PX340

PxDesigner application

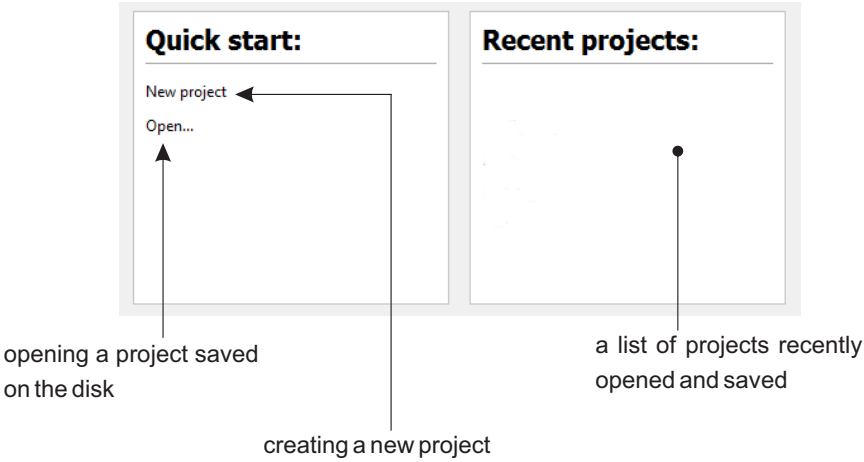
INSTRUCTIONS FOR THE USE OF THE APPLICATION ON PCs

PXM®

TABLE OF CONTENTS

1. GETTING STARTED

After the application has started, a controller model selection window is displayed (by default the application prompts you to select all controller models supported by it, in the application settings you can modify its default settings) and a welcome window in which you can select the following options:



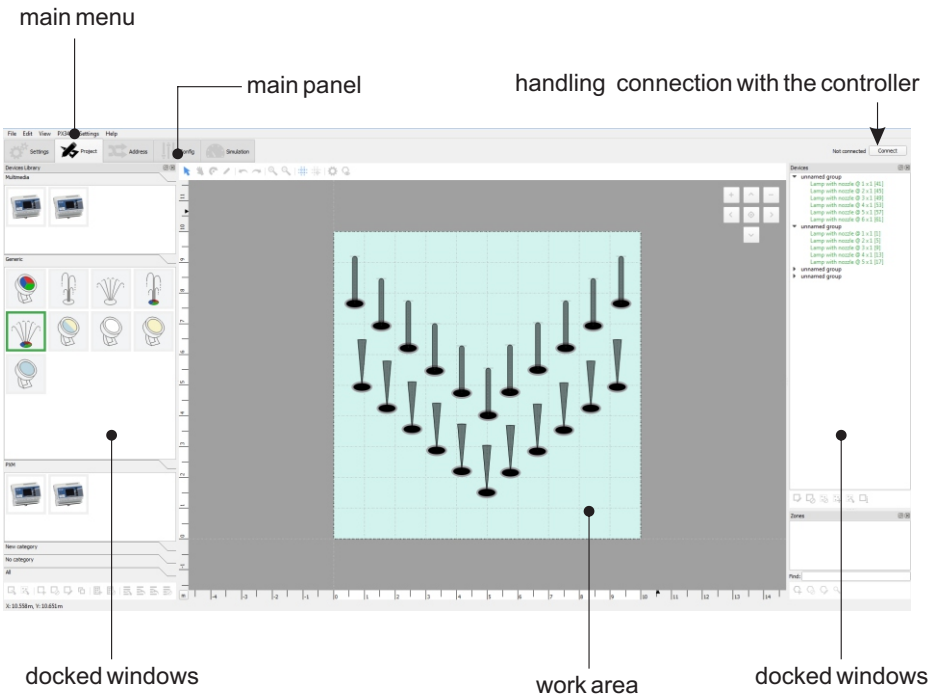
In the event of system failure, while the program is being started up again, in the [**Quick start**] field the [**Autosave**] option will be displayed; if you select it, you will be able to recover recent changes to the project. The autosave feature automatically makes project copies at one minute intervals.

NOTE: When connected to the controller, if changes are made in the configuration, they are not uploaded to the device on an ongoing basis.
The operations of uploading and downloading of the configuration are described in item 5 on page 25.

1.1. Application window structure

Information presented in the program is grouped on the top permanent panel which is divided into the following tabs: [**Settings**], [**Project**], [**Address**], [**Config**], [**Simulation**], and in the main menu, as a drop-down menu: [**File**], [**Edit**] [**View**], [**PX340**], [**Settings**], [**Help**]. The central part of the application window is a work area (main panel). On both sides of the work area there are docking windows whose contents change depending on the top panel tab selected.

A specimen application window:



Top panel tabs:

[**Settings**] - time option settings, controller input and output settings and granting privileges to users

[**Project**] - allows for adding and removing devices from a graphic project, manipulation (changing the position, rotating), grouping, ungrouping devices as well as creating and editing areas

[**Address**] - addressing devices added to the graphic project

[**Config**] - creating controller configuration and defining its operation

[**Simulation**] - visualisation of the behaviour of the controller in the configuration being edited, without the need to connect the device

The contents of the main panel are changed depending on the tab selected in the left panel.

Application menu:

[**File**]**:**

- *New* - opens a new project
- *Open* - opens a project previously saved on the disk
- *Recent files* - shows a list of projects recently opened and saved

- *Save* - saves changes made to the current project
- *Save as...* - saves the current project under the name provided
- *Import CSV*
- *Export CSV*
- Close project
- *Exit* - closes the application

[**Edit**]:
- *Undo* - undoes the last action (maximum 30 actions)
- *Redo* - redoes the action that you undid

[**View**]:
☐ Devices Library
☐ Devices
☐ Zones
☐ Configuration
☐ Effects
☐ Params
☐ Control
☐ Timeline
☐ Simulation

the menu contains a list of all docked windows. Using the checkboxes you can select windows that you want to be visible.

NOTE: If you close a dockable window, you can restore it by selecting the relevant checkbox from the [**View**] menu.

☐ Fullscreen - maximises the program window

[**PX340**]:
- *Connect* - the application searches for controllers on the web, please refer to the connection description on page 84
- Disconnect - disconnects the application and device
- Upload configuration - transmits configuration from the application to the controller
- *Download* configuration - downloads configuration from the controller to the application
- *Monitoring* - preview of the status of DMX input and output channels, digital and analog inputs as well as elements currently running in the controller
- *Admin tools* - controller network settings, security options, renewals, firmware update

[**Settings**]:
Advanced application settings.

[**Help**]:
- *About* - displays the software's details and the contact data of it's manufacturer
- *Manual* - opens the user guide (the user guide is displayed in the language which is currently set in the application)

2. SETTINGS

The [**Settings**] tab contains all the settings for the controller. These are further divided into: global system settings, input settings, output settings and user settings. To the right-hand side of the window there are drop-down tabs. The contents of the main panel on the right-hand side are changed depending on the tab selected.

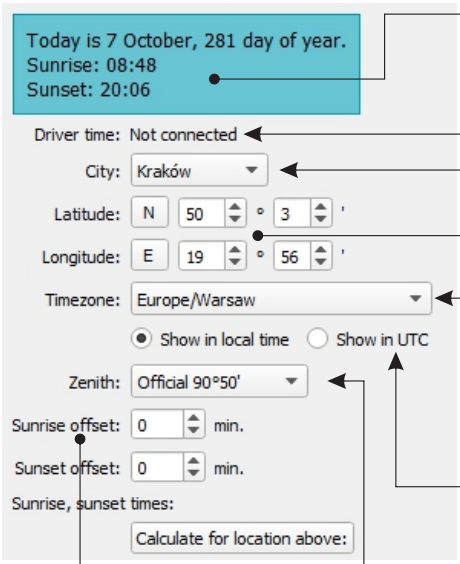
Available settings vary depending on the controller for which a project is being created.

2.1 System

Global system settings.
The [**Time**] tab contains all the settings for the controller astronomical clock.
It is used to calculate sunrise and sunset times.

In order to calculate the times, provide the geographical coordinates and the time zone, and next press [**Calculate for location above**].

NOTE: If the configuration utilises events happening since the sunrise and since the sunset - it is very important that this tab be completed and that you re-calculate the table before uploading the configuration to the controller.



today's date and today's sunrise and sunset times, based on the table calculated

time retrieved from the controller

a drop-down list of pre-defined cities; if a city in the drop-down list is selected, the coordinates and time zone are automatically filled in

the latitude and longitude are retrieved automatically if you select a city from the drop-down list

time zone drop-down list

the checkbox ticked makes allowance for the summer time offset

setting the point in time to be used as the sunrise
Each element on the drop-down list has a short description.

does not modify values in the table, but the controller reacts to events with the offset selected

2.2 INPUTS

2.2.1 DMX input

In the [**DMX input**] tab you can set parameters for DMX input channels. This tab is not available for PX345 controllers.

number of DMX channels from which data are received

DMX channel reference number

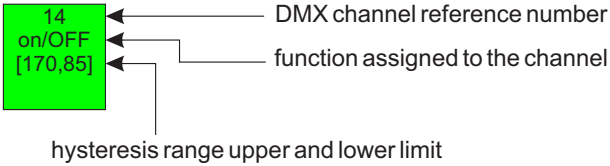
changing the parameters of the channels highlighted in the table

a ticked checkbox ☑ allows you to receive data from DMX channels
an unticked checkbox ☐ - DMX input channels are inactive

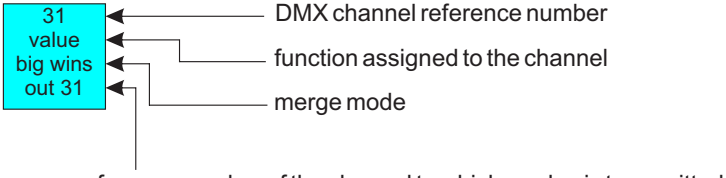
function assigned to the channel

Structure of a single DMX table tile:

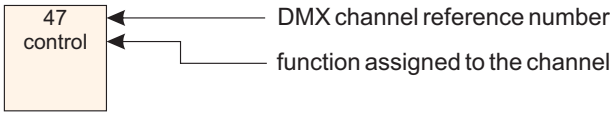
a) On/OFF



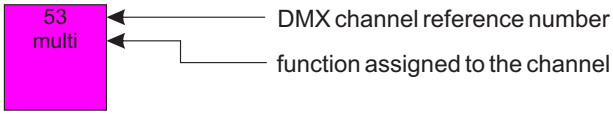
b) Value



b) Control



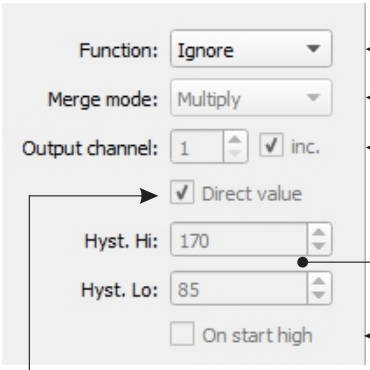
b) Multirange



You can select DMX channels to be edited in the following manner:

- **One by one** - by LMB clicking the selected channel in the table
- **On a group basis**
  - LMB clicking with Ctrl key depressed - adds/clears selection
  - LMB clicking with Shift key depressed - highlights a range
  - dragging the mouse with the LMB pressed - rectangular selection

To the right-hand side of the table there is a panel that you can use to change the parameters selected in the channel table.



assigning a function to a channel

merge mode drop-down list

determining to which channel the value from the input channel will be transmitted (in the case of the [**Value**] function)

If multiple channels are highlighted - the [**inc**] option will cause subsequent input channels to be transferred to subsequent output channels (not to the same, one channel).

a value in an output channel will be transmitted directly to the DMX output - omitting the output channel characteristic (for the [**Value**] function)

an option to set the hysteresis range (Hi - upper limit, Lo - lower limit) available if the [**On/Off**] function is selected

a ticked checkbox means that upon the controller being turned on, the initial status will be set to ON, while an unticked checkbox means OFF (available if the [**On/Off**] function is selected)

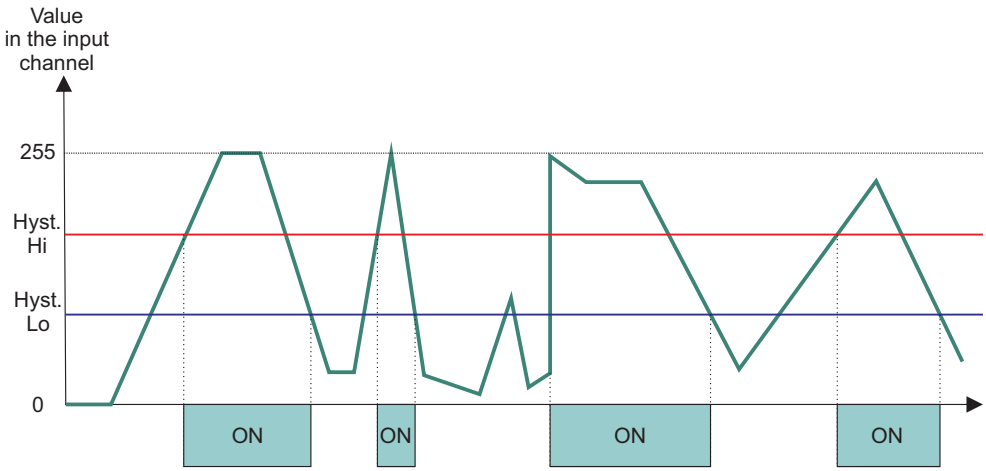
The [**Function**] parameter specifies the manner in which a given input channel is operated. Available options include:

- **IGNORUJ** - an input that is not used
- **ON/OFF** - the input is treated as binary - generates 2 events: since switching on and since switching off
- **VALUE** - transmission of values to the DMX output channel selected according to the merge mode set
- **CONTROL** - generates a single event with a value, can be used to control e.g. scene masters, program masters
- **MULTIRANGE** - a multi-range channel, the user defines a table with value ranges per channel. Each range generates 2 events, since entering the range and leaving the range. The total of all ranges in [**Multirange**] channels may not exceed 256.

For the On/Off function:

NOTE: The upper hysteresis limit [**Hyst Hi**] should be higher than the lower limit [**Hyst Lo**].

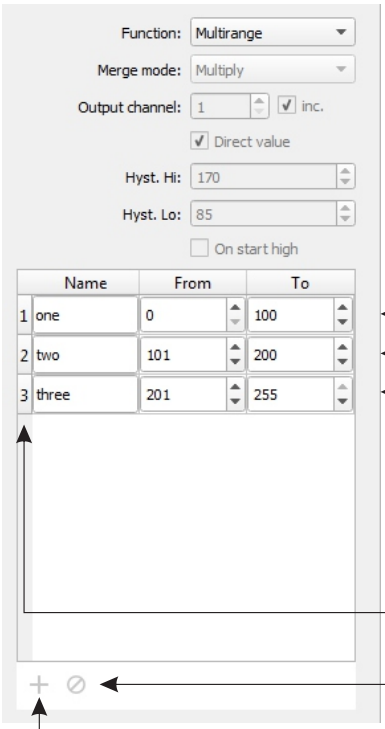
A graph showing how hysteresis operates:



Available merge mode values for the [**Value**] function:

- **NO MERGE** - an input value is transmitted directly to the output, the controller ignores the value calculated
- **BIG WINS** - the higher of the two values is transmitted to the output (transmitted from the input or calculated)
- **LAST WINS** - the most recently changed value is transmitted to the output (transmitted from the input or calculated)
- **MULTIPLY** - the value being the product of multiplication of two values: transmitted from the input and calculated one, is transmitted to the output

If you select the [**Multirange**] function, the application will display range tables:



designation of the range, value from ....to

If ranges are set overlapping each other, the application will display a warning message reading “Ranges (numbers) are overlapping!”.

subsequent ranges

range reference numbers

[**Delete**] – removes the range selected/highlighted

[**New**] – adds a range to the list, by default a range of values from 0 to 255 is added

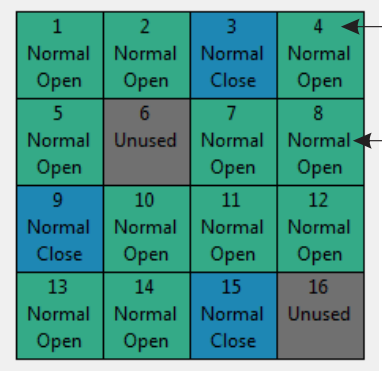
2.2.2 Digital inputs

Sterownik posiada wbudowanych 16 wejść cyfrowych

Each input can be set to operate as follows:

- **Normal Close** – opening the button contact generates an event since switching on, closing the contact - since switching off
- **Normal Open** – closing the button contact generates an event since switching on, opening the contact - since switching off
- **Unused** – the button does not generate any events

The colour in the table depends on the button mode.



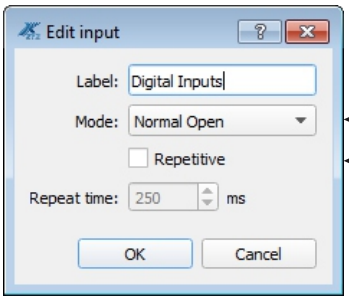
button reference number

mode

In order to change the mode, LMB-click the button tile, and the modes will change as follows:

[**Normal Close**], [**Normal Open**] i [**Unused**].

RMB-clicking the button tile opens a menu - in this menu you can set the mode or go to the [**Edit**] small window.



a input mode drop-down list: [**Normal Close**], [**Normal Open**] i [**Unused**]

if a button is pressed and held down, it will generate events since being pressed at a pre-set [**Repetitive**]; this function is useful for "increase/decrease master" events

2.2.3 Analog inputs

The controller has 4 in-built analog inputs. Each input can be defined in a different way.

Functions assigned to analog inputs are the same as in the case of DMX inputs, i.e.: [**Ignore**], [**On/Off**], [**Value**], [**Control**], [**Multirange**], their description is provided on page 14.

In addition, the user can filter analog input values before they are transmitted to the controller; you can define the following filter parameters:
[**Filter function**] - defines an algorithm with which a sample buffer is processed; the following filters are available:

- **none** - values transmitted directly to the controller
- **average** - an average of a specific number of samples is calculated
- **average no extremes** - an average of a specific number of samples is calculated, with the highest and lowest values being excluded
- **minimum** - the lowest of the samples stored in the buffer
- **maximum** - the highest of the samples stored in the buffer
- **median** - a median value of the values stored in the buffer, arranged in an ascending order
- **dominant** - the value most frequently found in the buffer

[**Filter samples count**] - determines the amount of analog input values stored in the buffer
[**Filter samples period**] - determines the interval at which a new sample (value) is taken, added to the buffer and recalculated using the function selected

If you select the [**On/Off**] and [**Multirange**] functions, a hysteresis and ranges are defined (for more information, go to page 10); it needs to be remembered that, for the analog input, the value entered corresponds to voltage:

0 → 0V
255 → 10V

2.2.4 Modbus input

"Write holding registers" Modbus command - is treated as if it were multi-value input channels. The configuration of the Modbus input is identical to that of the DMX input (see page 14).

