

PX314

AC+ Dimmer

24 x 3600W

User manual



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

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1 Description

PX314 is a professional AC class dimmer rated at 24 x 3600W.

AC+ Dimmer 24 x 3600W can be powered by three phases, and has an integrated system fully protecting against the effects of reverse phases connection. The device allows yo control 24 independent channels with a power of 3.5kW each. The dimmer enables to control input signals from 6 different sources simultaneously, including:

- 2 x DMX-512 lines
- 3 x Art-Net lines
- 24 x analogue inputs (option available to order)

The device has a color touch screen, four buttons and a knob, which allow for navigating through an intuitive menu and setting all parameters of the dimmer as well as viewing its status.

The device has a built-in merger system with an option to select one of 13 priorities, including permanent activation of any circuit, regardless of the controls. The advanced electronics allows to address each output channel in any way, to select and edit the driving characteristics (5 factory characteristics, 5 user's characteristics), and to set limits for voltage and output current for each channel individually.

The device is equipped with the bulb heating system (10 levels) and control of the attached fuse and broken circuit / burnt bulb. In addition, the user can define the dimmer response to the lack of the driving signal. In

addition to the basis options (*ON, OFF, HOLD, SLOW TURN OFF*), 64 stages and the program are available to be defined.

The integrated "*soft-start*", "*soft-on*" and "*even-off*" systems assure reliable operation in the most extreme conditions. Direct detection of zero of the network and optical insulation of DMX input guarantee high resistance to interface.

PX314 has a solid metal housing with an efficient cooling system, adapted for wall mounting.

The device includes software for PCs which enables connecting a maximum of 16 dimmers at the same time. The application allows for viewing current parameters and particular channels of the device, and changing the configuration.

2 Safety conditions

PX314 dimmer is a device powered directly from the 230V mains. Failure to observe safety instructions may result in electric shock and pose a threat to life. Therefore, you should strictly adhere to the rules outlined below:

1. Installation of the device, and in particular, connection of power, should be made by a suitably qualified person, as described in the manual.
2. The device can be connected only to 3- or 5-wire installation (with a separate protective conductor).
3. Protect all cables against mechanical and thermal damage.

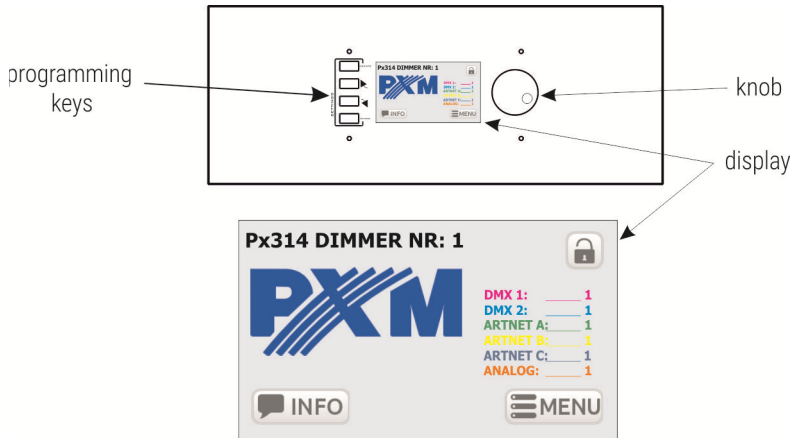
4. In case of failure of any of the cables, it must be replaced with a cable of the same technical parameters.
5. Use only 3-wire cables of not less than 2,5mm² for connecting devices to the dimmer.
6. Each receiver should be powered by a separate cable.
7. After installation, test the effectiveness of resetting all the equipment controlled.
8. All repairs that require the housing to be removed can only be carried out with power disconnected.
9. The dimmer must be strictly protected against contact with water or other liquids.
10. Avoid sudden shocks, particularly dropping.
11. Do not connect dimmer with damaged (dented) housing to the power supply.
12. Do not operate the device in rooms with humidity above 90%.
13. The device must not be used in rooms with a temperature below +2°C or above +40°C.
14. Clean only with a damp cloth – the dimmer must be at this time completely disconnected from the power supply.

NOTE!!!

1. Improper connection of the protective conductor (of yellow and green color) creates the risk of electric shock.
2. Improper connection of the neutral wire (of blue color) will automatically turn off the dimmer and start the buzzer.
3. It is also acceptable to power the dimmer with one or two phases.

3 Control elements

The device is equipped with a color touch display with a resolution of 480 x 272px. During operation, it displays basic information and possible warning and errors. The displays also allows to set the parameters of the dimmer. You may be asked to give a password to enter the settings menu.



3.1 Knob

It is used to quickly change the numerical values in the boxes and switch between successive elements on the screen. Pressing the knob is equal to pressing the *Enter* key.

3.2 Keys

The four keys on the left side of the screen help navigate the menus:

- ***Enter*** – it activates the selected item. If the selected item is a key – it presses this key, if a list – it expands this list, if a text box – it starts to edit it.
- ***Next / Prev*** – they are used to switch between successive items on the screen and select values from the list and numeric fields
- ***Esc*** – it allows to cancel the changes

