



CirPark Scada



Scada software for parking management

Editor's Manual

V4.2.2

MU610105-16A-EN-CirPark Scada-2-Editor



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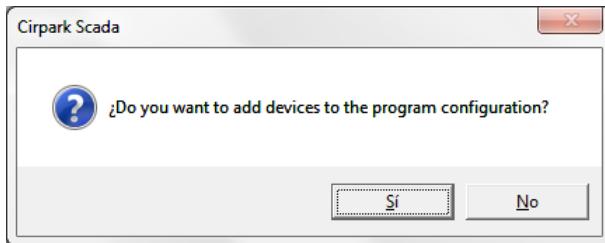


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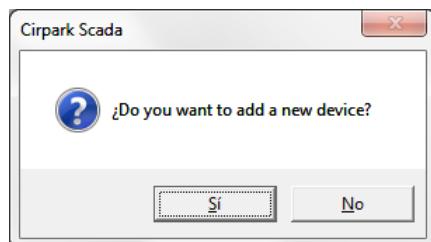
1 Run the program for the first time

When running for the first time the program will ask if you want to add devices.

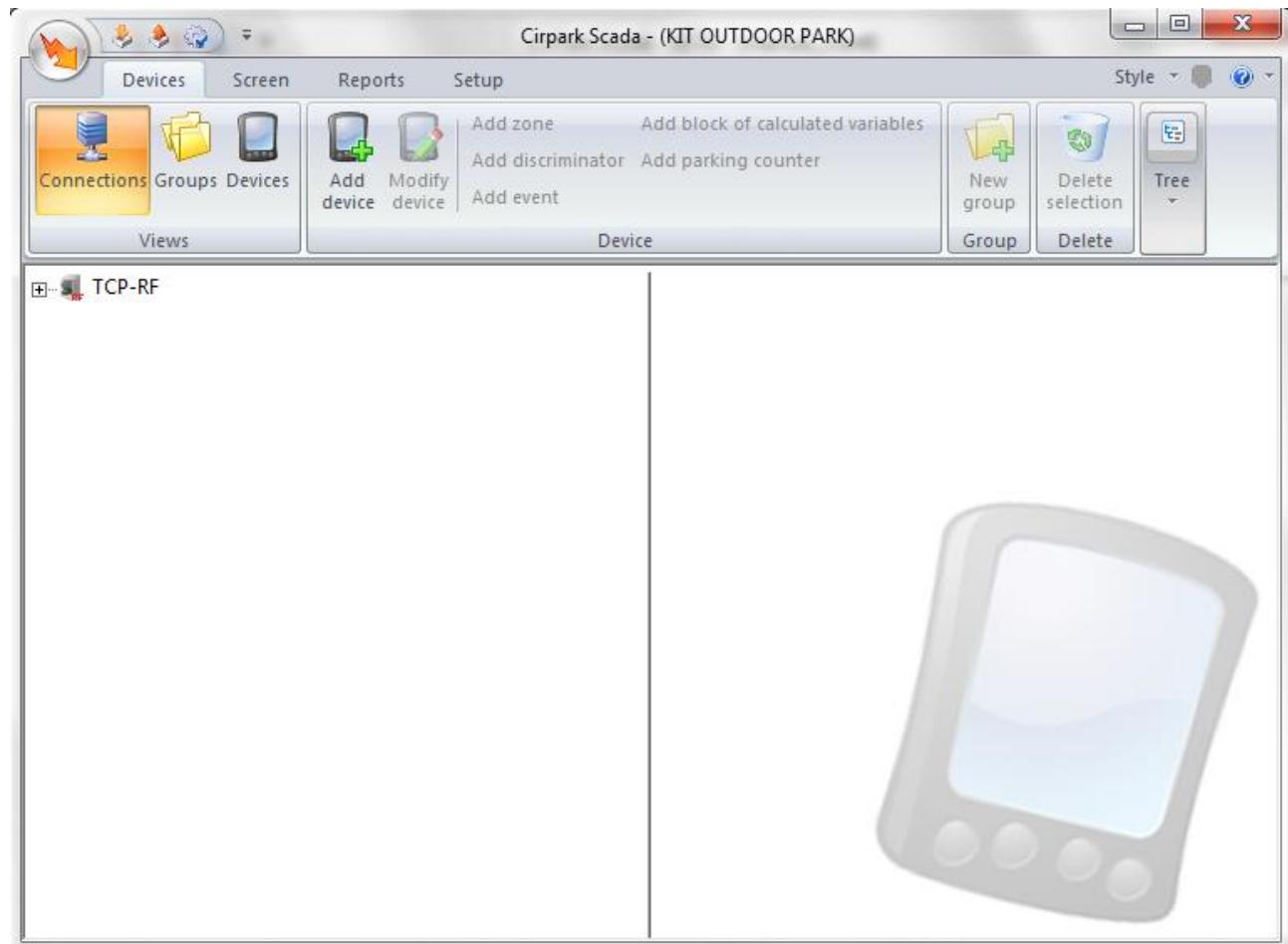


By selecting 'Yes', you can proceed to add devices. See "Devices Manual".

When the device is added, you will be asked if you want to add any more devices.



Choose 'Yes' to add new devices or "no" to quit this window. The main window of CirPark Scada will appear.

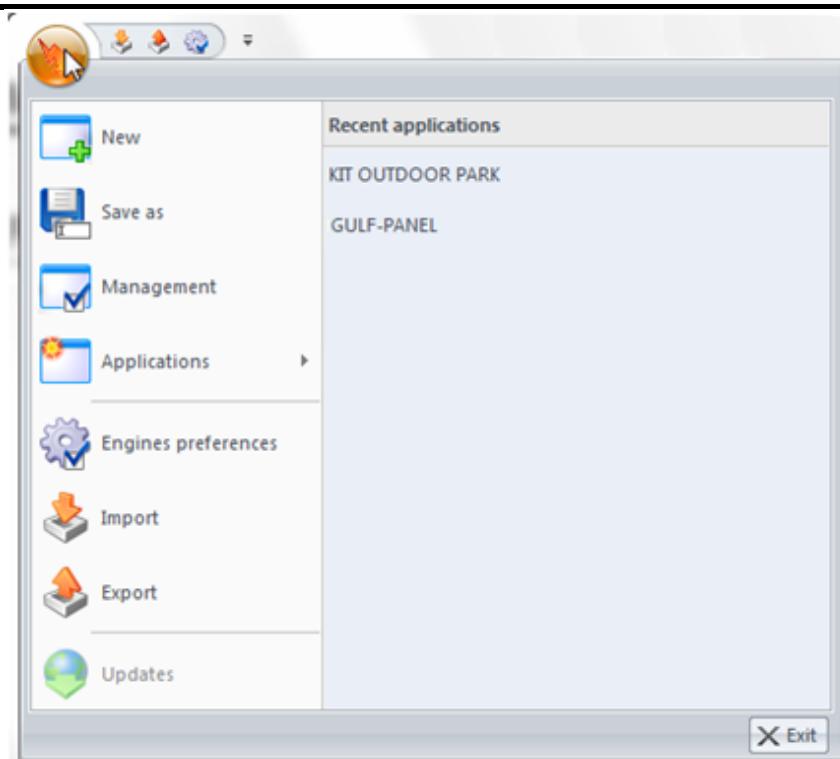


The program consists of three distinct areas:

- **The main menu:** Situated at the top. Accesses all program functions.
- **Button bar:** Just below the main menu. Provides fast access to the most frequently used functions.
- **Main display:** Occupies the rest of the available space and contains the current active view.

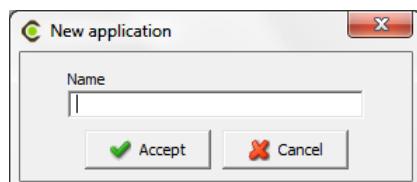


2 Menu Bar



2.1 New

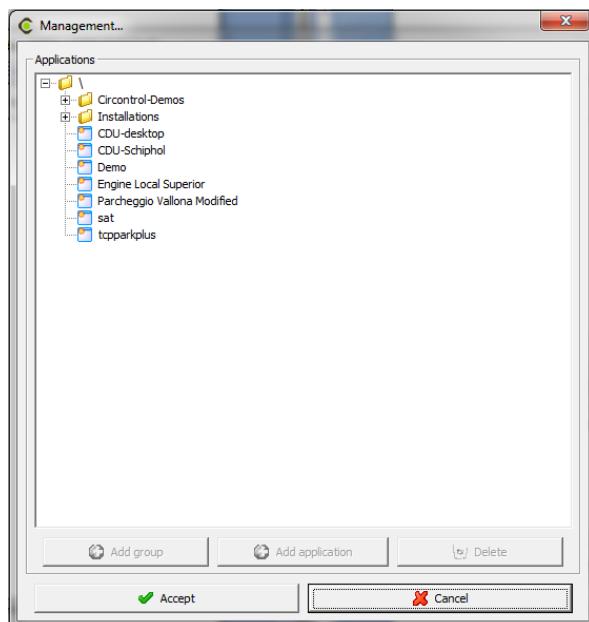
This option allows you to create a new application and edit it.





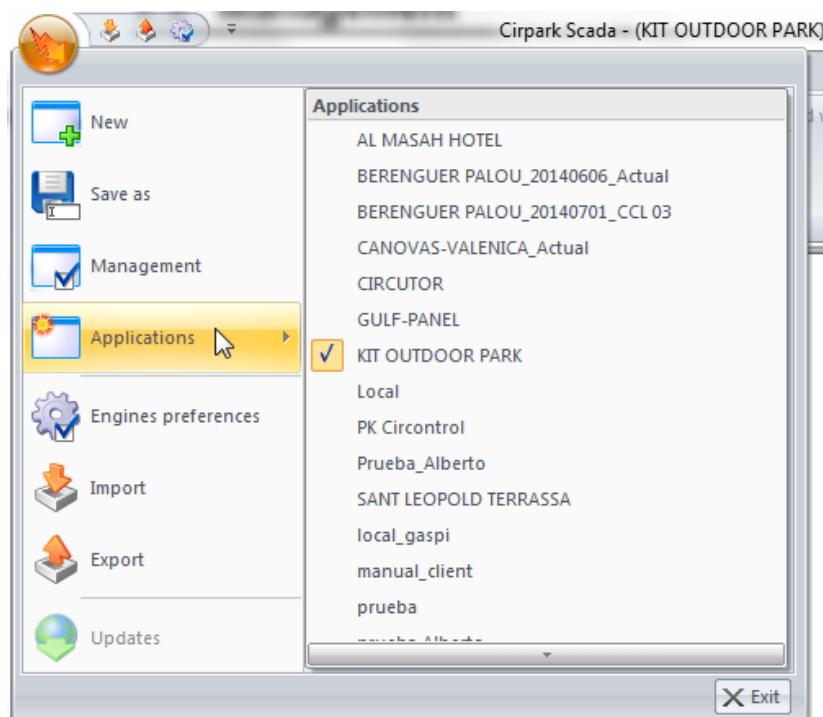
2.2 Management

This option is used to create a directory tree of all the applications managed by Editor. It enables adding/deleting groups and editing/deleting applications from the tree and the drive.



2.3 Application

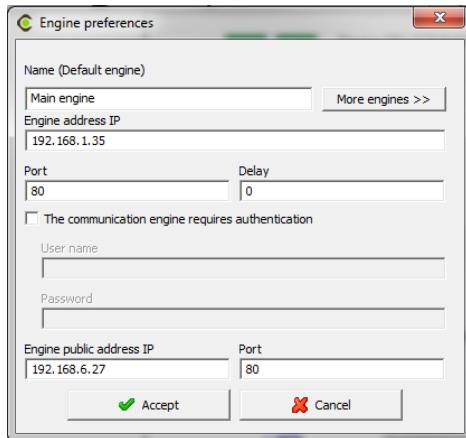
You have direct access to the recently opened applications.



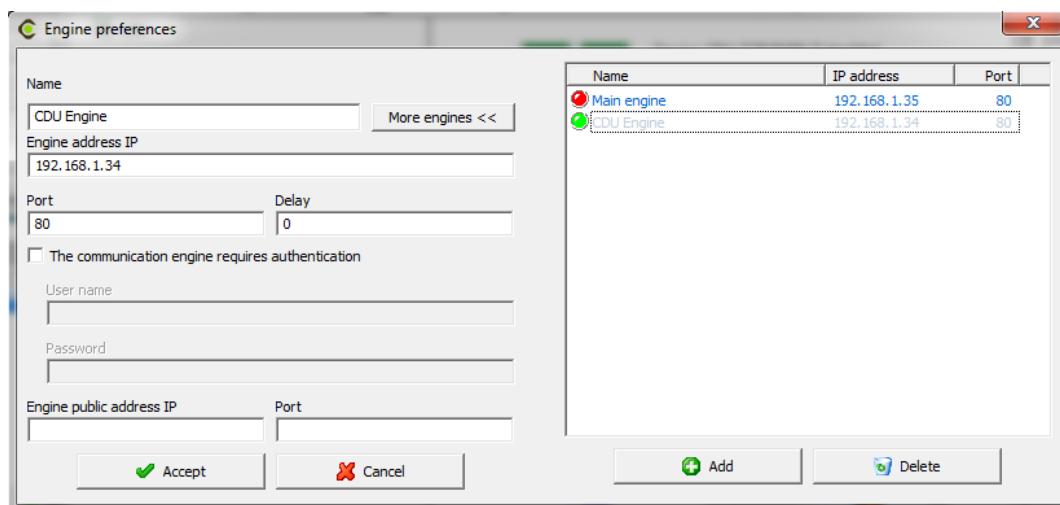


2.4 Engine preference

This option configures the address and port of the communications engine. You may also indicate user and password if authentication is required. These parameters are used to import/export the application.



The "More motors" option is used to create a list of motors to be connected together, depending on the status displayed by the traffic light associated with each motor.



2.5 Import

It allows configuration of the communications engine to be imported for subsequent modification.

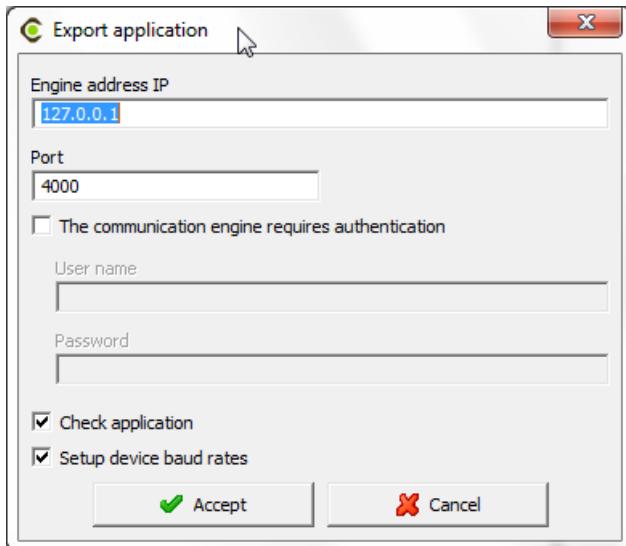


You may Import:

- The active application: The engine configuration is imported into the active application. The contents of the active application are overwritten.
- A new application: The engine configuration is imported into a new application. The name of the new application will be requested.

2.6 Export

It allows to exports the application being edited to one or several preconfigured motors and to the ones in communication.



The default options are shown in 'Engine preferences', but can be modified to send the application to any other communications engine.



If the ‘Check application’ option is selected before export the application is verified to be correct or invalid elements are reported.

If the ‘Setup device baud rates’ option is selected, it will try to communicate with the devices before sending the application and display a summary of the devices it could not communicate with.

2.7 Updates

This software has an internet update system. In case of a new update will available, this button is available as well

3 Devices menu

When you click on this button the next menu will be shown:



3 Kinds of views exists and each one has different tools. These tools will be shown available depending on kind of view. (The device section is explained on the device manual).

3.1 Connections

You can see a list of devices with tree view, distributed how they are physically connected. You can add new devices or modify that already exists.

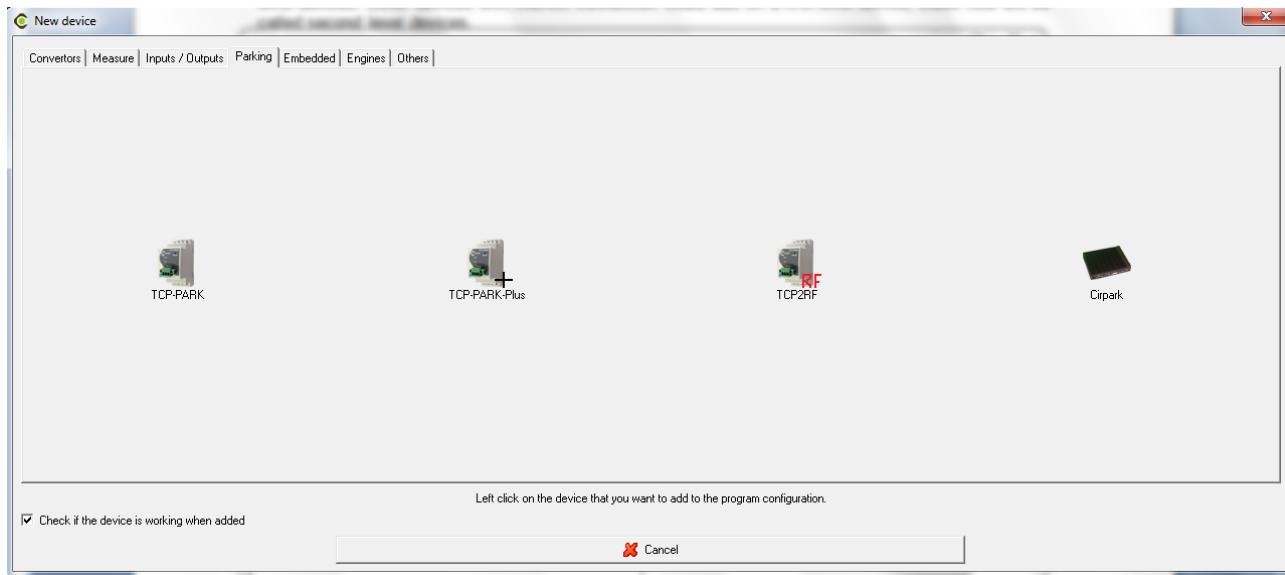
You can choose two ways to add a new device; through the icon or clicking with right button on screen.



Devices have been classified into those which have a direct connection and converters and those devices which must be connected to others so that the software can connect with them. The former appear on the list at the left of the dialogue, and will be called first-level devices from now on, the second type can be found on the right, and from now on will be termed second-level devices.



Click “Add” and the following dialogue box will appear to the left:



The device that needs to be added is selected from here. The first level devices are organised divisions:

- Converters: Directly connected devices by internet or RS232 direct PC connection, and communication converters.
- Measure: Electrical measure devices available on SCADA
- Inputs/outputs: Different input/output specific devices
- Parking: Concentrator devices and CirPark Motor
- Embedded: Embedded devices available on SCADA
- Others: IP camera, user and mobile management, fire-fighting footbridge

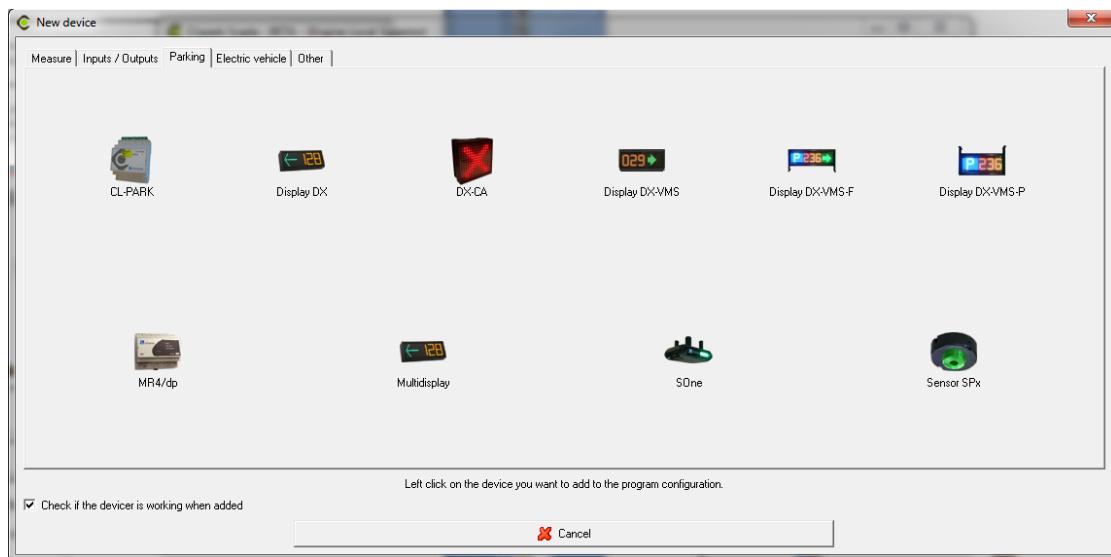


Remember that deleting a first-level device will also delete any second-level devices connected to it.

Once the first-level device has been selected, the devices connected to it may be added by clicking on the ‘Add’ button to the right of the dialogue. In this case only those devices which can be connected to a first-level device appear in the dialogue selection.



- Devices with converter connections (RS-232 / 485, TCP2RS and TCP2RS+)

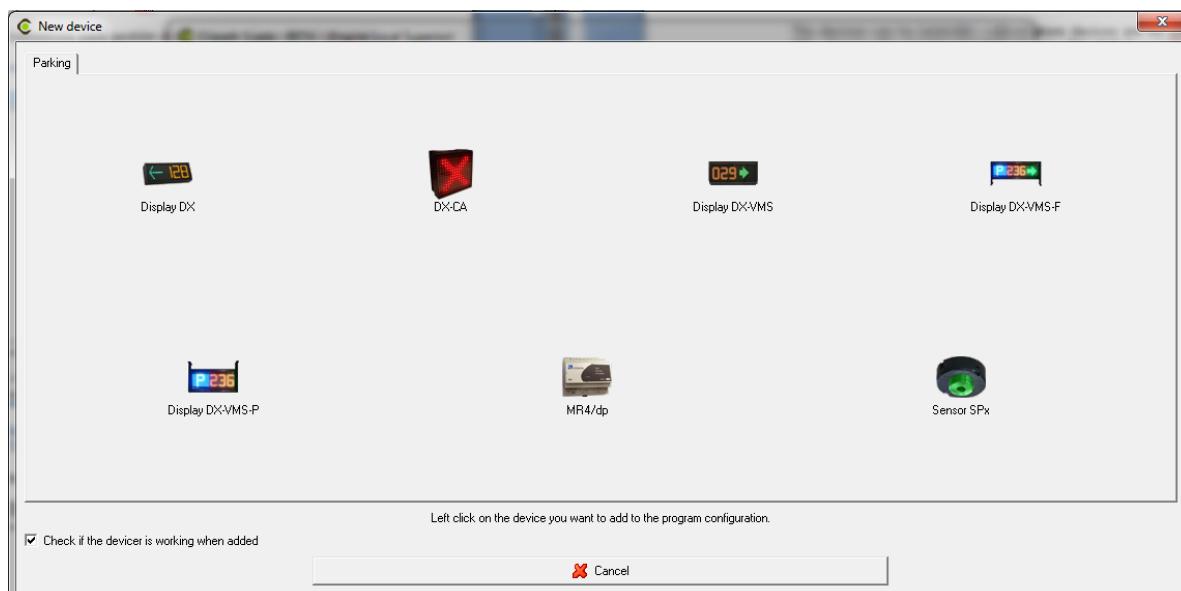


The devices can be added to converters will be divided into 4 groups:

- Measure: It may add to energy control devices (CVM-MINI).
- Inputs / Outputs: It may add to inputs/outputs control devices (MR44-PARK and MR42-PARK).
- Parking: It may add to parking management control devices (Sensor SPx, Display DX, Display DX-CA, Display DX-VMS, Display DX-VMS-F, Display GS24x8RGB, MR4/dp, SOne, and CL-PARK).
- Electric Vehicle:
- Other: It may add to monoxide control devices (FM-CO) and card reader.

- Devices with concentrator connections (TCP-PARK, TCP-PARK Plus and TCP-RF)

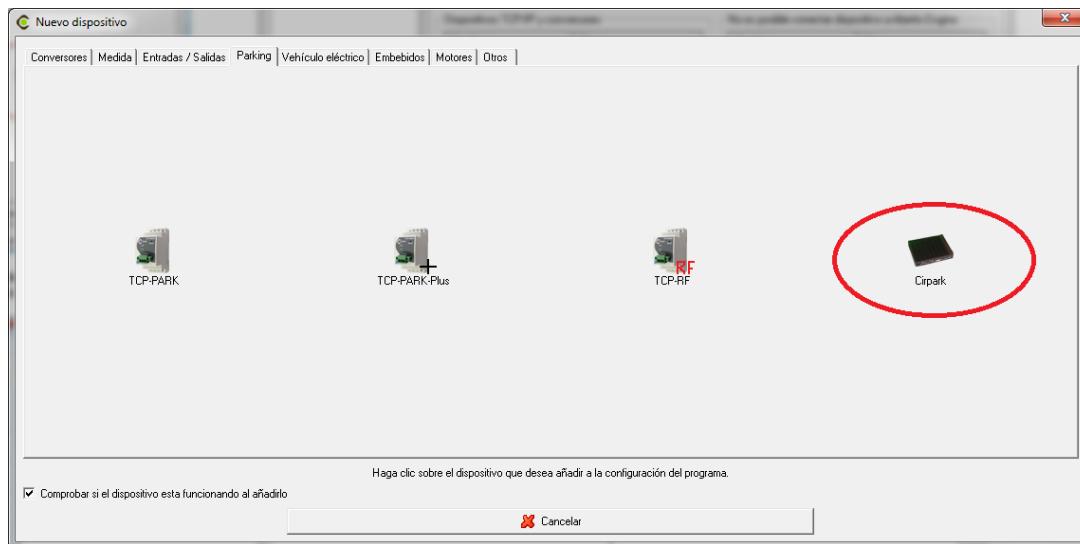
The devices can be added to concentrators devices are for parking management system (TCP-PARK, TCP-PARK-Plus and TCP-RF).



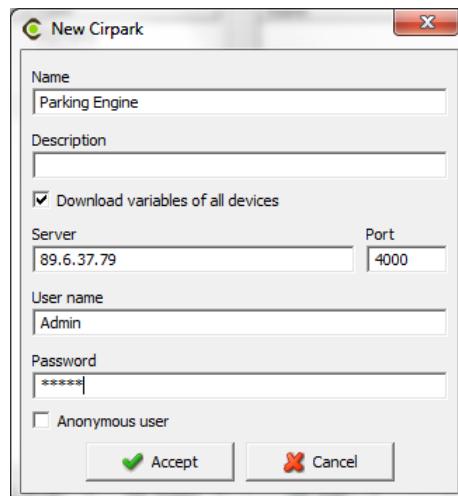


The devices that can be added to concentrators system only are for devices to parking guidance management.

- Devices with connection to engine (Cirpark)



When configuring the Cirpark engine can download all variables of the devices configured in the CirPark engine. Allow configures a remote engine for local control.



The option “Check if the device is working when added” allows the user to verify if the device is connected to RS485 bus. An error message will appear if the device is not responding. Uncheck this option if you don’t wish to verify the communication with the device after setting up.



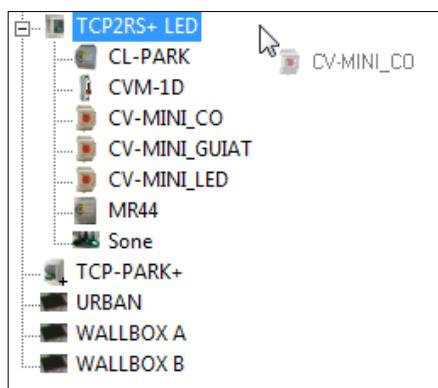
When a device is added or edited, communications may not be possible if the configured speed is different from the connection speed. When software finalises the speed configuration process communication will be possible.



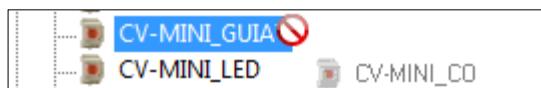
The table below shows the possible combinations between different devices. First-level devices are shown in the first-level columns. Rows show the second-level devices that can connect to First-level ones.

	RS232/485	TCP2RS+	TCP-PARK	TCP-PARK+	TCP-RF
SENSOR SP3	X	X	X	X	
SENSOR SOne		X		X	
SENSOR SM		X			X
DISPLAYS	X	X	X	X	X
MR4/dp	X	X	X	X	X
CVM-MINI	X	X			
CL-PARK		X			
AUTOMATION	X	X			

It is possible to move second-level devices from one to another first-level device dragging and dropping this second-level device:



If it is not possible to move the device to the desired first-level device, either because communication is not permitted, second-level devices cannot be connected or there is an inconsistency between devices, the cursor will change to to signal that the operation is not permitted



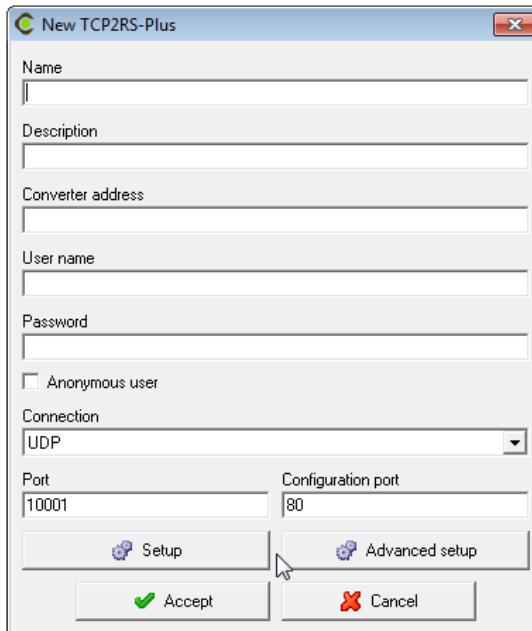


3.2 Add a first-level device

Depending on the type of device you want to add the device screen can change.

The typical first-level device configuration screen will be displayed below, although depending on the device you want to add some parameters do not exist or specific parameters for the device should be configured.

The special parameters for each first-level device will be dealt with in detail in the section dealing with the device.



- **Name:** Alphanumeric field which uniquely identifies the device throughout the program. There are no two devices in the configuration with the same name.
- **Description:** Alphanumeric type data to insert a brief description of the device.
- **Converter address:** Corresponds to the address through which the program can communicate with the device. This parameter can be an IP address or a name. This address should not be confused with the MAC address.
- **Name:** it can be possible to be required a user to access to converter, if it not necessary check "Anonymous user" box.
- **Password:** If user exists have associated a password which can be written here.
- **Port:** Corresponds to the communication port.
- **Configuration port:** Corresponds to the communication port that the program uses to configure communications on the devices.
- **Parameters:** General communication parameters configuration.
- **Advanced setup:** Advanced settings of the device.

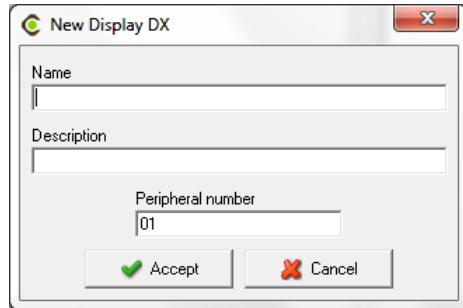


Depending on the device added there may be more or fewer parameters. For more information see the section on the corresponding device.

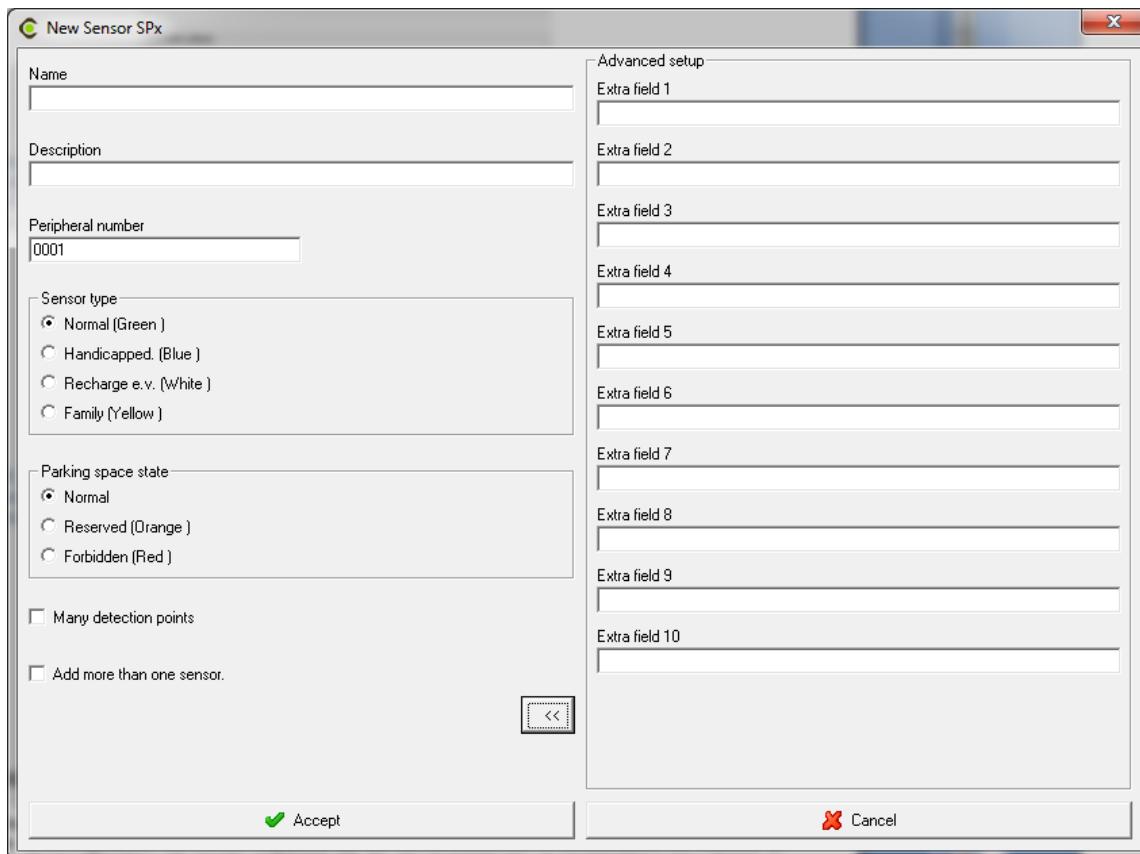
3.3 Add a second-level device

The configuration of second-level devices will be easier as communication configuration is not required. Second-level devices communicate with the programme through the first-level devices they are connected to.

- General configuration devices.



- **Name:** Alphanumeric field which uniquely identifies the device throughout the program. There are no two devices in the configuration with the same name.
 - **Description:** Alphanumeric type data to insert a brief description of the device.
 - **Peripheral number:** Number identifying the device for communications. Two second-level devices connected to the same first-level device may not have the same peripheral number.
- Sensor configuration.



- **Name:** Alphanumeric field which uniquely identifies the device throughout the program. There are no two devices in the configuration with the same name.
- **Description:** Alphanumeric type data to insert a brief description of the device.
- **Peripheral number:** Number identifying the device for communications. Two second-level devices connected to the same first-level device may not have the same peripheral number.
- **Parking spaces for handicapped:** Check this option if the parking is reserved for handicapped users.
- **Sensor mode:** Select the default sensors state. Choose between normal for normal functioning, Reserved to set the lighting indicator permanently in orange and Forbidden to set the lighting indicator permanently to red. If “Parking spaces for handicapped” is checked, the sensor mode options are normal for normal functioning and Forbidden with lighting indicator permanently red.

For both Reserved and Forbidden states, the CirPark Scada screen will show the real occupancy state.

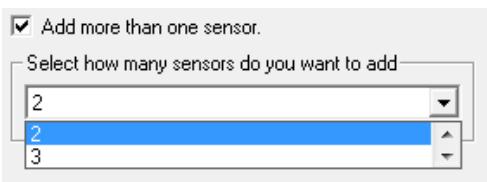




- **Many detection points:** check this option if more than one sensor is used to detect the place occupancy. Up to five sensors can be defined, each one with its own address. Only when all sensors defined here detects occupancy, the parking place will change to “Busy” and the lighter indicator will change.

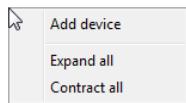


- **Add more than one sensor:** Check this option to create a list of devices. In “Select how many sensors do you want to add” define the amount of devices to create. The program will create the sensors without address.

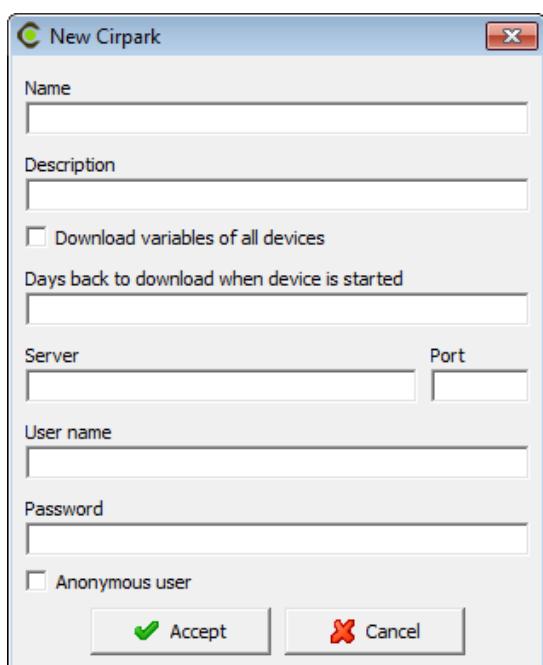


3.4 Add motor (Multiengine)

Software SCADA can manage a few engines (multiengine). To include more engines (CONECPARK, Circarlife, other PC...) is necessary to include these on main engine of system (most of times is a server o PC). The procedure is detailed next:



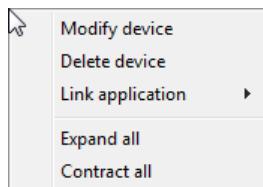
The first step is the same of others devices, that is add a new device. You option Cirpark in parking tab.



