

PX186

Driver LED C.C.

6 x 700mA

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

The PX186 driver is designed to control the LEDs. This is the most advanced device of this type available in the offer of the PXM company. The PX186 is placed in a housing equipped with a color screen LCD. This allows to program and control of the operation of the device to run intuitively. DMX receiver allow to control up to 6 channels (e.g. 2 x RGB) directly using the DMX protocol.

Wide power supply voltage range allows to control large quantities of LEDs. In addition, the device uses overcurrent protection, temperature protection to prevent overheating of the driver and the DMX line surge protection.

The PX186 can be either controlled from DMX protocol or act independently. In this case, the user have 8 fully programmable scenes and 8 programs. Both of them can also be abundantly changed, where such setting like: the playback speed or fluidity changes in steps can be modified. Thanks to 16-bit resolution control of parameters of each channels is completely smooth.

The driver has a built-in real time clock. It allows to set a time of switching on / off LED lamps what is particularly useful for advertising systems. In addition, the built-in astronomical clock option allows, based on information about the current date, geographical coordinates of the place of installation of the device (location) and settings relative to universal time (Greenwich UT) automatically determines the daily, time points of turning on

and off the driver outputs according to astronomical sunrise and sunset times.

The device has the option to change the signal tuning frequency (*"flicker free"* technology), which makes it particularly useful in applications for the television industry. In addition, a USB input allows to communicate with the computer. PXM has prepared software that allows setting program and scene parameters on the driver from a PC with Windows®.

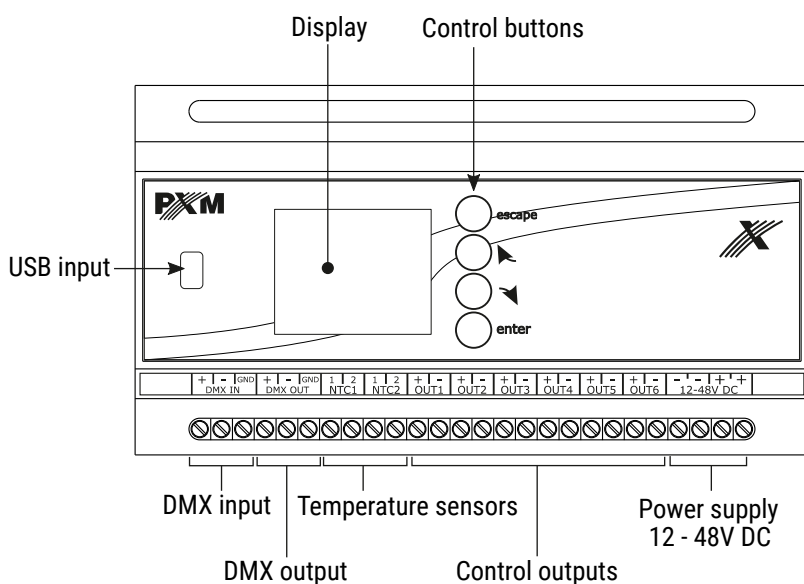
2 Safety conditions

PX186 is a device powered with safe voltage 12 – 48V DC; however, during its installation and use the following rules must be strictly observed:

1. The device may only be connected to 12 – 48V DC with current-carrying capacity compatible with technical data.
2. All the conductors should be protected against mechanical and thermal damage.
3. In the event of damaging any conductor, it should be replaced with a conductor of the same technical data.
4. Connection of DMX signal can only be made with shielded conductor.
5. All repairs and connections of outputs or DMX signal can only be made with cut off power supply.
6. The PX186 should be strictly protected against contact with water and other liquids.
7. All sudden shocks, particularly dropping, should be avoided.





8. The device cannot be turned on in places with humidity exceeding 90%.
9. The device cannot be use in places with temperature lower than +2°C or higher than +40°C.
10. Clean with damp duster only.



3 Connectors and control elements




4 Menu navigation

Menu navigation is facilitated by programming keys. Each one is described on the right side and their use is as follows:

-  *escape* – exits the currently programmed parameter without saving changes or moves us to a higher page in the menu (if we exit the context menu, the pressing of the *escape* button takes us to the *Summary screen*)
-  – scrolls the menu to the top or to the left (in the horizontal menu)
-  – scrolls the menu to the bottom or to the right (in the horizontal menu)
-  *enter* – allows for entering a selected device option and confirms set values

To change the value of a given parameter, select the “+” or “-” buttons on the screen by using  or  keys and then change the value using the *enter* key.

