

PX178

Driver LED C.V.

6 x 7,5A

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

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PX178 is designed to control lamps or voltage LED strips. This is the most advanced driver of its kind offered by the PXM company. The driver has been placed in a housing with a width of 9 standard rail modules and equipped with a color display. This allows the user to program and control the device intuitively. The built-in DMX receiver allows for control of 6 channels (e.g. 2 x RGB) by directly using the DMX protocol. The wide supply voltage range and high output current-carrying capacity (7.5A) enable the user to control large numbers of LED diodes. In addition, the driver incorporates an over-current protection device, a temperature protection device preventing driver overheating as well as a DMX line surge protection device.

You can control the PX178 using DMX signals or it can operate independently. In such a case, you can choose from 8 fully programmable scenes and 8 programs, and, in relation to these scenes and programs you can vary playback speed and step transition smoothness. Thanks to the interpolated resolution of the output control at the 16 bit level, the control of the parameters of individual channels is completely smooth. The driver has a real time clock that allows to set power on and off times for the LEDs controlled, which is particularly suitable for advertising sign light systems. Besides, the built-in astronomical clock feature, using the current date, the coordinates of the driver installation location and its position relative to universal time (Greenwich UT), automatically sets driver output turn on and off times,

on a 24-hours basis, in accordance with astronomical sunrise and sunset times.

The driver also features an option allowing to change the control signal adjustment frequency ("*flicker free*" technology), used in television broadcasting. The USB port allows the driver to communicate with a computer. The PXM company has developed software for setting program and scene parameters in the driver from the level of a computer running the Windows® system. The software can be downloaded from the manufacturer's website (<https://pxm.pl/>).

## 2 Safety conditions

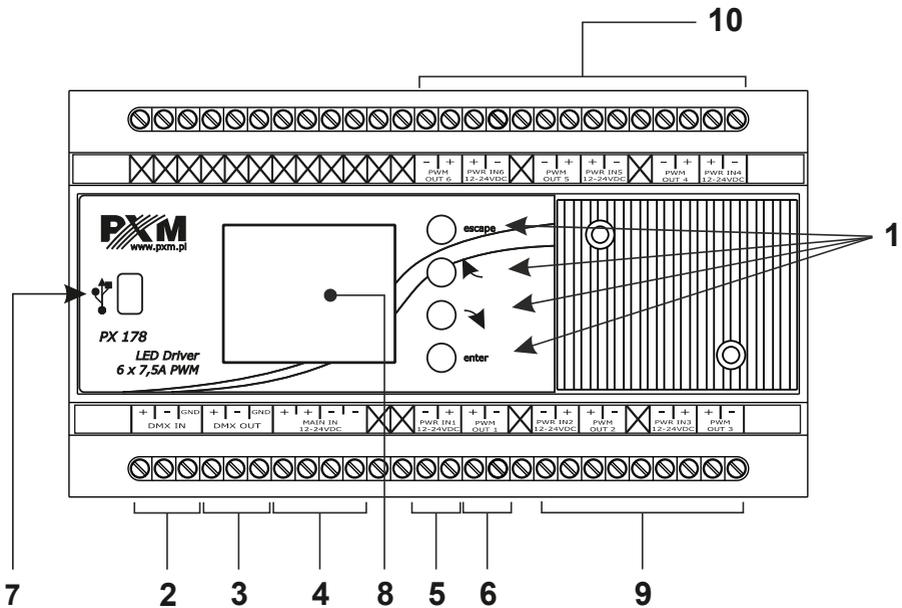
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The PX178 is a device powered with safe voltage 12 – 24V DC, however, during its installation and use the following rules must be strictly observed:

1. The device may only be connected to 12 – 24V DC current (stabilized voltage) 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 any conductor damaging, it should be replaced with the one of the same parameters.
4. Connection of DMX signal should be made with shielded conductor only.
5. All repairs and connections of outputs or DMX signal can only be made with power off.

6. The PX178 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 used in places with temperature lower than +2°C or higher than +40°C.
10. For cleaning use only a damp cloth.

### 3 Connectors and control elements



1. Programming buttons
2. DMX input
3. DMX output
4. Power supply 12 – 24V DC
5. Input power for the first PWM output
6. First PWM line output
7. USB port
8. Display
9. Second and third PWM outputs with power connections
10. Fourth, fifth and sixth PWM outputs with power connections

## 4 Navigating the menu

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Navigating the menu allow programmable buttons. Every button is described on the right side and their use is as follows:

-  *escape* – exits from the currently programmed parameter without saving the changes or goes to the upper level in the menu. Pressing the *escape* button while being in main menu will cause to exit to the *Summary* screen
-  – scrolls up the menu or right (horizontal menu)
-  – scrolls back the menu or left (horizontal menu)
-  *enter* – allows to enter the selected option and approve set value

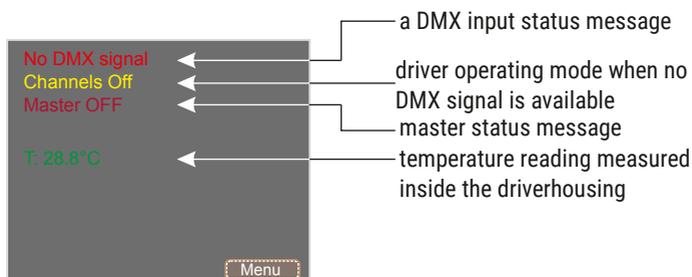
To change the value of selected parameter, you must choose on the screen button "+" or "-" using the button  or , and then using the *enter* button to change the value.