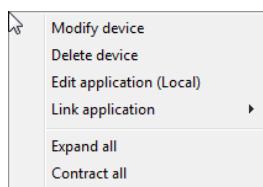
- **Name:** Alphanumeric field that is unique identifier for whole program. Can't set two devices with same name on setup program.
- **Description:** Alphanumeric value to introduce a little description of the device.
- **Download variables of all devices:** Select it if you wish to download engine's data. You must check this box to have access to all engines data in multiengine mode.
- **Days back to download when device is started:** All data on the selected number of previous days are discharged.
- **Server address:** Is the address which the program could communicate with the engine. That can be an IP or a name. Don't confuse this address with MAC address.



- Port: It corresponds to the communications port engine, defect port may be 80.
- User name: it can be possible to be required a user to access to converter, if it not necessary check “Anonymous user” box.
- Password: If user exists have associated a password which can be written here.



Once the engine is introduced like a device, this have an extra option to link an application. This option allows exporting this application to the engine or imports the application of engine.



Once an application of editor is linked, you have choice to access in it to edit from device. Or link other application.

Assure all applications are in the appropriate engine.

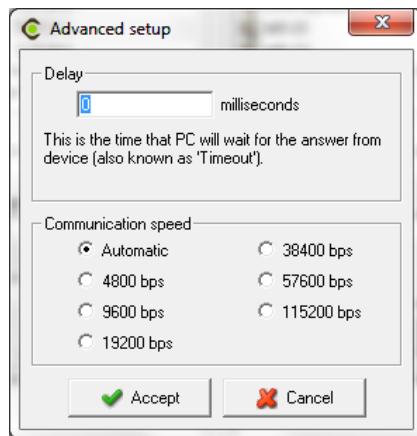
A new engine in a existing application implies have access to devices, variables and reports of this new engine.

3.5 Advanced devices configuration

Devices with direct connection, such converters, configuration of certain communication aspects is possible. The configuration dialogue of device TCP2RS-Plus below shows the button that gives access to these parameters.

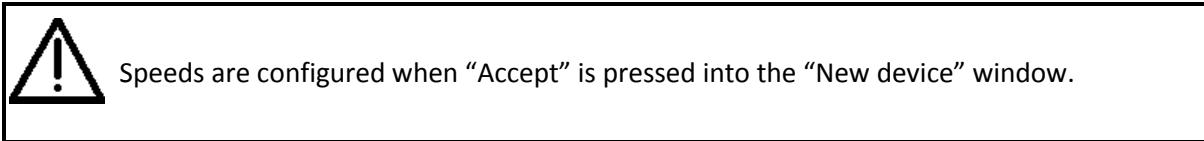


Click ‘Advanced setup’ to visualize the advanced setup configuration window.

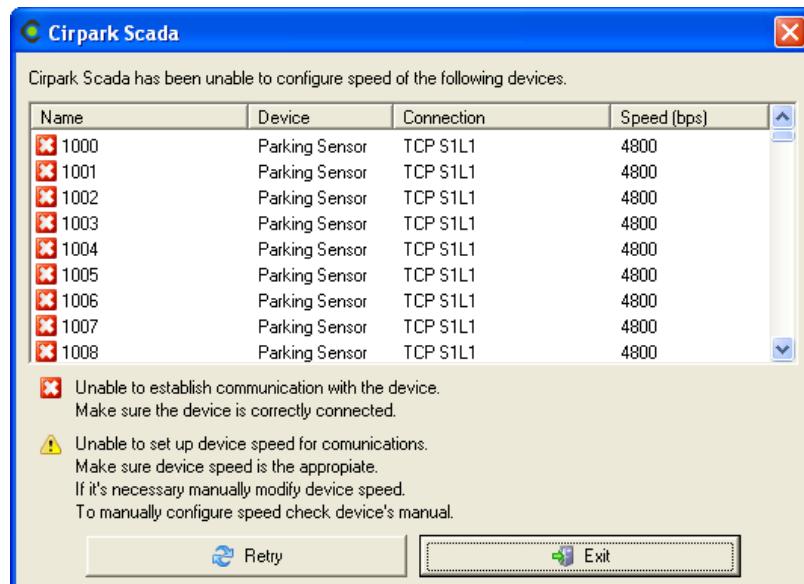


Depending on the device being configured, it is possible that some of these parameters do not appear.

- **Delay:** Value in milliseconds. This value known as "Timeout" is used to control the time that software will wait for the answer from the device. The value entered will be added to the default time to wait for a response from the device.
- **Communication speed:** Allows communication speed between the converter and the device to be selected. By default this speed is automatically assigned, but it can also be forced. For an automatic configuration, the converter will try to configure the devices at a maximum speed common for all of them. If a specific speed is selected, the software will configure the devices at this speed, if the communication speed is not the same, the devices will not communicate.



Once speeds are configured, if there are any problems the following dialogue will appear.



Show a list of not communicating possible devices.



Two warning icon types are possible:

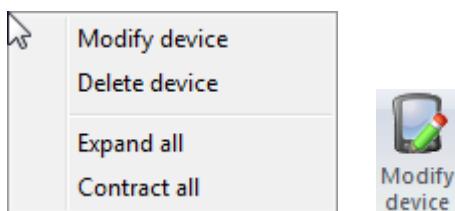
- ☒ Means communication error with device. User 'Retry' button to retry the communications again.
- ⚠ Communications speed cannot be changed due to device properties.



The user is responsible for manually configuring the suitable speed on those devices where it is not possible to configure the speed by communication. To learn how to change the speeds on the devices, consult the corresponding manual.

3.5.1 Modify devices

All setups explained in before sections can be modify once the device to modify is in device list. You can access to modify menu through right button on the device or modify device button.

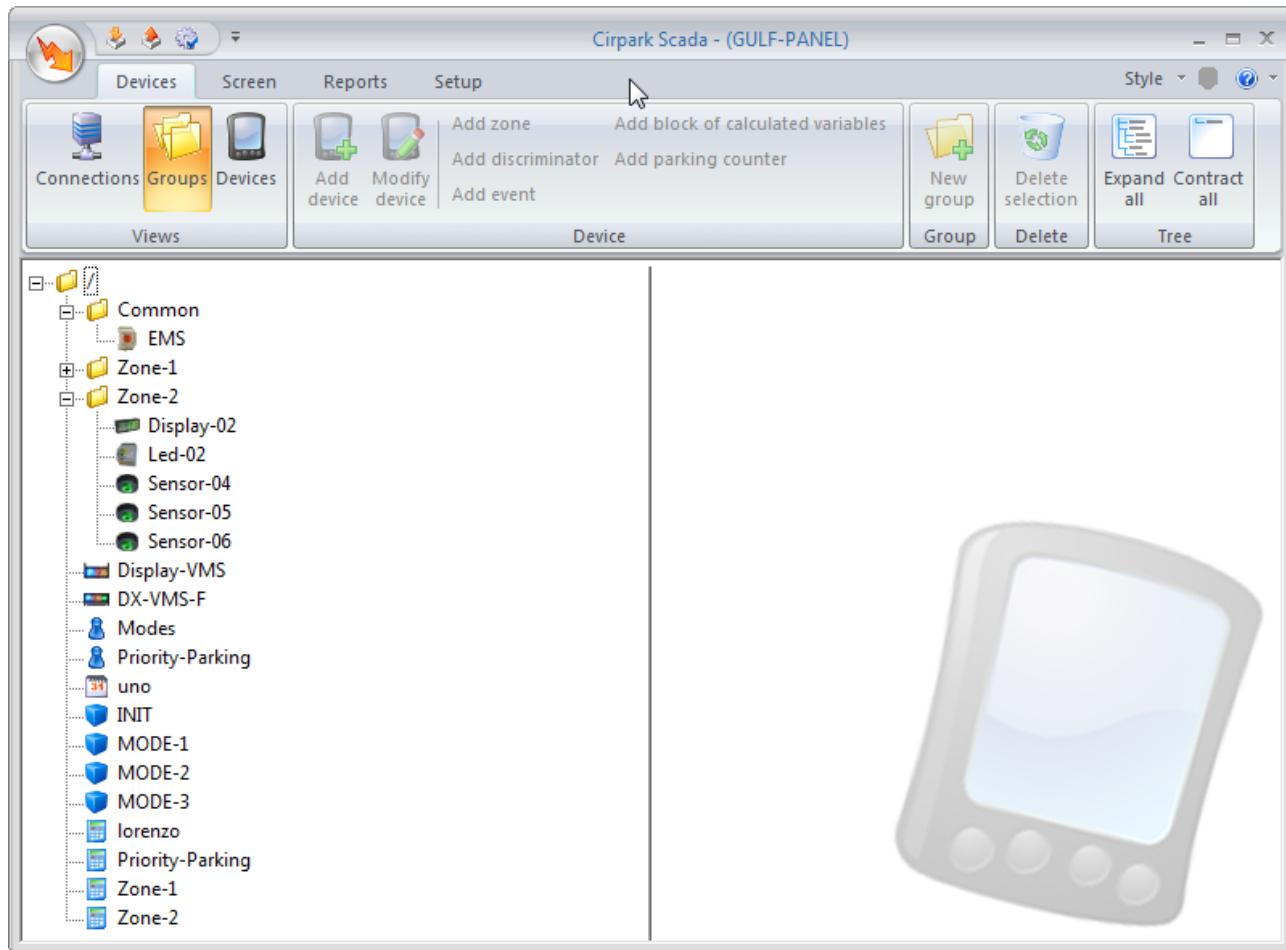


Access to modify device



3.6 Devices groups

Using this option, devices can be grouped together. It is possible to have the same device in different groups; groups can also be grouped.



The left part of the dialogue corresponds to the defined groups. The tree structure (with child and father nodes) will facilitate the visualisation of the dependency between groups.

/ This is the root group of the tree. When new devices are added, these are added automatically to this root group.

Clicking it will make the group as son of the selected group (father). Only a name of the group must be entered in the new group created.



If you want to change the name of a group at a later stage, the group must be selected and then click on the name with the left mouse button.

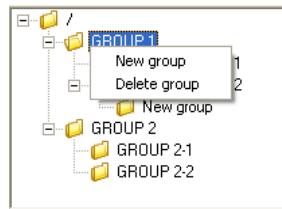


Within the same father group the names of the son groups cannot be repeated, but it is possible to repeat the names of the groups in father groups

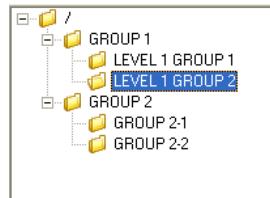


Clicking will eliminate the selected group, as well as all the son groups. It will be possible to eliminate any group except ' / (root group).

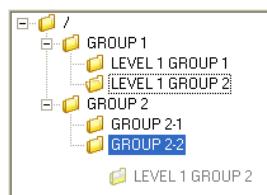
It is also possible to add or delete groups pressing the right button of the mouse on the node you want to add a son node or on the node you want to delete. Pressing will cause the corresponding menu to appear to select the desired action.



Last, it will be possible to move or copy a group. For this press the left mouse button on the group you want to move or copy.



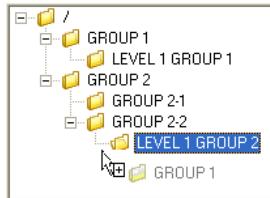
Without releasing the mouse button, drag the group to the destination parent group.



If you want to move a group, just release the left mouse for the change to take place.



If you want to make a copy of the group, press the CTRL button and without releasing the left mouse button, the cursor will change to indicating that the copy will be made of the group.



Last, release the left mouse button of the mouse to make a copy of the group.

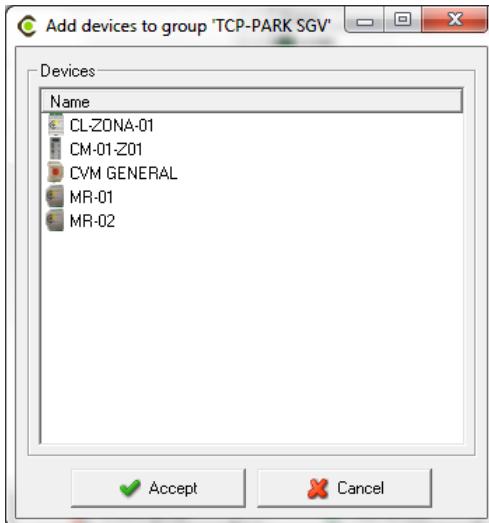


If you want to drag and drop a group which is not possible to copy or move the cursor will change to , to indicate that the action is not permitted.

The right side of the window shows the device list that belongs to the group selected from the tree.

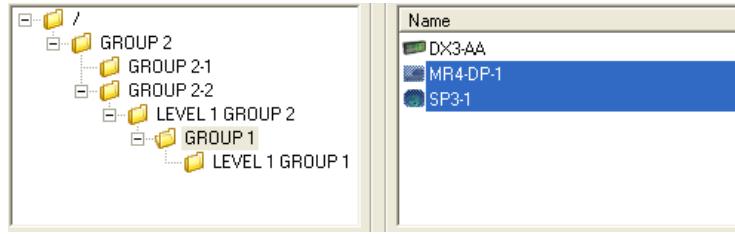
The name of the group is indicated in the list description for easier identification **'GROUP 1' group devices**

Pushing the button the following dialogue box will appear:

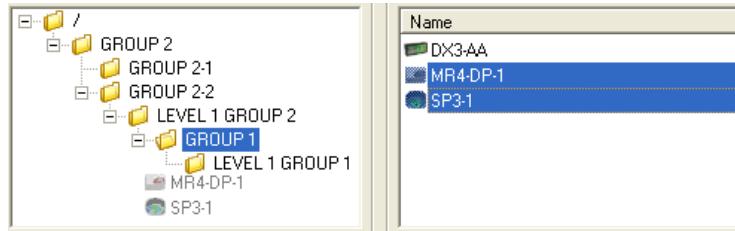


The non-belonging to these group devices will appear in the list. Pushing the "Accept" button, to add to the group the devices selected from the list.

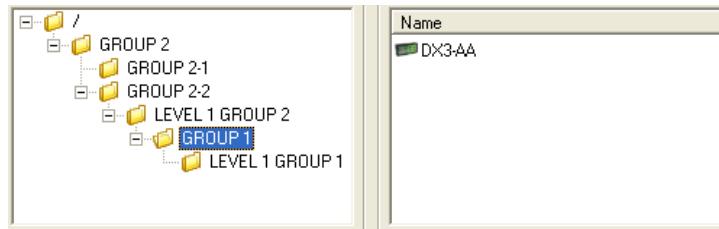
Likewise, once the devices have been added to a group, it will be possible to change them or copy them easily just clicking the left mouse once having selected one of the selected devices.



Drag the target group without releasing the left mouse button.



Finally release the left mouse button for the change to take place.



If you want to copy the devices to another group, proceed in the same manner as with the copy of groups pressing the CTRL key before releasing the left mouse button.



This will only be active if there are devices selected from the device list. On pushing the button the devices selected from the corresponding group will be eliminated.

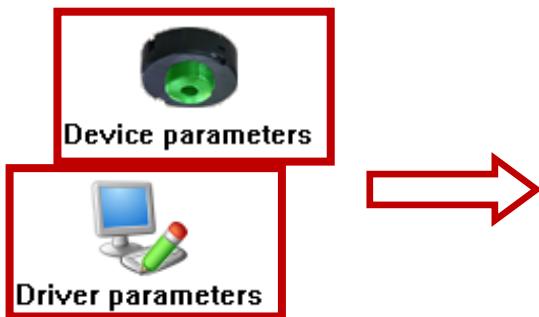


3.7 Information menu



When one device is selected their information appears on the right side of the window:

- (1) Contains general information about the device selected on the tree and device settings



- (2) Different options to set selected device, these depends of type of device and can be able more.

4 Screen menu

SCADA allows display of one or more windows, with or without a background image, incorporating display control, turning the PC into a powerful and versatile synoptic panel of the installation.

The aim is to generate an application, consisting of one or more screens, which can run independently in a designated facility.

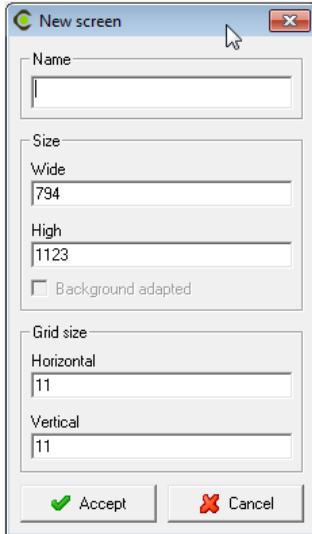
A standard application would consist of a main screen serving as a basis for others that will appear according to given requirements. The number of screens is only limited by the conditions existing on the PC where the program is running.



4.1 Add / Remove screen

The first time you access to this menu you must create a screen, due the program doesn't have any. You can't access to this menu if not exist any screen.

All screens must have a few parameters that could be modified in the future though button.

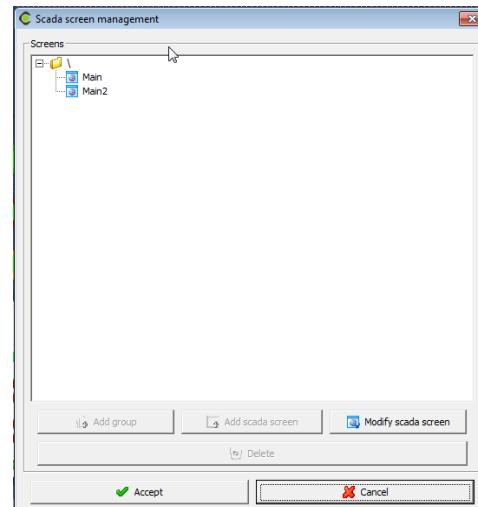
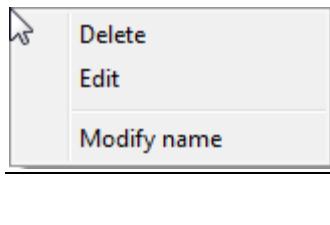


- **Name:** name as the screen will called
- **Size:** you can specify the screen resolution, the width and height in pixels, or adjusted to the bottom of the screen (only modify an existing set screen with their background). Keep in mind that each screen has different physical resolution. The size of the SCADA screen can be adapted to the size of this background by checking box Background adapted.
- **Grid size:** adjust vertical and horizontal parameters of a tool called grid

Once these parameters are set these will be applied immediately. A new screen will appear with a white background. If you modify an existing screen to make their size lower could mess up all elements in screen.

To modify the screen's parameters, create group of screens delete screens, you can access to scada screen management

In the same way to manage group of device you can manage screens, move screens between groups or modify clicking on mouse right button:



or

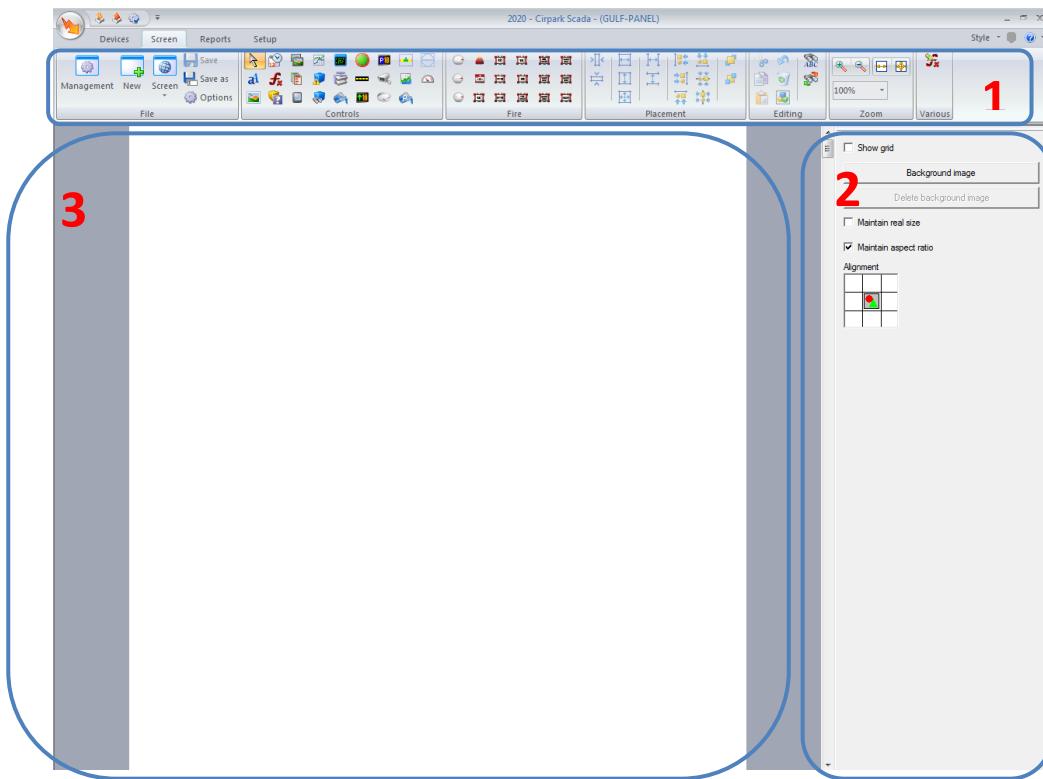


4.2 Editing Scada screens

Use this function to add, change or delete screen controls. Use these controls to display the value of a variable, perform an action, paint an area of the screen, and so on.

The purpose of the screen is to display the status of the installation in a simple manner, allowing the situation on the different lines in the plant to be viewed, display the installation electricity variables, etc. The screen controls make this possible.

The edit window of the SCADA screen looks like this:



The window is divided into three areas:

- Tools (1)
- Information panel (2)
- SCADA screen (3)

The tools permit a simpler configuration of the SCADA screen design.

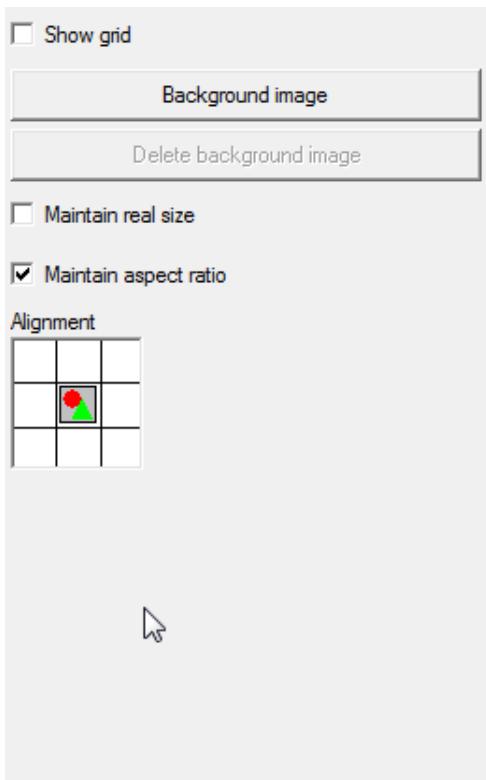
The information panel allows access to all the configuration options of a selected control being added to the design of the SCADA screen.

The SCADA screen is the design view from which the controls are implemented.

Thus, using the tools (1) controls may be entered on the SCADA screen (3) whose properties may be configured in the information panel (2).



When creating a new SCADA screen, its background configuration properties will appear by default on the information panel. These properties are the same as those which appear when no control selected.



- Show grid: option displays or hides the grid, which indicates the position of objects on the screen. If the grid is shown, the object will be automatically aligned to the grid.
- Background image: Select this option to add an image from the image manager so that it can appear in the report background. (look: 6.1.4. image manager)
- Delete background image: Click on this button to delete the present background image.
- Maintain real size: If this option is enabled, the background image is displayed in its actual size. If disabled the background image will be stretched or fit to the margins of the SCADA screen.
- Maintain aspect ratio: If enabled, this option will maintain the aspect ratio of the selected background image. If disabled it will force the image to occupy the entire width and height of the SCADA screen expanding or shrinking its measures as appropriate.
- Alignment: Enables the selected background image to be placed in any of the seven positions shown in the figure.

In terms of tools, there are several grouped according to their use:



- File tools
- Control tools
- Fire tools
- Placement tools
- Editing tools
- Zoom tools
- Various tools



4.2.1 Control tools Palette

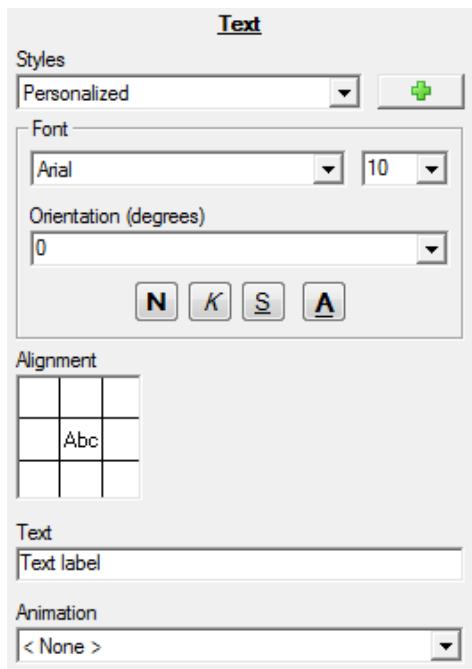
4.2.1.1 Controls select

This tool allows the user to select one or more controls that have been placed already on the report sheet to edit their properties or to apply any other tool. To select a control just click the left mouse button over it. To select more than one control hold down the left mouse button and draw a rectangle covering the controls we want to use. The controls outside of the rectangle remain unchecked or cease to be selected if previously checked.

The behaviour of this tool can be amended if we keep pressing the "*Control*" key or the "*Shift*" key. If when selecting the *Controls* we select the "*Control*" key what happens is that the selection we are making will be reversed, i.e. we select the *Controls* that are not selected and we will no longer select those which are. If we keep the "*Shift*" key pushed what we will do is add controls that have not been selected to those which already are.

4.2.1.2 Text control

This tool will allow fixed text strings to be included in the report or screen. Select this tool and draw a selection box on the report by keeping the left mouse button pressed. The properties than can be configured from this control are:



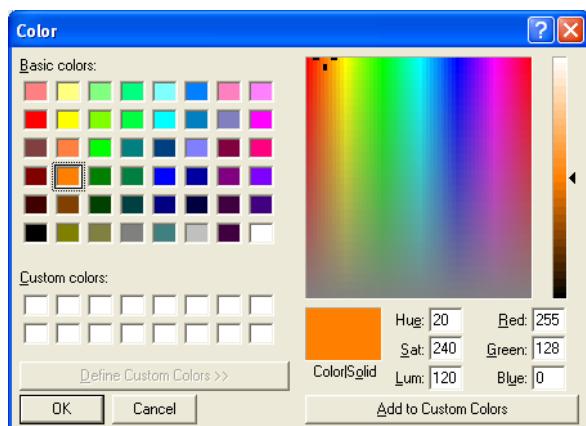
- Styles: Choice of a previously created text style or creation of a new personalized one.

- Font: The style will apply to the font type used for the text.
- Bold and/or italic: Depending on the font selected, bold and / or italics may be chosen.

- Size: Corresponds to the size of the font. The size may be between 1 and 90. The size can either be entered manually or selected from the dropdown menu showing the options available.

- Orientation: Corresponds to the text orientation. The orientation (expressed in degrees) may be between 0 and 350. The size can either be entered manually or selected from the dropdown menu showing the options available.

- Color: Clicking on this allows the text color to be selected.



- Alignment: This allows positioning of the text within the rectangle defined in the report sheet.

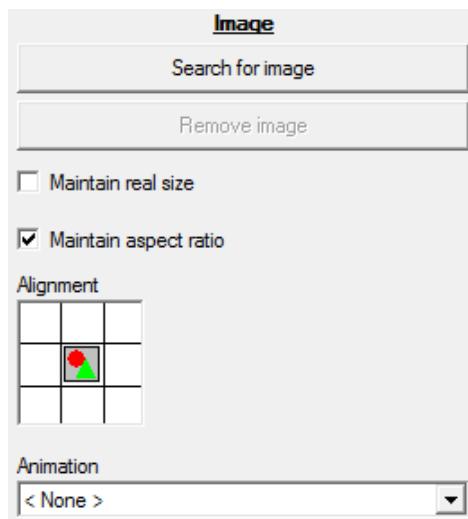
- Text: The text to be displayed is written here.

Use this button to add the personalized configuration created for the active text control as a style for use with other controls.



4.2.1.3 Image control

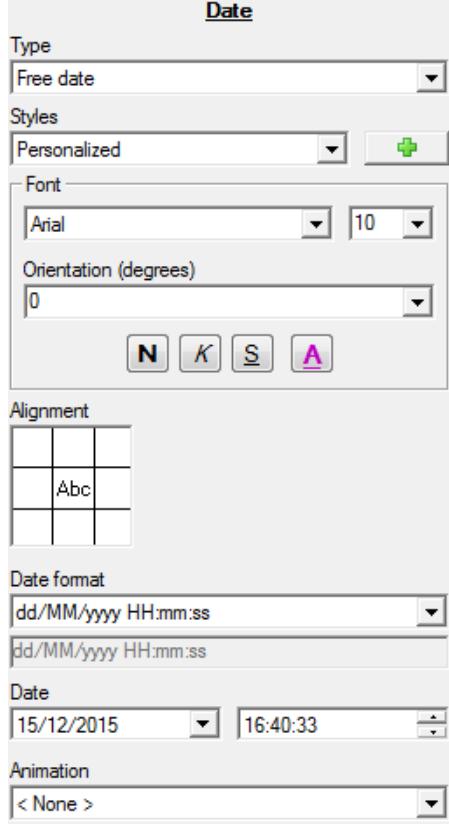
This tool will allow the inclusion in the still pictures report. Once this tool has been selected, it will be necessary to draw a rectangle on the report by keeping the left mouse button pressed. The properties than can be configured from this control are:



- Search for image: By selecting this option an image from the image manager can be selected.
- Remove image: Click on this button to eliminate the present background image.
- Maintain aspect ratio: If activated, this option will maintain the width and height proportions of the selected image. If deactivated, it will force the image to occupy the entire length and width of the rectangle defined in the report, expanding or contracting it measurements as required.
- Alignment: This will help decide on which side of the rectangle defined on the report sheet will the image be placed.
- Animation: This option allows animate on to different ways: displacement (scroll) or alternate. (explained on manual, section: 2.1.17)

4.2.1.4 Date control

This tool allows a date to be entered in the report or screen (current or not). Select this tool and draw a selection box on the report by keeping the left mouse button pressed. The properties than can be configured from this control are:



- Type: This option enables the type of date shown on the report to be chosen. The following choices are available:
 - *Any date*: Any date defined by the user.
 - *Present date*: The date at the moment the report is made.
 - *Start date*: The start date of the information used in the report. (only for reports)
 - *End date*: The end date of the information used in the report. (only for reports)
- Styles/Font/Aligment/Animation/orientation: this configuration is the same for all controls (see: **¡Error! No se encuentra el origen de la referencia.** **¡Error! No se encuentra el origen de la referencia.**).
- Date format: Here the date format may be established. Several are pre-defined and can be manually entered from the keyboard. The different models defined are:
 - *y* → year. If the number of letters is 3 or more the full year is represented (2006) and if not the abbreviated value (06).
 - *M* → Month of the year. If the number of letters is 3 or more it will be interpreted as the name of the month, if not the number of the month.
 - *d* → Day of the month. The number of letters will be the minimum number of digits with which the value can be represented.



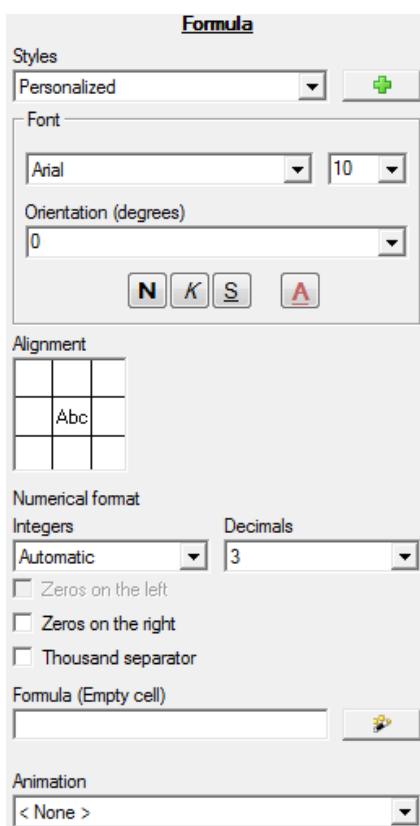
- E → Day of the week. If the number of letters is 4 or more the full name of the day of the week is displayed. If the value is less the abbreviation of the name is displayed.
- H → Time of day from 0 to 23. The number of letters will be the minimum number of digits with which the value can be represented.
- m → minutes. The number of letters will be the minimum number of digits with which the value can be represented.
- s → seconds. The number of letters will be the minimum number of digits with which the value can be represented.
- ' → Text may be added to any part of the model using quotation marks. The single quotation marks are only needed if some of the characters used in the models are desired.

- Date: This option will only appear in the case of having selected 'Any date'. Where in a specific date can be chosen to show in the report.

Use this button to add the personalized configuration created for the active text control as a style for use with other controls.

4.2.1.5 Formula control

This tool will permit a formula to be included in the report or screen (the final result will be seen in the report). Select this tool and draw a selection box on the report by keeping the left mouse button pressed. The properties than can be configured from this control are:



- Styles/Font/Alignment/Animation/orientation: this configuration is the same for all controls (see: **¡Error! No se encuentra el origen de la referencia. ¡Error! No se encuentra el origen de la referencia.**).
- Numerical format: Using these selectors the number of whole and decimal numbers shown by the result value of the formula calculation can be specified.
- Zeros on the left: This option will only be available if a specific number of whole numbers has been specified in the previous option. If the value resulting from the formula does not reach the specified whole number, the remaining spaces will be padded with zeros
- Zeros on the right: This option will be available only in the event that a specific number of decimal places have been selected in the previous option. If the value resulting from the formula does not reach the specified whole number, the remaining spaces will be padded with zeros
- Thousand separator: Will display a thousand separator in the value resulting from the formula. This separator will depend on the regional configuration of the system where the program is running.
- Formula: Here the formula that will produce the result to be displayed on the report page is specified. It can be entered manually or using the "wizard"



4.2.1.6 Conditioned control

This tool will allow us to include both a control and the previously defined data (text label, image, formula, date) in the report that will be shown only during specified conditions. The common options will be:

<u>Conditioned</u>	
Condition	
<input type="button" value="Add"/> <input type="button" value="Remove"/>	
Condition (Empty cell)	<input style="width: 20px; height: 20px; vertical-align: middle;" type="button" value="..."/>
Control type	<input style="width: 100px;" type="button" value="Label"/>

- Condition: Here the condition which gives rise to the appearance of the chosen control on the report page is specified. It can be entered manually or using the "wizard" (see **¡Error! No se encuentra el origen de la referencia.** **¡Error! No se encuentra el origen de la referencia.**)

Once the condition has been specified, click the 'New' button and the condition will be added to the condition list. To delete a condition from the list just select it and push the 'Delete' button. When there is more than one condition on the list, the control will activate when one of more of them is complied with.

- Control type: The properties that you can set of this tool are owner of type of control that you choose.

4.2.1.7 Screen

This tool will allow us to include a button in a scada to access to other scada. The common options will be:

<u>Screen</u>	
Screen	<input type="button" value="< None >"/>
Display	<input type="button" value="< None >"/>

- Screen: Here the target display to which will be accessed by clicking on the embedded control on the screen will specify SCADA
- Display: Here the aspect of control shall be specified in the SCADA screen. You can select 'button', 'image' or 'text' that this include configuration tools.

4.2.1.8 Report

By selecting this option, control will become a shortcut to a predefined report (see: 5 Menu Reports). The common options will be:

<u>Report</u>	
Report	<input style="width: 20px; height: 20px; vertical-align: middle;" type="button" value="..."/>
Grouped by	<input type="button" value="Week"/>
Display	<input type="button" value="< None >"/>

- Report: Here you choose the report that is displayed when you click the control from the customer view.
- Grouped by: Also you can choose the type of group for the data to be displayed in the report: day, week, month, or user-defined. If the "User Defined" is selected, the following fields appear

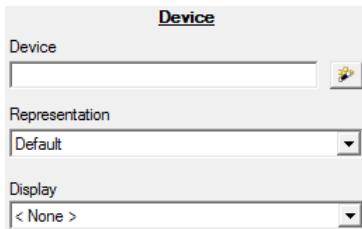
From	<input type="button" value="15/12/2015"/>	<input type="button" value="17:14:52"/>
To	<input type="button" value="15/12/2015"/>	<input type="button" value="17:14:52"/>

Where you spicify the period for which you want to view the report specified.



4.2.1.9 Device

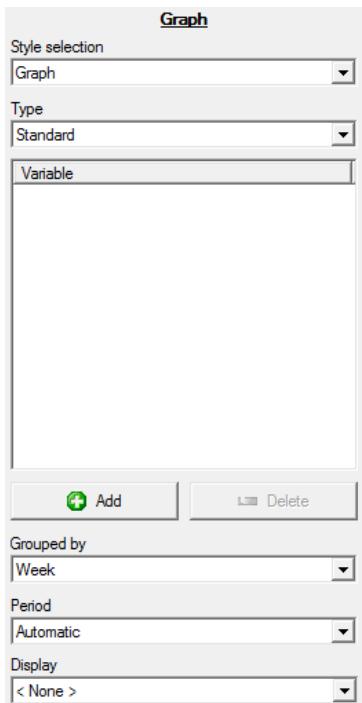
By selecting this option, control will become a shortcut from screens show the variables of a device. The common options will be:



- Device: Also you can choose the device whose screen is displayed variables by clicking on the control from the customer control.
- Representation: Can be represented analogicly or digitaly.
- Display: Here the aspect of control shall be specified in the SCADA screen. You can select 'button', 'image' or 'text' that this include configuration tools

4.2.1.10 Graph

Using this option, the control is used to make a graph or a table of one or more variables of one or more computers. The options available are:



- Style selection: You can choose graph or table.
- Type: You can choose different types depending on style selection chosen:
 - Graph: Standard, harmonics, wave form, events duration, semicircle effective voltage.
 - Table: Standard, harmonics, wave form, events duration, semicircle effective voltage, change transaction, transaction, movements, device's events, device movements.
- Variable: You add here the variables which you want represent on a graph. Click on "add" to choose variables to add in a graph or a table or delete clicking on a "delete".
- Grouped by: You can choose how values are grouped in time in a graph as well.
- Period: In the same way you can specify the period which will be shown on a graph
- Display: Here the aspect of control shall be specified in the SCADA screen. You can select 'button', 'image' or 'text' that this include configuration tools

The most important parameter, apart from the variables to be represented, and that will determine the final aspect of the graph (and, most importantly, the amount and distribution of information to show), is the period of time.

