PX741

Trailing Edge Dimmer

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

PX741 is an intelligent transistor dimmer with phase cutting where control is carried out on the falling edge (the so-called trailing edge dimming).

The module controls four channels 200W each and has an built-in system of interference suppression, fuses and signal controls. The device has the DMX512 input, analogue inputs 0 – 10V or a possibility to link outer buttons and control them in compliance with one of four functions. The dimmer offers a lot of possibilities to adjust the control characteristic.

Each of the four output channels can be configured individually.
The settings consist of the following parameters:

- the control mode (DMX, analogue, buttons)
- DMX address
- the reaction of the lack of the DMX signal
- the choice of key functions together with the full regulation of reaction time
- advanced functions and parameters allowing to adjust control to the type and characteristic
  of capacity (a minimum and maximum level of control, a characteristic curve, a function of pre-glow)

The dimmer is designated to work with capacity of R and RC types:

- dimmable LED bulbs
- LEDs connected with a dimmable adapter of the CC type
- traditional bulbs
- halogen bulbs 230V
- halogen bulbs 12V connected with the dimmable electronic transformer

The device is closed in the standard housing designated for bar assembling.

2 Safety conditions

Dimmer PX741 is powered directly from standard 230V grid, what can cause electric shock when safety rules are not observed. Therefore it is necessary to observe the following:

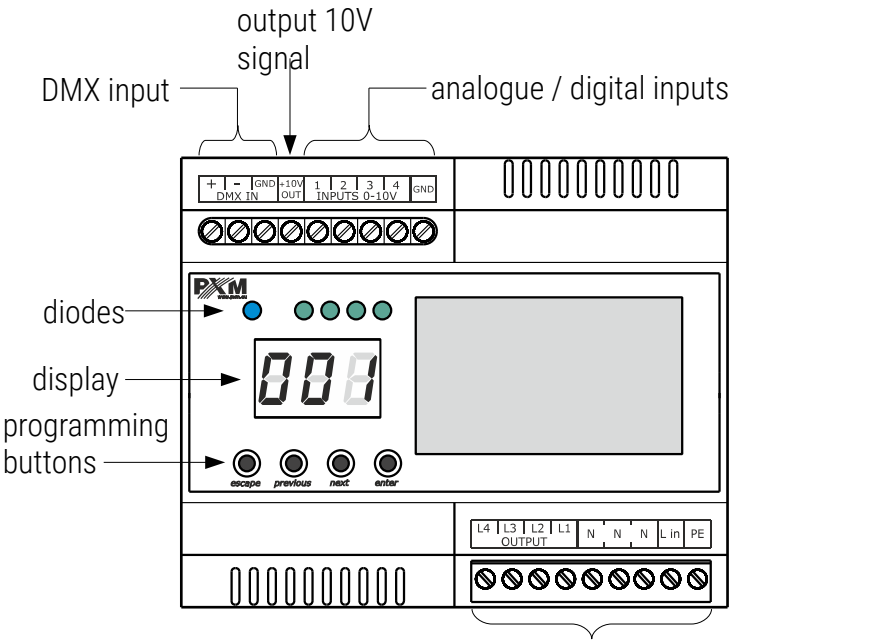
1. Installation, particularly power connection, should be performed by a person holding the appropriate qualifications, according to the description in the user manual.
2. Dimmer can be connected to socket which has protecting installation – separate PE strand – in working order only (3-strand grid).
3. All the conductors should be protected against mechanical and thermal damage.
4. In the event of damaging any conductor, it should be replaced with a conductor of the same technical data and attestation.

5. To connect the devices to the dimmer, use only wires with a cross-section of not less than 0.75mm.
6. Dimmer can be installed in closed electrical switching stations only, with restricted access for people who does not handle proper qualifications 230V supplied devices maintenance.
7. Power input must to be protected with an external residual current breaker with overload of 6A rated current and B-type characteristic.
8. After the installation is completed, check the neutralization efficacy of all powered devices.
9. All repairs demanding casing opening should be made with cut off power supply.
10. The device should be strictly protected against water and other liquids.
11. All sudden shocks, particularly dropping, should be avoided.
12. Device with damaged (bent) casing should not be connected to the mains.
13. The device cannot be turned on in places with humidity exceeding 90%.
14. The device cannot be used in places with temperature lower than +2°C or higher than +40°C.

NOTE!!!

1. The inappropriate connection of a protective wire creates the risk of electric shock.
2. The inappropriate connection of the neutral wire results in the faulty operation of a dimmer.
3. The dimmer can regulate exclusively the circuits (of capacity) of the resistive type or the capacities one.

3 Connectors and control elements



Supply connector (starting from the left L4, L3, L2, L1, 3 x N, L in, and PE)
L1 – L4 are the output (controlled) phases

4 Designation of displayed messages

 address of the DMX device – the elementary position in the MENU

 setting parameters for all the channels simultaneously

 setting parameters for each channel separately

 blank screen – screen saving ON / OFF

 current temperature value

 total working time

 firmware version

 reset to factory default settings

 control source selection

 control curve selection

 control range selection

 setting a linear control curve

 setting a switched control curve

 setting a logarithmic control curve

 setting an exponential control curve with index 2

 setting an exponential control curve with index 3

 minimum level of an output connection while rising

 minimum level of an output connection while falling

 maximum control level

 forcing a minimum output level

 extension of an output curve to the full control range

 channel control with the DMX signal

 channel control with the analogue input

 channel control with buttons

 setting the DMX address

 selection of the reaction mode to no DMX signal

 calibration of analogue inputs

 selection of one of four control function

 rise time in the push-button mode (from min to max)

 duration in the push-button mode (in function 4)

 falling time in the push-button mode

 minimum level which can be reached while dimming in function 2

 scene: a control value for no DMX signal

 settings for the first channel

 total working time of the device

 total duration of channel control

 setting seconds

 setting minutes

 setting hours

 setting a day number

 setting a year

 infinity

 inversion of the selected control curve

 setting a normal (non-inverted) selected control curve

 confirmation

 switching off the outputs

 switching on the outputs for 100%

 setting the first function

 phase detection

5 Device programming

After switching on the device, the basic MENU item will appear (DMX address). To access the main menu, press "*enter*", and the display will show *ALL*. Press "*prev*" or "*next*" to select appropriate menu and press "*enter*" to confirm your selection.