Then, save the settings before exiting one page up to save the input value. To do this, after selecting the  key, confirm it by pressing *enter* on the device screen.

5 Using the device

After turning on the device, the main window of the *Menu* appears on the screen. It describes the current status and selected active settings working at a given moment. The settings include, among other things, driver input signals and temperatures of operating sensors.

If no DMX signal in the input is detected, the screen displays the **No DMX Signal** message. Under this message the running device operation mode option is displayed when it is not receiving a DMX signal, e.g. **Last value** and information regarding the master mode (its activation or deactivation).

If the device receives a DMX signal, a green **DMX Signal OK** message will appear. Below, there is the starting DMX address of channels that is occupied by the signal sent by the PX186. Then, the driver operation mode is presented, e.g. **2x RGB**. The operating mode options can be changed in the *Driver operation mode* menu.

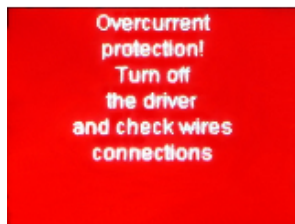


Screen layout depending on enabled options and connected devices

Description of the other messages displayed in the *Menu* screen:

- *Scene 1, Program 1, (...), Last value* – currently set function in the sub-menu of the *Menu* → *No DMX Signal*

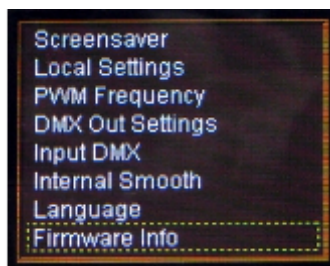
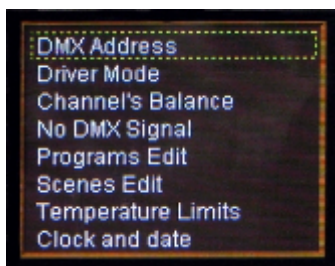
- *Master ON/OFF* – information on the master mode status. If turned on, *Master ON* is displayed; if turned off, *Master OFF* is displayed.
- *T1: N/A (23,4°C), T2: N/A (25,2°C)* – temperature value read from the sensors connected to the *NTC1* or *NTC2* inputs. If no sensors are connected, the following message appears *N/A*.





If the cables are incorrectly connected to the driver joints, an appropriate message will appear on the screen. To restore the device to work, follow the instructions on the screen. After disconnecting the power supply and connecting the cables to the following joints correctly: *OUT1*, ..., *OUT6*, the device can be turned on again.

6 Programming device functions

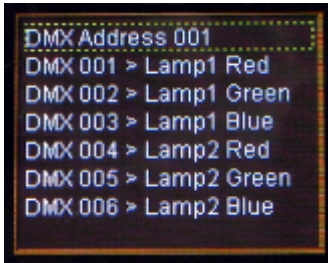
After confirming *Menu* option using the *enter* button, the sub-menu appears on the screen. To program any of them, after selecting one of them confirm the selection using the *enter* button. The user will be taken to a sub-menu screen, where all the available options can be set.




To program an option, select it with the yellow frame visible in the pictures above using the  or  keys, and confirm your selection by pressing *enter*.

6.1 DMX address

The *DMX Address* sub-menu displays currently set values of the DMX address for six available channels. By default, the device is set to the values shown below (controlling two RGB lamps on subsequent channels).

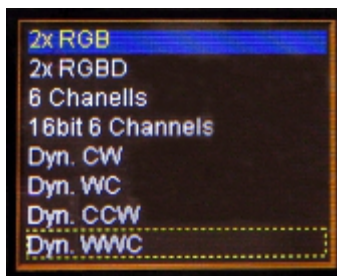


To change the chosen value, select and confirm a given parameter using the *enter* button. A menu will appear in which a value of the available functions can be changed in accordance with your needs. To do this, select the "+" or "-" keys located on the screen and set an appropriate DMX address value confirming it using the *enter* button. After changing the value, save your settings by pressing the  button on the screen and confirm them by pressing *enter*.