After that you need to save the settings before going level up, this will allow storing value in memory of the PX178. To do this, after moving to the screen button  you need to push *enter* button.

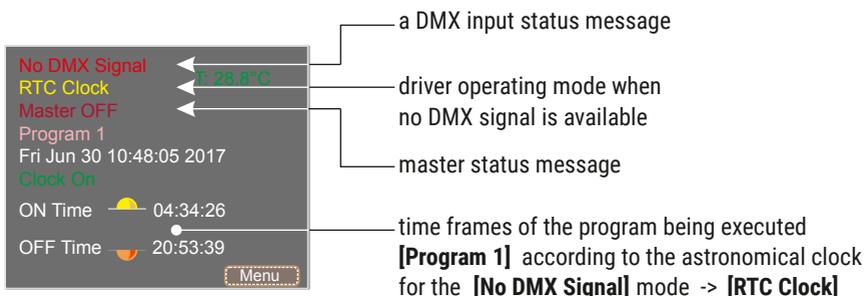
## 5 Use of the device

Once the driver is powered up, the start screen displays the main window **[Menu]**, with information on the current status of the device and selected active settings running at the moment. Information displayed includes, among other things, driver input signals and temperature values provided by the sensor active at a given moment.

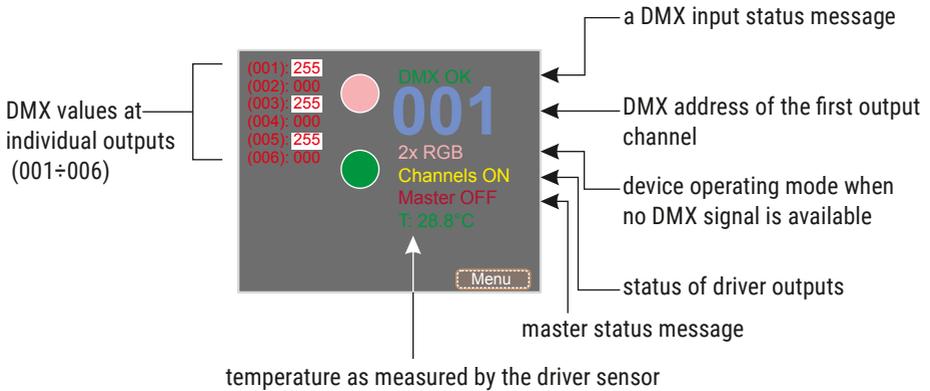
If no DMX signal is detected at the driver input, the screen will show a **red** **[No DMX Signal]** message:



Other (sample) parameters settings for the *No Signal* mode for the PX178:

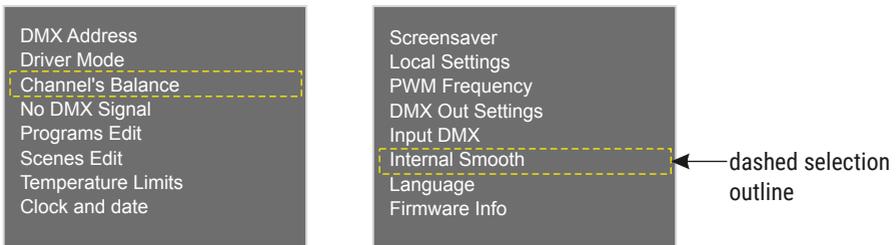


If the device is receiving a DMX signal, a **[DMX OK]** message in **green** letters is displayed:



## 6 Device programming

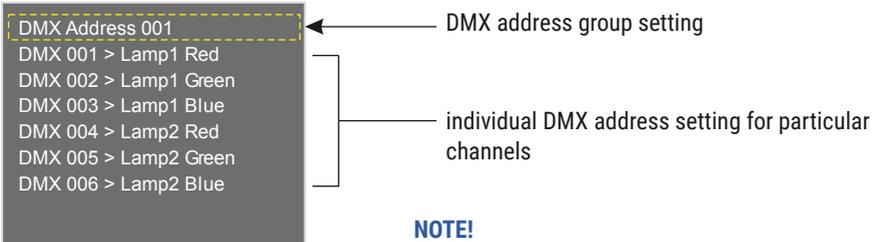
After confirm selection of the **[Menu]** option by pressing the *enter* button, a submenu will display, allowing to select available options. In order to program any of the options, select an option and confirm selection by pressing the *enter* button. This will take you to a feature menu screen where you can set all the parameters and features.