5.1 Button features

esc – goes back to the previous MENU level or discards changes made

prev – scrolls to the previous feature on the same MENU level or decreases the parameter's value

next – scrolls to the next feature on the same MENU level or increases the parameter's value

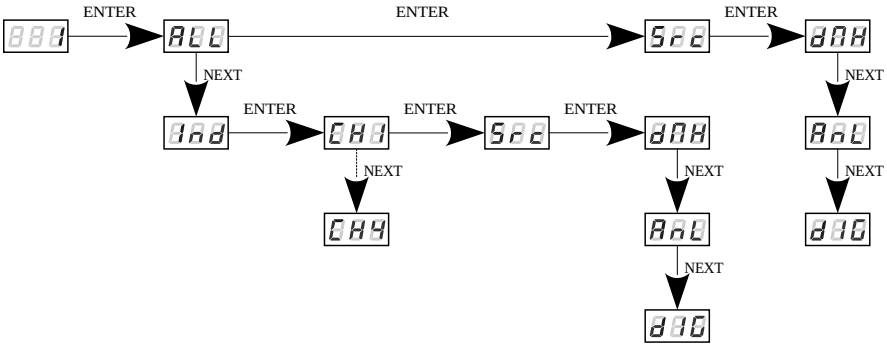
enter – enters the next MENU level and confirms changes made

5.2 Setting control modes

The menu of the PX741 device allows to set the control mode of the device. Each of the device channels can be controlled with:

- the DMX *dMX* signal ()
- the analogue input *AnL*
- the buttons *diG*

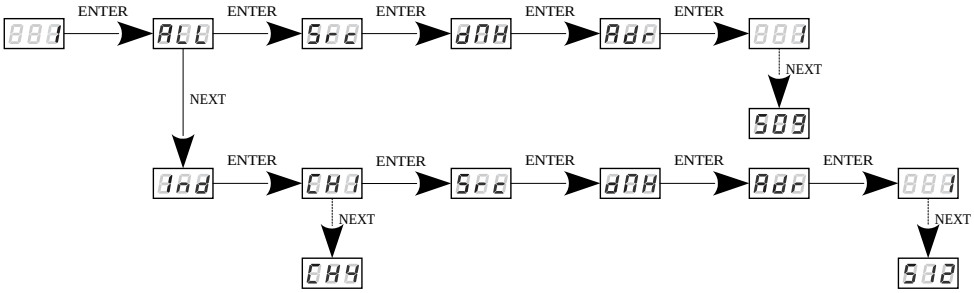
Setting the modes, the curve and the range of control is possible individually (*Ind*) for one of four channels (*CH1 – CH4*) or collectively(*ALL*) for four channels simultaneously, the scheme is on the next page.



5.2.1 DMX control

DMX addressing

In this menu, the DMX address can be set for individual channels individually or collectively for all the channels simultaneously and then the set address will be designated to the first channel and the next DMX addresses will be designated to next channels. For example, if the module occupies 4 DMX channels and for the first one will be assigned channel 100, then the fourth one will be assigned to 103 DMX channel. The address programmed this way cancels all the previously individual settings of each channel.



Reaction to the lack of the DMX signal

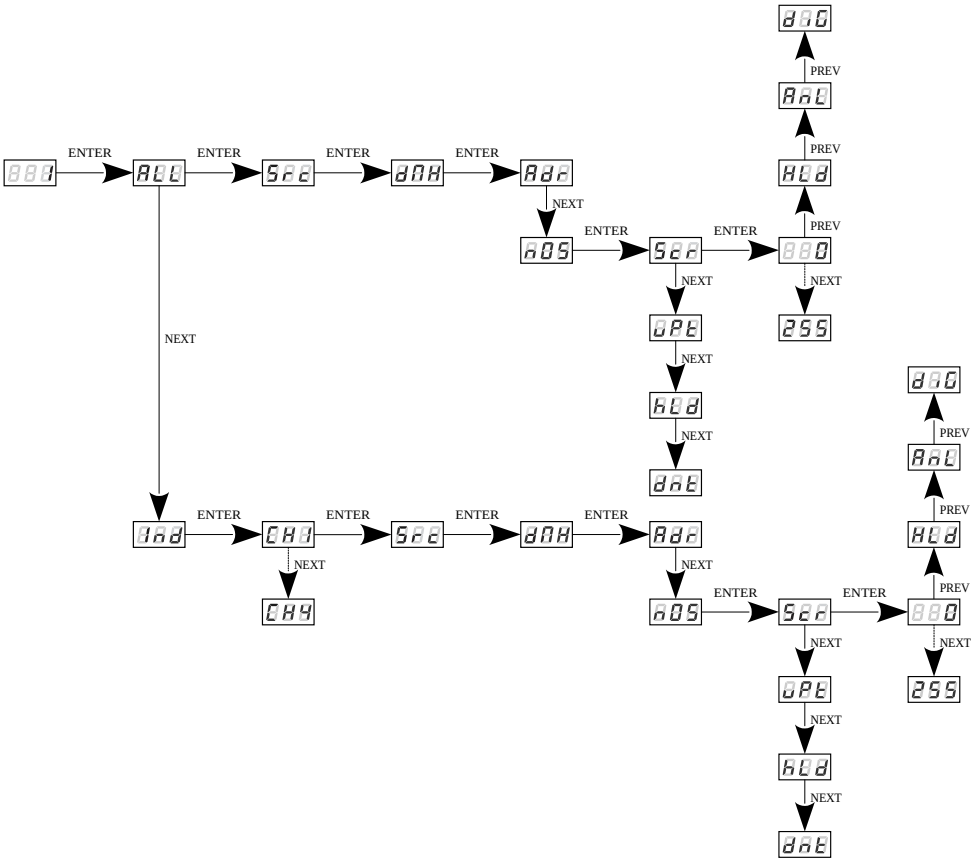
This function is used both to secure the installation against disappearance of the DMX signal and to achieve the desired value without the connection of an outer controller. On activating it, in case of no DMX signal, the module will realize the selected option individually. The realized option will be stopped automatically after re-connecting the DMX signal and the module will realize commands sent through the DMX line again.

Sc – programming the stage value in the range 0 – 255, for which the available options are:

- maintaining the last value *Hld*
- a signal from the analogue inputs *AnL*
- a signal from the buttons *diG*

Apart from that, the transition parameters can be defined:

- up time – *uPt* – the rise time in the push-button mode (from min to max), time from 0 seconds to 24h
- hold – *hLd* – duration in the push-button mode (in function 4), time from 0 seconds to infinity
- down time – *dnt* – falling time in the push-button mode, time from 0 seconds to 24h

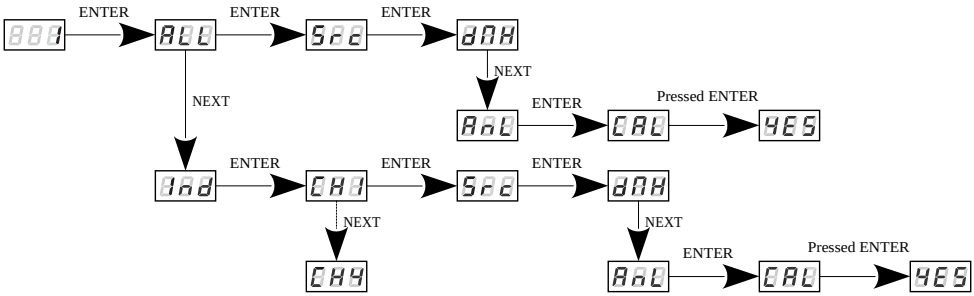


Setting time:

- *InF* – infinity time
- *SEC* – seconds
- *Min* – minutes
- *Hr* – hours
- *dAY* – days

5.2.2 Analogue control

The control source from the analogue inputs can be set for each channel individually or collectively for all of them. Calibration should be carried out to ensure that the inputs work correctly. In order to do it, the maximum value should be set in the input and the *CAL* option should be selected, and then the message *YES* should be confirmed with the key "*enter*".



