

PX163+

DRIVER LED  
48 x 700mA

MANUAL



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

# 1. GENERAL DESCRIPTION

PX163+ is a 48-channel voltage driver designed for the RGB matrix systems, ideally suited for controlling lighting in large areas consisting of multiple modular elements. An example can be here the façade - LED screens or illuminated floors.

It is possible to control all 48 channels through the DMX-512 protocol with the use of the in-built DMX signal receiver. The wide range of supply voltage (12-24V DC) and the high ampacity of outputs (maximum 0.7A per channel) enable the connection of a lot of LEDs, and consequently the whole surface is equally lit. By the application of 12bits for 274Hz and 10bits for 1kHz of resolution, the brightness control of individual channels is entirely smooth. The implementation of modern technology "flicker free", i.e. a possibility to select frequency 1kHz is the additional advantage. By means of this option, the PX163+ driver can successfully be used in installations made for the needs of the television industry. What is more, the RDM protocol has been implemented in PX163+. In comparison with the previous version the device has been extended with a display unit, an intuitive menu and buttons, which allows convenient configuration.

The device has the function of channels addressing, 18 integrated programmes and one scene that can be programmed. The programs can be played in the effective mode, or in the case of the disappearance of DMX signal. The driver is produced in a "common anode" version, which allows you to connect LEDs with the common plus.

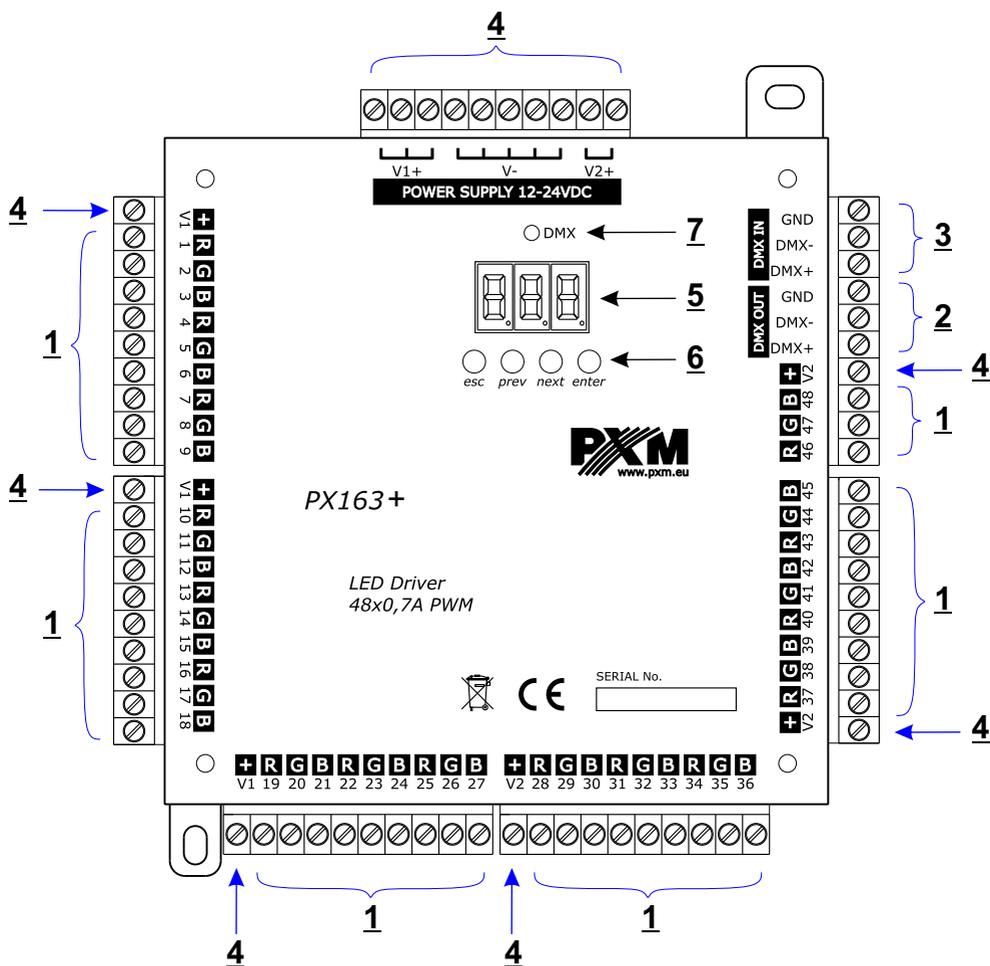
A flat small housing with dimensions of 151 x 158.5 x 30 mm is designed for wall mounting. Screw connectors allow for quick and easy installation.

