



# Movicon NExT

## 16.0 Scheduler Manager

Ver.3.4.268



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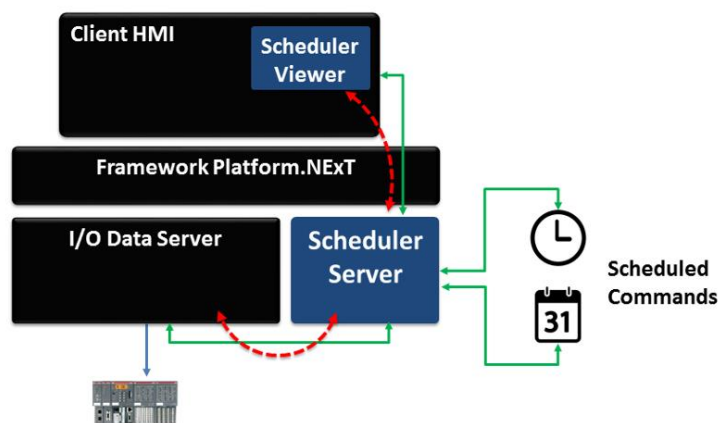
# 1. Scheduler Manager

The Platform.NExT project's 'Scheduler' resource is the tool used for configuring command executions in the project based on prefixed times, weekly plans or calendar dates. The Resource is based on a Scheduler Server module therefore an applied module that is part of the platform.

The scheduler is very handy to use when needing to activate commands based on a specific time or date especially when the need to activate in the plant on a regular basis for a certain length of time. It also saves a great deal of time when creating projects with commands that needed to be repeatedly activated at preset time ranges in the plant.



The Schedulers use the time set on the PC in which the Scheduler Server is run.

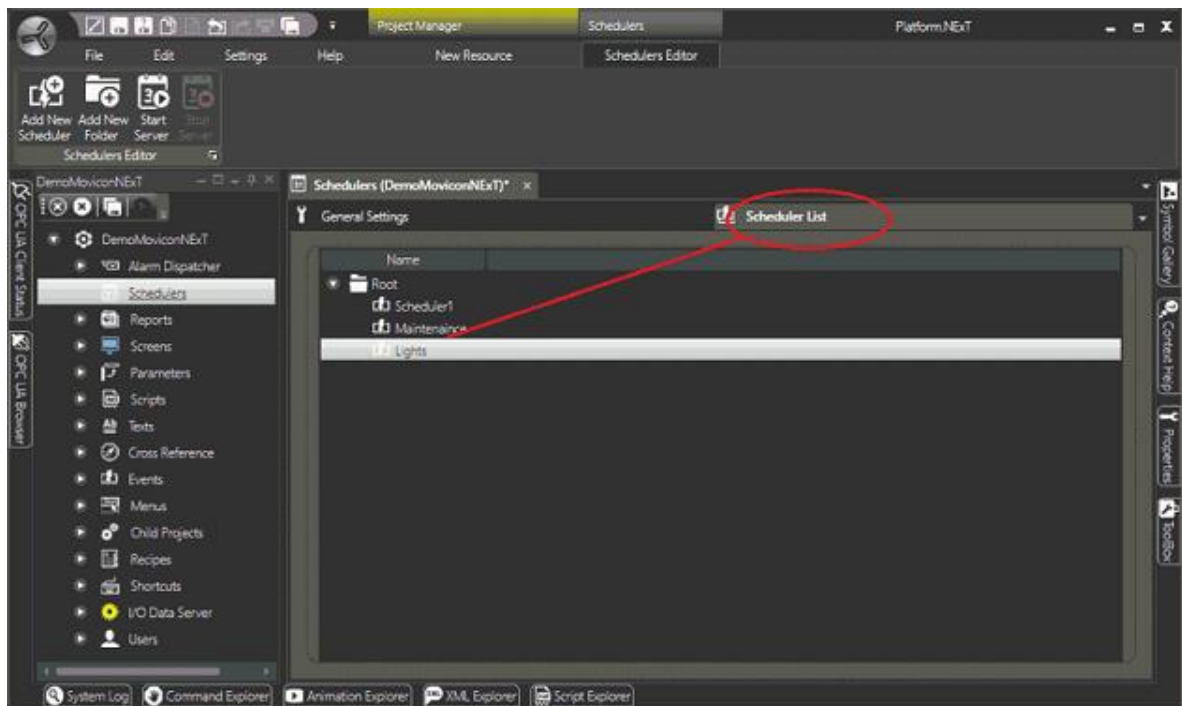


The Scheduler offers great operative advantages in any type of application especially in those sectors (e.g. building Automation, Scheduled Maintenance ecc..) that usually require commands to execute automatically in function with preset time schedules. Just think of all those turning on/off light commands and central heating systems for instance. These operations, even though simple, can be performed using the appropriate resource assigned the task to slim down and speedup the setting procedures of these types of commands.