5.2.3 Control with buttons

The control source from the digital inputs (with the buttons) can be set for each channel individually or collectively for all of them.

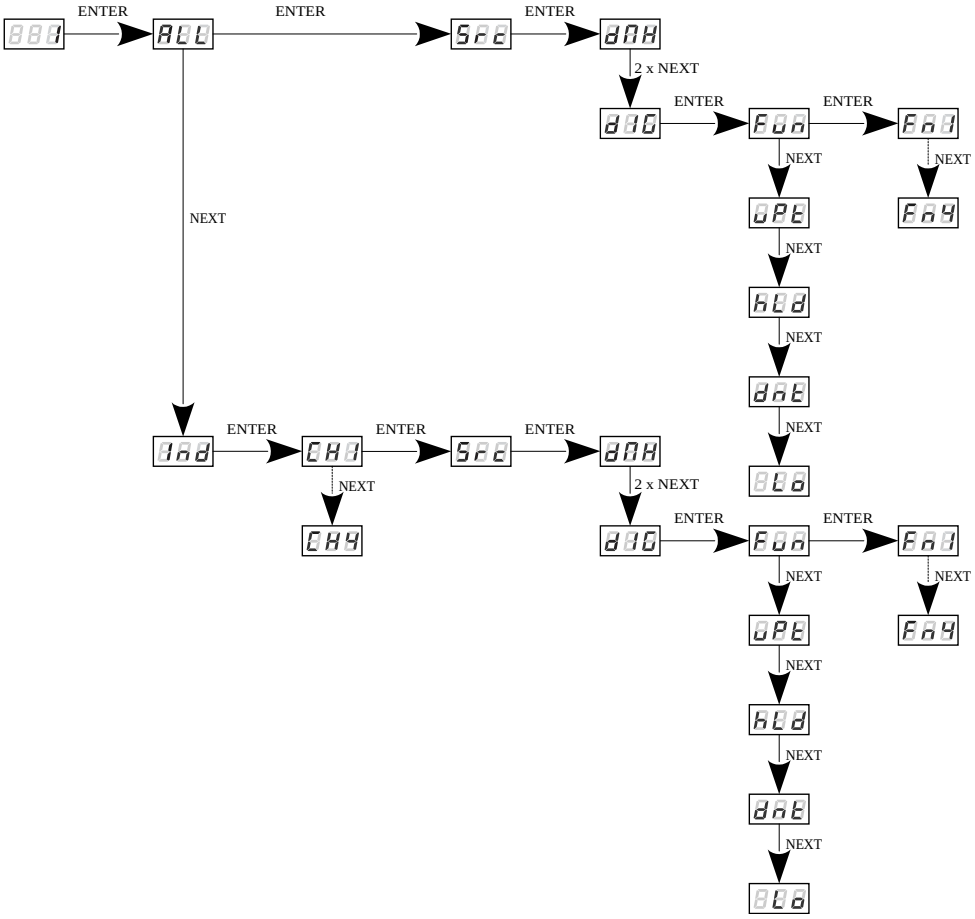
The first step is to select one of four functions *Fn1 – Fn4* (described on the next page), and then to set its parameters:

uPt – rise time

hLd – duration

dnt – falling time

Lo – a minimum level which can be reached while dimming function 2 (0 – 50%)



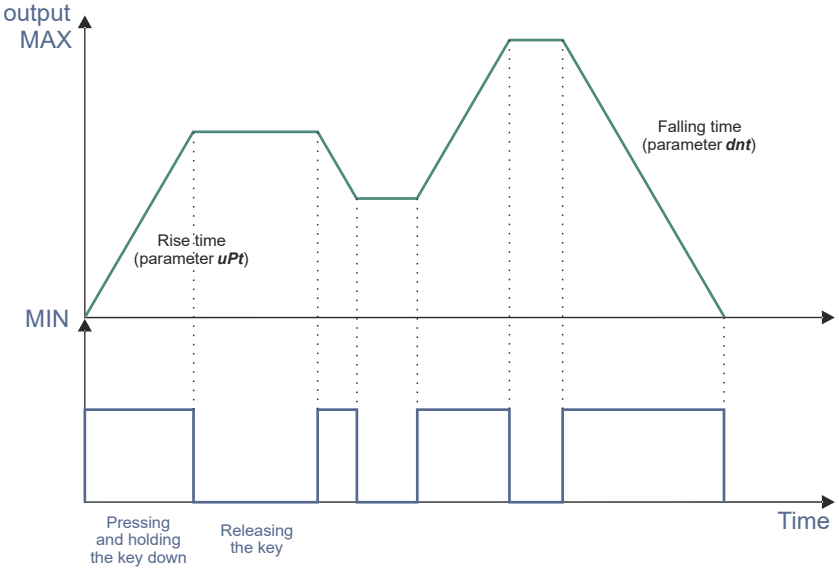
Setting times:

- *InF –* infinity time
- *SEC* – seconds
- *Min –* minutes
- *Hr –* hours
- *dAY* – days

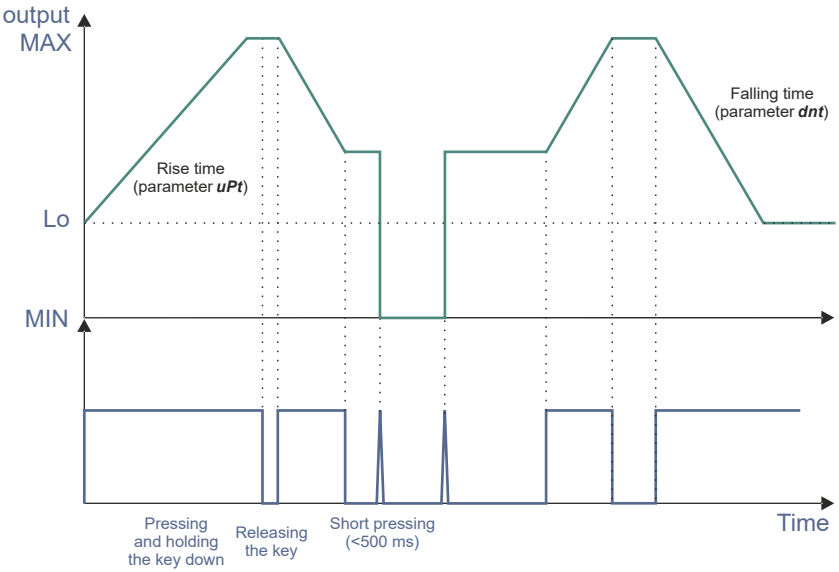
Function	Available parameters
1	*uPt, dnt*
2	*uPt, dnt, Lo*
3	*uPt, dnt*
4	*uPt, hld, dnt*

Function diagrams for external button control:

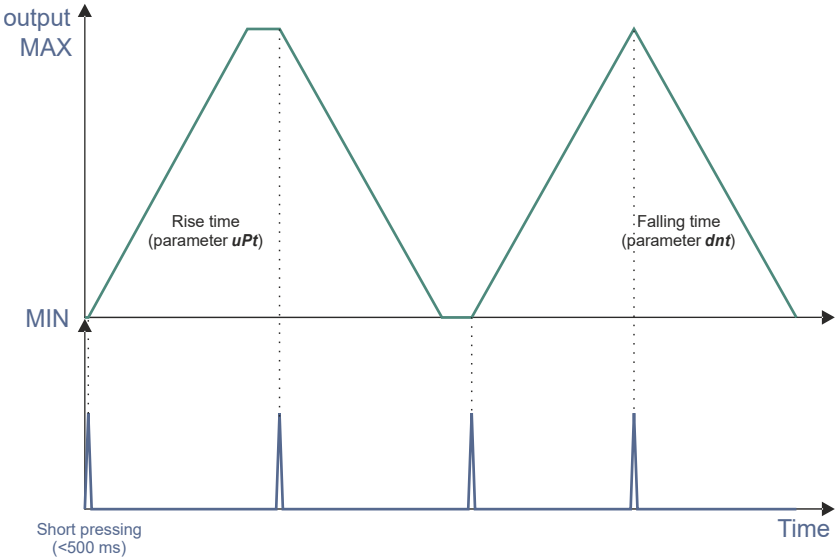
Function one



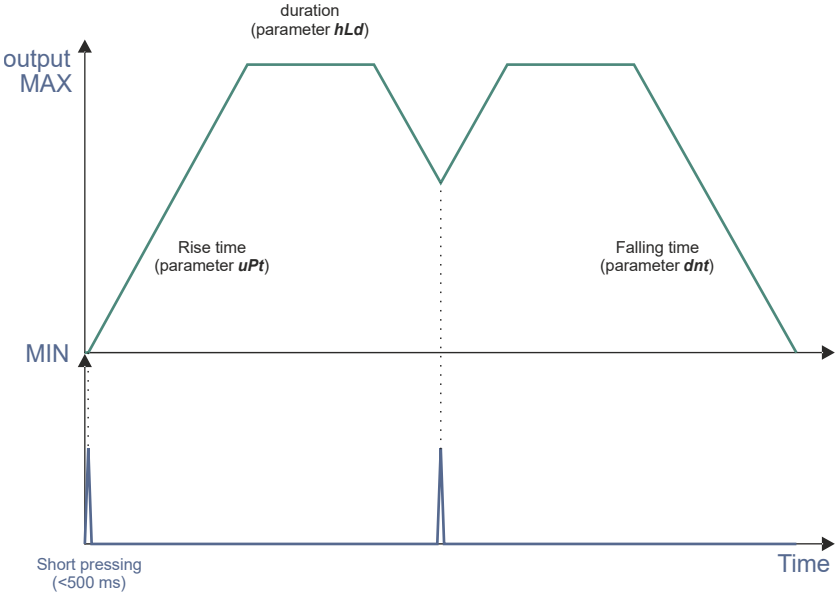
Function two



Function three



Function four



Each next short pressing of a key when the function realizes the parameter ***hLd*** causes that the time of the parameter is counted from 0 (it reset the time elapsed), prolonging the operation of the function at the same time. The value of this parameter is only taken into consideration in the fourth function. It is ignored in other three functions

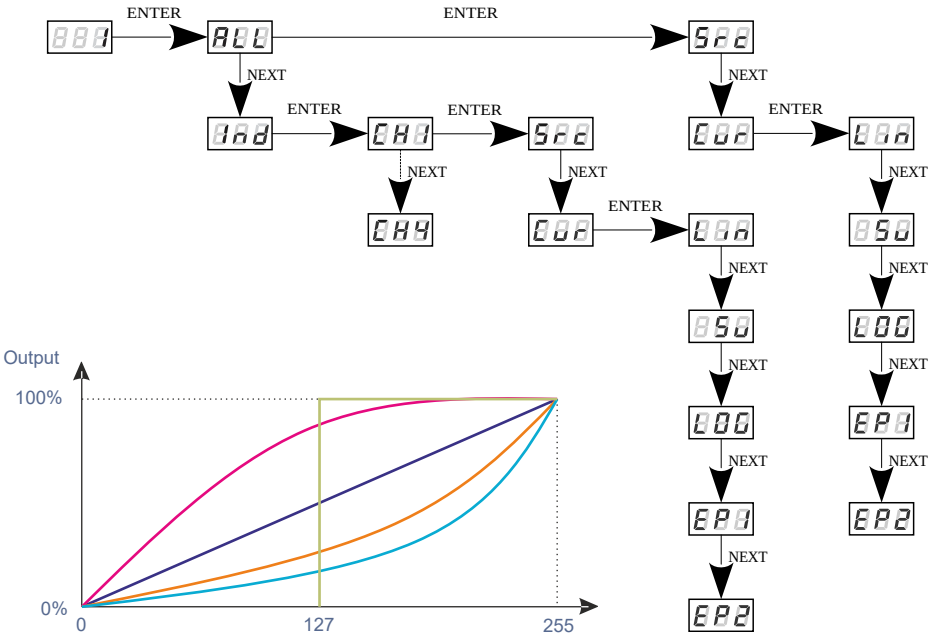
5.3 Choice of the control curve

One of five control curves of the output can be selected for each channel:

- linear ***Lin –*** the value on the output is linearly proportionate to the control value
- switched ***Su*** – the two-stage characteristic
- logarithmic ***LOG***
- exponential ***EP1*** with index 2
- exponential ***EP2*** with index 3

The following options can be set for each control curve:

- normal ***nor*** – the value on the output is directly proportional to the value on the input and in accordance with the chosen characteristic
- inverted ***inu*** – the value on the output is inversely proportional to the value on the input and in accordance with the selected characteristic



The curves:

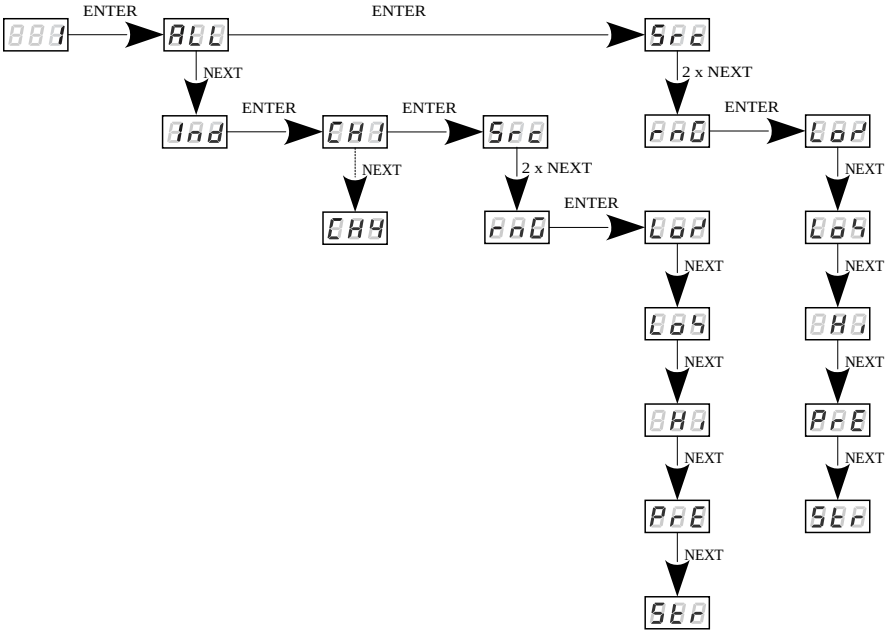
- linear
- switched
- logarithmic
- exponential with index 2
- exponential with index 3