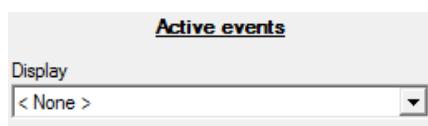


The period can be automatic, 5 minutes, 10 minutes, 15 minutes, 20 minutes, 30 minutes, 1 hour, 1 day and 1 month. In the event that the period is automatic we can choose the number of values of the variables that make up the graph we want to see.

There is a fundamental difference between choosing the automatic period and any other period. The automatic function groups the data according to the graph period. So, for example, if the graph period is one week, the values of all variables to be represented will be grouped into a single value for the graph. It is therefore necessary to indicate the number of periods to be displayed, and these periods must always be prior to the report period. Thus, a monthly report with an embedded graph, an automatic period and 6 values, will produce a graph with values grouped by month, displaying the month of the report (last value) and the previous five months. If automatic is not chosen, the values represented will be grouped according to the period specified, and only those included in the period of the report will be included. For example, a weekly report with an embedded graph that has a one day period, will produce a graph of the week's report with the values grouped by days (typically 7 values). With a period other than automatic, values that are not included in the report period are not shown, whereas the automatic option allows the display of values prior to the report period.

4.2.1.11 Active events

With this option, control will become a shortcut to the display window active event.



- Display: You can choose the aspect of control in the SCADA screen. You can select 'button', 'image' or 'text' that this include configuration tools.

4.2.1.12 Event viewer

With this option, control will become a shortcut to the window display events stored in files. The options available are:

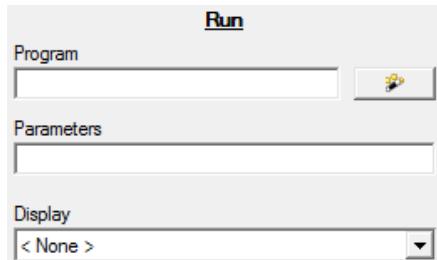


- Group: You can choose a group of events which will be shown on events display.
- Grouped by: You can choose how values are grouped in time on events display.
- Add up: Choose this check box to see all events add up or not.
- Display: Here the aspect of control shall be specified in the SCADA screen. You can select 'button', 'image' or 'text' that this include configuration tools



4.2.1.13 Run

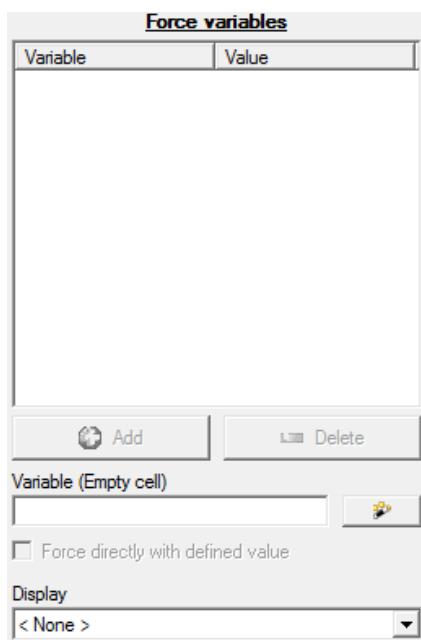
This tool allows you to include the SCADA access to another application that is present in the system screen. The properties that can be configured from this control are:



- Program: You must specify the complete path of application which will be called when you click on control in a scada screen. For instance:
C:\WINDOWS\SYSTEM32\CALC.EXE.
- Parameters: Allow specify parameters (if are necessary) that will be added to an application called on "program".
- Display: Here the aspect of control shall be specified in the SCADA screen. You can select 'button', 'image' or 'text' that this include configuration tools

4.2.1.14 Force variables

This tool allows you to force the value of the variables that can be enforced, such as equipment with digital outputs. The properties that can be configured from this control are:

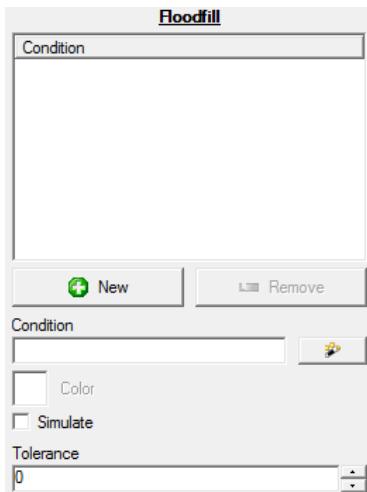


- Variable: Here the variable to which the value will be enforced. This can be written manually or via the button "wizard" (see section: 9.1.1 Wizard to create expressions and conditions).
 - Once the variable is specified, pressing 'New' button will add this variable to the list of forced variables. To remove a variable from the list simply select it and press 'Delete' button. All variables listed when pressing on the control from the client will be forced to the established state in each as defined below.
 - Force directly to specified value: Check this box to set a value to an enforced variable, will appear a field (Value). Not being checked this box, when this control will run on a client, a pop-up screen run asking the desired value.
 - Value: you specify here an action to do when the control will active by scada client (open or close). This selector will appear when values to be able to force will appear on a specific list. (For instance, to a digital output the option could be open or close). If instead the variable could be forced to any value (for instance a counter) will appear a field where you can specify manually that value.
- Display: Here the aspect of control shall be specified in the SCADA screen. You can select 'button', 'image' or 'text' that this include configuration tools



4.2.1.15 Floodfill

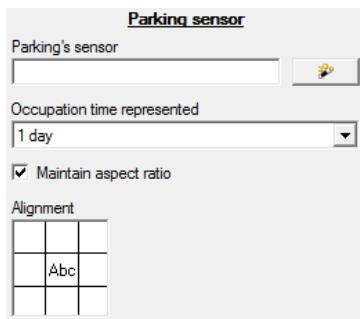
The filling control will allow change of colour of uniform background areas, or background image (all pixels having the same colour) regular or irregular. The control aspect is marking the point from which the pixel filling area begins. From the client will not be displayed, changing the colour of the area starting with the pixel marked by the point during the creation of the control. The properties that can be configured from this control are:



- Condition: This condition that has to be fulfilled for the application to paint the area with the selected colour you will specify.
 - Once the condition is specified, click on 'New' button and condition will be added to the list. To remove a condition from the list simply select it and click on 'Delete' button. When you have more than one condition in the list, control is activated when one or more of them are meeting.
- Colour: It lets you choose the fill colour that will be applied
- Simulate: If this check box are checked it will show a final simulation result of fill control, painting the fill area as it would be from the client scada if the selected condition is fulfilled.
- Tolerance: Also the tolerance, that this control will have, can be chosen with a maximum of 1000.

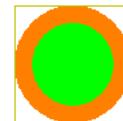
4.2.1.16 Parking sensor

Parking sensor control allows us to add the representation of each of the sensors added into the system in any part of any SCADA screen. This is a control that is refreshed in real time. The properties of this control are the following:



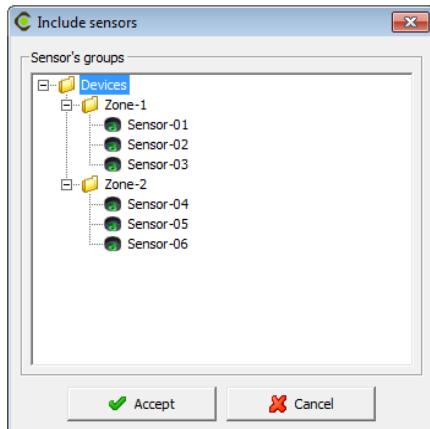
- Parking's sensor: Shows the name of sensor that is represented.
- Occupation time represented: Can set to: 1 hour, 6 hours, 12 hours or 1 day
- Maintain aspect ratio: preserves the proportions of figure
- Alignment: this configuration is the same for all controls (see: **!Error! No se encuentra el origen de la referencia.!Error! No se encuentra el origen de la referencia.**).

It allows indicate which sensor is to obtain status information detection time occupation represented, as well as properties, which apply to controls relating to the size of the control.



Exists different ways to insert control parking sensors:

- Indicating dimensions: Once parking control is selected, click on mouse right button and hold on it and move mouse till you will have the dimensions you wish.
- Selecting sensors: Once parking control is selected, do a click on mouse right button on screen without mouse movement then will be shown a device selection window:



You can select a folder to select all sensors in it. You can select sensors that you wish one by one and pushing "ctrl" key at same time. Or holding a click and dragging it to do a square that selects sensors which are in it. You can introduce these sensors in the next way:

you can be added it by one by one. The following icon appears:



Once added the first sensor you can resize it and the next sensors have the same size.

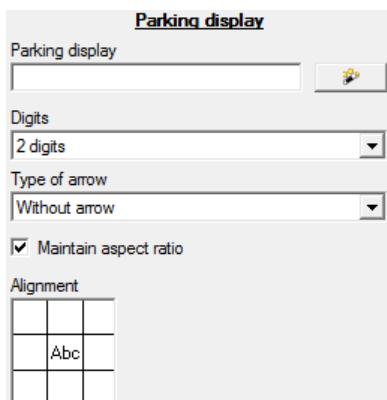
You can insert several sensors, selecting and dragging in the direction in which you want to insert (left-right or right-left). This control appears:



Once inserted any sensor, it is possible to manually move with the mouse or the arrow keys on the keyboard to adjust its final position.

4.2.1.17 Display parking

Display parking control allows us to add the representation of each of the displays added to the system in any area of any SCADA screen. This is a control that is refreshing in real time. Advanced range displays can be added to the second icon. The properties of this control are:

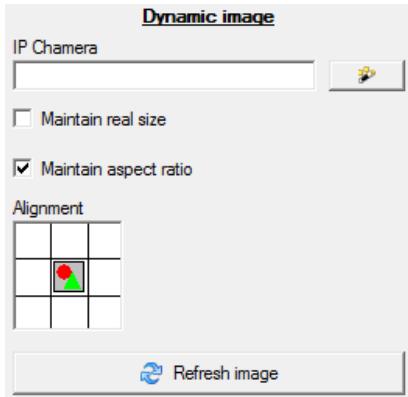


- Parking display: indicates which display information on the number of available seats is obtained
- Digits: indicates the number of digits that are represented in this display, can be 2-4 digits. This option is not available for the driver 'display CA / VMS / VMSF / VMSP'
- Type of arrow: You can set the arrow type. The options are: without arrow, arrow pointing up (north), arrow pointing down (south), arrow pointing to the left (west), arrow pointing to the right (east) or a combination of two of them. This option is not available for the driver 'display CA / VMS / VMSF / VMSP'.



4.2.1.18 IP camera control

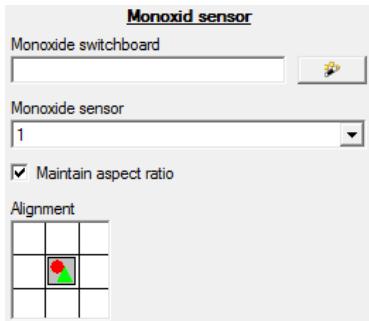
IP camera control allows us to add the image of a camera added to the system in any part of any SCADA screen. It is an image that is refreshing in real time. The properties of this control are:



- IP Camera: It indicates which camera is obtaining the sequence of images.
- Maintain real size: adjust to the real size of image of camera.
- Maintain aspect ratio: preserves the proportions of figure
- Image refresh: updates the camera image with a new picture request.

4.2.1.19 Unit monoxide control

The unit monoxide control allows us to add the representation of each of the units monoxide control added to the system in any part of any SCADA screen. The properties of this control are:



- Monoxide switchboard: indicates which of the connected stations to be connected.
- Monoxide sensor: select what sensor number (1 to 255) we'll represent.
- Maintain aspect ratio: preserves the proportions of figure



4.2.1.20 Analogue bar control

Use this tool to include an analogue bar in a report. This control, like others, can be placed anywhere in the report and enables a large number of different variables to be viewed. Select this tool and draw a selection box on the report by keeping the left mouse button pressed. The following properties may be configured from this control:

Analogic bar

Type	<input type="text" value="Maximum/minimum"/>
Variable type	<input type="text" value="Normal"/>
Orientation	<input type="text" value="Horizontal"/>
Value position	<input type="text" value="Top"/>
Variable (Empty cell)	<input type="text"/>
Decimals	<input type="text" value="3"/>
Maximum value	<input type="text"/>
Minimum value	<input type="text"/>
Prealarm value by maximum	<input type="text"/>
Alarm value by maximum	<input type="text"/>
Prealarm value by minimum	<input type="text"/>
Alarm value by minimum	<input type="text"/>
<input type="checkbox"/> Show annotations	

Type: Selection of values to be viewed in the control, maximums, minimums or both.

Orientation: Indicates the orientation of the control between horizontal or vertical.

Value position: Indicates where to display the control value label: above, below, left or right.

Variable: Select the variable that the control will monitor.

Maximum value: Indicate the maximum value the control can display.

Minimum value: Indicate the minimum value the control can display.

Prealarm value by maximum: Indicate the maximum prealarm value the control can display.

Alarm value by maximum: Indicate the maximum alarm value the control can display.

Prealarm value by minimum: Indicate the minimum prealarm value the control can display.

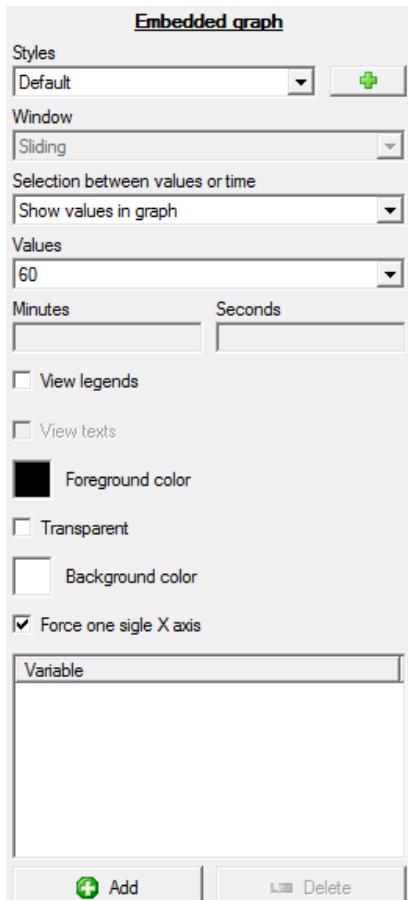
Alarm value by minimum: Indicate the minimum alarm value the control can display.

Show annotations: Indicate whether or not messages relating to alarm and pre-alarm values are displayed in the control.



4.2.1.21 Embedded graph

This tool allows the inclusion of an embedded graphic. This control, like others, can be positioned anywhere on the screen or report and displays a lot of different variables.



- Styles / Source / Justification / Animation: This setting is the same for all texts (see: 4.2.1.2 Control text).
- Window: no option enabled.
- Selection between values or time: You can choose to display values or time in the graph.
- Values: the number of values is selected to display in the graph.
- Minutes / Seconds: selection of minutes / seconds to be displayed on the graph.
- View legends: choose whether to display chart legends.
- View texts: This option is available only for variables chart type, where the texts of the variables will be displayed.
- Foreground colour:
 - Transparent: when this option is selected, the graph becomes transparent within the SCADA screen.
 - Forcing one single X axis: it is the option that forces the existence of a single axis X.
 - Variable: list of variables to be represented, each with its particular configuration.

- Type: For each variable you can choose the colour and type of representation we want. Possible types are: line, bar, point, pie variable chart or pie chart period.
- Style: the style is applicable for online graphics and point type with the following options:
 - Line: Solid, dashed, dotted, line-point or line-dot-dot.
 - Point: point, circle (5x5), square (5x5), diamond (5x5), blade (5x5), Cross (5x5), blade (3x3) and cross (3x3).
- Width: the style is applicable to the type line graphs with values of 1-10.
- Enforce minimum axis: type applies for line graphs, bar and dot. This option forces the value specified in 'minimum' on the Y axis
- Forcing maximum axis: type applies for line graphs, bar and dot. This option forces the value specified in 'maximum' on the Y axis



4.2.1.22 Parking flood fill

The filling control will allow change of colour of uniform background areas, or background image (all pixels having the same colour) regular or irregular. The control aspect is marking the point from which the pixel filling area begins. From the client will not be displayed, changing the colour of the area starting with the pixel marked by the point during the creation of the control. The properties that can be configured from this control are:



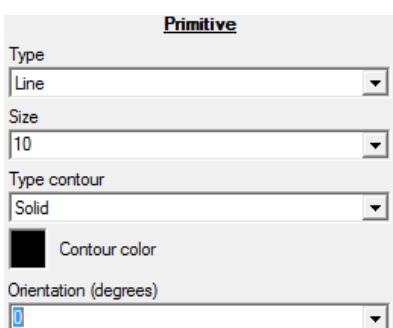
- Parking's sensor: This will specify what sensor you want to get status information detection.
- Simulate: If this check box are checked it will show a final simulation result of fill control, painting the fill area as it would be from the client scada if the selected condition is fulfilled.
- Tolerance: Also the tolerance, that this control will have, can be chosen with a maximum of 1000.

The colours displayed on the client depend on the selected state detection sensor. The colours are:

- Green: Free bay (sensor in the normal state).
- Blue: Free bay (sensor handicapped bay).
- Red: fully bay.
- Yellow: Family bay
- Orange: Reserved bay (reserved from the SCADA customer see manual 1.2.8.1)
- White: E.V. bay (sensor space electric vehicle charging)

4.2.1.23 Primitive

Primitive control is a tool for primitive drawings. Its properties are described below:

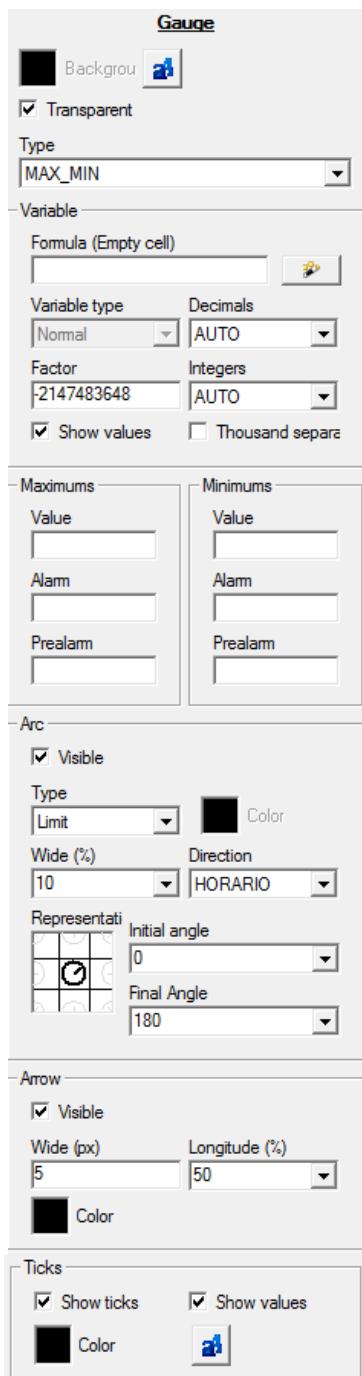


- **Type**: select the type of primitive form that can be: line, rectangle or ellipse.
- **Size**: The size of the primitive form with values from 1 to 90 is chosen.
- **Contour type**: You can chose different types of contours: solid, dashed, dotted, line point or line point to point.
- **Contour Colour**: you can choose contour colour through colour selection tool.
- **Orientation**: This option is only available for line, it can be adjusted from 0 to 360.
- **Transparent**: option available to rectangle and ellipse, becomes transparent within the selected shape.
- **Fill Colour**: option available to rectangle and ellipse selected the interior colour of the selected shape.



4.2.1.24 Gauge control

Gauge control is a control that provides visual information on values of parking.



Background colour: Using the colour palette is possible to adjust the background colour.

Transparent: This option overrides the background colour, become this control transparent.

Formula: formula or variable selected to represent.

Variable type: no option enabled.

Decimals: Sets the number of decimal to represent, can be automatic (AUTO) or a numerical value of 0-9.

Integers: adjusts to represent the whole, it can be automatic (AUTO) or a numerical value of 0-9.

Show values: the values are displayed or not in control.

Thousands separator: use or not the thousands separators.

Maximum / minimum: Fit different control values: value, alarm and prealarm. If not contains numerical value of colour it wouldn't displayed.

Visible: Sets if you going to see or not the arc.

Type: Can have limit, which is limited at end or cumulative, which accumulates values.

Width: the width of the arc is set in %.

Direction: Select the clockwise or anti-clockwise.

Representation: this option allows you to adjust the position of the control.

Initial angle: angle where the gauge starts.

Final angle: the angle where ends the gauge.

Visible: Sets if you can see or not the arrow.

Width: the width of the arrow is set with a numerical value.

Length: the length of the arrow can be adjusted in percentage value.

Show ticks: are the marks of separation of levels (max, alarm ...).

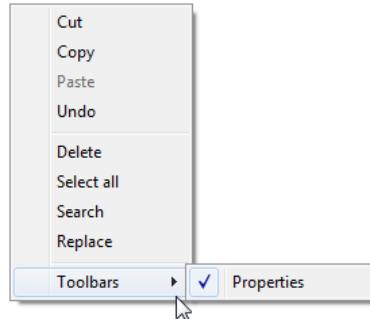
Show values: whether to display the values of the ticks.



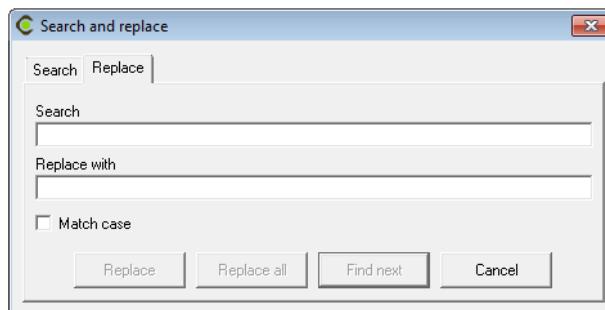
4.2.1.25 Mouse right-click options on Screen.

By pressing the right mouse button on the SCADA screen, we access several options:

- **Edit:** it is the common editing tools: cut, copy, paste, undo, delete, and select all



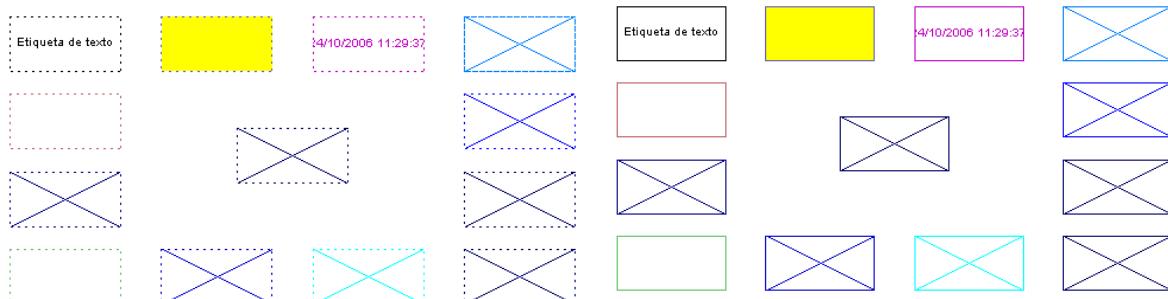
- **Search / Replace:** This option allows search for a text, or possibly replace it depending on the tool used.



- **Toolbars:** will be allowed to show or hide the property bar.

Any control inserted into the SCADA screen can be resized and moved. To resize control, simply place the cursor on one side of the rectangle that defines the control and keep it pressed while moving in the desired direction. To move a control will be necessary to press the left mouse button on it and hold it down while moving the mouse in the desired direction. It will also be possible to move more than one control at the same time grouping inside a rectangle. To group two or more controls should hold the left mouse button while moves the mouse to draw a rectangle that includes inside the controls wishing to move.

The controls inserted into a SCADA screen in normal mode are solid lines and being selected shown a dashed line around





4.2.1.26 Common options

Any control entered in the report sheet can be re-sized and moved. To re-size a control just place the mouse pointer on one side of the rectangle which surrounds the control and keep it pressed down while moving it in the desired direction. To move a control left click and hold while dragging the mouse in the desired direction. Move multiple controls by grouping them inside a selection box. Left click and hold to group two or more controls, drawing a selection box including the desired controls within.

4.2.2 Position tools

☞ **Horizontally center:** This function requires at least one control to be selected. Using the selected control as reference, one or more other controls situated on the report sheet can be aligned horizontally. The control or controls will move to the left or the right to end up completely aligned on the page. If this option is used with the “Control” button pressed each of the controls selected will be aligned independently.

☞ **Vertically center:** This control requires at least one control to be selected. Using the selected control as reference, one or more other controls situated on the report sheet can be aligned vertically. The control or controls will move up or down to end up completely aligned on the page. If this option is used with the “Control” key pressed, each control selected will be aligned independently.

☞ **Horizontally re-size:** This function requires at least two controls to be selected. The horizontal size of a control can be aligned to another existing one using this tool. Hold down the ‘Control’ key while left clicking the controls to be re-sized. The last control selected will be used as a reference for re-sizing the others, i.e., all the selected controls will end up with a horizontal dimension equal to the last control selected.

☞ **Vertically re-size:** This tool operates in the same manner as horizontal re-sizing but with reference to the vertical size of the last control selected.

☞ **Re-size vertically and horizontally.** This tool will re-size horizontal and vertical dimensions simultaneously.

☞ **Redistribute space horizontally:** This function requires at least three controls to be selected. The horizontal position of selected controls can be adjusted to place them equidistant from each other. I.e., controls to which this tool has been applied will be spaced evenly left to right.

☞ **Re-distribute space vertically:** This tool operates in the same manner as the horizontal space redistribution but with reference to the vertical re-distribution.

☞ **Align left:** This function requires at least two controls to be selected. Aligns controls according to the left most part. Hold down the ‘Control’ key while left clicking the controls to be re-aligned. The last control selected will be used as a reference for re-aligning the others, i.e., all the selected controls will end up aligned to the last control selected..

☞ **Align right:** This tool operates in the same manner as the left align but in the opposite direction.

☞ **Align top:** This function requires at least two controls to be selected. This function enables alignment of the upper edges of controls. Hold down the ‘Control’ key while left clicking the controls to be re-aligned. The last control selected will be used as a reference for re-aligning the others, i.e., all the selected controls will end up aligned with the top edge of the last control selected.



Align bottom: This tool operates in the same manner as top align but with reference to the bottom edges of controls.

Align vertically: This tool requires at least two controls selected for use. Using the same tool may be vertically align at position of the selected level of the central part of these controls. To make the adjustment, keep down the 'Control' key on your keyboard and clicking left mouse button on the different controls to want align.

Align horizontally: This tool requires at least two controls selected for use. Using the same tool may be horizontally aligning the position of the selected level of the central part of these controls. To make the adjustment, keep down the 'Control' key on your keyboard and clicking left mouse button on the different controls to want align.

Bring to Front: tool that puts selected control or controls in front of the other unselected controls.

Send to Back: tool that puts selected control or controls at the bottom of the other unselected controls.

4.2.3 Editing tools

These tools carry out the same operations as the options from the ‘File’ and ‘Edit’ menus.

Save: Use this tool to save changes made to the report.

Save as: Use this tool to save a copy of the report with a different name.

Cut: Use this tool to copy selected controls to the clipboard and delete them from the report. The same operation may be performed using the “Control” + “x” keyboard command

Copy: Use this tool to copy selected controls to the clipboard. The same operation may be performed using the “Control” + “c” keyboard command

Paste: Use this tool to paste the clipboard contents to the report. The same operation may be performed using the “Control” + “v” keyboard command

Undo: Use this tool to revert recent changes to a previous state. The same operation may be performed using the “Control” + “z” keyboard command

Delete: Use this tool to delete controls in the report.

Select all: Use this tool to select all report controls at once. The same operation may be performed using the “Control” + “e” keyboard command

Search: Use this tool to find specific text in report.

Replace: Use this tool to replace specific text in a report with different text.



4.2.4 Zoom tools

Zoom in/Zoom out: Using these tools you can zoom in or out from the image that is currently defined for the report page display.

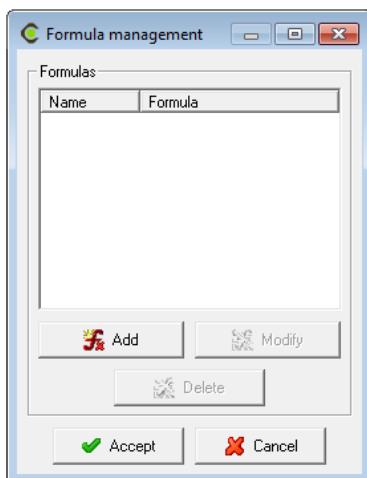
Adjust: It will adjust the zoom to sheet that is being viewed at that time to as large as possible that be displayed depending on the resolution of the screen where the program is running.

Fit width: It will adjust the zoom to wide sheet that is being viewed at that time to as large as possible that be displayed depending on the resolution of the screen where the program is running.

Use this control to indicate a specific zoom to implement on the report page. The values range from 50% to 1000%. Use 'Fit to page' mode to adapt the zoom to the report sheet being displayed, to appear as large as possible given the screen resolution where the program is running.

4.2.5 Miscellaneous tools

Configure formulas: Use this tool to define formulas, which may be applied to or referenced in any of the report pages for which they have been defined. The following window will appear when the button is clicked:

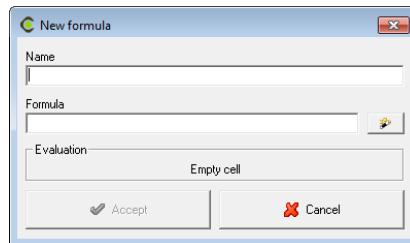


Right click the list of formulas and the following contextual message will appear:

Cut	Ctrl+X
Copy	Ctrl+C
Paste	Ctrl+V

You can enable cutting, copying, and pasting variables in the active report, as well as enabling formulas to be copied between different reports or SCADA screens. Some of the options from the context menu may not appear. Copy will only appear if there is a style selected, and the paste option only if the styles have been copied onto the clipboard. If no formulae are selected and there are no formulae on the clipboard when the right button is clicked the context menu will not appear.

Click 'Delete' to eliminate the selected formula. Click 'Add' or 'Modify' to open the formula modification window:



Where we can give a name to the Appendix 9.1 Expressions and that there are certain formulas names name of a formula can't contain characters or one of the reserved those that match the name of an Appendix 9.1 Expressions and Conditions).

formula and detail it (see Conditions). It is worth noting that are not allowed, thus the certain types of special words. Reserved words are available function (see

Horizontal/Vertical Orientation: This tool enables the orientation of the report sheet to be defined. Controls do not reorganize when changed from horizontal to vertical or vice versa. So some tools may end up invisible by virtue of being covered by another. However, these controls have not been deleted, and if the change is reversed they will become visible again.



4.2.6 Pages tools

Add page: Use this tool to add a new page to the report. Reports can have multiple pages with separate content. Each of these pages is linked to a single report and the only common elements between different pages are formula.

Delete page: Use this tool to delete the active page.

Forward / Back: Use these tools navigate through a report containing more than one page.

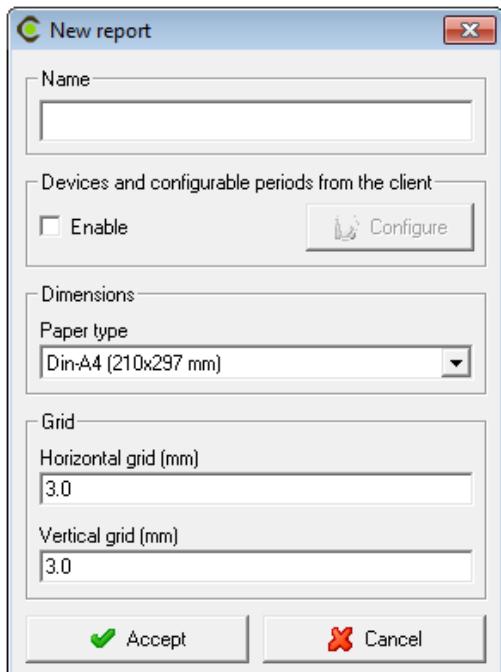
Using this control will directly show a page of the report without having to progress page by page with the tools described above. Clicking the control opens up a list of pages available for the active report.

5 Report menu

5.1 Add/ modify/remove report

The first time you access to this menu you must create a report, due the program doesn't have any. You can't access to this menu if not exist any report.

All reports must have a few parameters that could be modified in the future though button.



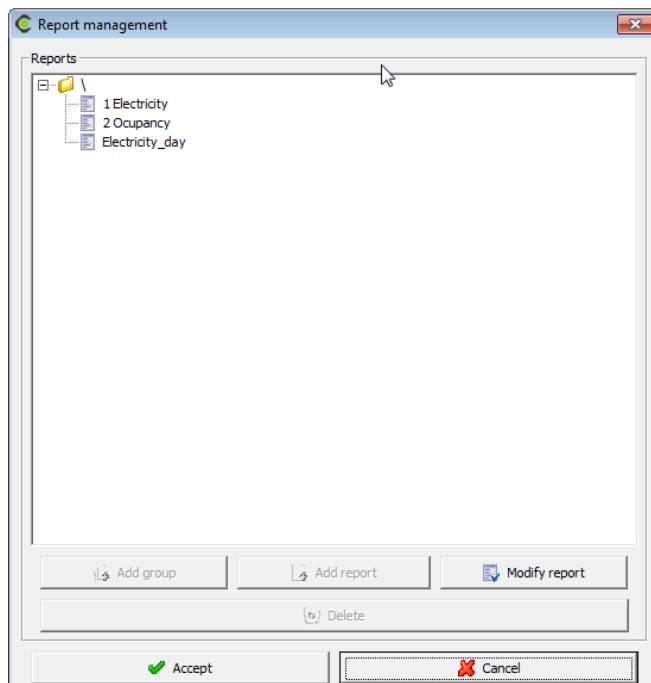
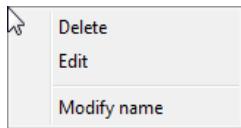
- Name: name as the report will called
- Devices and configurable periods from the client: this option doesn't be used by parking users.
- Dimensions: select the size of the report, these couldn't be modified due each report is distributed by their dimensions. The options are:
 - Din-A0 (841x1189 mm)
 - Din-A1 (594x841 mm)
 - Din-A2 (420x594 mm)
 - Din-A3 (297x420 mm)
 - Din-A4 (210x297 mm)
 - Din-A5 (148x210 mm)
 - Din-A6 (105x148 mm)
 - Din-A7 (74x105 mm)
 - Din-A8 (52x74 mm)
 - Din-A9 (37x52 mm)
 - Din-A10 (26x37 mm)
- Grid size: adjust vertical and horizontal parameters of a tool called grid



Once these parameters are set these will be applied immediately. A new screen will appear with a white background. If you modify an existing screen to make their size lower could mess up all elements in screen.

To modify the screen's parameters, create group of screens or delete screens, you can access to scada screen management

In the same way to manage group of device you can manage screens, move screens between groups or modify clicking on mouse right button:



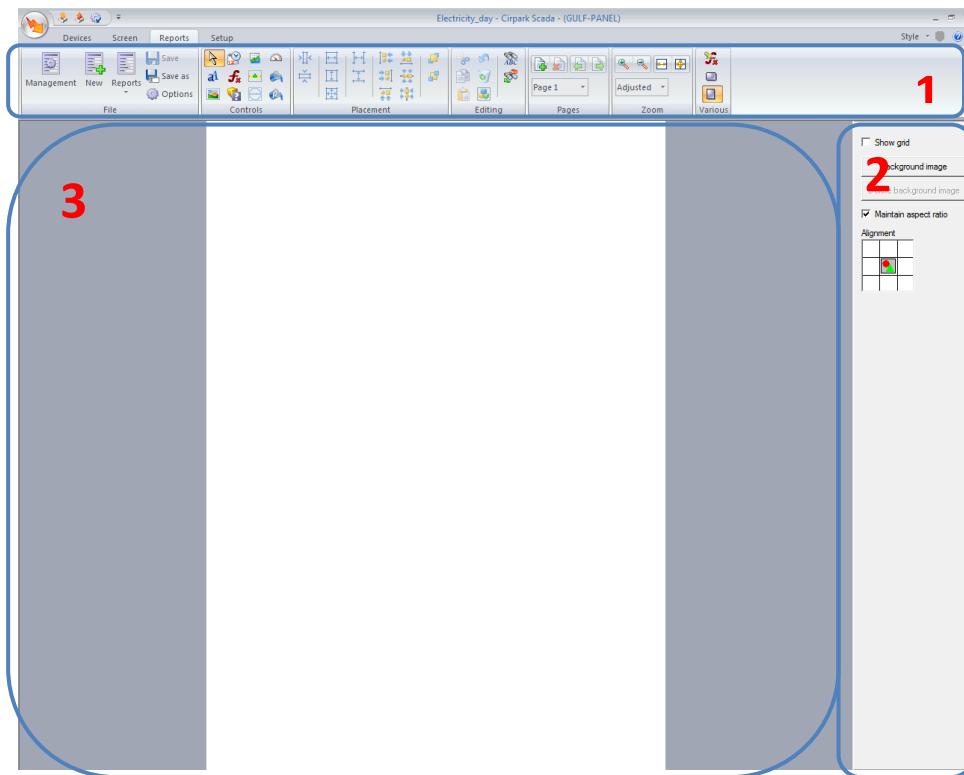


5.2 Report scada edition

Through report scada edition will be possible to add, modify or delete report controls. These controls can display the value of a variable, perform some action, paint an area of the screen, etc.