NOTE: Setting the DMX input as [**Value**] alone will not cause values to be transmitted to the output. In the configuration, you need to enable DMX transmission (using an event). Until you enable transmission, values calculated by the controller will be sent to the output.

2.3 Outputs

2.3.1 DMX output

The [**DMX output**] tab allows you to set parameters for a signal and for each DMX output channel. The structure of the application window displayed after you select the [**DMX output**] tab is as follows:

mark between DMX frames (in accordance with standard: .....[**range**])

estimated number of full DMX frames per second, at current parameters

DMX channel table
The cell colour represents channel modes: green – linear
blue – non-linear

of the parameters selected in the table

Above the DMX channel table there is a toolbar containing:
[**Output channels number**] - a parameter that allows you to limit the number of DMX channels sent out

A — sets the number of output channels to a minimum number necessary for addressing devices included in the project

B — sets the maximum number of channels for the controller

A single table cell corresponds to a single DMX channel. Cells can be highlighted in the same way as in the DMX input channel settings.

You can define for each channel:

- a minimum value
- a maximum value
- a characteristic: linear or nonlinear
- whether or not the channel is master-controllable, i.e. whether or not it reacts to adjustment by the master of a scene, program or zone

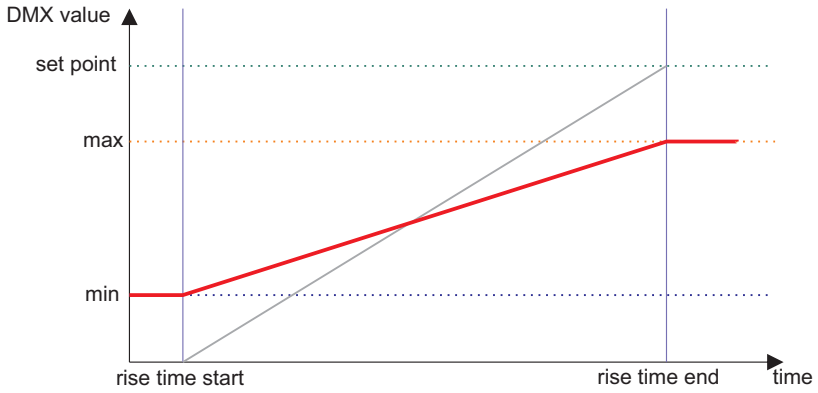
A channel can be:

- master-controllable at all times
- never-master-controllable
- master-controllable depending on the device assigned to the channel

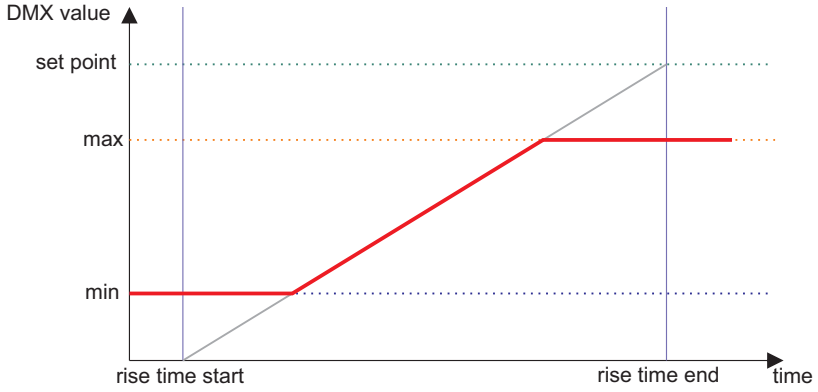
A difference between linear and non-linear characteristics only arises when minimum or maximum value limits have been imposed on the channel.

The difference between both characteristics is shown below:

a) linear

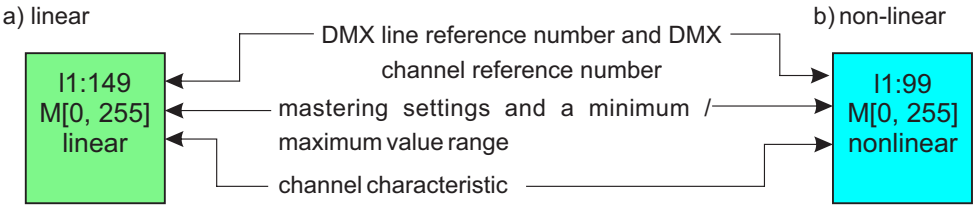


b) non-linear



Minimum and maximum value limits imposed on output channels are of higher-level nature, prevailing over all the other parameters. A difference between a linear and a non-linear channel: a channel value calculated by the controller is displayed as grey, as pink - after a value has passed through the channel characteristic.

Structure of a single DMX channel:



The following mastering settings for DMX output channels are available:

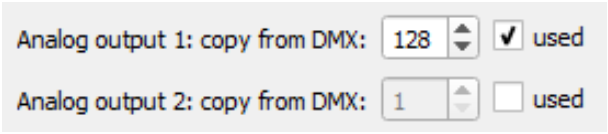
[**Device dependant**] - without any designation
[**Always masterable**] - marked with an "**M**" in front of the value range
[**Never masterable**] - marked with an "**m**"

2.3.2 Analog outputs

This tab is available only when you are creating a project for PX340 and PX710 controllers. The controller has 2 analog outputs with a range of 0-10V. In the analog output tab you can determine if a given output is to be used, and if so, from which DMX channel values are to be written to this output.

If the output is being used, voltage is proportional to the value in the DMX output channel set:

0 → 0V
255 → 10V



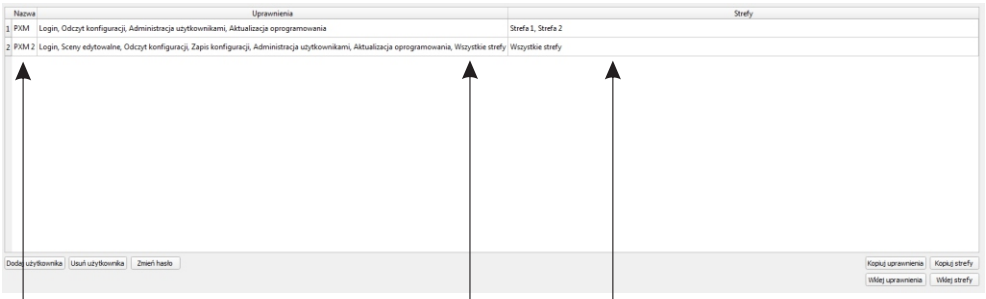
2.4 Users

In the controller configuration you can create user accounts that will have various privilege levels and access to selected zones. The user feature is especially useful when you operate your controller with your smartphone.
The controller has an in-built permanent ADMIN account that cannot be removed. It has full privileges and is used to manage the controller.
The default ADMIN account password is the serial number of the controller. It is recommended that when the first connection with the controller is established, the ADMIN account password should be changed. You can change the password using the small window [**Admin tools**] - see page 85.

Using the factory settings you can reset your password to the default one.

The other users are part of the settings and can created and removed using the [**Users**] tab. The maximum number of users depends on the particular type of controller.

<u>The user list table sets out the following categories:</u>



user name (must be unique)

zones visible to the user, while connected to the smartphone

user privileges

The toolbar located below the table contains the following options:

[**Add user**] - the application displays an add-user window in which you need to provide the username and password

[**Delete user**] - removing the user selected

[**Change password**] - in order to change the selected user's password, you need to enter the current password and then enter the new password twice

[**Copy permissions**] - copies the user privileges selected

[**Paste permissions**] - pastes the user privileges copied to the selected location

[**Copy zones**] - copies access to the selected user's zones

[**Paste zones**] - pastes the zones copied to the selected location

Privileges that can be assigned to users:

[**Login**] - the user can log into the controller from a PC. The user may not modify anything. When logging from a smartphone, the user has access to the zones assigned to this user and in these zones he only is allowed to switch on and off available elements.

[**Editable scenes**] -in addition, the user can edit selected scenes from smart-phone level

[**Read configuration**] - the user can download configuration from the controller

[**Write configuration**] - the user can save configuration to the controller (without users' configurations)

[**Users admin**] - the use can manage users' configuration

[**Firmware upgrade**] - the user can upload firmware updates

[**All zones**] - the user has access to all the zones at all times

2.5 Application settings

NOTE: Some changes will be made after restart of the application.

The [**Settings**] main menu opens a window that contains the following application settings:
[**Language**] - the user can switch between two languages for the applications: Polish and English, and determine which city will be displayed as a default from the list of predefined cities in the tab [**Settings**]→[**System**]

[**Appearance**] - tab allows the user to change the appearance of the application, possible modifications are listed below:

- **Skin** - a choice of classic default dark and white
- **Tabs** - resizing the main tabs (ie. [**Settings**], [**Project**], [**Address**], e.t.c.), by default, the tab keys are displayed in the form of tiles, but the user can reduce it (by selecting the "slim")
- **Navi buttons** - By default, the navigation buttons on the board of the project are „visible", the user can also select the "hidden" option
- **Navi buttons size** - editing sizes navigation buttons within the range of 10 to 100
- **Navi buttons action** - if the user select "normal" board design moves with respect to the project window, the "inverted" causes the opposite effect
- **Pointer style** - the selection arrow (default) or crosshair

[**Units**] - tab allows the user to swap units, the position of the origin and dimensions of devices:

- **Primary unit** - the user can set the following basic units: milimeter [mm], centimeter [cm], meter [m], inch [in], foot [ft], yard [yd]
- **Secondary unit** - as above
- **Device library unit** - as above
- **Coordinates origin** - bottom left or top left
- **Minimum items size**: „yes" or „no"

[**Name searching**] - search settings configuration items:

- **Pattern syntax** - RegExp, RegExp2, Wildcard, WildcardUnix, FixedString, W3CXmlSchema11
- **Case sensitive** - whether the search is case-sensitive
- **Exact match** - there are only the identically named elements
- **Autoname new items** - adds 1, 2, 3, ... to the name if it repeats

[**Communication**] - setting communication with the controller:

- **Ask for logout on quit** - option with checkbox ☑
- **Downloading configuration** - determines in what way the configuration file downloaded from the controller will be opened. Available options are: „open in designer" or „save to file".
- **Driver types**: PX340 or PX345

3. DESIGNING

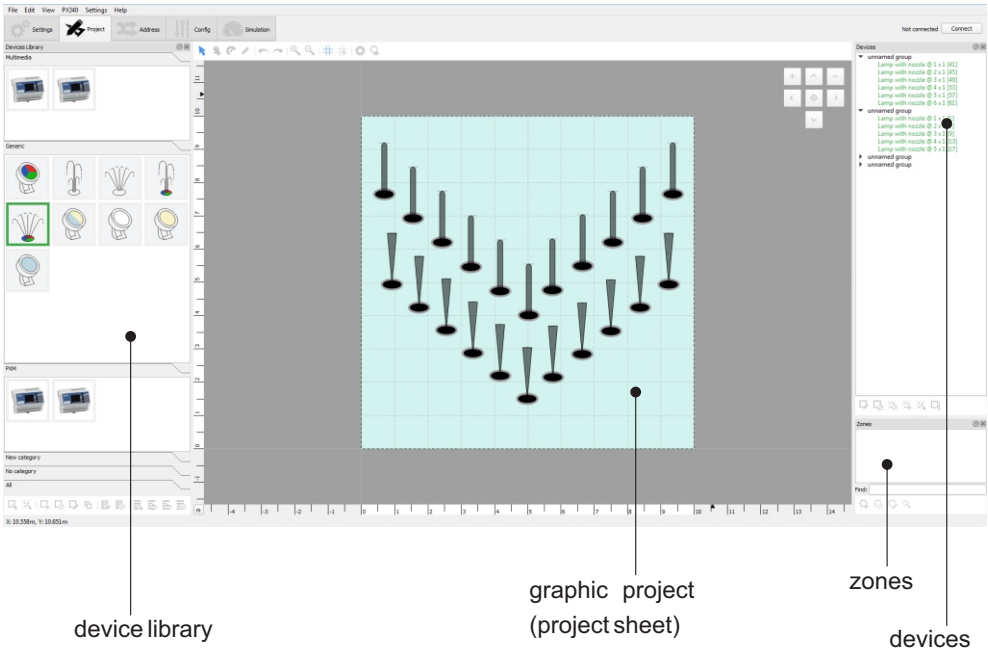
The PxDesigner application allows for creating graphic projects, including the positioning of final elements that will be controlled by the DMX controller. A graphic project allows for easy and fast configuration creation; however, it is not necessary to create such a project.

The application is supplied with a basic device library which can be transferred to projects.

The designing mode allows for adding and removing devices from a graphic project, manipulation (changing the position, rotating), grouping, de-grouping devices as well as creating and editing areas (zones).

While you create a graphic project, the following windows are available:

- Device library
- Graphic project
- Devices in the project
- Zones



3.1 Graphic project

The [**Graphic project**] window is used to create graphic projects, to position devices in projects and define areas. On the left-hand and bottom edge of a project there is a ruler adjusted to the dimensions provided by the user in the project options. At the top of the window there is a toolbar.
Toolbar contents:


Select/Move - selecting and moving devices


Move project - moving a project relative to the graphic project window


Rotate - rotating the device / device group selected is done by scrolling the mouse-wheel. If you press Ctrl on the keyboard and simultaneously scroll the mouse-wheel, rotation speed will increase.


Edit position - sets device positions and rotation (feature allowing for entering an exact value)


Undo - causes the last action to be undone (you can undo a maximum of 30 actions)


Redo - redoes the last undone action


Zoom in - zooms in on the project sheet


Zoom out - zooms out on the project sheet


Show grid - if the button is held down, the project displays a grid (in accordance with the parameters provided by the user in the grid options). If the button is inactive, no grid is displayed.


Snap to grid - if the button is held down (regardless of whether or not the grid is visible or not), while objects are being moved, the cursor is drawn to the nearest grid intersection point. If the button is inactive, objects can be moved freely.


Open project settings - displays the project settings window - see its description on the next page


Show zones - if the button is held down, zones are displayed on the project, if the button is inactive, no zones are displayed

If a background image is set - a slider will be displayed on the toolbar allowing you to adjust image transparency.

 - the button is enabled (blue colour)

 - the button is disabled (grey colour)

3.1.1 Project settings

You can change the appearance of project sheets (dimensions, background, grid size). If you do not select any image, the background will be of the uniform colour, as selected in the "background colour" field.

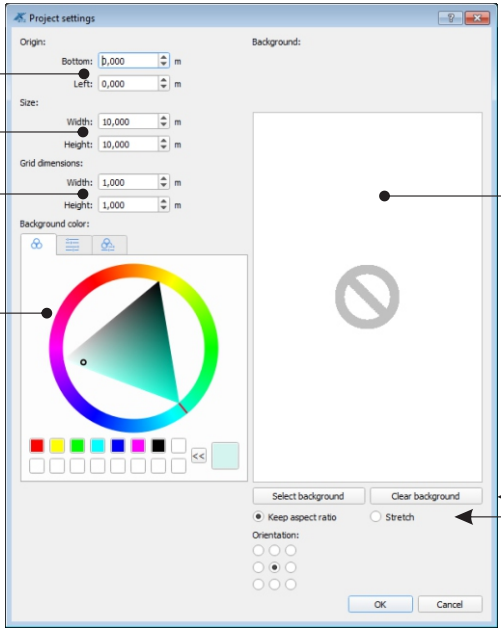
In order to access project sheet settings, click the button in the menu located above the project sheet:

determining the position of the sheet relative to the project

project sheet size

project grid size

background colour change field



preview box background

image selection and change

If the image width/height ratio is different than that of project sheets, you can choose whether to keep the ratio or to extend the image. If the ratio is to remain unchanged, the "orientation" field allows you to determine the position of the image relative to the sheet.

3.1.2 Navigation

In the upper right-hand corner of the project sheet there are navigation keys:

- zooming in / zooming out on the project sheet

- moving a project sheet within the project field

- restoring the default position of the project sheet

It is also possible to navigate using a mouse, the keys and buttons on the toolbar (see page 21 for details).
If you double-click on the mouse-wheel, the project sheet will be positioned in its original position.

3.1.3 Adding devices to the project

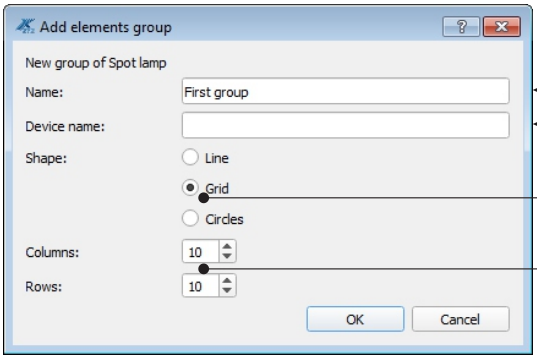
A project can have devices added to it in a number of ways:

- Individually
  - by pressing the small icon on the device library toolbar

If you click on a selected point on the project, you will add devices. To finish adding devices press "Esc".

- using the “drag and drop” method - you can drag selected devices from the library to the project.

- On a group basis:
  - by selecting the small icon on the device library toolbar



group name change field

change field for the names of devices included in a group

selection of the shape of a device group

selection field for the size of a group, contingent on the shape selected:
Line: quantity
Grid: number of columns; number of rows
Circles: number of radiuses, number of rings

When you click the “OK” button, you will be taken to the group position mode (the group symbol is “glued” to the mouse). In order to specify the position of a group, click on two points. For a line, click on the starting and finishing point, and for the grid and circles - two opposite corners.
A group is automatically created with the devices added.

3.1.4 Removing devices from the project

In order to remove a device, select it and press “Delete” or click the icon  . Prior to removing, the application asks “Do you want to delete selected items?”
You can remove more than one device at a time.
If you want to remove a device that is part of a group, first you need to ungroup the group.

3.1.5 Duplicating devices in the project

It is possible to duplicate devices added to the project; in order to do that select the device(s), press Ctrl+c and then press Ctrl+v, the copied device will appear in the area pointed to by the cursor.

