PxDesigner Application

User manual

Table of Contents

Manufacturer reserves the right to make modifications in order to improve program operation.

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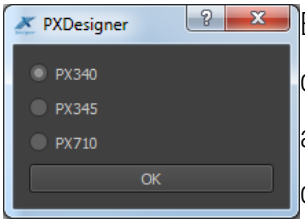
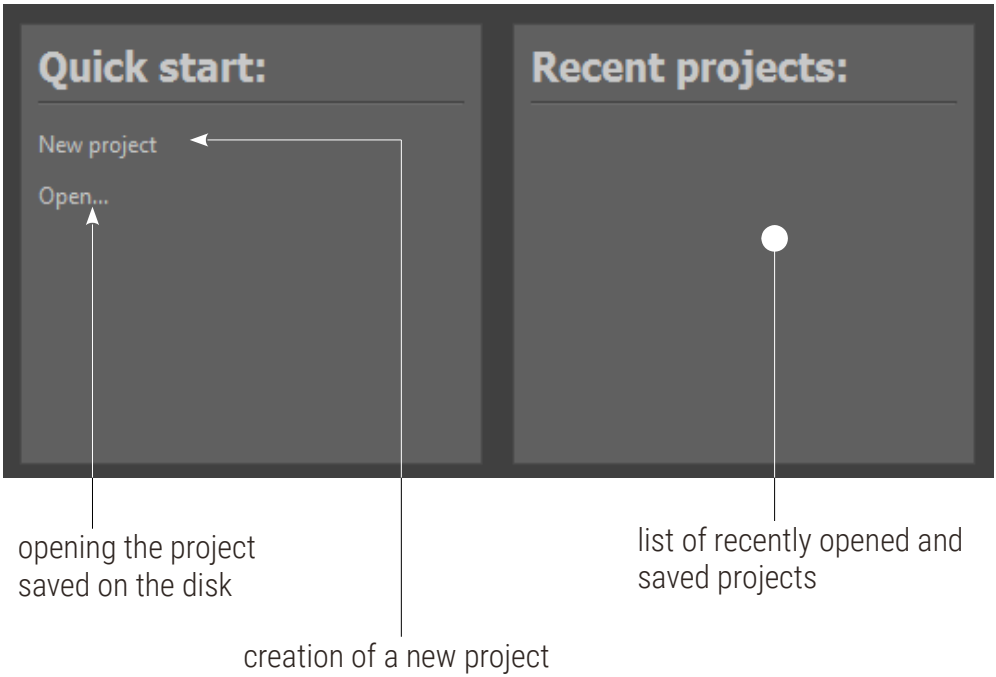
1 Getting started

After launching the application, the driver's model selection window will be displayed:



By default, the application offers the choice of all driver models supported by the application, in the application settings it is possible to change the default settings, after selecting the device, the program start window will appear, in which the user can choose the following options:



In the event of a system failure, the next time the program is run in the [Quick start] field [Autosave] appears, selecting it will allow you to recover the last changes made to the project. The autosave function creates an automatic copy of the project every 5 minutes.

NOTE! During the connection with the controller, changes made in the configuration are not sent to the device on an ongoing basis.

Sending and downloading configuration is described in point 7 Logging into the controller.

FIRST LOGGING TO THE DRIVER

To log in to the driver, click [Connect] → [Search], then double-click the name of the searched driver or select it and select [Login].

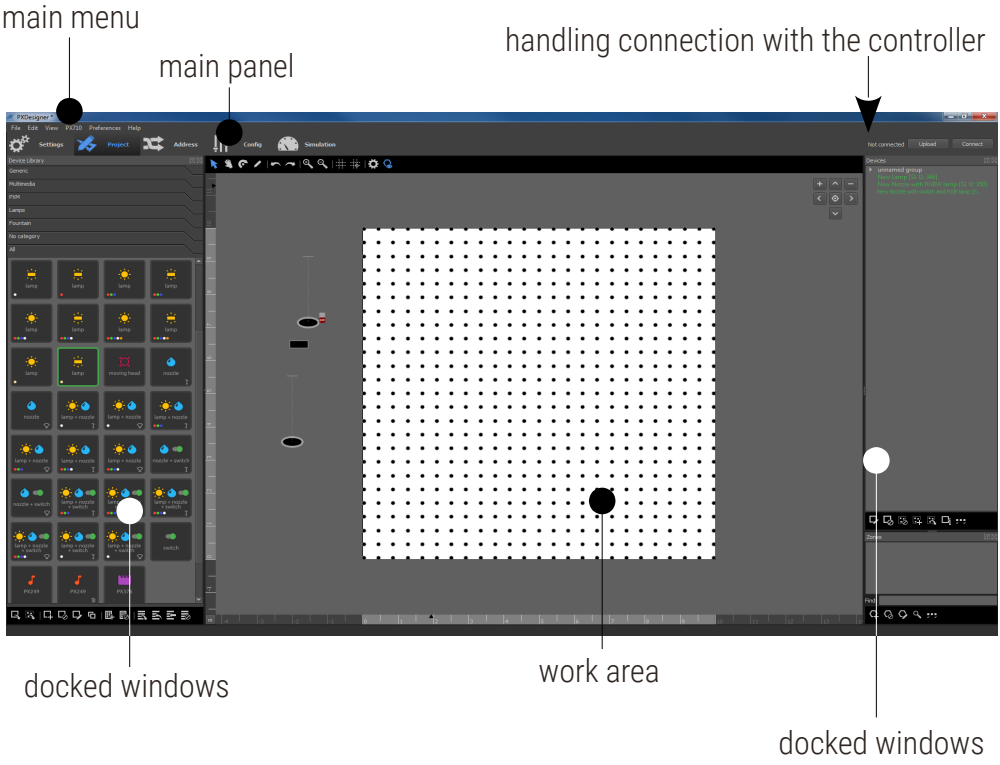
During the first login, enter the ADMIN in the [Login] field and the device serial number in the [Password] field.

Pressing the [Default] button causes the program to enter the serial number into the [Password] field.

1.1 Application window structure

Information presented in the program is grouped on the top permanent panel which is divided into following tabs: **[Settings]**, **[Project]**, **[Address]**, **[Config]**, **[Simulation]**, and in the main menu, as a drop-down menu: **[File]**, **[Edit]**, **[View]**, **[PX340/PX345/PX710]**, **[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] – visualization of the behavior 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 – imports scenes saved in **.csv* format
- Export CSV – exports scenes saved in **.csv* format
- Close project
- Exit – close the application

[Edit]:

- Undo – undoes the last action (max. 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 – maximizes the program window

[PX340/PX345/PX710]:

- Connect – search for controllers in the network is performed, description of the connection → in item 7
- 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

- **Report Modbus** – report Modbus opens the window with the charts for all the elements of the configuration, which there may be an access to through the Modbus function

[Settings] – advanced application settings

[Help]:

- **About** – displays the software's details and the contact data of it's manufacturer
- **Manual** – opens the user guide

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. On the left side of the window there are drop-down tabs. Depending on the selected tab, the content of the main panel changes.

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

2.1 System

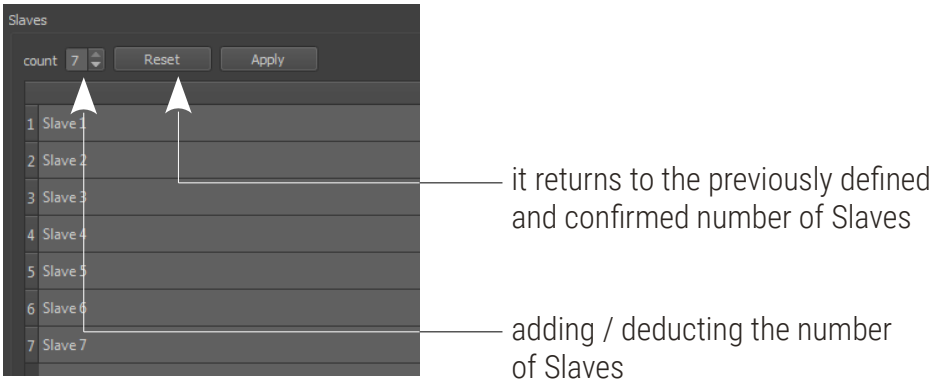
Global system settings.

In the **[Controllers]** tab – user defines the number of Slaves. This is an option available only for PX710.

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

2.1.1 Controllers (only PX710)

Settings connected with the whole system (applies only to PX710).



NOTE! Each change in the number of Slaves should be confirmed by pressing [Confirm].

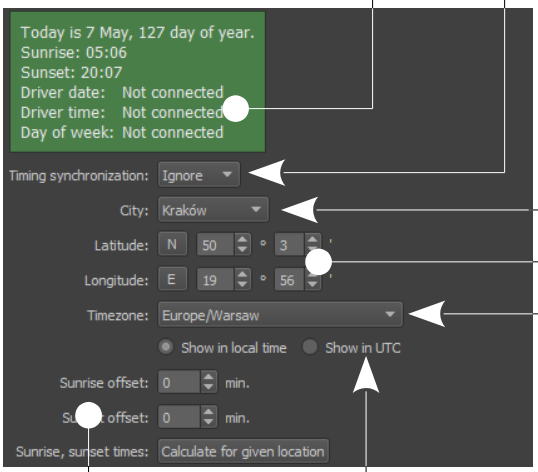
2.1.2 Time

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 utilizes 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.

drop-down list of options for timing synchronization of the driver
[Ignore] – ignores synchronization
[Send] – sends a synchronization signal
[Receive] – receives a synchronization signal

today's date and today's sunrise and sunset times, based on the table calculated, date and time retrieved from the controller



a drop-down list 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

box makes allowance: shift the summer time offset and Universal Time Coordinated (UTC)

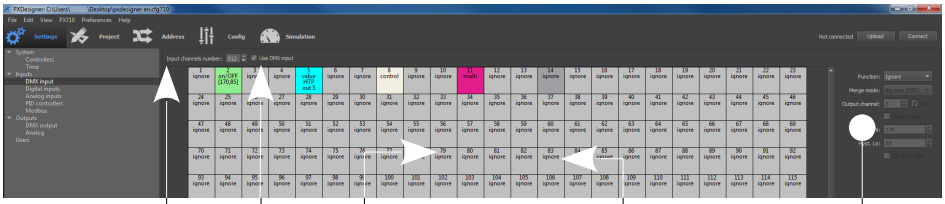
Introduction of offset for sunrise and sunset. The values in the table are not modified if in the preferences -> Time -> the option "include offset in sun table" is checked. By default, this option is selected.

2.2 Inputs

2.2.1 DMX input

In the **[DMX input]** tab it is possible to 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

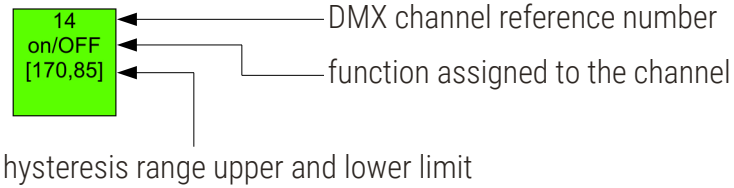
changing the parameters of the channels highlighted in the table

functions assigned to the channel

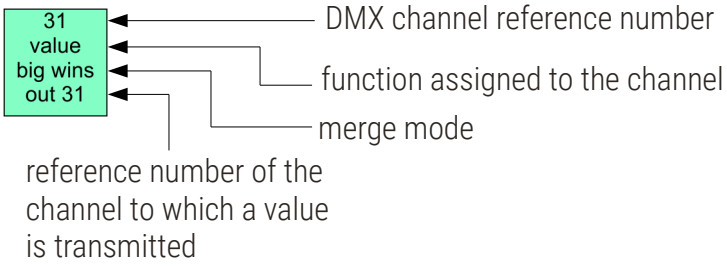
a ticked checkbox ☑ allows to receive data from DMX channels
an unticked checkbox ☐ – DMX input channels are inactive

Structure of a single DMX table tile:

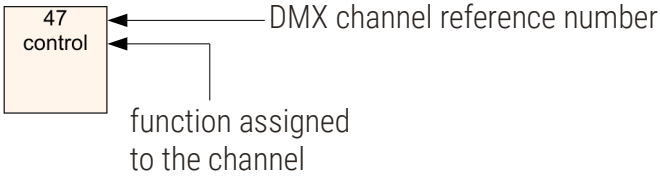
a) **On/OFF**



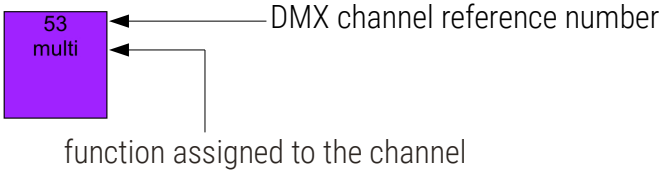
b) **Value**



c) **Control**



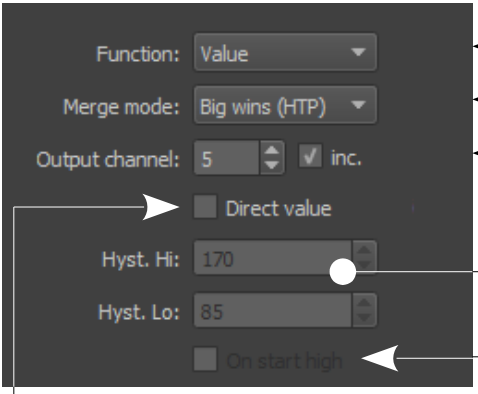
d) **Multirange**



It is possible to 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 / clear selection
  - **LMB** clicking with **Shift** key depressed – highlights a range
  - dragging the mouse with the **LMB** pressed – rectangular selection

On the right side of the table there is a window for changing 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 characteristics (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)

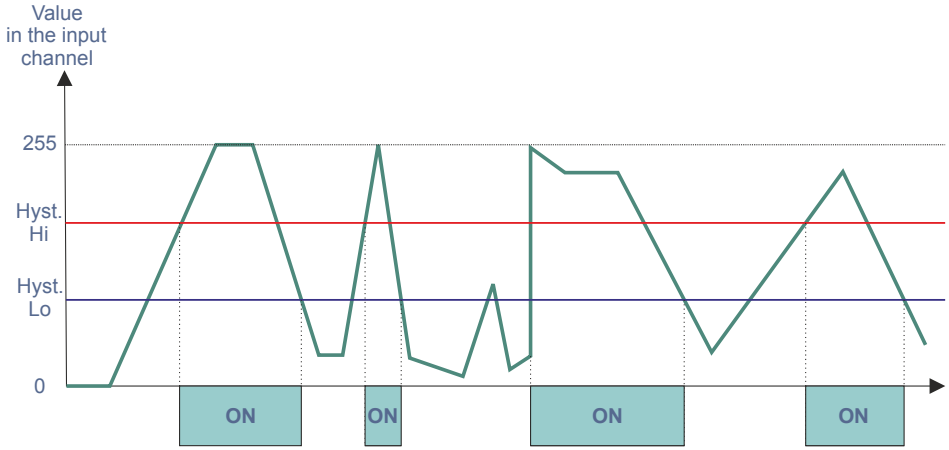
The [Function] parameter specifies the manner in which a given input channel is operated. Available options include:

- IGNORE – 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 multirange 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 [Hyst Hi] should be higher than the lower limit [Hyst Lo].

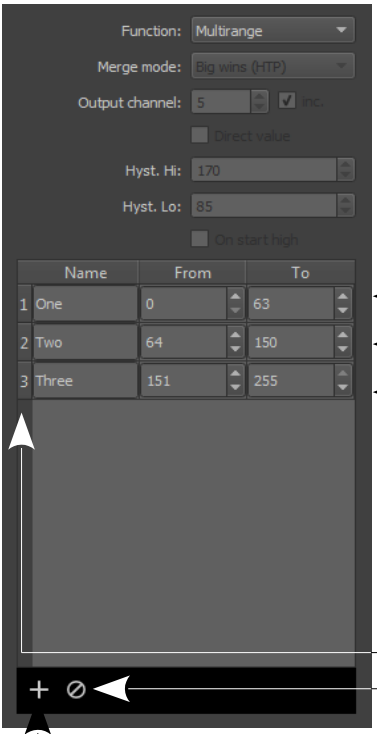
A graph showing how hysteresis operates:



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

- **NO MERGE** – an input values 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
- **AVERAGE** – the average value (arithmetic) is sent to the output, it is possible to set it in **[DMX input]**, **[Analog inputs]** or **[Modbus]**

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

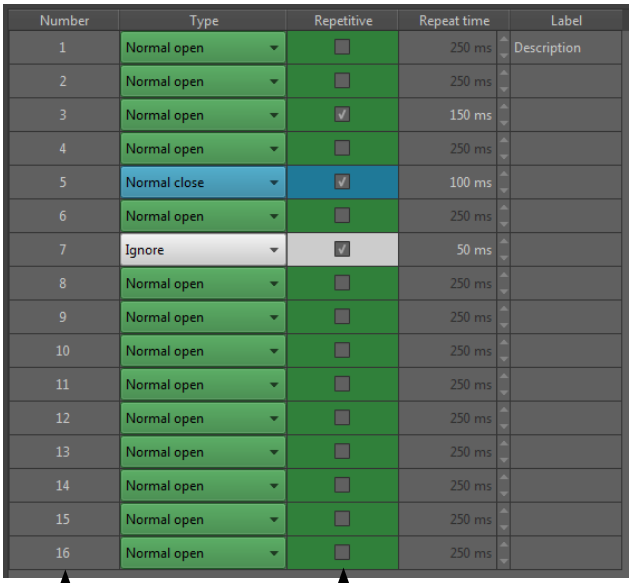
2.2.2 *Digital inputs*

The controller has 16 built-in digital inputs and the ability to add more through external modules.

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
- **Ignore** – the button does not generate any events

The color in the table depends on the button mode.

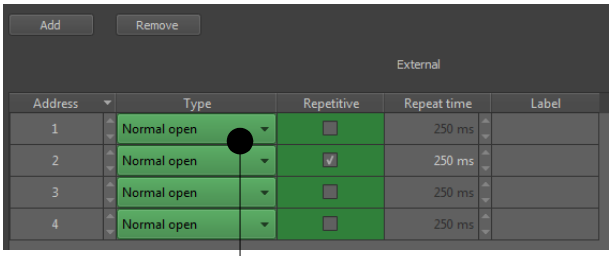


input number

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

EXTERNAL DIGITAL INPUTS

External digital inputs are used by external modules that send digital signals to the controller, e.g. keypads, motion detectors, etc.



Information on the function can be found in → section 2.2.2

Initially, the list of digital inputs is empty – inputs ca be added **[Add]** and delete **[Remove]**. The number of supported external digital inputs depends on the type of controller

Controller	Number of analog inputs	Number of digital inputs
PX345	0	0
PX340	64	256
PX710	256	1024

2.2.3 Analog inputs

BUILT-IN ANALOG INPUTS

The PX340 and PX710 master controllers have 4 built-in analog inputs and a possibility to add next ones through the connection of outer modules. Each input can be defined in another way.

Functions assigned to analog inputs are the same as in the case of DMX inputs, i.e.: [Ignore], [On/Off], [Value], [Control], [Multirange], they are described → in point 2.1.1.

In addition, the user can filter analog input values before they are transmitted to the controller; user 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 sampling 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 (more information → in point 2.1.1), it needs to be remembered that, for the analog input, the value entered correspond to voltage:

0 → 0V

255 → 10V

OUTER ANALOG INPUTS

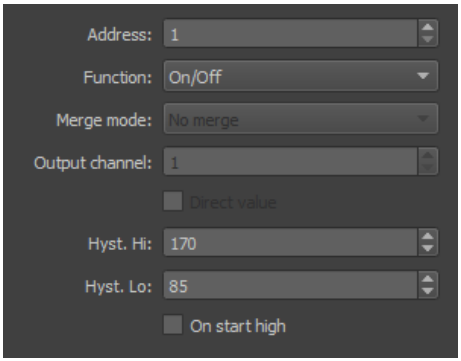
External analog inputs are used by external modules that send analog signals to the controller, e.g light intensity sensors. Initially, the list of inputs is empty – inputs can be added [Add] or deleted [Remove].

The bookmark is not visible while creating the configuration for PX345.

The settings are available for the input like for the DMX input, and apart from that it is possible to set the address [Address] for the inputs from outer modules.

The number of external analog inputs supported depends on the type of controller.

NOTE! It is not possible to add a configuration for one input twice.



Information on the function can be found in → section 2.1.1

2.2.4 External modules

External modules allow to extend the capabilities of PX340 and PX710 controllers. They allow adding digital and analog inputs to the controller (depending on the type of module).

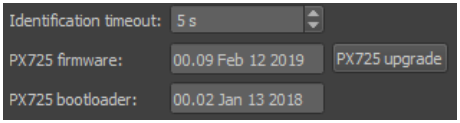
Configuration of externals modules is located in the [Settings] tab. Then go to [Inputs]→[External modules]. This tab is visible only after logging into the controller.

NOTE! External modules are seen by the controller as external inputs. To use an external module, you must first configure the appropriate external inputs for it. The configuration of external inputs is described in → 2.2.2 and → 2.2.3.