# 2. SAFETY CONDITIONS

DRIVER LED 48 x 700mA powered with safe voltage 12-24V; however, during its installation and use the following rules must be strictly observed:

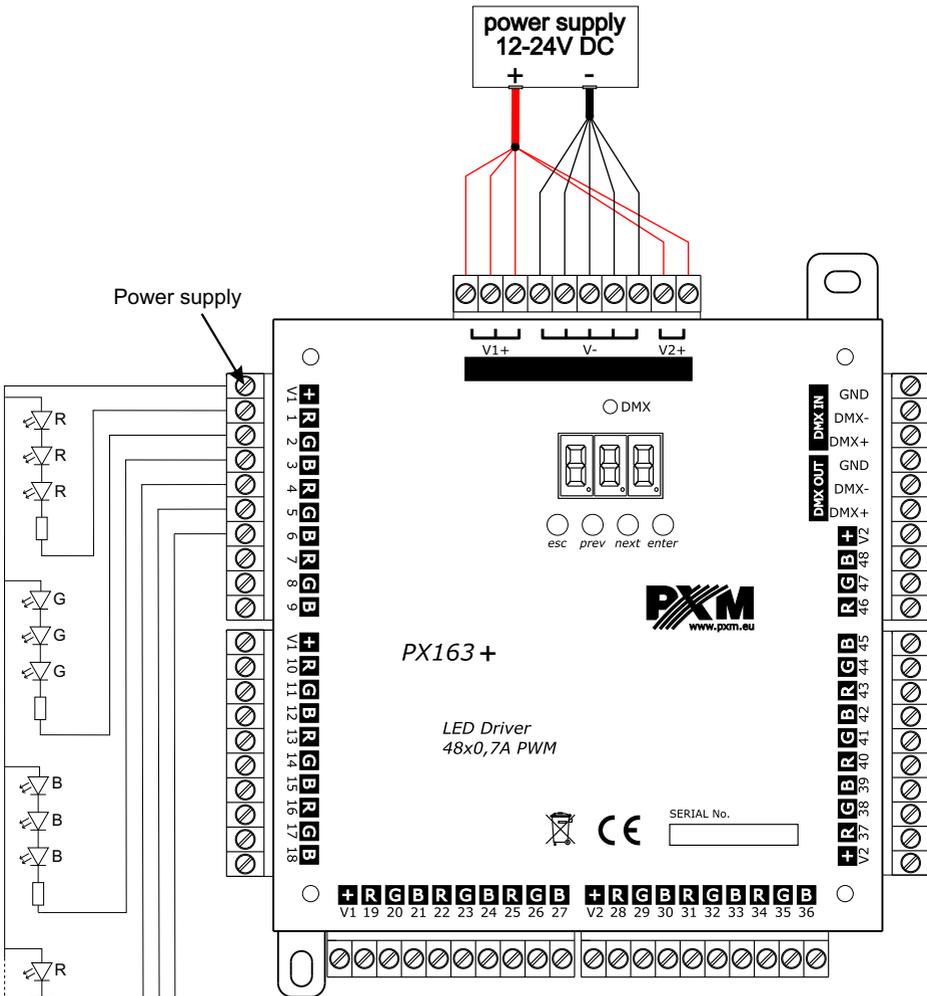
1. Installation of equipment, in particular, power connection should be made by a licensed person, in accordance with this manual.
2. The device may only be connected to DC current (stabilized voltage) with current-carrying capacity compatible with technical data.
3. Product is designated only to indoor usage. In case of any outdoor usage it should be protected against any weather conditions.
4. All the conductors should be protected against mechanical and thermal damage.
5. In the event of any conductor damaging, it should be replaced with the one of the same technical specification.
6. Connection of DMX signal should be made with shielded conductor.
7. All repairs and connections of outputs or DMX signal can only be made with power off.
8. PX163+ should be strictly protected against contact with water and other liquids.
9. All sudden shocks - particularly dropping - should be avoided.
10. The device cannot be turned on in places with humidity exceeding 90%.
11. The device cannot be used in places with temperature lower than +2°C or higher than +40°C.
12. For cleaning use only a damp cloth.

