

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.

By using the integrated DMX signal receiver, it is possible to drive all 48 channels with DMX-512 protocol. A wide range of supply voltage (12-24V DC) and high outputs current load (up to 0.7A per channel) allow you to connect large quantities of LEDs, and hence obtain uniform illumination of the entire surface. Due to using 9-bit resolution, brightness driving of each of the channels is completely seamless. An additional advantage is the implementation of modern "flicker-free" technology with which PX163+ driver can be successfully used in the systems created for the television industry. In addition, the RDM protocol was implemented in PX163+. In relation to the previous version, the device was expanded with a display, an intuitive menu and buttons allowing for convenient setting up.

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.

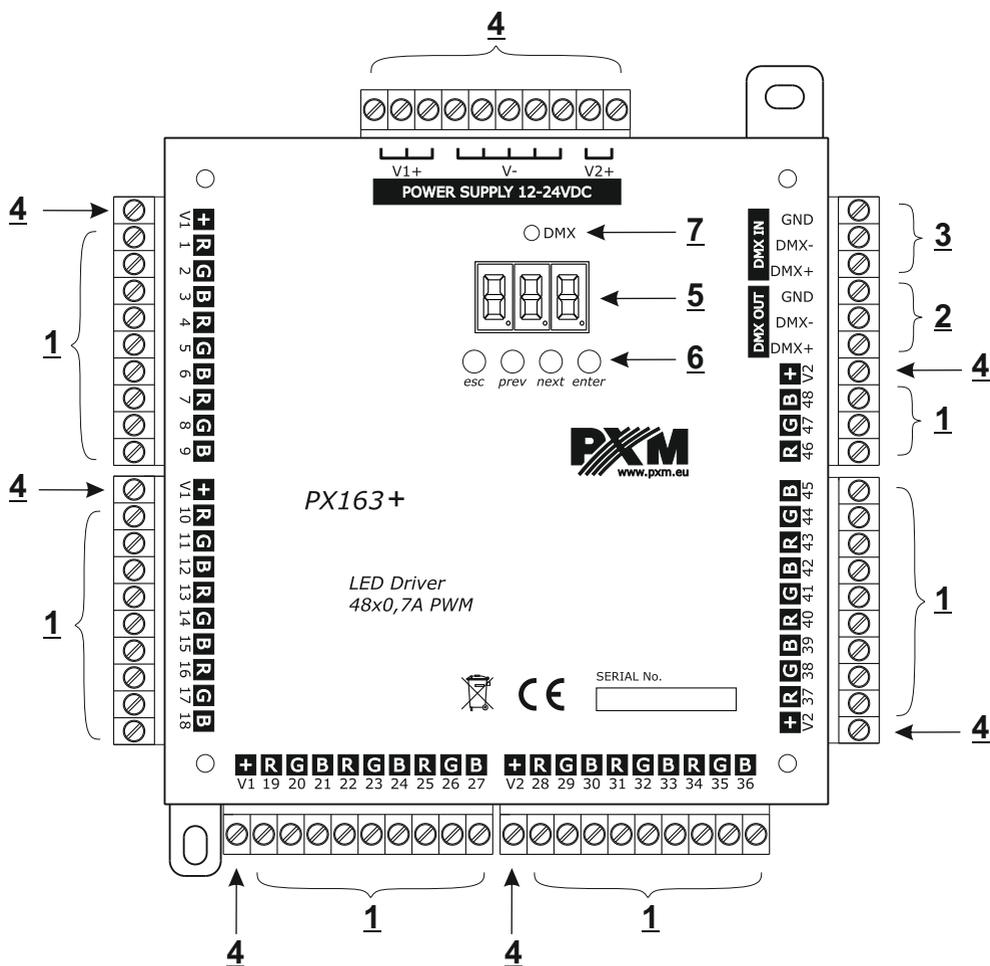
A flat small housing with dimensions of 151 x 158.5 x 30 mm is designed for wall mounting. Screw connectors allow for quick and easy installation.