The Platform.NExT Scheduler Manager is in fact a OPC UA Server that when started up connects as a Client to the Project's Data Server to access its tags. The graphical Scheduler objects also connect as Client but to the Scheduler Server instead.

The Scheduler Server can be started up manually by using the "Start Server" ribbon command or automatically with the Platform.NExT project in which it has been configured.

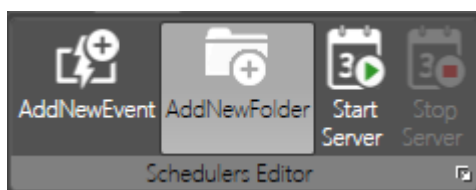


The Scheduler Resource can be opened project edit mode by double clicking on the relative resource in the Platform.NExT project's tree structure. The resource will open in the workspace in edit mode with two main areas, **General Settings** and **Scheduler List** that can be accessed by selecting the relative Tab on the top border of the resource area.

When selecting the Scheduler List tab you will be able to insert new scheduler objects or display and modify those that already exist by using the Property window.

## Commands for inserting schedule events

The command used for editing scheduler events are available in the "Schedulers Editor - Schedulers Editor" Ribbon.



*Ribbon containing the commands needed for editing Scheduler Events*

### Add New Event

The command is used for inserted a new Event after which must be configured accordingly.

### Add New Folder

This command is used for creating a new Folder within which the events are to be inserted. These Folders are only for project organization purposes and can be nested in many levels.

### Start Server

The Scheduler is in fact a OPC UA Server that connects to the Platform.NExT project's I/O Data Server as Client. The Server can be started up manually by using the Start command.

### Stop Server

This command is used for stopping the Scheduler Server manually after the Start command has been used.

## 1.1. Types of Schedulers

The Scheduler objects each have a **Event ON** and **Event OFF** execution which offer the possibility to set the desired value to one of the I/O Data Server's tags. Substantially, each Scheduler object executes its own ON and OFF according to the which **Type** it has been set with. This type may be Every minute, hour, day or certain day, Weekly Plan or Calendar.



The Scheduler's 'Runtime editable' property can be enabled to allow the operator to set time schedules in runtime as well.

### *Cyclic Scheduler:*

The Cyclic Scheduler has a reoccurring event based on a preset time. The options provided are:

- **Every Minute (ON and OFF within each minute)**
- **Every Hour (ON and OFF within each hour)**
- **Every Day (ON and OFF within each day of the week)**
- **Every specific day of the week (ON and OFF within the specified day of the week)**

### *Schedule Plans*

The Schedule Plan comes with two options, the weekly plan or the Calendar. The events in the Calendar can be set to occur on a particular prefixed date and time, or a time range comprised of two dates:

- **Weekly Plan**
- **Calendar: Prefixed Date**
- **Calendar: Day comprised of two fixed dates**
- **Calendar: Reoccurring day annually**

For further information please refer to this object's property settings.

### Event ON - OFF in Cyclic Scheduler "Every ... "

When selecting one of the "Every Minute", "Every Hour" or "Every Day" settings, the event will be executed according to the time set in the "**Time ON**" and "**Time OFF**", fields that must be set appropriately to establish the command's ON and OFF execution time within the period indicated.