### 3. MODEL DESCRIPTION



- 1. Driving outputs: 48 (OUTPUTS)
- 2. DMX OUT
- 3. DMX IN
- 4. Power supply
- 5. LED display
- 6. Driving buttons
- 7. Diode of DMX signal

## 4. CONNECTION DIAGRAM



The receivers are connected to the driving and power supplying outputs as shown in the figure. The specified number of light sources can be on each line, depending on consumed power, and the load of each line is max. 700mA. Therefore, after connecting all the receivers, add all lines and select the adapter with adequate power.

### NOTE!!!

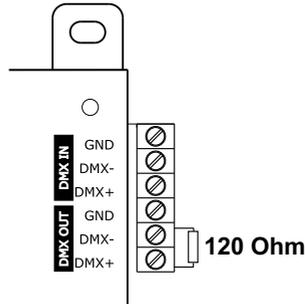
**Current load capacity of a single power connection must not be greater than 10A !!!**

In order to increase the current load capacity of connection, perform the connections of several inputs. The minimum cross section of the cable is 2.5 mm<sup>2</sup>.

## 5. DMX SIGNAL CONNECTION

PX163+ must be connected to DMX line in series. This means that DMX IN terminals in the device must be provided with a driving cable, and then from DMX OUT connector the driving cable must be provided to other DMX receivers.

If PX163+ is the last device in DMX line, "DMX+" and "DMX-" terminals must be provided with the terminator-resistor of 120 Ohm.



## 6. MEANING OF DISPLAYED MESSAGES

**000**

DMX address of the device - the basic position in the MENU

**ALL**

setting of the parameters for all channels simultaneously

**111**

setting of the parameters for each channel separately

**ADD**

setting of DMX address

**066**

selection of the driving method

**ABS**

selection of the response to the lack of DMX signal

**EFF**

driving in the effective mode

**011**

switching on of all outputs at 100%

**0FF**

switching off of all outputs

**522**

scene

**504**

setting the scene

**111**

program no. 17

**001**

setting of DMX address for the first channel

**488**

driving in a 48-channel mode

**SPD**

the program playing speed

**FRD**

liquidity level of changing the steps in the program

**BDN**

setting of brightness of the program

**FRF**

frequency of PWM signals

**SCP**

switching on of the screen backlight

**ERR**

the memory error message

**DFD**

the restore default settings menu in the device

**SEH**

the function of smoothing of transitions between different values

**DFS**

minimum level of brightness

## 7. PROGRAMMING OF GROUP PARAMETERS

Programming in this menu is common to all channels. After selecting **ALL** from the main menu, confirm selection by pressing "enter", then with "next" or "previous" select the parameters to be set:

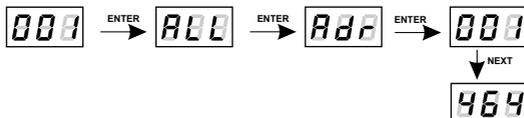
- Adr** - DMX address of the device,
- Cbn** - selection of the driving method,
- noS** - response of the device to the disappearance of DMX signal,
- Sth** - the function of the smoothing of transitions between different values.

The next step is to confirm selection by pressing "enter".

The address programmed in this way will delete the previous individual settings of the channels.

### 7.1. Setting of DMX address

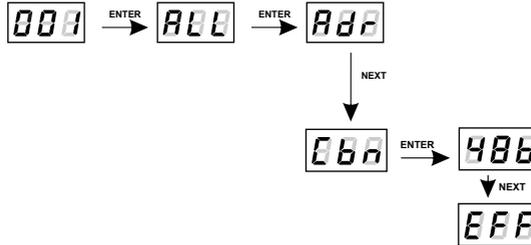
PX163+ driver's menu allows you to set DMX address of the device in the range from 1 to 464 or from 1 to 5 depending on the operating mode. For **48b** mode, the module takes further forty-eight DMX addresses, when setting 464 address, the last channel takes 512 address. For the effective mode, it takes further 4 DMX addresses.