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:

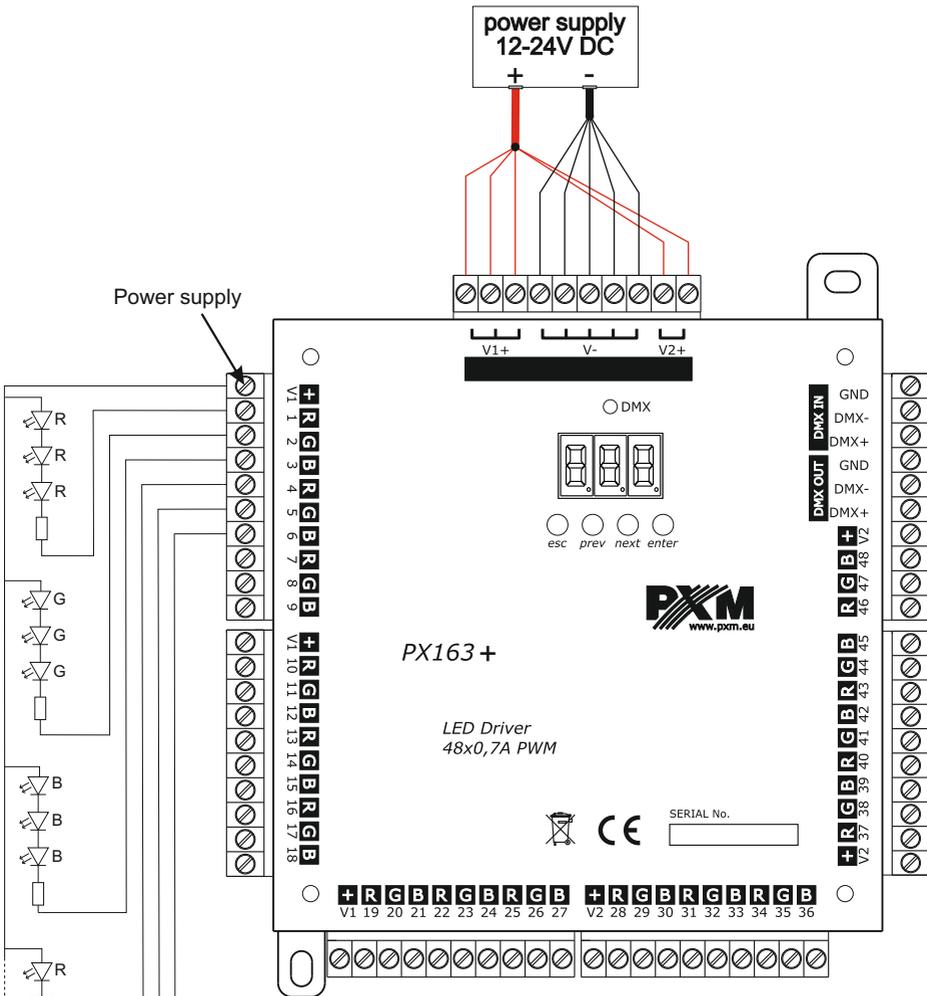
1. Installation of equipment, in particular, power connection should be made by a licensed person, in accordance with this manual.
2. The device may only be connected to DC current (stabilized voltage) with current-carrying capacity compatible with technical data.
3. Product is designated only to indoor 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!!!

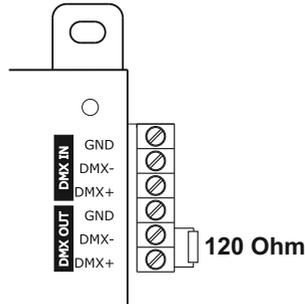
Current load capacity of a single power connection must not be greater than 10A !!!

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 mm².