6.2 Driver operation mode

The *Driver operation mode* allows for setting the number of channels and their properties available during driver operation.

Below is presented the arrangement of the *Driver operation mode* menu visible after selecting this option in the main menu and confirming it by pressing *enter*.



The device can operate in the following modes:

- **RGB** – colors: red, green and blue on 3 consecutive DMX channels
- **RGBW** – colors: red, green, blue and white on 4 consecutive DMX channels
- **RGBWA** – colors: red, green, blue, white and amber on 5 consecutive DMX channels
- **RGBWAX** – colors: red, green, blue, white, amber and different color (X) on 6 consecutive DMX channels
- **RGBD** – colors: red, green and blue on 3 consecutive DMX channels + Dimmer on 4 channel
- **RGBWD** – colors: red, green, blue and white on 4 consecutive DMX channels + Dimmer on 5 channel
- **RGBWAD** – colors: red, green, blue, white and amber on 5 consecutive DMX channels + Dimmer on 6 channel
- **RGBWAXD** – colors: red, green, blue, white and amber on 5 consecutive DMX channels + Dimmer with an additional color on 6 channel
- **HSV** – Hue Saturation Value – (white light power), the first channels is the hue, the second is saturation and the last is the white light power

- **2x HSV** – 2 channels of **HSV** mode
- **2x RGB** – 2 channels of **RGB** mode (allows for controlling two lamps at the same time)
- **2x RGBD** – 2 channels of **RGBD** mode with Dimmers on 4 and 8 channel
- **6 Channels** – any 6 channels
- **16bit 6 Channels** – 16-bit control of 6 channels
- **CW Dyn.** – a lamp with cold and warm white LEDs (color adjustment on the first channel) with the dimming function on the second channel; in this mode, the driver can control up to 3 lamps (color temperature adjustment from cold to warm)
- **WC Dyn.** – a lamp with cold and warm white LEDs (color adjustment on the first channel) with the dimming function on the second channel; in this mode, the driver can control up to 3 lamps (color temperature adjustment from warm to cold)
- **CCW Dyn.** – mode for a lamp equipped with 2 cold white diodes and 1 warm white diode with Dimmer function on the second channel
- **WWC Dyn.** – mode for a lamp equipped with 2 warm white diodes and 1 cold white diode with Dimmer function on the second channel

6.3 Channel balance


This option allows for setting the modulation value of each of the six channels operated by the driver. It enables changing the maximum brightness of LEDs obtained on a given channel and thus determining the range of colors lit by the operated lamps.

To enable this option, check the *Channel balance off* and confirm it by pressing *enter*. The backlight of the texts will turn green and the channel modulation values can be set now. To disable this function, select the *Channel balance on* and confirm it by pressing *enter*.



To set the channel balance value of a given channel confirm the selected channel by pressing *enter* (the screen shown below will appear), then press “+” or “-” on the screen to set a value. After selecting an appropriate button confirm the selection by pressing *enter*.



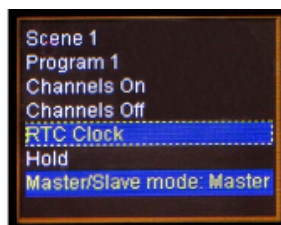
Remember to save your settings by selecting  and confirm by pressing *enter*

6.4 No DMX signal response

In this menu, it is possible to set the device's response to no DMX signal which controls LEDs. An interesting option is the possibility to activate the astronomical clock. It allows for turning on and off the lights in accordance with the sunrise and the sunset – setting the sunrise and sunset hours is parameterized by the user – the position of the device on the globe (latitude and longitude) needs to be set. The following is a detailed description of all available options.