## 7.2. Operation mode

PX163+ driver can operate in the effective mode (**EFF**) and the 48-channel mode (**48b**).

In order to select the colour mode, in **ALL** menu enter **Cbn** function, and then select **48b** for 48-channel or **EFF** for 4-channel mode (effective).



The description of operation of EFF 4-byte (effective) mode

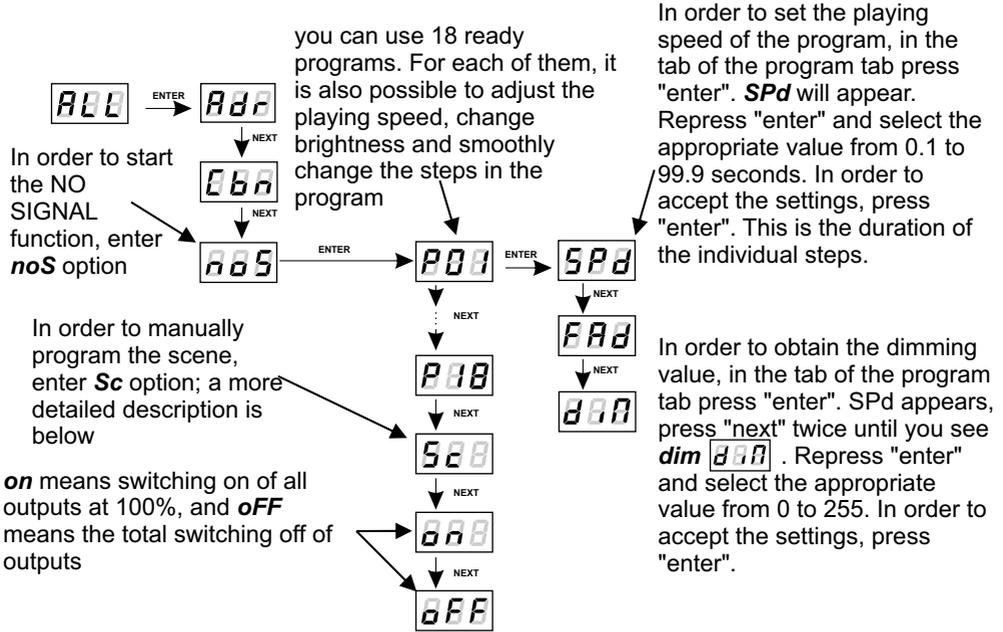
The description of the effective mode channels			
CHANNEL 1 - EFFECT	CHANNEL 2 SPEED	CHANNEL 3 FADE	CHANNEL 4 BRIGHTNESS
< 0 - 12 > Program 1	X	X	X
< 13 - 25 > Program 2	X	X	X
< 26 - 38 > Program 3	X	X	X
< 39 - 51 > Program 4	X	X	X
< 52 - 64 > Program 5	X	X	X
< 65 - 77 > Program 6	X	X	X
< 78 - 90 > Program 7	X	X	X
< 91 - 103 > Program 8	X	X	X
< 104 - 116 > Program 9	X	X	X
< 117 - 129 > Program 10	X	X	X
< 130 - 142 > Program 11	X	X	X
< 143 - 155 > Program 12	X	X	X
< 156 - 168 > Program 13	X	X	X
< 169 - 181 > Program 14	X	X	X
< 182 - 194 > Program 15	X	X	X
< 195 - 207 > Program 16	X	X	X
< 208 - 220 > Program 17	X	X	X
< 221 - 233 > Program 18	X	X	X
< 234 - 255 > OFF	-	-	-

- CHANNEL 1 - select the effect
- CHANNEL 2 - setting of speed (higher value - faster changes)
- CHANNEL 3 - setting of fade (higher value - smoother transition)
- CHANNEL 4 - setting of brightness (higher value - stronger light)

- sign („X”) - means the ability to drive the parameter of the selected effect
- sign („-”) - means no ability to drive the parameter of the selected effect