The external devices window consists of three parts:

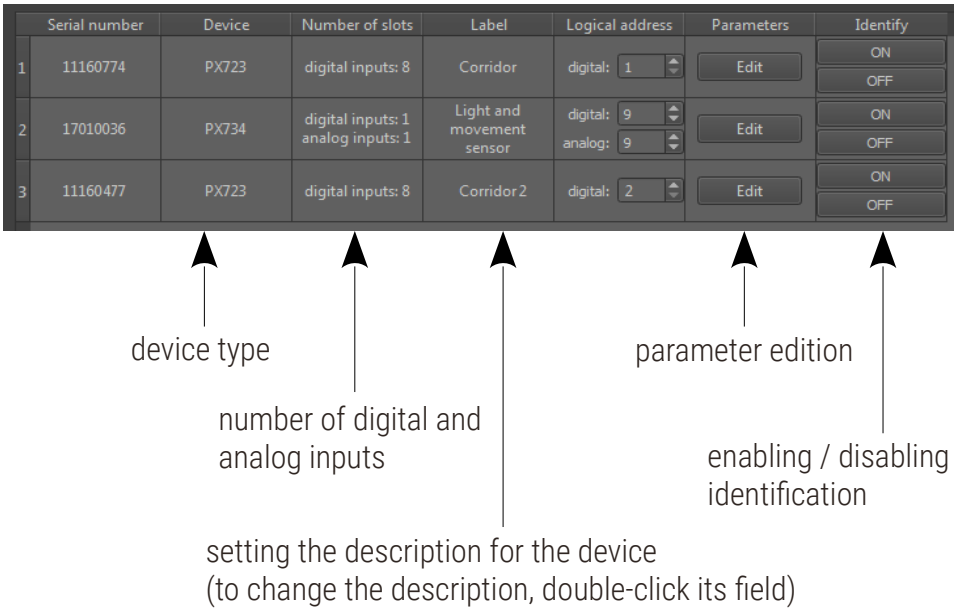
- Settings, data and update PX725
- Table with search devices
- Buttons for approving / canceling changes and searching devices

PX725 SETTINGS



[Identification timeout] – this is the time after which the device identifies normal mode, the time range is from 1 – 59s. Identification usually involves the diodes on the device flashing. This part also displays information about the PX725 (firmware version and bootloader version) and it is possible to update the firmware of the device.

TABLE OF DEVICES



[Logical address] – the address of the first input from the available pool of addresses (next entries in the given device will have subsequent addresses). Logical addresses are set separately for digital and analog inputs.

[Device] – information about type of the device

[Number of slots] – information on the number of device inputs

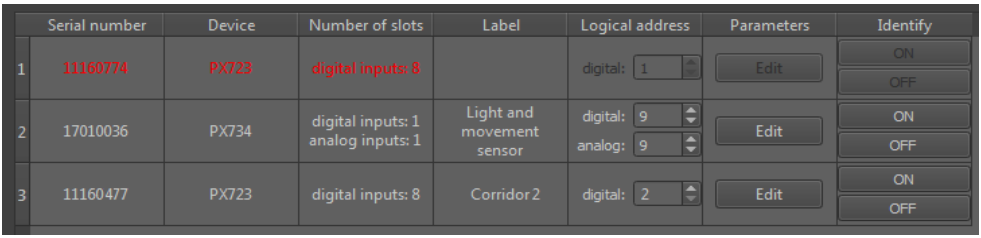
[Label] – device description, to edit the description, double-click LMB

[Parameters] – parameters specific for a given device, clicking on the button located in this cell opens the dialog box with device settings. The content of the window varies depending on the type of device.

[Identify] – causes visual changes in the behavior of the device, for example, the LEDs on the device are flashing. The identification time is set in the PX725 settings PX725.

NOTE! All changes made in the table should be confirmed by pressing the [Send changes] button under the table.

Modules that are in PX725 memory, but failed to connect to them are marked in red.



BUTTONS

In the lower right corner of the application window there are buttons to approve changes and search devices:

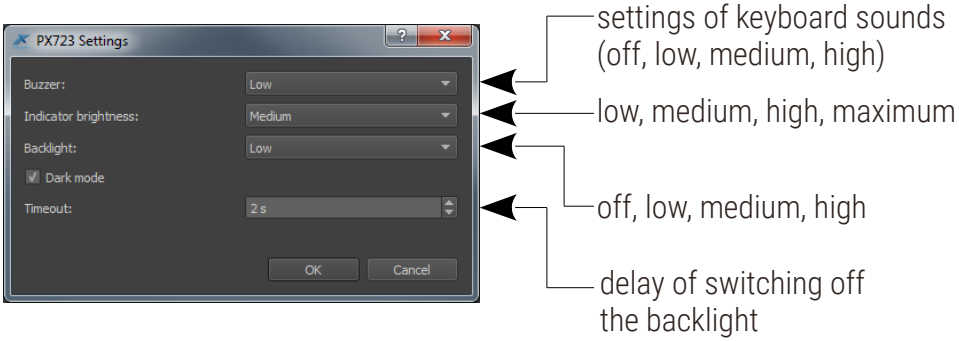
- [Search devices] – searches for devices that are connected to PX725. The time to search for devices depends on their quantity.
- [Reload table] – loads devices stored in PX725 memory. The connection to the devices is also checked. Devices that can not be connected are markered in red in the device table.
- [Undo changes] – resets the changes made in the table, which are still they were not sent to devices

- [Send changes] – causes sending new parameters from the table to all devices

ADDING AND SETTING EXTERNAL ZONES

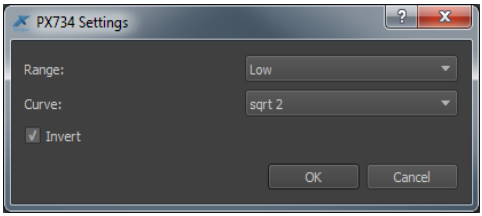
External modules are seen by the controller as external inputs. External inputs can be added by going to the [Settings] tab, and then [Inputs]→[Digital inputs] or [Inputs]→[Analog inputs] depending on the type. Editing external inputs does not differ from the editing of built-in inputs, except for the possibility of changing the address for external inputs. In addition, external analog inputs do not have filter settings. There are separate events for external inputs.

MODULE PX723 8-KEYBOARD KEYPAD



[Dark mode] – if the dark mode is on ☑ then the backlight diodes go out after the set time after the last key press, if is off ☐ the keys are illuminated all the time if the [Off] parameter has not been set in the backlight settings.

MODULE PX734 MOTION AND LIGHTING SENSOR



Sensor ranges:

- Low 0 – 800 lux
- Medium 0 – 8000 lux
- High 0 – 80000 lux

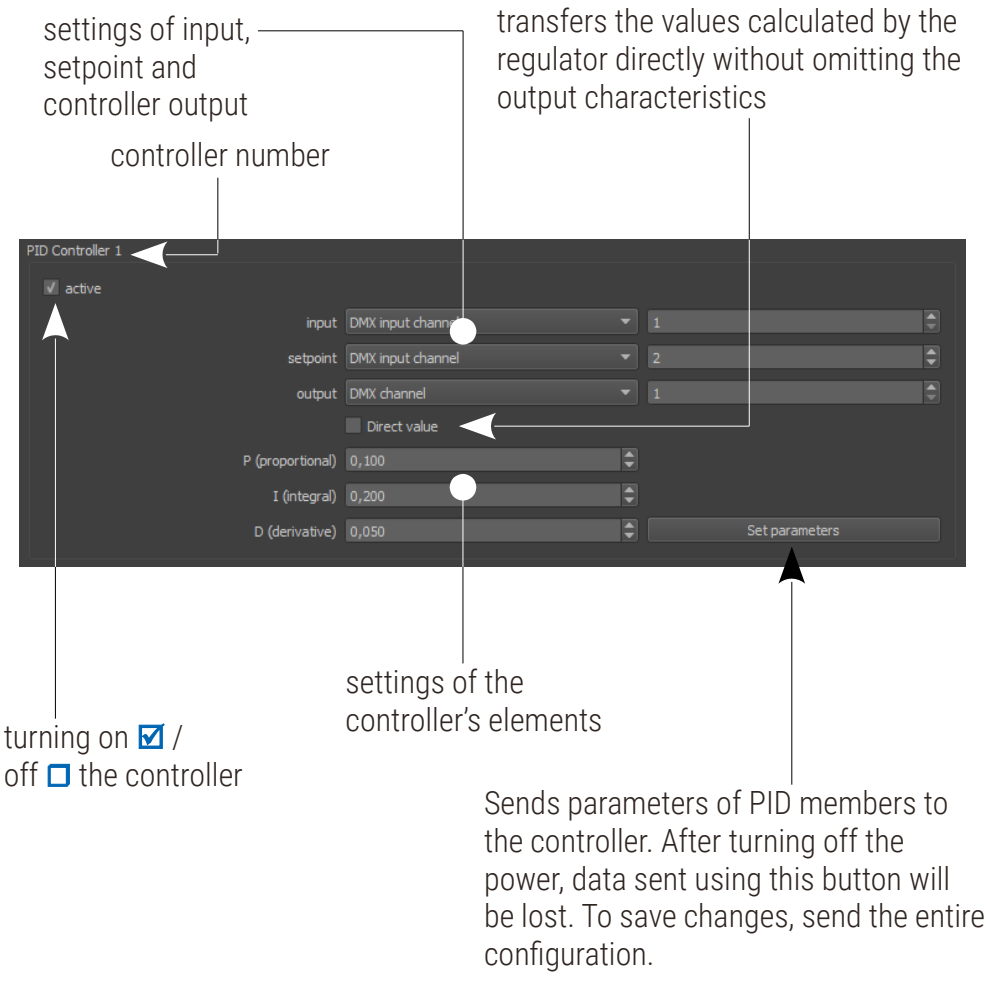
[Curve] – characteristics of the light intensity sensor:

- linear – linear characteristics
- sqrt 1 – square root function
- sqrt 2 – function cubic root
- sqrt 3 – function of the fourth degree element

[Invert] – invert the values sent by the light intensity sensor, switched on ☑ or off ☐

2.2.5 PID controllers (applies only to PX340 and PX710)

The PX340 and PX710 controllers support 16 PID controllers.



REGULATOR PARAMETERS

[Active] – enables / disables the regulator

[Input] – the input source of the regulator:

- DMX input channel
- Built-in analog input
- External analog input
- Modbus

[Setpoint] – setpoint of the controller:

- DMX input channel
- DMX output channel
- Built-in analog input
- External analog input
- Modbus
- Constant (value in the range from 0 to 255)

[Output] – controller output signal:

- DMX channel (previously you should enable the transmission using the PID ON action)
- Control – output signal sent to the regulator event. The event (description is in → 5.7 Events) can be used, for example, to set the master or the playback speed.

[Direct value] – transmits the controller's output signal, omitting the output characteristics

[P (proportional)] – proportional member value

[I (integral)] – value of the integrator

[D (derivative)] – the value of the differential

[Set parameters] – sends parameters of PID members to the controller. This data will not be saved after turning off the controller's power supply. This function is used to select the optimal controller settings.

NOTE! In order for the data to be saves, send the entire configuration to the controller.

2.2.6 Modbus input

"Write holding register" Modbus command – is treated as if it were multi-value. The configuration of the Modbus input is identical to that of the DMX input (description → in point 2.2.1).

NOTE! Setting the DMX input as [Value] alone will not causes values to be transmitted to the output. In the configuration, you need to enable Modbus 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 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:

a drop-down controller selection list for which output channels are displayed in the table (an option available for PX710)

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

output parameters selected in the table

DMX channel table

The cell colour represents channel modes:

green – linear

blue – nonlinear

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

Above the DMX channel table there is a toolbar containing:

[Output channels number] – a parameter that allows 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

R sets 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.

It is possible to 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

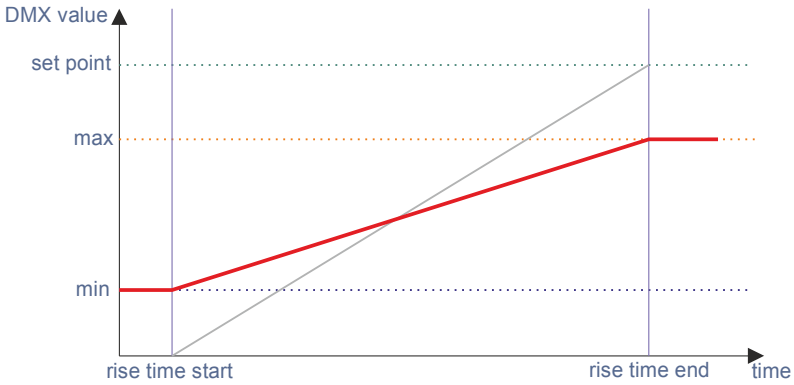
A channel can be:

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

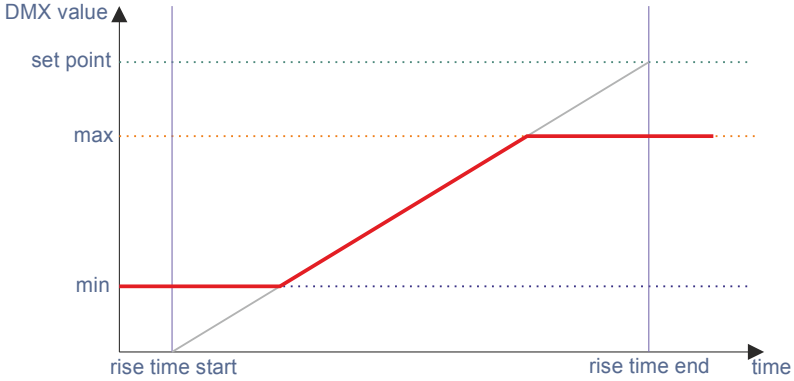
A difference between linear and nonlinear characteristics only arises when minimum or maximum value limits have been imposed on the channel.

The difference between both characteristics is shown below:

a) **linear**



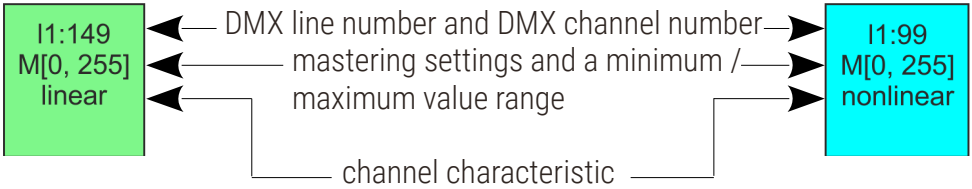
b) **nonlinear**



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 gray, as red – after a value has passed through the channel characteristic.

Structure of a single DMX channel:

a) **linear** b) **non-linear**



The following mastering settings for DMX output channels are available:

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

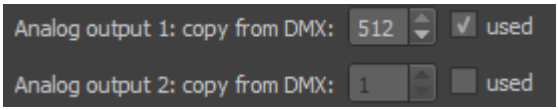
2.3.2 Analog outputs

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 smartphone.

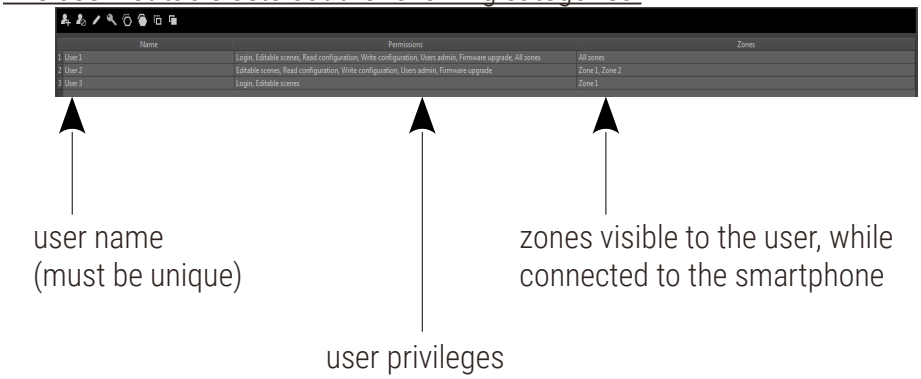
The controller has a built-in permanent ADMIN account that cannot be removed. It has full privileges and is used to manage the controller.

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]** – description → in point 7.6 Admin tools.

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.

The user list table sets out the following categories:



The toolbar located above 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 user name – allows to enter a new username

 Change password – in order to change the selected user's password, you need enter the new password twice

 Copy zones – copies access to the selected user's zones

 Paste zones – pastes the zones copied to the selected location

 Copy permissions – copies the user privileges selected

 Paste permissions – pastes the user privileges 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 can only switch on and off available elements.
- [Editable scenes] – in addition, the user can edit selected scenes from smartphone level
- [Read configuration] – the user can download configuration from the controller
- [Write configuration] – the user can save configuration to the controller (without users' configuration)
- [Users admin] – the user can manage users' configuration
- [Firmware upgrade] – the user can upload firmware update

- [All zones] – the user has access to all zones at all time
- [ALL] – selects all the permissions listed above

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 application, possible modifications are listed below:

- Skin – a choice of classic default dark and white
- Tabs – resizing the main tabs (i.e. [Settings], [Project], [Address], etc.), 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 cross-hair

[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: millimeter [mm], centimeter [cm], meter [m], cal [in], foot [ft], yard [yd]
- Secondary unit – as above
- Device library unit – as above
- Coordinates origin – bottom left or top left
- Minimum items size – regulates minimum size of the device in the project

[Time] – setting the point in time to be used as the sunrise and the option selection "Include offset in sun table", for the change be made, the sunrise and sunset tables should be recomputed for given location

[Name searching] – search settings configuration items:

- Pattern syntax – RegExp, RegExp2, Wildcard, WildcardUnix, FixedString, W3CXmlSchema11
- Case sensitive – whether the search in 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 ☑
- Drivers types – determines which types of controllers to choose from when starting the application

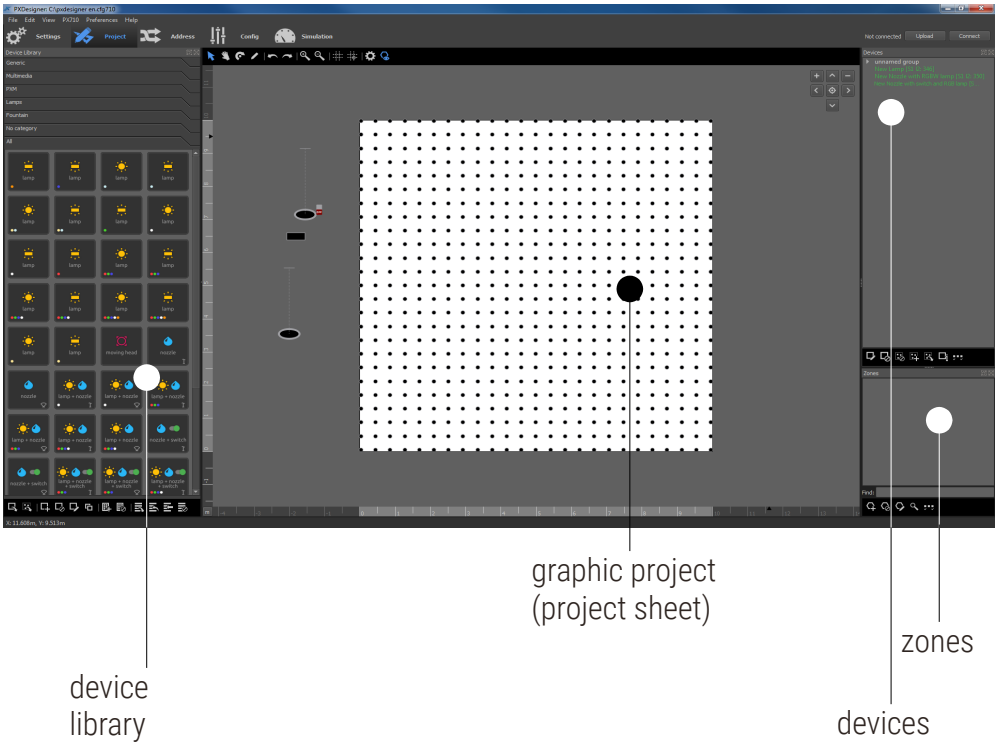
3 Designing

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 creating a graphic project, the following windows area 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 id 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 buttons 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.