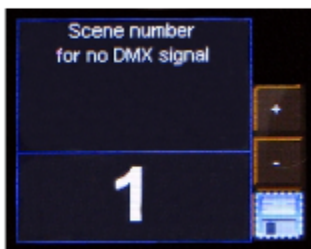



To set any of the options available in the menu, select and confirm it by pressing *enter*



All available options in this menu:

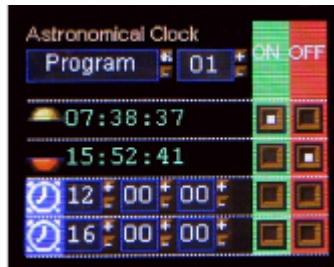
- **Scene 1** – sets one of 8 scenes available (programmable in the *Scene editing* menu) if the driver does not detected the DMX signal. To set the scene, double-tap the *enter* button after selecting *Scene 1* in the menu – the scene number selection screen appears; use “+” or “-” keys to select an appropriate scene.



Remember to save your settings by selecting  and confirm by pressing *enter*

- **Program 1** – sets one of the 8 available programs (programmable in the *Program editing* menu) if the driver does not detect the DMX signal. To change the number of the displayed program, follow the instructions shown in the preceding point.
- **Channels on** – after DMX signal disappearance all outputs are switched on 100%
- **Channels off** – after DMX signal loss all outputs are completely turned off
- **RTC Clock** – the astronomical clock allows for enabling and disabling the lamps, a specific program or a scene, depending on the time of the sunrise and the sunset. The user can also set the hours according to which the PX186 will turn on and off the available options. To program

this menu, select the *RTC Clock* option and confirm the selection twice with the *enter* button. The screen shown below will appear:



The first option under the *Astronomical Clock* text allows for selecting which event will be switched on or off according to the clock pre-set. It can be a selected program and scene, lights or full brightness. Below, there is an astronomical clock calculated according to the data input in the *Local settings* menu and the date and time stored by the PX186 driver.

The last two lines on the screen are the manually set time at which the options described above can be enabled and disabled.

The green and red backgrounds include boxes responsible for turning on or off a given time at a height at which the given boxes are located. Keys are used to navigate in the menu. Values are changed after confirming a selection with *enter*.



- ***Last DMX value*** – after selecting this option, if the DMX signal disappears, the driver continues to send its last value
- ***Master/Slave mode: Master (Slave)*** – in this mode, it is possible to determine whether the device works as a driver after the controlling DMX signal entering the driver disappears. This is the co-called Master

mode. The slave mode allows for operation only as a DMX signal transmitter.

6.5 Program editing

Program editing is a menu where parameters of programs and scenes, which individual programs are composed of, are custom set by the user. This option allows for setting the course of a particular program which will be used later if the driver operates in the no DMX signal mode. The menu consists of three columns. The first one enables a program that we want to edit. The next one allows for selecting a scene we want to edit. The last one is responsible for the parameters of an edited scene.



To select individual parameters, select the specified parameter with a dotted frame using the  or  keys, then confirm the selection by pressing *enter*.

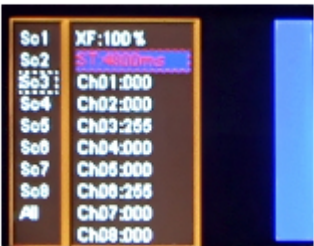
Meaning of individual messages displayed in this menu:

- ***Pr1 – Pr8*** – programs from 1 up to 8 – selection of one of them allows for introducing changes to the settings of the program
- ***Sc1 – Sc20*** – scenes from 1 up to 20, selection of one of them determines the parameters to be edited
- ***All*** – by selecting this option, it is possible to makes changes to the settings of all parameters of a given column in which this function is located
- ***XF (xfade)*** – fade time – the time of dimming LEDs
- ***ST (scene time)*** – the length of scene entry in milliseconds
- ***Cont/End*** – continuous program or scene playback or their end
- ***Ch01:000 – Ch36:255*** – subsequent channels from 000 to 255

To assign a different input parameter to the output DMX channel, select the one in which you want to make changes, then press the *enter* key. Then, use the “+” or “-” buttons to set a new value and confirm it by pressing *enter*.

6.6 Scene editing

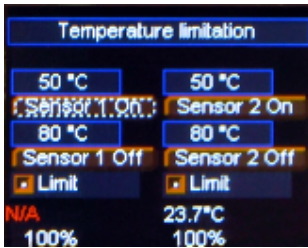
In the *Scene editing* menu, it is possible to change parameter settings for a given scene. As for the *Program editing* sub-menu, after selecting the scene display option by a lamp or group of lamps, in the simultaneous absence of an input DMX signal to the PX186 driver, the programmed scene is played continuously. The meaning of particular messages is described in the item 6.5 Program editing.