3.2 Devices

The window displays a list of all groups and devices added to the project. Groups in the list are drop-down ones. A device may only be assigned to one group. Each device in the list has a label. If you hover your mouse over a device, further information is displayed. If the pane is displayed in the addressing mode, the controller is additionally displayed in parentheses (M - master, S1 - slave 1…) as well as the DMX addresses it takes up. A device that is not addressed is displayed as red, an addressed one - as green. A device with split channels is displayed as yellow.
Selecting a device in a graphic project will automatically cause it to be selected in the device list. It works the same way the other way round.

The toolbar is only visible in the designing mode and contains:

 **Edit** - displays a device edit window containing the fields [**Name**], [**Description**]

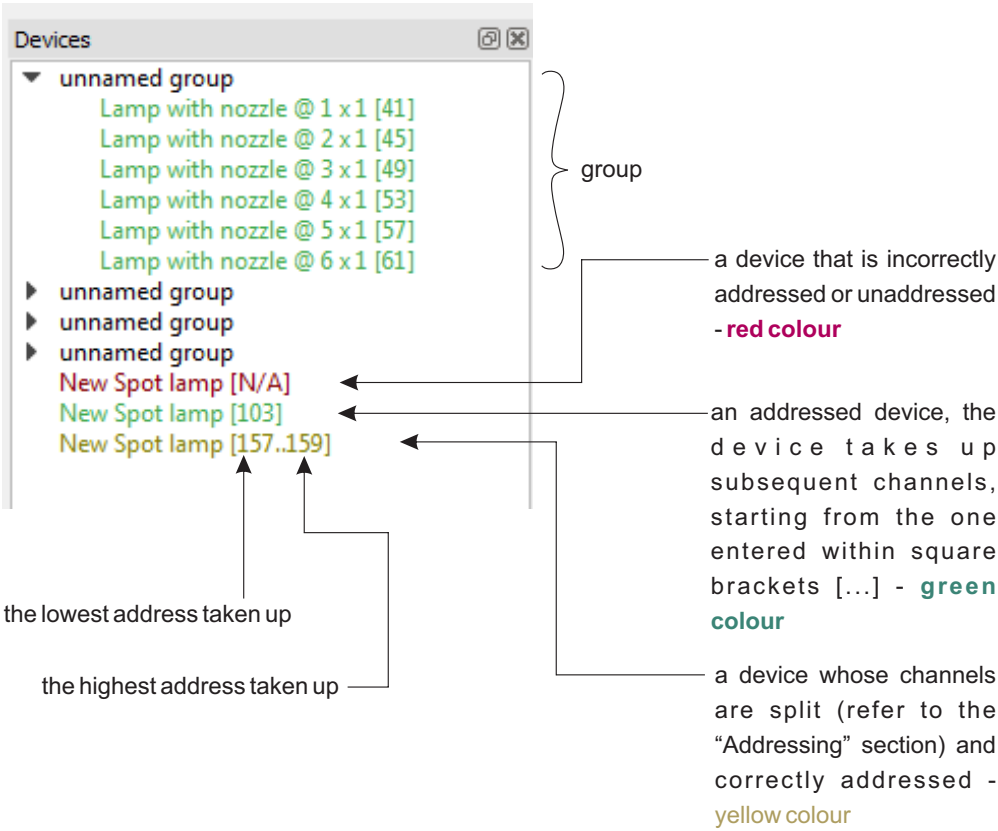
 **Delete selected devices** - it is possible to remove one or more devices at a time. If a selected device is part of a device group, the following message will be displayed: “Cannnot delete elements. Some elements are in groups. ungroup elements first.”

 **Delete group and all of its devices** - you can only remove the entire device group if you select all the devices forming part of that group.

 **Create group from selected devices** - this option allows you to create a group with selected devices. If a device is part of another group, this action cannot be completed and the application displays the following message: “Elements cannot be grouped”.

 **Delete group but keep devices** - ungroup devices option

 **Device info** - preview of information that identifies a device



3.3 Zones

The [**Zones**] pane contains a list of all zones created in a configuration. A zone is delineated in the project by a set of polygons. Zones may overlap each other. In this guide the terms "zone" and "area" are used interchangeably.

Underneath the list there is a toolbar for areas:

New - adding a new zone

Delete - removing a selected, highlighted zone

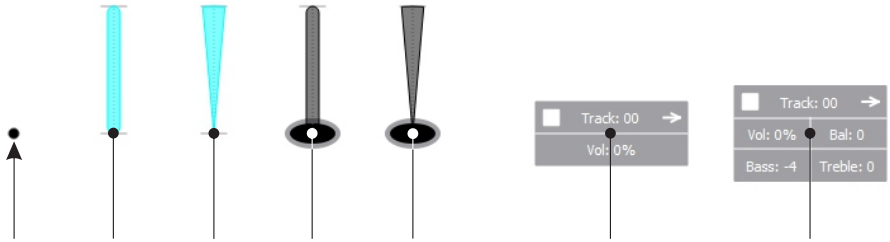
Edit - if the button has been pressed, it is possible to edit the zone selected (adding/removing zone polygon points, changing the name and colour, description, master)

Check dependency - verifies where a given zone is being used (e.g. in scenes, events etc.)

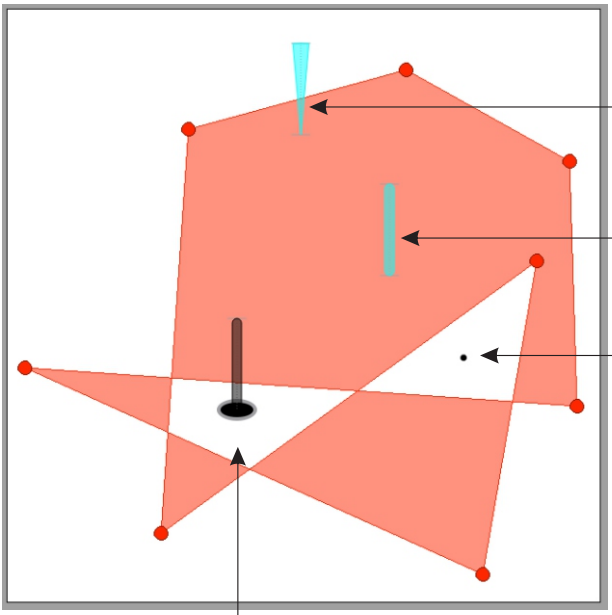
3.3.1 Devices in zones

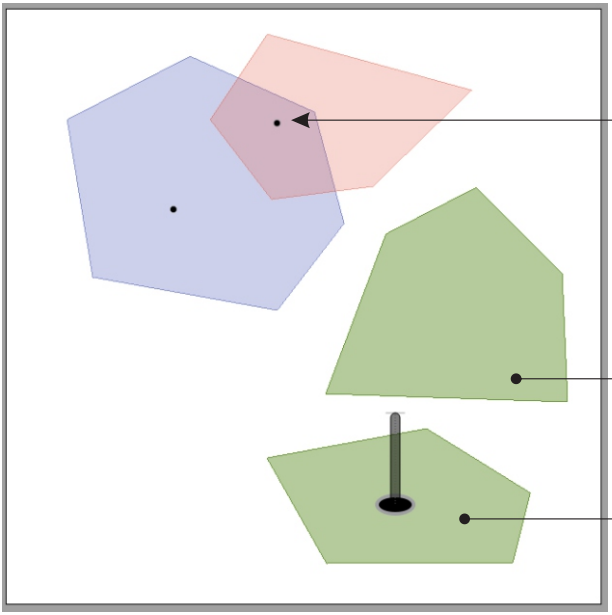
A device is part of a zone if the former's centre point is located within the zone.
NOTE: The centre point of a device need not be the geometric centre of the figure (of the visualisation).

The location of the centre point of selected devices:



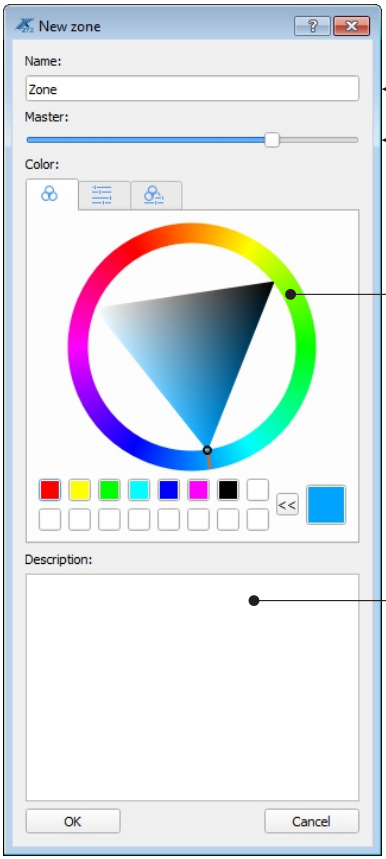
CENTRE POINT




the zones overlap, the device is in both zones
a single zone made up of two polygons

3.3.2 Adding and removing zones

In order to add a zone, press the button . The application will display a window for editing new zone parameters:



zone name change field

master of the zone - decreases values in all master-controllable channels (proportionally)

selection of zone colour

description of a zone

Next, in the project sheet, add subsequent zone polygon points. To finish adding the zone press "Esc".

Keyboard short-cuts to add and edit zones:

LMB	- left mouse button
RMB	- right mouse button
LMB drag, **RMB drag**	- move the mouse with LMB/RMB held down
MW drag	- move the mouse with the scroll-wheel held down
MW rot	- rotate the scroll wheel

Keyboard short-cut	Function
LMB	Adds a vertex to the present polygon
RMB	Finishes creating a polygon (without a point under the cursor)
Enter	Finishes creating a polygon (with a point under the cursor)
Ctrl+LMB	Starts a new polygon in a given zone
2xRMB / 2xLMB (vertex of the zone polygon)	Removes the vertex that is under the mouse cursor. If, as a result of this operation, the polygon has fewer than 3 vertexes – the polygon will be removed
2xLMB (edge of the zone polygon)	Adds a point to the edge (click on the area close to the edge, inside the polygon)
Shift+2xLMB	Removes the polygon that is under the mouse cursor
LMB drag (vertex of the zone polygon)	Moves the vertex of the polygon
Esc	Cancels adding to the current polygon

In order to remove a zone:

1. Highlight the selected zone in the zone list.
2. Select the option  or press “Delete" on the keyboard.

It is also possible to select several zones at the same time - using the Ctrl key or the mouse.

ZONE EDITING

If you double-click on the zone name opens panes for editing zone names, masters, colour and description.

Pressing the button allows for editing the zone selected (adding/removing/moving zone polygon points, changing the name and colour, description, master).

3.4 Device library

The PxDesigner application contains a device library which can be used on a graphic project. All changes made to the library are saved in the application and are independent of the project that is currently open. In addition, each device added to a project is also saved in this project, that is why it is possible to transfer projects from one computer to another.

The window displays devices found in the device library i.e. a standard device library supplied together with the program you cannot remove or edit these devices) as well as additional devices defined by the user. The devices that you are allowed to edit are marked with blue border. It is possible to drag devices directly from the library to the area of a zone.

Devices are displayed as a list divided into drop-down categories. Devices in the list are shown as tiles (an image as saved in the database + supplier + name). If you double-click on a device in the library, a pane will be displayed with information about the device.

At the bottom of the window there is a toolbar:

- **Add device to project** - adds the device currently selected in the library to the project, to the area chosen by the user
- **Add group of devices to project** - opens a pane for adding device groups
- **New device in library** - opens a window for adding a device to the library
- **Delete device** - this function is only available when you have selected a device added by the user. If the device to be removed is being used in the project - a question will be displayed, asking you what you want to do with the devices in the project.
- **Edit device** - this function is only available when you have selected a device added by the user. Opens a window for editing a device. If the device is being used in the project, the application asks the user if the device in the project should be updated too.
- **Duplicate device** - allows for making copies of devices

New category - allows for adding a new category to the library

Delete category - allows for removing a category from the library. If the category is non-empty, the application asks if the devices that also are in the category should be removed or moved to another category (and if so, then to which one).

Save library to a file - allows for saving the library as a file with the *.dl340 extension, to a specified location on the disk. It is necessary to provide the name of the library.

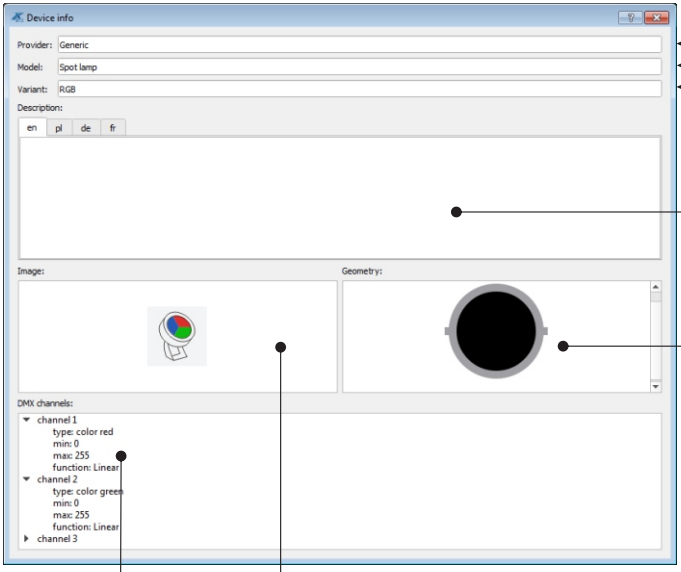
Merge library - allows for importing devices from a file. If in the library that you want to add there is a similar device (but not identical), the application will display an appropriate message.
The user has the following choices: **Copy** (a device will be placed in the library/a device will be overwritten in the library), **Replace** (a device in the library will be overwritten) and **Cancel** (a device in the library will be overwritten). The program recognizes identical devices.

Merge project library - imports to the library additional devices, from a project, which do not exist in the library

Clear library - removes devices that were added to the library. Does not remove default devices

3.4.1 Device preview

You can preview information about a device by double-clicking the device tile in the [**Device library**] tab.



supplier

device model

device version

device description divided into 4 language categories

shape, visualisation of the device which will be displayed in the graphic project

a photograph or a drawing of the device

device channels and their parameters (type, nominal value, maximum value, function) whose preview is available as a drop-down list

3.4.2 Adding devices to the library

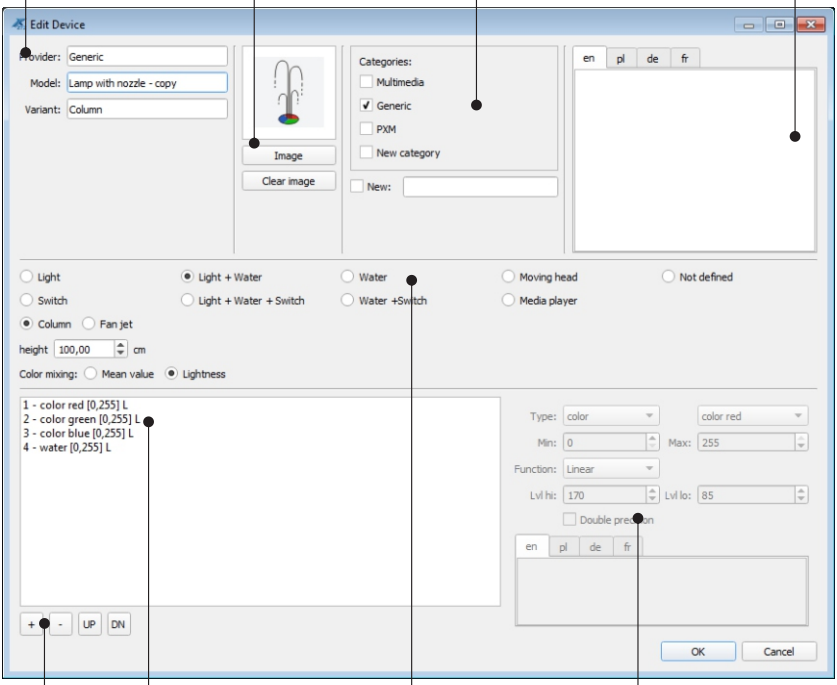
You can add to the library devices that you have defined. In order to do that, select the option and enter the selected parameters of the device.

information identifying the devicece

the picture that will be displayed in the tile of the device in the library

assignment of a device to a category. A device can be displayed in several categories

description



type and number of channels

channel option editing field, description
Before you start editing, you need to choose a channel to edit.

adding/removing a channel, setting the order in which they appear in the list

specifies the way in which the device will be displayed in the graphic project and which controls will available to control this device

Allowable channels in a device (when adding a device to the device library):

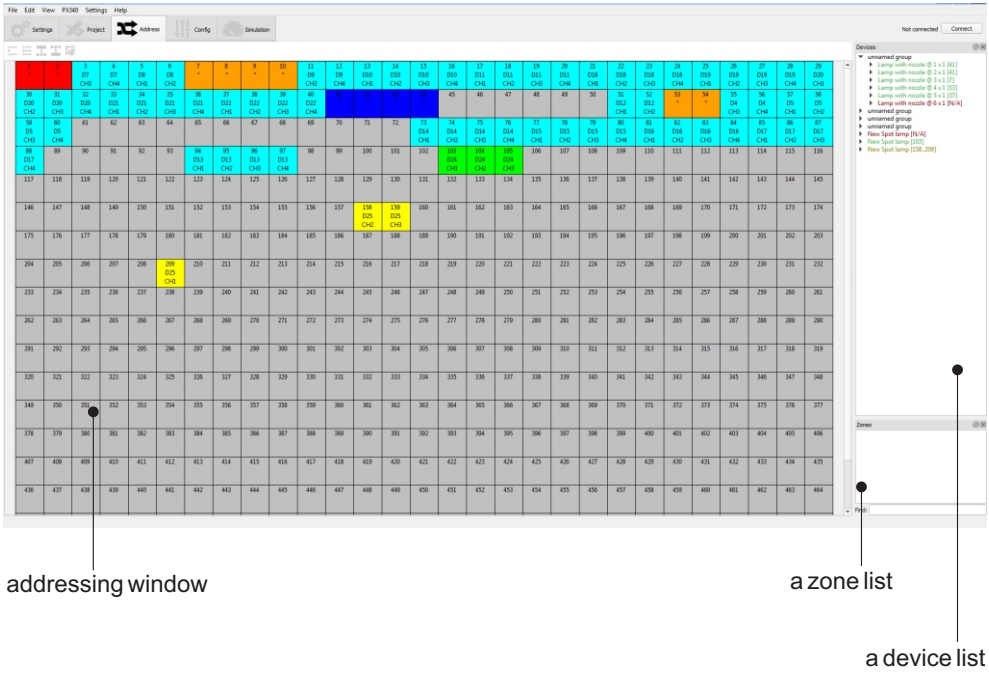
Device	Allowable channels
Light	color, brightness, dimmer, white balance
Water	water
Switch	switch
Light + water	color, brightness, dimmer, white balance, water
Light + water + switch	color, brightness, dimmer, white balance, water, switch
Water + switch	water, switch
Media player	control, track, volume, mode, balance, treble, bass
Moving head	color, brightness, dimmer, white balance, position, gobo

4. ADDRESSING

When you access the [**Address**] tab, you can assign DMX addresses to individual devices in a graphic project. Addresses can be assigned automatically by the application or manually by the user.