### 7.3. Response to the lack of DMX signal

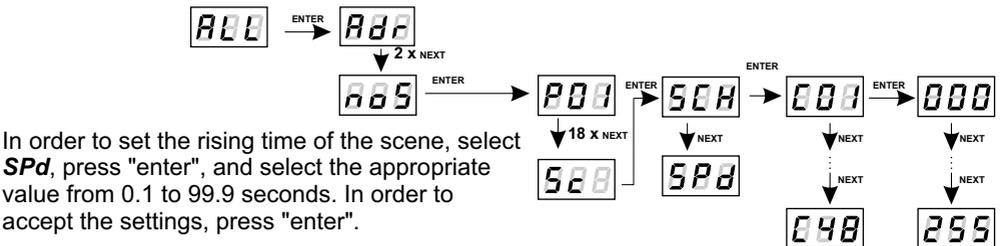
This function is used both to protect the system against the disappearance of DMX signal and to gain the driving of LEDs without connecting an external driver. After it has been activated, in case of the lack of DMX signal, the module will perform the selected function by itself. Reconnecting of DMX signal will automatically break the performed function, and the module will again send the command with a DMX line.



In order to accept the settings, press "enter".

In order to change the speed of changing the steps, press "enter" in the tab of the selected program. Then click "next" or "previous" to set **FAd** parameter. Repress "enter" and enter the selected value between 0 (transition function) to 100 (completely smooth transition) by using "previous" or "next". Confirm the settings with "enter".

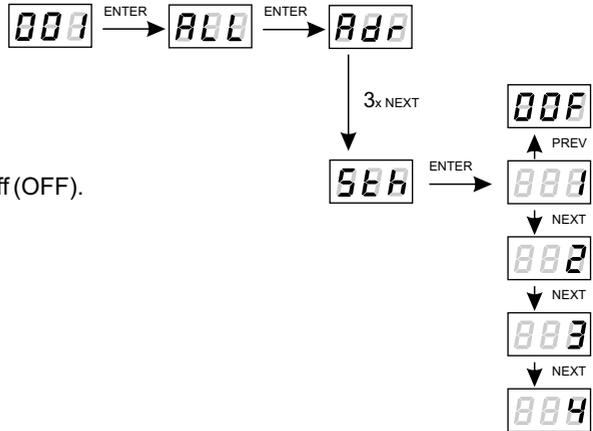
In order to program the scene select **Sc**, then confirm with "enter". For the selected channel (48 channels available) repress "enter" and select the appropriate value from 0 to 255. In order to accept the settings, press "enter".



## 7.4. The smoothing function

The device has also the smoothing option. Smoothing allows for smooth brightness and colour changes. When the function is on, the transition between further DMX values sent to the lamp (e.g. responsible for brightness) occurs smoothly without obvious jerks, which prevents the effects of "vibrations" in the lighting system.

The user can select one of four levels of smoothing (1 – 4).



Level 1 – lowest smoothing

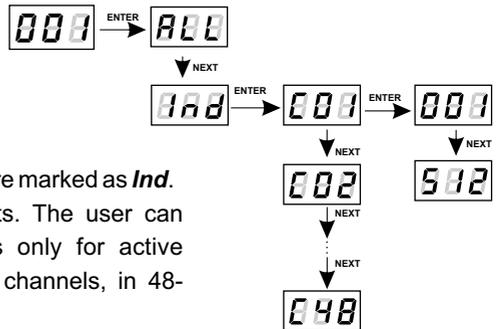
Level 4 – highest smoothing

The user can also switch smoothing off (OFF).

## 8. PROGRAMMING OF INDIVIDUAL PARAMETERS

PX163+ module has the option of individual settings. It allows you to provide each output channel with any address. The simplest example is the driving of brightness with LED of the same colour connected to each driver output.

In this case, provide the channels from 1 to 48 with the same address (e.g. 1), so that with one slider on the driving panel or due to change of the value of DMX, you can cause the response on any of 48 channels.

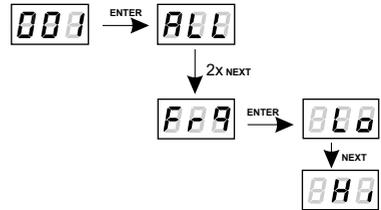


In order to program the individual settings:

1. Enter the function of individual settings that are marked as *Ind*.
2. Set the address for the remaining outputs. The user can change the individual channel addresses only for active channels (in the effective *EFF* mode four channels, in 48-channel mode *48b* forty-eight).
3. By pressing "next" or "previous", select the appropriate DMX channel from 1 to 512.