5.4 Control range

The minimum and maximum control values and the manner of behavior while reaching the limit values can be defined for each channel:

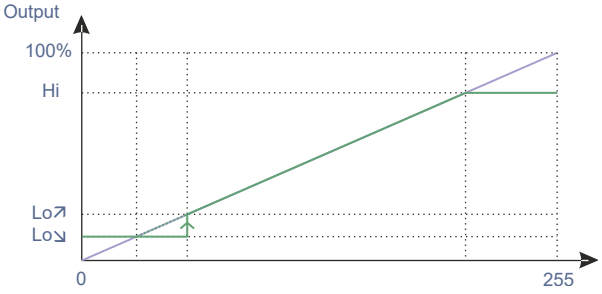
- the minimum level of connecting the output while rising
- the minimum level of connecting the output while falling

- the maximum level of control *Hi*
- forcing the minimum status on the output *PrE* (when the channel is not controlled)
- extending the output curve t the full control range *Str*

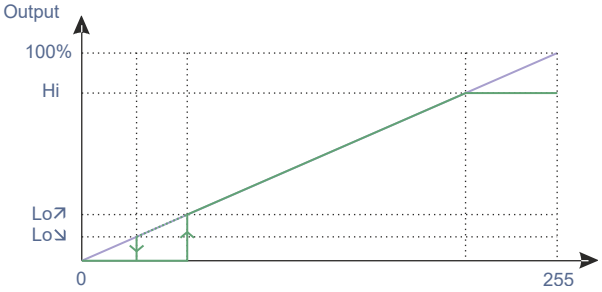


<u>Below there are exemplary diagrams of control for the linear curve:</u>

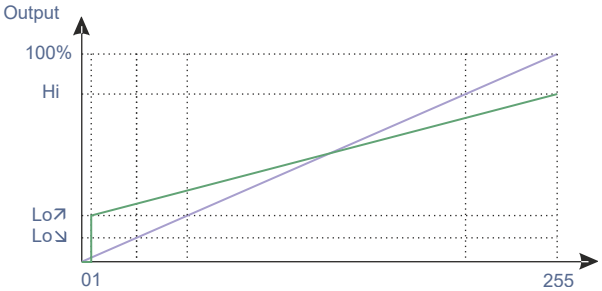
a) Str = OFF, PrE = On



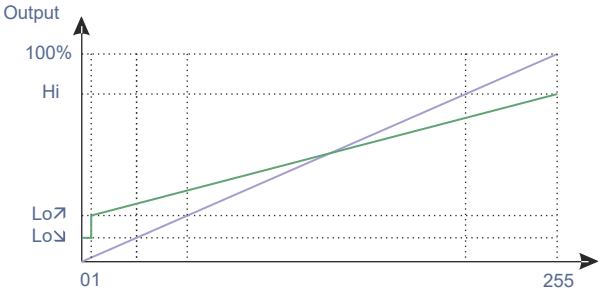
b) Str = OFF, PrE = OFF



c) Str = On, PrE = OFF



d) Str = On, PrE = ON



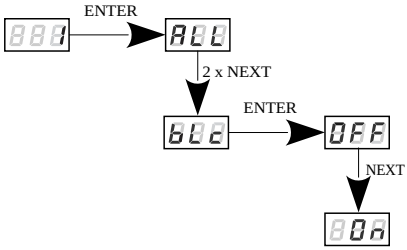
The curves:

control level

value on the output

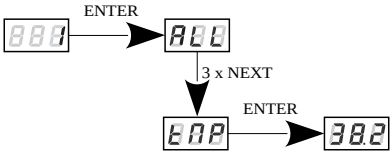
5.5 Screen saving

The device was equipped with the possibility to switch off backlights for LED displays and signal diodes. The activated option ***bLc*** switches off the display after a period of one minute of inactivity (when the buttons are not used). The device is still working without interference with other parameters. To activate backlights, any key should be used.



5.6 Temperature

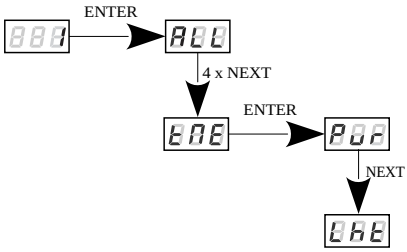
The device was equipped with the possibility to read the current temperature inside the device. The reading is given in degrees Celsius [°C].



The dimmer has temperature protection. Above +60°C the outputs are completely switched off. They will be switched on again when the temperature drops to +50°C.

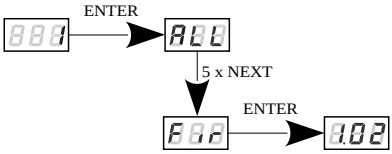
5.7 Working time

Dimmer has been equipped with the ability to read the total working time of the ***Pwr*** device and the total time of actuation of the ***Lht*** channels.



5.8 Firmware version

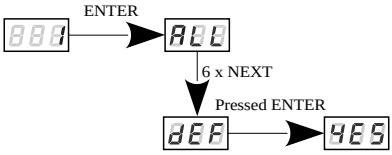
To verify the latest version of firmware, the option ***Fir*** should be selected and then the key "***enter***" should be pressed to confirm.



5.9 Default settings

To restore the factory default values, the ***dEF*** option should be selected and the key "***enter***" should be kept longer. Then, when the message ***YES*** appears, confirm with the key "***enter***".

It is also possible to exit from the level of this menu without the return to the factory default settings, in this case the key "***esc***" should be selected.



Default device settings:

- Screensaver: OFF
- DMX address: 1
- control mode: DMX
- Button control: function 2
- Rise time (button control): 5s
- Duration (button control): 5s
- Fall time (button control): 5s
- Control curve: linear
- Curve characteristics: normal
- No signal: scene value 0

5.9.1 Phase Detection Error – PHA

When the device displays a PHA message, please contact service.

6 Indication lights

Dimmer is equipped with 5 indicators signaling:

Indicator	Action	Function
greens	is on	channel drive power indication
blue DMX	flashing	receiving (IN) / transmitting (OUT) DMX
	fast flashing	temperature exceeded (power is limited)
	is off	no DMX signal

7 RDM – available parameters

The PX741 supports the DMX-RDM protocol. DMX protocol allows only of a one-way data transmission, while its extension the RDM protocol can transmit information in two directions. This makes possibility of monitoring activities of the compatible devices. Thanks to RDM some available settings of compatible devices may be programmed using this protocol.