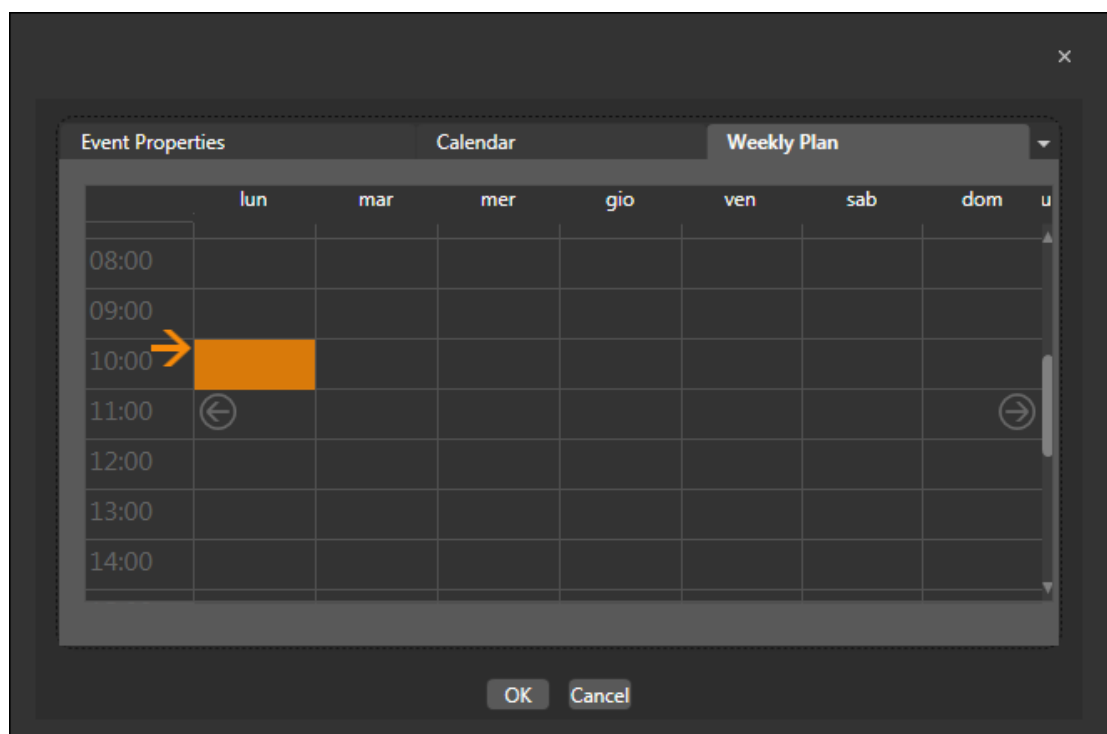
In cases where the "Time On" and "Time Off" values are the same, only the event ON will be executed!

- **everyMinute:** Event executed every **Minute**, with ON and OFF in the **Seconds** field for the set ON and OFF time.
- **everyHour:** Event executed every **Hour**, with ON and OFF in the **Minute and seconds** field for the set ON and OFF time.
- **everyDay:** Event executed every **Day**, with ON and OFF in the **Hour:Minutes:Seconds** field for the set ON and OFF time.
- **everySunday:** Event executed every **Sunday**, with ON and OFF in the **Hour:Minutes:Seconds** field for the set ON and OFF time.
- **everyMonday:** Event executed every **Monday**, as above.
- **everyTuesday:** Event executed every **Tuesday**, as above.
- **everyWednesday:** Event executed every **Wednesday**, as above.
- **everyThursday:** Event executed every **Thursday**, as above.
- **everyFriday:** Event executed every **Friday**, as above.
- **everySaturday:** Event executed every **Saturday**, as above.

## Weekly Planned Events

The Weekly Plan can be selected for planning events through out the week. This is done by using the **Weekly Plan** settings that can be accessed using the Tab in the settings window.

The Weekly Plan's settings window provides a graphical user interface grid showing a week divided into days and hours. This window is used to configure the activation time or time range of the command to be scheduled throughout the week.





*This is a Weekly Plan window used to program events at certain times on a weekly basis*

Different command activation time ranges can be set throughout in the Weekly Plan including several on the same day. The minimum time range settable is a minute. The ON event will be executed on the '00' second of the time range's start minute. The OFF event will be executed on the time range's '59th second of the last minute.



CAUTION! In cases where the pc's clock is turned back, and the time set in the "weekly Plan" is changed to coincide with the pc's new clock, the scheduler command will not be executed.

### Inserting Times

To insert a new time range simple double click on the box of the day and hour desired or right click and activate the "Add Schedule Time" to open a window where a new time range can be entered.