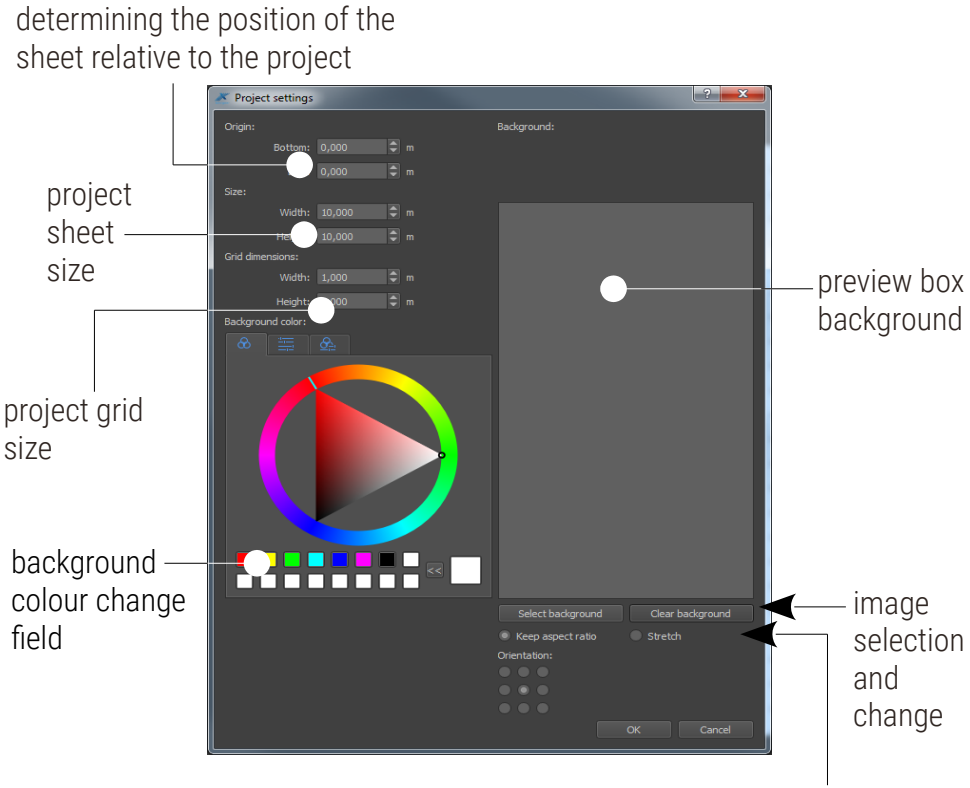
– the button is enabled (blue color)

– the button is disabled (gray color)

3.1.1 Project settings

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

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



If the image width / height ratio is different 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

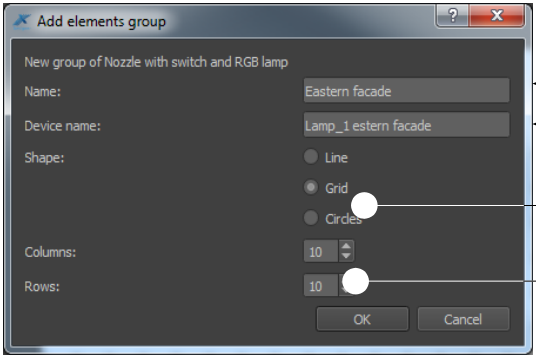
It is also possible to navigate using a mouse, the keys and buttons on the toolbar (description above).

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 "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

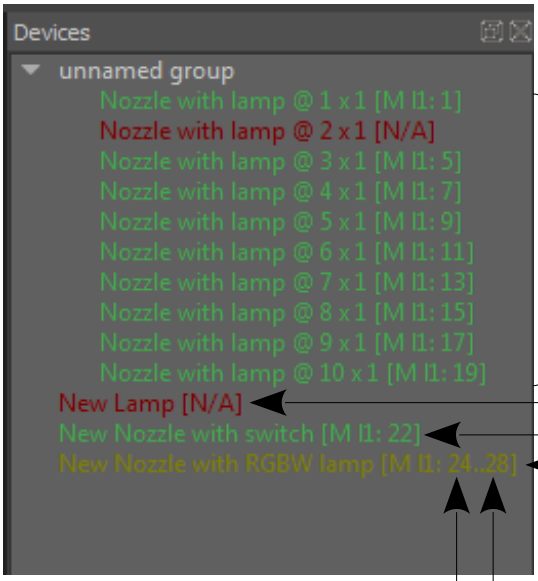
The window displays a list of all groups and devices added to the project. Groups in the list are drop-down ones. A device may only be assigned to one group. Each device in the list has a label. If you hover your mouse over a device, further information is displayed. If the pane is displayed in the addressing mode, the controller is additionally displayed in parentheses (M – master, S1 – slave 1… – applies only to PX710) 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: "Cannot 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 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 device option
-  **Device info –** preview of information that identifies a device
-  **Select** – an option to mark, unmark or reverse selection of selected elements within a specified range



group

a device that is incorrectly addressed or unaddressed – red colour

an addressed device, the device takes up subsequent channels, starting from the one entered within square brackets […] – green colour

the lowest address taken up

the highest address taken up

a device whose channels are split (refer to the "Addressing" section) and correctly addressed – yellow colour

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:

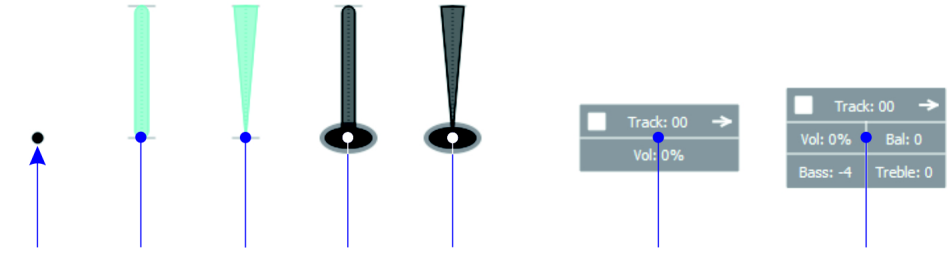
- New – adding a new zone
- Delete – removing a selected, highlighted zone
- Edit – if the button has been pressed, it is possible to edit the zone selected (adding / removing zone polygon points, changing the name and color, description, master)
- Check dependency – verifies where a given zone is being used (e.g: in scenes, events, etc.)
- Select – an option to mark, unmark or reverse selection of selected elements within a specified range

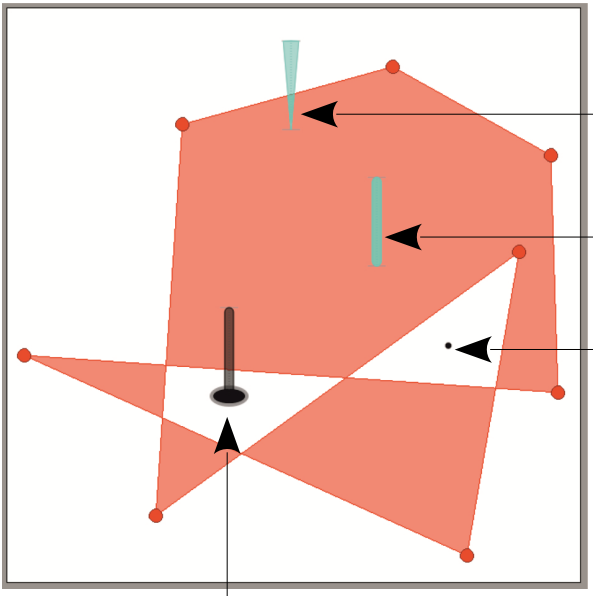
3.3.1 Devices in zones

A device is part of a zone if the former's center point is located within the zone.

NOTE! The center point of a device need not be the geometric center of the figure (of the visualization).

The location of the center point of selected devices:



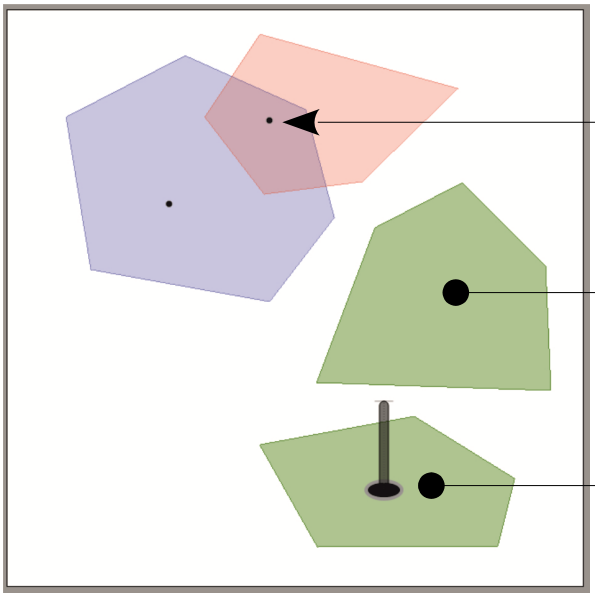


the device is part of the zone (CASE 1)

the device is part of the zone (CASE 1)

the device is **not** part of the zone (CASE 2)

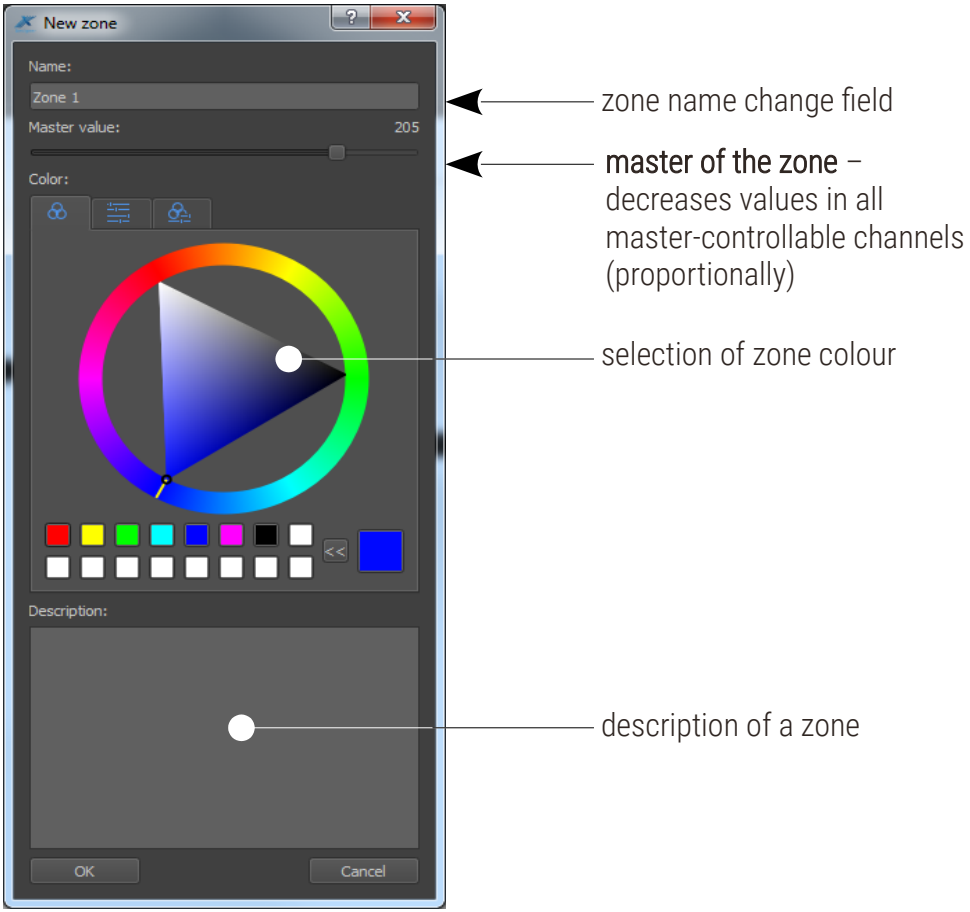
the device is **not** part of the zone (CASE 2)


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:



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
2 x RMB / 2 x LMB (vertex of the zone polygon)	Removes the vertex that in under the mouse cursor. Is, as a result of this operation, the polygon has fewer than 3 vertexes – the polygon will be removed.
2 x LMB (edge of the zone polygon)	Adds a point to the edge (click on the area close to the edge, inside the polygon)
Shift + 2 x LMB	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 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, color and description.

Pressing the button  allows for editing the zone selected (adding / removing / moving zone polygon points, changing the name and color, 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 device in the project.
- **Edit device –** this function 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 file –** allows for saving the library as a file with the **.dll* extension, to a specified location on the disk. It is necessary to provide the name of the library.

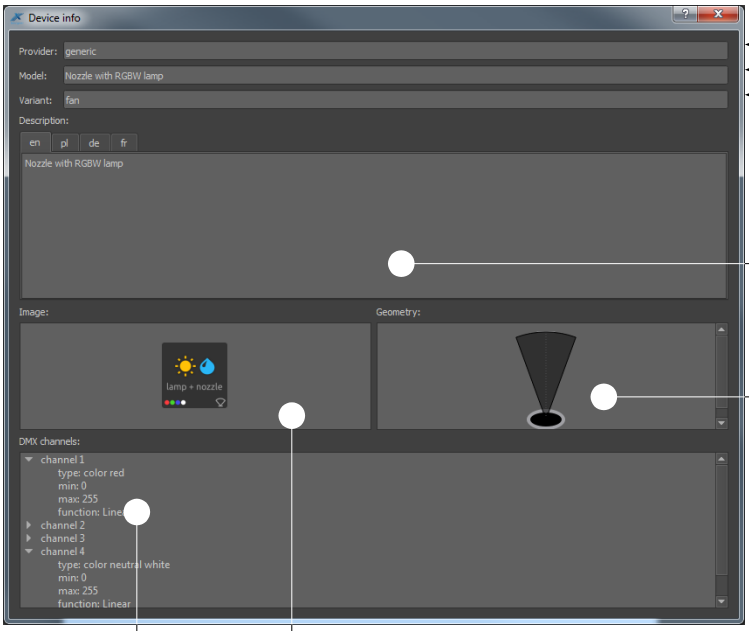
Merge library – allows for importing devices from a file.
If in the library that you want to add there is a similar device (but not identical), the application will display an appropriate message.
The user has the following choices: **Copy** (a device will be placed in the library), **Replace** (a device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

shape, visualization 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.

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

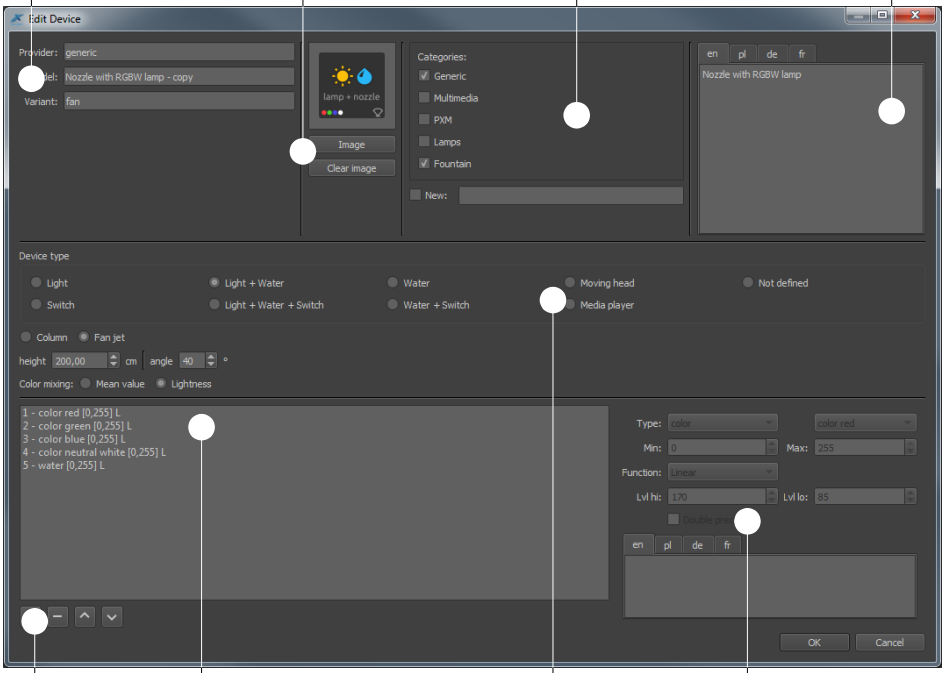
DEVICE	ALLOWABLE CHANNELS
Light	color, brightness, dimer, white balance
Water	water
Switch	switch
Light + Water	color, brightness, dimer, white balance, water
Light + Water + Switch	color, brightness, dimer, white balance, water, switch
Water + Switch	water, switch
Media player	control, track, volume, mode, balance, treble, bass
Moving head	color, brightness, dimer, white balance, position, gobo

information identifying the device

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

description

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



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

type and number of channels

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

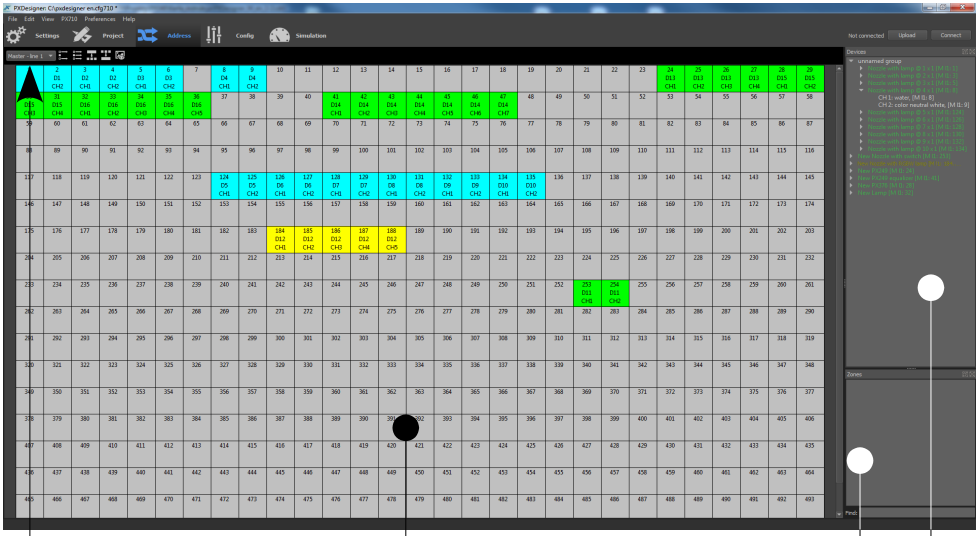
specifies the way in which the device will be displayed in the graphic project and which controls will available to control this device

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.



addressing window

a zone list

a drop-down controller selection list for which output channels are displayed in the table (an option available for PX710)

a device list

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 last 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 **[Address not addressed]** button on **[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 elements are 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.

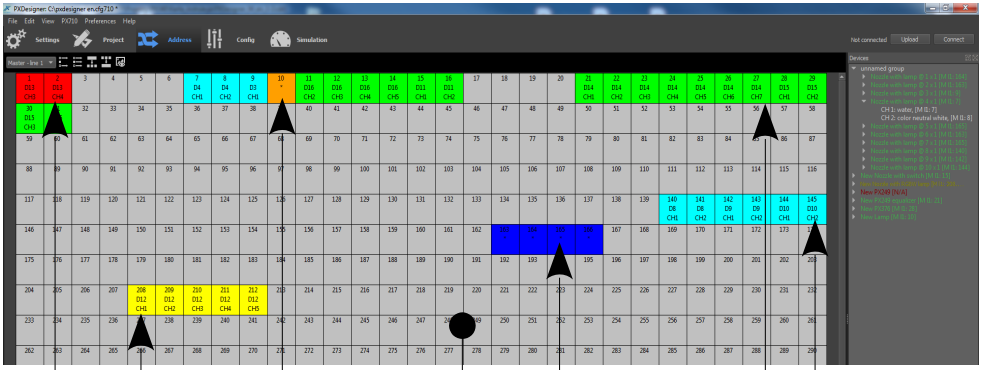
A device group can be moved as a whole – the order of the devices being addressed does not change.

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

channels of a split device - yellow colour

empty channel - gray colour

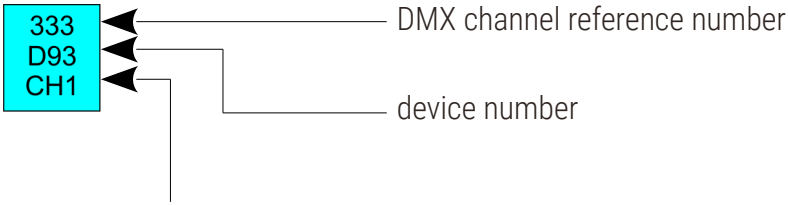
a single device in a channel, grouped - light blue colour

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

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
- Shows
- Sequences
- Events
- Scenes / programs groups
- Statuses
- Smartphone
- Delays

Underneath each element category there is a toolbar containing:

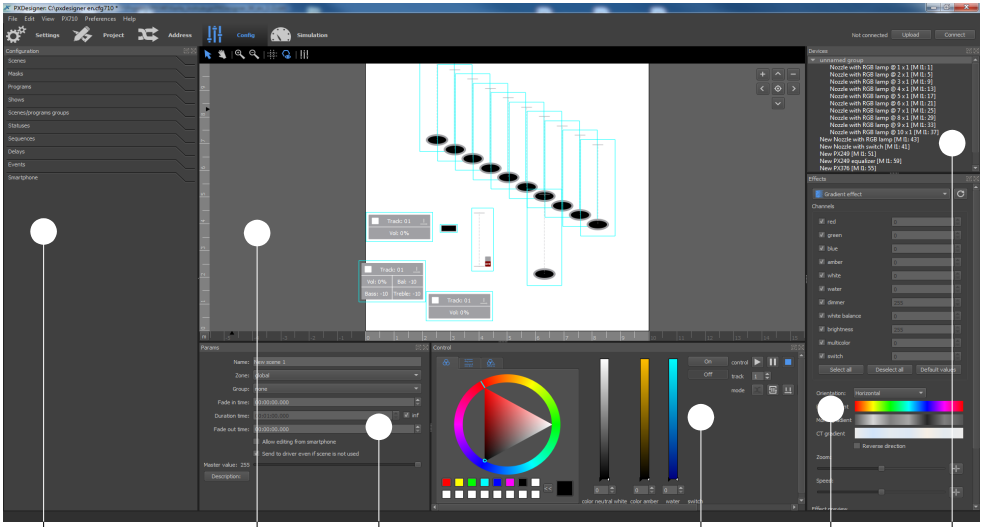
- **New** – a new element creation option, if you select it, the application will open an element editing window
- **Delete** – removing the element selected. It is possible to remove several elements at a time. If an element to be removed is open, the application will display an appropriate message.
- **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.
- **Select** – an option for selecting, deselecting or inverting the selection of selected elements within a specific range
- **Import** – allows to load previously saved configuration items

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 251000 scenes.