List of RDM parameters supported by the PX741:

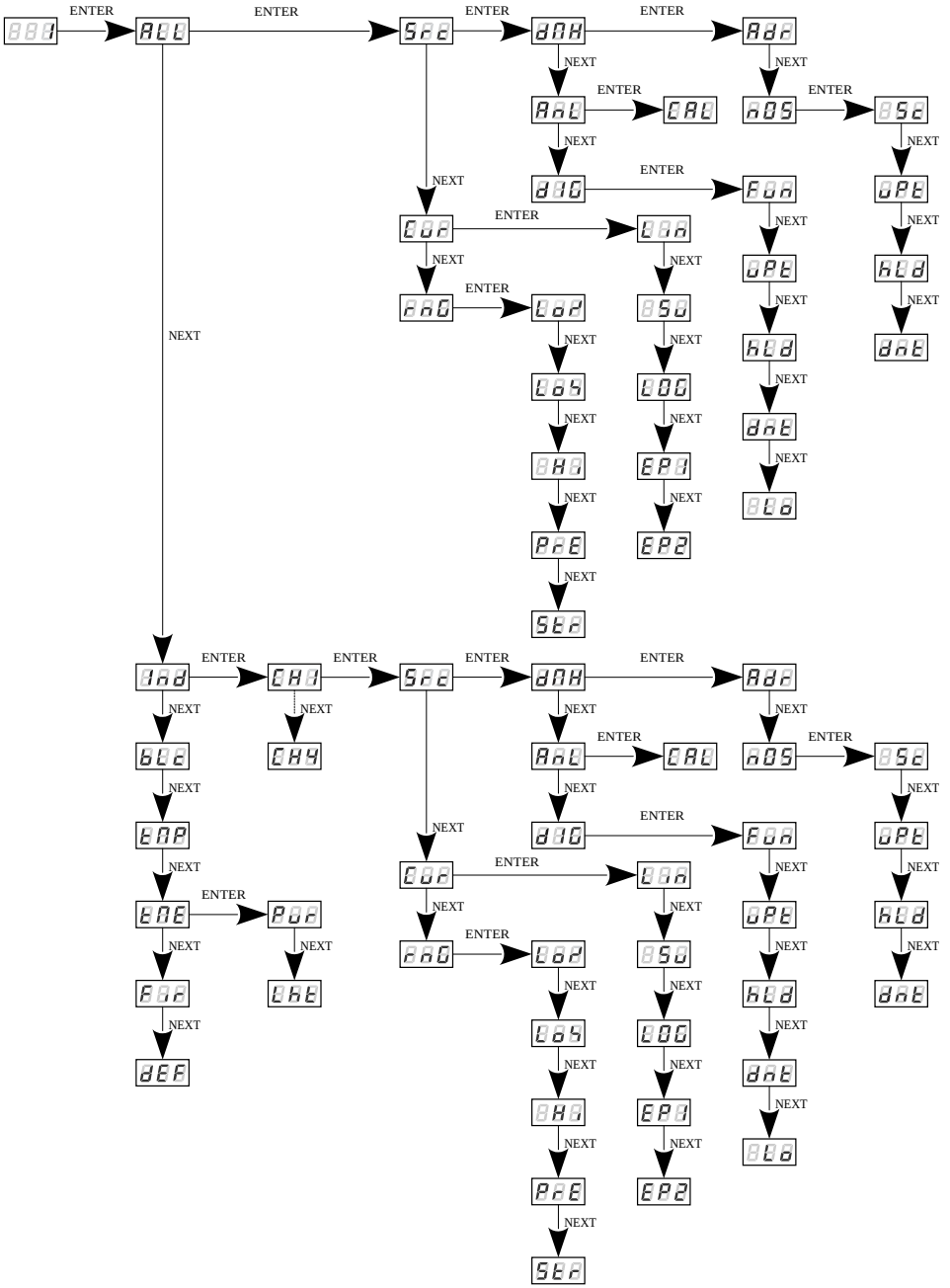
Parameter name	PiD	Description
SUPPORTED_PARAMETERS	0x0050	all supported parameters
PARAMETER_DESCRIPTION	0x0051	description of additional parameters
DEVICE_INFO	0x0060	information concerning the device
FACTORY_DEFAULTS *	0x0090	device default settings
SOFTWARE_VERSION_LABEL	0x00C0	firmware version of the device
DMX_START_ADDRESS *	0x00F0	DMX starting address of the device; Range 1 – 509
IDENTIFY_DEVICE *	0x1000	device identification; Two states are possible: identification is off (0x00 value) and identification is on (0x01 value).
DEVICE_MODEL_ DESCRIPTION	0x0080	device description, e.g. name
MANUFACTURER_LABEL	0x0081	manufacturer description, e.g. name

Parameter name	PiD	Description
DEVICE_LABEL *	0x0082	additional device description; It is possible to enter an additional device description using up to 32 ASCII characters
DMX_PERSONALITY *	0x00E0	DMX operational mode
SENSOR_DEFINITION	0x0200	information on the selected temperature sensor
SENSOR_VALUE	0x0201	information about sensors
DEVICE_HOURS	0x0400	operating time counted
CONTROL_HOURS	0x0401	time of channel control
DIGITAL_MODE	0x8039	setting the control mode of the channel with the buttons
DIGITAL_RISE_TIME *	0x8056	setting the rise time for control with the buttons in range 0 – 24h
DIGITAL_LAST_TIME *	0x8057	setting the duration for control with the buttons in range 0 – 24h or infinity (0xFFFFFFFF)
DIGITAL_FALL_TIME *	0x8058	setting the fall time for control with the buttons in range 0 – 24h
DIGITAL_MIN_LEVEL *	0x8059	setting the minimum level which can be reached while dimming for the control mode with the buttons in range 0 – 50%
OUTPUT_CURVE *	0x8049	selection of the control curve in range 0 – 24h
OUTPUT_CURVE_INVERT *	0x804F	selection of the invert function for the previously set 0 – normal, 1 – inverted

Parameter name	PiD	Description
MINIMUM_LEVEL_INC. *	0x804A	minimum level of connecting the output while rising in range 0 – 100
MINIMUM_LEVEL_DEC. *	0x805A	minimum level of connecting the output while falling in range 0 – 100
MAXIMUM_LEVEL*	0x8048	maximum level of control in range 0 – 100
PREHEAT *	0x805B	forcing the minimum level on the outputs (when the channel is not controlled); 0 – switching off, 1 – switching on
STRECH_OUTPUT *	0x805C	extending the output curve to the full control range; 0 – switching off, 1 – switching on
NOS_VALUE *	0x801C	setting the reaction to the disappearance of DMX signal
NOS_RISE_TIME *	0x805D	rising time setting in range 0 – 24h
NOS_LAST_TIME *	0x805E	duration setting in range 0 – 24h or infinity (0xFFFFFFFF)
NOS_FALL_TIME *	0x805F	falling time setting in range 0 – 24h