*Window used to insert or modify time ranges*

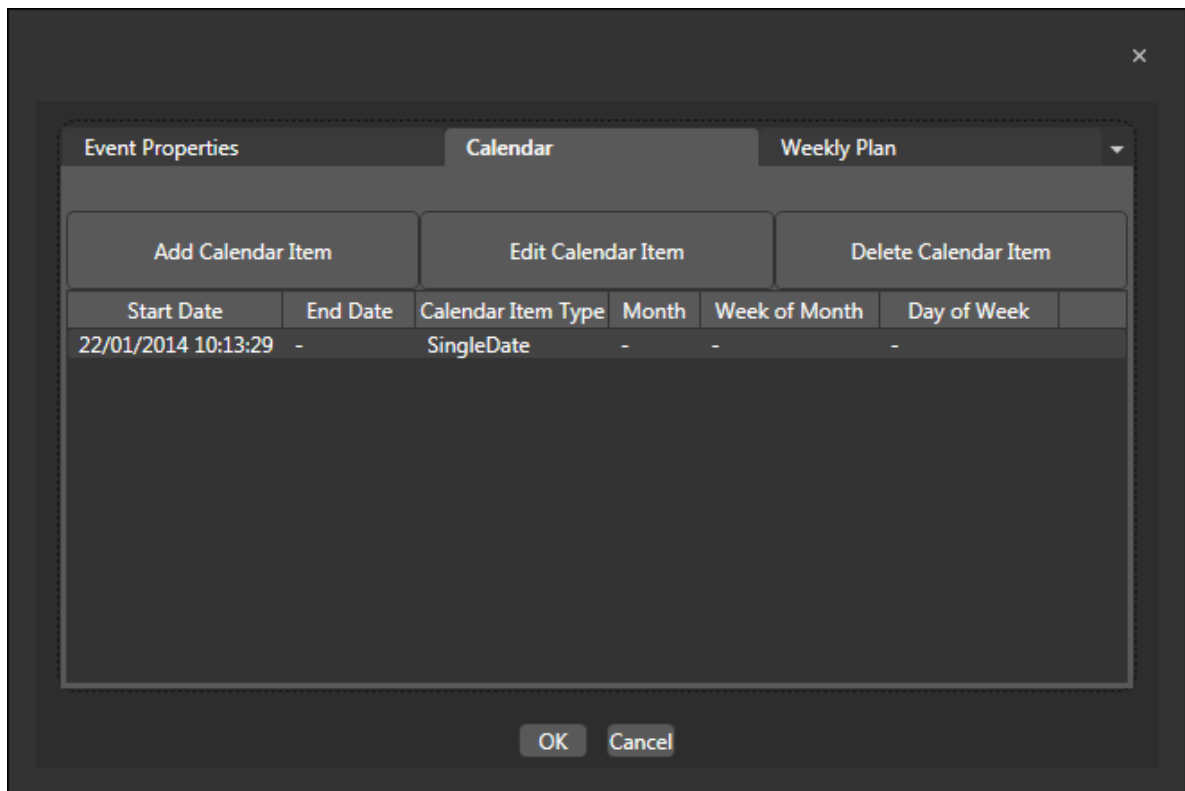
The above window is used to insert a time range by defining the start and end times and the day or days of the week in which the time range is to start and finish. If two different days are entered in the 'Day of Week' fields, the time range will start with the first day and end with the second.

The time ranges can also be dragged and repositioned with the mouse.

### Scheduled Calender Events

When selecting "Calendar" event type, the events will be scheduled based on specific **Calendar dates**. In order to set these dates you will need to use the **Calendar** settings which can be accessed through Tab shown in the settings window.

The Calender settings window has a user interface that allows you to insert, modify or remove each single Calendar Item type inserted. Each inserted Calendar Item Type must then be set appropriately through the same window.



The Window used to set Calendar events.

Different event types can be inserted by using the "Add Calendar Item". The different events are:

### Single Date

When selecting a "Single Date" event you will be able to define a fixed date and time for command execution. The ON event will be executed according to the date and time set and the OFF event will be executed at the beginning of the following minute.

### Data Range

When selecting this event type, it will be possible to set its start and end date. In this case, the ON event will be executed according to the Start Date and Time set and the OFF event will be executed according to the End Date and time set.