To program any of the options, select it with the dashed outline shown above using the  or  buttons and press *enter* to confirm your selection.

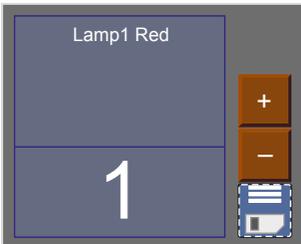
## 6.1 DMX address

After you select the **[DMX address]** submenu, the screen will display the current DMX address settings for the six available channels. The values shown below are the default settings for the device.



### NOTE!

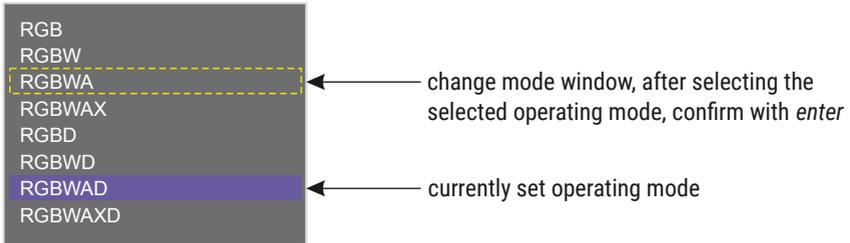
Group change of DMX addresses will overwrite the individual settings of particular channels.



In order to change the default value in a channel, select the channel with a yellow outline, confirm by pressing the *enter* button, and using "+" or "-" buttons, set the desired value for the channel. Confirm the change by pressing the save button.

## 6.2 Drivers' working mode

The [**Driver mode**] menu allows to set the number of DMX channels used and the method they will use to control the output channels:



The device can operate in the following modes:

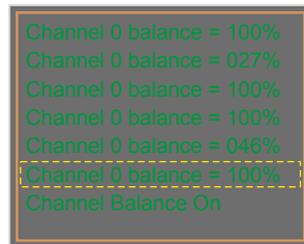
- **RGB** – colors: red, green and blue on 3 consecutive DMX channels
- **RGBW** – colors: red, green, blue and white on 4 consecutive DMX channels
- **RGBWA** – colors: red, green, blue, white and amber on 5 consecutive DMX channels
- **RGBWAX** – colors: red, green, blue, white, amber and different 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

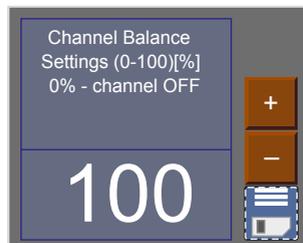
## 6.3 Channel's balance

This option allows to set control values for each of the six channels operated by the driver. You can adjust maximum brightness that the diodes can reach in a particular channel and thus set the range of colors that the lamps controlled will output.

To enable this option, select the **[Channel Balance Off]** option and confirm your selection by pressing *enter*. The color text will change into **green** and you will be able to adjust control values of individual channels. To disable this option, select the **[Channel Balance On]** option and confirm your selection by pressing *enter*.

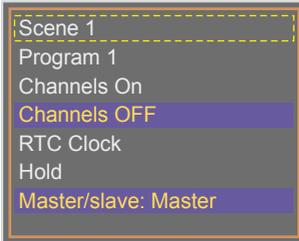


In order to limit values for a particular channel, select a channel and confirm your selection by pressing *enter* (after which the screen shown below will be displayed), and using the "+" or "-" buttons, set the desired value on the screen.



## 6.4 No DMX signal

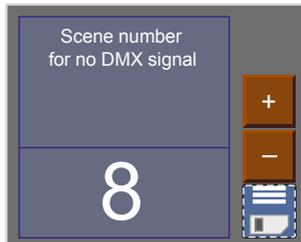
In this menu, you can configure the response of the device if no DMX signal is received. The astronomic clock feature is one of the options you can enable. This feature will switch on and off your lighting system according to sunrise and sunset; you can parameterize sunrise and sunset time settings, by entering the longitude and latitude values.



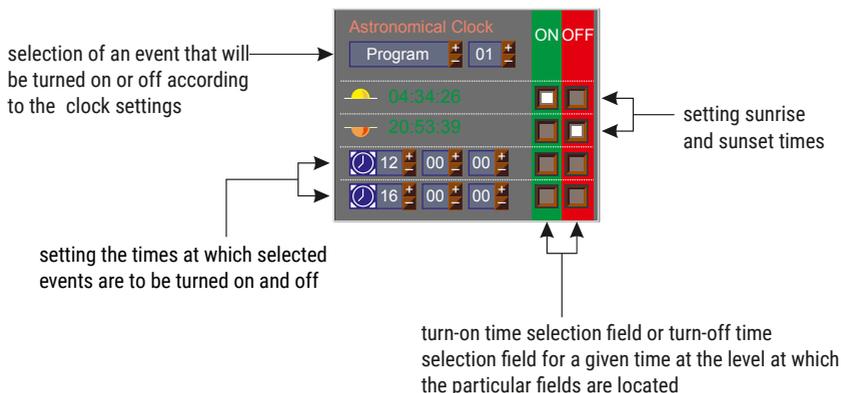
In order to set an option available in this menu, select an option and confirm it by pressing *enter*