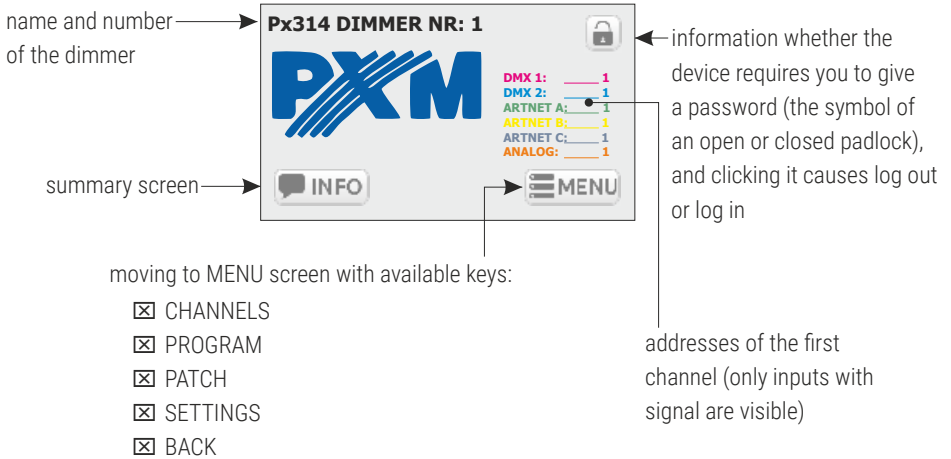
3.3 Interface

During the preview of information and setting parameters on the screen, there are 3 types of interactive elements: keys, text boxes and selection lists. Items can be selected directly on the touch screen or by using the arrow keys. *Next / Prev* keys (or knob) are used to select the next / previous item on the screen (item envelope becomes orange), the *Enter* key is used to activate the currently selected item (item envelope and background become orange). Activation of the key causes it to be pressed, activation of the text box allows to enter a new value, activation of the selection list causes it to expand and display available options. When using the touch screen, numeric values in the text boxes are added using the onscreen keyboard, *Next* and *Prev* keys or the knob.



4 Operation

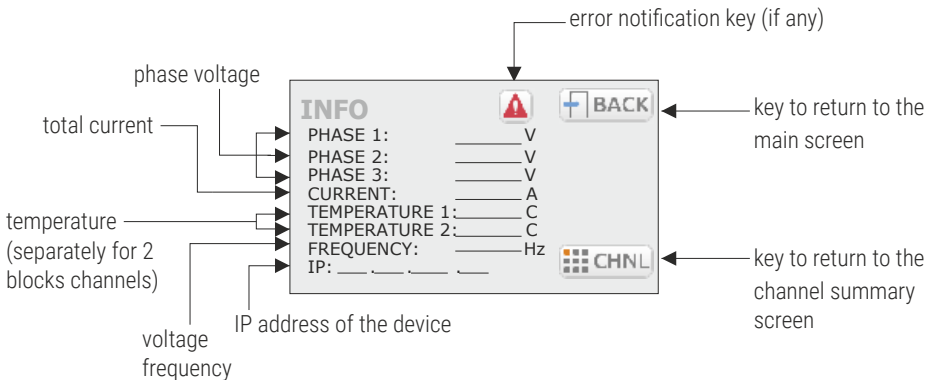
After starting the device, the display shows the start screen, including:



Start screen is visible to every user, without a password.

4.1 Summary screen

Pressing the [INFO] key takes you to the summary screen. This screen includes the following information:



Error notification key is displayed on the screen when one of the following errors is detected in the dimmer:

- **DRIVER HIGH TEMPERATURE** – warning about exceeding the maximum temperature set in the **FAN** menu
- **PHASE LOSS** – error, no voltage on the phase (contact the service)
- **PHASE ERROR 1** – internal error (contact the service)
- **MODULE NOT RESPONDING** – error, no communication with the unit (contact the service)
- **DRIVER TERMISTOR MISSING** – error, thermistor damage (contact service)
- **DRIVER TERMISTOR SHORTED** – error, thermistor is shorted (contact the service)
- **CHNL OUTPUT SHORTED** – error, channel is shorten (contact the service)
- **CHNL FUSE MISSING** – warning, fuse is not enabled or one supply phases is missing
- **CHNL OVERLOAD** – warning, channel overcurrent
- **CHNL TRIAC SHORTED** – error, triac is shorted (contact the service)
- **CHNL OPEN CIRCUIT** – warning, open circuit or burnt bulb

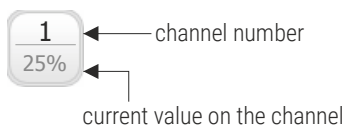
The messages are divided into errors and warnings – errors are shown in red and a warnings in orange.

NOTE! In case of closing the output circuit, the dimmer automatically disconnects the circuit. In this case, disconnect device from the power supply and check the cause of short circuit.

4.2 Channel summary screen

The channel summary screen [CHANNELS INFO] shows keys corresponding to 24 output channels.

Each key shows:



The colors of captions depend on the source of value on the channel:

☒ **violet** – DMX 1

☒ **orange** – Art-Net 3

☒ **blue** – DMX 2

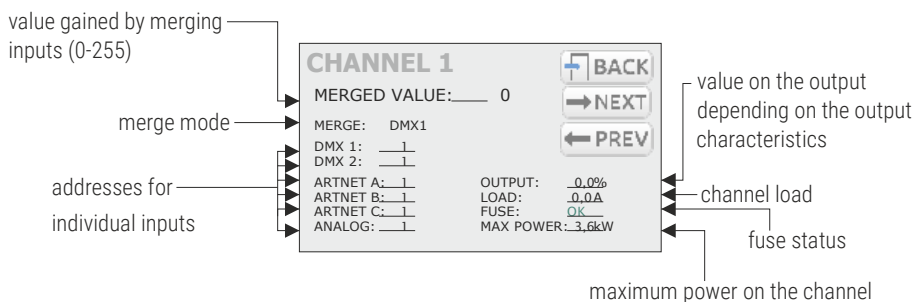
☒ **brown** – analog input

☒ **green** – Art-Net 1

☒ **black** – no signal

☒ **yellow** – Art-Net 2

Pressing one of the channel keys takes you to the corresponding channel summary screen. This screen displays the following information:







On this screen, there are also available the [NEXT] and [PREV] keys used to quickly navigate to the next / previous channel and the [BACK] key used to return to the list of channels.

