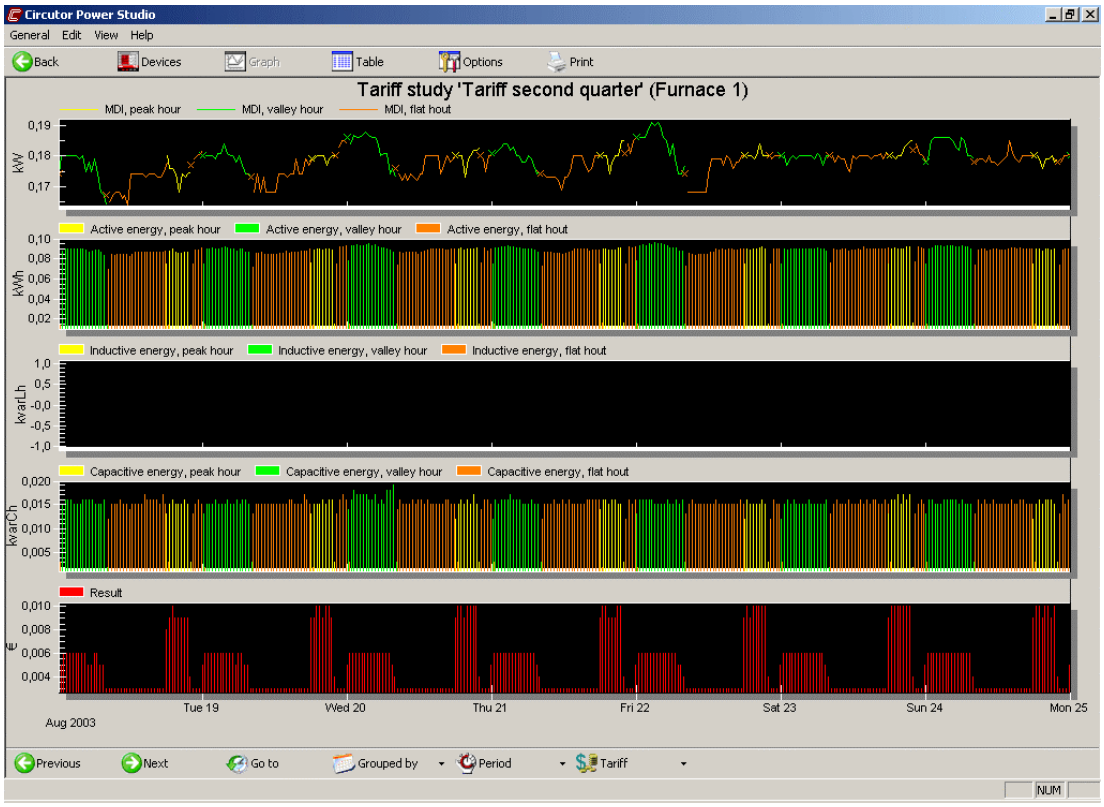
Once defined tariffs could be applied to generated data by devices. For that we could access to “Apply tariff” menu



When you apply the tariff the program will know that you wish to make a study about kept data by the device viewing in that moment. If you could not view any device next screen will appear:



Here we will select the device that we want to do the study and then the program will show us data as a graph.



As you could see the program applies the selected tariff of the selected device. Basically reparts devices variables that are susceptible to be analyzed (Active energy, inductive,

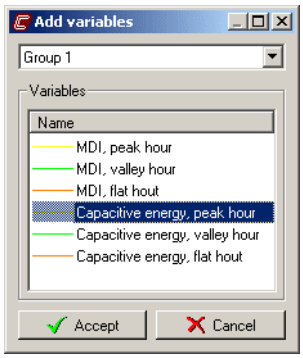
capacitive and maximum demand) between types of hour even the calendar defined and calculates the result of the total cost even defined formulas.

It is possible that the system decides that the name of variables that there are in the study (for example, if exists a lot of types of defined hours for the analyzed tariff) is too big to view in a clarity way. In this case will fail any variables, being possible to add these if the user wishes. Never will be failed the variable of the total tariff cost.

Default will be represented in bar graph mode grouped by weeks (seeing the present week) and in 30 minutes periods. So that, we will have a variable for each found variable in the device and the type of hour and the variable that has the result of cost calculation.

About the previous study you could do the same calculations as in a standard graph, that's to say, we could change the group and period of data, variables colors, axis margin and change to graph or table views.

One difference between tariff study representation and normal representation is that you could only add a limited variables number. So, variables addition dialog will be next:



Where you could see that it is not allowed make reference to any other device and you could only add variables that belongs to the study (could be variables removed before or variables that the program has failed to avoid a saturation in the representation)

The basic difference between a normal representation and a tariff study is that in this one we could change the tariff that we want to apply to devices data analyzed with this option 

being possible to compare the different tariffs on the same data.

8 DDE – Dynamic data exchange.

Any Windows based application that has got DDE functions might be linked to Power Studio for Windows for dynamic data exchange actions.

The DDE (Dynamic Data Exchange) is a Windows' protocol between applications. It is possible to act in a client mode (To request data to other applications) and/or in a server mode (To supply data to other applications). The program Power Studio acts in server mode, that is, once a communication with another Windows application (Excel, Paradox, Word, programs in C, in Visual Basic, etc..) is set, Power Studio supplies to them the values read by the diverse drivers. That way, for instance, a voltage, current, etc. could be real-time displayed in an Excel screen.

Those applications that allow to fix a value through the DDE will be able to modify any driver parameter, such as, for example, digital outputs, internal registers, etc.

The DDE communication has the following features:

☞ The used link is a "warm link" type one. That is, Power Studio advises to the applications when values have changed and, if it is necessary, those applications request it for those values.

☞ The program can simultaneously send data via DDE to several applications, the limit is fixed by the own PC memory.

☞ For each customer a link is set per each requested parameter.

☞ The protocol DDE basically consists of three elements: the ***Conversation***, the ***topic***, and the ***item***.

Conversation A text that the applications distinguish. It has to be unique for each application. This avoids possible question-and-answer crossing between different applications. In this case: "**PWSTDValues**". For example =**PWSTDValues**|Device1!VI1.

Topic Like the *Item*, it does not have a defined meaning, as it depends on the use given by each application. For the Power Studio case, the *Topic* identifies the device that we want to obtain the information. For example =PWSTDValues|**Device1**!VI1

Item The *Item* is the element requested by the applications: Voltage phase 1, frequency, a relay state, etc. For example = PWSTDValues|Device1!**VI1**.

In this explication done it about different drivers for CIRCUTOR devices, it has been included a table detailed the expression to use to the different devices variables.

9 System requirements

- Microsoft Windows version 98, NT, 2000, XP.
- Personal computer Pentium II 350 MHz or higher.
- 64 MB minimum of RAM memory (Recommended 128 MB).
- 25 MB frees in the hard disk.
- CD-ROM unit.
- Monitor VGA or higher.
- Compatible mouse Windows.

In the multi-user systems (Windows NT, 2000 y XP), for the correct use of the software it is necessary to install it as an administrator, or user with administrator privileges. Also, once installed, users that have not got administrator privileges and wish to use the software, they should to have read and write access to the directory where it has been installed the software.