List of options available:

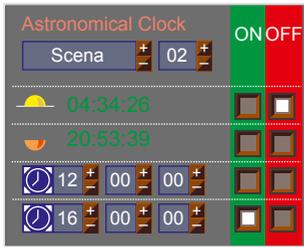
- **Scene 1** – this option sets one of the 8 available scenes which are programmed in the **[Scenes Edit]** menu when the driver does not detected a DMX signal at the input. To set such a scene in the menu you need to press *enter* button twice after you select the **[Scene 1]** option, and a scene number selection screen will display where you can select an appropriate scene using “+” or “-” buttons.



- **Program 1** – this option sets one of the 8 available programs which are programmed in the **[Program Edit]** menu when the driver does not detect a DMX signal at the input. To change the number of the displayed program, proceed as described in the **[Scene 1]** section.
- **Channels On** – if the driver detects a DMX signal loss, the output channels are set to full brightness.
- **Channels Off** – if the driver detects a DMX signal loss, the output channels are disabled, which in turn, will switch off the lamps.
- **RTC Clock** – the astronomical clock allowing for switching on and off e.g. a particular program, scene or lamps according to sunrise and sunset times or times set by the user. To proceed to program this menu, you need to select the **[RTC Clock]** option and confirm your selection by pressing the *enter* button twice. Then the screen shown below will display:



In the example shown above, *Program 01* will be turned on at sunrise and turned off at sunset.



← **Scene 02** is scheduled to be turned on at 4.00 p.m. and turned off at sunrise

- **Hold** – after this option is selected, when the driver detects loss of DMX signal at the input, it will continue to hold the last value at the outputs.
- **Master / Slave: Master (Slave)** – in this mode, you can determine whether or not, after DMX signal is lost, the device is operating as a controller. This is the so-called *Master* mode. The *Slave* mode allows the device only to operate as a DMX transmitter.

## 6.5 Program edit

**[Program edit]** is a menu in which you can set the parameters of subsequent programs and the scenes (which are subsequent steps of the program) these program consist of. With this option, you can set the course of a particular program which the driver can subsequently use when operating in the no DMX signal mode.

Pr1	Sc1	XF:50%
Pr2	Sc2	ST:5000ms
Pr3	Sc3	[Cont]
Pr4	Sc4	Ch01:255
Pr5	Sc5	Ch02:000
Pr6	Sc6	Ch03:000
Pr7	Sc7	Ch04:255
Pr8	Sc8	Ch05:000
All	Sc9	Ch06:000
	Sc10	Ch07:000

editing the parameters of individual scenes of the program that is selected in the first column

selection of one of 20 scenes (or simultaneously **[ALL]**) for editing

selection of a single program (or simultaneously **[ALL]**) for editing

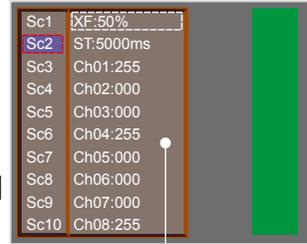
### Scene parameters:

- **[XF]** (*xfade*) – smoothness of fading between programs steps
- **[ST]** (*scene time*) – length of the entry of a scene in milliseconds
- **[Cont/End]** – continuous playback of a program or a scene or terminator
- **[Ch01:000, ..., Ch36:255]** – program step values in individual channels

In order to assign a different input parameter to a DMX output channel, select the one in which you want to make changes and press *enter*. Next, using the  or  buttons set a new value and confirm it by pressing *enter*.

## 6.6 Scenes edit

In the **[Scene edit]** menu you can change settings for individual scenes. A programmed scene is played back continuously. The meanings of particular messages are described in the section 6.5 Program edit.



Sc1	XF:50%
Sc2	ST:5000ms
Sc3	Ch01:255
Sc4	Ch02:000
Sc5	Ch03:000
Sc6	Ch04:255
Sc7	Ch05:000
Sc8	Ch06:000
Sc9	Ch07:000
Sc10	Ch08:255

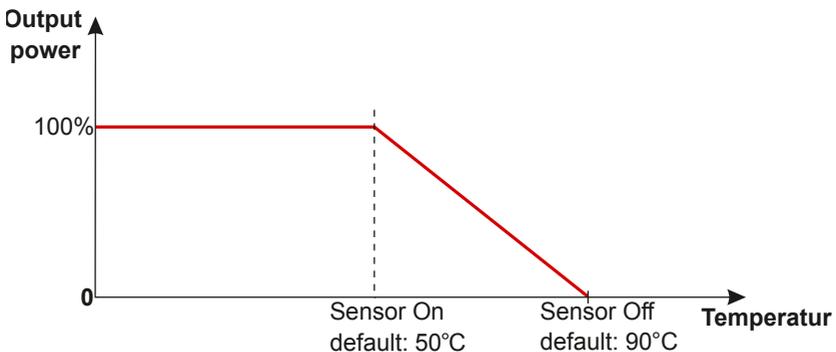
editing individual scenes of the program that is selected in the first column

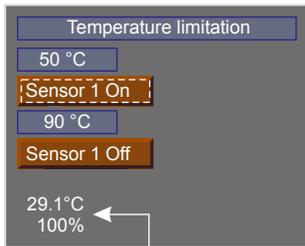
selection of one of 20 scenes (or simultaneously all of the scenes **[ALL]**) for editing

## 6.7 Temperature limits

The **[Temperature limits]** option allows to set a temperature limit which, if reached, triggers power reduction or causes the device powered by the driver to be turned off.