If the dimmer is connected to the application on a PC – all the information is also available on an ongoing basis in the program.

5 Programming



5.1 Menu

Pressing the **[MENU]** key on the main screen of the dimmer, takes you to the screen with available keys:

-  **CHANNELS** - setting the parameters of output channels
-  **PROGRAM** - defining the scenes and program that can be activated in the absence of DMX signal
-  **PATCH** - addressing inputs and merge mode for individual inputs
-  **SETTINGS** - other settings

5.2 Setting the channel parameters

After selecting **[CHANNELS PARAMETERS]**, you can set the parameters:

-  **SINGLE** - separately for individual channel
-  **RANGE** - collectively for the channel range

If you select **[RANGE]**, the following fields will be available on the screen:

reduction of output power
(range 0 - 100%)

maximum current on
the channel (1 - 16 A)

input characteristics of the channel

RANGE

POWER 100 %

MAX CURRENT 16 A

CURVE LINEAR

PREHEAT OFF

✖ ESC

✔ SAVE

FROM 1

TO 1

range of channels for which
the parameters are to be set

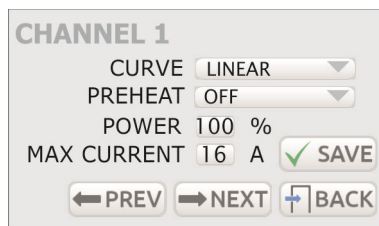
lighting the channel – 10 levels of
channel lighting to choose from:
OFF, LEVEL 1 - LEVEL 9

The user can select the following curves:

- **LINEAR** – the value on the output is directly proportional to the input value
- **EXPONENTIAL** – exponential characteristics
- **LOGARITHMIC** – logarithmic characteristics
- **ON/OFF** – two-level characteristics
- **REVERSED** – the value on the output is inversely proportional to the input value
- **USER 1 – 5** – 5 curves to be defined by the user

Pressing the **[ESC]** key exits the screen without saving your changes, press the **[SAVE]** key to exit the screen and save your settings for all channels in a given range.

If you select the **[SINGLE]** option, the screen will display the keys for all output channels. Pressing one of the channel keys takes you to the corresponding parameter screen:







CHANNEL 1

CURVE **LINEAR**

PREHEAT **OFF**

POWER 100 %

MAX CURRENT 16 A  **SAVE**

 **PREV**  **NEXT**  **BACK**

[NEXT] and **[PREV]** keys allow to quickly switch between successive channels. To save your parameters, press **[SAVE]** before switching to another channel.

5.3 Program

In the **[PROGRAMMING]** menu, you can program 128 scenes and a program that can be activated in the absence of DMX signal. Scene is a static adjustment of the value at the output channels. Program is a set of successive scenes.

The screen shows the following keys:



EDIT
SCENE

- editing on of 128 scenes



COPY
SCENE

- copying set values between the scenes



CAPTURE
SCENE

- capturing the current scene output status



EDIT
PROGRAM

- defining the order of scenes in the program



PLAY

- scene or program preview

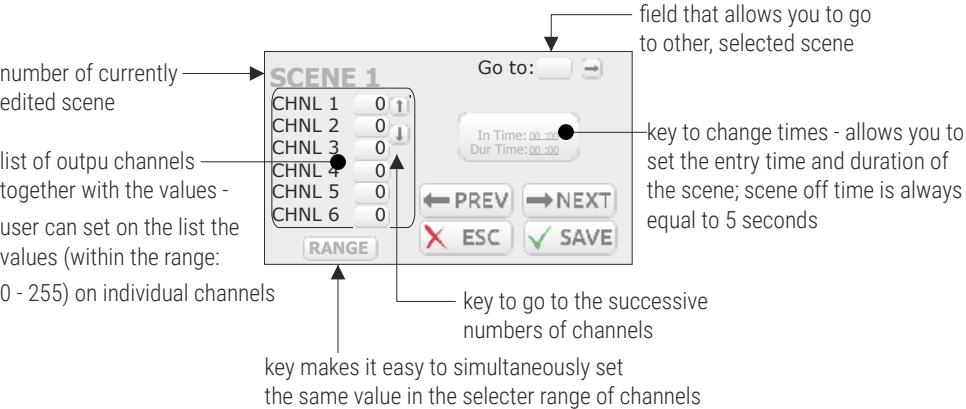


NO SIGNAL

- defining the dimmer operation in the absence of DMX signal

5.3.1 Scene editing

Scene edit screen includes:



When you select **[EDIT SCENE]**, the application displays the screen for editing scene 1; in addition, scene 1 occurs on the outputs.

[NEXT] and **[PREV]** keys allow to switch between the scenes. Transitions are made in a linear way.

5.3.2 Scene copying

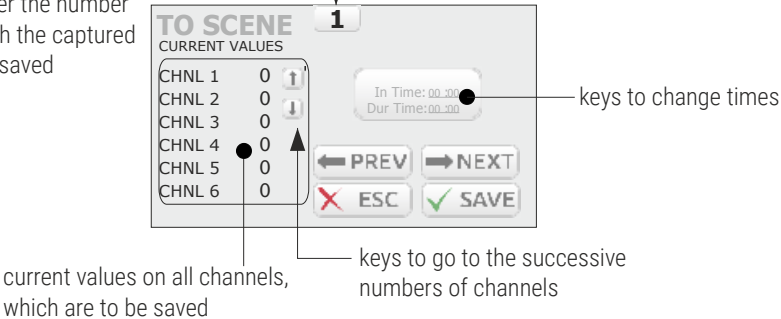
Scene copying screen contains 2 fields: **[FROM]** and **[TO]** which allow you to specify the source scene and the target scene between which the values are to be copied.