In the addressing mode, on the left-hand side, you can see a table with DMX output channels, on the right-hand panel - a list of devices and a list of zones (without toolbars).

In the address table all the DMX channels in the project are visible. When you are creating a project for a PX345 device, 128 channels will be visible by default, for a PX340 - 512 channels, for a PX710 - 1024 channels for a Master controller and for each slave.



In the addressing mode, it is possible to switch on a graphic project preview feature. Each device highlighted in the address table is automatically highlighted in the device list and the graphic preview feature (if visible). Highlighting a zone in the zone list automatically highlights this zone also in the graphic preview feature.

The toolbar above the channel table contains:

Address not addressed - addresses all un-addressed devices according to the automatic addressing algorithm

Address all - addresses all devices according to the automatic addressing algorithm (including those addressed previously)

Split selected channels - allow for splitting channels into single channels which will be displayed as yellow in the DMX channel table

Merge selected channels - allows for joining previously split channels in a given device. Prior to using this option, you need to highlight at least one channel of the device whose channels are to be joined.

Show visual project - displays the project sheet window

After selecting [**Show visual project**] above the project sheet window, a menu bar with additional options will be displayed:

Show addresses - if the button is pressed, device addresses are displayed on the project sheet

Export project to image - this option allows for saving an image from the project sheet in one of the formats: *.png, *.bmp, *.jpg, *.svg, in a location on the disk selected by the user

4.1 Automatic addressing

Pressing the [**Address not addressed**] button or [**Address all**] button will trigger an automatic addressing algorithm: the algorithm takes into account the fact of devices being part of zones and groups.

If there is a shortage of DMX channels, the device will not be addressed (all the channels of a device must be within the allowable addresses).
The algorithm does not address multiple devices in a single channel, does not partly address devices, i.e. leaving some of the channels outside the DMX range or on 2 different DMX lines (in the case of the controller PX710)

Messages displayed:
Some elements were not addressed as intended - if, for example, a group of devices is not addressed in a continuous manner
Some elementsare not addressed! - if the DMX channels ran out

4.2 Manual addressing

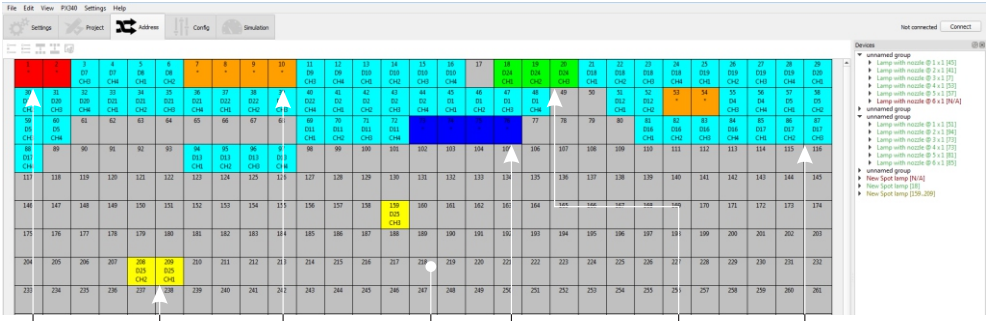
You can address devices manually by dragging them to the DMX table (if a device was previously addressed, the address will be changed) or by moving an already addressed device around the table. A device can be split into separate channels (option ) and such channels can be moved independently of each other.

A device group can be moved as a whole - in such a case its internal addressing does not change, only the first channel offset changes.

NOTE: A restriction applies to the action of moving - the device and the group all have to be on the same DMX line.

If there are too many devices in the channel, by clicking RMB you can choose which devices to highlight.
You can also split multi-channel devices by clicking RMB one of the channels and selecting the option „Split channels".
Using LMB you can move devices, device groups as well as individual channels of a split device.

4.3 Channel type designations



multiple devices in a single channel - orange colour

a single device in a channel, grouped - light blue colour

empty channel - grey colour

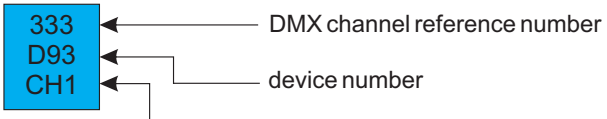
channels of a split device - yellow colour

multiple devices in a channel, all being part of the same group - navy blue colou

incorrectly addressed device (in this case addressing out of the range of channels) - red colour

a single device in a channel, non-grouped - green colour

Structure of a single DMX table tile:



reference number of the device channel which is assigned to this DMX channel

If an asterisk * is displayed, this means that a given DMX channel has had assigned to it several device channels.

5. CONFIGURATION

In the [**Configuration**] tab you can create individual configuration elements and dependencies between them. If you have created a graphic design, such elements as scenes and programs need to be created in graphic mode.

NOTE: You cannot control devices that have not been addressed.

The [**Configuration**] tab contains the following drop-down element categories:

- **Scenes**
- **Masks**
- **Programs**
- **Sequences**
- **Delays**
- **Events**
- **Movies**
- **Scenes/programs groups**
- **Statuses**
- **Smartphone**

Underneath each element category there is a toolbar containing:

New - a new element creation option, if you select it, the application will open an element editing window

Delete - removing the element selected. It is possible to remove several elements at a time. If an element to be removed is open, the application will display an appropriate message.

Edit - editing the element selected. It is possible to edit several selected elements and in such a case the parameters being edited will change in all the elements selected.

Duplicate - makes a copy of the selected element(s). A duplicated element has the same parameters as the element being copied.

Check dependency- verifies where a given element is being used

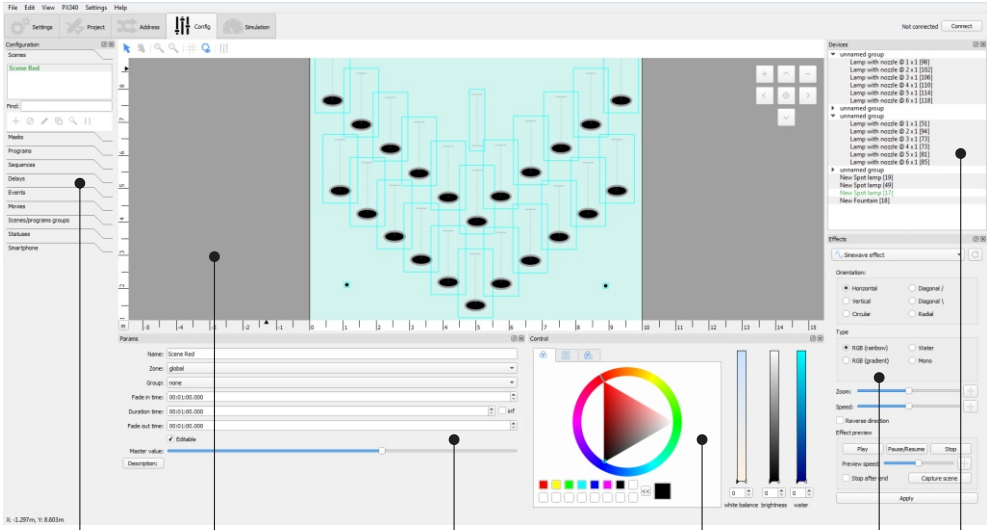
Move selected items - after you highlight scenes and selecting this option, the application will additionally display a window in which you can specify a new position of the scene in the scene list. This option is only available for scenes.

Duplicate program and its scenes - makes a copy of a program, together with program step scenes. This option is only available for programs.

5.1 Scenes

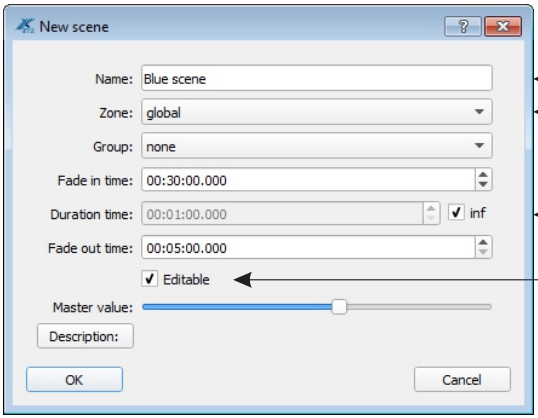
[**Scene**] - is a static setting of output channel values for which fade in time, duration time and fade out time is provided.
You can define 256 masks.

Application window structure during scene creation:



In the graphic project window, you can select devices, but you cannot move them around. In the project window, a preview of values is shown on an ongoing basis.

In order to add a scene, select the button +, and in the [**Scene settings**] pane enter the following data:



scene name

a zone; you need to choose either a global zone or a user-defined zone

if the scene duration is set to infinite, its text box is inactive

if the checkbox is selected ☑, this means that you can edit the scene on other devices
All the parameters can be modified at a later time in the scene parameter pane.

The default zone is a “global zone” that is there at all times and contains all the DMX channels. If you select a different area in the pane, its outline will be highlighted in the graphic project, and you can only highlight and control devices that belong in this area.
In each scene time option field, you can enter a maximum value of 23h59m59.9s, and values in these fields can be changed with an accuracy of 0,001 s.

NOTE: The total of all time values may not be lower than 10 ms.

Default scene times are as follows:
- fade in time: 00h 00m 00s 000ms
- duration: infinite
- fade out time: 00h 00m 00s 000ms

The [**Group**] field is a drop-down list containing available scene and program groups. It is not necessary to add an element to a group. Groups should be created beforehand in the [**Scenes/programs groups**] tab.

The starting of an element being part of a group automatically turns off all the other elements in that group.

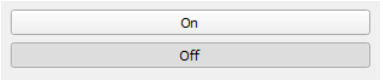
You can vary the [**Master value**] parameter over a range of 0 - 255; a change to this parameter only affects master-controllable channels (the brightness value is proportionately decreased).

The [**Edit**] window is active if you have highlighted devices in your project and the contents of the window depend on the type of the channels of the devices highlighted.

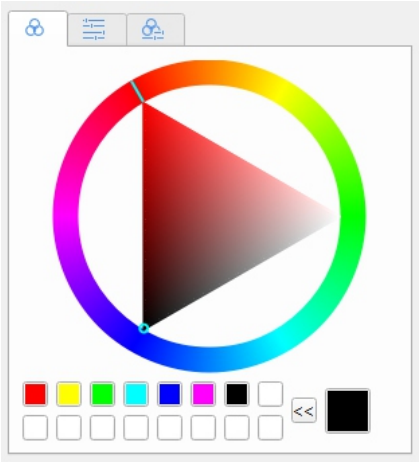
Device control controls:

a) a device with 1 adjustable channel, e.g. a monochromatic lamp, a pump - a single slider

b) a device with an "ON/OFF" switchable channel

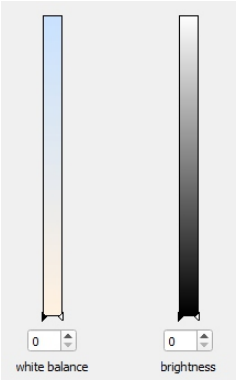


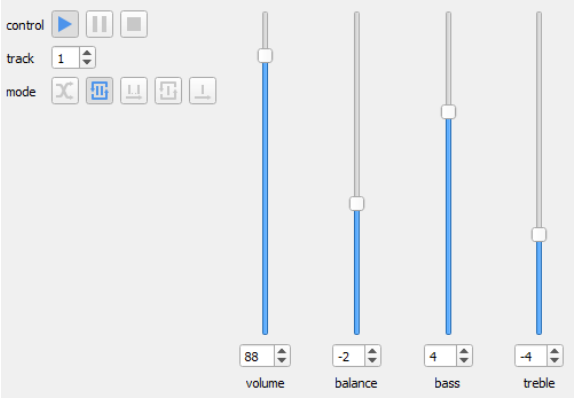
c) an "RGB" lamp - a color wheel



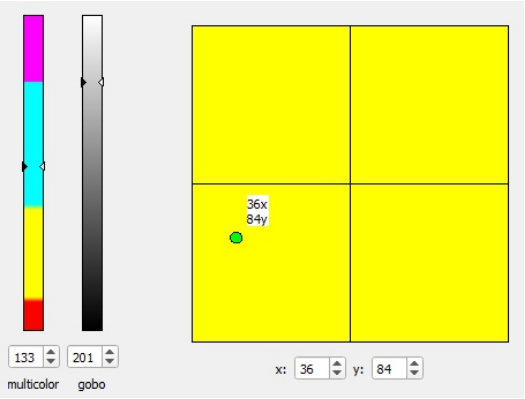
d) a "dynamic white" lamp - two sliders, one for temperature color control, the other for brightness control

e) a media player - control of the piece being played, playing mode and volume





f) moving head - control of position, gobo pattern selection, color selection



If a device has more channels, the controls for all the channels are visible.

Above the graphic project, there is a button ; if you press it, you will be taken to the DMX direct control section. All DMX output channels are visible in the window. In order to be able to control a channel, you need to highlight this channel and set the value using the slider or enter the value directly in the channel value field. You can control multiple channels at the same time.
By default all the output channels are displayed in sequence, but you can switch the view mode to a view with channels being grouped per device.

slider - is used for manually setting the channel value over a range of 0÷255

DMX channel reference number

device name, type of channel

DMX channel value

Above the channel list, there is a modified toolbar containing:

Select all - after you select this option for edition, all the channels will be activated, a change to the value in one channel will result in the identical value being set in all the other channels

Deselect all - after you select this option, all the channels will be deselected

R [**Select red**] - selecting red channels to be edited

G [**Select green**] - selecting green channels to be edited

B [**Select blue**] - selecting blue channels to be edited

[**Group sliders by device**] - if the button is pressed, sliders grouped by device are displayed on the project sheet. The sliders that have not been taken up by devices are not displayed.

[**Graphic project**] - displays the project sheet of a device

NOTE: If no graphic project has been created, the slider mode is the only mode available for creating scenes.

A scene can also be created using effects (for information on effects refer to page 67).

5.2 Masks

In the [**Masks**] tab, you can define 256 masks of three different types. Just like a scene, a mask is a static arrangement of the values of all channels. A mask takes precedence over scenes and programs - it can modify DMX output channels values.

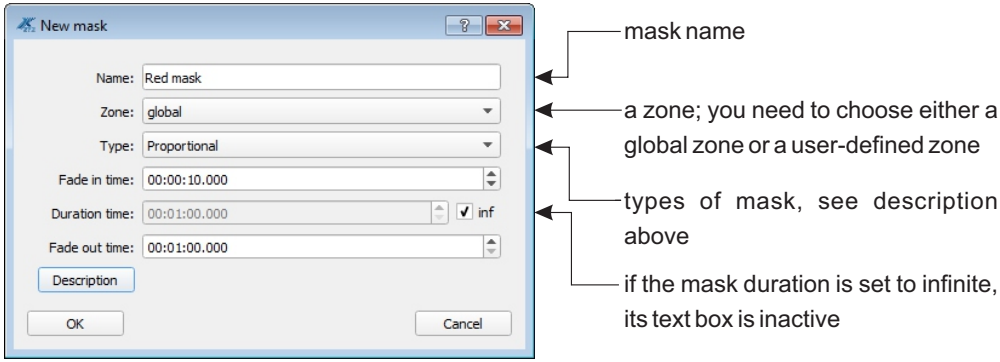
There are 3 mask types available:

Proportional - changes the value in the output channel in proportion to the pre-set value. By default, all channel values are set at 255, which means that a mask does not change the output channel value. Decreasing the mask value to 127 for the selected channel will cause any value appearing in the channel to be reduced by half (at the moment when the mask is active).

Maximal - this type of mask allows you to set the maximum value that can appear in a given channel. Any higher value will be replaced by the maximum value. By default, the value of all the channels is set at 255.

Minimum value - this type of mask allows you to set the minimum value that can appear in a given channel. Any lower value will be replaced by the minimum value. By default, the value of all the channels is set at 0.

Masks are created in the same way as scenes (chapter 5.1 Scenes).
The slider mode is the default mode.

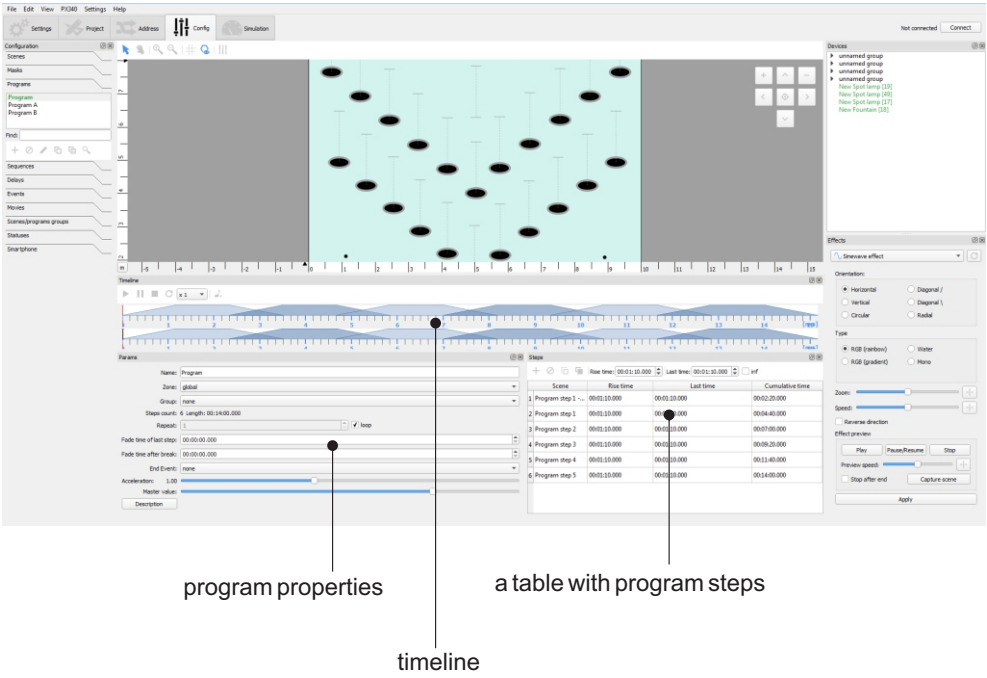


5.3 Programs

A program is an arrangement of consecutive scenes, together with the defined fade in times and duration of each step. The next program step is thought of as the scene assigned to this program. The fade out time of each step (except the last one) is defined as the fade in time of the next step. The last step also has the attribute of fade time. In the [**Programs**] tab, you can define 512 programs.