The graph below shows how this feature operates:

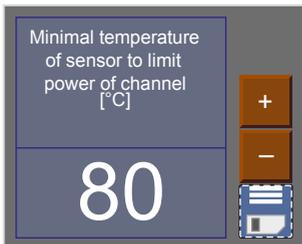




brightness reduction trigger temperature (set within the range of 20÷70°C)

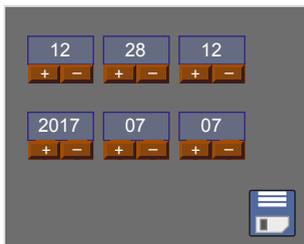
temperature at which brightness is totally reduced (e.g. lamps are turned off) - set within the range of 20÷90°C

current temperature and power output level



## 6.8 Date and clock

This menu allows to change dates and times saved in the driver. Changes are made using the “+” and “-” buttons.

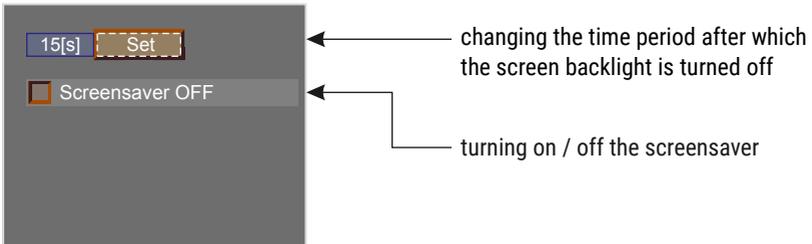


time [hour:minute:second]

date [year:month:day]

## 6.9 Screensaver

This driver has a feature allowing to turn off the screen backlight. In the **[Screensaver]** menu, you can enable this mode after a pre-set idle time (i.e. not pressing programming buttons on the driver). To set the screensaver, confirm by pressing the *enter* button **[Screensaver OFF]** and then set the time period after which the screen backlight will be turned off. To do this, select the **[Set]** button and confirm by pressing *enter*. A new screen will display where you can set screensaver parameters.



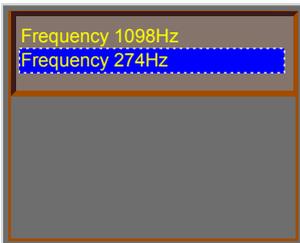
## 6.10 Local settings

The local settings are responsible for setting the location of your PX178 device according to geographical coordinates (longitude and latitude), and for setting the time zone in which the device operates.



## 6.11 PWM frequency

[PWM frequency] – this allows to change the LED refresh rate from 274Hz to 1098Hz. Changing to a higher frequency enables the “*flicker free*” mode. This feature is very useful for the purpose of controlling lamps in television studios. It allows the user to prevent unpleasant flicker effect that is due to inadequate synchronization of the LED control signal.



← the current frequency setting is highlighted in blue; to change the frequency, use the arrows to move the outline rectangle and confirm by pressing the *enter* button

## 6.12 DMX output settings

After you select the **[DMX Output Settings]** menu, the screen displays the current settings for DMX signal parameters. This menu allows to modify the parameters of the DMX signal being transmitted by the driver operating in the master mode. The values shown below are the default settings for the device:

120	Break Time [ $\mu$ s]
60	MAB Time [ $\mu$ s]
0	MBF [ $\mu$ s]
100	Packet gap [ $\mu$ s]
512	Channels number

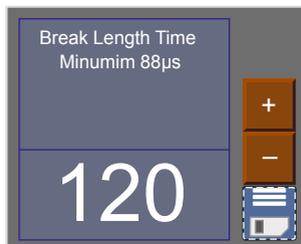
Packet length: 22808[ $\mu$ s]  
Refresh rate: 43[Hz]

At the bottom of the screen, aggregate **[Packet length]** and **[Refresh rate]** are displayed for the parameters thus configured.

### 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.

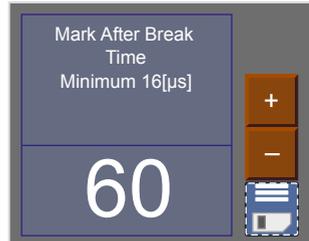


To save the value before leaving level up in menu you need to select floppy disc button and press *enter*

## 6.12.2 MAB Time

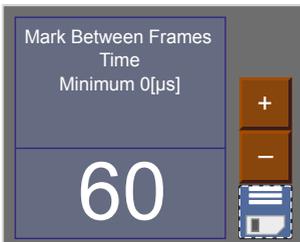
Mark After Brake is the interval time that occurs in each package according to the standard DMX512.