5.3.3 Scene capture

Scene capture option allows to save current values on the output channels to the selected scene.

Scene capture screen includes:

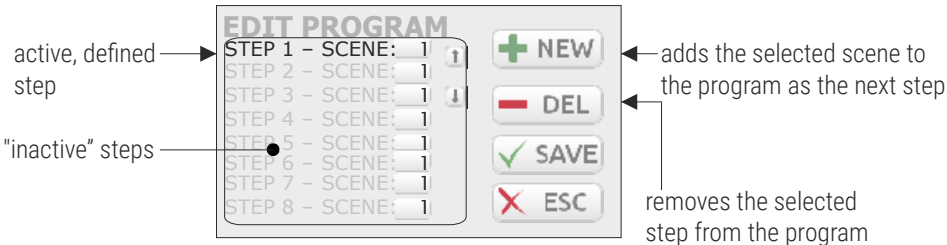
scene number field in which the user can enter the number of scene to which the captured values are to be saved



[NEXT] and [PREV] keys allow to switch between the scenes.

5.3.4 Program edit

The program edit screen shows a list of 64 steps and scenes corresponding to these steps.



5.3.5 Playback

The playback screen [PLAY] allows to preview the created scenes and program. On the screen, there are keys to play and stop the program and the

field to select a scene, as well as play and stop keys for the selected scene. The [BACK] key which exits the screen.

5.3.6 *No signal*

By using the **[NO DMX SIGNAL]** screen, you can program the operation of the device in the absence of DMX signal.

Available options:

- **ON** – all channels will be enabled at 100%
- **OFF** – all channels will be disabled
- **SLOW TURN OFF** – there will be a slow blanking of all channels
- **HOLD** – the last value present before the signal loss will be saved on the channels
- **SCENE** – the selected scene will be displayed
- **PROGRAM** – the program will be played

5.4 Patch

The **[PATCH]** menu allows to set the merge mode for inputs and DMX address on the various inputs, as well as to determine whether the channel is controlled with double-precision (using two DMX channels).

Settings can be changed separately for the selected channels **[SINGLE]** or in groups for a fixed range of channels **[RANGE]**.

Selecting **[RANGE]** takes you to the screen for group settings. This screen includes the following fields:

The screenshot shows the 'RANGE' settings screen. It has a title 'RANGE' at the top left. Below it is a table with two columns: 'SOURCE' and 'ADDRESS'. The rows are: 'DMX 1' with address '1', 'DMX 2' with address '1', 'ARTNET A' with address '1', 'ARTNET B' with address '1', 'ARTNET C' with address '1', and 'ANALOG' with address '1'. To the right of the table is a 'MERGE' dropdown menu currently set to 'DMX1', and a 'DOUBLE PRECISION' checkbox. At the bottom right are two buttons: 'ESC' with a red 'X' icon and 'SAVE' with a green checkmark icon. Annotations with arrows point to specific fields: one points to the 'FROM' field (set to '1') and the 'TO' field (set to '24'), with the text 'range of channels for which the changes are to be made'; another points to the 'MERGE' dropdown menu with the text 'selection list for the merge mode'; and a third points to the 'ADDRESS' column of the table with the text 'starting address for each type of source (channels are addressed sequentially)'.

SOURCE	ADDRESS
DMX 1	1
DMX 2	1
ARTNET A	1
ARTNET B	1
ARTNET C	1
ANALOG	1

FROM 1 TO 24

MERGE DMX1

DOUBLE PRECISION

ESC SAVE

Available values of the merge mode:

- **HIGH** – the highest of value
- **LAST** – last value
- **DMX1** – value from the DMX 1 input
- **DMX2** – value from the DMX 2 input
- **UNIVERSE 1** – value from the Art-Net 1 input
- **UNIVERSE 2** – value from the Art-Net 2 input
- **UNIVERSE 3** – value from the Art-Net 3 input
- **is DMX1/DMX2** – value from the DMX 1 input, if there is a signal, if not – DMX 2 input
- **is DMX1/DMX2 CAPTURE** – if DMX 1 and DMX 2 are enabled, value from the DMX 1 input is selected. If you disable DMX 1, value from the DMX 2 is selected only when it reaches the DMX 1 input value. This mode prevents abrupt changes in values.
- **is DMX2/DMX1** – value from the DMX 2 input, if there is a signal on it, if not – DMX 1 input

- **is DMX2/DMX1 CAPTURE** – if DMX 1 and DMX 2 are enabled, value from the DMX 2 input is selected. If you disable DMX 2, value from the DMX 1 is selected only when it reaches the DMX 2 input value.
- **is DMX1/UNVRS 1** – value from the DMX 1 input, if there is a signal on it, if not – UNIVERS 1 input
- **is DMX1/UNVRS 1 CAPT.** – if DMX 1 and UNIVERS 1 are enabled, value from the DMX 1 input is selected. If you disable DMX 1, value from the UNIVERS 1 is selected only when it reaches the DMX 1 input value.
- **is UNVRS 1/DMX1** – value from the UNIVERS 1 input, if there is a signal on it, if not – DMX 1 input
- **is UNVRS 1/DMX1 CAPT.** – if DMX 1 and UNIVERS 1 are enabled, value from the UNIVERS 1 input is selected. If you disable UNIVERS 1, value from the DMX 1 is selected only when it reaches the UNIVERS 1 input value.
- **ALWAYS ON** – channel is always enabled

Selecting **[SINGLE]** allows to set the same option for individual channels.