The aim of the report is to show simply historical plant data, allow you to see the status of the various lines of the plant, showing electrical installation variables, etc. The elements that will get will report controls.

The editing window reports SCADA looks like this:



The window is divided into three areas:

- Tools (1)
- Information panel (2)
- Report page (3)

These tools allow the report design to be configured more easily.

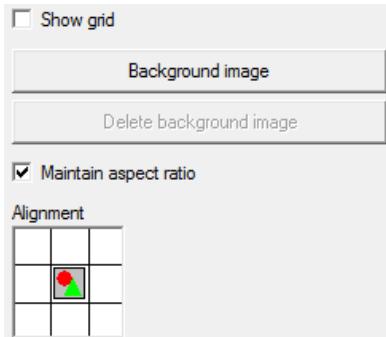
The information panel enables access to all the configuration options of a control, which is added to the report design and may be selected at that time.

The report sheet is the report design view.

Therefore, using the tools (1) controls can be inserted in the report sheet (3) whose properties can be configured in the information panel (2).

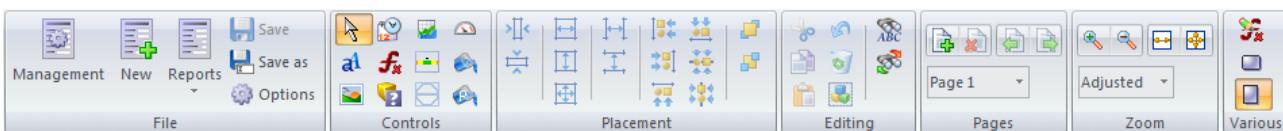


When a new report is being created, the configuration properties will appear by default in the information panel at the bottom of the report. These are the same properties that appear when no control selected.



- Show grid: The '*Display grid*' option displays or hides the grid, which indicates the position of objects on the screen. If the grid is shown, the object will be automatically aligned to the grid.
- Background image: Select this option to add an image from the image manager; **Error! No se encuentra el origen de la referencia.** so that it can appear in the report background.
- Delete background image: Click on this button to eliminate the present background image.
- Maintain aspect ratio: If activated, this option will maintain the width and height proportions of the selected background image. If deactivated, it will force the image to occupy the entire length and width of the report sheet expanding or contracting it as required.
- Alignment: It enables the image chosen to be situated as the background to any of the seven positions defined in the figure.

As for tools, there are several kinds grouped according to their usefulness:

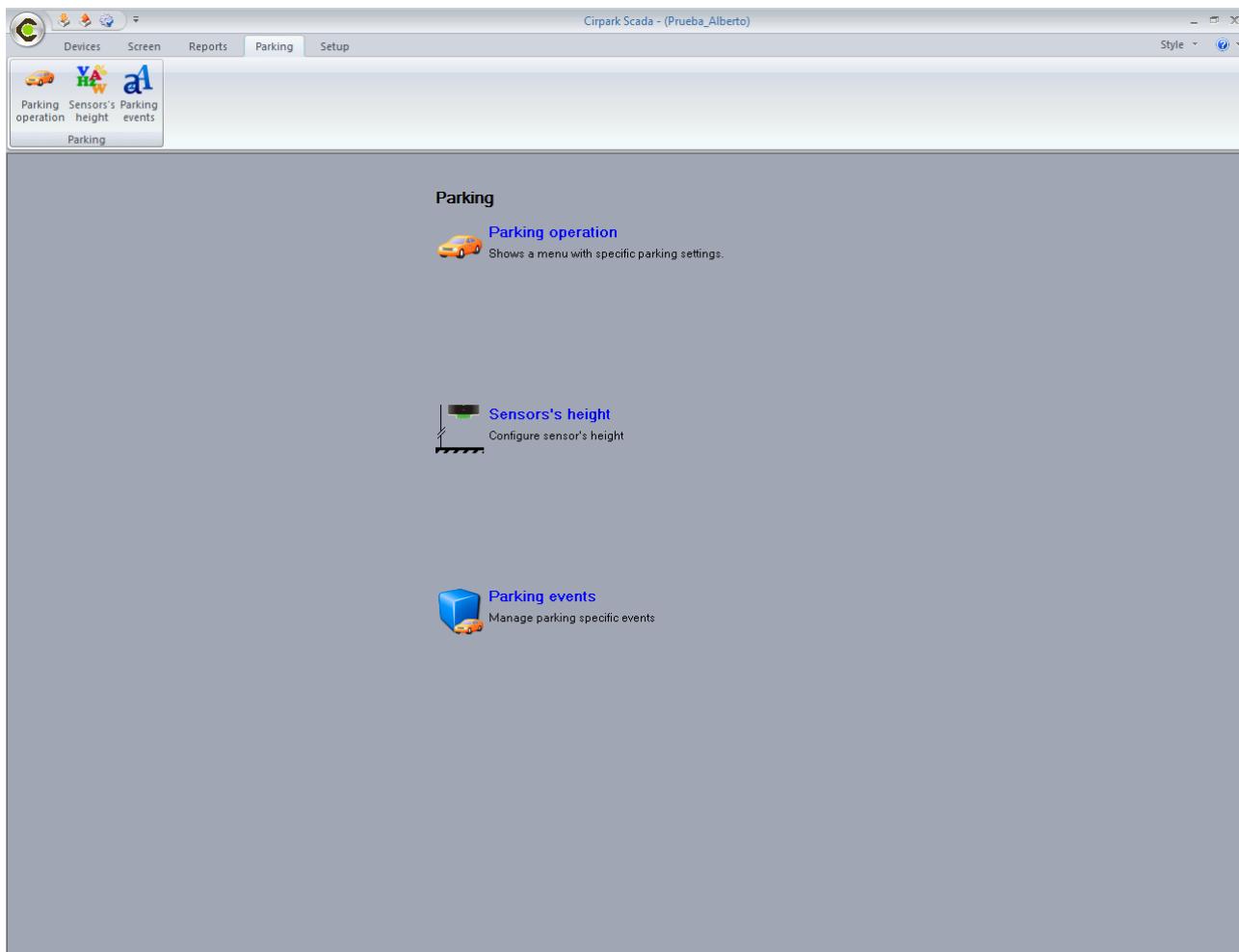


- Tools "actions"
- Tools "position"
- Tools "pages"
- Tools "zoom"
- Tools "various"
- Tools "edition"

All controls are explained in 4.2.1 action tools.



6 Parking



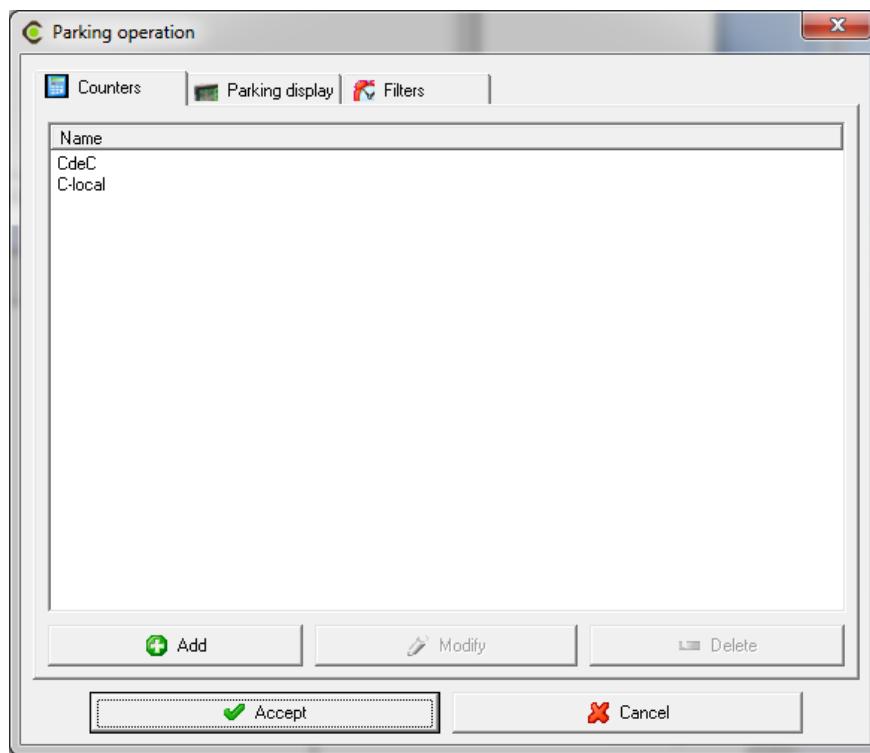
This setup menu groups several settings and parking functions that you must make in any parking guidance system. It is possible that in certain installations all the options available are not used here because it depends on the installation requirements and / or end user.

They divided into 3 sections they will explain each in detail below.



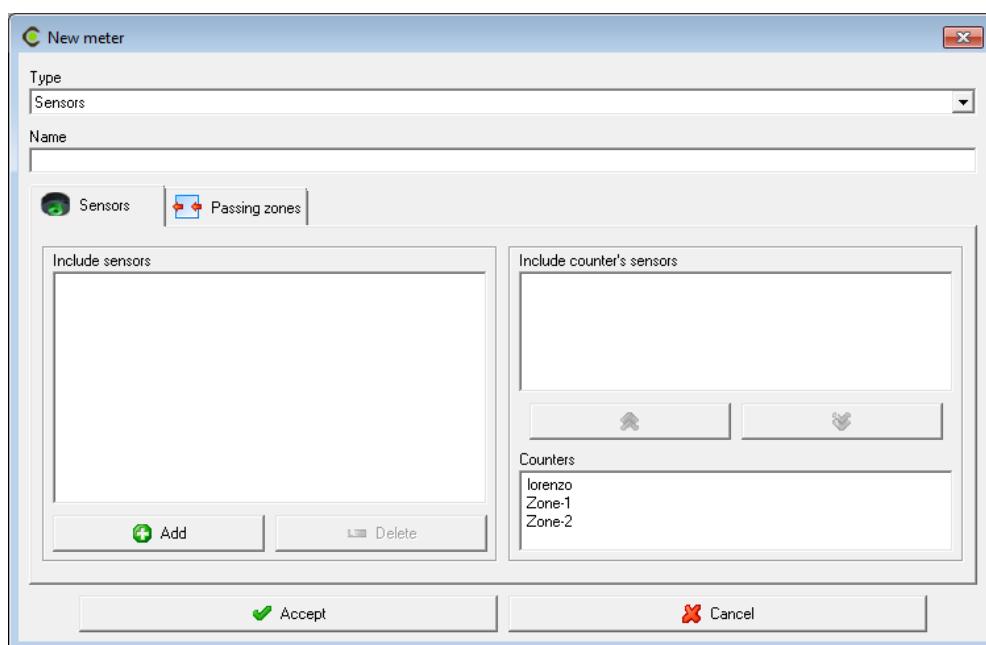
6.1 Parking operation

When this option is selected, following windows appears:



The screen will display three tabs; the first is for adding, modifying or deleting car park counters. The second tab is for selecting the counters for each car park display configured in the Device option. The third tab activates a filter for distinguishing detections.

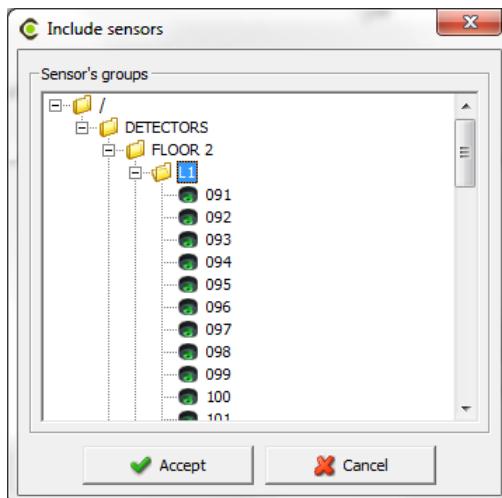
Pushing the Add button on the Counters tab, the following pop-up will appear:





- **Type:** Defines the counter type.
 - **Sensors:** Counter for zones with space to space sensor guides.
 - **Capacity:** Counter for zones without space to space sensor guides.
 - **Multiparking Counters:** Counter of counters in other car parks. This advanced feature is used for creating counters as a sum of others pertaining to different motors.
 - **Advanced Counters:** This counter displays a formula that does not have a limit of the number of free spaces like the other counters. This makes it possible to display other types of countable spaces or spaces with user defined conditions.
- **Name:** An alphanumeric field for identifying the counter.
- **Sensors:** This tab is used for choosing the sensors with which the counter will calculate the free spaces.

Click add button to visualize the “Select Driver” window. All sensors groups are shown.



Select a group to add all sensors that belongs to this group or select an independent sensor.

Several sensors can select at once. Press the “Control” button of your keyboard and use the left mouse button to click over the sensors to be selected.

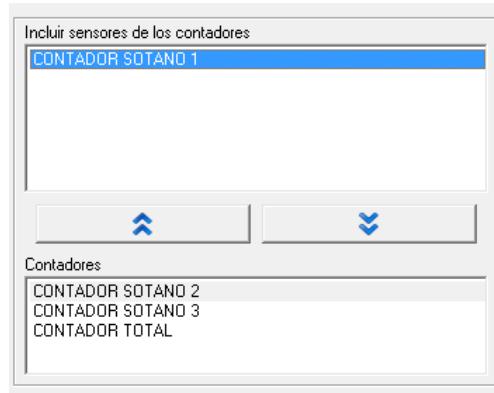
Use the “Shift” key to select a group of consecutives sensors. Selected sensors are shown with a blue background.

Click delete button to unlink a sensor from this counter.

The section "Include counter's sensors" allow adding counters previously created to this counter.

Select a counter from the list “Meters” and click to include the counter's sensors.

To unlink a counter, select the definition from “Include counter's sensors” and click .



Other way more visual to create a counter is to make it through one screen where you can see your parking map and your sensors. When you are on your screen, where you can see the sensors which you want to create a counter, you can choose them, click on right mouse button, select "Create parking counter sensor", give a name to the new counter and it will created automatically. In addition you can link a display to this counter on the same way. When you select sensors on screen you only must choose the display which you want to link and follow previous instructions the counter will be created automatically and display will be linked too.

- **"Passing Zones" Tab:** If your installation is a combination of sensors and pass detectors, use this tab to define the inputs of the MR4/dp used for this counter.

When this input detects the pass of a vehicle, the counter will decrement a free space during the specified "Time". Pass detectors, photocells, magnetic loops and contacts can be used.

"Passing zones" shows the list of available MR4/dp and inputs previously created. Select the input from the MR4/dp and click . To add this input to the "Passing zones on the counter".

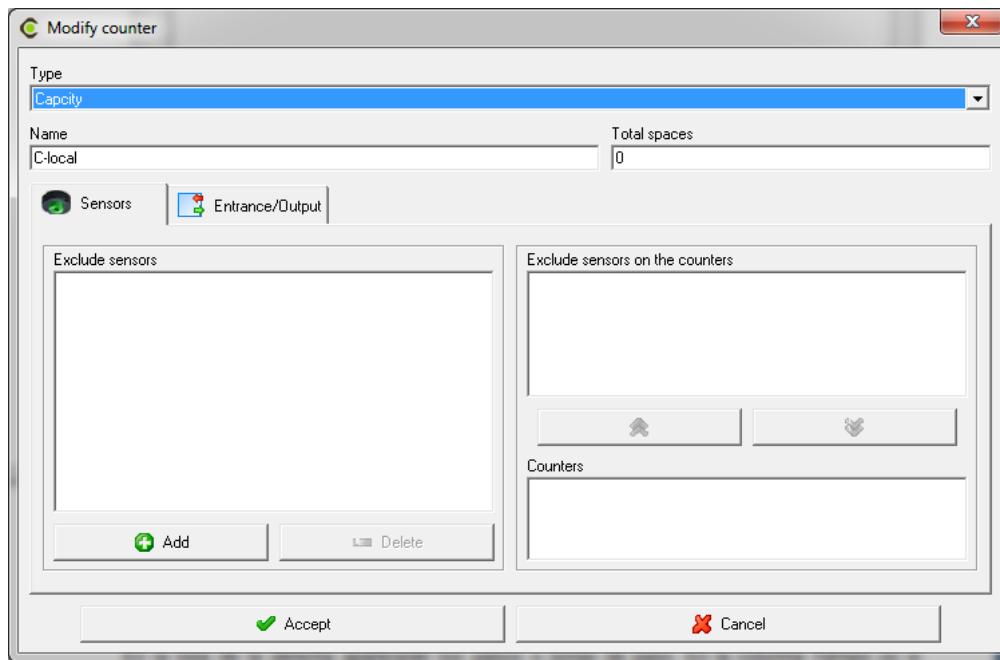


All selected inputs will appear in the "Passing zones on the counter" list. For each input definition, a "Time" in seconds must be defined. This time must be the average time used by the car to park in an empty parking place after crossing the input of the MR4/dp.

MR4/dp inputs can be programmed as single inputs, directional or bidirectional. If Bidirectional inputs are defined, two senses are available for each input. Sense A is used when activation sequence goes like: 1-2, 3-4, ... Sense B is the inverse sequence, 2-1, 4-3, ...

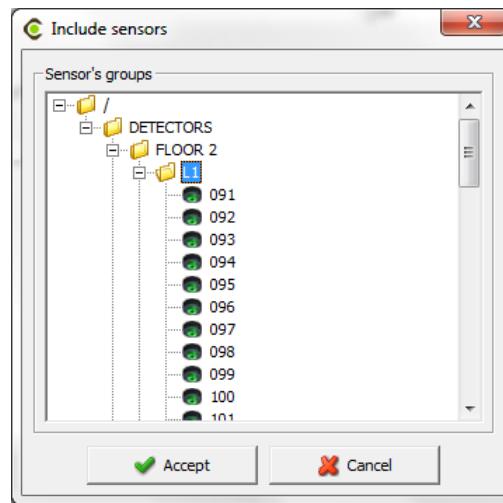


- **Fitting out a zone without sensors:** Check this box to create a counter without sensors. Use this option in installations where MR4/dp's are used to count cars into zones. When checked, the window changes as follow:



- **Total spaces:** Indicates the number of parking spaces that composes the zone.
- **Sensors:** When single space detection is combined with zone counting, select the sensor that will be excluded from the counting.

Click add button to visualize the “Select Driver” window. All sensors groups are shown.



Select a group to add all sensors that belongs to this group or select an independent sensor.

Several sensors can select at once. Press the “Control” button of your keyboard and use the

- **Entrance/Output:** Select the inputs of the MR4/dp that will compose the “Inputs on the Counter” and the “Outputs on the counter”.

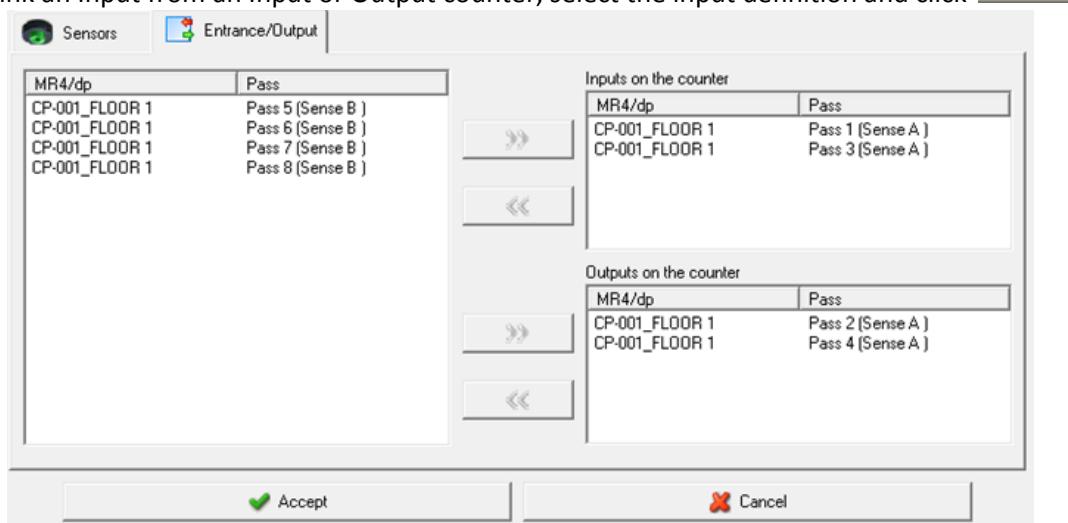


Inputs defined in “Inputs on the counter” will decrement a value of the “total space”. Inputs defined in “Outputs on the counter” will increment a value of the “total space”

DPU crossing detector, photocells, magnetic loops or dry contacts are examples of Inputs on the MR4/dp.

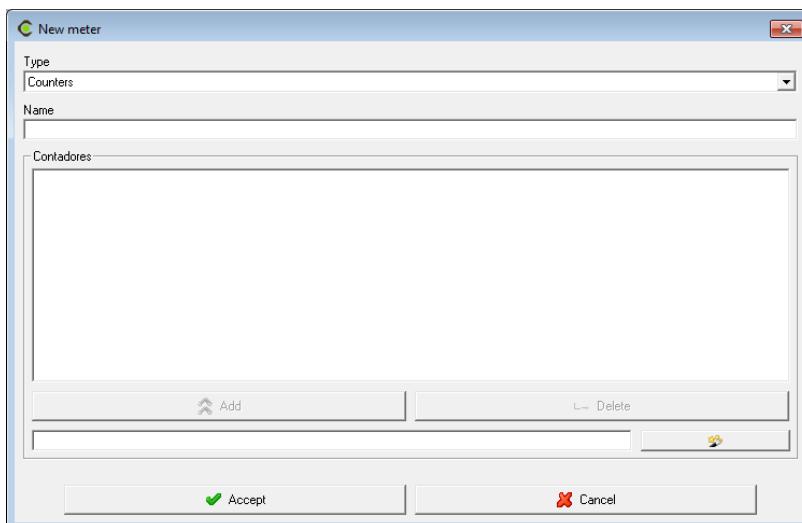
The left side of this window shows all the MR4//dp previously created in the Devices menu.

Use the icon to set an input from the MR4 to an Input or an Output of the counter. To unlink an Input from an Input or Output counter, select the input definition and click



MR4/dp inputs can be programmed as single inputs, directional or bidirectional. If Bidirectional inputs are defined, two senses are available for each input. Sense A is used when activation sequence goes like: 1-2, 3-4, ... Sense B is the inverse sequence, 2-1, 4-3,....

- **Multiparking Counters:** Selecting this option changes the on-screen display:

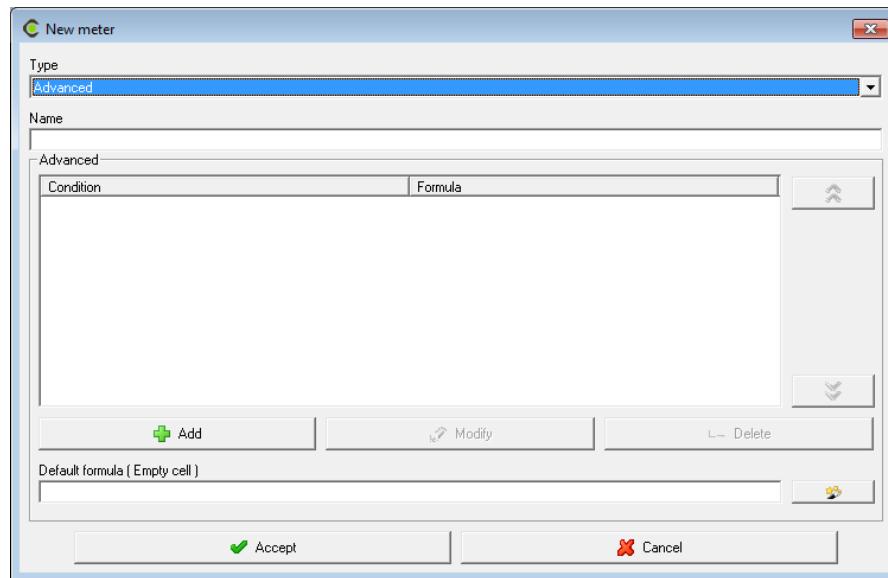


The application device tree will open for selecting the external counter to be added and inserting it in the "Counters" list.

- **Advanced Counters:** Selecting this option changes the on-screen display:



- **Multiparking Counters:** Selecting this option changes the on-screen display:



This procedure is the same as when entering formulas. Both for default conditions and formulas, created on the Cirpark screens (see **!Error! No se encuentra el origen de la referencia.!Error! No se encuentra el origen de la referencia.** for more detailed information on how to create these formulas).

6.2 Sensors height

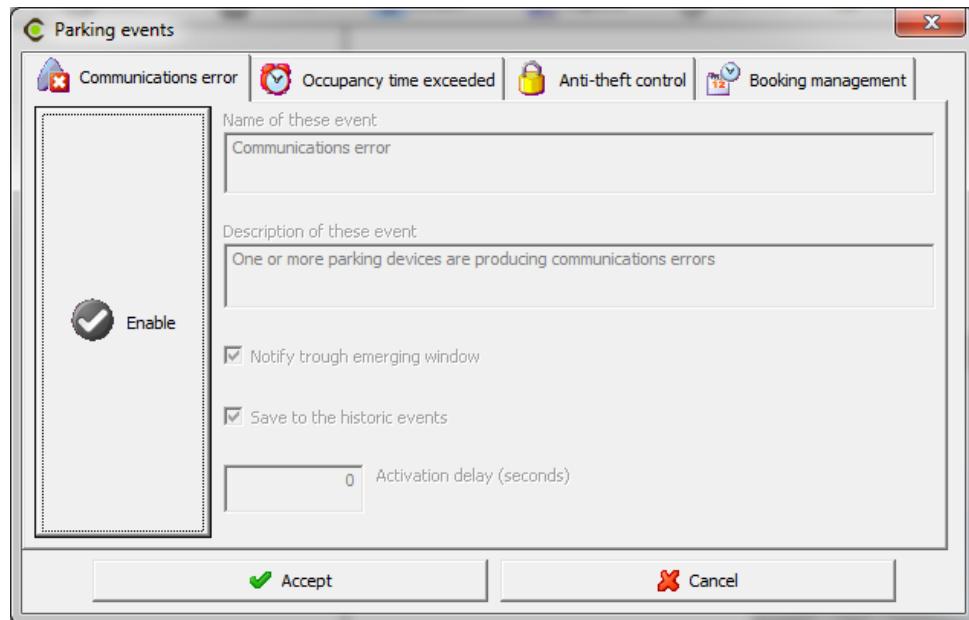
This screen allows you to set up parameters for each device. When opening dialogue will read the configuration software of the device, by the end, if 'OK' button is pressed and software changes have occurred will send the information to the device. In any case, this information is saved to the hard disk of the PC.





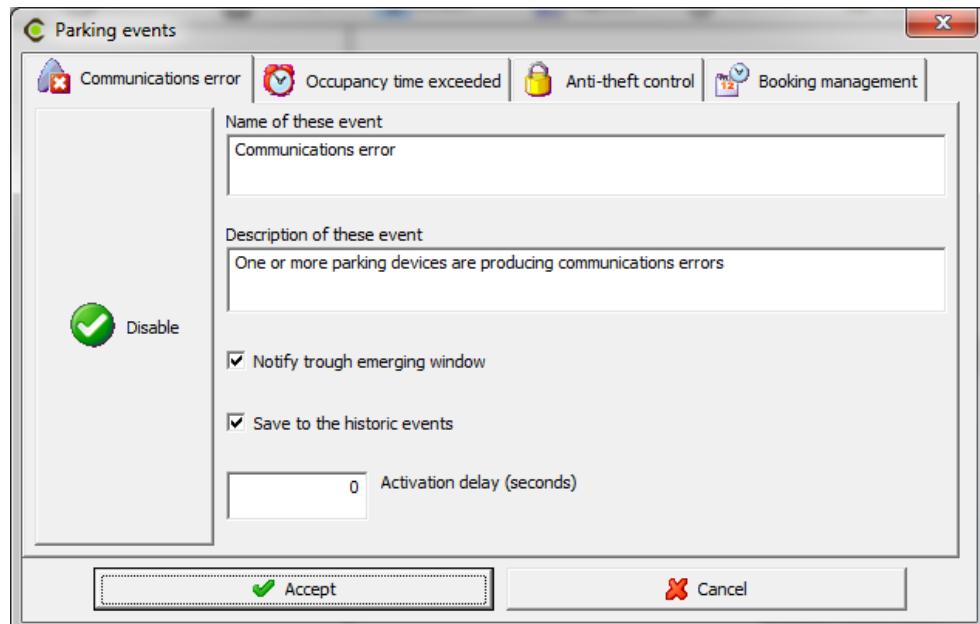
6.3 Parking events

Selecting this option opens the following window:



This window is used for enabling the notification and logging of different groups of incidents. The different descriptions of the incident types, as well as application manager generated notifications and incident types can be defined and logged in the system.

- **Communication Errors:**

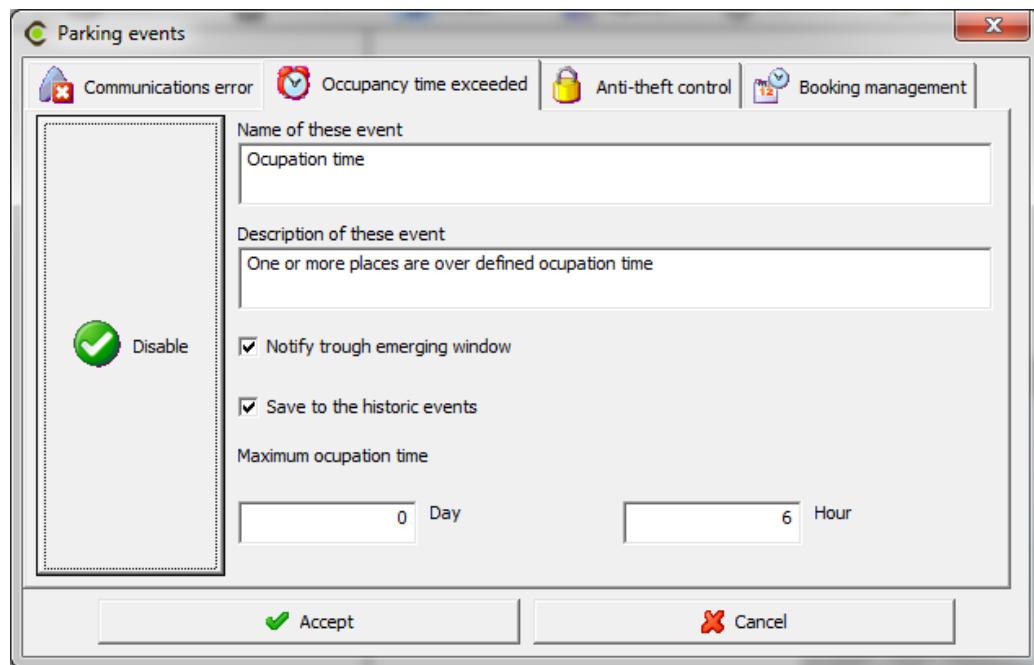


This tab is used for enabling the advanced communications system error log, pop-up notifications, system log file error logs, and delayed activation of said notifications and logs.

All of this information can be accessed on the system from the "Incidents" submenu.

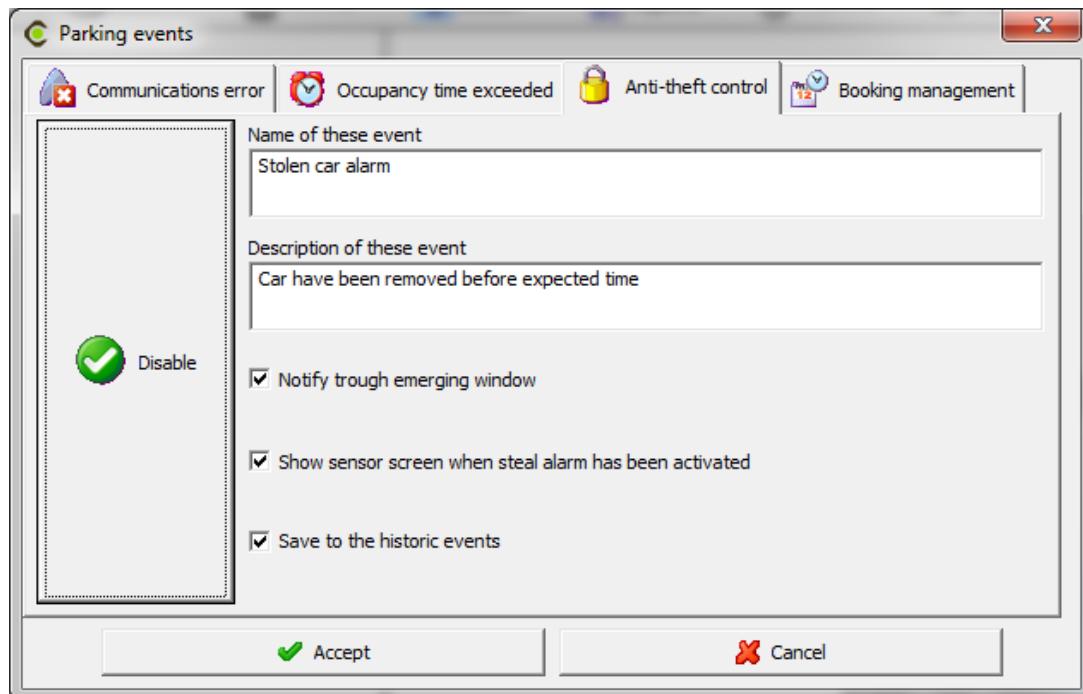


- **Time limit exceeded:**



This tab is used for enabling the log for spaces that exceed the pre-defined occupation time; the spaces with this feature (see Customer's manual for enabling this feature in the desired spaces) will enable this incident. It is also possible to enable the incident notification pop-up window, the error log in the system log files, and a generic occupation time for the entire car park (see Customer's Manual for personalising different occupation time limits in each space).

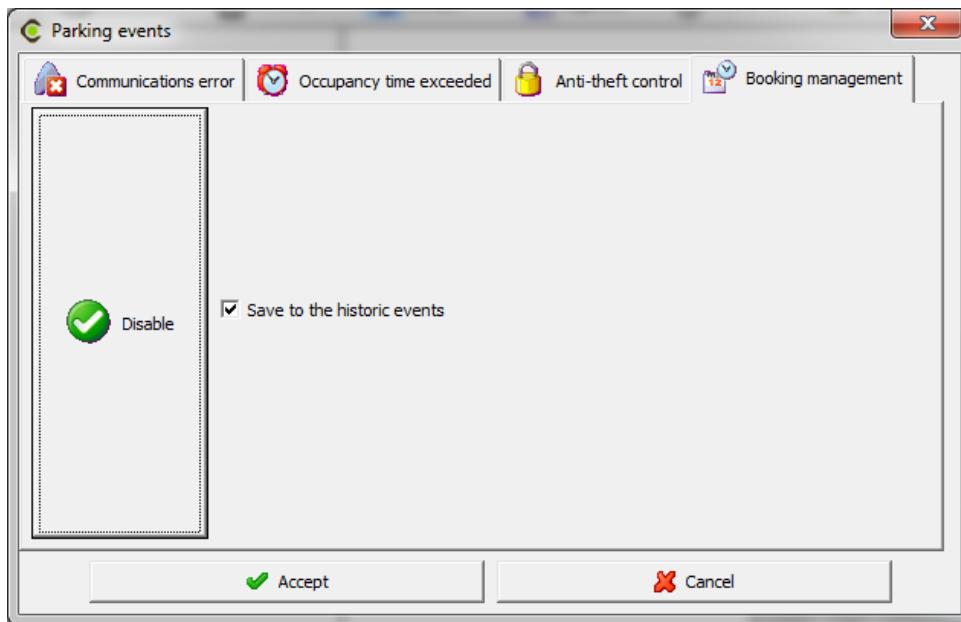
- **Anti-theft Control:**





In this tab the log of spaces that have been freed ahead of time can be enabled for offering the anti-theft feature. Similarly, the incident notification pop-up screen and the error log in the system log files can be enabled to automatically display on the screen the space where the vehicle being freed unexpectedly is occurring.