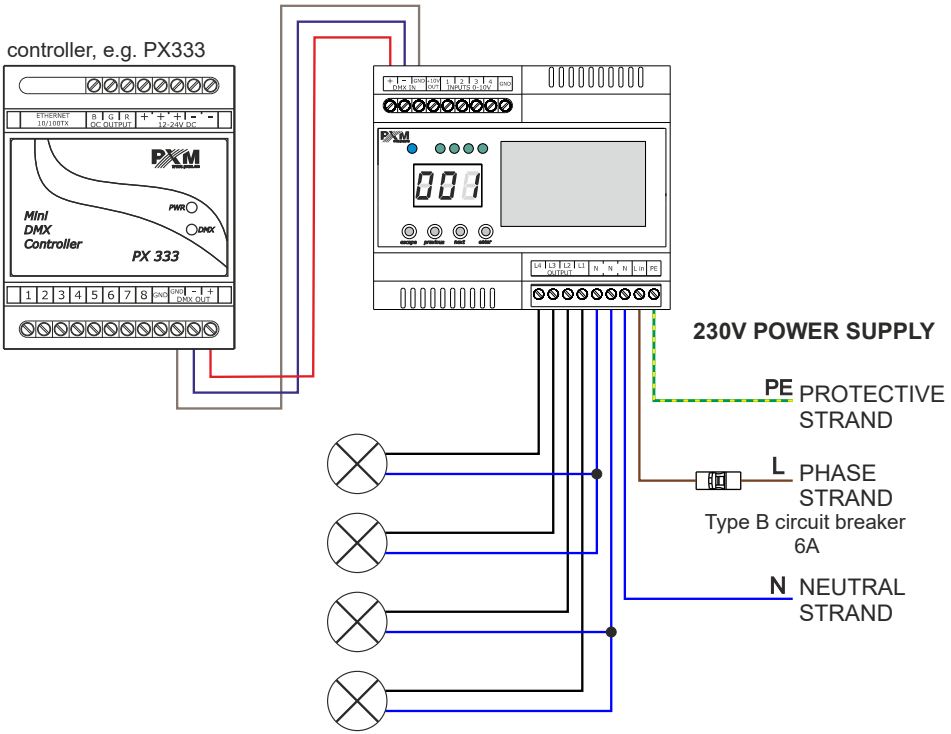
* - editable parameter

8 Programming

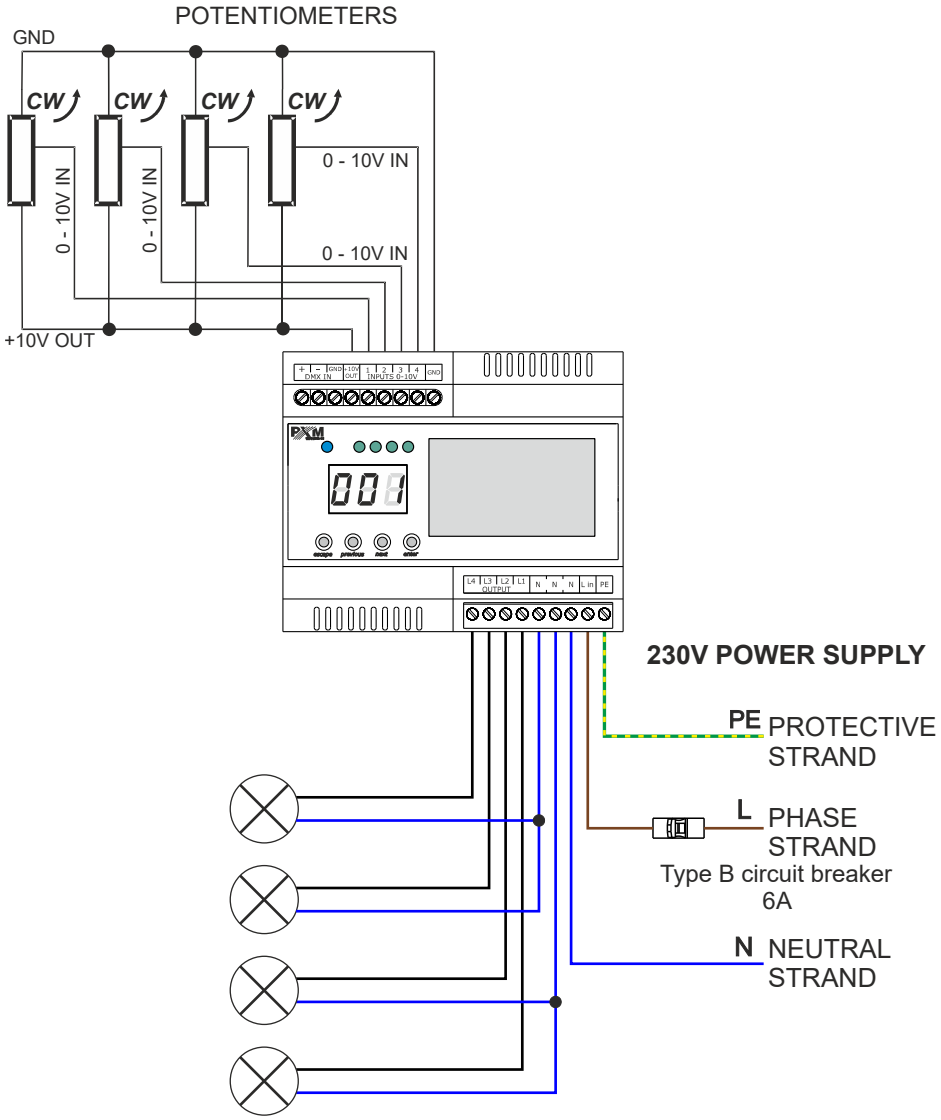


9 Connection scheme

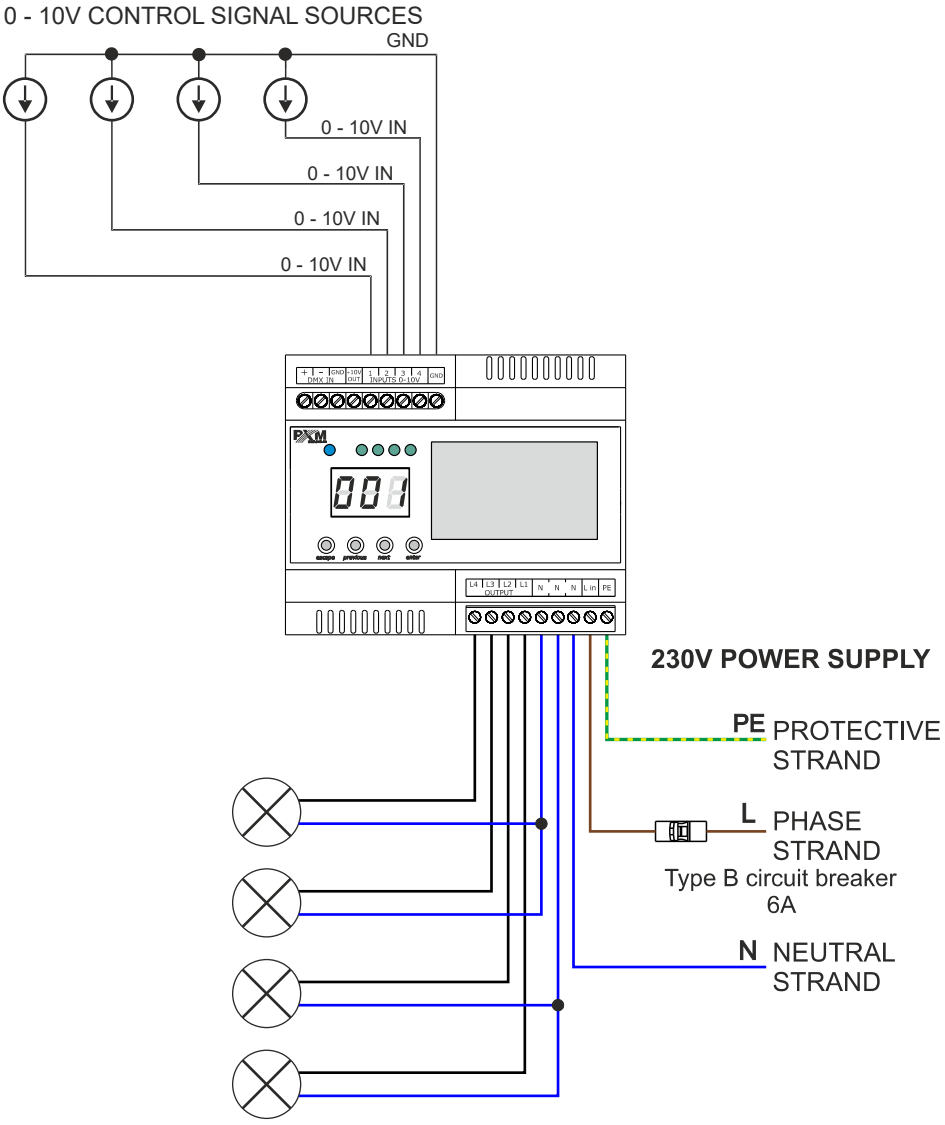
a) DMX controller



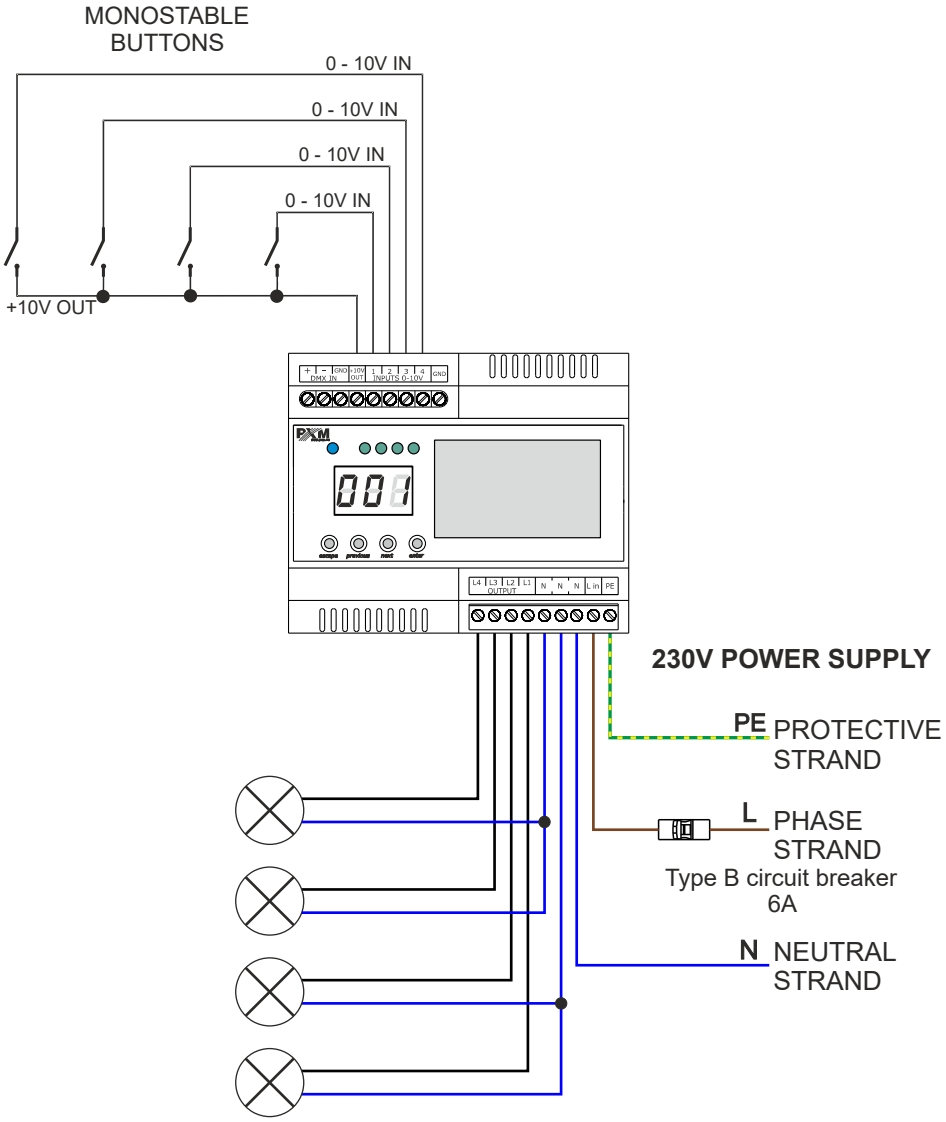
b) Potentiometers control



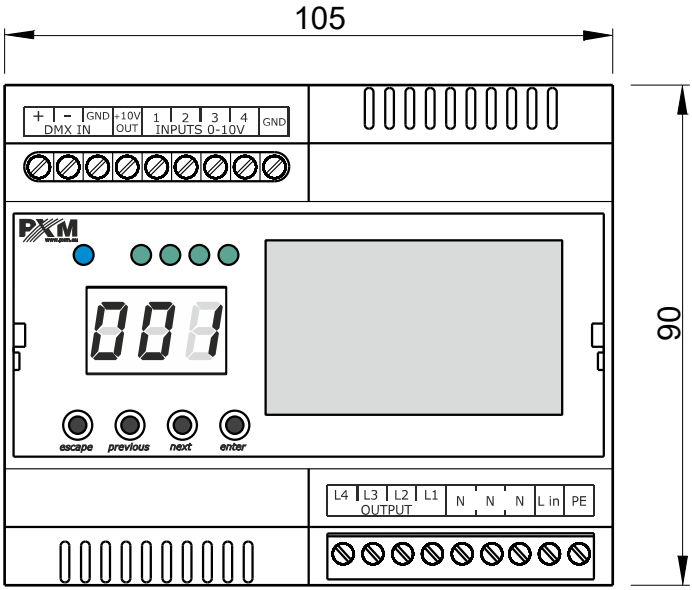
c) 0 – 10V control



d) Monostable buttons control



10 Dimensions



11 Technical data

type	PX741
power supply	230V / 50Hz
max. power consumption	4A
number of outputs	4
voltage of outputs	230V / 50Hz
load	max. 200W / output
control inputs	0 – 10V DMX512 monostable buttons
power consumption inputs 0 – 10V	0,1mA
weight	0.3kg
dimensions	width: 105mm (6 DIN rail modules) height: 90mm depth: 58mm

Podłęże, 09.04.2019

DECLARATION OF CONFORMITY

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

we declare that our product:

Product name:	Trailing Edge Dimmer
Product code:	PX741

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

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