5.5 Settings

The **[SETTINGS]** menu includes the following categories:



CURVES - management of characteristics curves



ADMIN - administrator settings



ARTNET - Art-Net settings



FAN - fan settings



LCD - display settings



LAN - network settings

5.5.1 Curves

10 curves are available in the device: 5 preset and 5 user-definable. Preset curves can be previewed and copied. User's curves can be edited.

The **[CURVES]** screen includes 10 keys for all the curves:

- **LINEAR**
- **REVERSED**
- **SWITCHED**
- **LOGARITHMIC**
- **EXPONENTIAL**
- **USER 1 – USER 5**

Clicking on of the keys takes you to the preview of the curve. For pre-set curves, **[COPY]** and **[BACK]** keys are displayed next to the preview. For user's curves, **[EDIT]** and **[BACK]** keys are available.

Pressing the **[COPY]** key displays the copy window, where you can determine to which user's curve, and to what extent, the selected curve will be copied. Pressing the **[EDIT]** key displays windows with 12 points for which you can enter values. The curve will be drawn between the designated points. The curve can be created from 2 to 12 points.

NOTE! The first point of the defined curve must always have the x coordinate equal to 0.

Sample configuration of the user's curve:

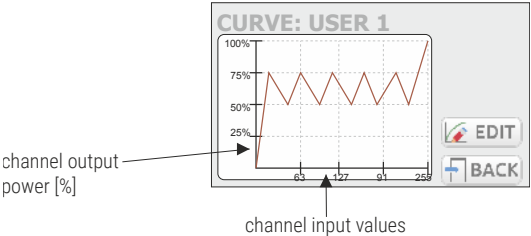
- 1. From the **[CURVES]** menu, select the user's curve key, for example **[USER 1]**
- 2. Press **[EDIT]**, the application displays a table of 12 coordinates of the points between which the new curve is drawn
- 3. Complete the table

x	y	x	y
0	0	139	50
23	75	162	75
46	50	185	50
69	75	208	75
92	50	231	50
115	75	255	100

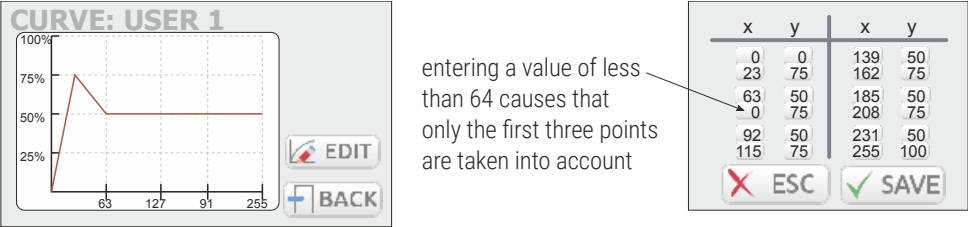
ESC

SAVE

- 4. To save the settings, press **[SAVE]**, a user-defined curve appears on the screen



Only the points for which the values on the x-axis are given incrementally are taken into account, e.g.:



5.5.2 Admin

Category **[ADMIN]** contains the administrator settings:

ADMIN DEFAULT CONFIG

DEVICE NR:

PASSWORD

ADMIN

EXPERT

USER

restoring the factory default configuration

setting the device number




by selecting this option, you can set the access password

administrator, technician and user password (a number in the range 0 - 9999)

device reset, the device stops in the bootloader and it is possible to upload new software
To go to the program, click on any key.

NOTE! If an incorrect administrator password is entered ten times (in each case, the message “NO RIGHTS TO ACCESS!” is displayed), the device will be blocked and you will need to contact customer service.

Switching between user accounts:

1. Click the button  (located on the start screen of the panel), it will cause the user logout
2. Click again in the padlock key , to display the login screen
3. Select the account that you want to log on and enter your password
4. Confirm 

The device has 3 users whose access levels are shown in the table below:

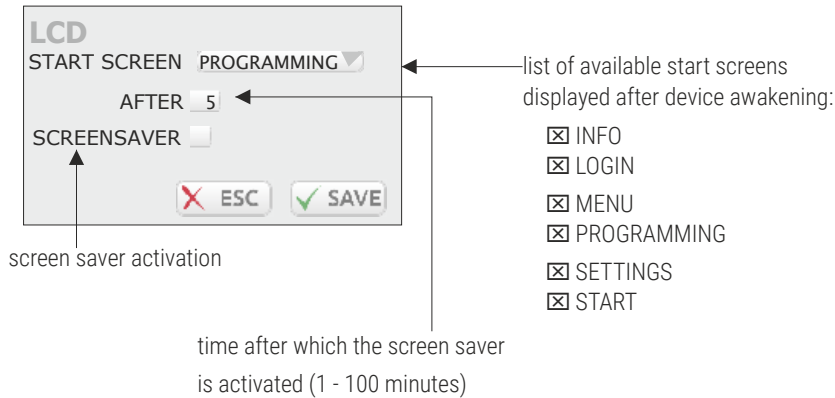
	No logging	User	Technican	Administrator
Start screen	✓	✓	✓	✓
Summary screen	X	✓	✓	✓
Channel preview screen	X	✓	✓	✓
Scene / program running	X	X	✓	✓
Channel settings	X	X	✓	✓
Program / scene edit	X	X	✓	✓
Channel patch	X	X	✓	✓
Curve, fan, display setting	X	X	✓	✓
Ethernet, Art-Net settings	X	X	X	✓
User and password management	X	X	X	✓

5.5.3 *Art-Net*

In the [ARTNET] menu, there are address settings [SUBNET] and [PORT] which allow you to select Univers for each of the three Art-Net input ports.