Application window structure during scene creation:



a graphic project or sliders (depending on the option selected)

an effect library

scene settings

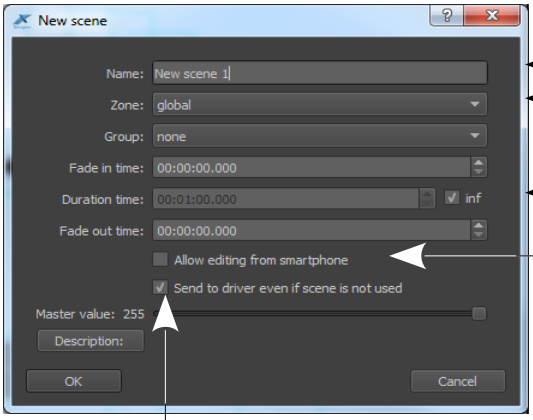
configuration

a list of devices used in the project

controlling devices selected

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.

A scene not used in the configuration is not sent to the controller. If, despite this, the user wants to use it, e.g. by Modbus command then check the checkbox ☑.

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 0.001s.

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

Default scene times are as follows:

- fade in time: 00h 00m 00s 000ms
- duration time: 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 groups.

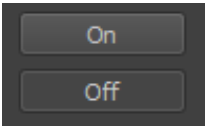
You can vary the **[Master value]** parameter over a range of 0 – 255, a change to this parameter only affects master-controllable channels (the brightness value is proportionately decreased).

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.

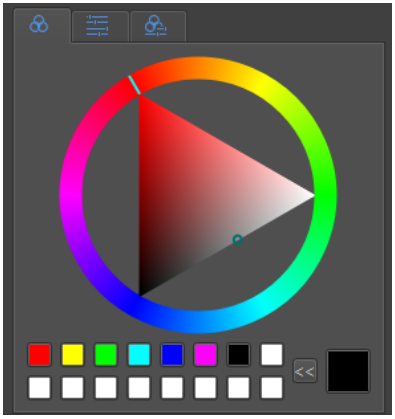
Device control controls:

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

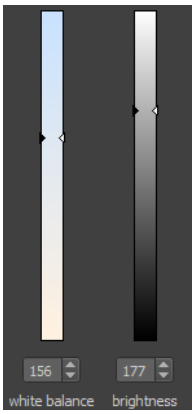
b) **a device with an "ON/OFF" switchable channel**



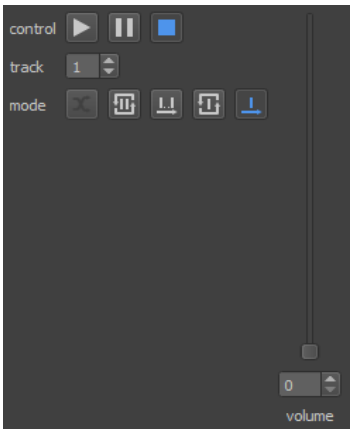
c) **an "RGB" lamp** – a color wheel



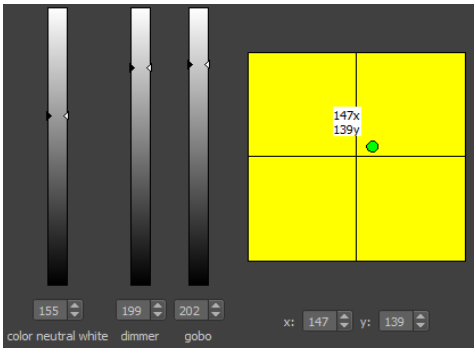
d) **a "dynamic white" lamp** – two sliders, one for temperature color control, the other for brightness control



e) **media player** – control of the piece being played, playing mode and volume

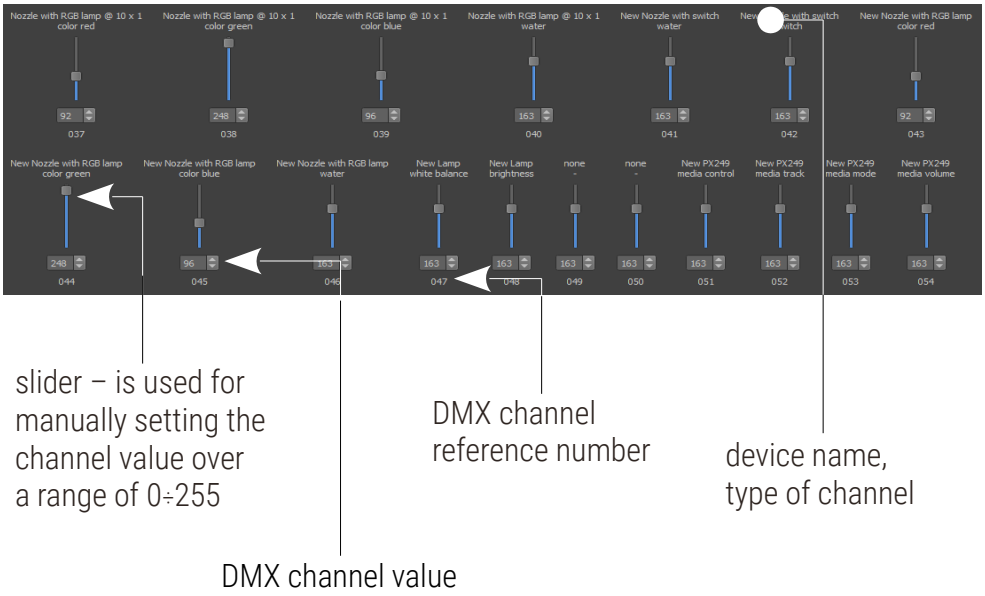


f) **moving head** – control of position, gobo pattern selection, color selection



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



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

- **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
- [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
- [Select] – a channel selection drop-down list, shown in the table (this option is available only if the "grouping by device" feature is deactivated)

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 (information on the effects can be found in → 5.11 Effects).

5.2 Masks

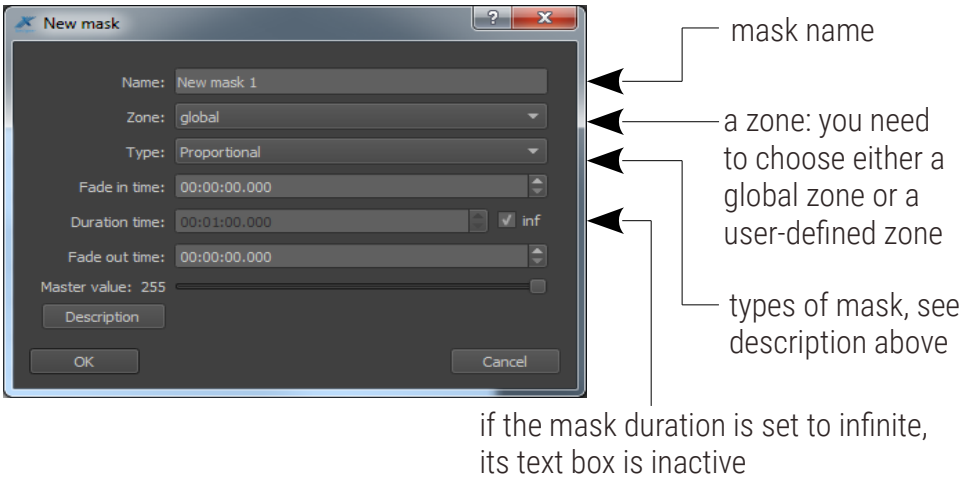
In the **[Masks]** tab, you can define 256 masks of three different types. Just like a scene, a mask is a static arrangement of the values of all channels.
A mask takes precedence over scenes and programs – it can modify DMX output channels values.

There are 3 mask types available:

- **Proportional** – changes the value in the output channel in proportion to the preset 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.
- **Minimal** – 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.

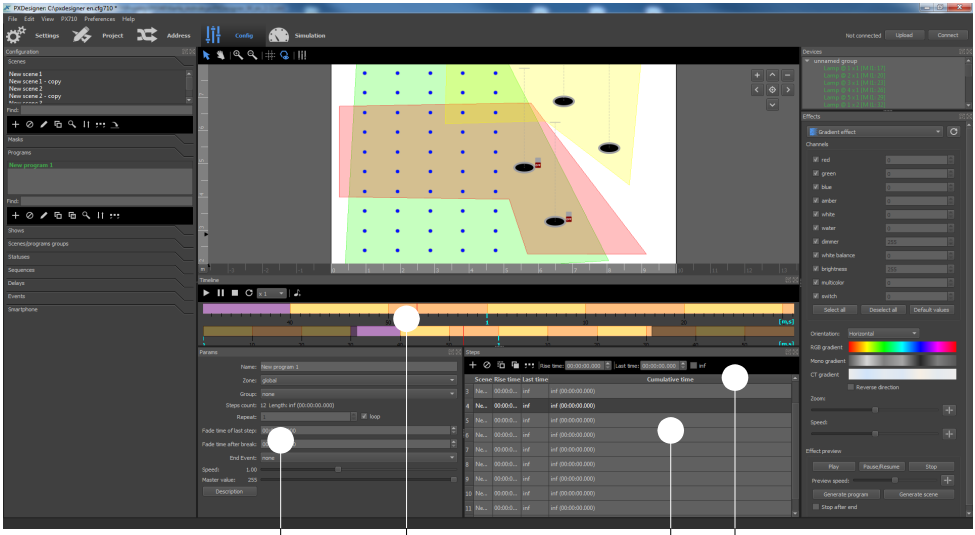


5.3 Programs

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 the step is independent of the duration of the scene assigned as a program step.

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



Dockable windows **[Timeline]**, **[Params]** 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 is 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.

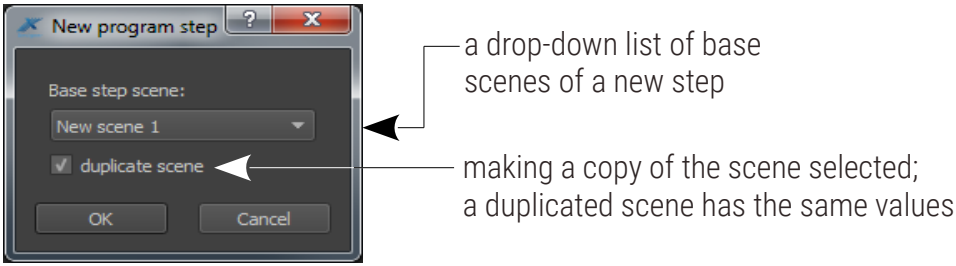
- Adding a step using a command from the toolbar

  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:



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

Select – an option for selecting, deselecting or inverting selection of selected steps within a specific range

Check correctness – error notification button (if an error has / error 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 shorten then 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. The preview of a looped program loops automatically.

Preview speed – contains sound playback speeds and program preview speeds can be adjusted over the range of 0,25x÷2x

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

Close WAVE file – close the sound files previously loaded to the time track

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

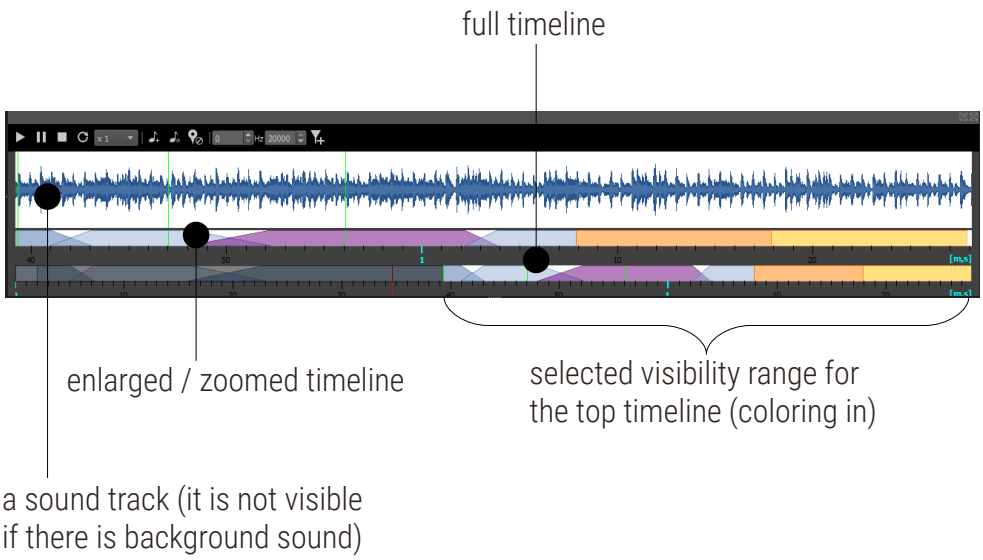
Band-pass filter – if the button is pressed, above the timeline the filtered spectral components of the signal – sound are displayed (within a specific frequency range). If the button is not pressed, the application displays the sound track together with all of its frequency components.

NOTE! Files with sound must be in the same directory as the project file.

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 modify program steps in the top timeline.

The bottom timeline is used to zoom in on / narrowing down items visible on the top timeline.

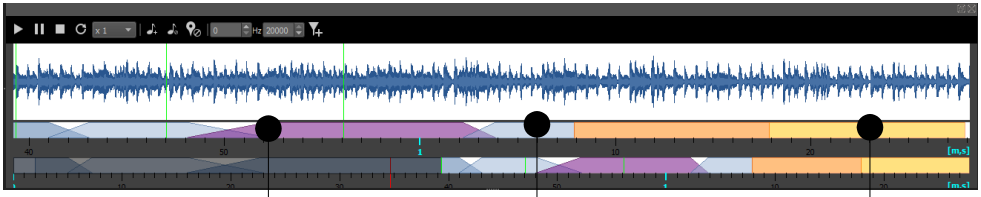
The bottom timeline always displays the full time span of the program. What is visible on the top path is colored on the bottom one and what is outside the span is grayed out on the bottom one.

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	Invert step selection, other steps remain selected
Shift + LMB	Selection of scope of steps
Esc	Deselection of marked steps



a violet trapeze – a selected step

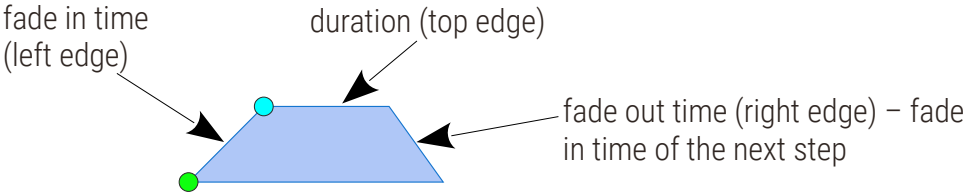
a blue trapeze – a program step

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 duration.

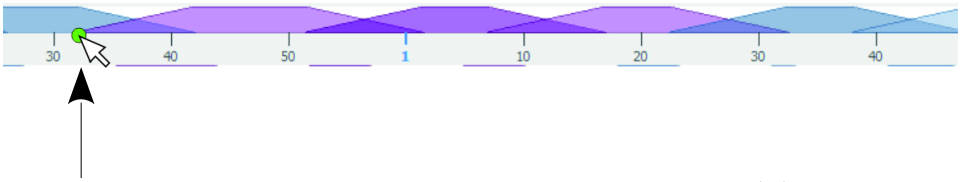
A preview of the step selected displays automatically in the graphic project window. A right-click (**RMB**) displays a context window containing such commands as: edit, remove, fade in time, duration, step scene (the application opens a list of scenes that you can load).

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 preceding and the following step after the selected one



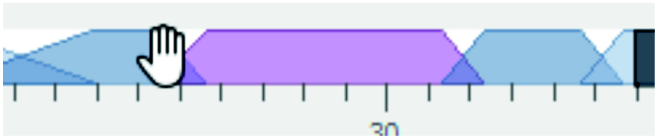
Ctrl + the green circle in the left bottom corner of the trapeze (●) – moving selected steps in such a way that the others should not change their position

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:

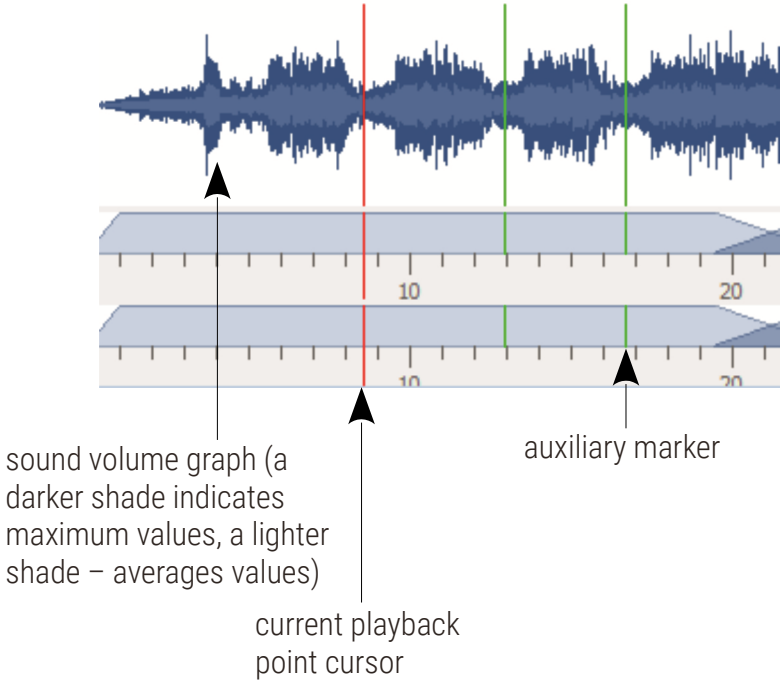
- **hand icon** – when the mouse is located within the highlighted area – moving the view to the left / right



- **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
2 x LMB	Returns to the full timeline view

SOUNDTRACK



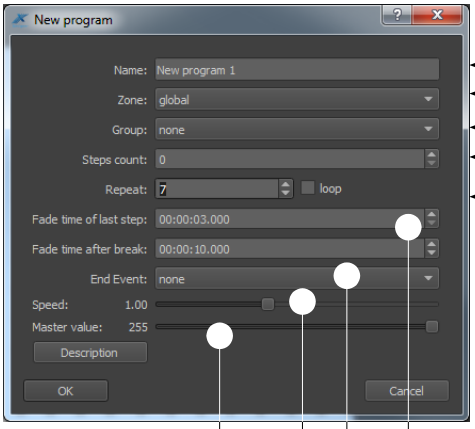
You can add a sound track by clicking the key on the toolbar above the timeline and selecting a **.wav* from the disk.

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 the **[Steps]** window

you have two options: looping playback ("loop: checkbox ☑) or setting the number of times to repeat (max. 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 adjustment over a range of x0 (stopping the program) ÷ x2,55

GENERATING A PROGRAM OUT OF EFFECTS

You can create a program quickly using default effects. Select the effect from the **[Effects]** tab, set the appropriate parameters for it, and then press **[Generate program]** to save the created program or **[Generate scene]** to save the created scene.

A detailed description of effects can be found → in point 5.11 Effects.

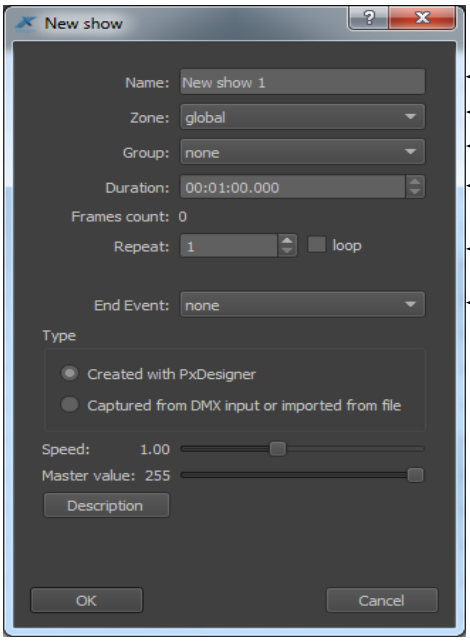
5.4 Shows

Show – recording of the time path with elements placed on it (stages, programs or DMX Streams). You can edit it at any time.

STREAM DMX – created from the show using the function **[Generate stream]**, recording frame by frame of DMX values, which the controller transfers directly to the output without enumeration. Stream can be captured from the DMX input and save to the controller or generate from the show.