NOTE: The duration of a step is independent of the duration of the scene assigned to this step.

Structure of the application window displayed after you select the [**Programs**] tab:



Dockable windows [**Timeline**], [**Parameters**] and [**Steps**] appear after being selected for editing or after the creation of a new program.
The step table and timeline are synchronized, so any change to the timeline is immediately visible in the table and vice versa.

NOTE: If the timeline is not visible, select it in the [**View**] menu.

PROGRAM STEP TABLE

In the table, you can see subsequent steps together with the names of scenes assigned to them as well as fade in times and duration. Steps in the table can be selected. It is possible to set the same fade in times and duration times for a number of selected steps. All the changes made are immediately visible in the table and on the timeline, after switching to graphical mode.

Adding steps:

- **dragging and dropping a scene from the scene list**

Dropped scenes will add new steps to the program in the order in which they were selected on the scene list. When you are dragging a scene, a blue cursor will appear between the existing steps, in the target area. After you drop the scene, a pane with a question will be displayed, asking if the existing scenes or copies of scenes being dragged should be used.
Program steps will have default fade in times and duration times equal to scene times.

- **dragging a program from the program list (only one at a time)**

It is possible to drag a different program to the step table, which will cause the steps of the program being dragged to be placed in the program being edited.
A cursor will appear, and after you drop the program a pane with the same question as in the case of scene dragging.
The added steps will have default times equal to the step times of the program being dragged (and not scene times).
The dragging of scenes and programs works in the same way for a timeline and for a step table.
Undo/Redo actions (Ctrl+Z/Ctrl+Y) affect the adding and removing of program steps.

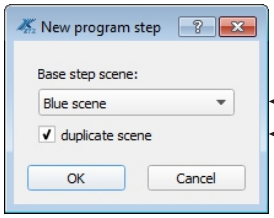
- **adding a step using a command from the toolbar**

Creating a new step will automatically create a new scene.

In the table, you can see subsequent steps together with the names of scenes assigned to them as well as fade in times and duration times. It is possible to set the same fade in times and duration times for a number of selected steps.

Above the step table, there is a toolbar containing:

+ **Add step** - option allowing you to create a new program step; after you select it, the application will open a window



a drop-down list of base scenes of a new step

making a copy of the scene selected; a duplicated scene has the same values

Delete step - removing the step selected; it is possible to remove several steps at a time

Copy - copies the program step selected

Paste - pastes the program step copied to the selected location

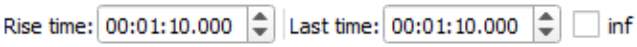
Check correctness - error notification button (if an error has/errors have occurred)

Errors are likely to occur if:

- a program step scene zone is different than the program zone
- the duration of a program step scene is shorter than minimum time

After you press the [**Check correctness**] button, the application will ask whether you want errors to be corrected.

It is possible to set the same fade in times and duration times for a number of selected steps. If you select the checkbox ☑ next to "inf" field, duration will be infinite.



TIMELINE

The timeline displays all the program steps. In addition, you can load a sound file, which facilitates creating a show synchronized with music.

Above the timeline window, there is a toolbar which:

Play - plays sound and a program preview (at the speed as set in [**Preview speed**]

Pause - stops playback but does not return to the beginning of the program

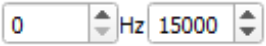
Stop - stops playback and returns to the beginning of the program

Loop preview - plays what was selected in the top timeline multiple time

Preview speed - contains sound playback speeds and program preview speeds can be adjusted over the range of 0,25x÷4x

Open WAVE file - allows for loading **.wav* sound files from the disk

Close WAVE file - closes the sound files previously loaded to the time track

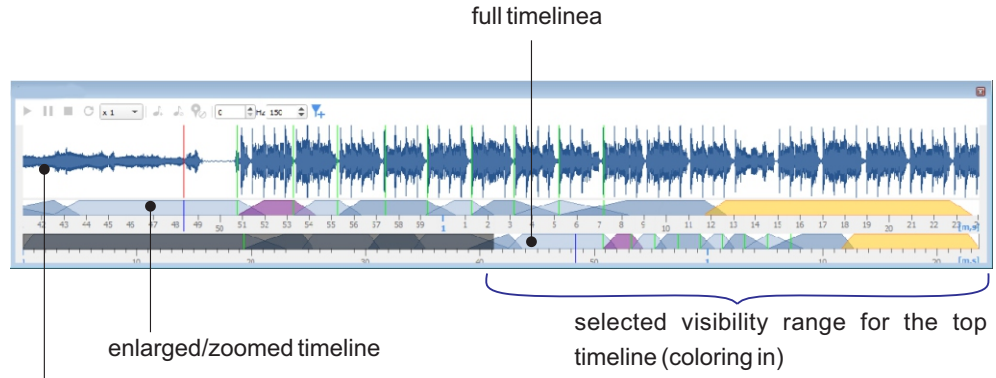


contains fields for selecting the filtering range of the band-pass filter

Band-pass filter - if the button is pressed, above the timeline the filtered spectral components of the signal - sound are displayed (within a specific frequency range). If the button is not pressed, the application displays the sound track together with all of its frequency components.

You can drag created scenes from the configuration pane to the time axis (more than one can be dragged at a time). The next step always begins right after the previous one.
Scenes being dragged can be placed in between the existing steps (they are spread apart to make room for the new step). On the axis, steps can be moved and swapped with each other. Clicking a step selects it on the timeline and in the table and causes it to be displayed in the graphic project window. If you have not highlighted any step, the preview displays values at the current cursor position. To deselect a step, press "Esc".

Timeline structure:



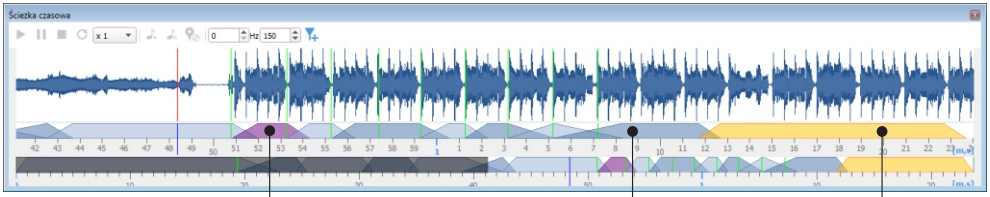
You can only modify program steps in the top timeline.
The bottom timeline is used to zoom in on / narrowing down items visible on the top timeline.
The bottom time line always displays the full time span of the program.
What is visible on the top path is colored on the bottom one and what is outside the span is greyed out on the bottom one.

TOP TIMELINE

Step selection is synchronized with the step table.

Short-cuts:

Keyboard short-cut	Function
LMB	Selects a step, deselects the other
Ctrl+LMB	Inverts step selection, other steps remain selected
Shift+LMB	Selection of scope of steps
Esc	Deselection of marked steps



a violet trapezoid - a selected step

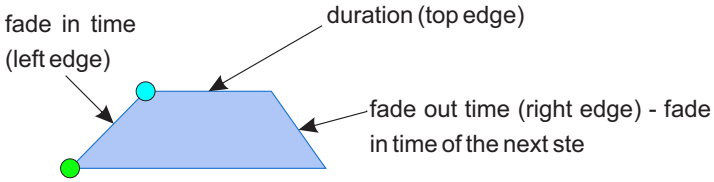
a blue trapeze - a program step

an orange trapeze - a step of infinite (shown as a 10-second rectangle base)

It is not possible to modify a step on a timeline of infinite (*inf.*) duration.

A preview of the step selected displays automatically in the graphic project window. A right-click (RMB) displays a context window containing such commands as: edit, remove, fade in time, duration, step scene (the application opens a list of scenes that you can load).

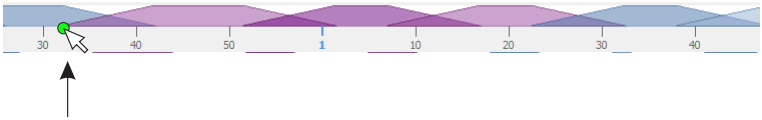
Structure of step duration trapeze:



Shifting times:

the blue circle in the top part - shifts the boundary between the duration and the fade in time of a step

green circle in the bottom part - shifts/moves a step, modifying the duration of the preceding step or, if you press and hold down Ctrl - modifies the duration of the current and preceding step



Ctrl + the green circle in the left bottom corner of the trapeze (●) - moving selected steps in such a way that the others should not change their position

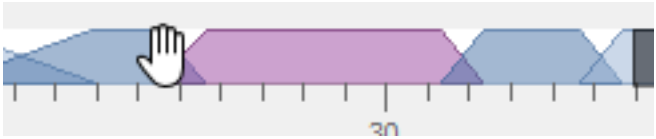
Ctrl + the green circle in the right bottom corner of the trapeze - modifies proportionally in the same way as without Ctrl button held down, but the other steps do not move

Shift + the green circle (left one) - shortening / lengthening selected steps in such a way that the others should not change their position

BOTTOM TIMELINE

mouse icon - LMB drag:

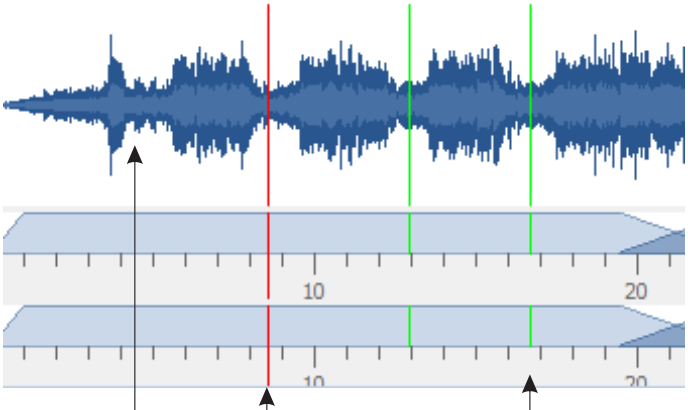
• hand icon - when the mouse is located within the highlighted area - moving the view to the left/right



• vertical line crossed by horizontal arrows - when the mouse is located on the boundary of a ranges - moving the left/right edge of a range

Keyboard short-cut	Function
Mouse wheel	Moving the view (i.e. that which is on the top timeline) to the left/right
Ctrl + Mouse wheel	Zooming
2xLMB	Shows all the steps

SOUNDTRACK



sound volume graph (a darker shade indicates maximum values, a lighter shade - average values)

current playback point cursor

auxiliary marker

You can add a sound track by clicking the key on the toolbar above the timeline and selecting a **.wave* from the disk.

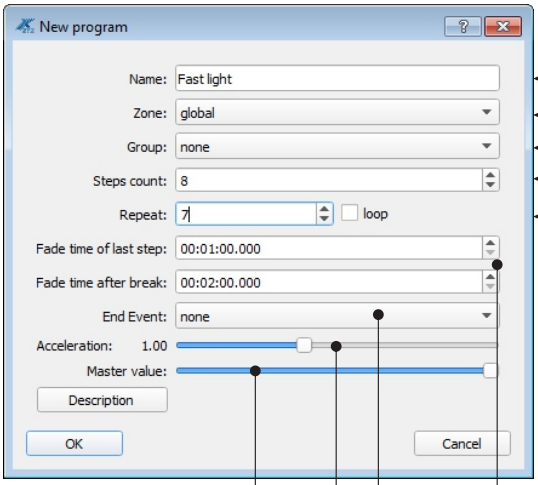
Keyboard short-cut	Function
LMB	Adding a marker under the mouse cursor
RMB	Removing the closest marker under the mouse cursor
Enter	Adding a marker under the cursor

You can add an auxiliary marker on a timeline. To this end, start playing back a file and at selected moments press ENTER on the keyboard. The application will automatically add a support marker(s) in appropriate places. You can also RMB-click the sound track in the selected place.

Markers allow for selecting important points in a sound composition.

CREATING A PROGRAM OUT OF SCENES

From the toolbar of the [**Programs**] tab, select the option + and complete the [**New program**] pane:



program name

a zone; you need to choose either a global zone or a user-defined zone

it assigns a newly created program to a group of scenes and programs; you can choose not to add the program to any group [**none**]

after the number of steps is specified, the application will add a specific number of scenes to the step table in in the [**Steps**] window

you have two options: looping playback ("loop" checkbox ☑) or setting the number of times to repeat (maximum 254)

[**Master value**] - allows for global control of the brightness level of a program

time options

in order to be able to select a final event, first you need to define such an event in the [**Events**] tab

program speed acceleration; increases or decreases playback speed, you can make speed adjustments over a range of 0x (stopping the program) ÷ 2.55x

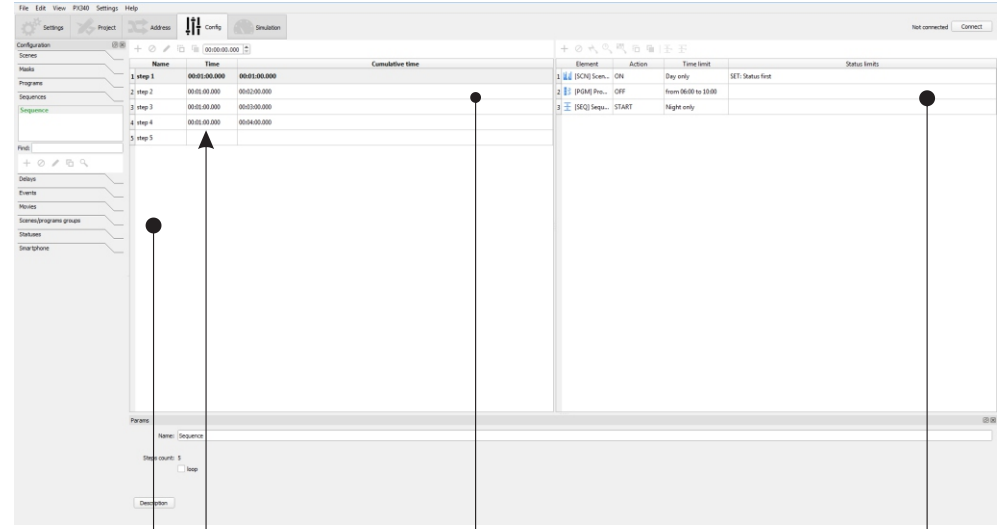
GENERATING A PROGRAM OUT OF EFFECTS

You can create a program quickly using default effects.
Choose an effect from the [**Effects**] tab, set appropriate parameters for the effect, and then save the program using the [**Apply**] button.
A detailed description of effects can be found on page 67.

5.4 Sequences

A sequence consists of individual steps and in each step you can trigger various actions simultaneously.

Structure of the application window displayed after you select the [**Sequences**] tab:



Above the sequence step list table, there is a toolbar containing:

Add step - adds a step to the list of sequence steps

Delete step - removing the step selected; it is possible to remove several steps at a time

Edit - editing a selected step; after you select this option, the action table will display actions for the step being edited

Copy - copies the sequence step selected

Paste - pastes the sequence step copied to the selected location

A sequence is composed of consecutive steps. A sequence step is a list of actions that are executed simultaneously at the beginning of the step. A step has duration - this is the time that elapses until the next step begins.

By default, the list of steps is empty; in order to create a new step, you need to press + on the toolbar above the list of steps.

In order to change the name of a step, click twice on it. The duration of a step is edited in the same way.
In order to edit a selected step, highlight it and press or double-click the aggregated duration next to the step selected. The step being edited is displayed in green.
You can drag a scene, mask, program, delay, sequence, status or film onto a list of actions. Elements can be dragged from a configuration window. If you drop an element at a step, the element will be added to this step with a default action of switch on/set /start (depending on the element).
In the table, you can change elements, their actions and restrictions by double-clicking on a selected column.

Above the window with an action table for steps there is a toolbar which:

New action - adds a new empty action to the list of actions for the step; you need to specify an element and an action for it, time limits and status limits

Delete action - removes a selected action. It is possible to remove several actions at a time.

Set action - sets a selected action for all the highlighted elements (elements have to be of the same type)

Set time limits - specifies time conditions for performing an action, for more information refer to page 63

Set status limits - specifies limits of action performance statuses, for more information refer to page 63

[**Action**], [**Time limit**] and [**Status limits**] can also be set individually, directly in the “list of actions for steps" table.

Copy - copies a selected element

Paste - pastes the element copied to the selected location

Complete previous step - creates actions that deactivate the elements activated in the previous step

Complete all steps - creates actions that deactivate the elements activated in all the previous steps

5.5 Delays

The [**Delays**] tab allows you to program 1024 delays which you can subsequently use when programming other events so that actions should start after a pre-set time period. The action table is the same as in the case of events, and is described in chapter 5.6 Events.
Activating a delay starts the countdown of preset time. When the delay period elapses, the action list is called up. If you disable the delay before the preset time elapses, the count-down will be discontinued and the actions will not be executed. If you reactivate the delay, the count-down will begin from the start.

5.6 Events

In the [**Events**] tab, you can define controller responses to various events.

Available event triggers:
a) powering up
b) internal ones – can be triggered by
- touch panel
- smartphone
- at the end of the program

An internal event can transmit a value (e.g. events triggered by a slider on the touch panel).

c) from ON/OFF inputs – two events assigned to each input:
- rising edge
- falling edge

d) from multi-value inputs – events from inputs (DMX, analog, Modbus inputs) depending on the configuration:
- absence of an event
- change to a value
- ON/OFF
- entering and exiting a range

e) from clock – timers and astronomical clock:
- sunrise and sunset – with the option to move forward or backward
- timers triggering themselves at specified times

CREATING AN EVENT

In order to add an event, you need to press + on the toolbar under the event list; next, in the new event creation pane, enter the name of the event and specify its type.

In the action table, you can add elements to events and actions for these elements. It is also possible to set time limits and status limits for individual elements.

If you try to add event since [**Power on**], [**Sunrise**] and [**Sunset**] again, the application will display a message reading “Event already exists! Continue anyway?”

NOTE: The controller has only one event since powering up, and one since sunrise and since sunset.