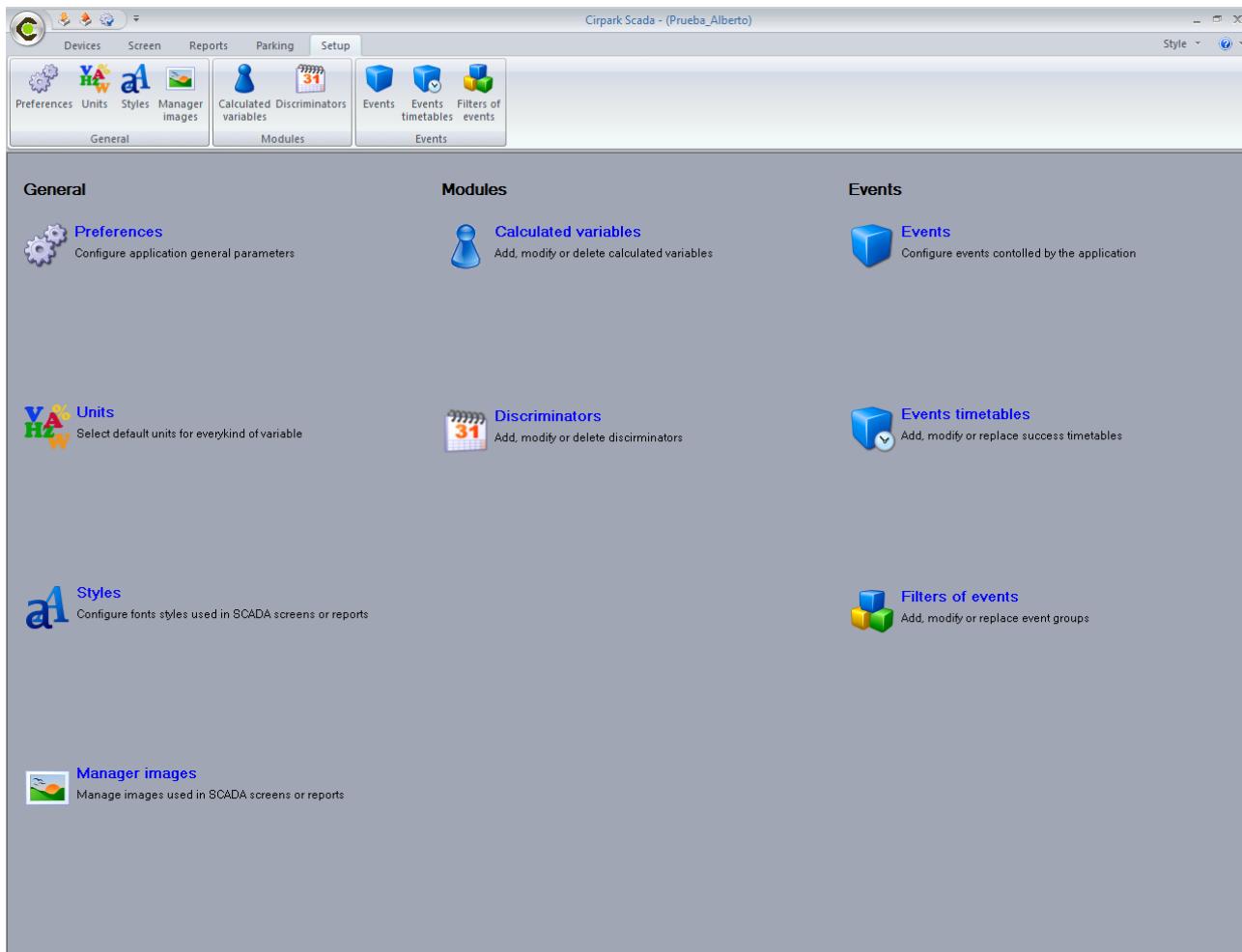
- **Booking management:**



This tab is for enabling the reserved space log (see Customer's Manual for defining reserved spaces).



7 Setup menu



This setup menu groups several settings you must make in any installation. It is possible that in certain installations all the options available are not used here because it depends on the installation requirements and / or end user.

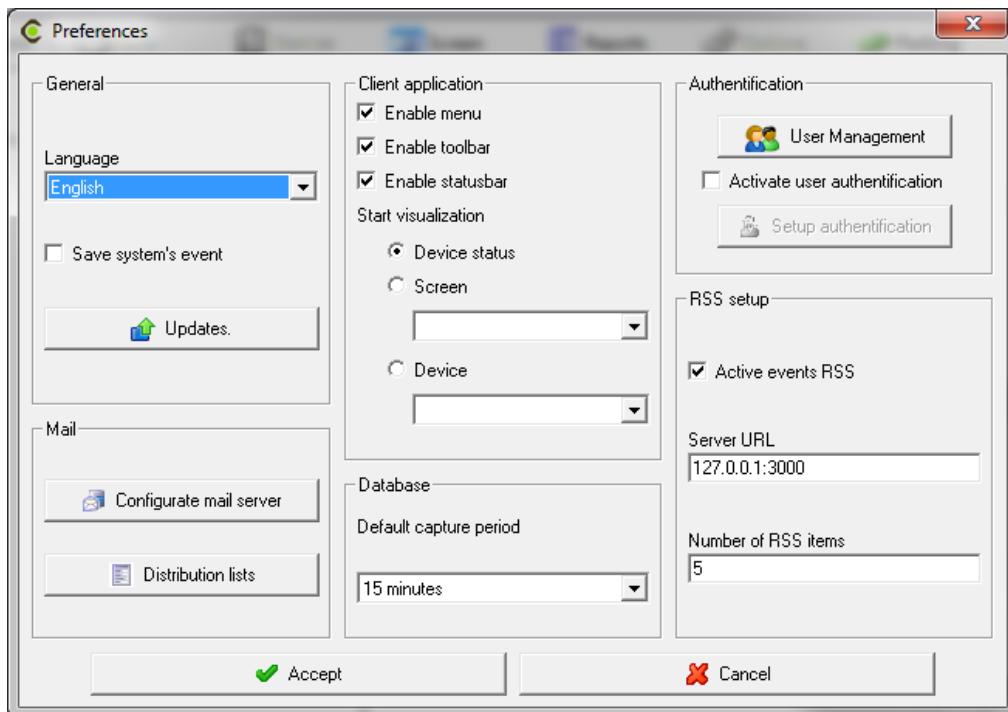
They divided into 3 sections they will explain each in detail below.



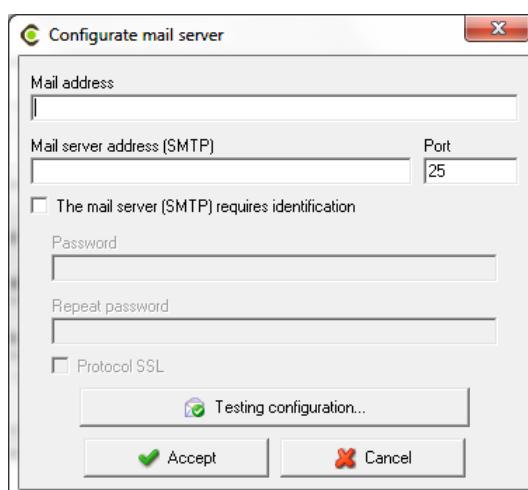
7.1 General

7.1.1 Preferences

General parameters of the CirPark scada are defined here.



- Language: Select the language to be used in the application. It has the following languages: Arabic, Catalan, Chinese, Croatian, Czech, Dutch, English, Finnish, French, German, Greek, Hebrew, Norwegian, Polish, Portuguese, Russian, Serbian, Slovenian, Spanish, Swedish, Thai y Turkish.
- Save system's event: If checked, events are saved in a log file and a Report window is enabled indicating all activities of the system in the CirPark Scada client.
- Configurate mail server Opens the “Configurate mail server” window to define the electronic mail parameters and send emails when an event occurs.





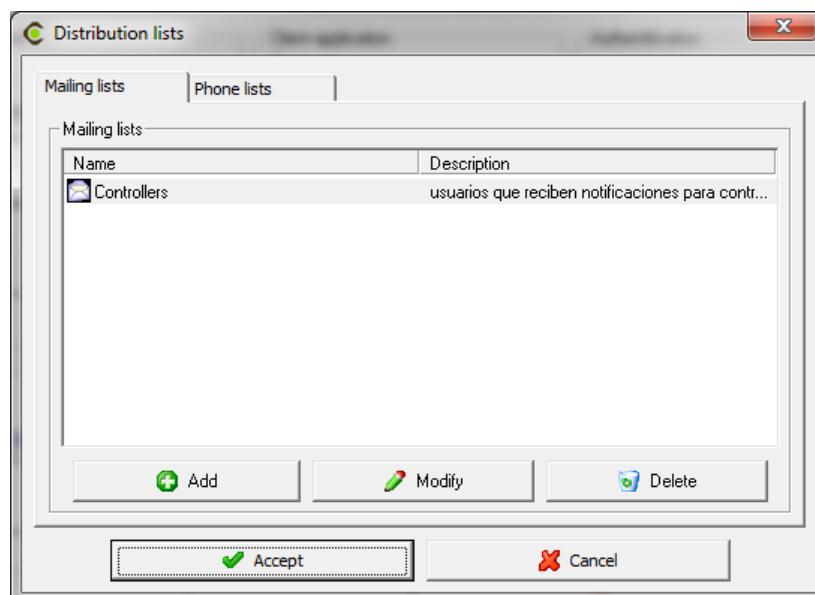
Set the '*E-mail address*' of the sender, and the SMTP address in "*Mail server address (SMTP)*" Check "The mail server (SMTP) requires identification" if needed.

It will be possible to test parameters by clicking on "Check configuration." An e-mail will be sent to the sender or an error message will appear.



Contact your system administrator to have more information about the parameters of the email server.

A user email and telephone list can be created for setting up different distribution lists for sending notifications of incidents, events, alarms and errors to predefined groups.



Update: Use this option to update easily the software properties. The section **Updates** explains the detailed features of this option.

User Management: Allows you to enter additional user data for registration, notification by SMS, email, etc. If the 'Save System Events' option is on the actions taken by users will have saved, whether they have access to the resource as if it has been denied access permissions.

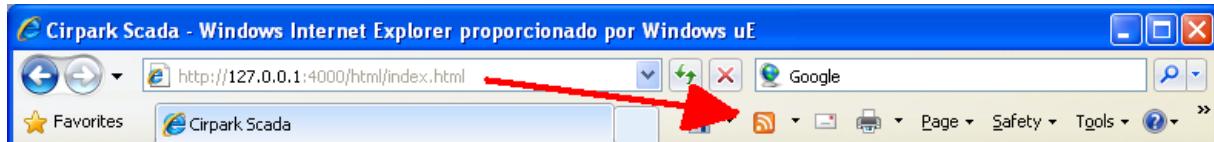
Enable user authentication: it may be requested a name and password to the user who tries access the application via a remote PC, to allow access to a range of application resources and deny access to other resources. (See 6.4.3 Wizard to create expressions and conditions).

Client application: Allow enable or disable viewing of menus and toolbar at the Java Client. It also allows you to configure the display if the application using the Java Client is displayed.

Configuring RSS syndication: The engine can be configured as a RSS content producer so that we can generate news related to events so they can be consulted by any RSS news reader (available free for almost at any platform or environment). Activate the corresponding box in the window '*Configuration of the RSS feed*' and configure the two required fields.



In 'Server URL' you must define the address to which the HTML server is configured. In 'Number of RSS items' the maximum number of news stories we want to publish is defined (stories are published in a circle, so that when the maximum number of stories are published the oldest are removed to continue publishing new stories). Typically browsers detect that the server contains an RSS feed and allow access thereto (subscribe).



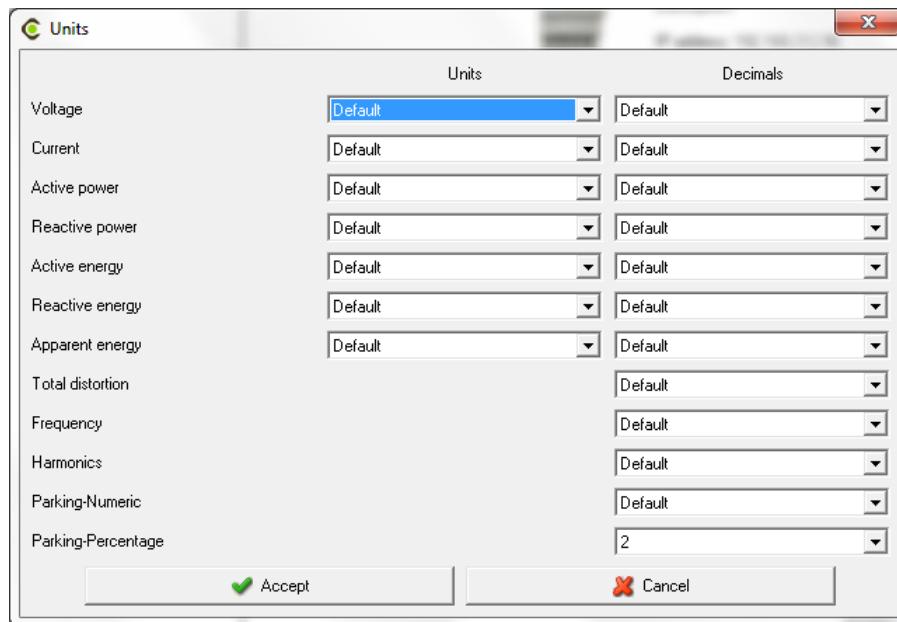
Message on the Internet Explorer about the RSS FEED found

The RSS newsreader provided by Internet Explorer allows consulting the news published by the engine.

There are other RSS readers displaying the news in different ways for almost any imaginable environment, including mobile devices, PDAs, etc. Note that each event must be set if we want an RSS news related to it or is not published.

7.1.2 Units

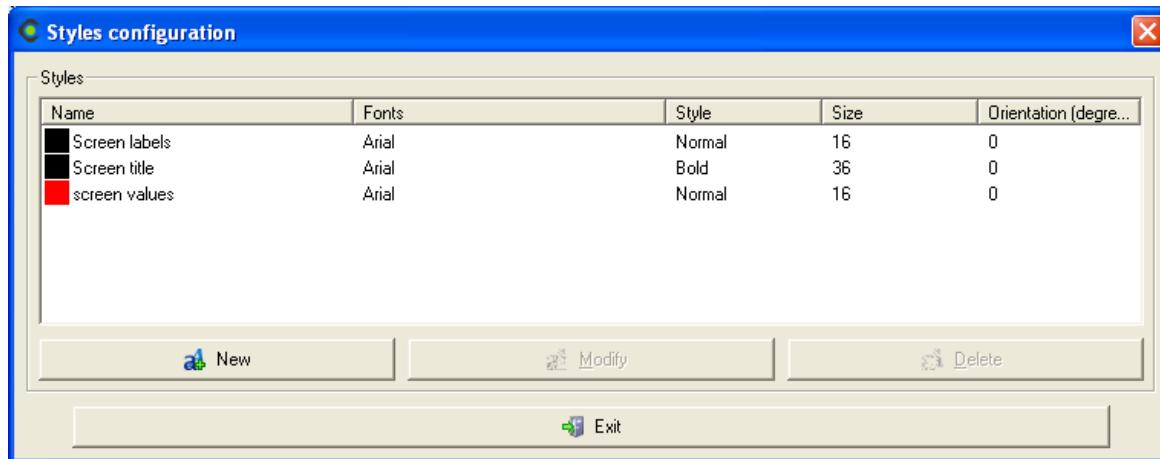
Allow configuring the default units and decimals of the variables.



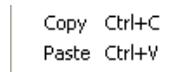


7.1.3 Styles

This option can be used to add, modify or delete font styles to be used to show the values on the different Scada screens and reports. Each one of the styles will be made up of a colour and a font format.

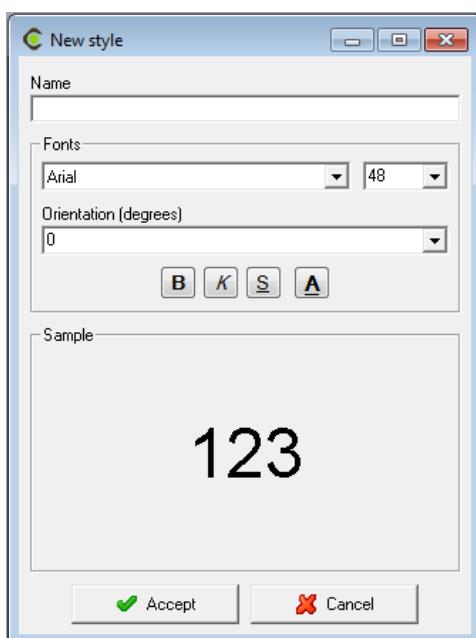


Click the right-button on the mouse over the list of styles, the following contextual message will appear.



Enabling styles to be pasted and copied. It may be possible that some of the options from the context menu do not appear, copy will only appear if there is a style selected and the paste option only if the styles have been copied onto the clipboard. If no style is selected there are no styles on the clipboard, when the right button is pushed the context menu will not appear.

Push the 'New' or 'Modify' button and it will be possible to add or modify a style.

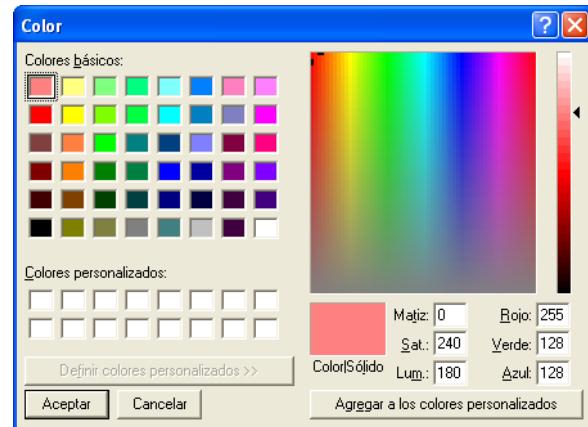


- Name: Corresponds to the name of the style. This name will uniquely identify the style; there are no two styles with the same name.
- Fonts: Will correspond to the type of font used for the style.
- Bold and/or italic: Corresponds to the style of the font. Depending on the font selected, you can choose bold and / or italics.
- Size: Corresponds to the size of the font. The size could be between 1 and 90. The size can be either keyed in or selected from the dropdown menu which shows the options available.
- Orientation: Corresponds to the orientation of the text. The orientation (expressed in degrees) could be between 0 and 350. The size can be either keyed in or selected from the dropdown menu which shows the options available.



- Color: Clicking on the button the style colour can be selected.

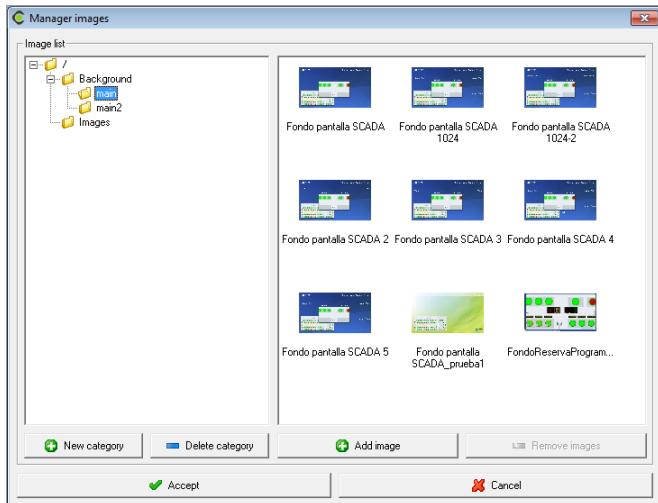
Shows an example of how the style will appear:



The '*Delete*' button will only be active if there are styles selected from the style list. Pushing the button will eliminate the styles selected.

7.1.4 Manager images

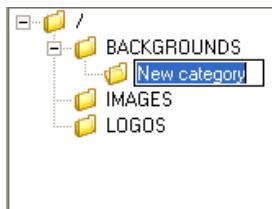
Using this option images used to create a Scada screen or a report can be added, modified or eliminated. The organization of the images is in the form of a tree so it can be classified into three different categories to be chosen by the user.



The left side of the dialogue corresponds to the categories defined. The representation in tree form (nodes with children and parents) will facilitate the display of dependency between categories.

The / is the root of the tree category. When adding new images, they are automatically added to this root group.

- New category: On pressing this button the category will be added as a child of the selected category (father). Then the name of the category is introduced in the new node created.



To change the name of a category, select the category and click on the name with the left mouse button.

Within the same father category, the names of the children cannot be repeated, but it is possible to repeat the names of categories in different parent categories.

- Delete category: Press this button to eliminate the selected category, as well as all the children categories. It will be possible to eliminate any category except the / (root category).



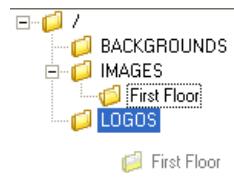
It will also be possible to add or remove categories pushing the right mouse button on the category you want to add a child category or on the category you want to delete. Pressing will bring up the corresponding menu for the selection of the desired action.



It is possible to move or copy a particular category. Press the left mouse button over the category you want to move or copy.



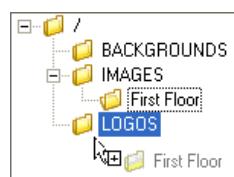
Without releasing the mouse button, drag to the destination category.



To move a category, release the left mouse button to make the change.



To copy a category, press the CTRL button keeping the left mouse button. The cursor will change to indicating that a copy will take place on the category.



Release the left mouse button to make a copy of the category.



To drag a category where it is not possible to copy or move it, the cursor will change to '✗'; to indicate that the action is not permitted.

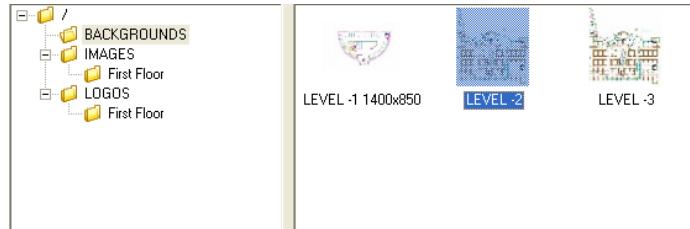
The right side of the dialogue is formed by a list of images which belong to the category selected from the tree.

New image: Pressing this dialogue appears that allows you to select an image stored on the PC for later use in SCADA screens or reports. CirPark Scada will copy the original image file to a local directory.



Allowed images must never be higher than 2 Mbytes and the maximal resolution allowed is 2048x2048 pixels.

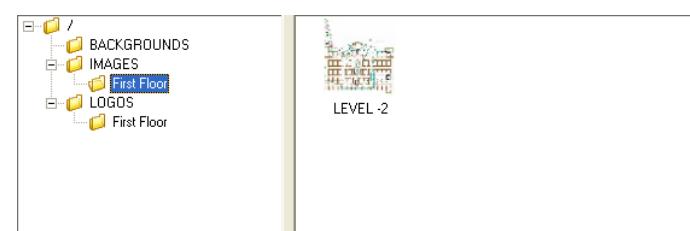
When images are added to a category, it is possible to copy or change them easily. Click the left mouse button to select one.



Keep the left mouse button pressed and drag the image to the destination category.



Release the left mouse button to move the image.

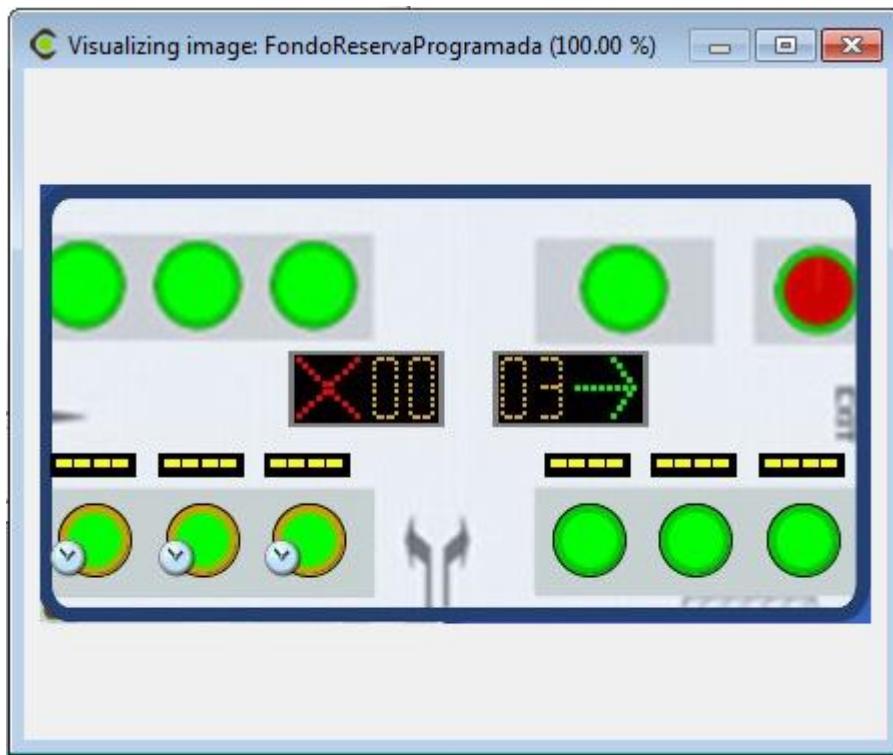




To copy images to another category, follow the same procedure as a copy of categories by pressing CTRL before releasing the left mouse button.

- **Remove images:** Select an image and click this button to remove the image. CirPark Scada will eliminate only the local file stored in the CirPark Scada directory.

Display the image by double clicking the image:



7.1.5 Users authentication

This section explains how to configure remote user access to the resources of the application.

To access the settings of these profiles, select "Preferences" menu, activate "enable user authentication" option if it is not and select "Configure authentication".



Different profiles are defined. Profiles contain access privileges. Same access privileges can be link to different profiles.

Following, user's accounts must be defined in the "Users" tab. Each user has a different name and a password used to log on the application, avoiding non-authorised access. Users are link to Profiles, allowing

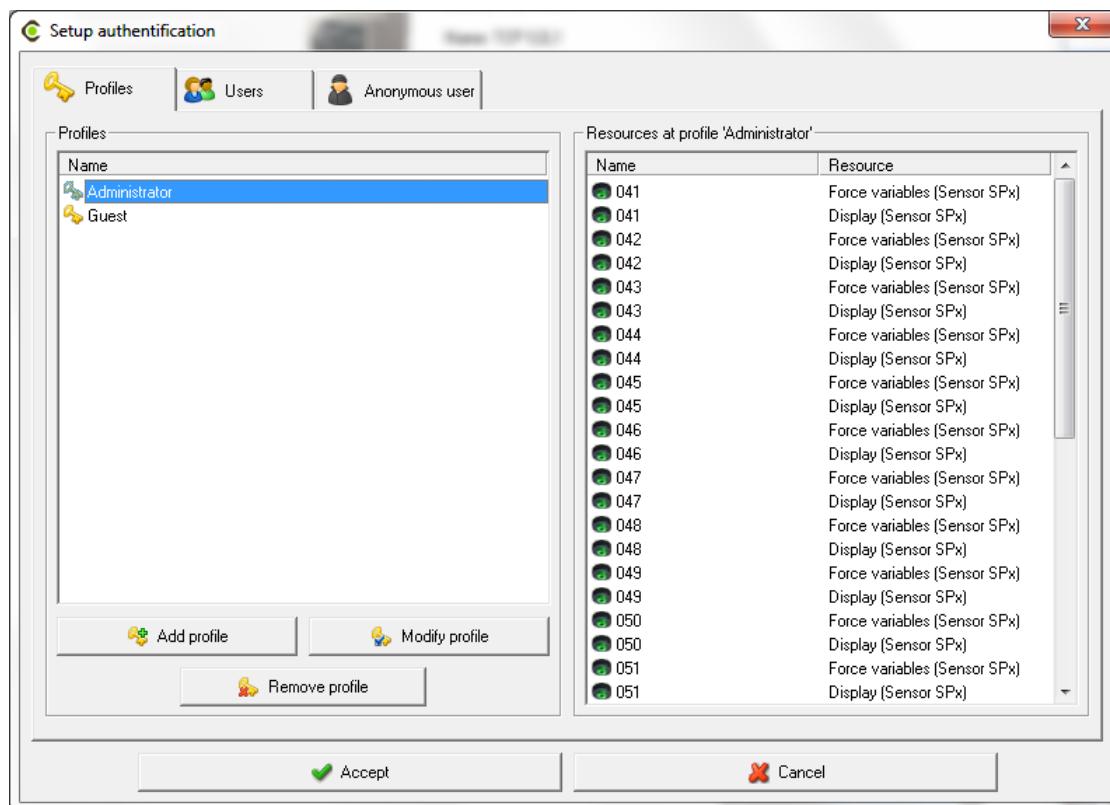


access to all the resources contained in profiles. A profile can be assigned to more than one different user and vice versa.

Also, the software allows activating the “Anonymous user”. The anonymous user does not have a name and password, allowing access to any remote user without identification.

Profiles are assigned to this user in the same way, allowing access to the different resources of the application.

7.1.5.1 Profiles



The “setup authentication” window different profiles are defined for remote access to the application resources.

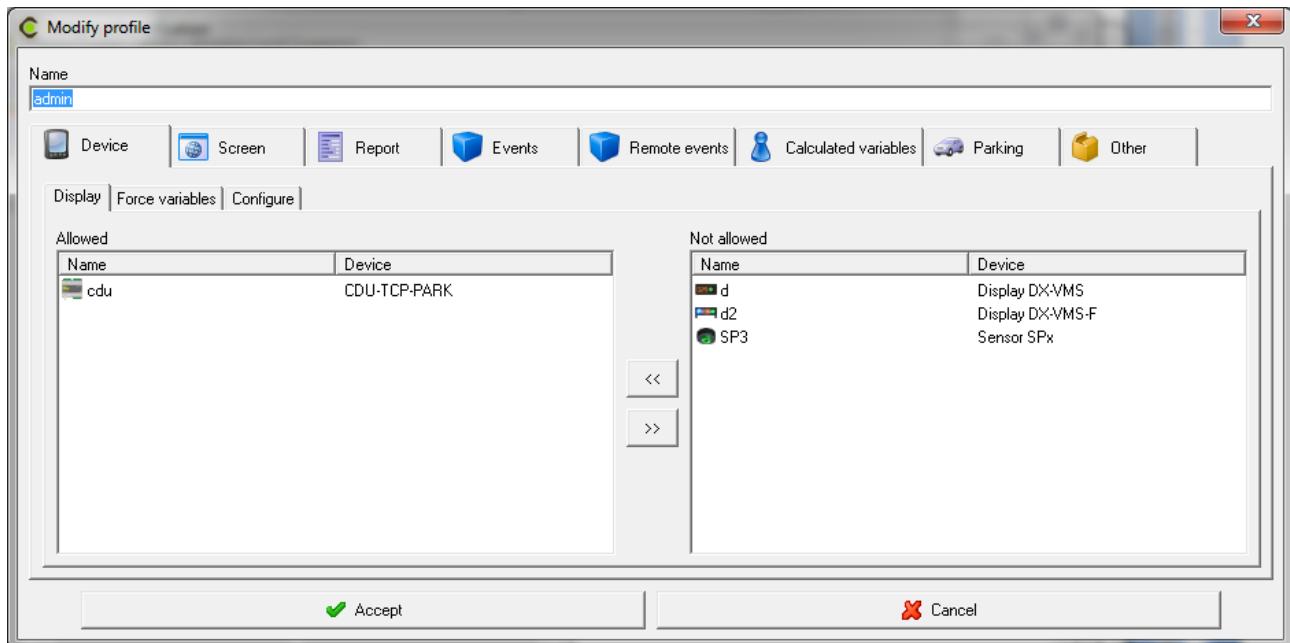
The left list shows all the profiles available. The right-hand list shows the resources associated to the selected profile.

Click right mouse button over the profiles list to visualize the following contextual menu.

Copy Ctrl+C
Paste Ctrl+V

This menu enables profiles to be pasted and copied. Some of the options from the contextual menu may not appear, copy will only appear if there is a profile selected on the list and the paste option only if the styles have been previously copied onto the clipboard. If no profile is selected and there are no styles on the clipboard when the right button is pushed, the contextual menu will not appear.

When ‘Add profile’ or ‘Modify profile’ are clicked the following dialogue box will appear:



In this dialogue box the name and resources of the profile will be added or modified depending on the button chosen. This name will be used to identify the profile and will be unique; two profiles cannot exist with the same name.

The list situated to the left of the dialogue shows the resources added to the profile that can be used by the users who have that profile assigned, while the left-hand list shows the resources that the profile user does not have access to.

To add resources to the profile, "*Not Permitted*" should be selected from the list and passed onto the "*Permitted*" list using the '' button, whereas if we want to eliminate resources from the profile the opposite should be carried out, select "*Permitted*" from the list and push the '' button to pass over to the "*Not Permitted*" list.

The different types of resources that can be added to a profile are:

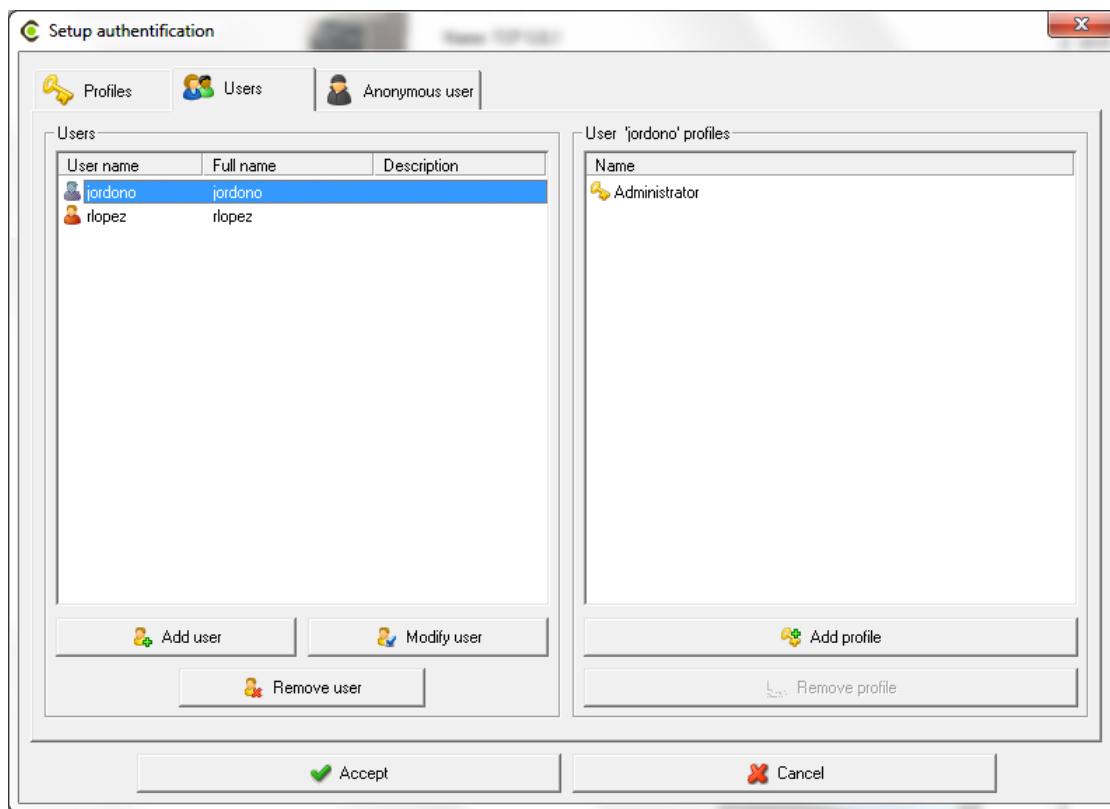
- **Devices:** Devices configured on the software.
 - **Visualise.** Allows the chosen devices to be visualized.
 - **Force variables:** This allows the variables values of the devices to be forced. Only devices where it is possible to force one or more variable can be shown, for example digital outputs.
 - **Configure.** Allows certain parameters of the devices can be configured. Only devices where it is possible to configure parameters while on the execution mode will be shown.
- **Screens:** Will show the different SCADA screens which configure the application
 - **Display.** Enables the chosen screen to be visualised.



- **Force Variables:** Permits variables to be forced using the "force variable" controls on the SCADA screens.
- **Areas:** Will show the different areas that setup the application
 - Visualization: Enables the chosen area to be visualised
 - **Force Variables:** Permits variables to be forced using the "force variable" controls on the selected area.
- **Discriminators:** Will show the discriminators of the application
- **Reports:** Enables the defined reports to be visualised.
- **Events:** Will display the various resources of events that can be added to a profile:
 - *Execute event actions on client.* Will enable programmed actions to be carried out on the client when activated, acknowledged, disabled or while events are being produced.
 - *Recognise notified events.* Allows a notified event to be acknowledged.
 - *Visualisation of active events.* Allows active events to be displayed or not.
 - *Visualisation of notified events.* Allows events which need to be notified to be displayed or not.
 - *Visualises event variables* It allows graphs and tables of the variables generated by the events to be displayed (see section 10.4 Success variables)
 - *Display event browser.* Enables the list of events saved in the file to be seen, modified or not.
 - **Remote Incidents:** Displays the different incident resources that can be added to a profile:
 - *Recognise notified incidents.* Enables recognising a notified incident.
 - *Active incidents display.* Permits or prevents displaying active incidents.
 - *Active notified incidents display.* Permits or prevents displaying incidents that may require notification.
- **Calculated Variables:** Allows graphs and tables of the calculated variables configured on the software to be displayed.
- **Parking:** Will show the parking counters
- **Others:** Allows the table with the events of the system to be viewed.



7.1.5.2 Users



Using this dialogue box the users who have access to the application resources are defined.

The list situated to the left of the dialogue contains the configured users, while the right-hand list shows the profiles associated to the user selected from the user list.

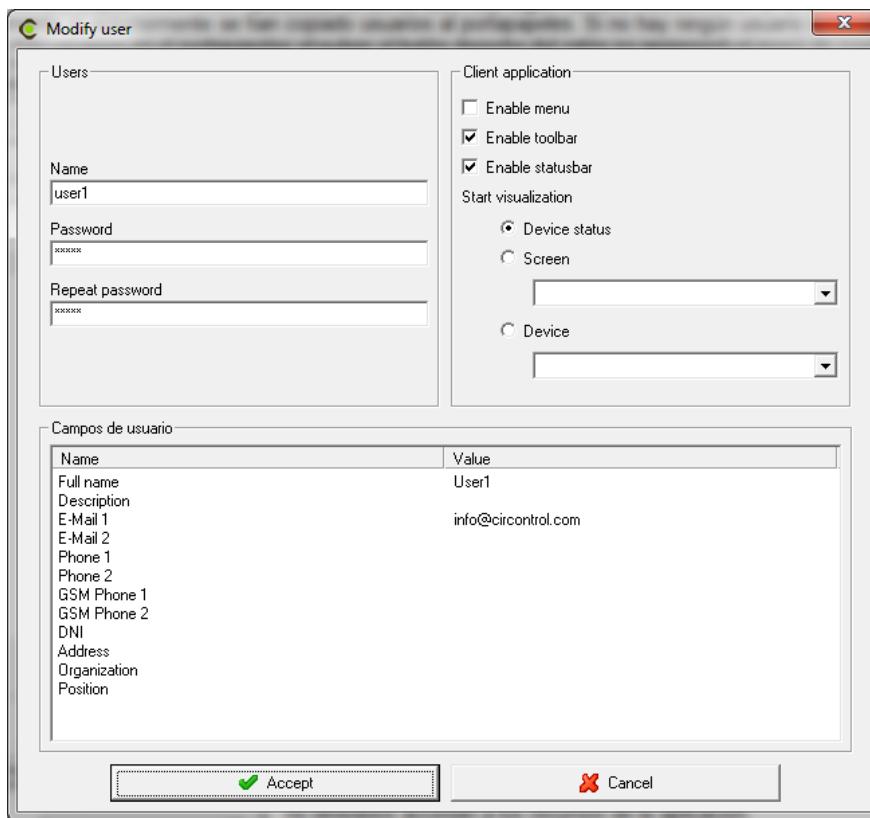
Pushing the right-button on the mouse over the list of users the following contextual message will appear.