### WeekNDate

When selecting a "WeekNDate" event it will be possible to define a plan based fixed on days, weeks or months. The field provided to enable this are:

- **Month:** this field is used for selecting the month in which to execute the even. Specific individual months can be selected, or odd months or even months only or all the months of the year.
- **Week of Month:** this field is used for selecting the week in which to execute the event. The first to the last week can be selected or all the weeks of the year.
- **Day of Week:** this field is used for selecting the day on which to execute the event. One specific day or all the days of the week can be selected.
- **Start Time:** this field is used for selecting the date and time in which to execute the ON event.

- **End Time:** this field is used for selecting the date and time in which to execute the OFF event.

## 1.2. General Scheduler Server Settings

The Scheduler resource as a Server has its own Configuration **Settings** section in its workspace. This section is divided into three areas, the main one being dedicated to the Scheduler Server's general Settings.

There are two other smaller sections. One is dedicated to the '**Transports**' settings if the Scheduler Server should ever need to communication with the platform. The other one is dedicated to its 'Status' where the Scheduler Server's system log messages will be shown.

### General Settings

The Scheduler Server's general command settings can be defined and configured in the Settings section:

#### Application Name

Name of the Server application. This name will be used to represent the OPC UA Scheduler Server on the Client browse list.

#### Log Connection String

This is the connection string which will be used by the scheduler for recording historical data. If a connection string is not defined, one for default will be inserted with the editor is opened. The default connection will be created in the SQL Server database using the instance from the local sql server and the Application Name as database name.

If for some reason the connection to the database is interrupted, the logged data will unload onto xml files in the project's "..\SchedulerServer\Historian" folder.

#### Log Max. Age

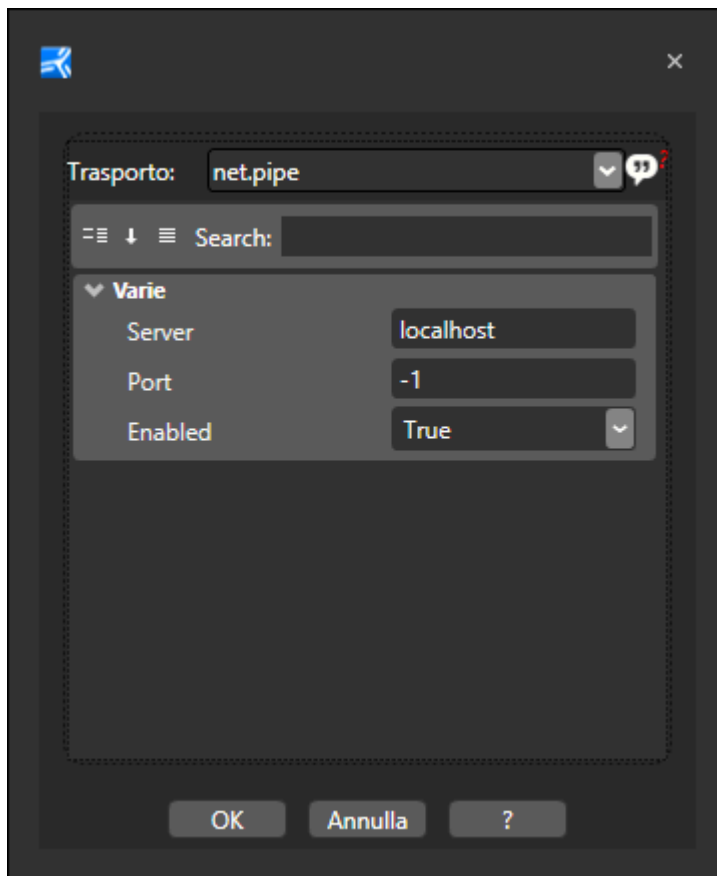
This indicated the maximum length of time that recorded historical data can remain in the DataBase. Data older than the value set here will be deleted.

#### Speech Enabled

When enabling this option, the scheduled events will also be announced vocally while being executed in runtime.

### Trasports

This window is used to define the protocols that are to be used for Server and Client communication. Once the Server has been started up, it will provide end-points according to the transports enabled in the project.



The order with which the transports are used, for example when connecting a variable to a display, is as follows:

```

Opc.Ua.Utls.UriSchemeNetPipe
Opc.Ua.Utls.UriSchemeNetTcp
Opc.Ua.Utls.UriSchemeOpcTcp
Opc.Ua.Utls.UriSchemeHttps
Opc.Ua.Utls.UriSchemeHttp
Opc.Ua.Utls.UriSchemeNoSecurityHttp

```

If only some of them have been enabled, the first available one will be used in the project. If none have been configured, the first one in the Server's configuration file will be used.