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 2<sup>nd</sup> stop bit) and the start of the next. Its length can range from 0 to 1 seconds, the shorter the better.

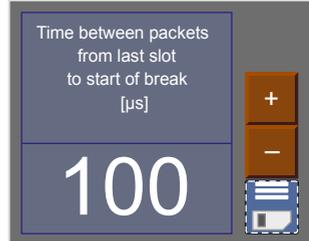


To save the value before leaving level up in menu you need to select floppy disc button and press *enter*

## 6.12.4 Packet gap

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

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

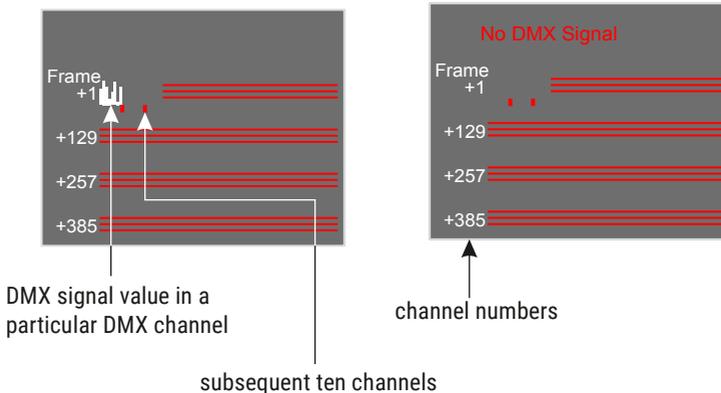


## 6.12.5 Channels number

Using this feature, it is possible to limit the number of channels sent from the PX178. The minimum value is 24 channels and the maximum is 512 (default).

## 6.13 Input DMX

The **[Input DMX]** menu is a graphical view of the DMX signal that is being received by the driver. The right-hand side picture shows the screen displayed when no DMX signal is being received by PX178:



## DMX signal presentation:

The value of DMX signal in a particular DMX channel is presented as a white bar whose height varies in proportion to the following relationship: the greatest height = DMX signal value is 255; no bar = DMX signal value is 0.

## 6.14 Internal smooth

The transition smoothing option, intended for transitions between successive control signal values, allows to make smooth transitions between e.g. colors in the lamps connected.

This menu allows for setting the smoothing feature in two versions:

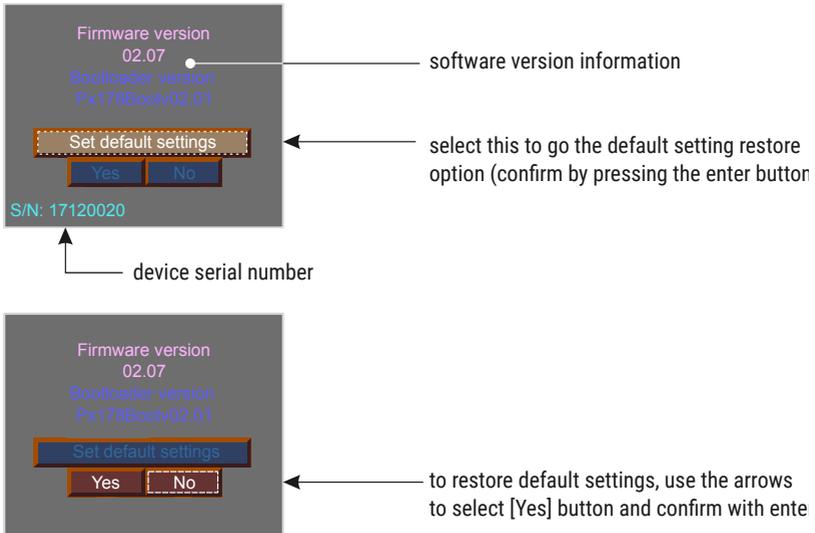
- **[Packet To Packet Smooth]** – the smoothing feature operates in a linear way between subsequent DMX signal packets being received by the driver
- **[Time Smooth]** – this feature allows to apply a time criterion for smoothing DMX signal received by the driver. Once you confirm the message using the *enter* button, you can select a time setting within the range of 10 – 400ms. This time setting determines the distance between DMX signal values that have been smoothed linearly.
- **[Smooth Disabled]** – if this option is enabled, the smoothing features is disabled

## 6.15 Language

The language settings allow to change the menu language. To do this, select the appropriate language icon and confirm your selection by pressing *enter*.