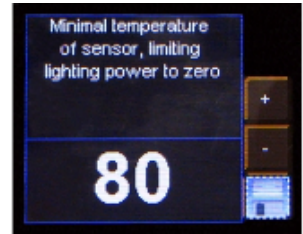
6.7 Temperature limits

This option allows for setting a temperature value which, if reached, limits power consumption or turns off the device powered by the driver. This can be applied to LEDs which are located in areas with high temperatures.

There are two PX186 inputs to which one temperature sensor can be connected. To set a limit, select an appropriate button on the screen, set the light power limitation temperature *Sensor on* and the total light power limitation temperature (lamps off) *Sensor off* for an appropriate sensor.

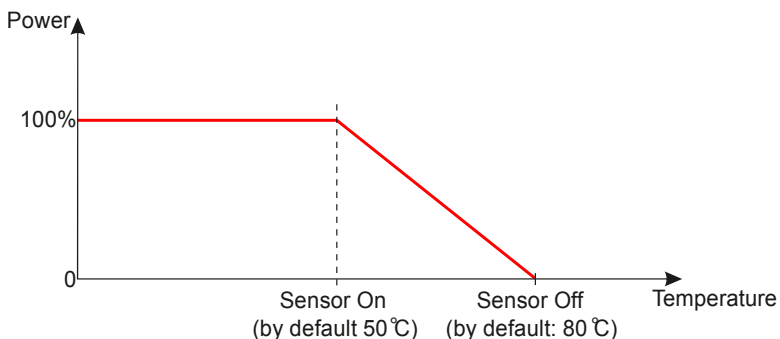


Remember to save your settings by selecting  and confirm by pressing *enter*



To change the values of the limitation temperatures for a given sensor, select an appropriate button on the screen and confirm it by pressing *enter*. A new screen with the temperature limitation value field will appear. To change the temperature follow the steps of the method described in the previous items of the instructions, e.g. 6.5 Program editing.

The *Limit* option allows for disabling the LED light power limitation function based on a temperature sensor in spite of the set temperature limitation values. By default, both sensors are enabled. To disable this function, uncheck the field next to the word *Limit* on the screen by pressing the *enter* button. Then, despite exceeding the pre-set temperature threshold, power will not be limited and the lamps will not be turned off.




6.8 Date and time

This menu allows for changing the date and time stored by the device. To do this, select an appropriate button “+” or “-” on the device screen below a corresponding value of time or date, and change it by pressing the *enter* button.

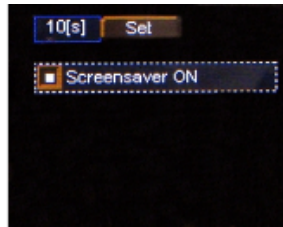
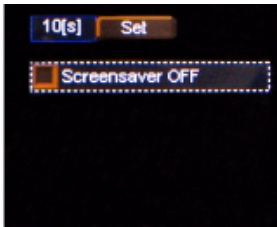
In the upper part of the display there is the time expressed, respectively, in hours, minutes and seconds, and below there is the date expressed, respectively, in years, months and days.




Remember to save your settings by selecting  and confirm by pressing *enter*

6.9 Screen saving

In this menu, it is possible to activate the screen saving mode after a specified period of inactivity (programming keys on the driver are not used). To set the screen saving mode, press the *enter* key after selecting the *Screen saving off*, and then set the time after which the backlight is switched off. To do this, select the *Set* button and confirm it by pressing *enter*. A new screen will appear. Select the screen saving parameters.




Remember to save your settings by selecting  and confirm by pressing *enter*

6.10 Local settings

Local settings are used to set the position of the device according to geographical coordinates (longitude and latitude) and the time zone in which the device operates.