In the list of configuration items, stream is displayed as follows: **[#]** name – **Stream**

After selecting [New], the application displays the window:



name of the show

a zone to choose from: global or user-defined

assigns a created show to a group of scenes and programs, you can add a show to any group [none]

duration of the show [Frames count] – calculated number of frames of the show, 1 frame lasts 20ms

the user has the option to play in the loop (checkbox "loop" ☑) or specify the number of repetitions (max. 254)

to select end events it is necessary to define it earlier in the tab [Events]

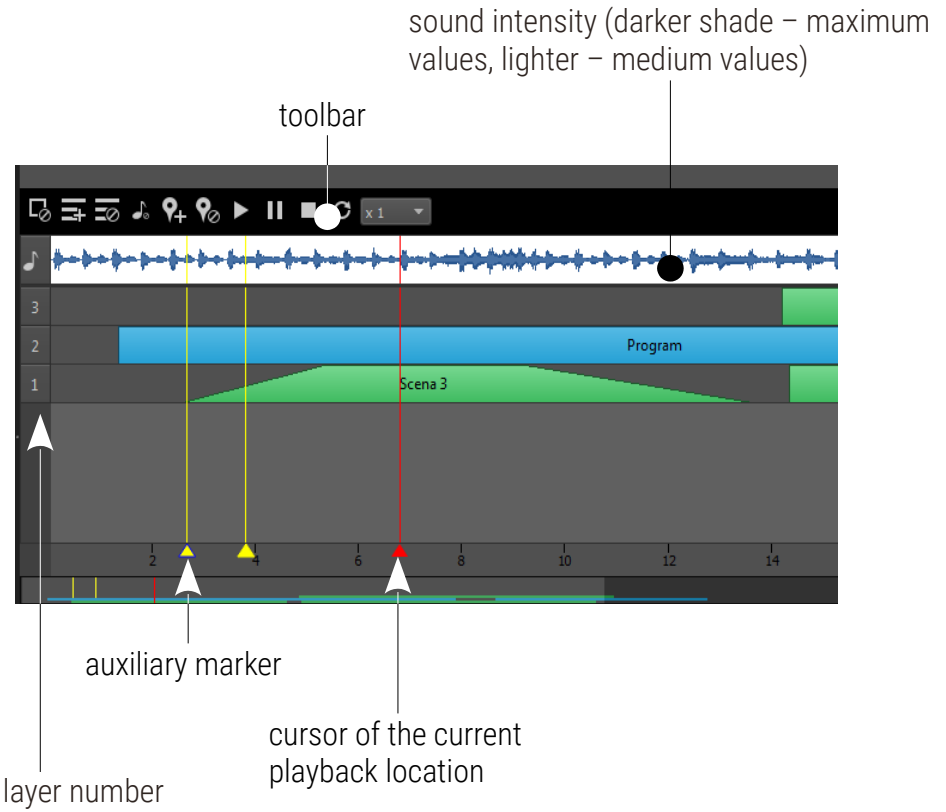
[Created with PxDesigner] – creating a show from the scenes, programs and streams stored in the application

[Captured from DMX input or imported from file] – creating a show from captured values from the DMX input or imported from **.csv* file

[Speed] – acceleration of the speed of the show, accelerates or slows the playback of the show, possible adjustment in the range of x0 (program stop) ÷ x2,55

[Master value] – allows global control of the brightness of the created show

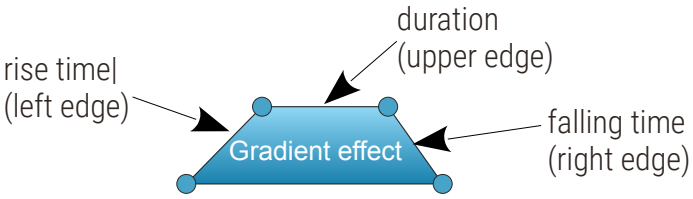
CONSTRUCTION OF THE WINDOW OF A TIME PATH



The marker can be:

- **add** (button on the toolbar or click on the space – it also works during playback) – in the place where the cursor is currently located
- **move** on the timeline
- **remove** (button on the toolbar) – last moved, clicked or added marker

Construction of the trapezoid duration of the show element:



Moving times:

● – editable points

Each point can be edited individually.

- I the "Alt" key is pressed while editing the start point or end of the rise time, the rise time remains unchanged.
- If the "Alt" key is pressed during editing of the end point or beginning of the descent time, the time of descent remains unchanged.

When the "Ctrl" key is pressed before starting the drag, the item is copied.

Above the window with the time path is a toolbar that contains:

 **Remove element** – removes the active element. It is also possible to delete an item with the "**Delete**" key.

 **Add layer** – the next layer is added to the time path. The maximum number of layers is 10.

 **Remove layers** – removes the active layer along with the elements on it.

 **Add sound** – add a soundtrack to the show (only one sound track can be used). You can add a separate wave file for each show. The location of the sound is recorded in the project. If the application can not find the file when the project is reopened, it displays the appropriate message.

 **Remove sound** – removes the soundtrack

 **Add marker** – adds a marker at the cursor location

 **Remove selected markers** – removes the active marker

 **Play** – plays the sound and preview of the show (with the speed set in **[Preview speed]**)

 **Pause** – stops playing but does not return to the beginning of the show

 **Stop** – stop playback and returns to the beginning of the show

 **Loop preview** – loops the preview of the show, even when the show is not looped. The preview of the looped show loops automatically.

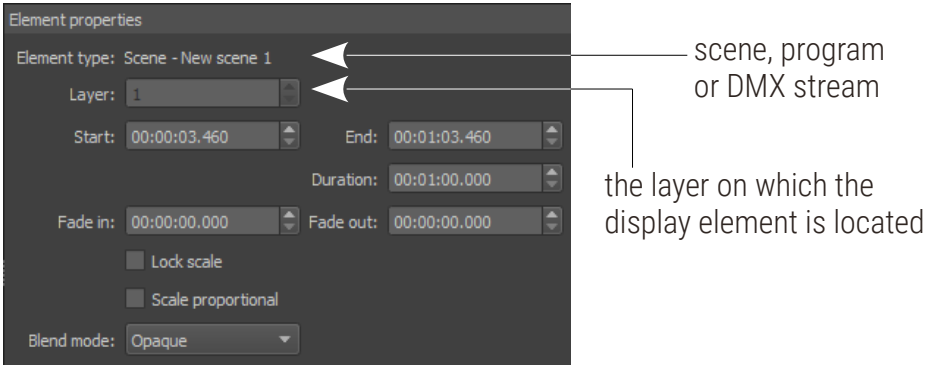
Preview speed – sound playback speed, possible adjustment in the range of x0,25 ÷ x8

ADDING THE ELEMENT

The new element can be dragged from the configuration window. Then it is added with the default time parameters. The “beginning of element” is glued to the mouse cursor when dragging it ti the timeline. The application blocks the option of adding an element that would overlap the other element on the same layer.

EDITION AND PROPERTIES OF ELEMENTS

Elements can be moved both along the time axis and between layers. They can be moved using drag&drop (grabbing inside the tile) or by changing the properties of the element. It is also possible to scale (change the length of time) on the axis – by grasping the edge of the tile.



[Start] – sets the beginning of the element (the element is moved, rise times, duration and falls do not change).
[End] – sets the end of the element (changes the duration, the rise and fall times as well as the beginning of the element remain unchanged).
[Duration] – it is calculated from the initial and final times or entered (then affects the end time).

The [Fade in] and [Fade out] times are within [Duration] and signifies infiltration of the start and end of the element tile. The method of penetration depends on [Blend mode]. The rise and fall times determine the percentage (0 – 100%) of a given element in the process of calculating the final value at a given moment.

For example, if the cursor is within 1/10 of the rise time of a given element, then 10% of the channel values for this element and 90% of the channel values from the layers below are taken.

[Lock scale] – blocks the editing of points, the element can only be moved
[Scale proportional] – in the case when proportional scaling is deselected ☐, only the duration is changed, and the rise and fall times and the beginning of the element remain unchanged. When the proportional scaling is marked ☑ changes the duration, the rise and fall times, only the origin of the element remains unchanged.

[Loop] – applies only to programs and streams. If it is checked ☑ then program / stream steps are not scaled but looped. If unchecked ☐ then program / stream is played only once, but proportionally scaled.

The modes of merging elements:

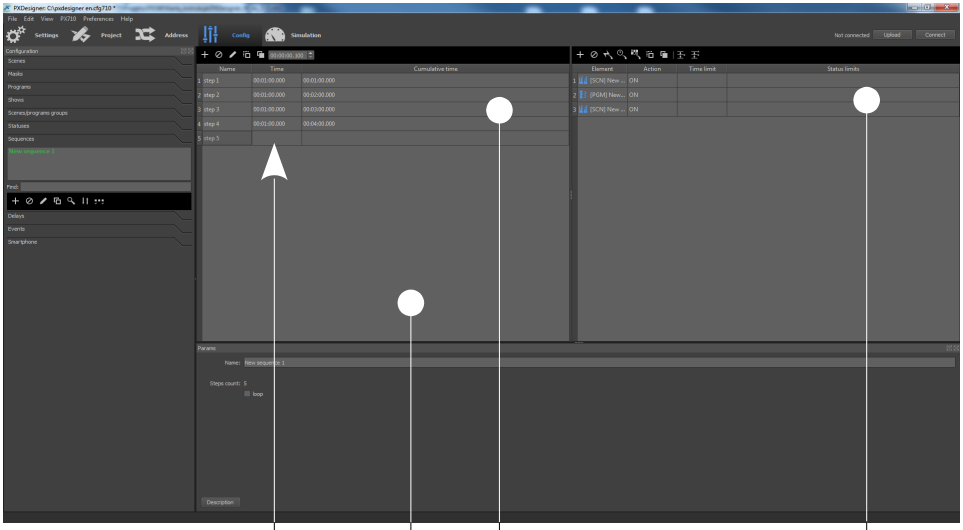
- Opaque – element completely covers all elements, which are on the lower layers. Works for all channels.
- Big wins (HTP) – the channel values of this element are compared with the values below and the larger one is selected.
- Alpha (enabled device) – this mixing mode works at the device level, not the channel. Only non-zero values cover elements from lower layers. For example, if the lamp has a red color, the values of all its channels are taken from this element, not only for the red channel.
- Light – only values for light channels are taken from a given element. For the remaining channels, the value from elements on the lower layers is taken.
- Water – only values for water channels are taken from a given element. For the remaining channels, the value from elements on the lower layers is taken.
- Color – only the color values (or color temperature) for devices related to light are taken from a given element. The brightness and values for other devices are taken from the elements on the lower layers.
- Brightness – only the brightness values for devices related to light are taken from a given element. Color and values for other devices are taken from the elements on the lower layers.

- White balance – only the channel values for white balance are taken from the element. For the remaining channels, the value from elements on the lower layers is taken.
- Add – the channel values for this element are added to the values from the elements below
- Subtract – the channel values of this element are subtracted from the values from the elements below
- Multiply – the channel values of this element are multiplied with the values from the elements below
- Mask – the element works as a proportional mask (it works on the level of channels, not devices)

5.5 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:

- **New 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 step** – 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
- **Set status limits** – specifies limits of action performance statuses

[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

5.6 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 5.7 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.

5.7 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:

- touchpanel
- 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 digital 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:

- change of a value
- ON/OFF
- entering and exiting a range
- regulators

e) **from clock** – timers and astronomical clock:

- sunrise and sunset – with the option to move forward or backward
- timers that trigger at certain minutes, hours, days of the week, days of the month, months, years or with a specific date

f) **from regulators** – events from value changes

The event from the regulator is an event with a value. With it you can control e.g. master value or program playback speed or show.

NOTE! Earlier, set the controller as active in the settings tab.

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]** or **[Sunset]** again, the application will display a message reading „Event already exists! Continue anyway?".

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

The toolbar under the event list contains an additional icon (a description of the other users can be found → in item 5 Configuration):

Events numbers – exports internal event reference numbers for the puprose of the controller supporting a PX181 panel

DESCRIPTION OF ACTIONS AVAILABLE FOR ALL ELEMENTS

ELEMENT	ACTION	ACTION RESULT
Scene / mask	ON	• If scene / mask has been activated – reset duration. • If it has been deactivated – activates it. • If is included in a group of elements – deactivates all the other elements in this group (except for statuses). • If it has been rising – nothing happens. • If it has been falling – is activated again.
	OFF	• If it has been activated – deactivates it. • If it has been deactivated – nothing happens. • If it has been rising – is deactivated again.
	SOLO	Activates a scene / mask and deactivates all the other scenes and programs in a particular zone.
	TOGGLE	• If it has been deactivated – operates as “activate”. • If it has been activated – operates as “deactivate”. • If it has been rising or falling – the direction gets changed.
	PAUSE	• If it is rising or falling – it is paused at this moment. • If it is in progress, it stops its time.
	RESUME	• If it has been paused while rising or falling – the process is resumed. • If it was stopped during it will resume.
	SET VALUE*	The master of a scene / mask (its overall brightness) is set to a value provided by the event.

ELEMENT	ACTION	ACTION RESULT
Scene / mask	INCR. VALUE	Increases the master value by 1 / 255 unless the 0 value has been reached. If it has been falling or rising – stops it.
	DECR. VALUE	Decreases the master value by 1 / 255 unless the 0 value has been reached. If it has been falling or rising – stops it.
	SAVE MASTER	Saves the master value for the scene / mask.
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 other elements in this group are turned off (except statuses).
	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 – decreases 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.

ELEMENT	ACTION	ACTION RESULT
Program	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	Decrease the master parameter by 1 / 255 unless the value of 0 has been reached.
	INCR. MASTER	Increases the master parameter by 1 / 255 unless the value of 255 has been reached.
	SET SPEED *	Speed acceleration is set to the value provided by the event.
	INCR. SPEED	Increases the value acceleration parameter by 1 / 255 unless the value of 255 has been reached.
	DECR. SPEED	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 to the next step. • If it has been deactivated – works as “activate”. • If it has been activated, during the last step, the, 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”. • If it has been activated in the first step – deactivates itself.
	SAVE MASTER	Saves the master value for the program.
	SAVE SPEED	Saves the program playback speed.
Sequence	START	Starts a sequence. If it has been started – does nothing.
	STOP	Discontinues the operation of a sequence. The elements that were started by this sequence remain enabled.
	OFF	Deactivates the sequence and all the scenes, programs, masks, delays and sequences that were started by this sequence.
Delay	ON	If the delay has not been activated, it starts countdown.
	OFF	Deactivates countdown – does not execute actions from the list.

ELEMENT	ACTION	ACTION RESULT
Delay	RESTART	Activates countdown from the start.
Status	ON	Sets a status if no status has been set. If a status has been set – nothing happens. If the status belonged to some group of elements – all other statuses from this group are turned off, running programs, scenes or shows from this group still work.**
	OFF	Deactivate 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 those input, analog and Modbus channels that have been properly defined.
	DMX OFF ANALOG OFF MODBUS OFF	Disables DMX, analog and Modbus transmission.
	PID ON	Enables transmission from PID controllers to the DMX output. Works only with controllers whose output has been sets as “DMX channel”
	PID OFF	Disables transmission from PID controllers to the DMX output. Works only with controllers whose output has been set as “DMX channel”

ELEMENT	ACTION	ACTION RESULT
Signal panel	panel number / signal number	Sends out a specific signal to a selected PX181.
Zone	SET MASTER *	The master of an area is set to the value provided.
	INCR. MASTER	Increase 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.
	SAVE MASTER	Saves the master value for the zone.
Diode	ON	LED is on.
	OFF	Extinguishes the diode.
	BLINK LONG	Turns on slow flashing of the LED.
	BLINK SHORT	Turns on the fast flashing LED.
Show	PLAY	• Starts the show. • If it was running – it does nothing. • If the show belongs to a group of elements then all elements from this group are turned off except for statuses.
	PAUSE	• If the show is running – it suspends its operation. • If the show is off or paused – nothing happens.

ELEMENT	ACTION	ACTION RESULT
Show	STOP	Interrupt the show.
	SET SPEED *	The playback speed is set to the value provided by the event.
	INCR. SPEED	Increases the playback speed by 1 / 255 if the value of 255 has not been reached.
	DECR. SPEED	Decreases the playback speed by 1 / 255 if the value of 0 has not been reached.
	RECORD PLAY	Recording the DMX input signal. The previous stream is deleted. Applies to stream only.
	RECORD RESUME	Recording the DMX input signal. The previous saved stream is not deleted. Applies to stream only.
	RECORD STOP	Ending DMX input signal recording. Applies to stream only.
	SET MASTER *	The show master is set to the value passed.
	INCR. MASTER	Increases the master parameter value by 1 / 255, unless the value of 255 has been reached.
	DECR. MASTER	Decreases the master parameter value by 1 / 255, unless the value of 0 has been reached.
	RESTART	Interrupts the show and starts it again. Resets the number of repetitions to date.
	SOLO	It works like enable, while disabling all other items in the same area.
	TOGGLE	• If the show was on – turn it off. • If the show was off – turn it on. • If the show was paused – resumes it.

ELEMENT	ACTION	ACTION RESULT
Show	SAVE MASTER	Saves the master value for the show.
	SAVE SPEED	Saves the playback speed of the show.

* – editable parameter

** – new functionality in firmware above 2.0

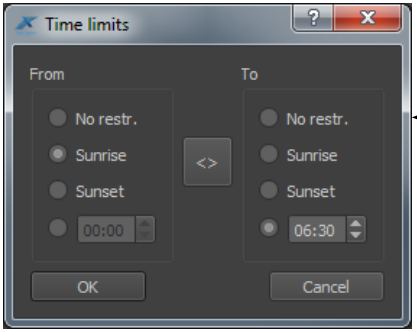
RESTRICTIONS ON ACTIONS

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 statuses, and 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.

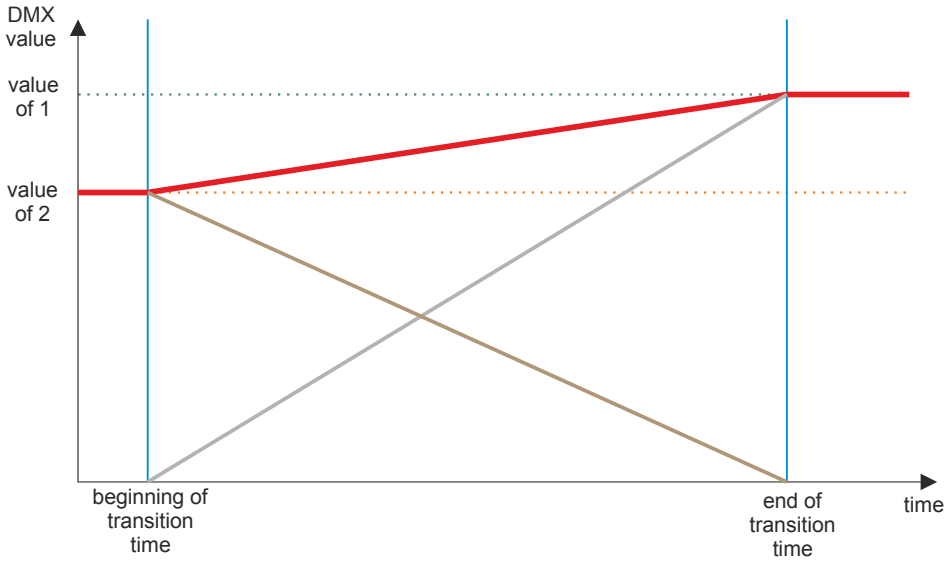
In order to be able to use the [Status limits] option, first you need to define a status in the [Configuration] tab.

5.8 Element groups

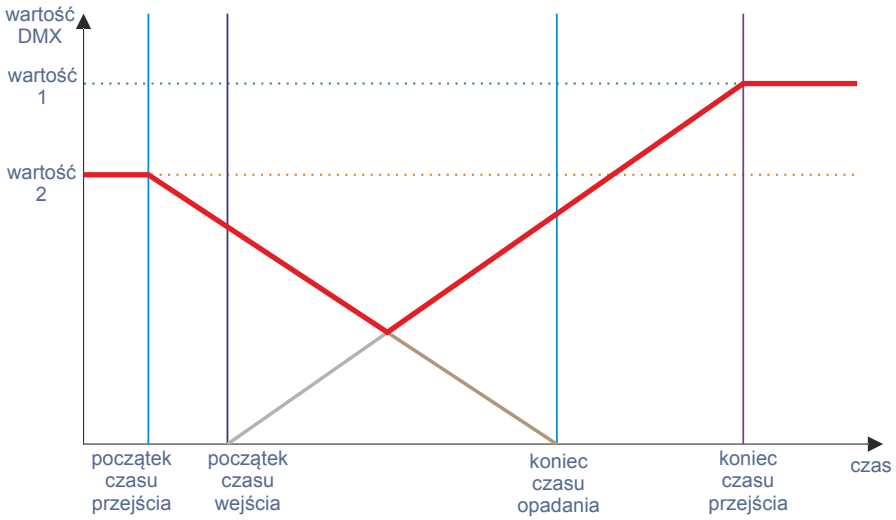
Scenes, programs and shows being part of the same area can be positioned within a single group of associated elements. Elements that are associated cannot be activated at the same time, that is why activation of an element included in a given group causes all the other elements in that group to be deactivated.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

In addition, statuses may also belong to the group. They work independently within the group, in relation to scenes, programs and shows. This means that if, for example, the status is in the same group as the scene, then starting the status does not turn off the scene but only the remaining statuses in the same group. The same way the other way round. For example, if we turn on the scene and the status is running in a given group, then running the scene will not turn off the status, but only the remaining elements in the group.