Copy Ctrl+C
Paste Ctrl+V

Allowing users to be copied or pasted. It may be possible that some of the options from the context menu do not appear, copy will only appear if there is a user selected and the paste option only if the users have been previously copied onto the clipboard. If no user is selected and there are no users on the clipboard when the right mouse button is pushed the context menu will not appear.



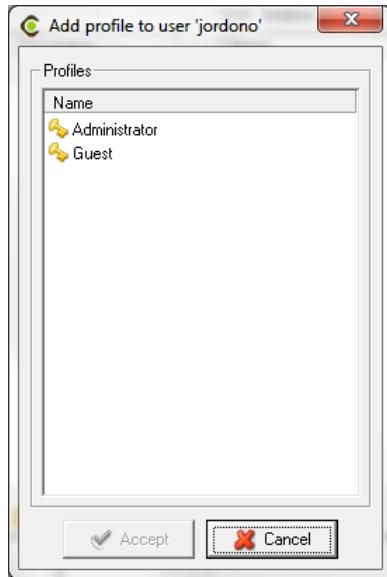
To add or modify a user push the button corresponding to 'Add user' or 'Modify user'.



- **User name:** Will be an alphanumeric field which uniquely identifies the user. This field will be used to identify the user when necessary.
- **Full name:** Corresponds to the user's complete name.
- **Description:** Field which permits a brief description of the user to be inserted.
- **Password:** Password which serves to avoid unauthorised users accessing the application resources.
- **Repeat password:** Field which serves to validate the password entered in the previous field. The values entered in the 'Password' and 'Confirm Password' must be the same in order to consider the password valid.
- **Enable menu and toolbar:** Enables the menu and the application toolbar for the user.
- **Start screen:** Allows the start screen viewed by the user from the client to be configured.

If we want to eliminate one or more users, select those users we wish to eliminate from the user list and click "Remove User" button.

Click on the "Add Profiles" button and new profiles can be assigned to the user selected from the user list.

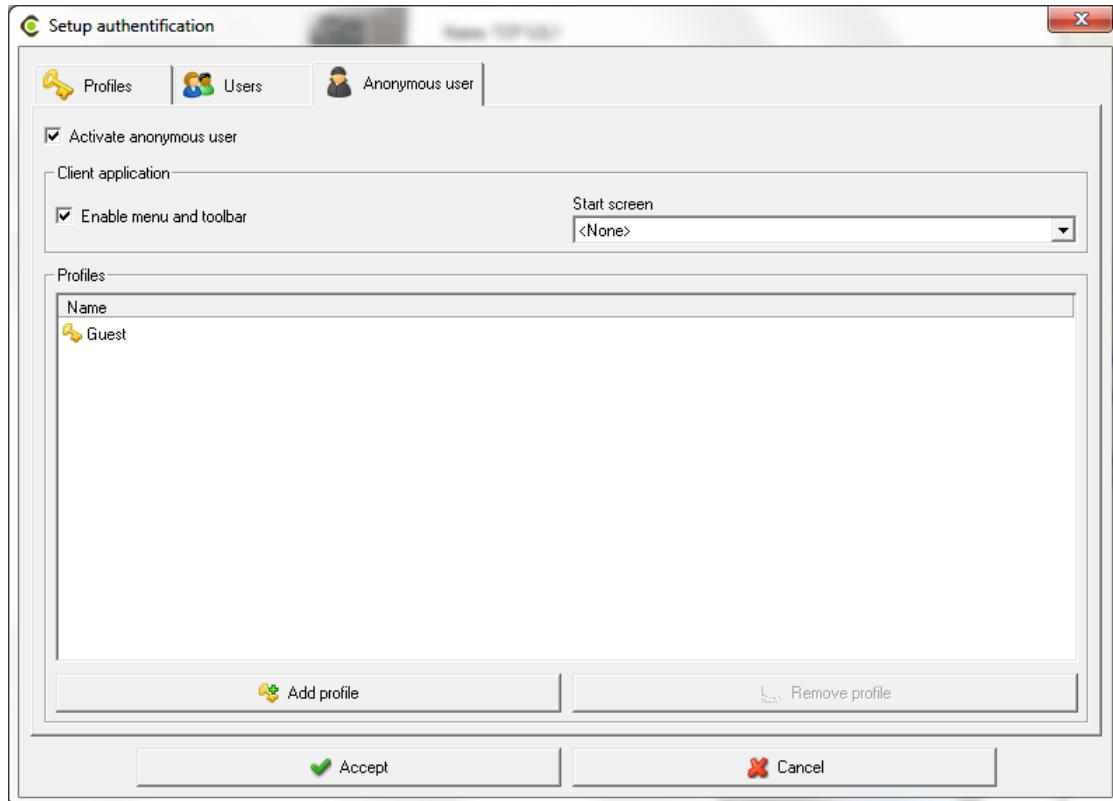


The dialogue will only show those profiles which have not been previously assigned to the user. In this case for the user "jordono" only the "Administrator" and "user" profiles will be shown as it is the only one which has not been assigned to the user. On choosing "Accept" the profiles selected from the list will be assigned to the user.

If we want to eliminate a user profile, select those profiles we wish to eliminate from the user and click "*Remove profiles*" button. Bear in mind that these profiles are only eliminated from the user profile list and in no case are they eliminated from the application.

7.1.5.3 Anonymous user

There is a special type of user that from now on we can call anonymous user. The main difference between this type of user and the other users is that they do not have a name or a password. The anonymous user can access the application resource to which they have access without having to enter a name and a password. To avoid non-authorised access, this user can be deactivated to have greater control over those who can access the resources and those who cannot.



Enabling or disabling the "Activate anonymous user" option will activate or not the option to permit the anonymous user through the Java Client.

The list will show the profiles assigned to the anonymous user, with the "Add profile" and "Eliminate profile" buttons working the same as those of any other user.

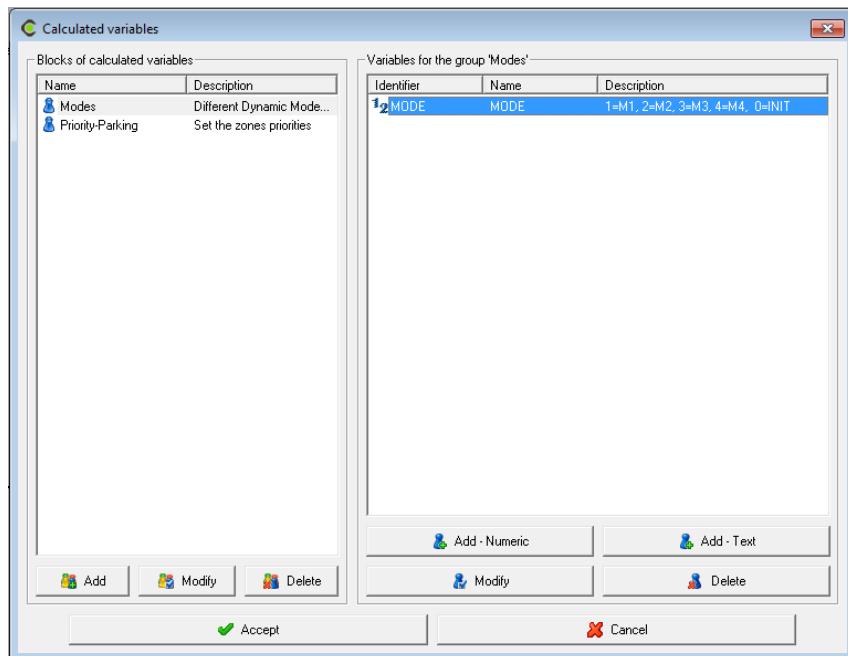


7.2 Modules

7.2.1 Calculated variables

There are certain situations where it is necessary to obtain the results of the operation between the variables of the different devices, for example the sum of counters. CirPark Scada has this type of feature available for the so-called calculated variables. The values of these variables will be the result of formulas comprising variable values of other devices or other calculated variables.

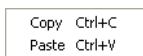
For a better organization, the calculated variables will be divided into groups of calculated variables.



Use this dialogue to define the groups and variables calculated to be used in the software.

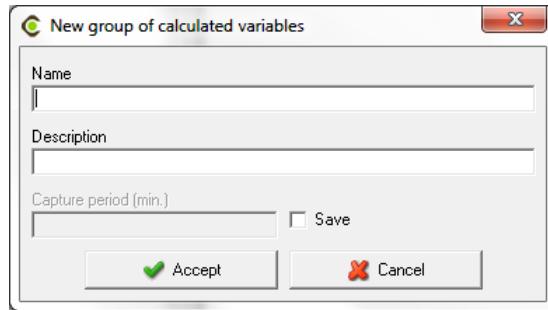
The list situated on the left contains the different groups of variables calculated, while the list on the right will show the variables calculated from the selected group.

Right click on the group list and the context appears.



Allowing calculated groups of variables to be copied or pasted. Some of the options from the context menu may not appear. Copy will only appear if there is a style selected, and the paste option only if the styles have been copied onto the clipboard. If no group is selected and there are no groups on the clipboard when the right button is clicked the context menu will not appear.

When adding or modifying a group the following dialogue will appear:

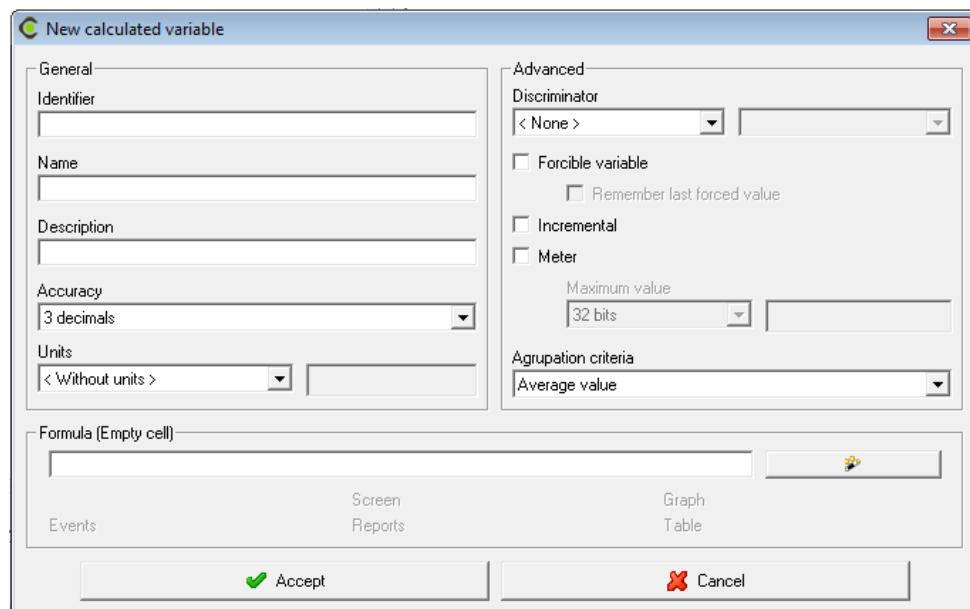


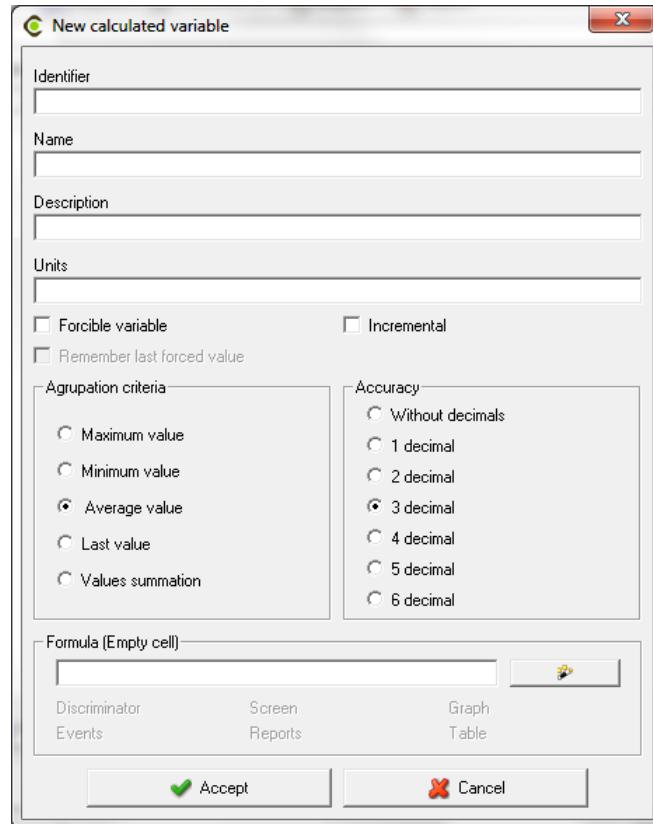
Here the calculated variables group name and a brief description may be entered for better identification within the software. The calculated variables may also be saved along with the capture time in minutes.

If what you want is to add or modify a calculated variable, it should be noted that there are two types explained in the following sections.

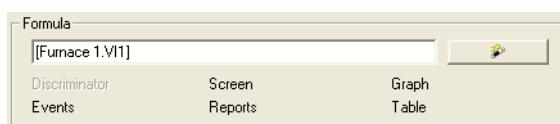
7.2.1.1 Numeric:

This type of variable is used to force only numerical values. The following dialog, that will appear, allows you configuration of the variable calculated:





- Identifier: Allows each of the calculated variables to be used in expressions and conditions.
- Name: Name of the calculated variable, used to better identify the variables.
- Description: Allows a text description of the calculated variable to be entered.
- Accuracy: This permits selection of the number of decimal places for the calculated variable from 6 to 0.
- Units: Text of the units in which the calculated variable value is expressed.
- Formula: Here the formula which will give the result of the virtual variable is shown. It can be entered manually or using the “wizard” . Once entered the formula will be automatically analysed and where it can be used will be shown. For example:



It can be used on SCADA screen and reports, to make graphs and tables with the values obtained; it can be used in the event conditions, but a filter cannot be applied.

The calculated variables are codified for their use in formulas and expressions like:

R\$CAL_group.variable

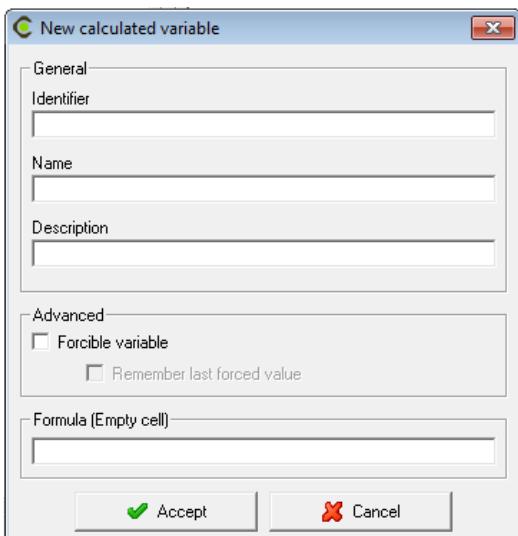


Using the prefix **R\$CAL** tells the program that this is a calculated variable rather than a device *variable*, *group* is the name of the group to which the calculated *variable* belongs and finally, *variable* to the identifier entered in the field corresponding to the calculated variable.

- **Discriminator:** discriminators are basically defined schedules where the calculated value is not executed, these are discrimination.
- **Forcible variable:** Here you may enable or disable the ability to change the value of the variable from the SCADA screen, or an event may be enabled or disabled . Only variables that do not contain references to other variables, devices or calculations in the formula may be forced.
- **Remember last forced value:** Allows for enabling or disabling the possibility of recalling the last forced value of the variable. This field is useful for rebooting the software using the last forced value.
- **Incremental:** Allows for enabling or disabling incremental calculation of the variable. This field is useful for viewing incremental, as opposed to absolute variable values.
- **Counter:** Used for electricity counters to set the cycle count (does not affect parking).
- **Aggrupation criteria:** Enables the grouping criteria for virtual values in graphs, tables and reports to be selected. For example, if a value is given every 5 minutes (e.g. 10, 12 and 7), and the values are grouped every 15 minutes, i.e., all three values expressed at once, the value obtained will be:
 - Maximum value: The maximum value of the 3 (12) will be shown.
 - Minimum value: The minimum value of the 3 (7) will be shown.
 - Average value: The average value of the 3 ($(10 + 12 + 7) / 3 = 9.66$) will be shown.
 - Last value: The last value (7) will be displayed
 - Sum of the values: The sum of the values will be shown ($10 + 12 + 7 = 29$).

7.2.1.2 Text

This type of variable is used to assign text to a variable. The following dialog will appear to allow its configuration:



- **Identifier:** Allows each of the calculated variables to be used in expressions and conditions.
- **Name:** Name of the calculated variable, used to better identify the variables.
- **Description:** Allows a text description of the calculated variable to be entered.
- **Forcible variable:** Here you may enable or disable the ability to change the value of the variable from the SCADA screen, or an event may be enabled or disabled . Only variables that do not contain references to other variables, devices or calculations in the formula may be forced.

Formula: Here you can write the text to force for this variable.



7.2.2 Discriminators

CirPark Scada provides a complete set of tools that allow the definition of energy filters as well as further analysis and study on the data collected by the devices in both a powerful and intuitive manner.

A filter study provides a consistent result in an energy consumption representation for each type of hour (counter) defined at any moment. This representation can be displayed either as a table or graph.

It is also possible to study this data displaying it at different time intervals or grouping it together in different periods. They may be displayed in annual intervals and grouped by months, in monthly intervals and grouped by days, etc.

The filter studies consist basically of defining the filters (typically a calendar) and applying said filter to the data stored in a device. Therefore, a representation of the study realized can be obtained as the user desires (and visible both in graph and table format.)

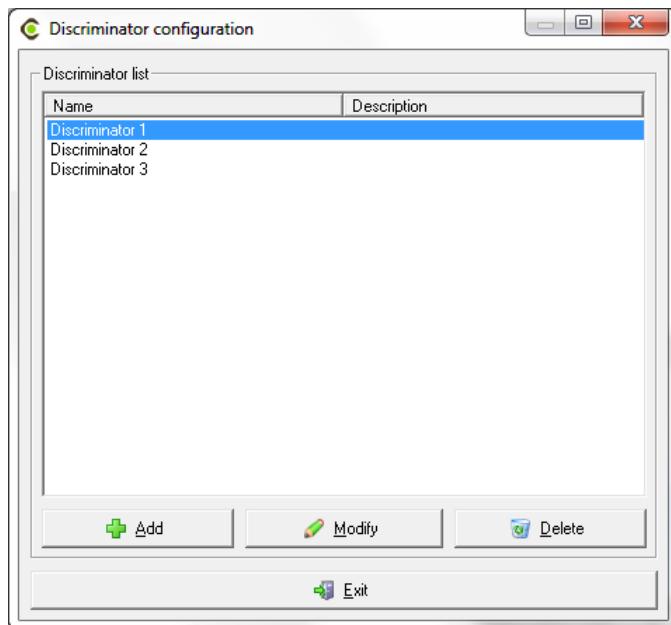
The time bands defined in the filters are in the editor's local time.

7.2.2.1 Discriminator configuration

The first stage is configuration of the filters we want to apply to the data for analysis. The user can add new filters and delete or modify existing filters.

To manage these actions the option "*Discriminators*" must be selected from the "*Setup*" menu.

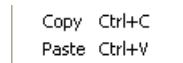
The following dialogue box will appear:



From where discriminators can be added, eliminated or modified.

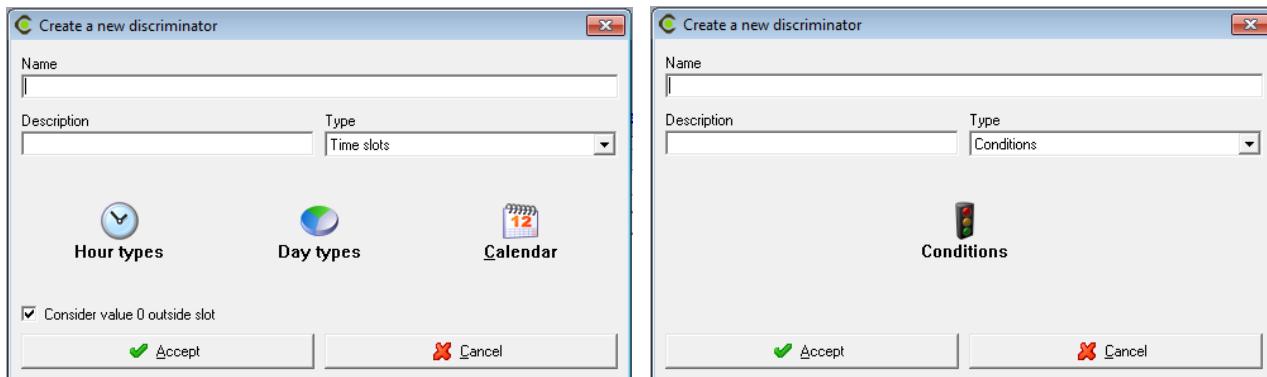


Pushing the right-button on the mouse over the list of discriminators the following contextual message will appear.



Enabling discriminators to be pasted and copied. It may be possible that some of the options from the context menu do not appear, copy will only appear if there is a discriminator selected and the paste option only if the discriminators have been copied onto the clipboard. If no discriminator is selected there are no discriminators on the clipboard when the right button is pushed the context menu will not appear.

When "Add" or "Modify", from the dialogue box "Discriminator Configuration" is clicked the following dialogue box will appear:



- Name: Alphanumeric type data which enables the user to be uniquely identified.
- Description: Alphanumeric type data which enables the user to be uniquely identified.
- Hour types: Configures the different types of hours defined in the discriminator.
- Day types: Configures the different types of days defined in the discriminator.
- Calendar: Configures the discriminator calendar.
- Conditions: Configures the discriminator conditions.



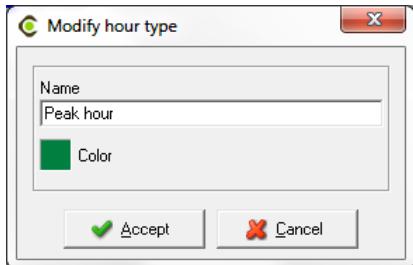
7.2.2.1.1 Hour Types

Through this dialogue the different types of decimator hours may be added, deleted or modified. These types of hour are the basic elements of the definition of the discriminators. Here the recorded consumption is distributed in accordance with the calendar (energy and peak demand). When adding or modifying the following dialogue will appear:



- **Types of hours:** Typically the types of hours corresponding to the different prices that can be applied to the energy consumed by the time zone where we are (or day in which we are).
- **Add / edit:** appears a dialog to add or modify the types of time.
- **Delete:** all kinds of hours are selected from the list are removed.
- **OK:** changes made are saved.
- **Cancel:** changes are cancelled.

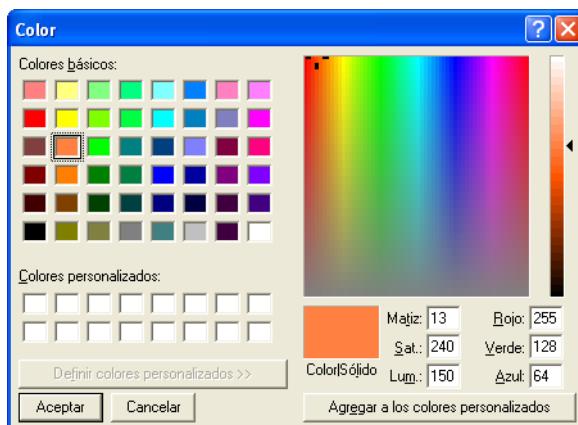
Dialog to add / modify types of time:



Name: Alphanumeric type data which enables the type of hour within the tariff to be identified in a unique fashion.

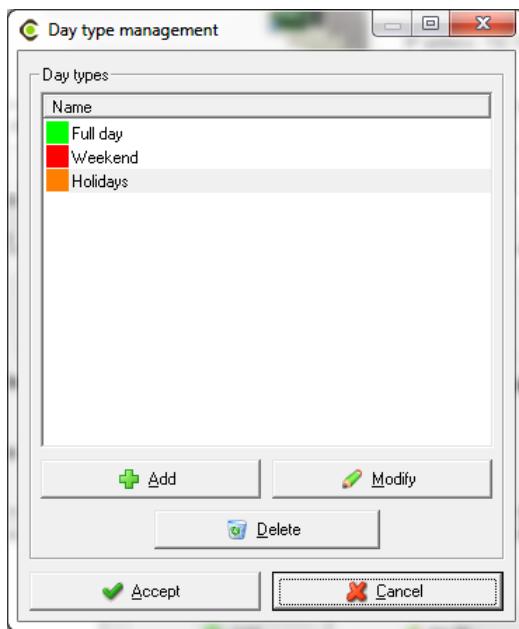
Color: Colour that visually identifies the type of time period in the discriminator and will be used for the graphic representation of the results of applying this discriminator to data stored by any device (all meters for the different peak demand and energy variables).

Pressing once with the left mouse button on the coloured box  1, the following dialogue appears where you can set the colour for the kind of day.

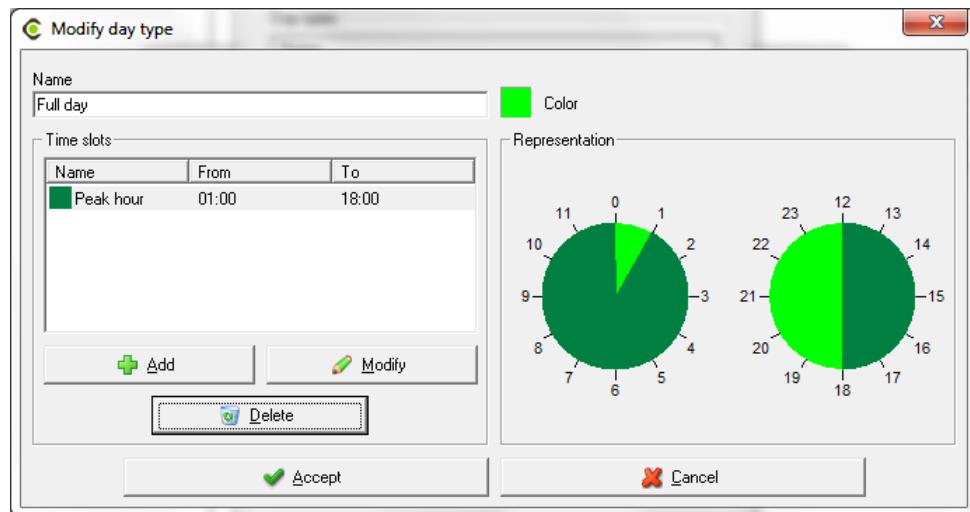




7.2.2.1.2 Day types

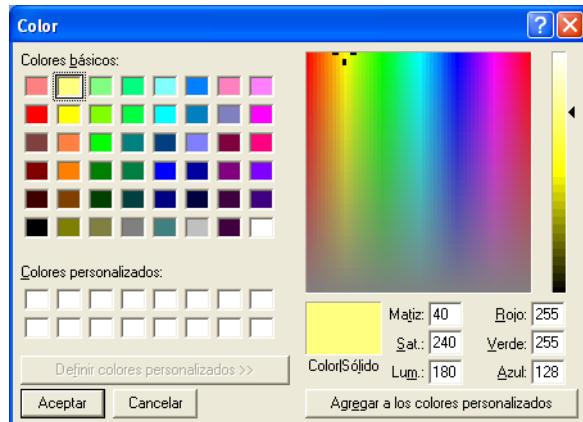


Through this dialogue the different types of day of the discriminator may be added, deleted or modified. On adding or modifying the following dialogue will appear:



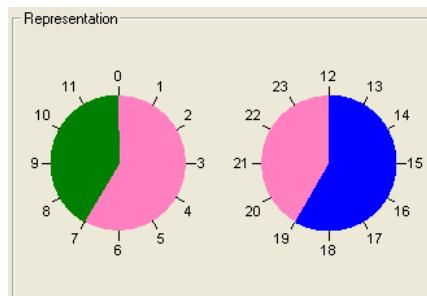
As you can see the definition of a type of day implies the types of hours into which it is divided (e.g. a Sunday could have all day defined as a type of reduced tariff time and a weekday could be divided into two sections i.e. daytime and night-time)

- Name: Alphanumeric type data which uniquely identifies the type of day within the discriminator.
- Color: Colour that visually identifies the type of day within the tariff. Pressing once with the left mouse button on the coloured box . The following dialogue appears where we can set the colour for the kind of day.



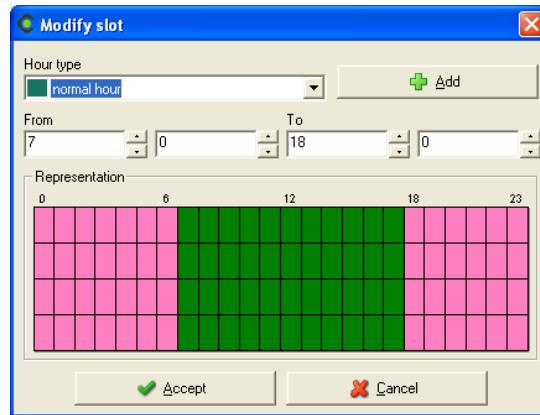
Time slots		
Name	From	To
happy hour	08:00	13:30
normal hour	07:00	18:00
special hour	12:00	19:00

Slots that shape the kind of day. These slots should occupy the entire 24 hour period, but not overlap. In practice different sections within one day indicate that energy is billed differently in each one depending on the time of day in which we are at.



Graphing slots. This gives us visual guidance on how we define such a day (as we will see quickly, among other things, if any slot throughout the day needs to be confirmed)

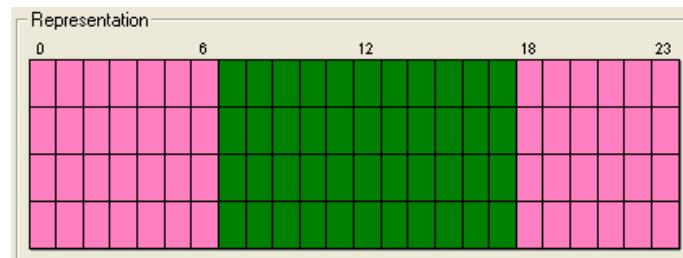
By adding or modifying a slot the following dialogue will appear:



Hour type: This corresponds to the type of hour within the slot. These types of hours will be those configured.

Add: Using this button, new types of hours will be added to the discriminator.

From/ to: Numerically selecting a time slot.



Graphing the slot. Each column represents one hour of the day, each row is a period of 15 minutes. For the slot selection proceed as follows:

- Click with the left mouse button on the yellow square; start of the slot.
- Without releasing the button, drag it yellow square; until the end of the strip.
- Release the button and the slot will have the colour of type of day red square.

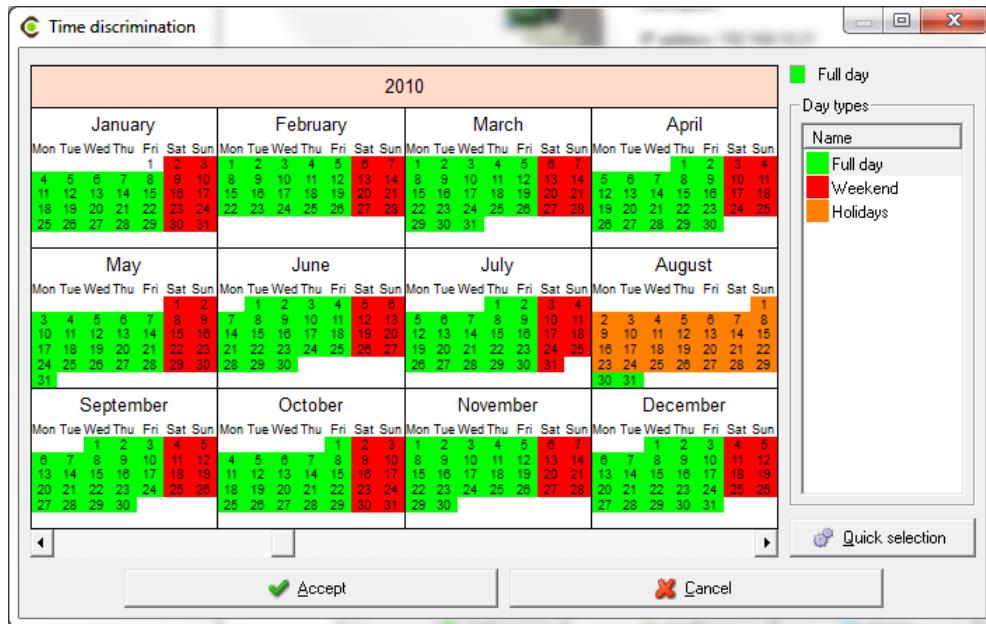
The slot can be defined manually in a numerical way but this is only useful if one wants to accurately define any slot precisely in minutes (for instance a slot from 10:10 to 15:40)

This dialogue only allows a continuous slot to be defined.



7.2.2.1.3 Calendar

Once defined the types of days that will shape the discriminator they will then be distributed in the overall schedule. To do so the types of days created beforehand in the discriminator process will be distributed on these calendars.



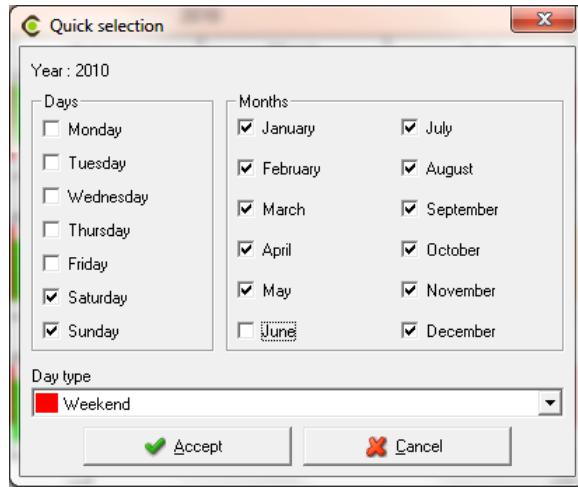
Day types may be assigned to the days of the year in course as well as to previous and forthcoming years.
Day selection is done as follows:

- Pressing on the desired day.
- Pressing on the day of the week selects all the days of the month for that day of the week.
- Pressing on the month name selects all the days of the month.
- Pressing on the year selects all the days of the year.
- Left click on a starting day and drag to select all the days that the cursor has passed through.
- Using the quickly selection option.

Day types: Listing with the different day types configured under the rate.

Summer day: Day type assigned to the calendar if selections are made. If no day type is selected **Deleting...** will appear, indicating that the days on the calendar will be selected rather than deleted.

Quick selection: with this option, selections will be made automatically. The following dialogue will appear.

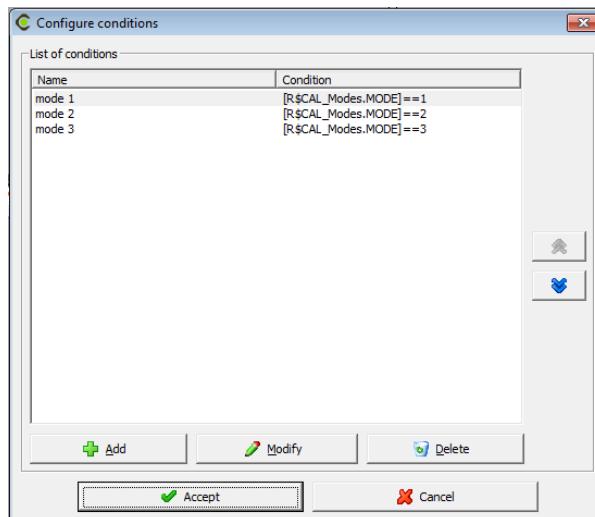


In this case, they make every weekend day of 2010 with the kind of day "weekend Day".

Eliminate the selection by pressing on the day with the same selected day type.

7.2.2.1.4 Conditions

You can introduce one or more conditions that if these are accomplished the discriminator will active. It can be entered manually or using the "wizard" button (see section: 9.1.1 Wizard to create expressions and conditions). You can see an instance below:



7.3 Events

7.3.1 Events

The program will only show events when it is in the running mode, and edit mode is when you can add, change or eliminate the different events that will be useful to warn of potential hazardous or exceptional states in the facility.

The events may be notified. In this case the events will be shown by means of a pop-up screen when activated, and remain on screen until they have been recognised and disabled.



In addition for each event an invalidation schedule of the event can be defined. That is, the periods in which the event is not valid can be defined and therefore will not be taken into account in the software.

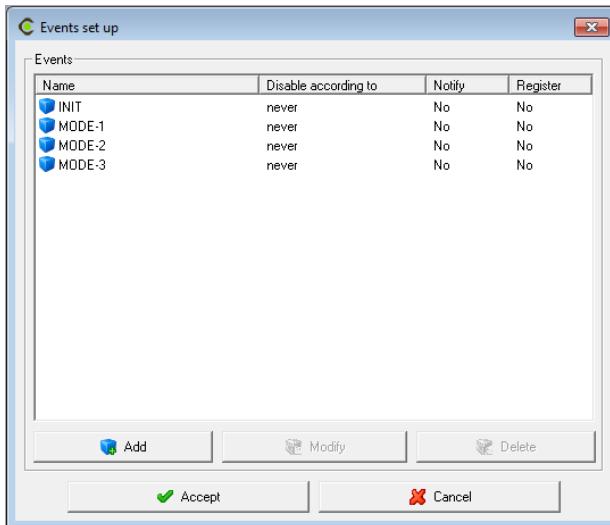
It will also be possible to associate a note each time that the event is activated, for example to guarantee the value of a variable which has caused the event.