## 9. FREQUENCY OF PWM SIGNALS

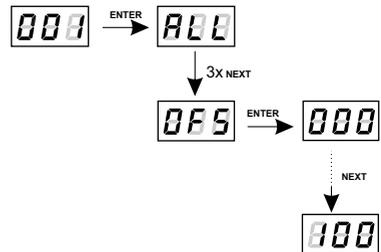
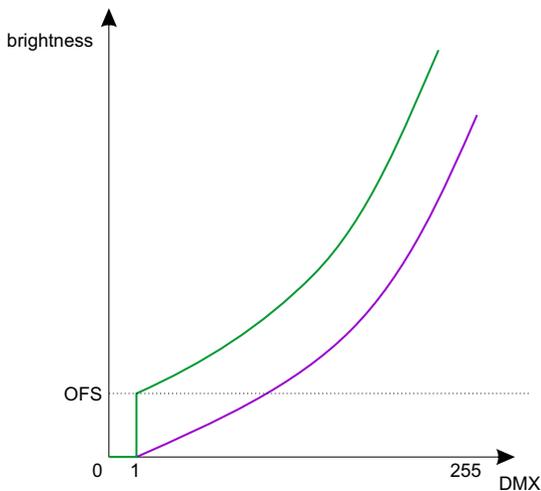
The **Frq** function allows you to set the base frequency to drive LEDs. This function is extremely useful for applications in the television industry. By using the "flicker free" technology, you can avoid an unpleasant image flicker effect caused by a lack of appropriate synchronization of LED driving signal. The user has two available frequency: 274 Hz (function **Lo**) and 1000 Hz (Hi). The value of frequency in the upper range avoids the flicker effect visible in the cameras.



## 10. MINIMUM LEVEL OF BRIGHTNESS

The function of setting the minimum level of brightness (OFS) has been implemented in the PX163+ device, which can be set in the range from 0 to 100.

The way it functions is presented in the diagram below:



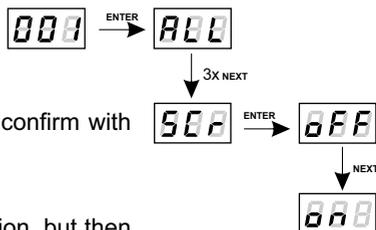
This parameter is useful when the diodes connected to the driver show unstable functioning at the low control levels. In such a case the increase in the value OFFSET can result in achieving better dimming effects.

## 11. SCREEN TIMEOUT

The device has been equipped with the option of switching off the backlight of the screen. This is provided by the **SCr** option. By using it, the display is switched off after approx. 1 min. of inactivity (buttons unused). The device still operates without interfering with other parameters. In order to restore the backlight, use any button.

In order to activate the backlight:

1. Set the **SCr** function and confirm with "enter".
2. With "next" or "previous" change the value to on and confirm with "enter".



You should follow similarly in order to switch off this function, but then select **oFF**.

## 12. ADDITIONAL FUNCTIONS

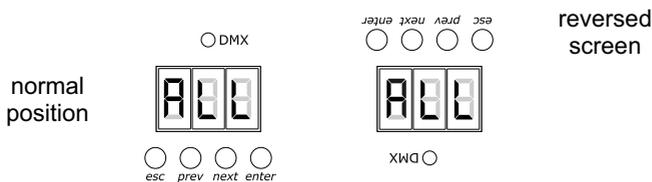
PX163+ has additional features: rotation of the display and possibility to restore the default settings of the device. In addition, the driver signals the integrated memory error.

### 12.1. Rotation of the display

If necessary, you can rotate the display without rotating the whole device.

Just hold two middle buttons ("previous" and "next") at the same time for approximately 3s.

**NOTE:** In addition to the display, the order of the buttons is also changed in terms of places.



In order to restore the standard setting, hold the middle buttons for approximately 3s.

## 12.2. Default settings and memory error

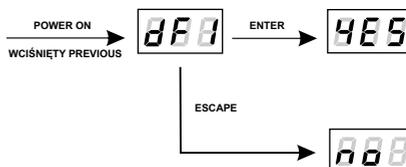
The device has been equipped with the option of restoration of the default settings.