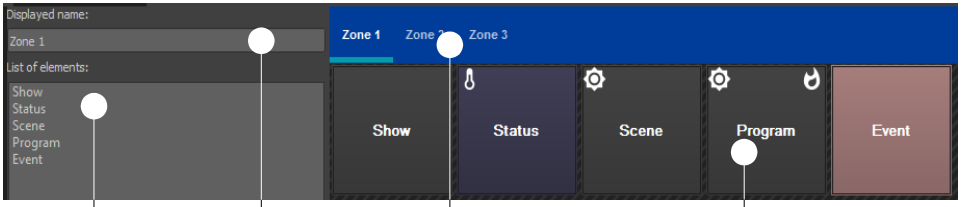
5.9 Statuses

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. Status can also be assigned to a group of elements.

5.10 Smartphone configuration

The [Smartphone] 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

desktops

configuration elements

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

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 scene, programs (from this zone only!), statuses and internal events. If you try drag an unauthorized element, an error message will be displayed.

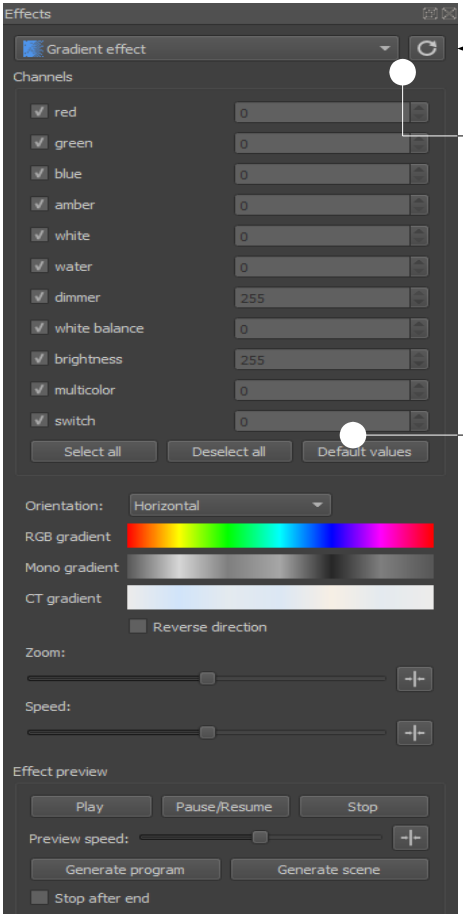
You can set a master for a scene, and for a program – a master and acceleration.

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
show	on / off tile – shows the status of the show	master, speed
status	tile – shows the state of a status	-
internal event	a tile that triggers an event	-

5.11 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] – pause

[Stop] and preview acceleration

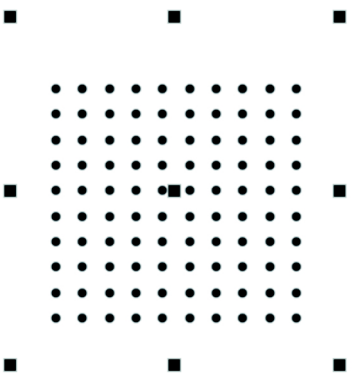
[Preview speed].

The currently displayed preview can be saved as a scene after using the **[Generate scene]** button – which will take a "snapshot" of the currently playing program or as a program **[Generate program]**. After selecting **[Generate scene / program]**, the application will ask for the name of the new scene / program and the number of program steps for which to save the result of the effect.

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 affect 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.

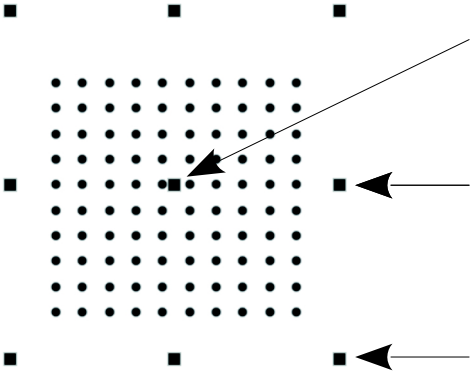


the selection box for the arrangement of which the effect is being created (this does not apply to the chaser effect)

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

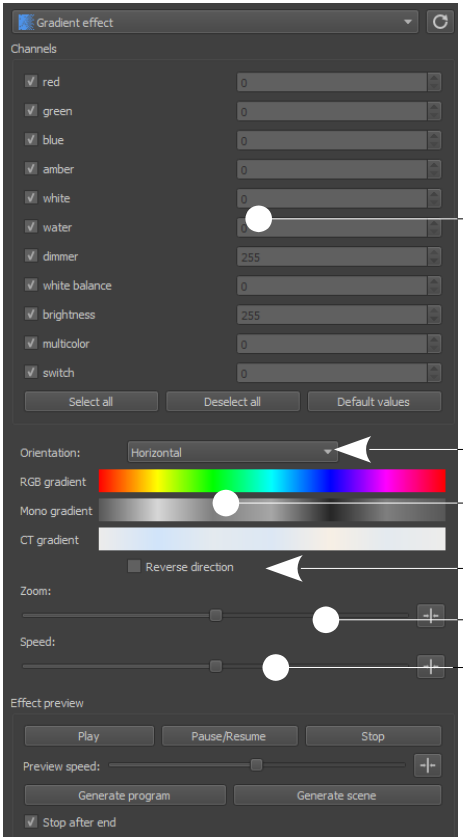
one of the four central points of the sides of the selection box – adjusting the height and width of the box

one of the four corners of the selection box – simultaneously, proportional adjustment of the height and width of the box

EFFECTS

The following are the effects available:

- **Gradient effect** – basic effect allowing you to design a smooth transition between colors



select the type of channel on which the effects work

orientation of the effect spreading

gradients used in effects and their application:
RGB gradient: red, green, blue
Mono gradient: amber, white, brightness, water
CT gradient: white balance

change of the direction of effect execution

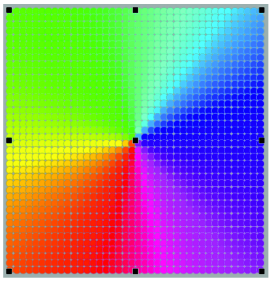
scaling the size of "superimposition" of an effect on the arrangement of devices (lamps, water nozzles, etc.), adjustment over the range 0.1x (left end of slider) to 10x (right-most position of slider)

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

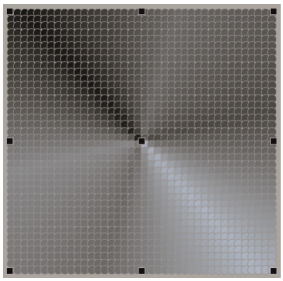
Clicking LMB on the gradient bar will open the gradient editing window.

After approval, the application will ask about the number of steps into which the effect should be divided in the created program. Too few steps will cause the end result to deviate from the preview.

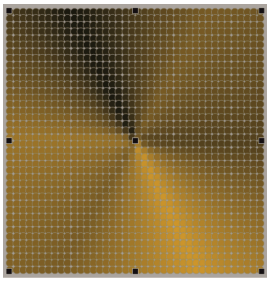
RGB



White balance + brightness

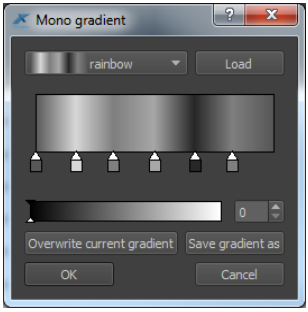


Amber



Other parameters available for other types of gradient effect:

Mono gradient:



CT gradient:

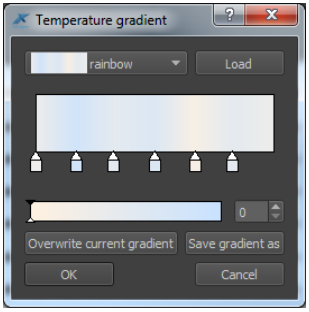
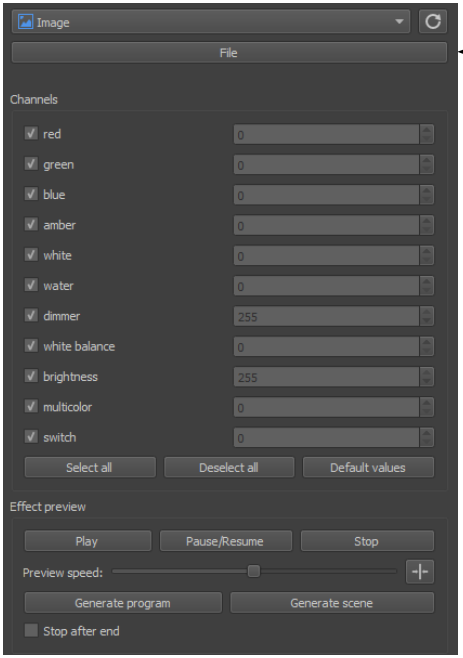


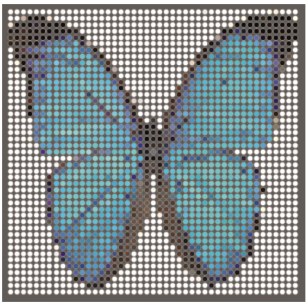
Image – creates a scene or program from the selected image. The image can be animated (GIF format), the image occupies the entire effect area, it can be “reflected”.



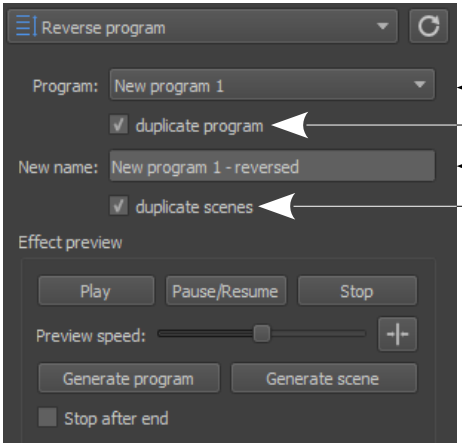
choosing a file with the extension *.gif, *.png, *.jpeg, *.jpg, *.jjjpe, *.bmp, *.tttga from disk space

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

For images in formats other than **.gif*, a program consisting of only one step is created.



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



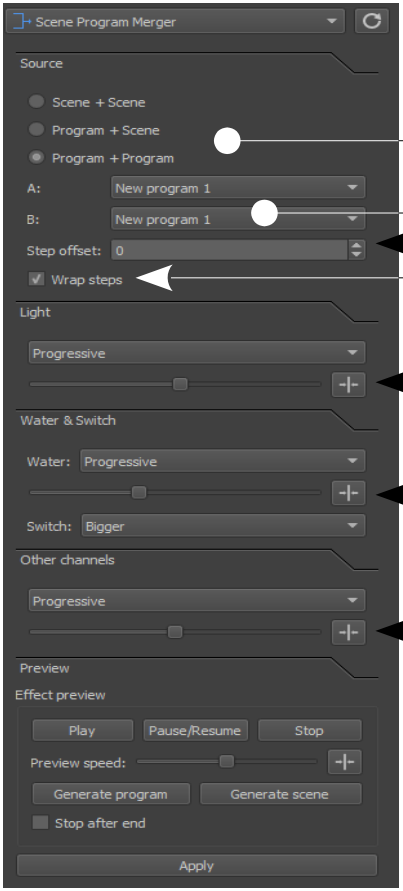
selection of a program to be reversed

checkbox ☐ – 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 / programs used to create an effect:
- **scene + scene** – combines the values of two scenes, the result is a scene
- **scene + program** – 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 a step of another program, the result is a program

source A and B

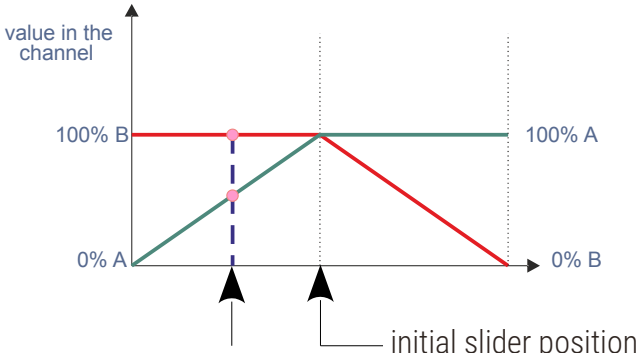
specifies by how many steps the start of program B is to be offset relative to the start of program A

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, B color
- A color, B brightness (only for light)

Channel combination procedure:

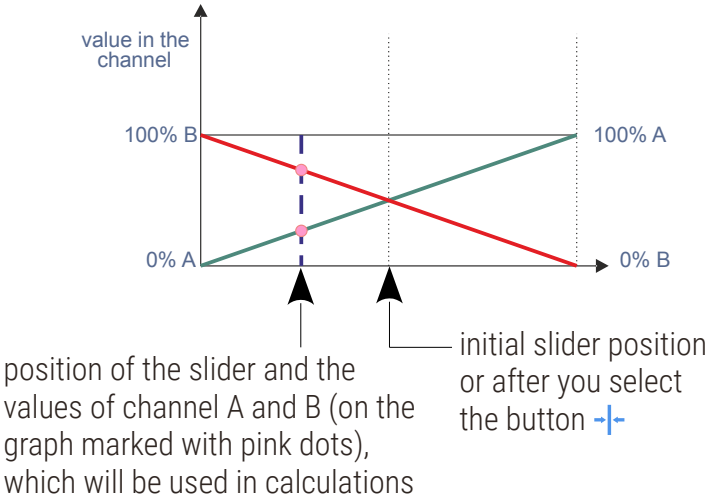
PROGRESSIVE – combining values from channel A and B depending on the position of the slider, according to the graph shown below. The procedure is used for the following channels: light, water and other channels.



position of the slider and the values of channel A and B (on the graph marked with pink dots), which will be used in calculations

initial slider position or after you select the button -|-

LINEAR – 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

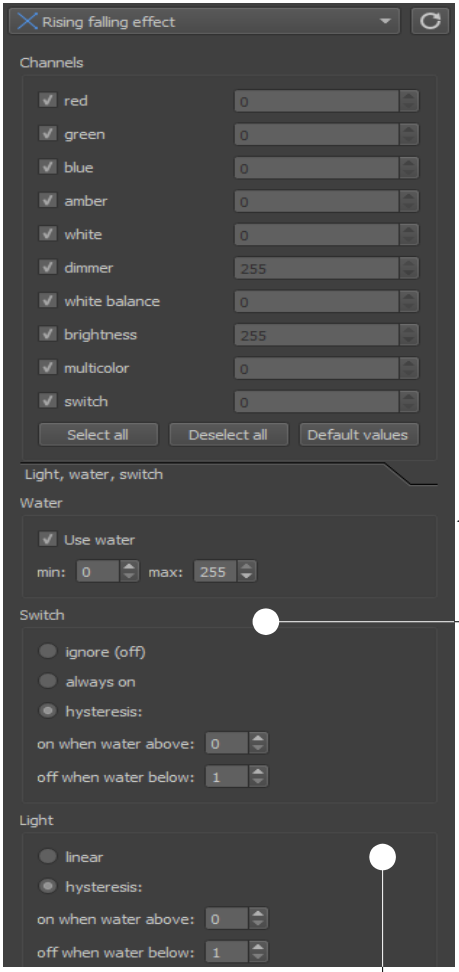
BIGGER – section of the greater of channel values from sources A and B

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

A LIGHTNESS, 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

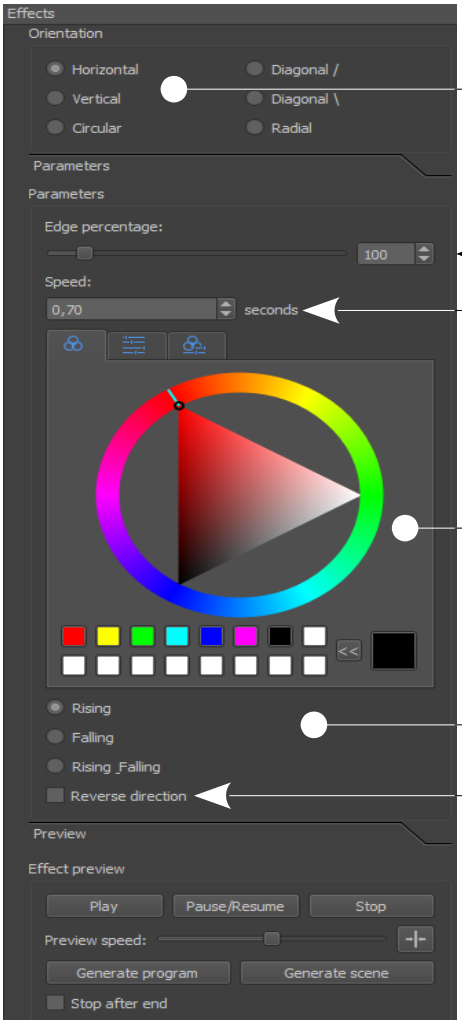
Rising falling effect – primarily for "light-water-switch" devices, it can create running light effect with water effect being switched on



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 values 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

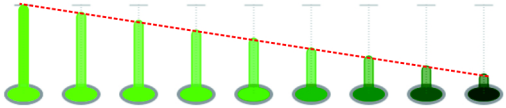
effect color change box

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

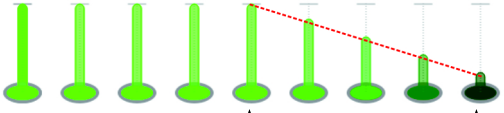
[Edge percentage] parameter – examples:

a) 100%



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

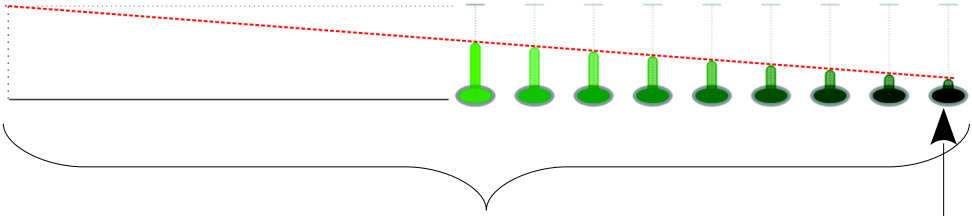
b) 50%



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

c) 200%

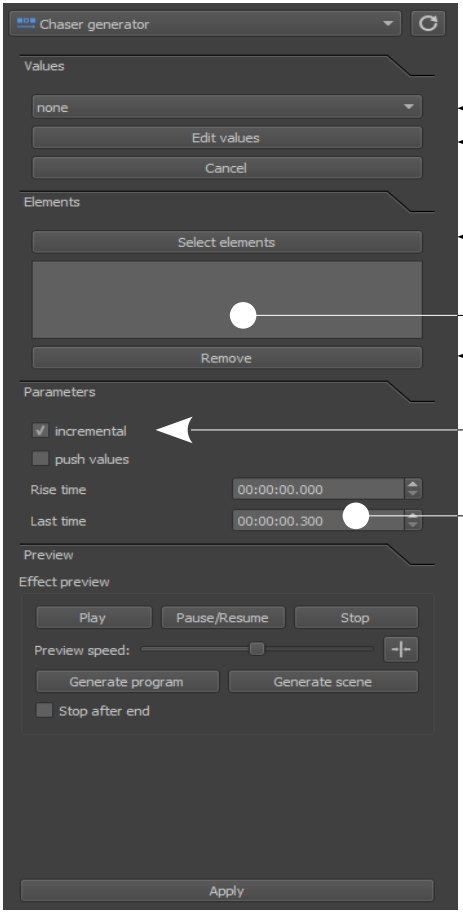


2x

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

value in the channel is 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:

a) **One by one:**

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

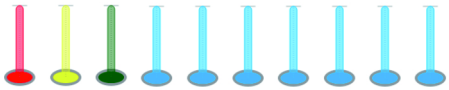
b) **On a group basis:**

- By dragging a group of devices from the device list on the **[Devices]** tab
- By dragging selected devices (using **Ctrl** key) from the device list in the **[Devices]** tab

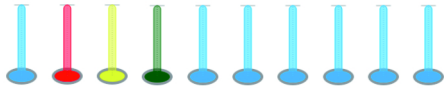
NOTE! A device should not be added to the list more than once.