5.5.5 LCD

The display menu [LCD] includes the screen saver settings. You can determine whether the screen saver is to be run, and if so, after what idle time and which of the screens is to be displayed after the “awakening”.



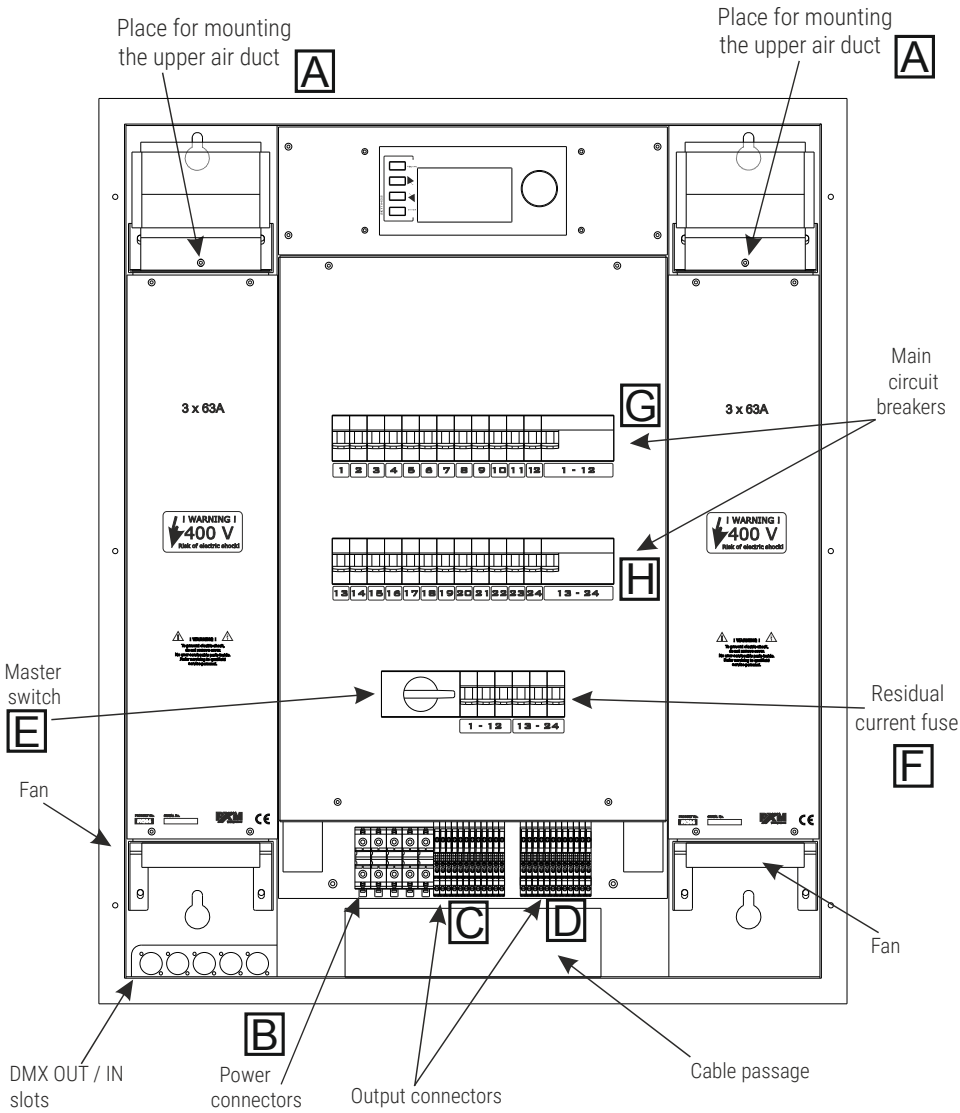
5.5.6 LAN

In the [LAN] menu, local network settings are available:

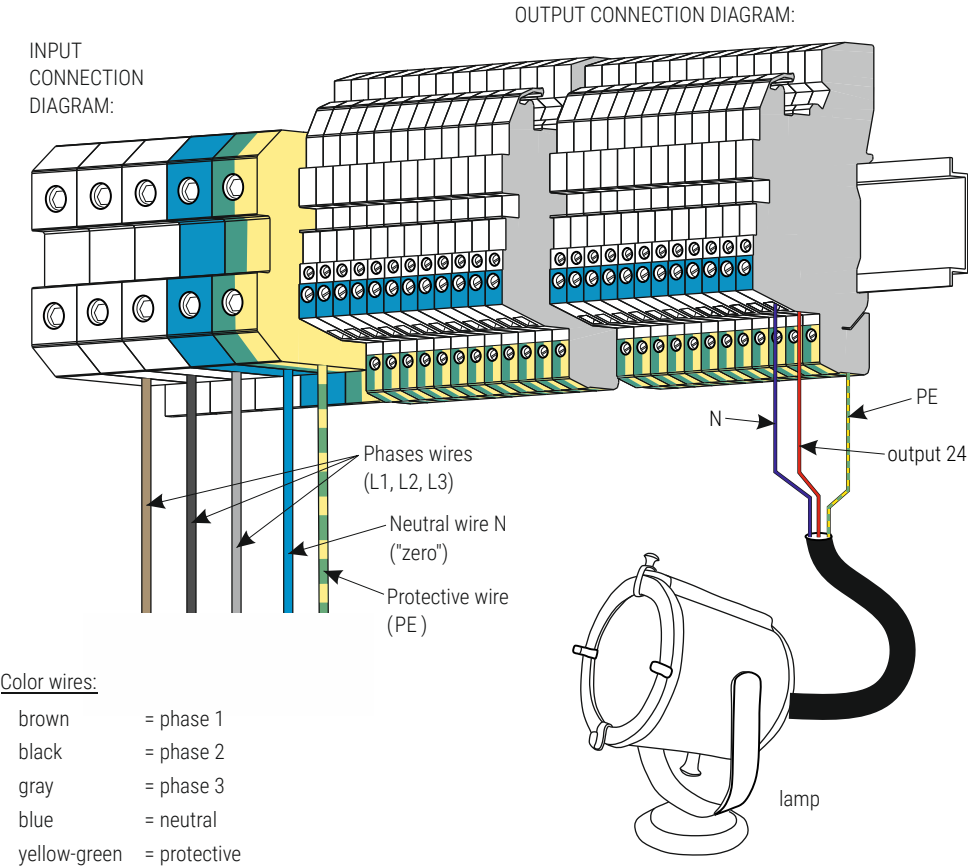
- IP
- MASK
- GATEWAY

6 Connection scheme

6.1 Dimmer view after opening the door



6.2 Connection scheme



The smallest cross section of an individual input cable is 25mm^2

The smallest cross section of an individual outpyt cable is $3 \times 2.5 \text{ mm}^2$

6.3 Installation steps

All electrical connections must be performed only by adequately qualified personnel!!!

1. Install anchor bolts in the wall according to the dimensions given in point 6.4 Arrangement of fixing holes. The size and type of anchor bolts depend on the "quality" of the wall. They must be chosen taking into account the weight of the dimmer, so that they would provide a safe and permanent fixing thereof. Do not use anchor bolts with a diameter of less than 12mm.
2. Remove the screws in the places marked with the letter "A" in the figure in point 6.1 Dimmer view after opening the door.
3. Pull out two upper ventilation ducts.
4. Attach the dimmer to the wall.
5. Insert the ventilation ducts.
6. Tighten screws securing the ducts – „A“.
7. Connect the power supply to the power connectors „B“.

NOTE! Pay special attention to the correct connection of the protective conductor.

8. Connect the receiver to the input connectors.

NOTE! Phase and zero conductors of one receivers **MUST** be connected to the same group of terminals (marked with letters "C" or "D" in the figure). Do not connect the phase conductor of one receiver to the group "C", and zero conductor to the group "D" and vice versa.

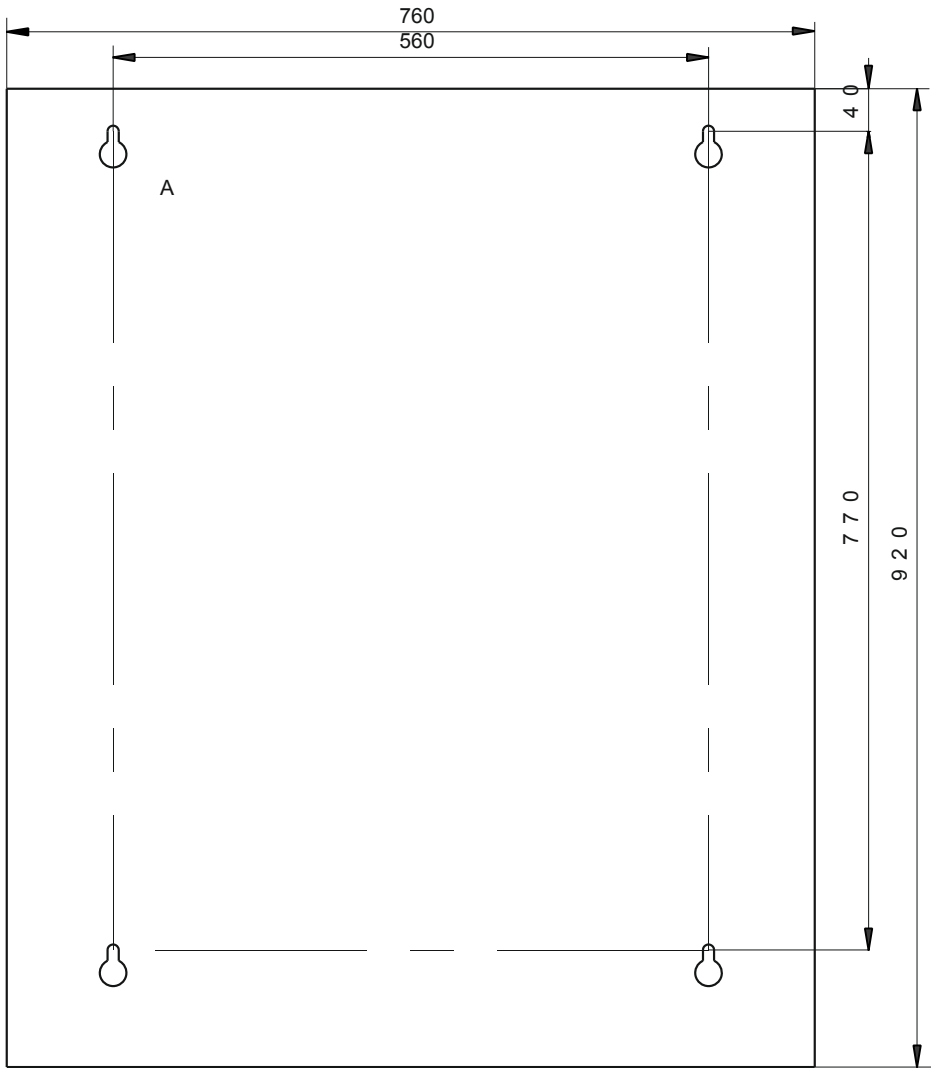
9. Switch off all fuses and circuit breakers.
10. Turn on the external power switch.
11. Turn on the master switch “E”, and the main circuit breakers “F”. The control panel should turn on.