Finally, for each of the possible states of the events, a series of actions can be defined that the software will execute while the event is found in each one of these states. Possible States are:

- *On Activating*: Will be produced when the event condition is complied with. For example, a value has exceeded a certain limit.
- *While is active*: This will be produced while the event condition is complied with, once the event has been activated.
- *On Recognizing*: Occurs when the operator carries out an event recognition action. This state is only possible if the incident is reported.
- *On Deactivating*: Occurs when the event condition is no longer fulfilled. For example: if an event is defined as the fact that a variable exceeds a certain value, the deactivation will be at the time it ceases to exceed.

The system configuration of events consists of event disablement calendars, groups of events and the events themselves. If you have no need to define groups of events or event disablement calendars go directly to section 9.3 Events Setup.

Both schedules and groups can be defined before or after the definition of the events themselves, however if you need to define calendars we recommend this should be done first and so that they can be then allocated to the events when creating them for the first time. In the same way, if you sure which groups of events are to be configured they should be defined them before creating the events so that they can be assigned directly on creating each event.





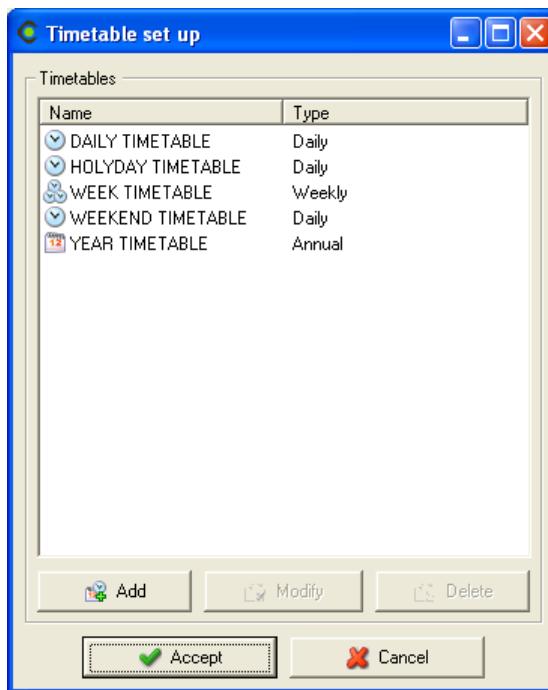
7.3.2 Events timetables

For each event a disablement schedule can be defined. In this schedule the time slots will be marked where the event will not be taken into account. If you do not want to disable the events you can go directly to **¡Error! No se encuentra el origen de la referencia.. Events setup.**



On the schedule the slots will be marked where not to take account of the event. Unless otherwise indicated, slots are not configured, the event will be taken into account and the program will monitor the status of the event assessing the condition configured in the event.

To configure the events click the option 'Events timetables' from the ' Setup ' menu. The following dialogue box will appear:



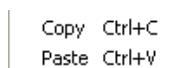
Here is where the different schedule slots are shown. Three different types of schedules can be configured:

⌚ **Daily:** The disabling slots of one day are configured.

⌚ **Weekly:** The disabling slots of one week are configured. For the selection of the different days that make up the week the previously configured "Daily" types are used.

📅 **Annual:** A schedule is used to configure the disabling slots. As with the 'Weekly' type, the days are selected from the previously configured "Daily" types.

Pushing the right mouse button on the list of schedules the context menu will appear

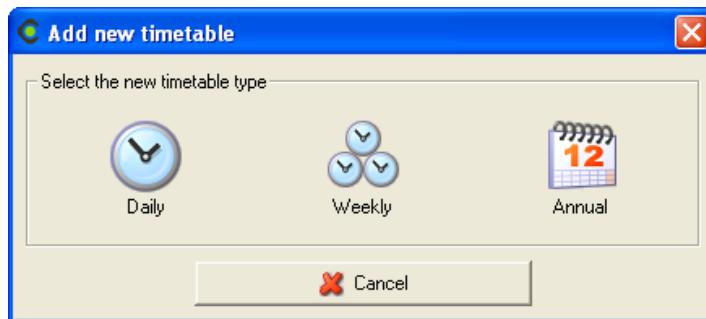


Allowing schedules to be copied or pasted. It is possible that some of the options in the context menu do not appear, copy will only appear on the list if a schedule is selected and the paste option only if calendars have



been copied previously to the clipboard. If there is no schedules selected or on the clipboard on clicking the right mouse button the context menu will not appear.

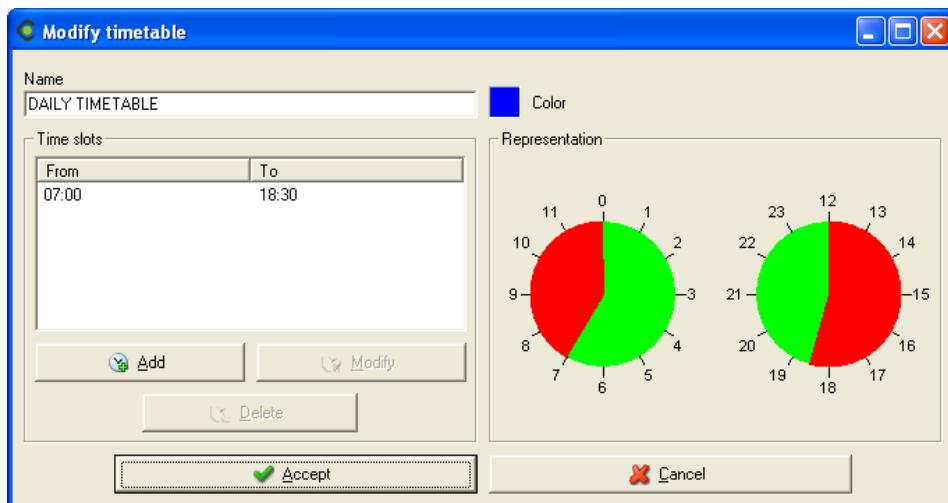
On pushing the "Add" button the following dialogue box will appear:



Where the type of schedule you want to add is selected. Once added, the type of schedule can not be changed, that is if one adds a "Daily" type, when you press the 'Modify' button the "Daily" type will be modified and in no case can the 'Weekly' or 'Annual' type be changed'.

7.3.2.1 Daily

This type of schedule corresponds to a day. In events that have a daily type selected, the disablement slots shall be the same for all days.

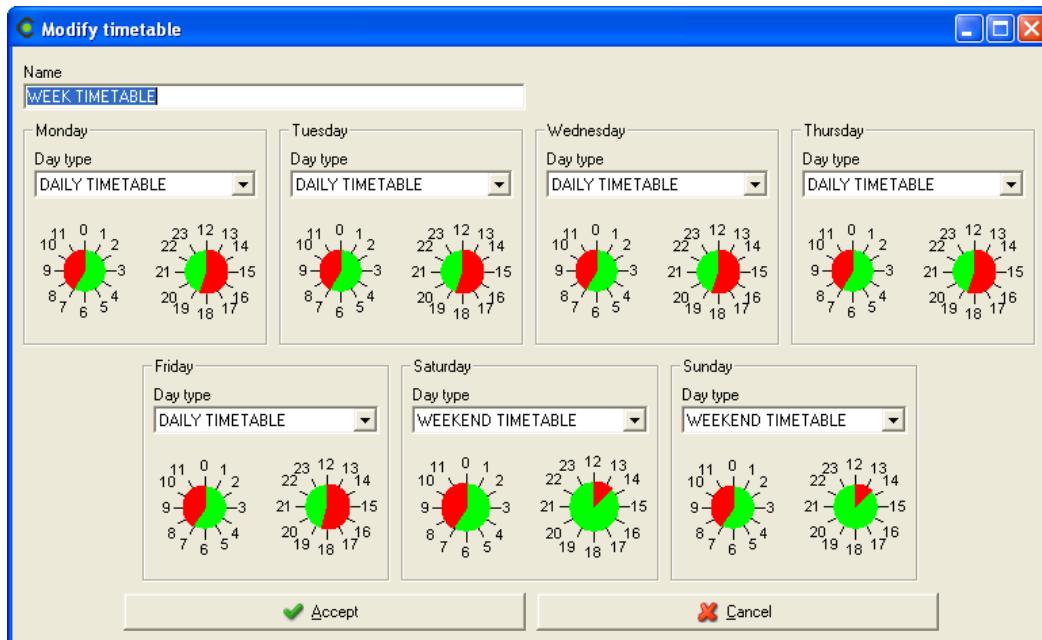


How the configuration of the types of day works is the same as explained for the types of day for discriminators, with the difference that there are no different types of hours, but only the schedule interval that does not take into account the events can be established (sections marked in red when showing the day).



7.3.2.2 Weekly

This type of schedule corresponds to one week. In the events selecting this week type, disabling sections will be the same for every week of the year.



- **Name:** Alphanumeric type data which enables the weekly type to be uniquely identified within the events schedule.
- **Day:** Configuration of each one of the 7 days of the week, where the 'type of day' selector contains different types of days, showing the representation of the type of day selected.

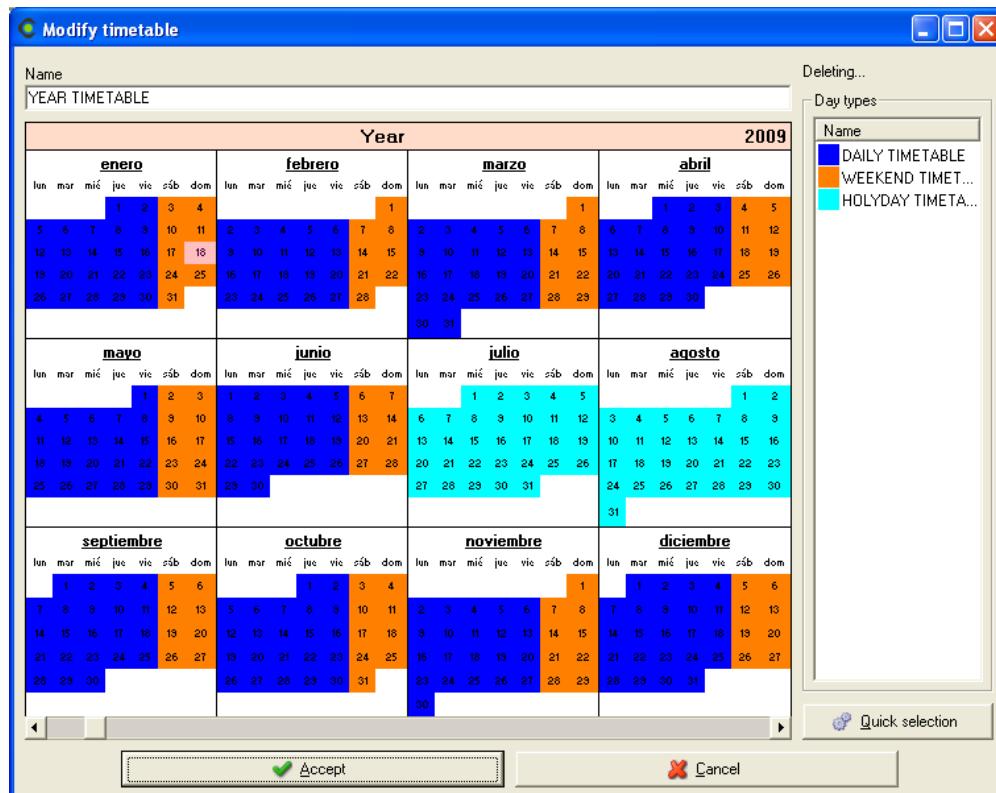
It will also be possible not to select any , in which case the event will not be disabled during this day.



7.3.2.3 Annual

This type of schedule corresponds to a calendar, where different types of days can be configured for several years.

As with the weekly type, the different types of day that may be selected correspond to different configured daily types.



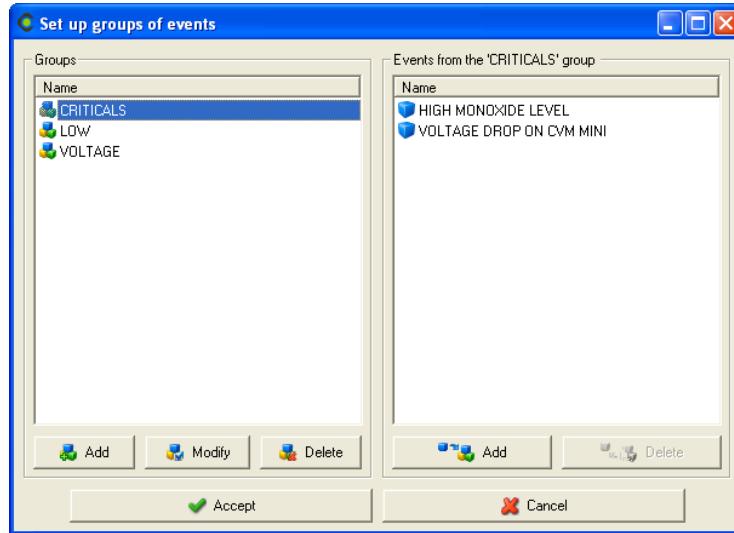
- **Name:** Alphanumeric type data which permits the annual type to be uniquely identified within the schedules of events.

Calendar configuration works in the same way as that explained for the discriminator calendar.



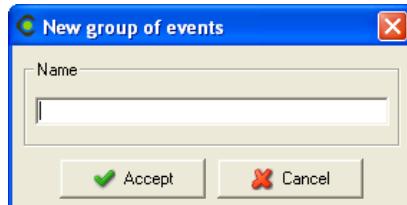
7.3.3 Filters of events

For a better display when it comes to showing the event browser, allowing only one type of event to be filtered and therefore displayed, the events may be classified into groups, allowing a single event to be allocated to more than one group. The option ‘Groups of events’ from the ‘Configuration’ menu will allow the different groups of events to be configured.

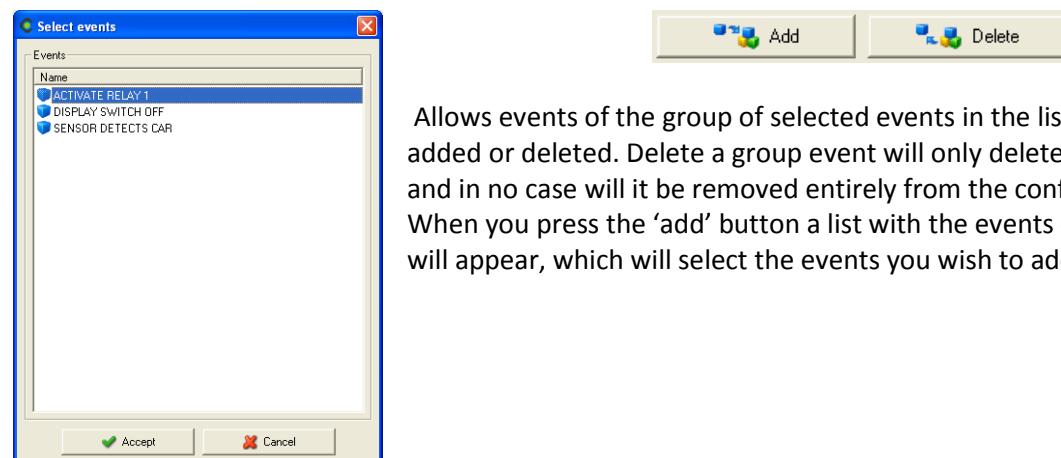


On the left-hand list all the configured event groups will be displayed, while on the list on the right events that have been assigned to the group selected from the list of groups will be displayed.

Allows add, modify or delete groups of events. On adding or modifying the following dialogue will appear:



This window is where the name of the event is entered. This name will identify the group in a unique way.

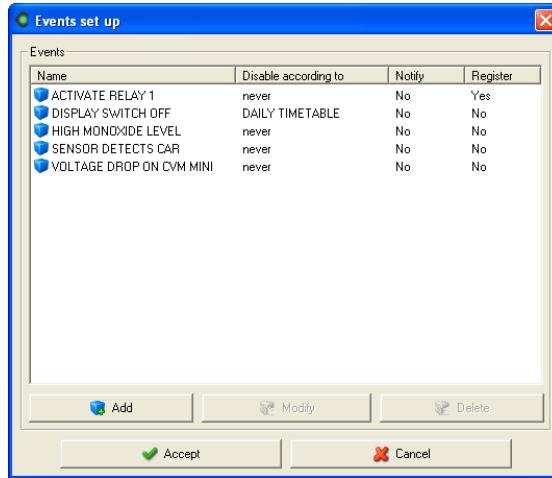


Allows events of the group of selected events in the list of groups to be added or deleted. Delete a group event will only delete it from the group and in no case will it be removed entirely from the configuration of events. When you press the ‘add’ button a list with the events outside the group will appear, which will select the events you wish to add.



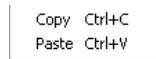
7.3.4 Events Setup

To add, modify or delete events 'Events' option from the "Configure" menu should be selected '. The following dialogue box will appear:



Where events configured are shown, the disablement schedule, whether it will be notified and finally whether it will be registered.

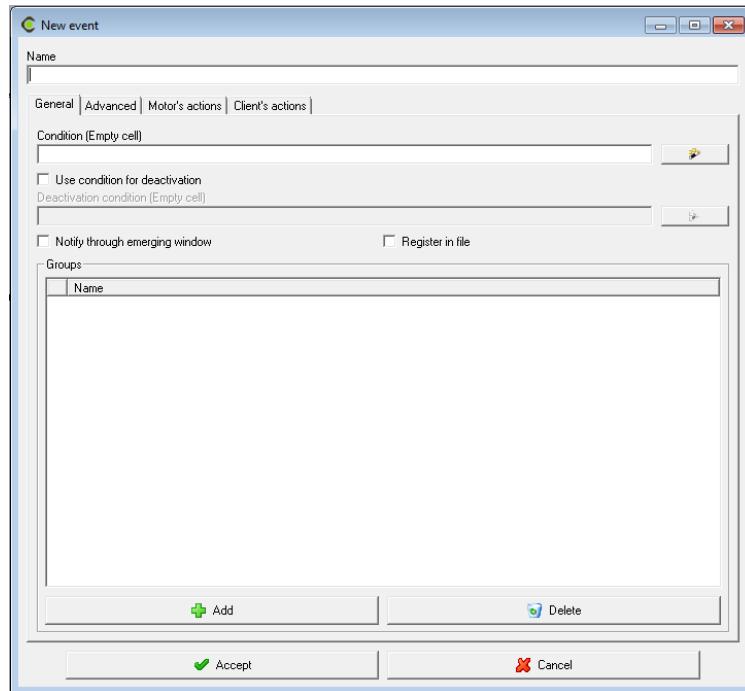
Pushing the right mouse button on the list of events the context menu appears.



Allowing events to be copied or pasted. It is possible that some of the options in the context menu do not appear, copy only appears if there are any events selected and the paste option only if these events have been copied to the clipboard. If no event is selected and there are no events on the clipboard by clicking the right mouse button the context menu will not appear.

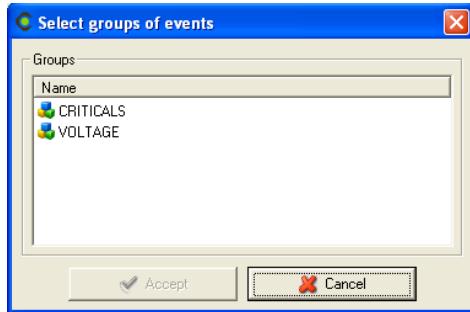
Pressing 'Delete' will delete the events that are selected in the list of events.

By clicking 'Add' or 'Modify', a new event will be created or an existing event amended. The following dialogue box will serve to create or modify an event.



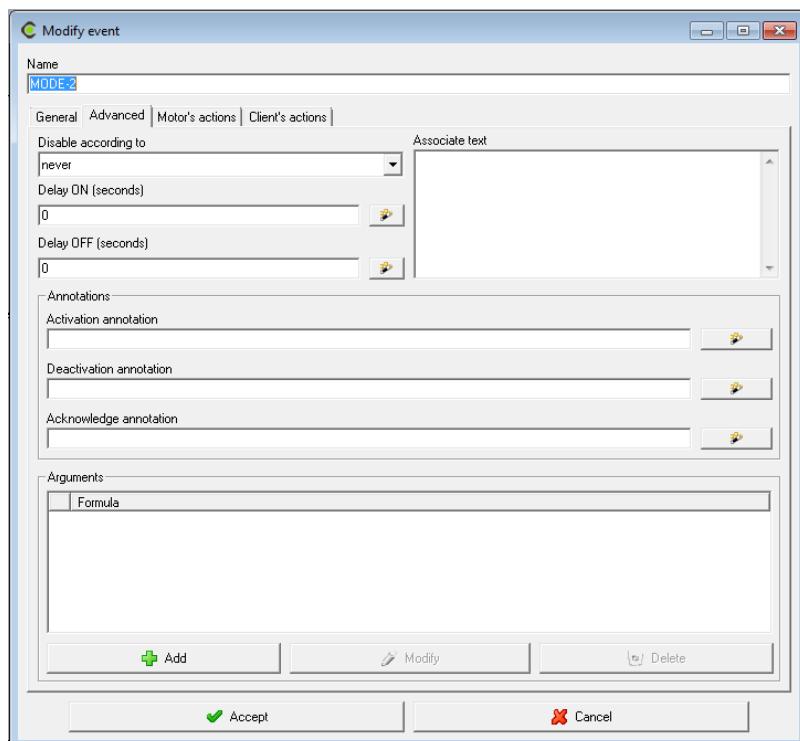
The functions of this dialogue are specified as follows:

- **Name:** Name that uniquely identifies the event in the application.
- **Tabs:** Allows switching to be carried out between different event configuration parameters. In the previous picture shows the general configuration of an event is shown.
- **Condition:** Condition of the event. The event will become activated when the condition is true and will remain disabled on the contrary. This can be entered manually or using the “wizard”  button.
- **Use condition for deactivation:** A condition for the deactivation of the event can be added, using the selection or not of this box which will indicate whether we want to use a prerequisite for disabling the incident. In this case the event will be activated when the voltage exceeds 240 and is disabled at less than 220.
- **Notify through emerging window:** Selecting or not of this box will indicate whether the incident should be reported or not. If the event is reported when the program is active a pop-up display will appear.
- **Register in file:** Selecting or not from this box will indicate whether the incident is registered or not and therefore may be displayed in the events’ browser or not.
- **Groups:** It shows the list of groups to which the events belong. Clicking on the ‘Add’ button brings up a dialogue with the list of groups that the event does not belong to, allowing the selection of the groups to which we want to add the event.



Through this dialogue groups are selected to which the event can be added, but are not currently added.

In the Advanced tab the following parameters appear:



Disable according to: Enable the disabling schedule of the event to be selected. If no schedule is selected, the event will always be supervised by the application. If an event has selected a disabling schedule, if the event is active and for scheduling reasons it becomes disabled the event will be deactivated.

Delay ON(seconds): This value corresponds to the delay in activating the event in seconds. The event will be activated when the activation condition is complied with for at least the time shown in this field. For example: if the activation delay is 5 seconds, to activate the event the activation condition must be met for at least 5 consecutive seconds, if the conditions are met for 4 seconds, the event would not be activated.

Delay OFF(seconds): This value corresponds to the delay in the deactivation of the event in seconds. The event will be deactivated, if when activated, the activation condition no longer meets at least the time shown in this field, in a similar way to the delayed activation.

Associate text: Brief description of the event.



Anotations: Allows an annotation to be configured which will be calculated when the event is activated and which may serve, for example, to ascertain the value detected of a variable that has activated the event.

Rss: Can be configured if Rss notifications are generated on activating, deactivating or acknowledging the event. In this case only the activation and deactivation of the event will appear. This option will only appear if the Rss of events on the software preference screen has been activated.

Arguments: The arguments will allow formulas to be configured for their use in the event annotation and actions. These formulas are calculated at the time of their use, being useful to display the value which has provoked the event as shown in the example.

The engine actions tabs allow the actions for each state of the event carried out by the communication engine to be configured, while for actions in the customer application those actions to be carried out by the client application are configured.

7.3.4.1 Annotation

The annotation of an event is text, with a number of variable parameters, which is associated with the activation of an event.

The parameters will be replaced by their corresponding value when the event is enabled; hence, for two different activations of a single event two separate annotations may be made.

One of the uses of annotations is to record the value of a specific variable at the time the event is enabled, extra information can be displayed in the event viewer.

Below are the different parameters that may be used in the annotation.

Parameter	Description
%n	Name of event
%c	Event condition.
%s	Deactivation condition
%b	Delay in enabling
%e	Delay in disabling
%d	Name of disabled schedule
%t	Text associated with the event
%gx	Group Name x, where x is the order of the group within the list of groups. The order will be displayed with a number to the left of the name of the group.
%ax	Argument x, where x will be the order of the argument within the list of arguments. The order will be displayed with a number on the left side of the argument. The arguments are explained in more detail in section iError! No se encuentra el origen de la referencia. iError! No se encuentra el origen de la referencia..
%%	Character%

Each of these parameters will be replaced correspondingly when the event is enabled, for example if the annotation is:

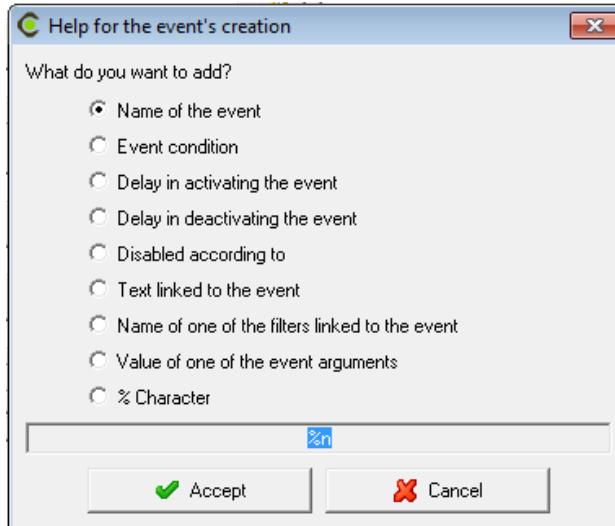
Event name '% n' was enabled when the voltage marked %a1 V.



When the event is enabled the annotation created specifically for this activation will be:

Event name Main voltage was enabled when the voltage marked 256 V.

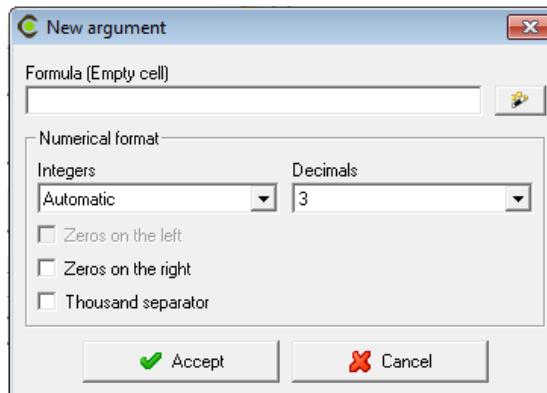
To facilitate creation of the annotation, click on the ‘wizard’ button and the following dialogue will appear:



Here you can choose a parameter to be added to the annotation.

7.3.4.2 Arguments

For the creation of the annotation a series of arguments can be defined. Each argument will consist of a formula and formula value representation format, as can be seen in the following dialogue:



When the event is enabled, if the argument is used to create the annotation, the program will assess the formula and represent it in accordance with the configured format.



7.3.5 Actions

For each event a series of actions to be taken in each event status may be defined. You may formulate actions both in the communications engine and for the client application. However, depending on the action, it will only be possible on one of them.

According to the event state the actions are divided into:

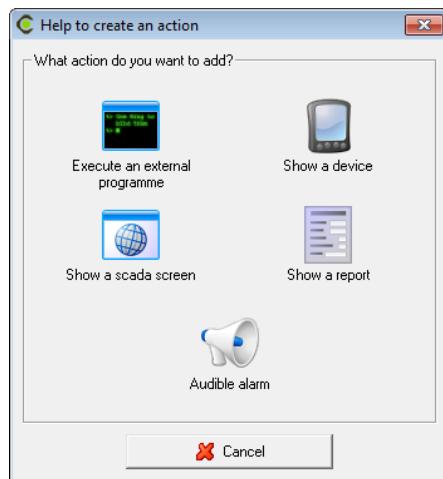
- *On activating:* These actions are executed only once when the event is enabled.
- *While active:* While the event is active, it will continuously execute this group of actions. Caution must be exercised in configuring actions; because they are running continuously they may block the system or connected devices.
- *On deactivating:* These actions are executed only once when the event is disabled.
- *When acknowledged:* These actions are executed only once when the operator acknowledges the event. This group of actions will only be available when the event must be reported.

This group of actions is only available when the incident must be notified, that is, when the following option has been enabled Notificar mediante ventana emergente .

By adding an action in the engine the following dialogue will appear:



Whereas if you want to add an action to the client the following will appear:

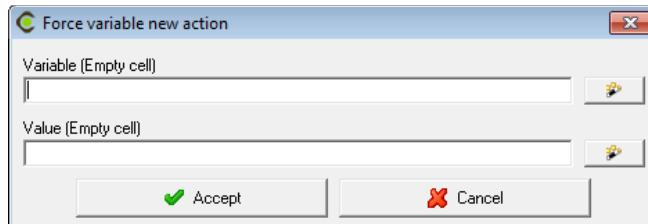


As can be seen actions that can be made by the engine are different from those that can be made by the client application. Bear in mind when adding actions, where they will be carried out. Once the action has been selected the corresponding window will appear for the configuration of these actions.

Because there are incompatibilities between actions, (e.g., it is not possible to show a device and a screen at once), adding non-compatible actions to the existing ones is not possible.

7.3.5.1 Forcing a variable

This action can only be done on the communications engine. It allows the value of a variable, such as a digital output or a counter to be changed.

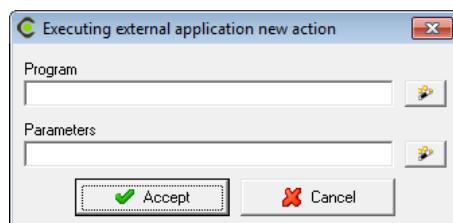


To configure the action one expression must be entered for the variable to be forced, and another for the value to which we wish to force it.

Both the variable expression and the value may be entered either manually or using the corresponding 'wizard'

7.3.5.2 Running an external program

This action may take place in both the communications engine and on the client application. Allows an external application, such as an audio file, which is present in the system to be executed.

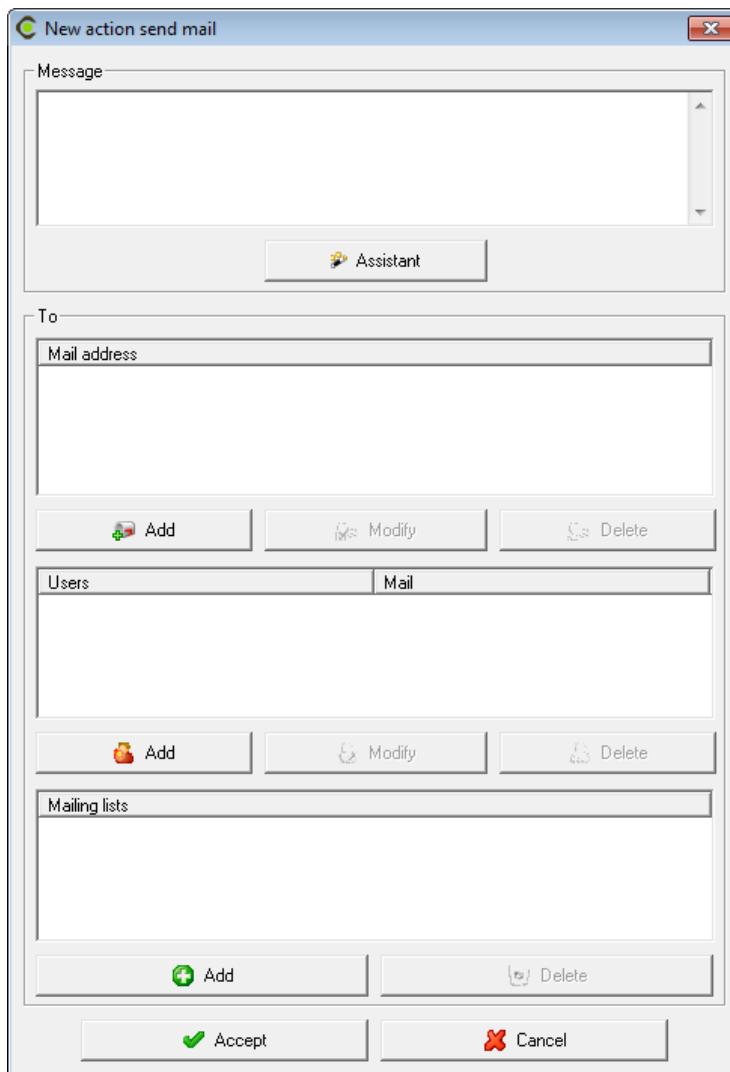




For correct operation it is advisable to indicate in the “*Program*” field the complete to the program so that the engine and the client application can find and execute it.

In the ‘parameters’ field the parameters necessary for the execution of the external application are entered, using the arguments configured in the event.

7.3.5.3 Sending Mail



This action can only be done on the communications engine. It enables an electronic mail to be sent to the selected addressees.

In this dialogue the message to be sent in the mail is entered. The format of this message is similar to the event annotation allowing any of the arguments configured in the event to be used. To facilitate entering the message the wizard can be used by clicking the button.

At the bottom a list of recipients to whom the mails will be sent appears.

7.3.5.4 Show a device

This action can only be done on the client application. In conducting the action, the client application will automatically display the selected screen monitoring device.

7.3.5.5 Show a SCADA screen

This action can only be done on the client application. In conducting the action, the client application will automatically display the selected SCADA screen.

7.3.5.6 Show a report

This action can only be done on the client application. In conducting the action, the client application will automatically display the selected report.

7.3.5.7 Sound Alarm

This action can only be done on the client application. On conducting the action, the application will emit a beep.



7.3.6 Events variables

Each of the events has an associated series of variables that can be used in SCADA screens, reports, graphs and tables.

Using these variables it is possible, for example, to know the status of the event on a SCADA screen, or the number of activations of the event in a report.

The number of variables associated with each event may vary depending on whether the event is reported or is stored in the event log.

The event variables are coded for use in formulas and expressions such as:

R\$EVE_variable.name

Using the *R\$EVE* prefix tells the program that this is an event variable rather than a device variable.

This coding can be used in formulas, graphs and tables, although in the case of reports, graphs and tables only the variables of those events that are recorded on file can be displayed.

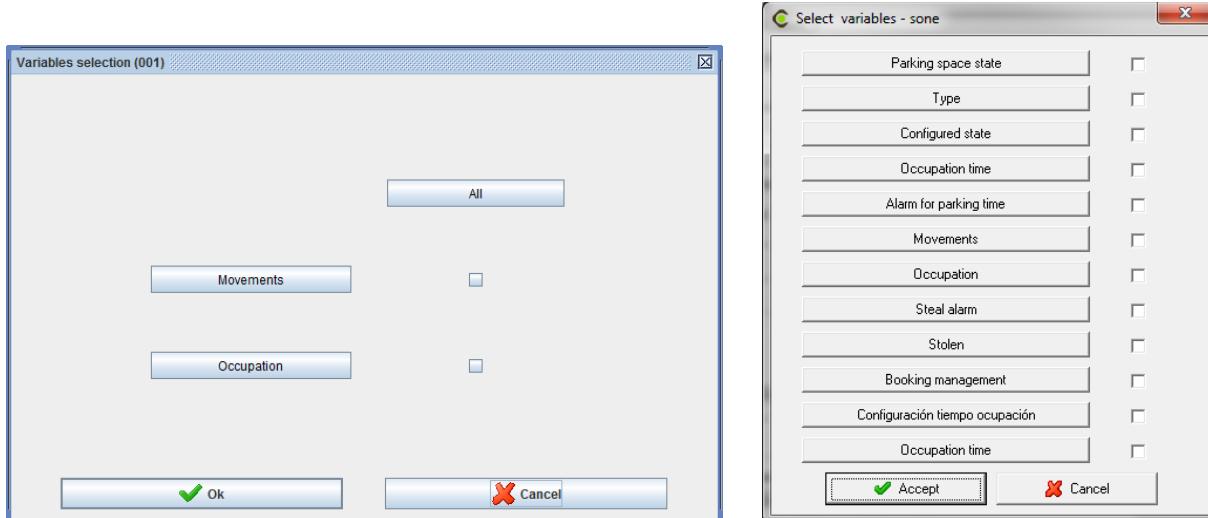


8 Variable selection

Where necessary the selection of one or more variables of a device, the dialogue for variable selection will appear.

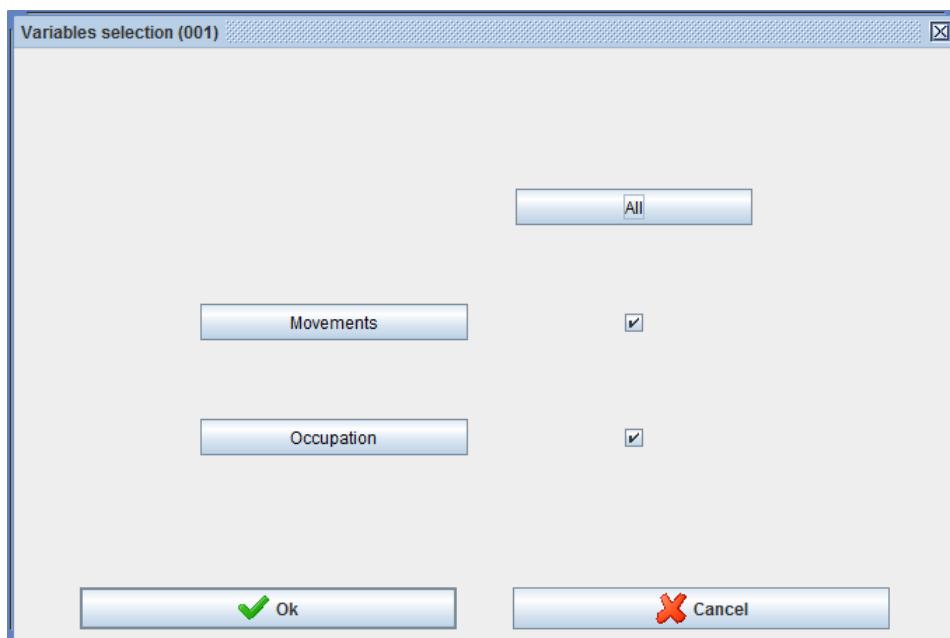
8.1 Parking Devices

Movement and Occupancy variables are available to check.