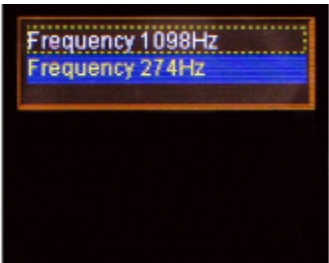
To set appropriate parameters, use the “+” or “-” buttons located next to a respective value being set and press the *enter* button to set the expected value.



Remember to save your settings by selecting  and confirm by pressing *enter*

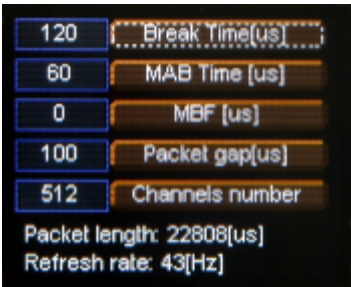
6.11 PWM frequency

The PWM frequency is a menu that allows for changing the LED refresh frequency from 287Hz or 1082Hz. Changing to a higher frequency activates the “*flicker free*” mode, which makes it possible to avoid an unpleasant flicker effect caused by improper synchronization of the LEDs control signal. This option is useful if TV cameras are present.



6.12 DMX output

After selecting the *DMX output* submenu, the current set values of the DMX signal parameters will appear on the screen. By default, the device is set to the values shown below.




At the bottom of the screen there is the total *Packet length* and *Refresh rate* for configured parameters.

6.12.1 Break Time

Allows to change the length of the interval between successive DMX packets.


At the top of the screen next to the option name are visible important information that simplify setting an appropriate value.



To save the value before leaving level up in menu you need to select floppy disc button  and press *enter*

6.12.2 MAB Time

Mark After Brake is the interval time occurs in each package according to the standard DMX-512.


To save the value before leaving level up in menu you need to select floppy disc button  and press *enter*



6.12.3 MBF Time


Mark Between Frames – the amount of time (if any) between the end of one frame (end of the 2nd stop bit) and the start of the next. Its length can range from 0 to 1 seconds, the shorter the better.

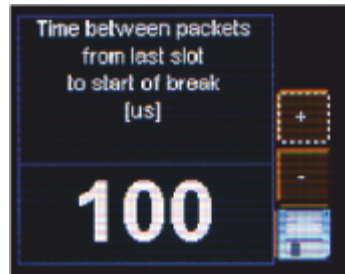


To save the value before leaving level up in menu you need to select floppy disc button  and press *enter*

6.12.4 *Packet gap*

The amount of time between packets. Its length can range from 16 to 5000 μ s.

To save the value before leaving level up in menu you need to select floppy disc button  and press *enter*

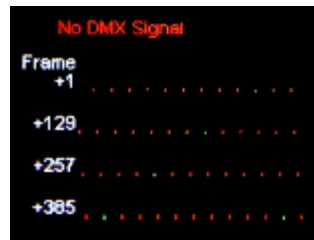
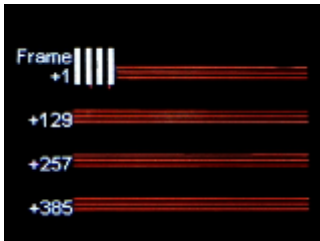


6.12.5 *Channels number*

Using this feature, it is possible to limit the number of channels sent from the PX186. The minimum value is 24 channels and the maximum is 512 (default).

6.13 DMX Out

This menu allows for a graphical view of the DMX-512 signal which is sent by the PX186.



DMX signal presentation method:

The DMX signal value on a given DMX channel is represented as a white bar the height of which varies proportionally, according to the following dependence:

- the greatest height = DMX signal value is 255
- no bar = DMX signal value is 0

DMX channels are described on the left side of the screen, respectively: +1, +129, +257, +385 for subsequent lines. Moreover, each line is divided by dots where red dots mark another ten channels and green dots each additional 100 channels.

6.14 Smooth

The smooth option makes transition between successive control signal smoother, i.e. color in connected lamps.