The toolbar under the event list contains an additional icon (for a description of the other icons refer to page 39):

Events numbers - exports internal event reference numbers for the purposes of the controller supporting a PX181 panel

DESCRIPTION OF ACTIONS AVAILABLE FOR ALL ELEMENTS

ELEMENT	AKTION	ACTION RESULT
Scene / mask	ON	• If a scene has been deactivated - activates it. • If it has been activated – resets the duration that has elapsed. • If a scene is included in a group of elements – deactivates all the other elements in this group (also the programs paused). • If a scene has been rising – nothing happens. • If a scene has been falling – is activated again.
	OFF	• If a scene has been activated - deactivates it. • If a scene has been deactivated - nothing happens. • If a scene has been rising – is deactivated again.
	SOLO	Activates a scene and deactivates all the other scenes and programs in a particular zone.
	TOGGLE	• If a scene has been deactivated - operates as "activate". • If a scene has been activated - operates as "deactivate". • If a scene has been rising or falling– the direction gets changed.
	PAUSE	• If a scene is rising or falling– it is paused at this moment. • In the other cases, nothing happens.
	RESUME	• If a scene has been paused while rising or falling – the process is resumed. • In the other cases, nothing happens.
	SET VALUE *	The master of a scene (its overall brightness) is set to a value provided by the event.
	INCR. VALUE	Increases the master value by 1/255 unless the maximum value has been reached. If a scene has been falling or rising – stops it.
	DECR. VALUE	Decreases the master value by 1/255 unless the 0 value has been reached. If a scene has been falling or rising – stops it.

ELEMENT	AKCTION	ACTION RESULT
Program	ON	• If a program has been deactivated – activates it. • If a program has been activated - nothing happens. • If a program has been paused – resumes it. • If a program has been included in a group of elements – all the elements in this group are deactivated (including the programs paused).
	OFF	• If a program has been activated or paused – deactivates it. • If a program has been deactivated - nothing happens. • Decreasing the current value occurs during the interrupted program. If time has not been defined – decrease happens during the time when the current step would fall.
	TOGGLE	• If a program has been activated - deactivates it. • If a program has been deactivated – activates it. • If a program has been paused – resumes it.
	PAUSE	• If a program has been activated – pauses it. • If a program has been deactivated or paused - nothing happens.
	SOLO	Operates as "activate" and at the same time deactivates all the scenes and programs in the same area.
	RESTART	Discontinues the running of a program and enables it anew. Resets the existing number of repeats.
	SET MASTER *	The master of a program is set to the value provided by the event.
	DECR. MASTER	Increases the master parameter by 1/255 unless the value of 255 has been reached.
	INCR. MASTER	Decreases the master parameter by 1/255 unless the value of 0 has been reached.
	SET ACCEL. *	Speed acceleration is set to the value provided by the event.
	INCR. ACCEL.	Increases the acceleration parameter by 1/255 unless the value of 255 has been reached.
	DECR. ACCEL.	Decreases the acceleration parameter by 1/255 unless the value of 0 has been reached.

ELEMENT	ACTION	ACTION RESULT
Program	NEXT STEP	• If a program has been activated – goes on to the next step. • If it has been deactivated - works as "activate". • If it has been activated, during the last step, then, depending on the loop status and number of repeats - moves on to the first step or finishes. The program transition counter goes up upon transition from the last to the first.
	PREV. STEP	• If a program has been activated – moves on to the previous step. • If it has been deactivated - operates as "activate", but starts from the last step. • If it has been activated in the first step - deactivates itself.
Sequence	START	Starts a sequence. If it has been started – does nothing.
	STOP	Deactivates the sequence and all the scenes, programs, masks, delays and sequences that were started by this sequence.
	OFF	Discontinues the operation of a sequence. The elements that were started by this sequence remain enabled.
Delay	ON	If the delay has not been activated, it starts count-down.
	OFF	Deactivates count-down – does not execute actions from the list
	RESTART	Activates count-down from the start.
Status	ON	Sets a status if no status has been set. If a status has been set - nothing happens.
	OFF	Deactivates a status if it has been set. If a status has been set - nothing happens.
	TOGGLE	Activates a status if it has not been set, deactivates it if it has been activated.
Transmit	DMX ON ANALOG ON MODBUS ON	Enables DMX transmission from input channels directly to the output. Such transmission can be used for those input, analog and Modbus channels that have been properly defined.
	DMX OFF ANALOG OFF MODBUS OFF	Disables DMX, analog and Modbus transmission.

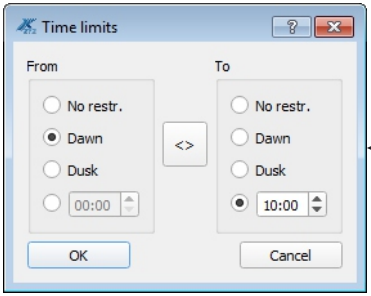
ELEMENT	ACTION	ACTION RESULT
Signal panel	panel number / signal number	Sends out a specific signal to a selected PX181 panel.
Self programming	ON/OFF	This option is only available for ON/OFF built-in inputs in the controller. • For input 24 - the controller enters/exits the self-programming mode. While entering, it writes the first 23 scenes to the buffer, while exiting it writes the buffer to the first 23 scenes. • For the other inputs (if the controller is in the self-programming mode – this action is executed, and not the other ones, if it is not – it works the other way round), responds only to short to ground - The DMX output has sent to it, from the buffer, the scene with the number corresponding to the number of the button pressed (1-23). Changes at the DMX input are captured and written to the buffer for a particular scene on an on-going basis. • Scenes are defined.
Zone	SET MASTER	The master of an area is set to the value provided.
	INCR. MASTER	Increases the master parameter by 1/255 unless the value of 255 has been reached.
	DECR. MASTER	Decreases the master parameter by 1/255 unless the value of 0 has been reached.
	ALL OFF	Deactivates all the scenes, programs and masks in a particular area.

RESTRICTIONS ON ACTIONS

You can impose on each action on the list the requirements that must be met for a particular action to execute. All requirements imposed on a given action have to be satisfied at a given moment.
a) **[Time limit]** – the time range within which a given action can be executed:

- during the day only – between sunrise and sunset
- during the night only – between sunset and sunrise
- between sunrise and a pre-set time
- between sunset and a pre-set time
- between a pre-set time and sunrise
- between a pre-set time and sunset
- within a specified time range (from - to)

In calculating sunrise/sunset time, account is taken of the sunrise/sunset offset entered in the settings by the user.



specifying time limits for an action

b) [**Status limits**] - the state of particular statuses that has to be fulfilled at a given moment for an action to be executed
In respect of each status, an action can:

- ignore its state
- start only if the status has been set
- start only if the status has not been set

For an action to start, at a given moment all requirements resulting from the statuses have to be satisfied.
Statuses are shown in the window of the [**Status limits**] table.

In order to be able to use the [**Status limits**] option, first you need to define a status in the [**Configuration**] tab.

5.7 Scene and program groups

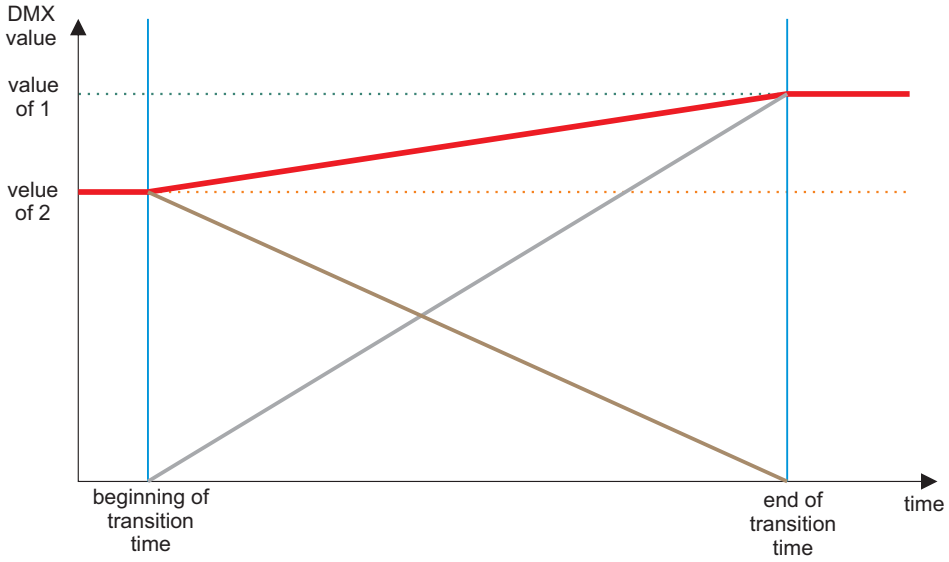
Scenes and programs being part of the same area can be positioned within a single group of associated elements. Elements that are associated cannot be activated at the same time, that is why activation of an element included in a given group causes all the other elements in that group to be deactivated.

Each element may only be part of one group.

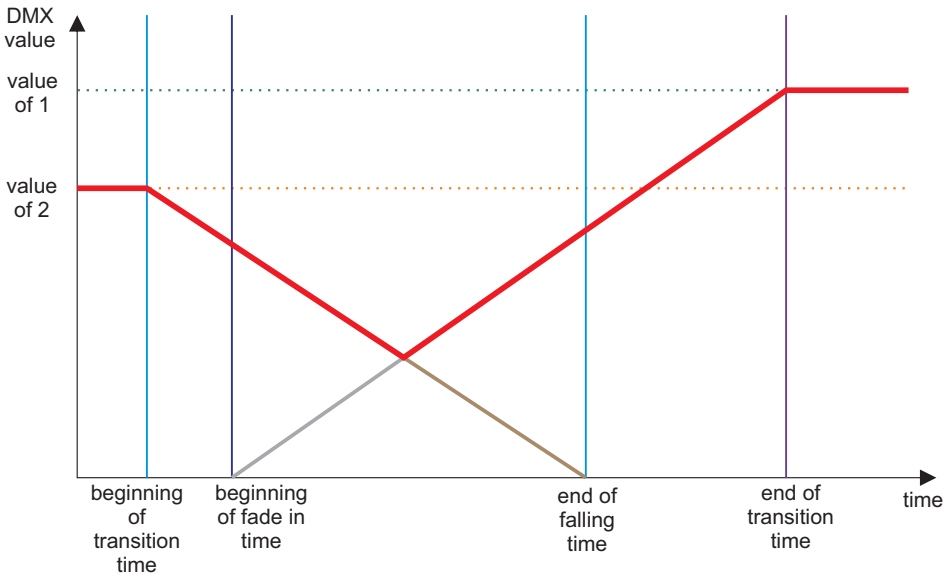
Within a group, there may only be elements from the same area.

Transition from the values of associated elements (at the instant when one of them is activated and the other one is simultaneously deactivated) is of linear nature, from value to value.

A sample transition of values in the channel for associated elements:



A sample transition of values in the channel for non-associated elements:



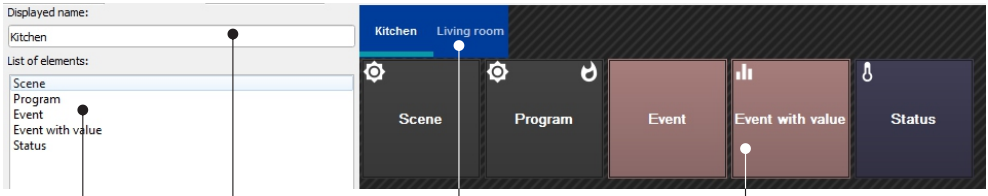
In this tab, you can create and remove groups and edit their names, with the assignment of scenes and programs to a group being carried out using the parameters of a given element.

5.8 Statuses

You can define a maximum of 256 statuses in the controller. Statuses can be activated and deactivated using appropriate actions. Next, you can make the execution of actions on various elements dependent on whether or not a given status has been set.
Defining a status involves assigning a name to it.

5.9 Smartphone configuration

The [**Smartphones**] tab contains a list of all areas created.
Clicking an area on the list opens a window in the main panel in which you can open a desktop for a given area for the purpose of controlling a smartphone:



a list of elements available on the desktop

a field for changing the desktop name - by default this is the name of the area for which the desktop is being created

desktops

configuration elements

Underneath the window with the [**List of elements**] there is a toolbar which contains the following commands: [**Add**], [**Delete**] and [**Edit**].

You add a new element by either dragging it from the side panel or by pressing the button + under the list. Pressing the button displays a dialog box with elements available for adding in a given zone.

You can add scenes, programs (from this zone only!), statuses and internal events.

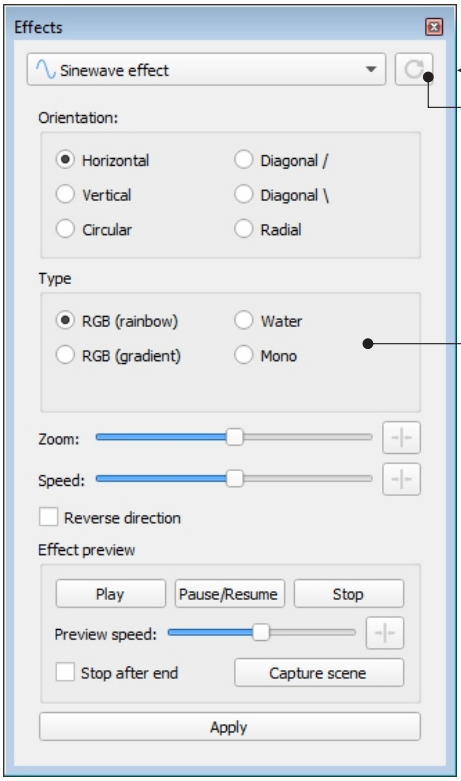
If you try to drag an unauthorized element, an error message will be displayed.
You can set a master for a scene, and for a program - a master and acceleration.

The icon in the right upper corner of the scene tile means that this scene is editable and that on your smartphone you will be able to change its value.

Configuration element	Displaying on the desktop	Additional parameters
scene	on/off tile - shows the state of a scene	master, an editable scene
program	on/off tile - shows the state of a program	master, speed
status	tile - shows the state of a status	-
internal event	a tile that triggers an event	-

5.10 Effects

The "effects" window allows you to quickly generate programs or scenes in accordance with the type selected and parameters set. There are several types of effects available in the application. Different effects affect different devices; however, most of them are used to create effects in RGB lamps or water nozzles.



a drop-down effects list

reset/refresh an effect
Selecting an effect from the list or pressing the [**Reset effect**] button opens a preview of the effect on the project board. In order to exit the effect preview, press ESC.

parameters of an effect that change depending on the effect chosen

[**Effect preview**] - control of effect preview [**Play**], pausing and resuming, [**Pause/resume**] and preview acceleration [**Preview speed**]

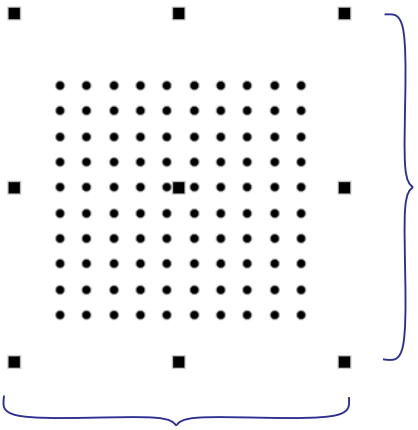
You can save the preview being displayed by pressing the [**Capture scene**] button - which will create a "snapshot" of the program being played back.

[**Apply**] - after you select it, the application will ask for the name of the new program and the number of steps for which the effect result is to be saved

PROJECT BOARD

You can see 9 little black squares delimiting the area where the effect operates. The effect only affects the devices located inside the rectangle delimited by these points. If you move a point, the effect operation area will be modified. The [**Reset effect**] button sets the entire project board (sheet) as the effect area.

Clicking a group of devices on the list sets the area taken up by the group as the effect area. If within the effect area no devices are highlighted, the effect will affect all the devices in the area. If some devices are highlighted, the effect affects only the devices highlighted within the area. The devices that are not affected by the effect are assigned DMX values of 0.

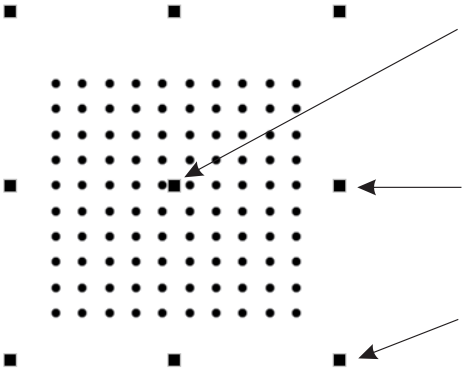


the selection box for the arrangement of which the effect is being created (this does not apply to the chaser effect)

If the arrangement of devices is not highlighted on the project sheet in the manner described above, click the refresh (reset) effect button

The arrangement selection box:

- can be moved - by clicking the central square
- can be scaled proportionately - by pulling on one of the squares located in the corners of the box
- can have its width or height adjusted - by pulling on the square located in the center of the side selected



can be moved as a whole, without changing its size

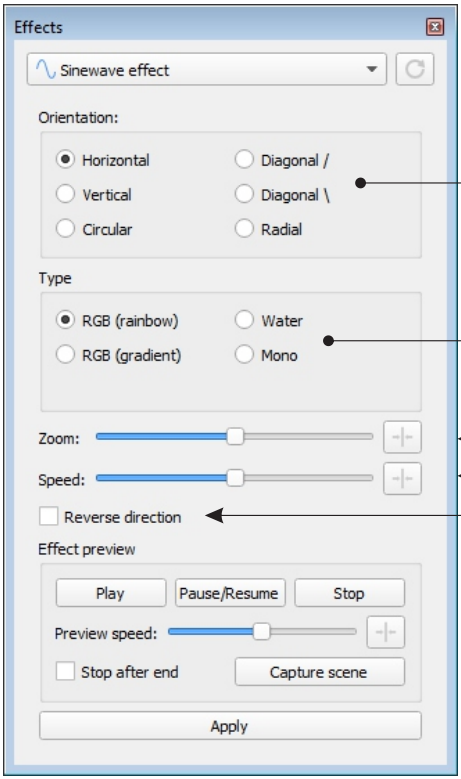
one of the four central points of the sides of the selection box - adjusting the height and width of the box

one of the four corners of the selection box - simultaneous, proportional adjustment of the height and width of the box

EFEKTS:

The following are the effects available:

Sinewave effect - basic effect allowing you to design a smooth transition between colors



orientation of the effect spreading

selection of the type of channel which the effect affects:

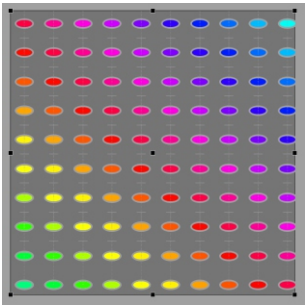
- **RGB (rainbow)** - RGB lamp control - displaying all colors one after another
- **Water** - controlling the channel responsible for water
- **RGB (gradient)** - RGB lamp control - displaying selected gradient colors
- **Mono** - control of monochromatic lamps

scaling the size of "superimposition" of an effect on the arrangement of devices (lamps, water nozzles, etc.), adjustment over the range 0.1x (left end of slider) to 10x (right-most position of slider)

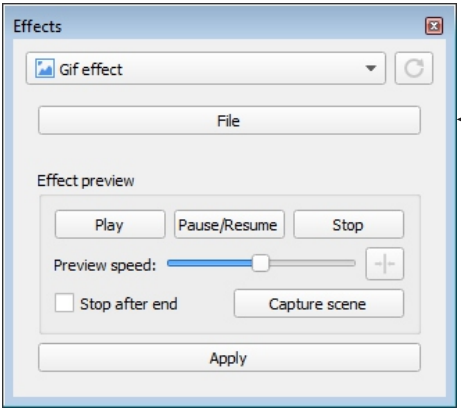
scaling the speed of the execution of a selected effect, adjustment over the range 0.1x to 10x

change of the direction of effect execution

After your approval, the application will ask about the number of steps into which the effect should be divided in the program being created. If there are too few steps, the final effect will differ from the preview.