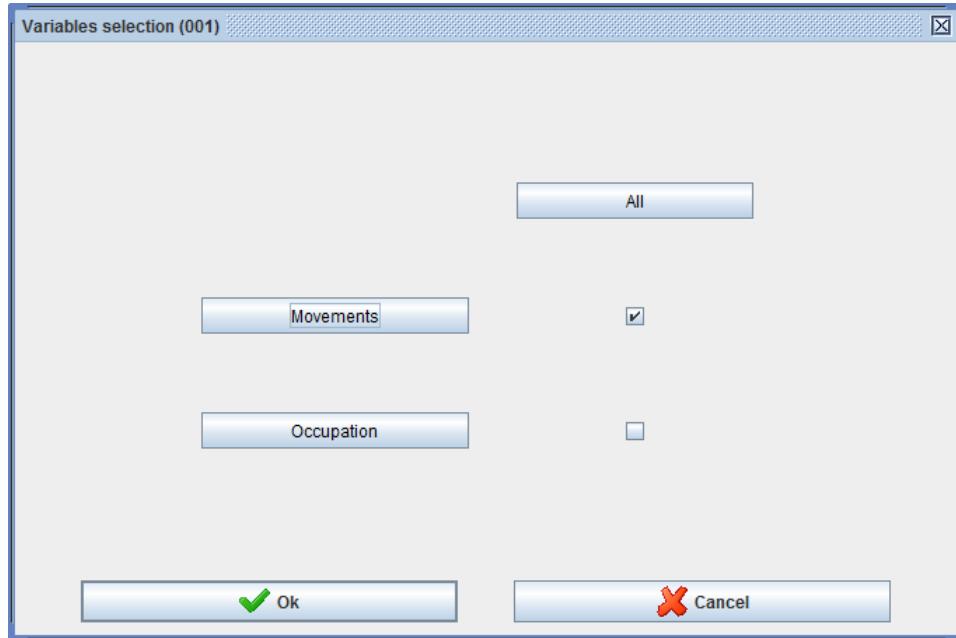


Check the variable to be selected. Selected variables appear with the checkbox and cannot be unchecked.

Click on **All** to check or uncheck all variables.



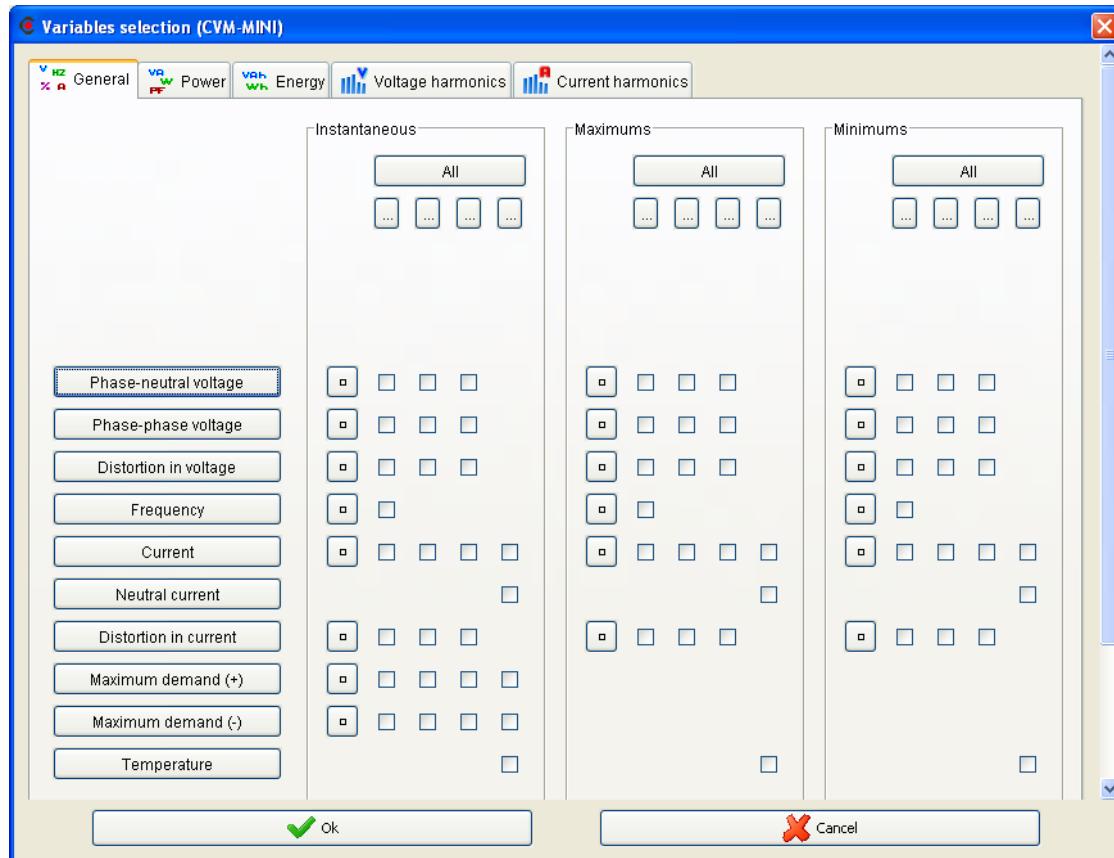
When checking variables, for example: **Movements**, all checkboxes for this variable will be checked or unchecked.



8.2 Measurement Devices

It will be possible to select both analogue variables (voltage, current, power, etc...), as well digital variables on equipment which permits this.

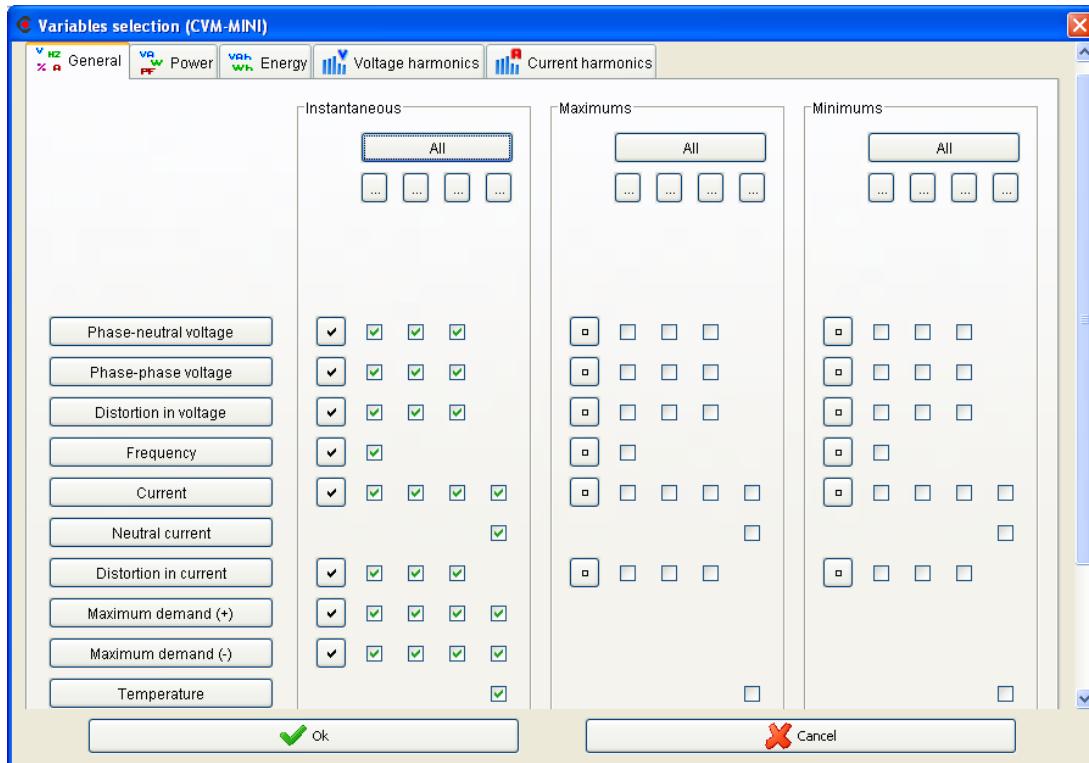
First the selection of analogue variables will be detailed. This dialogue will depend on the device connected; the explanation corresponding to CVM-MINI can be used for this section.



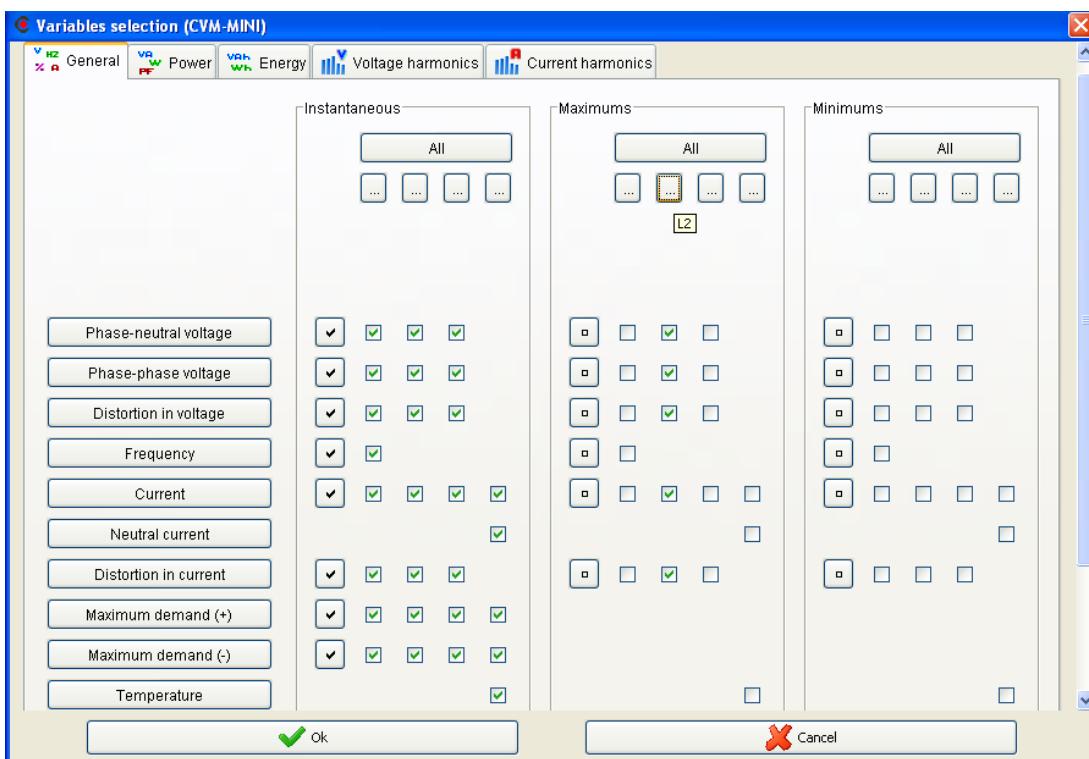
Where the variables we wish to select can be marked. If any variable is already selected it will appear marked as , and may not be unchecked.

If a discriminator has been selected, either by default or otherwise, the variables which can be discriminated will appear marked on the button as Energía activa * and an explanation will appear on the lower part of the screen *Variable discriminada

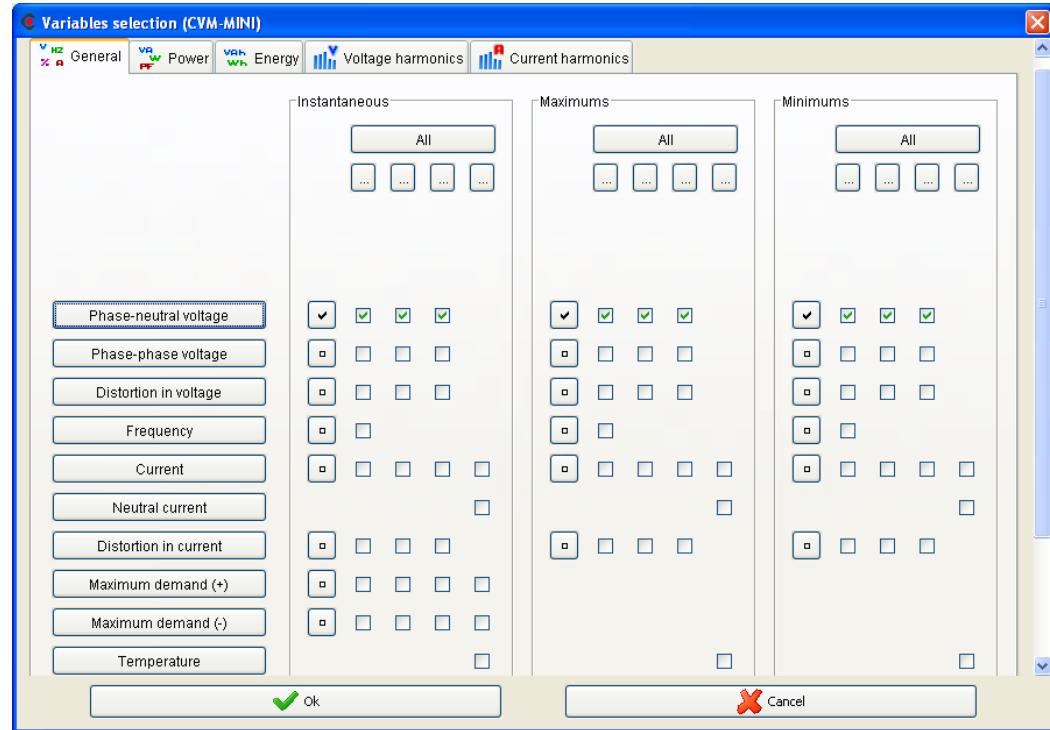
If the All button is pressed all the variables will be checked or unchecked.



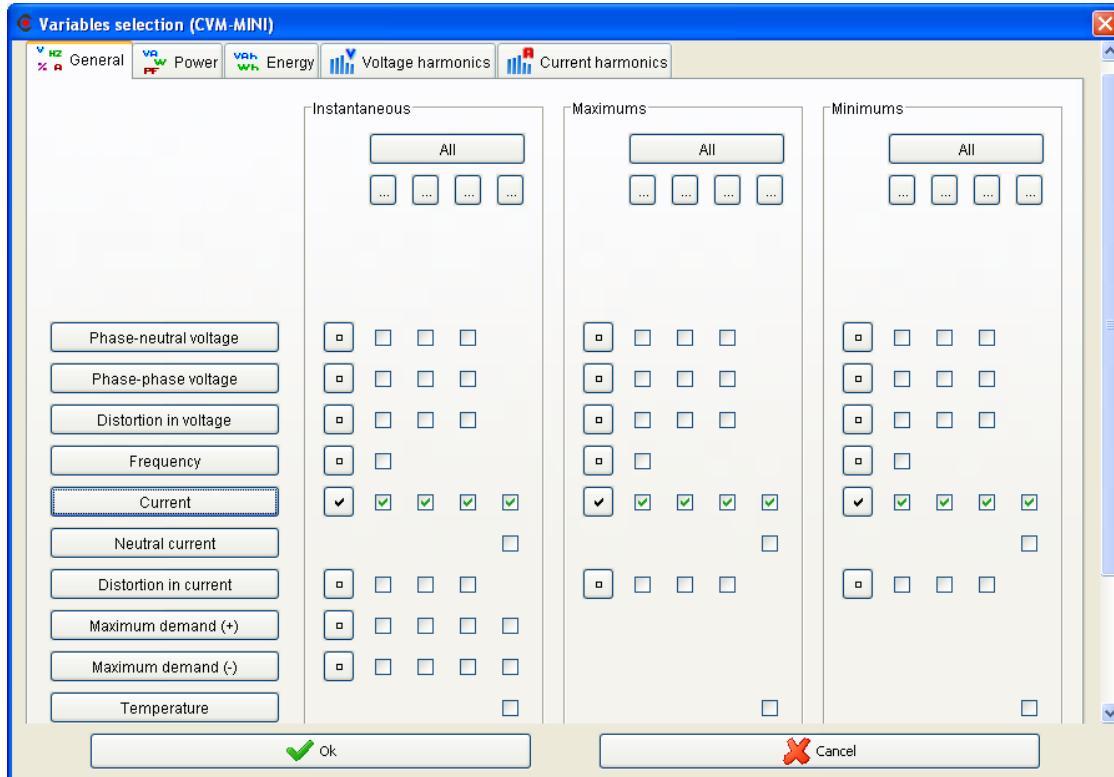
If you click on one of the stage buttons **L1 L2 L3 III**; only the variables for this stage will be selected or deselected.



If you click on one of the variables, for example **Phase-neutral voltage**, all the boxes for this variable will be selected.



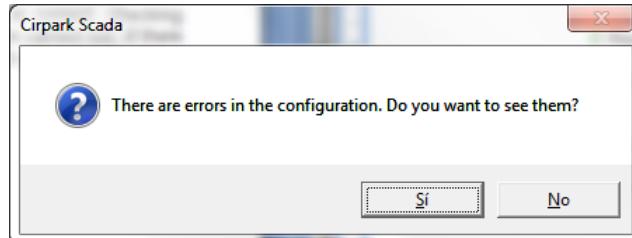
Finally, clicking on ; phases 1, 2 and 3, instant, maximum or minimum, are selected according to the button pressed. If all three phases are selected the button switches to , and when pressed, the 3 phases are deselected.





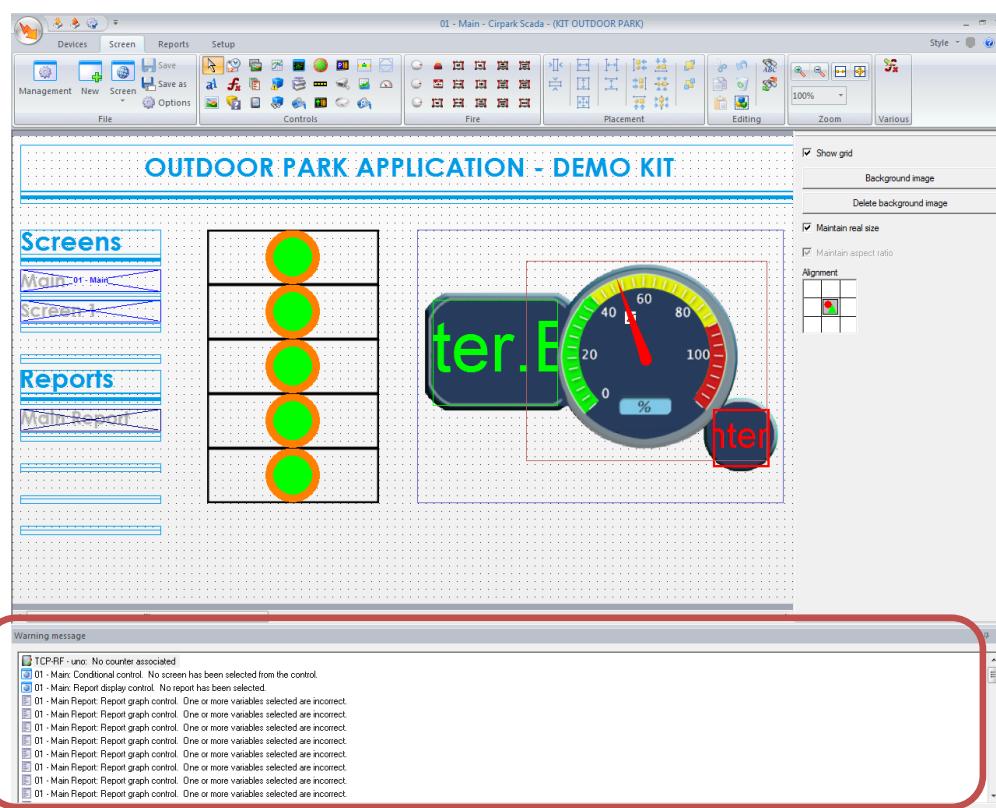
9 Error detection

On changing to runtime mode, CirPark scada will check whether the configuration is correct, checking possible mistakes on SCADA screens, reports, etc. Once the entire checking has been carried out, if there are any mistakes, CirPark Scada will give the opportunity of viewing these mistakes and correcting them.



If the answer is "No", and that we do not want to see the errors, we move onto running mode, but it is possible that the behaviour is not as desired on those controls that contain errors. That is why the configuration should not contain any errors.

An example of a screen with errors would be:



The list below shows the different errors found. The error information consists of the type of resource, name of the resort and a brief explanation of the error found. The different types of resources are

SCADA Screens

Reports

Events



When you double click the left mouse button on an error line, the program will automatically display the SCADA screen, report or event where the mistake was found and if it is a SCADA screen control it will select the control where that error has been detected.



10 Appendix

10.1 Expressions and conditions

Many parts of the program allow the inclusion of terms or conditions. To enter these, there is a standard text control available accompanied by a help button that will guide you through editing them.

Real numbers can be used in an expression or condition (in accordance with the IEEE 754-1985 standard, where among other aspects, it stipulates that the decimal separator is the “.”) symbol, parentheses (“(” and “)”), addition operators (“+”), subtraction operators (“-”), multiplication operators (“*”), division operators (“/”) and exponential operators (“^”). Thus, some valid examples would be:

$$2 * (4.56^2)$$
$$1 - (2.12 - 4) / 2$$

The following mathematical functions can also be used:

sqrt(exp) : Square root of the expression "exp"
log(exp) : Natural logarithm of the expression "exp"
exp(exp) : Number "e" to the power of expression "exp"
sin(exp) : Sine of the expression "exp" (in radians)
cos(exp) : Cosine of the expression "exp" (in radians)
tan(exp) : Tangent of the expression "exp" (in radians)
asin(exp) : Arcsine of the expression "exp"
acos(exp) : Arccosine of the expression "exp" (in radians)
atan(exp) : Arctangent of the expression "exp"
atan2(exp1, exp2) : Extended arctangent of the expression "exp1/exp2"
log10(exp) : Base 10 logarithm of the expression "exp"
round(exp) : Rounding off to whole number nearest to the expression "exp"
trunc(exp) : Truncation to the whole number of the expression "exp"
pi() : Returns the number PI (3.1415927...).
e() : Returns the number E (2.7182818...).
mod(exp1, exp2) : Return the modulus "exp2" of expression "exp1"
max(exp1, exp2) : Returns the maximum of the two expressions
min(exp1, exp2) : Return the minimum of the two expressions
abs(exp) : Returns the absolute value of the expression "exp"
rand() : Returns a real random value between 0.0 and 1.0



if(cond, exp1, exp2) : Evaluates the condition "cond". If the condition is true it returns the expression "exp1" if false it returns the expression "exp2"

We should remember some details about these functions. The square root function will return an error if the expression is negative. The logarithmic functions ("log" and "log10") will return an error if the expression is less than or equal to zero. The Arctangent function ("atan") assesses a range that goes from $-\pi/2$ to $\pi/2$ and returns zero if the expression is zero. The extended Arctangent function ("atan2") assesses a range that goes from $-\pi$ to π and returns zero if both expressions are zero. The Arcsine functions ("asin"), Arccosine ("acos"), Arctangent ("atan") and extended Arctangent ("atan2") return the result in radians. The functions that return the number pi ("pi") and e ("e") have no parameters, so they can be used with or without parentheses. The functions are not case sensitive. Examples of valid formulas are:

```
2*pi() -sqrt(10)  
round(exp(2) +atan2(1.2) -e*pi)
```

It is also possible to use certain time functions:

sunrise(exp1, exp2) : Returns the number of seconds from 00:00 hours until sunrise, the longitude being expression "exp1" and the latitude expression "exp2". Parameters "exp1" and "exp2" are in degrees.

sunset(exp1, exp2) : Returns the number of seconds from 00:00 hours until sunset, the longitude being expression "exp1" and the latitude expression "exp2". Parameters "exp1" and "exp2" are in degrees.

sunrisehours(exp1, exp2) : Returns the time of the sunrise, the longitude being expression "exp1" and the longitude expression "exp2". Parameters "exp1" and "exp2" are in degrees.

sunriseminutes(exp1, exp2) : Returns the minute of the sunrise, the longitude being expression "exp1" and the longitude expression "exp2". Parameters "exp1" and "exp2" are in degrees.

sunriseseconds(exp1, exp2) : Returns the second of the sunrise, the longitude being expression "exp1" and the longitude expression "exp2". Parameters "exp1" and "exp2" are in degrees.

sunsethours(exp1, exp2) : Returns the time of the sunset, the longitude being expression "exp1" and the longitude expression "exp2". Parameters "exp1" and "exp2" are in degrees.

sunsetminutes(exp1, exp2) : Returns the minute of the sunset, the longitude being expression "exp1" and the longitude expression "exp2". Parameters "exp1" and "exp2" are in degrees.

sunsetseconds(exp1, exp2) : Returns the second of the sunset, the longitude being expression "exp1" and the longitude expression "exp2". Parameters "exp1" and "exp2" are in degrees.

sunshinehours(exp1, exp2) : Returns the number of hours between the sunrise and the sunset, the longitude being expression "exp1" and the longitude expression "exp2". Parameters "exp1" and "exp2" are in degrees.

sunshineminutes(exp1, exp2) : Returns the number of minutes between the sunrise and the sunset, the longitude being expression "exp1" and the longitude expression "exp2". Parameters "exp1" and "exp2" are in degrees.

sunshineseconds(exp1, exp2) : Returns the number of seconds between the sunrise and the sunset, the longitude being expression "exp1" and the longitude expression "exp2". Parameters "exp1" and "exp2" are in degrees.



second() : Returns the second of the current date.
minute() : Returns the minute of the current date.
hour() : Returns the hour of the current date.
day() : Returns the day of the current date.
month(): Returns the month of the current date.
year() : Returns the year of the current date.

These functions return values relating to the date in the local time of the engine when viewed from the client, and values relating to the local date of the editor when editing a SCADA screen or report. The functions that do not contain parameters can be used with or without brackets. The "**second**" function returns a value between 0 and 59, like the "**minute**" function. The "**hour**" function returns a value between 0 and 23. The "**day**" functions returns a value between 1 and 31. The "**month**" function returns a value between 1 and 12.

The following time functions are only available in reports.

secondsinperiod(): Returns the number of seconds in the current period of the report
minutesinperiod (): Returns the number of minutes in the current period of the report
hoursinperiod (): Returns the number of hours in the current period of the report
daysinperiod (): Returns the number of days in the current period of the report
beginsecond (): Returns the initial second in the actual period of the current report
beginminute (): Returns the initial minute in the current period of the report
beginhour (): Returns the initial hour in the current period of the report
beginday(): Returns the initial day in the current period of the report
beginmonth(): Returns the initial month in the current period of the report
beginyear(): Returns the initial year in the current period of the report
endsecond(): Returns the final second in the current period of the report
endminute(): Returns the final minute in the current period of the report
endhour(): Returns the final hour in the current period of the report
endday(): Returns the final day in the current period of the report
endmonth(): Returns the final month in the current period of the report
endyear(): Returns the final year in the current period of the report

Both for the expressions and the conditions reference can be made to device variables added to the system. To make reference to one of these variables its name must be entered between the square brackets ("[" and "]"). The name of a device consists of two parts separated by a period ('.') the left side is the name of the device and the right side is the variable code of the device (to consult variable codes allowed consult the corresponding appendix for each device). Some examples are:

```
2 * [CVM144.VI1]  
[CVM K 1.AE]+[CVM K 2.AE]+[CVM K 3.AE]
```

In some parts of the program it is possible to apply a filter to the variable that is, to see the value of the filtered variable in accordance with a calendar. This is possible, for example, in reports or graphs and only in some specific variables, such energy variables.

In order to refer to the filtration of a variable we should indicate to the left of the variable, the name of filter plus the extension. "**XDCT**" followed by "@"and the type of hour we want to access. For example, if we have defined a filter with the name "**Rate**" that contains two types of hours "**H1** and **H2**," we can refer to both as follows:

```
[Tarifa.XDCT@H1:CVMK.AE]
```



[Tarifa.XDCT@H2:CVMK.AE]

It should be emphasized that after the name of the rate we should always find the ".XDCT," extensions followed by "@", the name of the type of hour and the symbol ":". Remember that not all variables of the devices can be filtered; see the variables code appendix for details on which variables of each device can be filtered.

In some parts of the program, such as in the reports and the SCADA screens, you can also refer to variables previously defined in the formula list. Both in the reports and in the SCADA screens there is a list of expressions each identified by a text that, can be used in controlling formulas or in the conditional control. So, an expression with the identifier "F1", be used in other expressions:

F1*2.0-1.3
1-sqrt (F1)

It should be emphasized that the identifier of an expression (name of the variable) cannot start with a numerical digit, although it may contain them.

Finally, in those places where a condition is required, it is possible to use the operators less than ("<"), greater than (">"), less than or equal to ("<="), greater than or equal to (">="), equal to ("=="), different to ("!="), logical "AND" ("&&"), logical "OR" ("||") and logical "NOT" ("!").

Remember that the comparison operators require the terms to the left and right be numerical, while the logical operators require expressions to be conditions. Thus, examples of correct conditions would include:

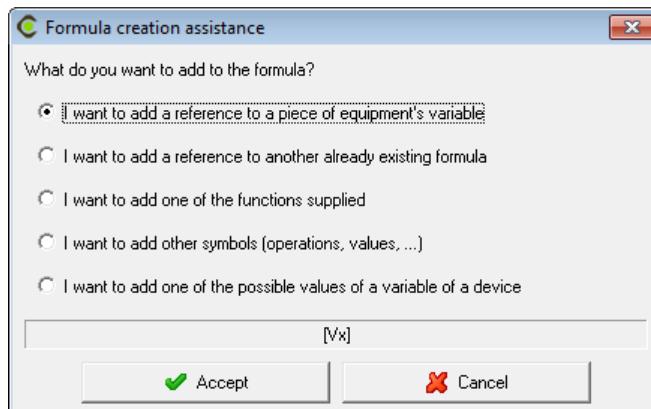
[CVMK.VI1]>(240-F1)
(F1!=10 && [CVMK.VI3]<=20)

Expressions and variables are always of the numerical type (real) while the conditions are the Boolean type.

10.1.1 Expressions and Conditions Creation Wizard

CirPark Scada has an assistant, or wizard, for creating conditions and expressions. This wizard can be accessed by clicking the button, which is next to the text controls where we can manually enter the terms and conditions.

Clicking on this button will bring up the following window:



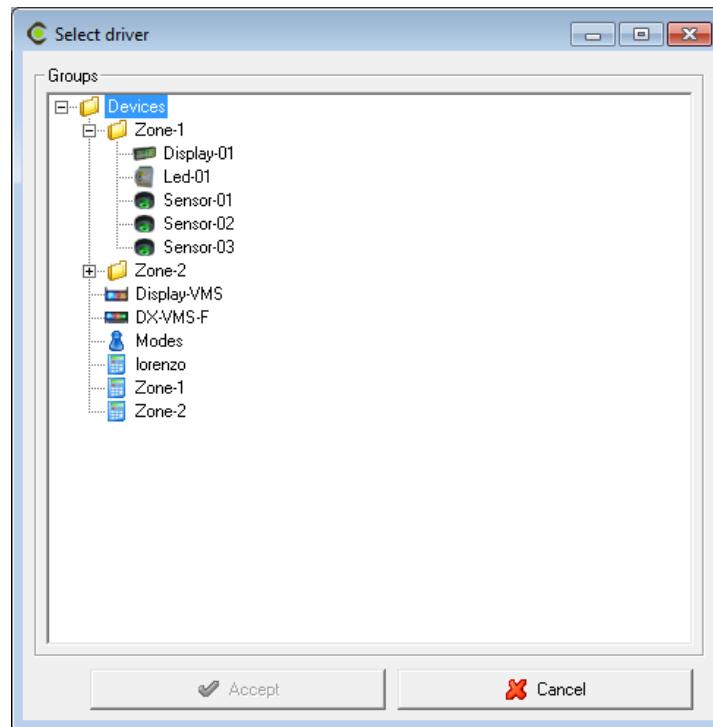


Here you may select what you wish to add to the expression. The option will be added in the position of the cursor in the text control associated to the expression. The lower part of the dialogue shows where to enter what you want to add:

- [Vx]. If we want to add a reference to a variable of a unit
- Fx. If you want to add a reference to another already defined formula
- F(x). If you want to add one of the functions provided
- x. If you want to add other symbols.

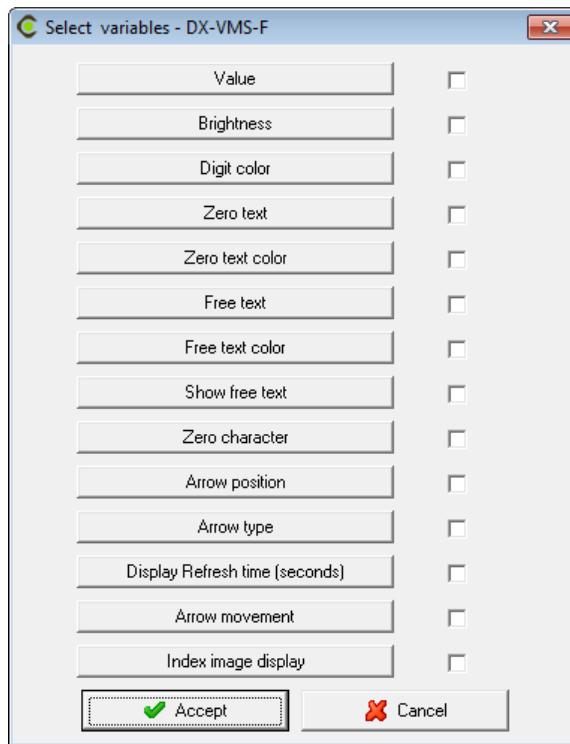
The wizard options are as follows:

- *Add a reference to a variable of a device:* Selecting this option will display a window where you can choose the device from which to add a variable to the formula.





Clicking to accept a menu to choose the specific variable of the chosen device appears. Only you can choose a single variable.

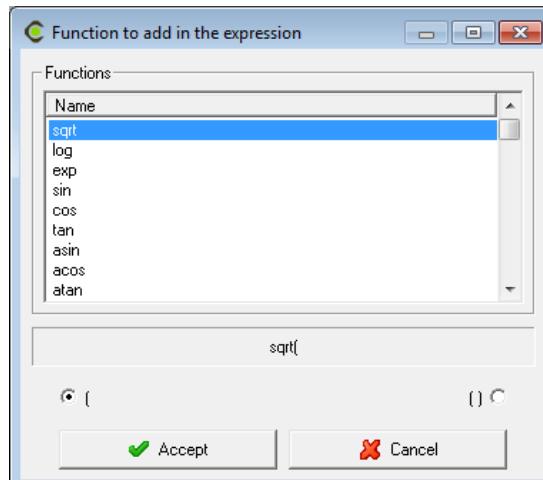


Likewise, you may specify a previously defined specific filter (see chapter 8) using the control:



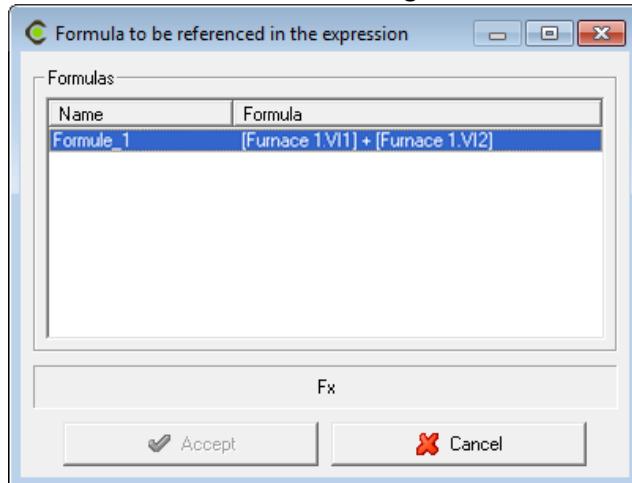
Once you have chosen the unit and the filter (where appropriate) the variables selection window will be displayed allowing you to choose the variable to be entered in the formula (see **iError! No se encuentra el origen de la referencia. iError! No se encuentra el origen de la referencia.**)

- **Add a reference to an already defined formula:** This option enables you to enter a reference to another previously defined formula. This option is only available in reports and SCADA screens. Selecting this option will display a window where a previously defined formula can be selected:

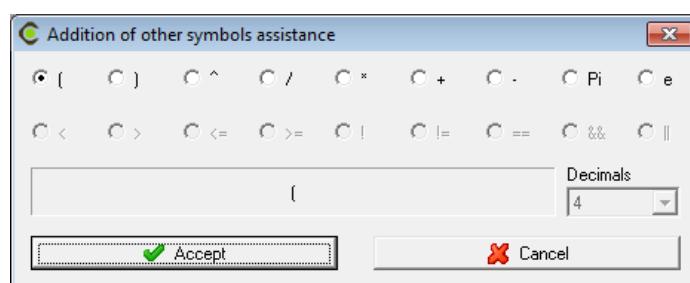




- *Add one of the functions provided:* This option allows access to a list of typical mathematical functions which can be entered into the formula being edited:



- *Add other symbols:* this option allows you to enter symbols such as comparators, logical functions, basic symbols, specific mathematical numbers, and so on.



Depending on whether what you are creating corresponds to an expression or a condition, some of these symbols will be disabled and therefore may not be selected.

- *Add one of the possible values of a variable of a device:* As its name suggests, the formula will introduce a value that is within the range of the variable device