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

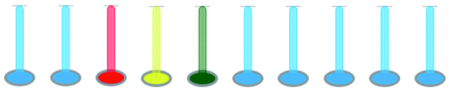
step 1:



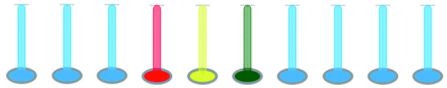
step 2:



step 3:

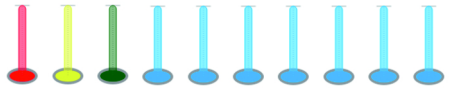


step 4:

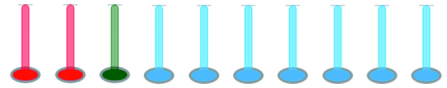


And example of the first 4 steps of a generated chaser, with the **"Incremental"** option:

step 1:

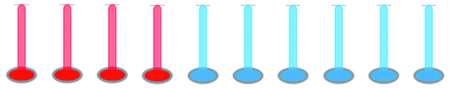


step 2:



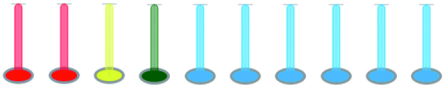
step 3:

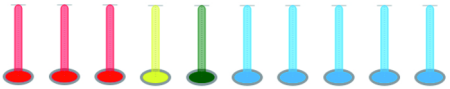
step 4:

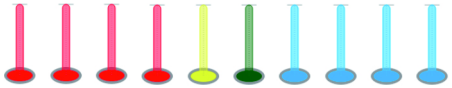


An example of the first 4 step of a generated chaser, with the **"Push values"** option:

step 1: 

step 2: 

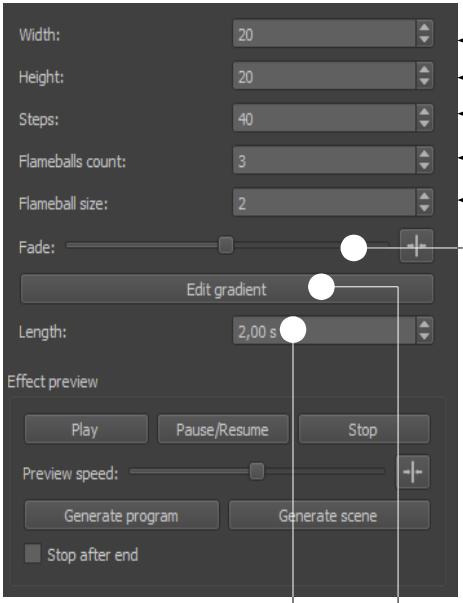
step 3: 

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

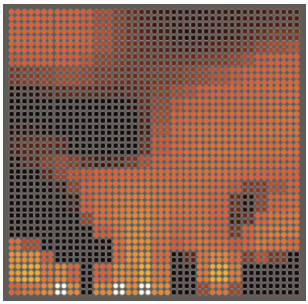
number of fireballs

size in grid meshes

speed of flame fading away, returning to the default value -|-

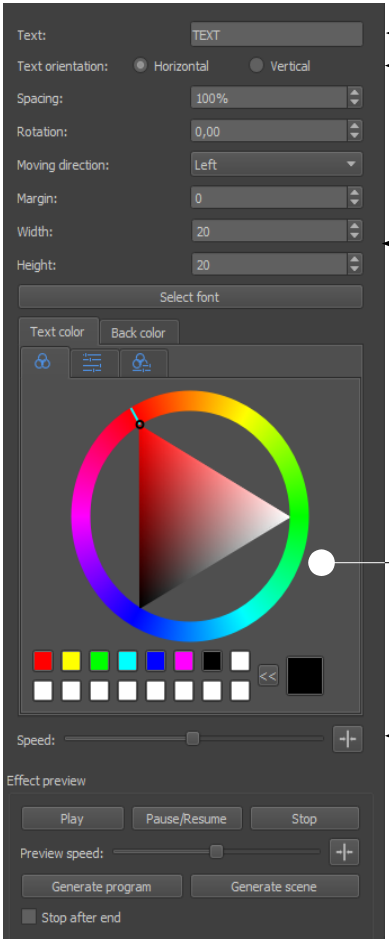
color editing description

the length of the entire program



T **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.



box where text is to be displayed (ASCII characters)

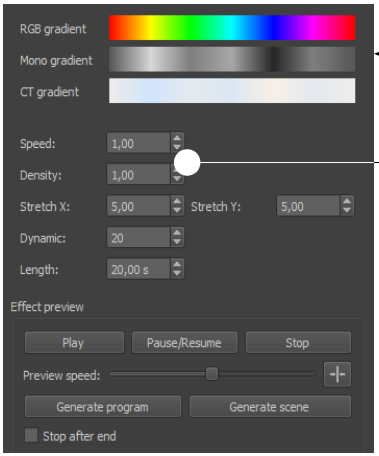
moving text relative to the grid top margin

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.

text and background color change boxes

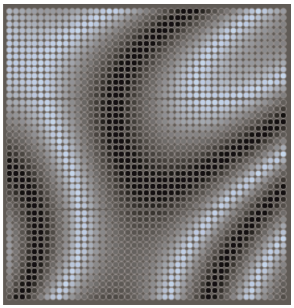
speed of effect playback

Plasma – requires a device grid with light-controlling channels

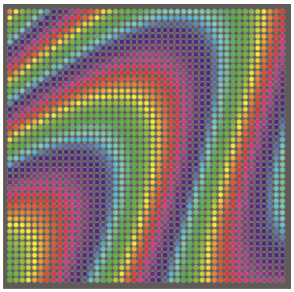


color editing description

Plasma effect parameters

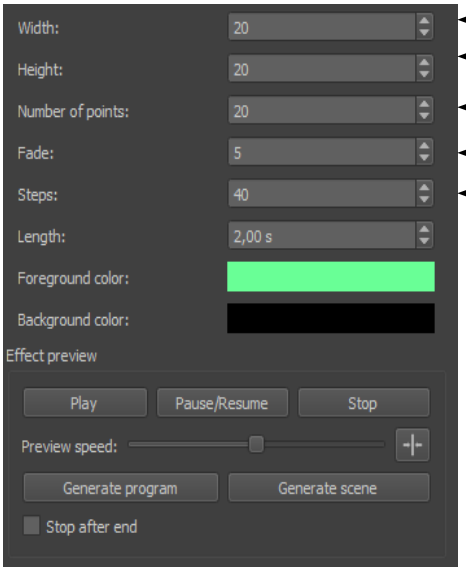


Mono



RGB

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.



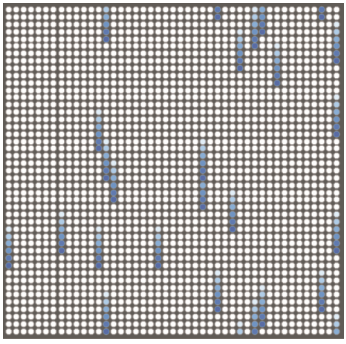
size of the effect grid, preferably it should correspond to the number of devices
Clicking a group of devices in the **[Devices]** tab automatically enters the relevant values in the **[Width]** and **[Height]** fields.

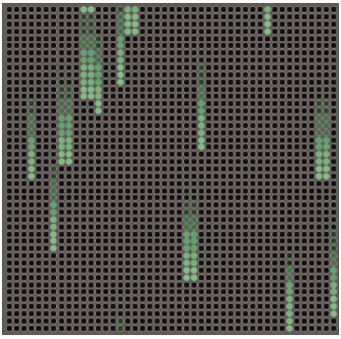
the number of drops being displayed simultaneously

speed of drops fading away

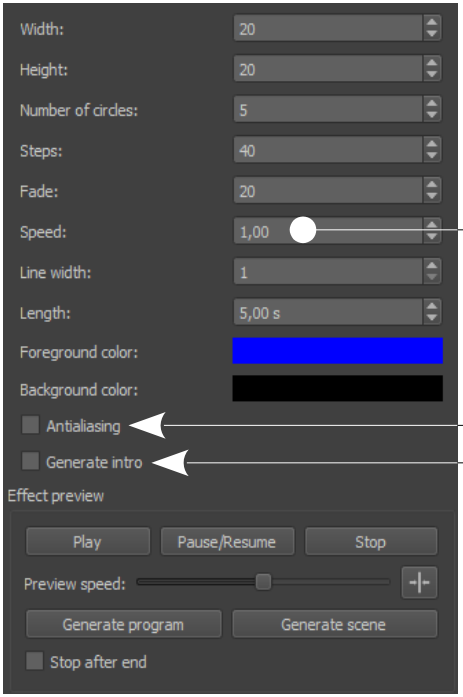
the number of steps for which a program will be generated

Matrix:





Circles – the effect of growing circles. 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.

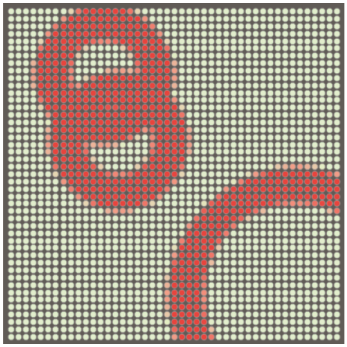


effect parameters settings

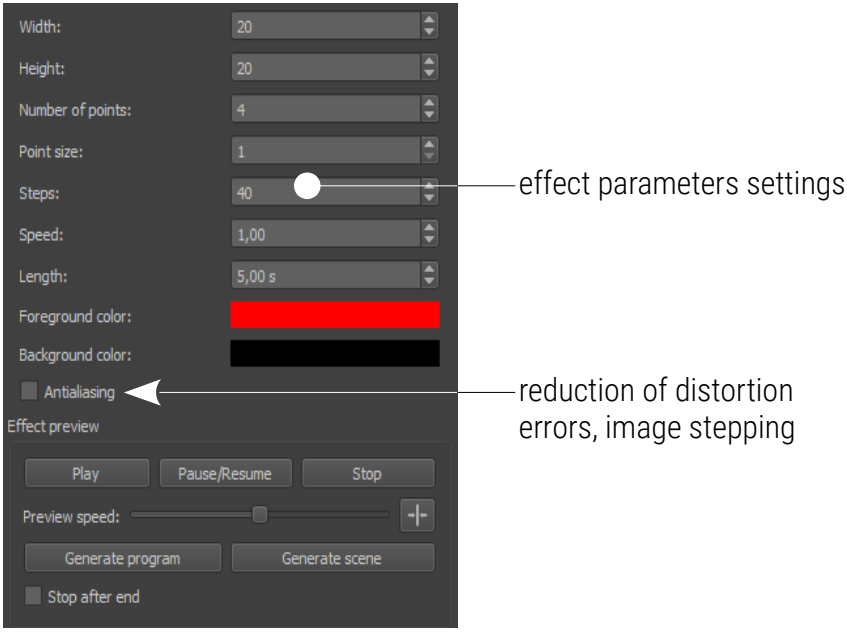
reduction of distortion errors, image stepping

creating an additional program, thanks to which you can get a better effect of entering (the right) program

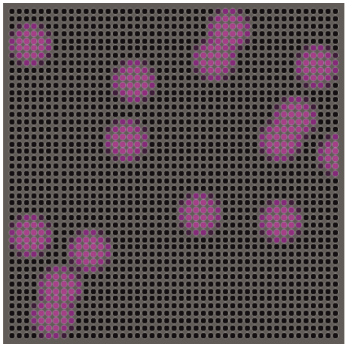
Circles:



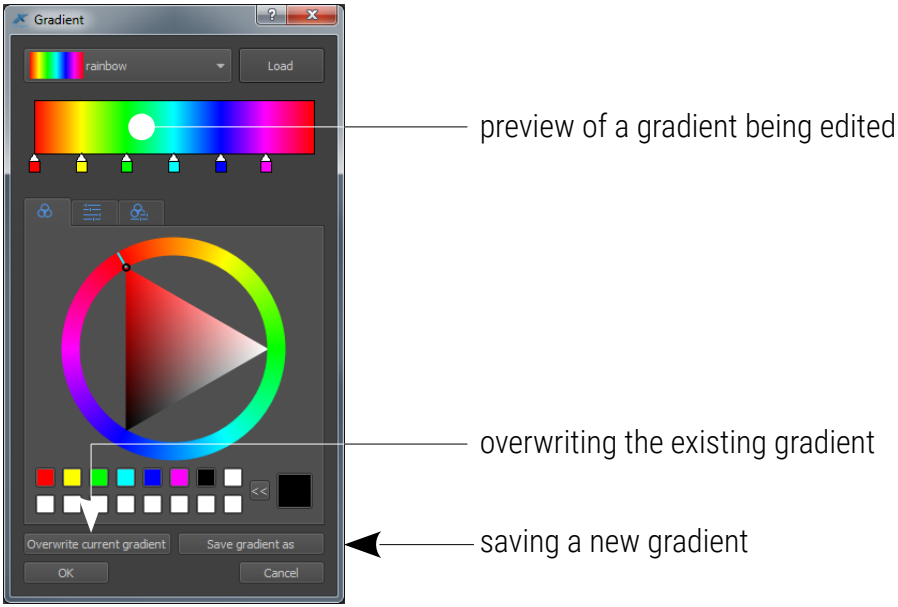
Metaballs – the effect of moving balls. Requires a device grid with light-controlling channels.
The number of devices in a column / row should be equivalent to the values entered as the effect parameters.



Metaballs:



EDITING 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.

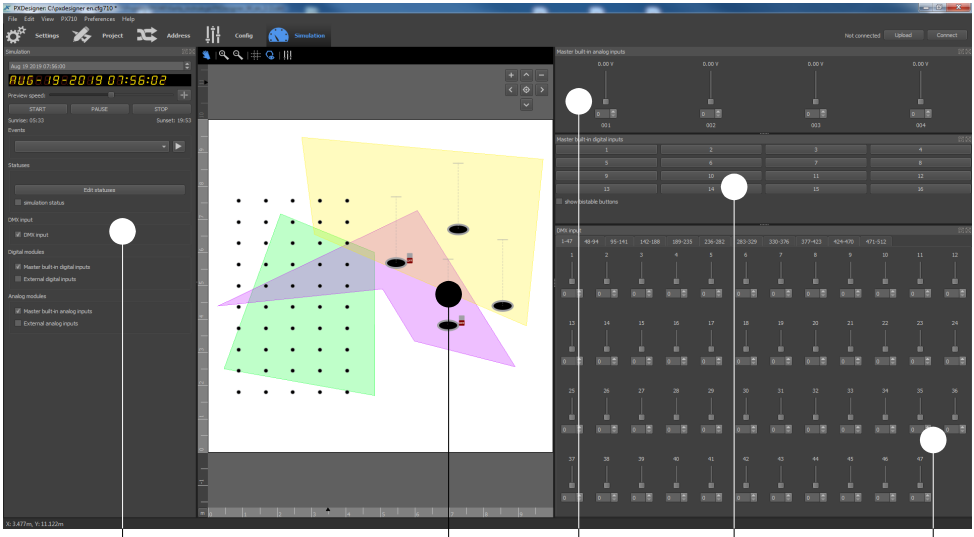
4b. Select the **[Save gradient as]** option – if you want to save the gradient you have created.

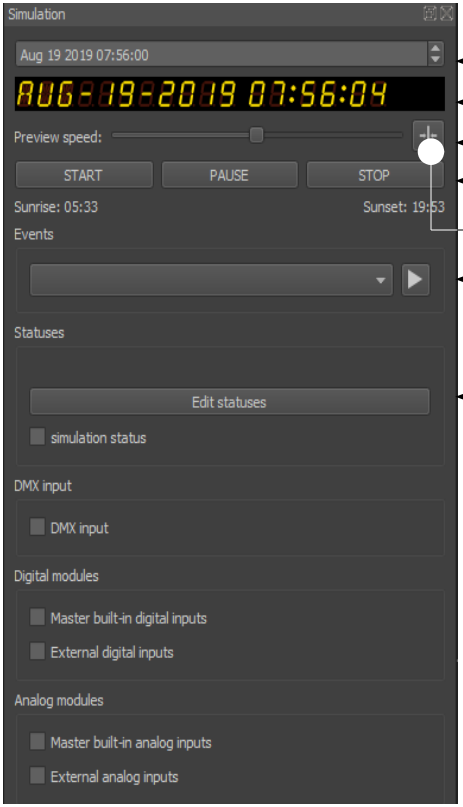
5. Click **[OK]** to load the selected / modified gradient into an effect.

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

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

restores the default speed

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 embedded and external modules. 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 Logging into the controller

Connection with the controller can be established as follows:

- by selecting: [PX340/PX345/PX710]→ [Connect]
- after clicking the [Connect] button in the upper right corner of the application window

Then the application will display a selection window of available controllers in the network. Each controller will display its name, MAC address, IP address, mask and gateway.

If the driver is not visible on the list, check the network connection between the computer and the controller. For a direction connection, check

the computer's network adapter settings. If the network settings of the controller have been changed, they can be restored to their defaults by holding the RESET button on the front of the housing for 5s. For more information on connecting the controller to the computer, see the controller manual.

Selecting [Search] will refresh the driver list.

The configuration saved in the program is not currently sent to the controller. To send the created configuration file to the device, select from the menu [PX340/PX345/PX710]→[Upload configuration]. This action will overwrite the configuration that was saved in the controller.

To download the configuration that is currently saved in the device, select from the menu [PX340/PX345/PX710]→[Download configuration]. This action will download the configuration from the controller and open it in the program.

7.1 Remote logging (external network)

The PxDesigner allows you to log in to the device from an external network via the internet, for this purpose it should be:

- have an external IP address on the router assigned by the internet provider and be able to establish connection from outside (incoming packets are not blocked by the provider's and router's firewall)
- forward any two ports (they must be one after the other) to the IP address of the controller working in the internal network and to ports 50000 and 50001 UDP/TCP (so-called forwarding port)
- unblock selected port in the router's firewall

- the address of the driver / drivers in the local network can not change (the driver must have a static IP address set or the DHCP server must assign the same addresses to the same devices each time)

Most routers available on the market usually have several parameters in port forwarding options:

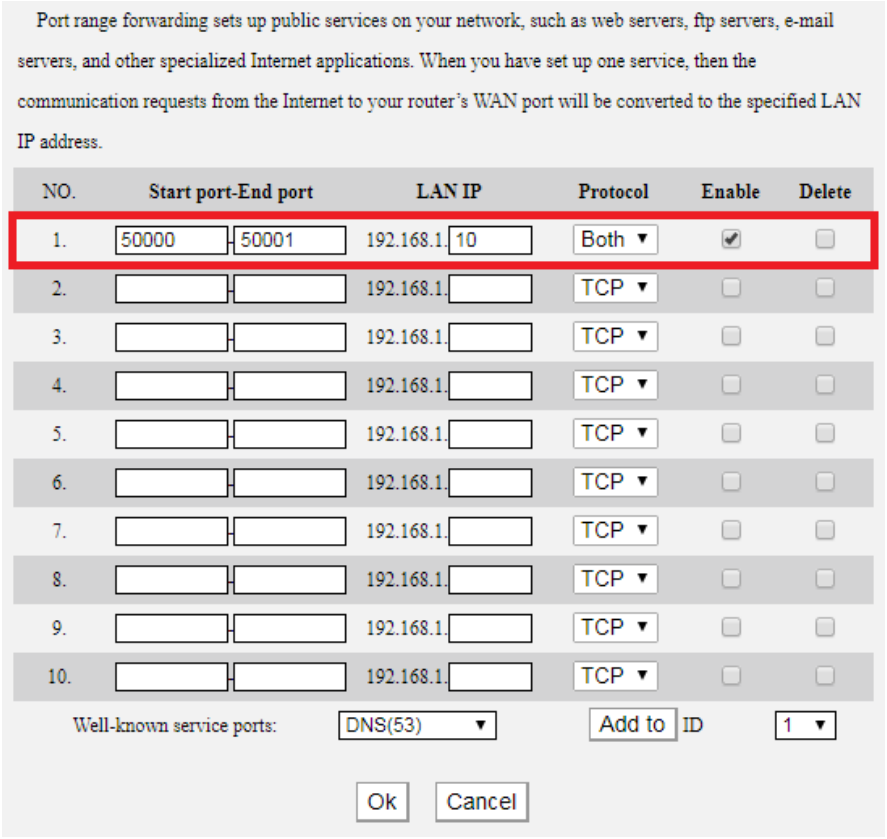
- forwarding number
- port or port range for redirection
- the IP address of the device to be redirected to
- protocol type (TCP / UDP or both)
- attach / delete diversion

Example 1:

One controller works in the local network with the following settings:

- external IP address: 66.77.88.99 (example address)
- IP address: 192.168.1.10
- mask: 255.255.255.0
- target device port: 50000 and 50001
- protocol: TCP or TCP/UDP (in this case option “Both”)

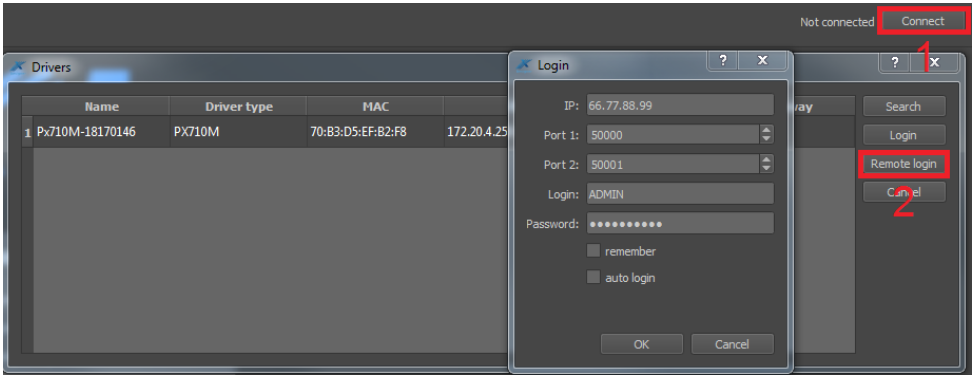
Below is the screen of the example setting in the router:



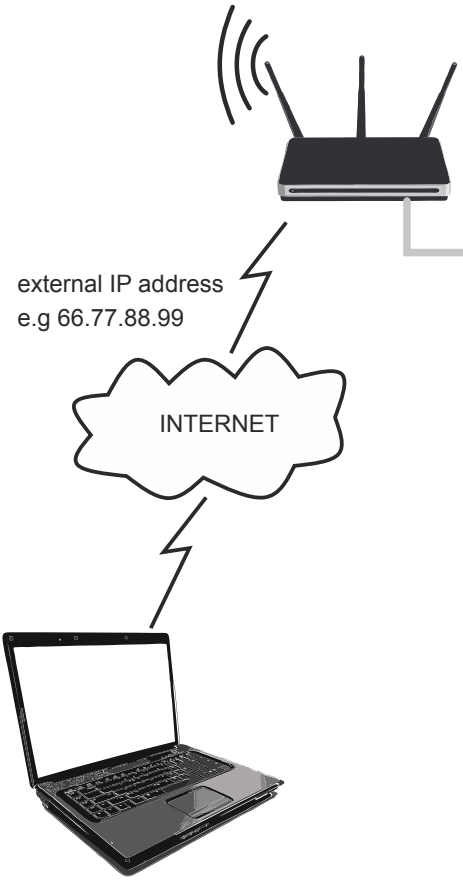
If there is no option to set the port range in the router, create two separate rules for each port separately (separately for 50000 and 50001).