Attention! The "net.pipe" transport is a local transport which required both Client and Server to be started up in the same work session. This transport cannot be used if the Client project and Server project run on different machines.

## Status

This is a log window which actiated when the Server is started up manually using the "Start Server" command and reports Server status or error messages.

## 1.3. Scheduler Objects and Properties

Each Scheduler inserted in the project's Scheduler Resource is configured like an 'object' which provides a scheduler with its own autonomous commands in respect to the other eventual schedulers inserted. Each scheduler object can be managed in runtime by the operator and using the Scheduler Viewer object from the toolbox for screens in visualization Movicon.NExT Client.

Each Scheduler object is configured when inserted using a settings window or at any other time using its Properties window.

The Scheduler properties are described below.

### Scheduled Event List

A list or predefined scheduled events is reported in the "Settings" section's "Scheduled Event List" window. Further events can be added by using the command from the "Add New Event" Ribbon. The events can be organized in folders created with the "Add New Folder" command.

When a new event is added, a popup window will open to define its properties. The window can also be opened by double clicking on an already existing event.

*Window used for setting Scheduled Event properties.*

### General Properties

The general properties of a Scheduler Object are used for define the general configuration settings:

#### Name

Represents the name associated to the scheduled event. The name must be unique within each individual folder.

**Enable**

This option is used for enabling or disabling the scheduled event. New events are inserted with this option enabled for default.

**Type**

Represents the type of schedule to be used. The different types that can be used are described in the "Types of Schedulers" topic.

**Enable Tag**

This field is used to select the I/O Data Server Tag in which the scheduler command will be applied.

**Schedule Item**

This field is used to insert the name of a Tag to be used for enabling the scheduled event in runtime. When a Tag is specified in this field, the event will be disabled when the tag is set with a 'zero' value and enabled when the tag is set with a different value that is not zero in runtime.

**Hide Runtime Exception Tab**

Enabling this property will prohibit the Holidays Tab from showing at runtime for the scheduler in question and therefore making it impossible to view and edit its list of holidays during runtime.

**Hide Runtime Settings Tab**

Enabling this property will prohibit the Settings Tab from showing at runtime for the scheduler in question making it impossible to view and edit its settings during runtime.

## Execution Properties

The execution properties of a Scheduler object are settings that define its functionality:

**Time On**

This field is used to enter the time when the scheduled On event is to be executed. The complete hour, or part of it such as the seconds or minutes, are only taken into consideration according to the event type selected in the "Type" field.

**Time Off**

The time when the scheduler Off event is to be executed is entered in this field. The complete hour, or part of it such as the seconds or minutes only are taken into consideration depending on the event type selected in the "Type" field. If the "Time Off" is equal to the "Time On", the OFF command will not be executed.

**Exception (Holidays)**

This command is used to open a window through which you can define holiday dates and periods or specific intervals during which the scheduler will not execute the commands that it has been set with. For example, you can set 25th December as a holiday independently from which year you are in at the moment.

When the holidays window opens for the first time, or each time holidays have not yet been set, a message-box will appear asking if you want to holidays for the current year. Upon confirming this message-box, the public holidays will be automatically set according to the culture defined in the system (for example, Italian public holidays are different from those in the USA). In addition, some holidays vary according to the current year (for example, the days which Easter falls on changes every year). Those public holidays that do not vary, such as Christmas) will be automatically be inserted

in "WeekNDate" mode that does not require you to specify a year. Other public holidays will be inserted according to the date's of the current year.

The list of holidays can be changed as pleased by adding, deleting or modifying each item listed. The list of holidays can also be modified at runtime using the Scheduler Window object.

#### **Value for Event On**

This field is used for inserting the value to be applied to the Tag when the scheduled ON command is executed.

#### **Value for Event Off**

This field is used for inserting a value to be applied to the Tag when the scheduled OFF command is executed.

#### **Commands for On**

This is used to set a list of commands when event becomes active.

#### **Commands Off**

This is used to set a list of commands when event becomes inactive



Attention! The commands currently function only when server + client start up. This commands will not be executed when client is started up with the -start -client option.

#### **Runtime Editable**

Enabling this option will allow the scheduled event to be modified in runtime by using the "Scheduler Viewer" object. When this option is enabled, any modification in runtime will also be linked to the user authentication fields: "Access Role", "Access Level" and "Access Mask".