## 6.16 Firmware info

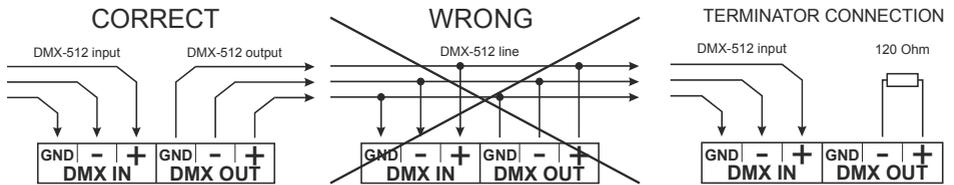
In this submenu you can check the firmware and bootloader version installed on the device. You can also restore the default settings implemented on the device.



# 7 DMX signal connecting

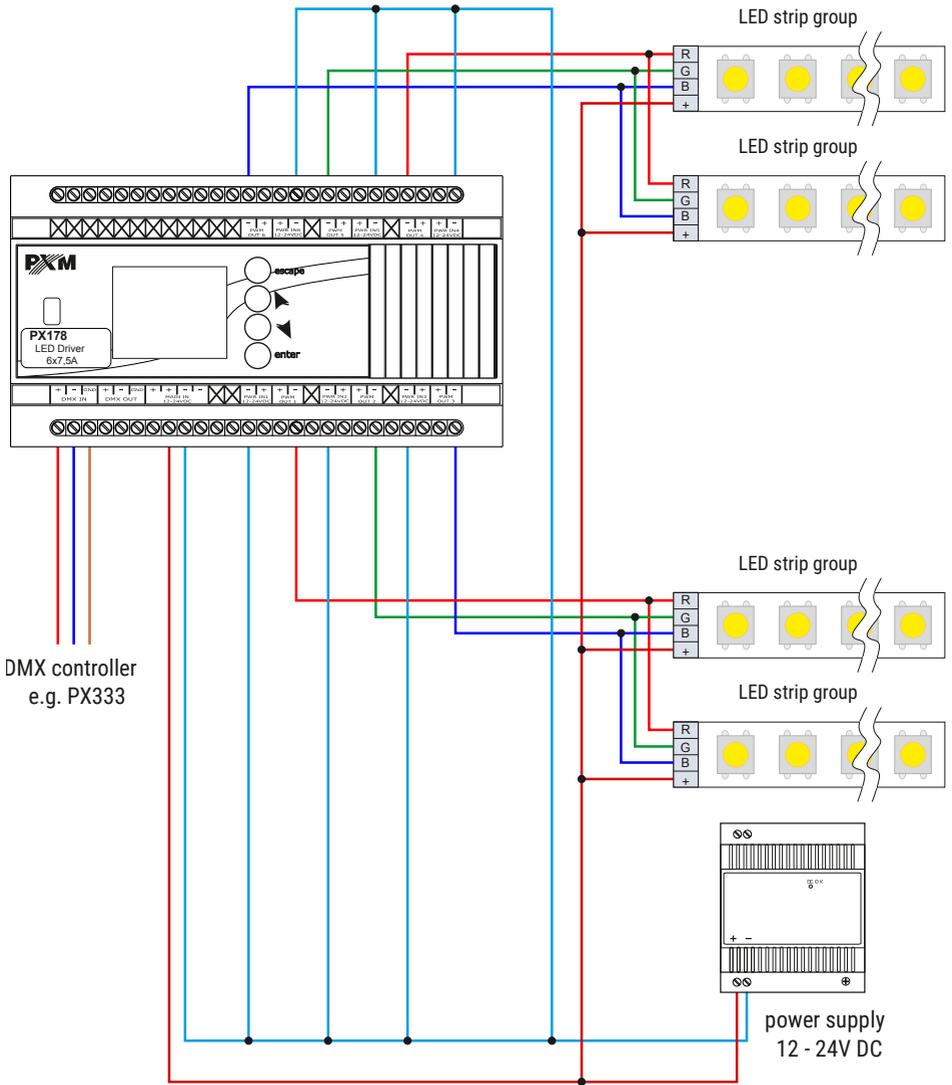
PX178 have to be connected to DMX line in serial mode, with no branches on DMX control cable. That means that DMX line, from the signal source, must be connected to **DMX IN** pins of PX178 and later, directly from **DMX OUT** pins to the next device in DMX chain.

If the PX178 is the last DMX chain receiver there should be terminator (resistor 120 Ohm) mounted between "+" and "-" pins of **DMX OUT** section.