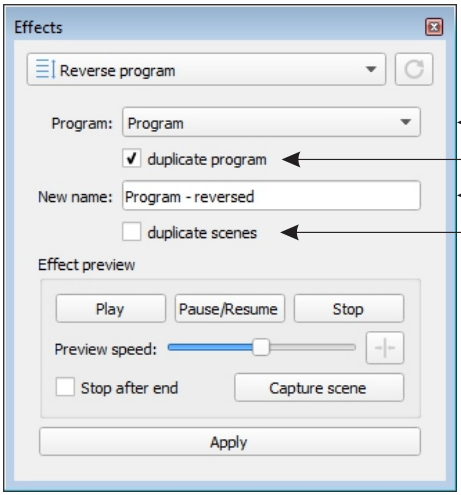
Gif effect - creates a program out of a selected GIF animated image, the image occupies up the entire effect area, it can be "flipped"



selection of a **.gif* file from a location on your disk

The application will create a program with the number of steps equivalent to the number of frames in the gif image.

Reverse program - it reverses the order of steps in a selected program. You can overwrite the existing program or save it as a copy.



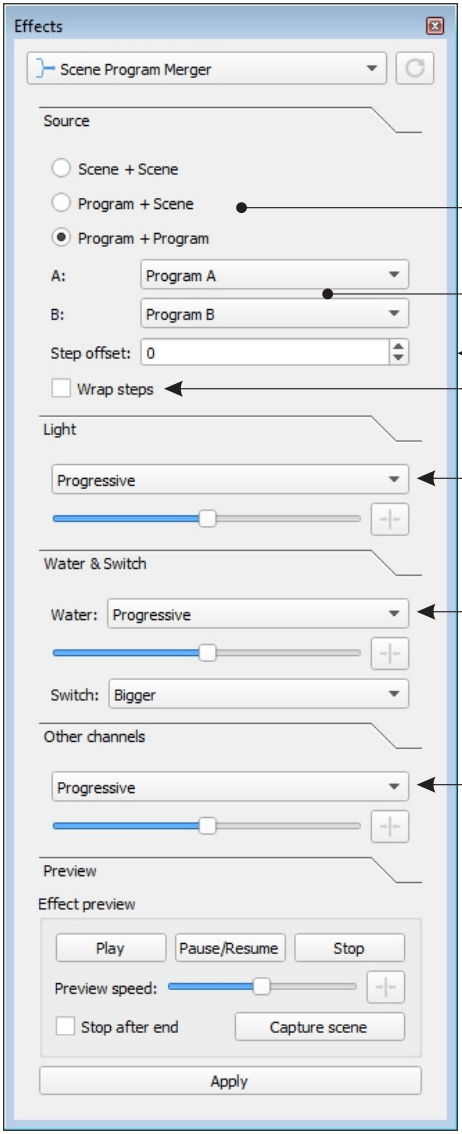
selection of a program to be reversed

checkbock ☐ - is not selected, the reversing of a program will modify the selected program, a selected checkbox ☑ - a program selected for the creation of an effect will not be modified and a copy of the program will contain the reversed program

name of a duplicated reversed program

if you select this option, all the scenes that make up the selected program will be duplicated

Scene Program Merger - allows you to combine the existing scenes and programs with each other



selection of a source of scenes/program used to create an effect:

- **Scene + Scene** - combines the values of two scenes, the result is a scene
- **Program + Scene** - combines the values of a scene with the values of the scenes of each program step, the result is a program
- **Program + Program** - combines the values of the scenes of steps of a program with the values of the scenes of steps of another program, the result is a program

source A and B

specifies by how many steps the start of program B is to be offset relative to the start of program A

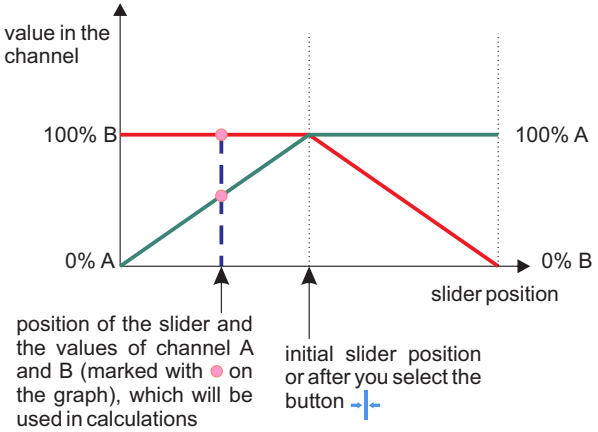
this function allows you to combine programs having different numbers of steps or if you have used the [**Step offset**] option

selection of the channel combination procedure (separately for light-controlling channels, water-controlling channels and the other ones); available options include:

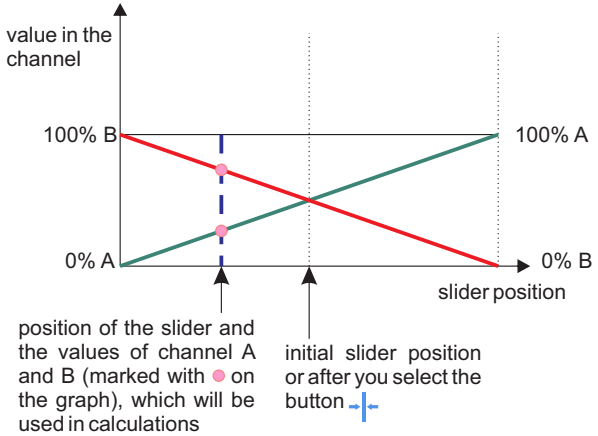
- Progressive
- Linear
- A
- B
- Bigger
- Smaller
- A lightness A, B color
- A color A, B lightness (only for light)

Channel combination procedure:

PROGRESSIVE - combining values from channels A and B depending on the position of the slider, according to the graph shown below. The procedure is used for the following channels: light, water and other channels.



LINIEAR - combining values from channels A and B depending on the position of the slider, according to the graph shown below. The procedure is used for the following channels: light, water and other channels.



A - channel value directly from source A

B - channel value directly from source B

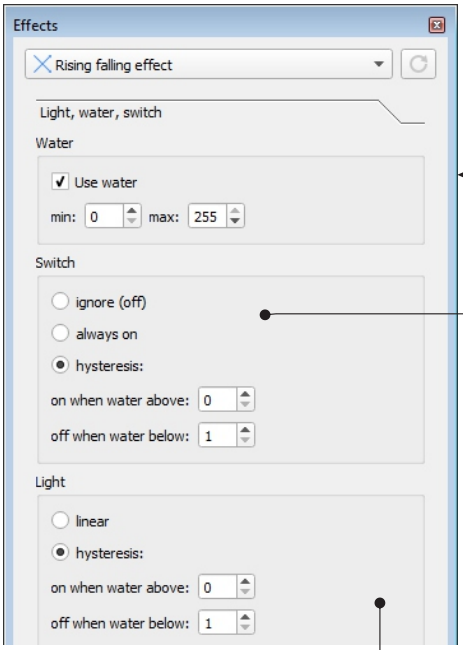
BIGGER - section of the greater of channel values from sources A and B

SMALLER - section of the smaller of channel values from sources A and B

A LIGHTNESS A, B COLOR - using the channel brightness value from source A and color value from source B

A COLOR, B LIGHTNESS - using the channel color value from source A and brightness value from source B

Rising falling effect - primarily for "light-water-switch" devices, it can create running light effect with water effect being switched on



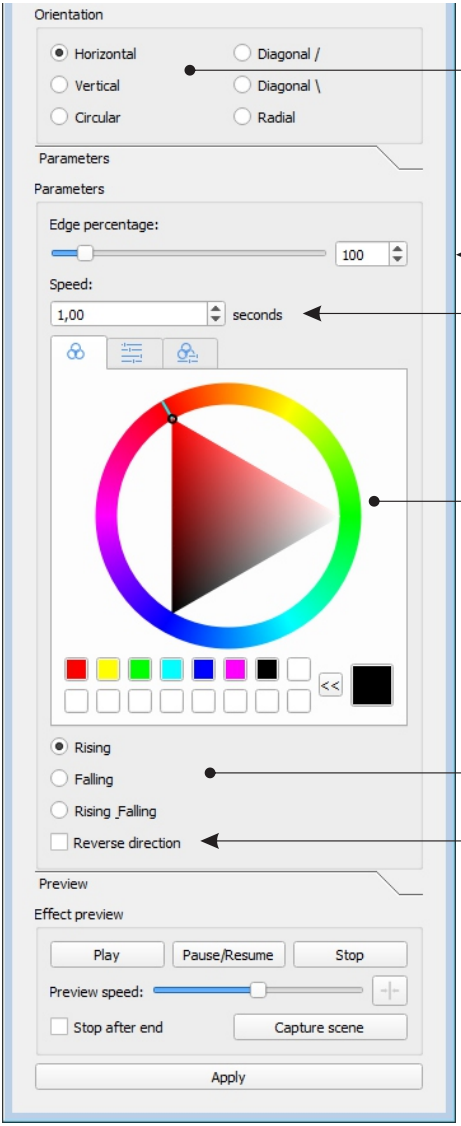
selected checkbox ☑ means that water will be used to create the effect (if an appropriate device is used, i.e. one having a controlled channel with water),
checkbox ☐ means that the channel responsible for water will take on the value of 0

used for devices of the „Light + Water + Switch" type

- **ignore (off)** - the switch channel takes on the value of 0
- **always on** - the switch channel takes on the value of 255
- **hysteresis** - specifies boundary conditions for water channel values for which the switch is turned on

control of the light channel:

- **linear** - the value in the channel changes linearly from 0 to 255
- **hysteresis** - specifies boundary conditions for water channel values for which light takes on the value of 255



orientation (direction) of the effect spreading

degree of effect transition smoothness
For 0, the effect will be snap-like; the higher the value, the smoother the transition.

speed (length) of effect payback

effect color change box

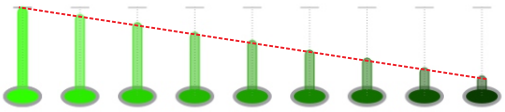
manner in which an effect is executed:

- [**Rising**] - a change in channels from the minimum value, i.e. 0, to maximum, i.e. 255
- [**Falling**] - a change in the channels from 255 to 0
- [**Rising Falling**] - a change in the channels from 0 through 255 and back to the minimal value of 0

selected checkbox ☑ means that the application will be executing a given effect in the opposite direction

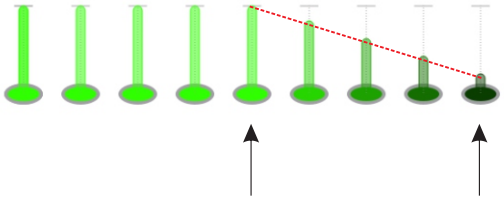
[**Edge percentage**] parameter- examples

a) 100%



the value in the channel of the last device will not rise until the value in the first device channel reaches 255

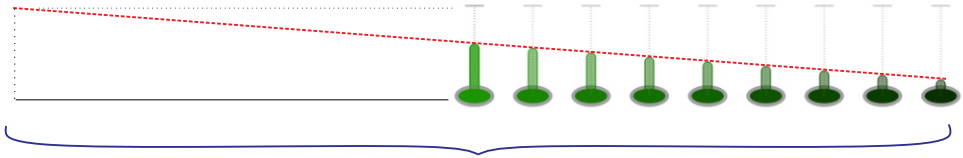
b) 50%



value in the channel is 255

the value in the channel of the last device will not rise until the value in the channel of the half-way device reaches 255

b) 200%

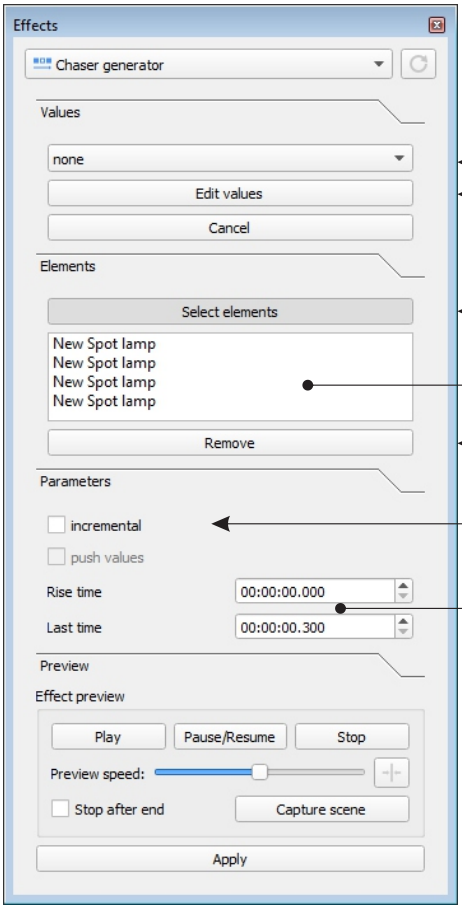


2x

value in the channel is 128

the value in the channel of the last device will not rise until the value in the first device channel reaches 128

Chaser generator - allows you to quickly create simple pattern transition through selected devices



specification of a pattern that is to pass through selected devices. You can copy a pattern from the existing scene.

adding devices to the list - please see below

a list of devices that will be used to execute chaser effect

removes devices selected on the list

manner of pattern transition - please see examples below

rise time and last time of the steps generated

You can add devices in the following manner:

• **One by one**

a) Using the “drag and drop” method - from the project board or the [**Devices**] tab

b) Using the [**Select elements**] button - as long as the button is held down, clicking devices on the graphic project adds these devices to the list. To finish, you need to deselect the button.

• **On a group basis**

a) By dragging a group of devices from the device list on the [**Devices**] tab

b) By dragging selected devices (using Ctrl key) from the device list in the [**Devices**] tab

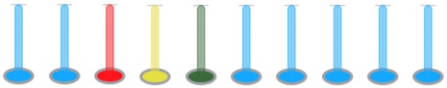
NOTE: A device should not be added to the list more than once.

An example of the first 4 steps of a generated chaser, without additional options:

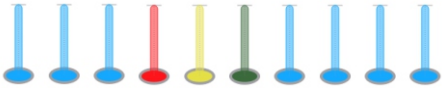
step 1:

step 2:

step 3:



step 4:



An example of the first 4 steps of a generated chaser, with the "Incremental" option:

step 1:

step 2:

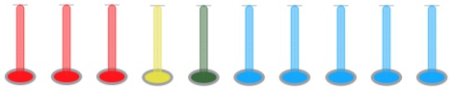
step 3:

step 4:

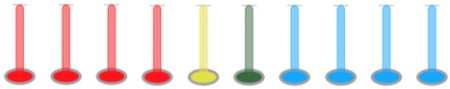
An example of the first 4 steps of a generated chaser, with the "Push values" option:
step 1:

step 2:

step 3:



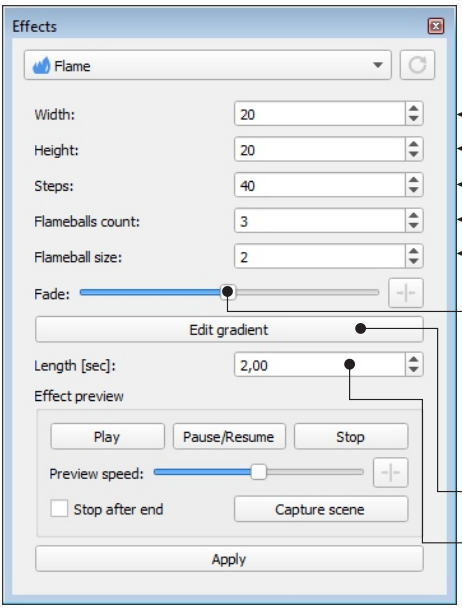
step 4:



The chaser effect will generate a program with the number of steps equivalent to the number of devices through which the pattern is to pass.

Flame - primarily for the RGB device grid

Generating flame effect:



size of the effect grid, preferably it should correspond to the number of devices
Clicking a group of devices in the [**Devices**] tab automatically enters the relevant values in the [**Width**] and [**Height**] fields.

the number of steps of the program generated

number of fireballs

size in grid meshes

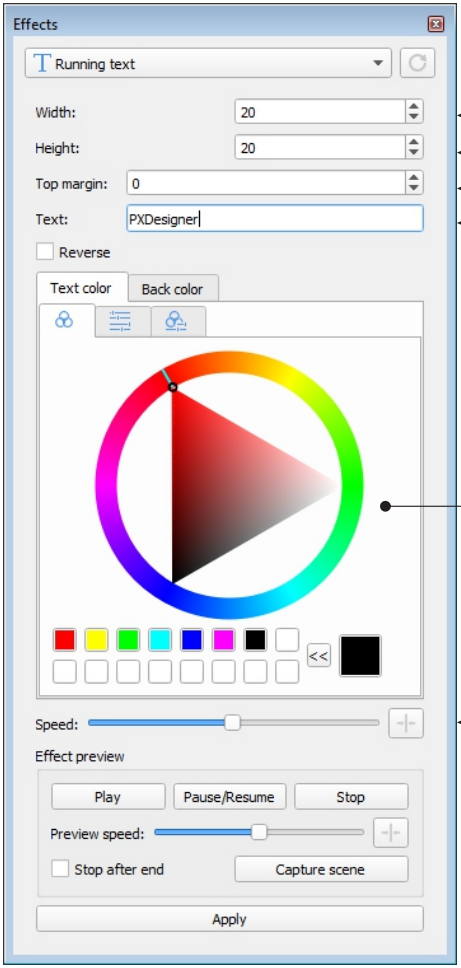
speed of flame fading away, returning to the default value

for color editing refer to page 41

the length of the entire program

Running text - generates a program with moving text. Requires a device grid (with light-controlling channels) having specific dimensions.