#### **Execute ON at startup (weekly plan)**

When the Scheduler is 'cyclic' type, the execution time of the scheduler ON event is entered in this field. The complete time or only part of it, e.g. only seconds, or only minutes and seconds, may be taken into consideration depending on the event type selected in the 'Type' field.

#### **Execute OFF at startup (weekly plan)**

When the Scheduler is 'cyclic' type, the execution time of the scheduler OFF event is entered in this field. The complete time or only part of it, e.g. only seconds, or only minutes and seconds, may be taken into consideration depending on the event type selected in the 'Type' field.

When the 'Time Off' is equal to 'Time On', the OFF command will not be executed.

### **User Access**

The User Management properties of a Scheduler object define its security settings:

#### **Access Role**

This field is used for selecting a user "Role" needed for performing scheduled event runtime modifications. In this case only the users assigned this role can modify the scheduler. The settings of this parameter are considered only when the "Runtime Editable" option has been enabled.

### Access Level

This field is used for selecting a user "level" needed for performing scheduled event runtime modifications. In this way only those users with levels equal to or higher than the one set in this field can modify the scheduler. The settings in this parameter will only be considered when the "Runtime Editable" option has been enabled.

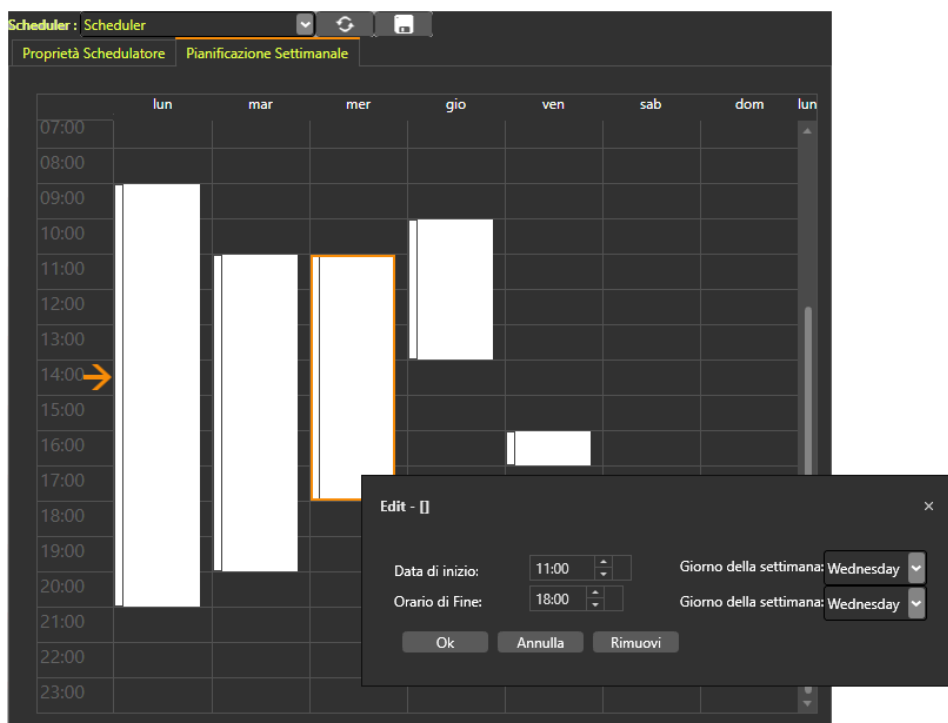
### Access Area Mask

This field is used for selecting a user "Mask" needed for performing scheduled event runtime modifications. In this case only those users with access masks that are compatible to the one set can modify the scheduler. The settings in this parameter are only considered when the "Runtime Editable" option has been enabled.

## 1.4. The Scheduler Viewer Object

The Scheduler Server can be displayed and edited by the operator during runtime by using the graphical Scheduler Viewer object located in the Viewer category in the screen toolbox.

The Scheduler Viewer object can be inserted on screen and configured as pleased through its properties as described in the topic relating to Graphical Screen displays.



*This is an example of the Scheduler Viewer object that can be inserted on screen.*

By using this graphical object, the operator can set scheduled events - where consented in the properties by the programmer - per each scheduler server object. The settings entered by the operator in runtime will have priority over those times set in object's properties in edit mode.