In order to use this option, disconnect PX163+ from power supply. Before reconnecting power supply, press and hold "previous". Then, after switching on, a **dFI** message will appear on the device's screen (while switching on power until **dFI** message appears, "previous" must be pressed).

This is the indication of the menu of the factory settings restoration. The acceptance of the message with "enter" restores the default settings. It is also possible to exit this menu without returning to the default settings. In this case, select "escape".

The default settings in PX163+ are as follows:

- DMX address - 1,
- operating mode of the driver - 48b,
- operating mode of no signal - OFF,
- smoothing function (smooth) - Level 1,
- frequency - 274 Hz,
- **SCr** option - switched off



## Err message - memory error

The device has an integrated operating control of the integrated memory.

In case of problems with the operation of the memory, on the display of PX163+ **Err** message - memory error will appear.

In this case, select "enter", then the device reloads the default configuration to the memory. If after this operation **Err** message is still displayed on the display, it means that the memory is permanently damaged and the device must be sent to the service.

### 13. RDM DESCRIPTION OF AVAILABLE PARAMETERS

PX163+ supports the DMX-RDM protocol. The DMX protocol has been designed to allow one-direction flow of data, while its extension, the RDM protocol, can send information in two directions. For this reason, it is possible to simultaneously receive and send information, and hence the possibility of monitoring the operation of the devices compliant with the RDM protocol, and possible reconfiguring of their operating parameters.

Below is a list of RDM parameters supported by the PX163+:

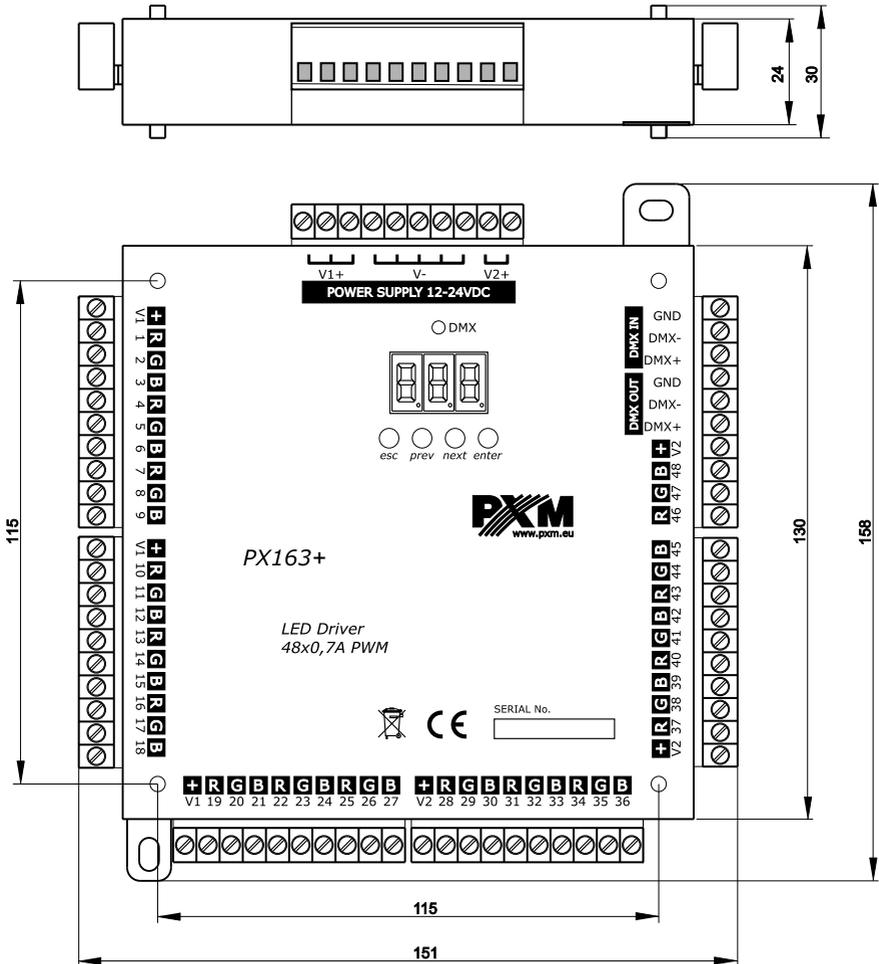
<b>Parameter name</b>	<b>PiD</b>	<b>Description</b>
PARAMETER_DESCRIPTION	<b>0x0051</b>	description of additional parameters
DEVICE_INFO	<b>0x0060</b>	information concerning the device
SOFTWARE_VERSION_LABEL	<b>0x00C0</b>	firmware version of the device
DMX_START_ADDRESS *	<b>0x00F0</b>	DMX starting address of the device; Range 1-464 or 1-508, depending on the operating mode.
IDENTIFY_DEVICE *	<b>0x1000</b>	device identification; Two states are possible: identification is off (0x00 value) and identification is on (0x01 value).
STATUS_MESSAGES	<b>0x0030</b>	information about device status
DEVICE_MODEL_DESCRIPTION	<b>0x0080</b>	device description, e.g. name
MANUFACTURER_LABEL	<b>0x0081</b>	manufacturer description, e.g. name
DEVICE_LABEL *	<b>0x0082</b>	additional device description; It is possible to enter an additional device description using up to 32 ASCII characters.
DMX_PERSONALITY	<b>0x00E0</b>	DMX operational mode
DMX_PERSONALITY_DESCRIPTION	<b>0x00E1</b>	description of individual operational modes