NOTE! If the control panel does not turn on and an acoustic alarm is started, immediately turn off the power supply and check if the power cables are properly connected. An acoustic alarm informs about improper connection of phases.

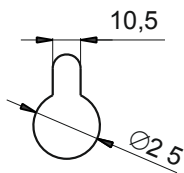
Turn on the two circuit breakers “G” and “H”.

12. You can turn on the fuses for the output channels and check the operation of the dimmer.
13. Connect DMX cables.
14. Program the dimmer in accordance with the description in this manual.

6.4 Arrangement of fixing holes

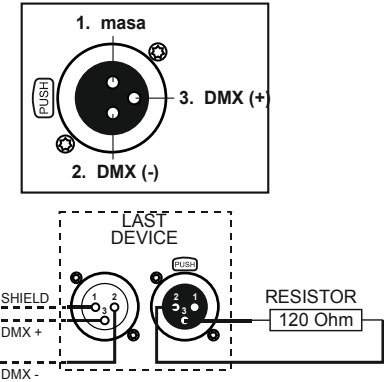


DETAIL A:



dimensions are given in milimeters

6.5 DMX signal connection

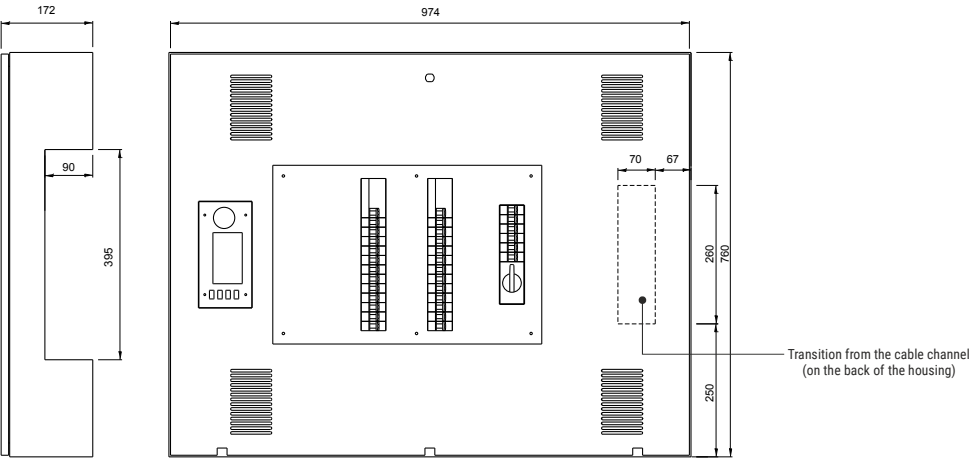


- 1. The recommended cable for the connection is RS485 (two wires in a shield).
- 2. Devices must always be connected in series.
- 3. To split the DMX line, use the Splitter

DMX (e.g. PX716).

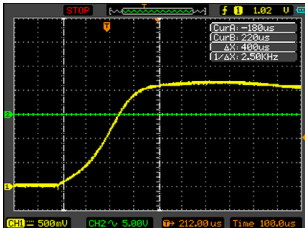
- 4. In the case of a larger number of devices or long distances use the Repeater DMX (e.g. PX097). It is a DMX signal amplifier.
- 5. It is necessary to install a terminator, i.e. 120 Ohm resistor, in the last device.

7 Dimensions



8 Technical data

type	PX314
DMX lines	2
Art-Net Universe	3
optically insulated DMX line	yes
circuit break detection	yes
overvoltage protection	yes
faulty circuit control	yes
residual current protection	yes (the ability to protect each circuit individually)
continuous measurement	voltage and voltage frequency of the current of each channel
built-in systems	soft-start, soft-on, even-off
number of characteristics	10 (5 programmable)
resolution of control	1 or 2 bytes
Touch Screen resolution	480 x 272px (4,3")
menu operation	4 buttons + knob
preheat	yes
output merge	yes (13 priorities)
output power limiter	yes
attenuation	according to standard PN-EN 55014



rise time of the suppressor choke:
at least 400µs

output carrying capacity	24 x 3600W – continuous resistive load 24 x 2400VA – continuous inductive load (conventional and neon transformers)
output protection	full electronic protection + automatic 16A fuses
built-in master switch	yes
fans	electronic control
input slots	35mm ² terminals
output slots	4mm ² terminals
power supply	3 x 230V AC
current consumption	3 x 128A (at full load)
weight	70kg
dimensions	width: 760mm height: 974mm depth: 172mm

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DECLARATION OF CONFORMITY

PXM Marek Żupnik spółka komandytowa
Podłęże 654, 32-003 Podłęże

we declare that our product:

Product name: AC+ Dimmer 24 x 3600 W

Product code: PX314

meets the requirements of the following standards, as well as harmonised standards:

PN-EN IEC 63000:2019-01	EN IEC 63000:2018
PN-EN 62368-1:2015-03	EN 62368-1:2014
PN-EN 61000-4-2:2011	EN 61000-4-2:2009
PN-EN IEC 61000-6-1:2019-03	EN IEC 61000-6-1:2019
PN-EN 61000-6-3:2008	EN 61000-6-3:2007

and meets the essential requirements of the following directives:

2011/65/UE **DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL** of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment
Text with EEA relevance.

2014/30/UE **DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL** of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility (recast)
Text with EEA relevance.

2014/35/UE **DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL** of 26 February 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits.


Marek Żupnik spółka komandytowa
32-003 Podłęże, Podłęże 654
NIP 677-002-54-53



mgr inż. Marek Żupnik.