If everything is correctly configured to connect to the controller from the (external) internet network, in the application click “Connect”, then select the option “Remote login” and then in the “IP” field enter the IP address of the router (assigned by the internet provider, in this case 66.77.88.99), enter the

port numbers 50000 and 50001 in the fields “Port 1” and “Port 2” and then the “Login” with the user’s “Password”.



The connection diagram is on the next page.



Router:
IP:192.168.1.1
Mask: 255.255.255.0
DHCP server ☐
Redirecting port 50000 and 50001
to the device address (192.168.1.10)

PX340:
IP: 192.168.1.10
Mask: 255.255.255.0
Gate: 192.168.1.1
DHCP ☐

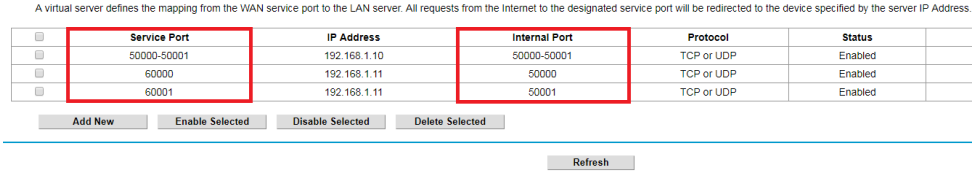
internet connection

Example 2:

More then one controller works in the local network with the following settings:

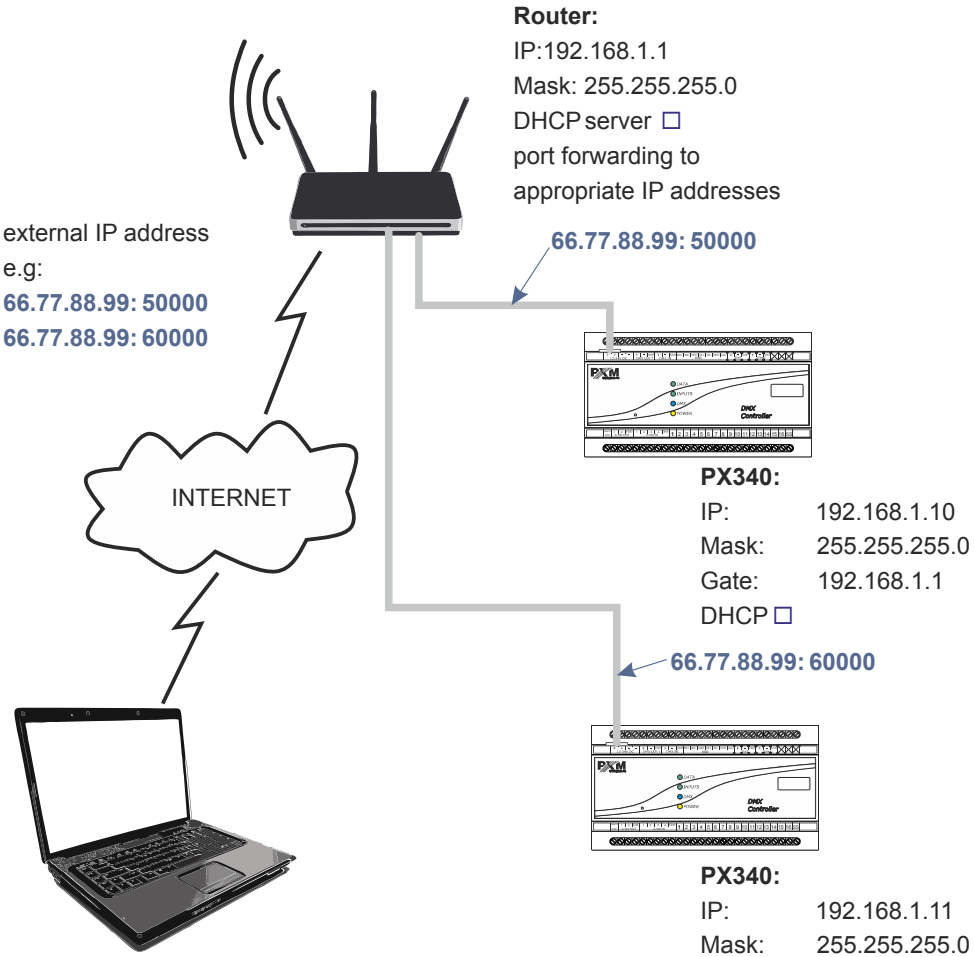
- external IP address: 66.77.88.99 (example address)
- IP address of the first controller: 192.168.1.10
- IP address of the second controller: 192.168.1.11
- mask: 255.255.255.0
- target device port: 50000 and 50001 for the first controller, 60000 and 60001 for the second controller (for ports 60000 and 60001, the target port in the internal network must be 50000 and 50001 – screen)
- protocol: TCP or TCP/UDP (in this case option “Both”)

Below is the screen of the example setting in the router:

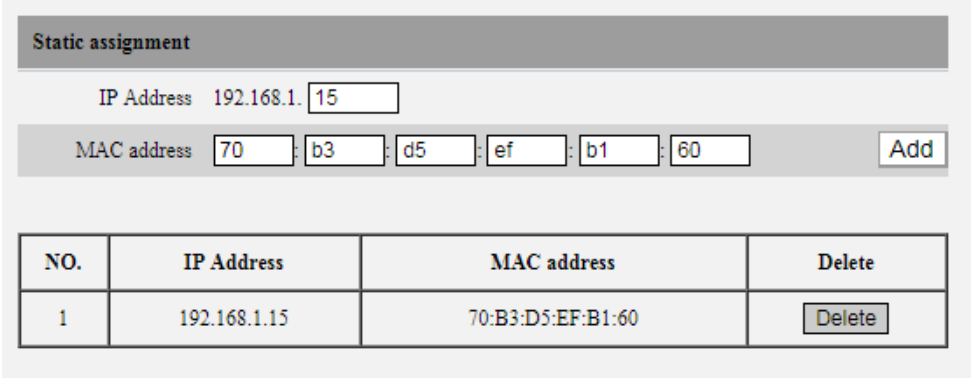


The connection is exactly the same as in example 1, except that the ports 50000 and 50001 are for the first device, and the 60000 and 60001 are for the second device.

Connection example:



NOTE! In most routers available on the market, you can set a static IP address by the DHCP server based on the MAC address of the device. For example, for a device with the MAC address 70:B3:D5:EF:B1:60 the IP address 192.168.1.15 will always be assigned by the DHCP server (example below).



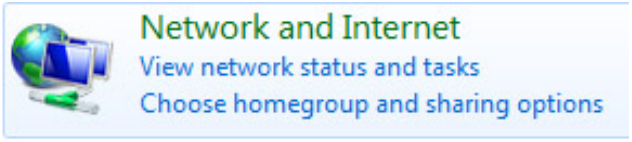
7.2 Change of the computer network configuration

The procedure for changing the computer network configuration varies depending on the operating system. Windows® 7 system is an example here.

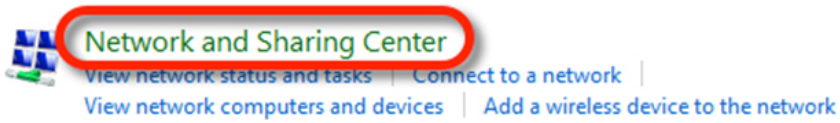
Change of the computer network configuration in the Windows® 7 operating system is done in the following:

1. Click **[Start]** 
2. Select **[Control Panel]** tab 

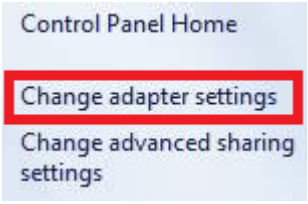
3. Go to **[Network and Internet]** tab



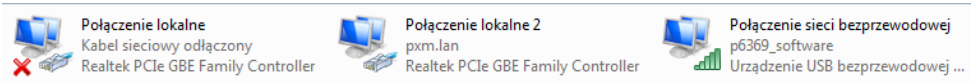
4. Enter **[Network and Sharing Center]**



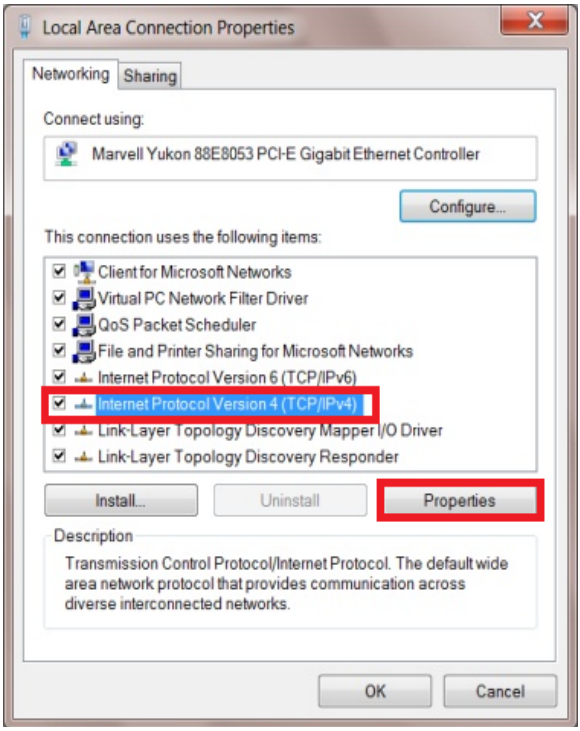
5. In the left panel select the **[Change adapter settings]**



6. Right-click on **[Połączenie lokalne]** (Local area connection) and choose the **[Properties]**

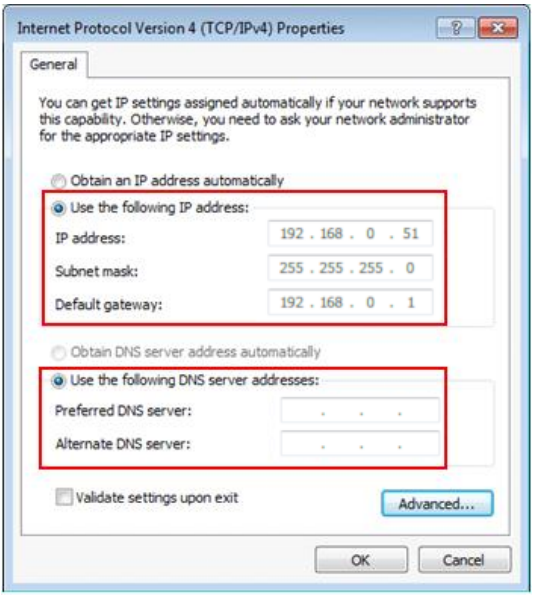


7. In the new window that appears, select **[Internet Protocol Version 4 (TCP/IPv4)]** and then press properties



8. In the next window, select **[Use the following IP address:]**

   To connect directly (computer – driver) with a controller that has a default configuration, use the sample settings:



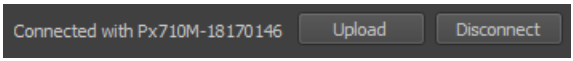
IP address: 192.168.0.51

Subnet mask: 255.255.255.0

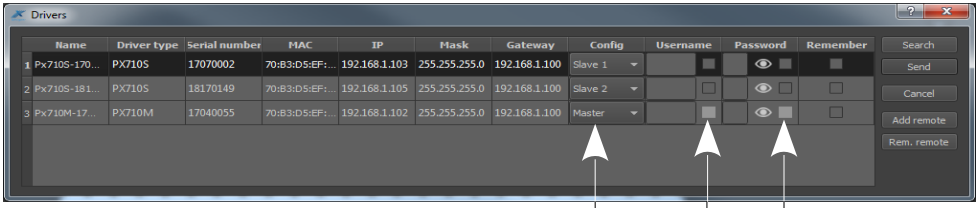
Default gateway: 192.168.0.1

7.3 Sending configuration to PX710

To enter the configuration sending settings, click **[Upload]**.



The following configuration window will appear:



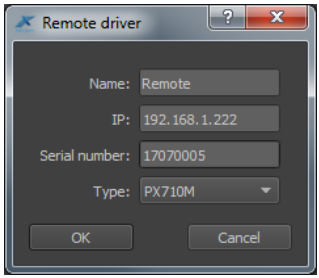
choosing a specific part of the configuration for a given driver

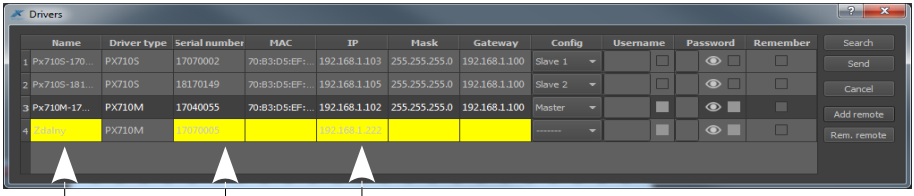
☑ checkboxes (only available for Slave controllers) allow you to copy the master password and username

Selecting the checkbox in the **[Remember]** column will remember the login details for the given driver. These data are associated with the serial number and the next time you try to send the configuration, the **[Username]** and **[Password]** fields are automatically filled.

7.4 Sending configuration to remote controllers

If the driver is not found, but its IP address is known and the serial number is using the **[Add remote]** function to create a remote controller that is marked in yellow. Option **[Rem. remote]** removes the selected remote driver.





device name

IP address

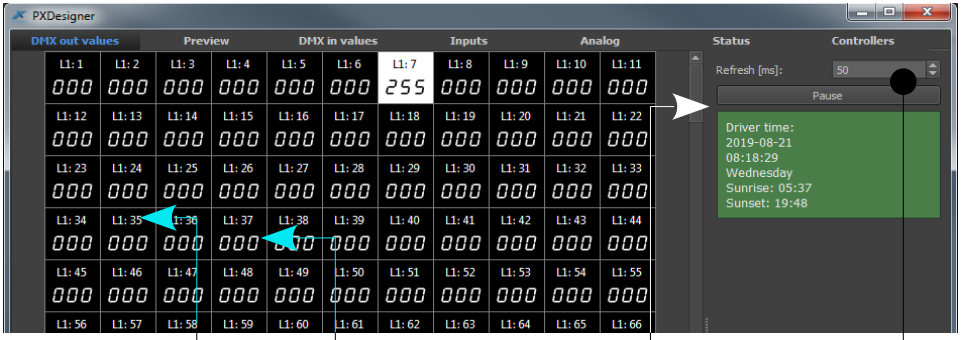
serial number

If we choose the **[Send]** option and we do not assign all the defined configurations to the controller, the application will display the “Driver selection error” prompt, list which configurations are not used and ask whether to continue sending anyway.

7.5 Controller preview

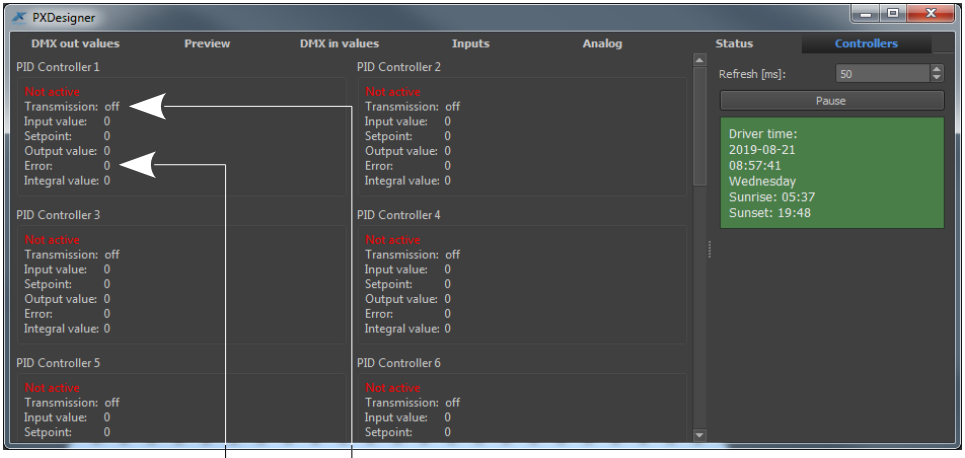
The **[Monitoring]** pane allows you to monitor values in the inputs and outputs (DMX and analog ones) as well as controller statuses; it has the following tabs:

- **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 (not applicable PX710S and PX345)

- Inputs – preview of the state of 16 digital inputs, red – deactivated, green – activated (not applicable PX710S)
- Analog – preview of analog channel values: for the 4 input channels, slider pairs are displayed (not applicable PX710S and PX345):
  - 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 (not applicable PX710S)
- Controllers

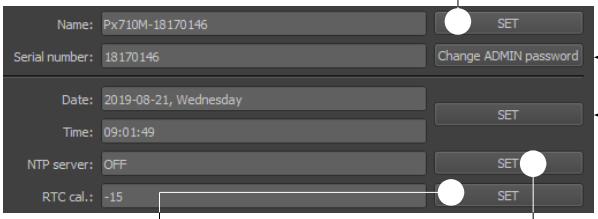


transmission of the controller output to the DMX output

difference between setpoint and input value

7.6 Admin tools

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



controller name change button

password change option is only available for the administrator

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

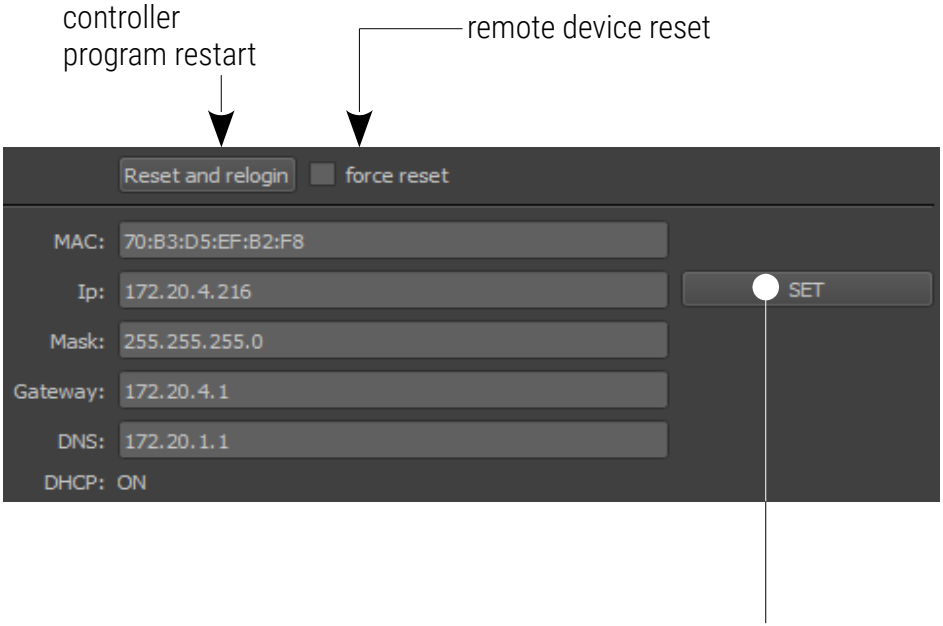
Allows you to set the clock in the controller (if it is connected to the application).
Calibration allows for accelerating and decelerating the clock, as internal electronic clocks tend to have a drift when compared with actual time. One unit set at a positive value can accelerate the clock by 10.7 seconds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

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

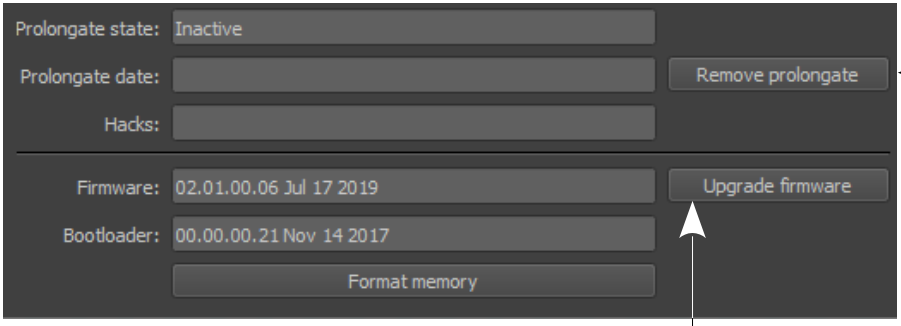
In the NTP server field, the status of connection with NTP has been added:

- NTP address OK (green)
- NTP address ERROR (red)
- OFF (no color change)



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

☑ 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.

NOTE! Selecting the **[Format memory]** button will completely delete all data from the memory, the deletion process takes about 4 minutes and is signaled by lighting of 3 LEDs (inputs, DMX and power). It is very important not to turn off the power until formatting is complete.

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.