<b>Parameter name</b>	<b>PiD</b>	<b>Description</b>
NO_SIG_P1-18 SC_19 ON_20 OFF_21 *	<b>0x801C</b>	choice of work mode for No DMX signal; Minimal Value is 1, maximal 21. For values 1-18 menu allows to chose program from 1 to 18 which is played during no DMX signal detection. For the 19 value a scene saved in memory is set and for the 20 value all outputs are set to ON with maximum value. The value 21 sets to OFF all outputs during time with no DMX signal received. Default value is 21.
SCREENSAVER_ON/OFF *	<b>0x8024</b>	settings of screensaver (display backlight in PX163+); With the 0 value display blanking is not active, the 1 value means screensaver active. Default value is 0.
PROGRAM_SPEED *	<b>0x8025</b>	programs playback speed settings (playing next steps of program); Minimum value is 1 and maximal 999 (maximum speed). By default it is set to 10. Value 1 represents 0,1s, and 999 - 99,9s.
PROGRAM_FADE *	<b>0x8026</b>	settings of smooth transition between following steps of a program; The minimum value is 0 (step transition) a maximum of 100 (transition completely smooth). The default value is 100.
PWM_FREQUENCY *	<b>0x8028</b>	LEDs refresh frequency; The minimum value is 366, and the maximum is 1500. The unit is [Hz] and the default value is 366.
DISPLAY_FLIP *	<b>0x8038</b>	inverting the meter display 180 degrees; The minimum value is 0, and the maximum is 1. The default value is 0.
PROGRAM_DIMMER *	<b>0x8032</b>	setting the value of dimming; The minimum value is 0, and the maximum is 255. The default value is 255.
SERIAL_NUMBER	<b>0x8030</b>	device serial number
OFFSET *	<b>0x8055</b>	minimum level of brightness; The minimum value is 0, and the maximum is 100

\* - parameter editable



## 15. DIMENSIONS



## 16. TECHNICAL DATA

DMX channels:	512
power supply:	12 - 24V DC
current consumption:	Max. 34A
output channels number:	48
outputs load capacity:	Max. 0,7A / channel
output sockets:	terminal blocks
dimensions:	Width: 151 mm
	Height: 158,5 mm
	Depth: 30 mm



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<http://www.pxm.pl>

## DECLARATION OF CONFORMITY according to guide lines 2004/108/WE

Name of producer: PXM Marek Żupnik sp. k.

Manufacturer's address: ul. Przemysłowa 12  
30-701 Kraków

*We declare that our product:*

Product name: **DRIVER LED 48x700mA/OC**

Product code: **PX163+**

*complies with the following standards:*

**EMC:** **PN-EN-61000-4-2:2011**  
**PN-EN 61000-6-1:2008**  
**PN-EN 61000-6-3:2008**

*Additional information:*

The DMX-512 output must be shielded and the shielding must be connected to the ground responding to the DMX connectors.



Marek Żupnik spółka komandytowa  
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NIP 677-002-54-53

Kraków, 17.08.2015

mgr inż. Marek Żupnik.