The menu enables setting the smoothing option in two versions:

- *Package to package smoothing* – the smoothing function proceeds in a linear manner between successive DMX signal packages received by the driver
- *Time smoothing* – this function allows for making a time criterion for smoothing the DMX signal received by a lamp. After confirming the message by pressing the *enter* button, the User can select the time range from 10 up to 300ms. This time determines the distance between the linearly smoothed DMX values.
- *Disable Smooth* – the smoothing function is disabled

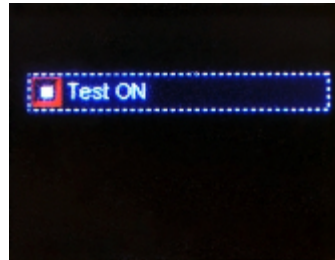
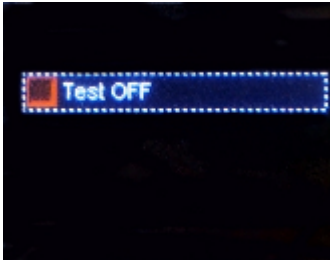
6.15 Language

The *Language* menu allows for changing the language of the menu. To do this, select a specific language icon and confirm your selection by pressing *enter*.

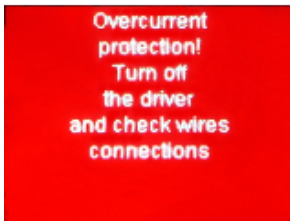


6.16 Connection test

The *Connection test* menu makes it possible to disable the correctness of connection of outputs of the device during start of PX186. This function has been designed to protect the device against damage as a result of miswiring. By default it is enabled.



If miswiring is detected, an appropriate message will appear on screen. Before switching on the unit again, check and correct wiring connections.



If the *connection test* function is disabled, PX186 will not check the connection correctness and thus protect against damage as a result of miswiring.

6.17 Firmware version

In this submenu, it is possible to check the firmware and bootloader versions installed on the device. Default settings implemented in the device can be also restored.

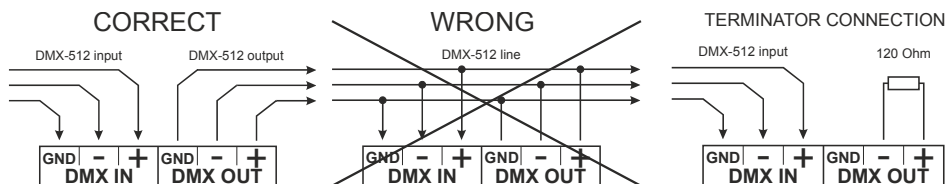


To do this, confirm the *Default settings* by pressing *enter*, then select the Yes button and confirm by pressing *enter* again. If this option is selected by mistake, exit the menu by selecting the No button or directly by pressing the escape button.

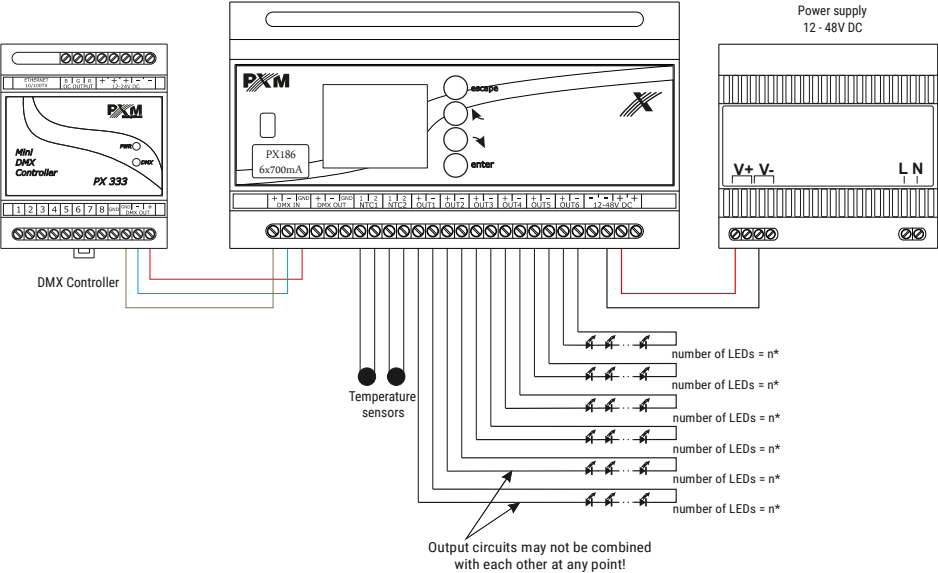
7 DMX signal connecting

PX186 have to be connected to DMX line in serial mode, with no branches on DMX control cable. That means that DMX line, from the signal source, must be connected to **DMX IN** pins of PX186 and later, directly from **DMX OUT** pins to the next device in DMX chain.