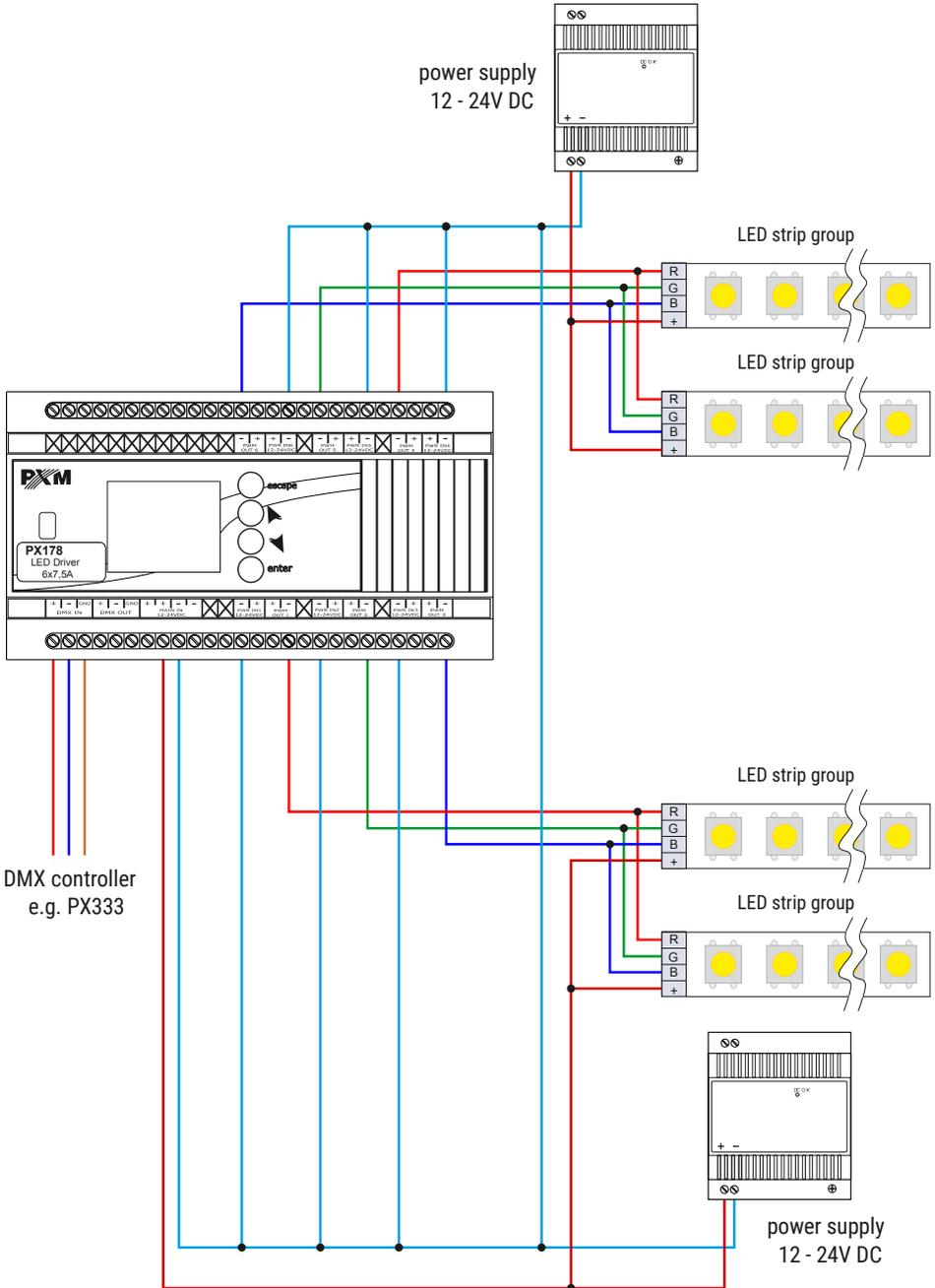


# 8 Connection scheme

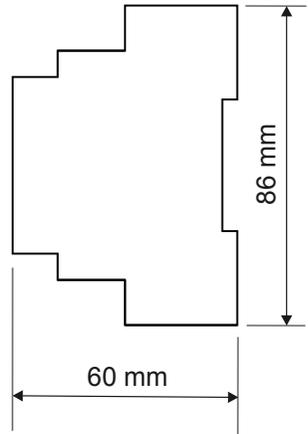
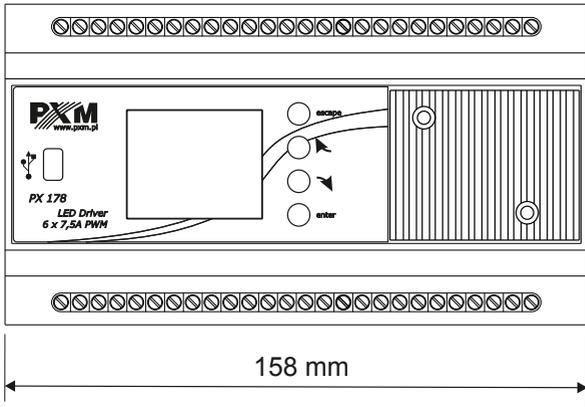
a) connection between LED strip group and a common power supply



## b) connection between a LED strip group and two power supply units



# 9 Dimensions



## 10 Technical data

---

type	PX178
DMX channels	512
power supply	12 – 24V DC
current consumption	max. 45A
number of output channels	6
interpolated resolution of output control	16 bit
programmable scene	8
number of programs	8
output load	7.5A / channel
output sockets	terminal blocks
Master / Slave mode	yes
real time clock	yes
dimensions	width: 158mm (9-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.V. 6 x 7,5A

*Product code:* PX178

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.