The number of devices in a column/row has to be equivalent to the values entered as the effect parameters.
Font size is 5x7px + margin of 1px between characters. It is possible to modify text position by moving the selection box:



size of the effect grid, preferably it should correspond to the number of devices
Clicking a group of devices in the [**Devices**] tab automatically enters the relevant values in the [**Width**] and [**Height**] fields.

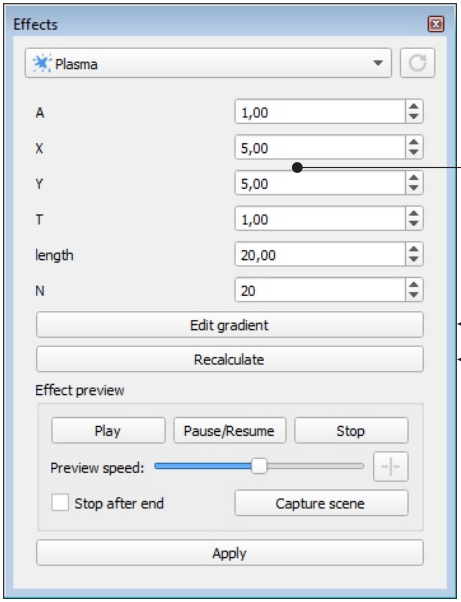
moving text relative to the grid top margin

box where text is to be displayed (ASCII characters)

text and background color change boxes

speed of effect playback

Plasma - requires a device grid with light-controlling channels

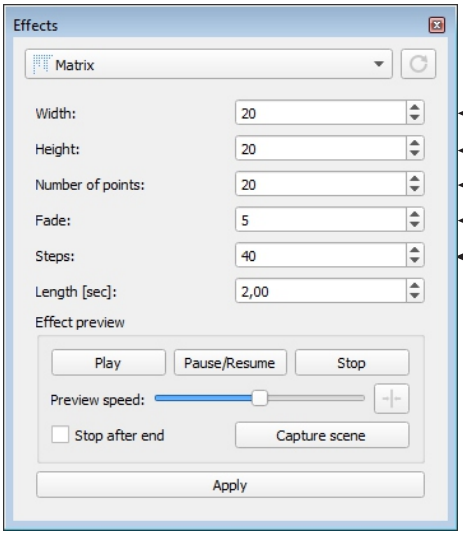


plasma effect parameters

for color editing refer to page 81

clicking this key causes the application to recalculate the adjusted modifying factors; if you press [**Play**] key, the changed effect preview will be displayed

Matrix - falling drops effect. Requires a device grid with light-controlling channels. The number of devices in a column/row should be equivalent to the values entered as the effect parameters.



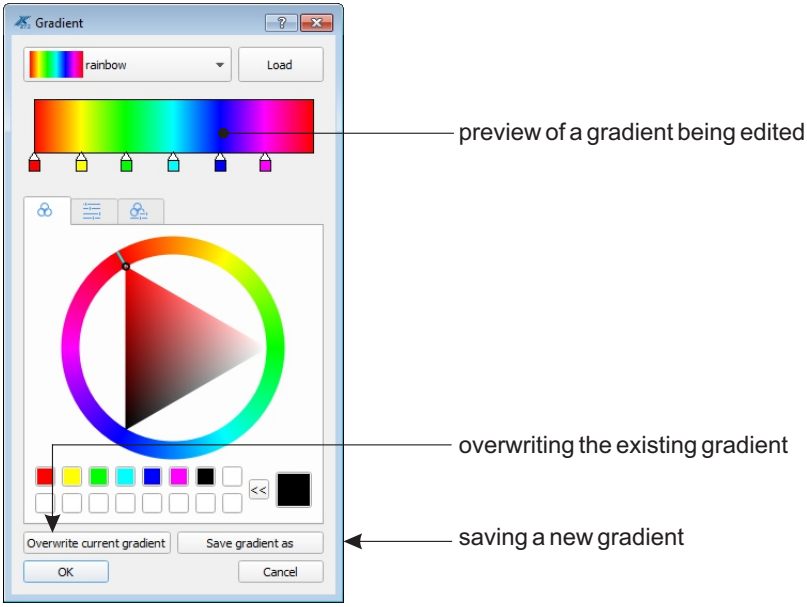
size of the effect grid, preferably it should correspond to the number of devices
Clicking a group of devices in the [**Devices**] tab automatically enters the relevant values in the [**Width**] and [**Height**] fields.

the number of drops being displayed simultaneously

speed of drops fading away

the number of steps for which a program will be generated

EDITING A GRADIENT:



The application has several basic gradients. You can edit the existing gradients or create new ones. A gradient is composed of points in which there are specific colors, and creates smooth transitions between these points.

You can edit color settings in the following manner:

1. Select a previously saved gradient from the drop-down tab
2. Click the [**Load**] button, and the gradient will display on the preview bar
3. If necessary, edit the gradient loaded in the following manner:

- active point

To make a point active, double click the selected slider. The active slider will be marked with a black cursor highlight. Using the color wheel, edit the color in the active point.

- an inactive point - the cursor is white

Double-clicking the gradient preview adds a control point. A single RMB click on any point removes this point.

You can move control points around by holding them with the LMB.

4a. Select the [**Overwrite current gradient**] option - if you want to modify a previously defined gradient

NOTE: You cannot overwrite default gradients.

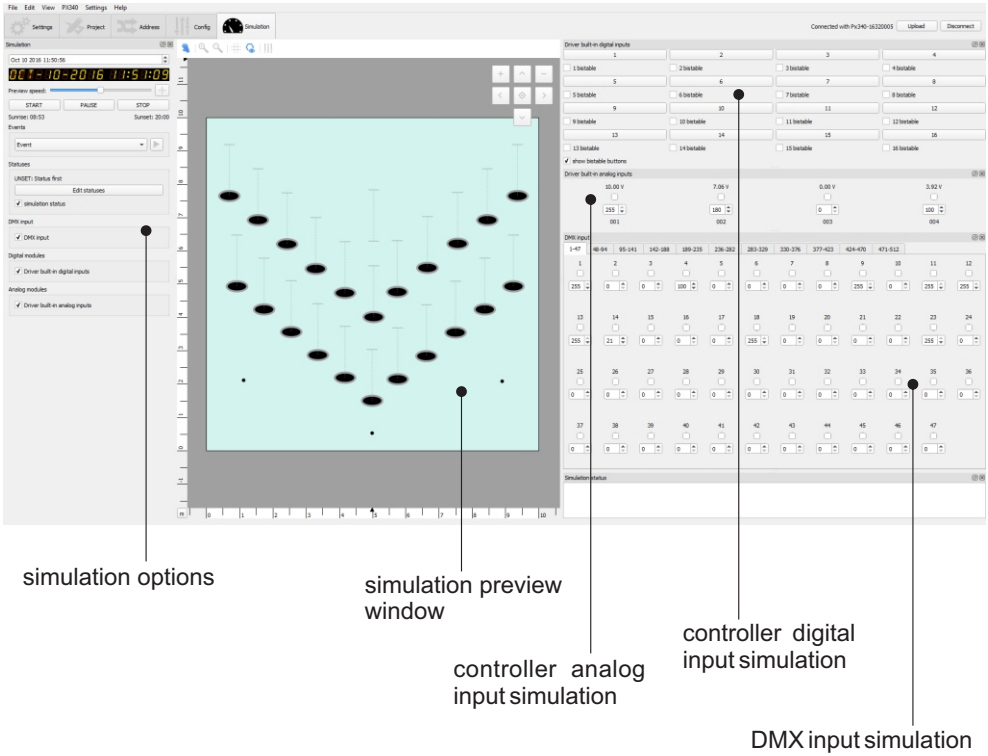
4b. Select the [**Save gradient as**] option - if you want to save the gradient you have created

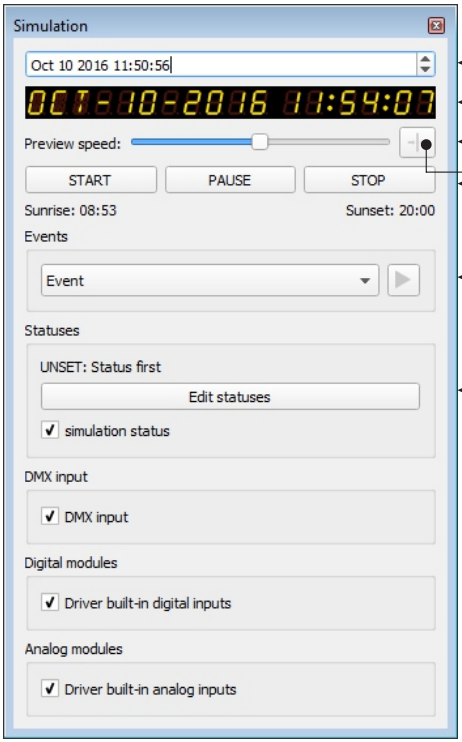
5. Click [**OK**] to load the selected/modified gradient into an effect

6. SIMULATION

The application allows you to verify how the configuration operates without actually loading it into the controller.

Structure of the application window displayed after you select the [**Simulation**] tab from the main panel:





start date and time (the controller responds e.g. to days of the week) from which simulation is to start

current simulation time

preview speed accelerates/decelerates the simulation

restores the default speed

the "**START**" button resets the simulation and starts it again from the time specified.
"**PAUSE/RESUME**" - pauses/resumes the simulation
"**STOP**" - deactivates and clears the simulation

you can activate an event irrespective of conditions
You can activate an event with a value - a pane will display with a slider and spinbox.

activating a status simulation

Simulation status, digital modules, analog modules, DMX input - selecting the checkbox ☑ displays a dockable pane with controls for a given module.

[**Simulation status**] - displays a list of elements currently running in the simulation
[**Digital modules**] - displays 16 buttons. Default buttons are monostable.
After you click "show bistable buttons" you can mark each button as bistable.

[**Analog modules**], [**DMX input**] - for each channel a slider with a spinbox is displayed. DMX channels are grouped in tabs.

NOTE: If you want to modify a project, stop the simulation, make changes and start the simulation again.
Modifying a project during a simulation may lead to errors.

7. COMMINICATION WITH THE CONTROLLER

Establishing a connection with the controller can be carried out as follows:

- by selecting: [**PX340**]→[**Connect**]
- after clicking the [**Connect**] key located in the right upper corner of the application window

(See more on page 17)

Next, the application will display a selection box with controllers available in the network. For each controller, the following will be displayed: its name, MAC address, IP address, mask and gate.

If you select the [**Search**] option, the controller list will be refreshed.

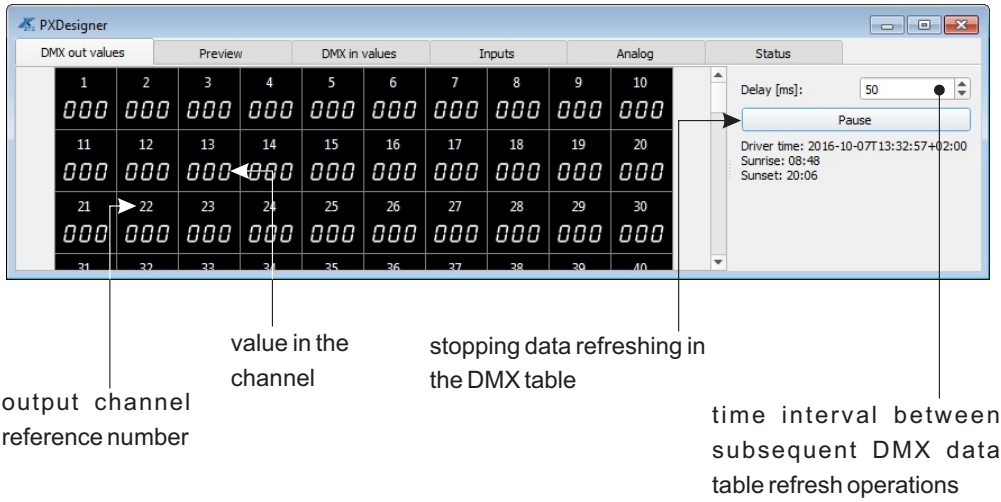
The configuration saved in the program is not sent to the controller on an ongoing basis.
In order to send a created configuration file to a device, select from the [**PX340**] menu [**PX340**]→[**Upload configuration**]. This will overwrite the configuration that was saved in the controller.

In order to download the configuration which is now saved in the device, select from the menu [**PX340**]→ [**Download configuration**]. This will download the configuration from the controller and save it to the disk or (depending on the option selected in the [**Settings**] tab→ [**Communication**]) will overwrite the configuration currently open in the program.

7.1 Controller preview

The [**Monitoring**] pane allows you to monitor values in the inputs and outputs (DMX and analog ones) as well as controller statuses; it has the following tabs:

- **DMX out values**



• **Preview** - allows you to preview a project sheet together with the devices. The user can move, zoom in on, zoom out on the project sheet, activate and deactivate grid visibility on the project sheet, activate and deactivate zone visibility and adjust background transparency.

• **DMX in values** - the DMX channel table looks the same as in the case of [**DMX out values**], input DMX values are displayed

• **Inputs** - preview of the state of 16 digital inputs, red - deactivated, green – activated

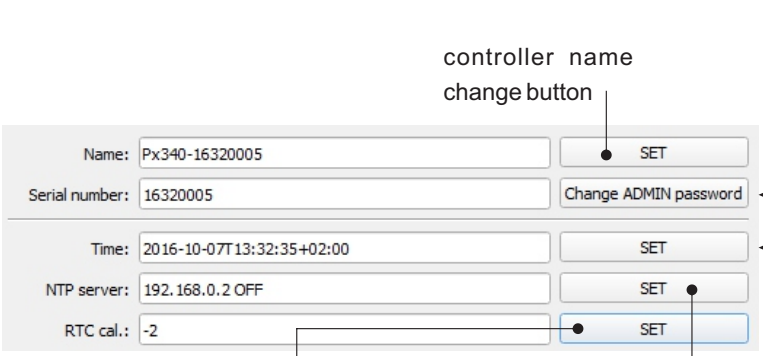
• **Analog** - preview of analog channel values: for the 4 input channels, slider pairs are displayed:

- values in the analog input channel after a selected filter is used
- values in the input channel before a filter is used and for 2 output channels

• **Status** - preview showing which configuration elements are currently activated

7.2 Administrative tools

[**Administrative tools**] tab contains advanced parameter adjustment options, such as network settings, renewal, time.



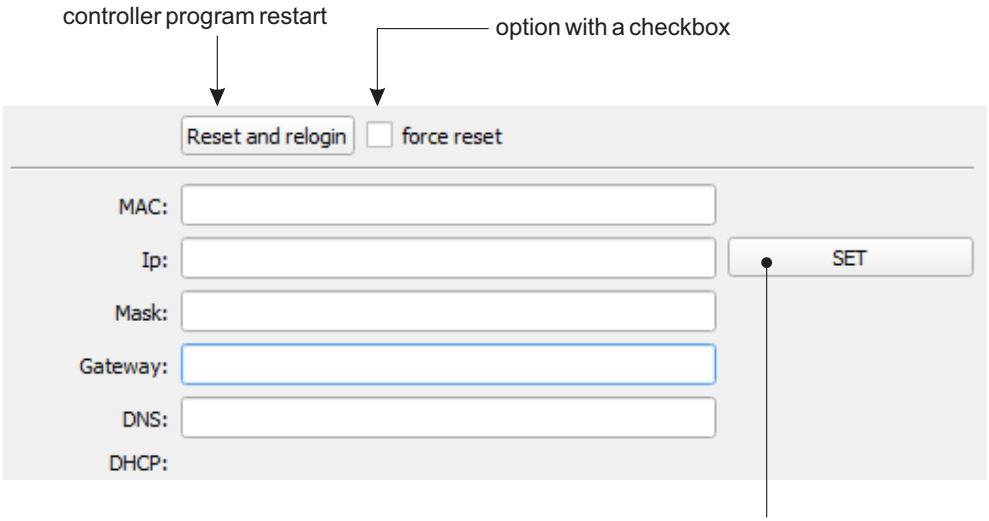
allows you to set the clock in the controller (if it is connected to the application)

Calibration allows for accelerating and decelerating the clock, as internal electronic clocks tend to have a drift when compared with actual time. One unit set at a positive value can accelerate the clock by 10.7 seconds per month, while one unit set at a negative can decelerate the clock by 5.35 seconds on a monthly basis.

the controller can synchronize its clock with an external NTC server. With this button, you can enable/disable this option and provide the server address.

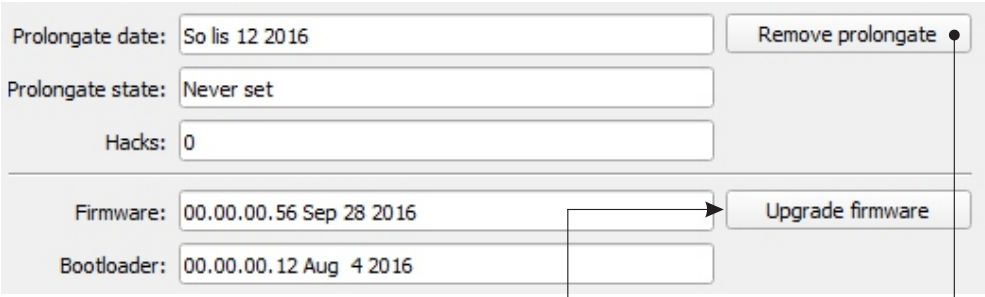
after you select this option, the application will display a pane containing the following fields:
- for changing date and time
- for selecting time: local or UTC
- specifying the time zone

and a button to set the current (system) time



changing the static network parameters of the controller: IP address, mask, gate address, DNS address

☑ DHCP - if this function is selected, an address is assigned from a DHCP server automatically, if not - the static address is used



in order to update the firmware, select a file with the latest software from the disk

in case renewal has been set, please click the [**Remove prolongate**] button and enter the requested code. In order to do that, contact our service desk by phone

8. SUPPORT OF PX181 PANEL

A PX181 touch panel is used to manage reproduction of the configuration saved in a PX340 controller.
When creating a configuration, you need to link internal events in the controller to the buttons and sliders. Event reference numbers are generated by application after you press of the icon  .

The panel configuration creation process is described in the PX181 user manual, and the procedure for connecting the panel to the controller is described in PX340_M_pl_1-0.