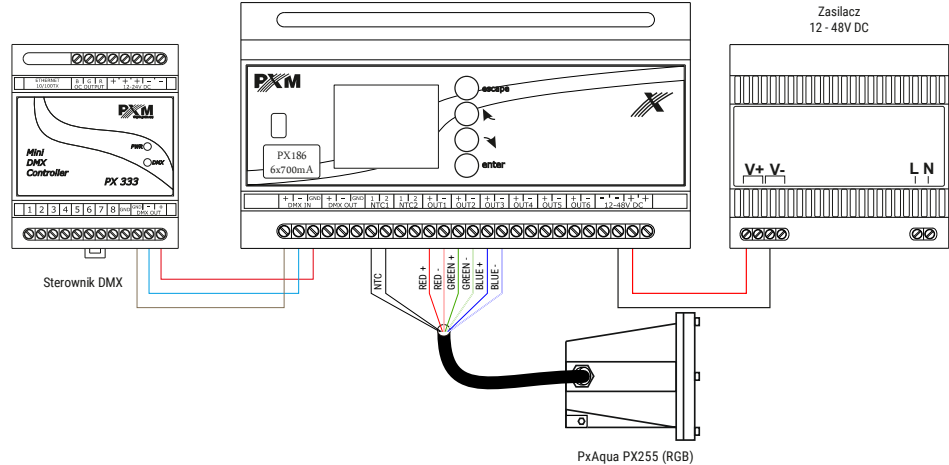
If the PX186 is the last DMX chain receiver there should be terminator (resistor 120 Ohm) mounted between "**DMX+**" and "**DMX-**" pins of **DMX OUT** section.



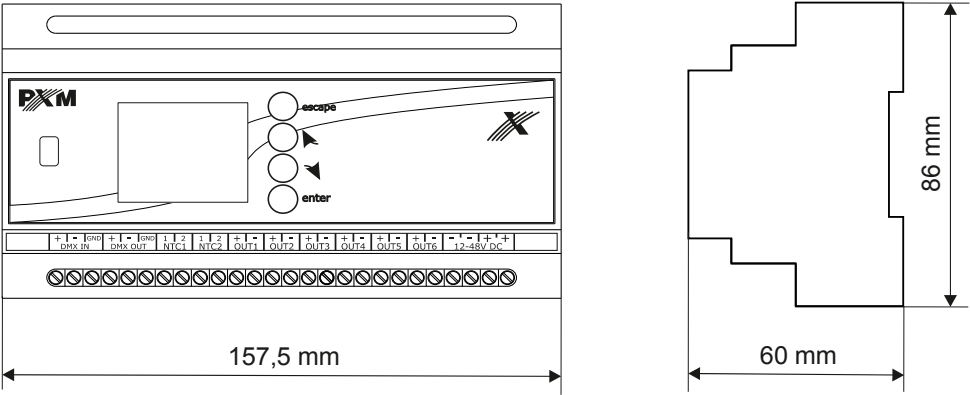
8 Connection scheme



* number of LEDs	Power supply
1 – 3	12V DC
4 – 6	24V DC
7 – 12	48V DC



9 Dimensions



10 Technical data

type	PX186
power supply	12 – 48V DC
DMX input	1 (512 channels)
DMX output	1 (512 channels)
number of output channels	6
programmable scenes	8
number of programs	8
control accuracy	16 bit
output load	700mA
MASTER / SLAVE mode	yes
output sockets	screw terminals, USB
weight	0.4kg
dimensions	width: 157,5mm (9 DIN rail modules) height: 86mm depth: 60mm

DECLARATION OF CONFORMITY

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

we declare that our product:

Product name: Driver LED C.C. 6 x 700mA

Product code: PX186

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

PN-EN IEC 63000:2019-01	EN IEC 63000:2018
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.


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



mgr inż. Marek Żupnik.