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

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

ALL setting of the parameters for all channels simultaneously

1nB setting of the parameters for each channel separately

ABP setting of DMX address

0bA selection of the driving method

nB5 selection of the response to the lack of DMX signal

EFF driving in the effective mode

0nB switching on of all outputs at 100%

0FF switching off of all outputs

52B scene

5CH setting the scene

P17 program no. 17

001 setting of DMX address for the first channel

EBN smoothing in the time interval

486 driving in a 48-channel mode

SPd

the program playing speed

FAb

liquidity level of changing the steps in the program

dBn

setting of brightness of the program

FAA

frequency of PWM signals

SCP

switching on of the screen backlight

EPA

the memory error message

DFI

the restore default settings menu in the device

SEh

the function of smoothing of transitions between different values

dB5

the switching off of the smoothing function

PPP

smoothing between the packages of DMX signal

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".

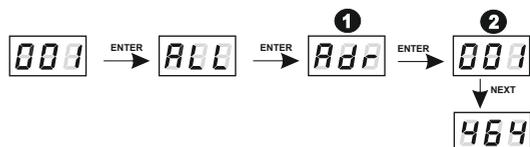
The address programmed in this way will delete the previous individual settings of the channels.

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.

In order to set DMX address:

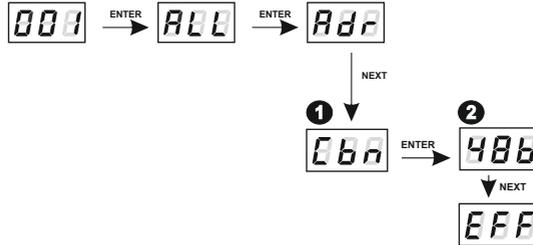
1. Set the **Adr** function.
2. By using "next" or "previous" set the selected DMX address.



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

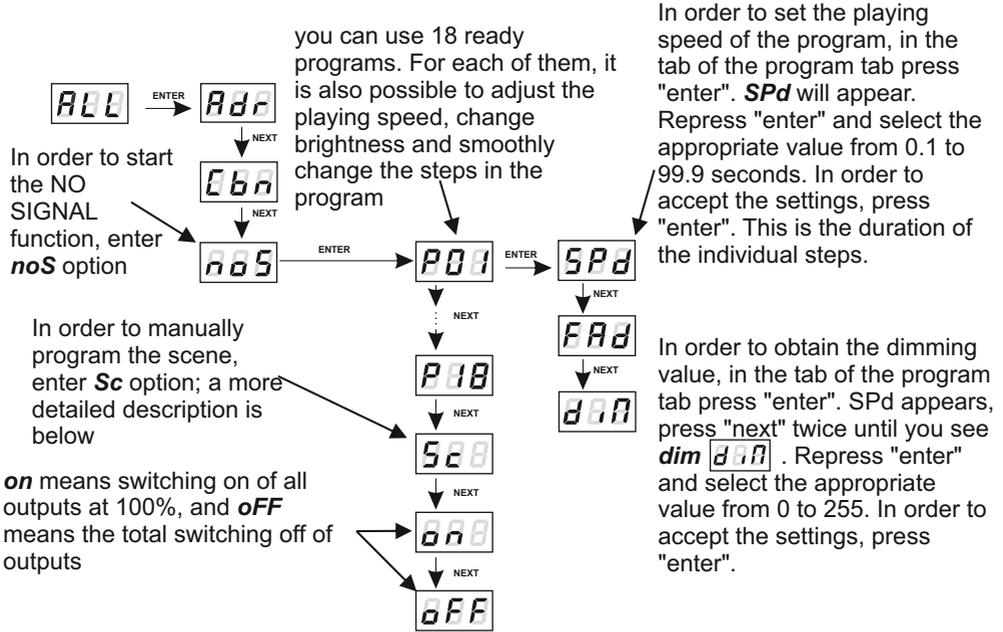
The description of the effective mode channels			
CHANNEL 1 – Effect	CHANNEL 2 SPEED	CHANNEL 3 FADE	CHANNEL 4 BRIGHTNESS
< 0 - 12 > Program 1	X	X	X
< 13 - 25 > Program 2	X	X	X
< 26 - 38 > Program 3	X	X	X
< 39 - 51 > Program 4	X	X	X
< 52 - 64 > Program 5	X	X	X
< 65 - 77 > Program 6	X	X	X
< 78 - 90 > Program 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

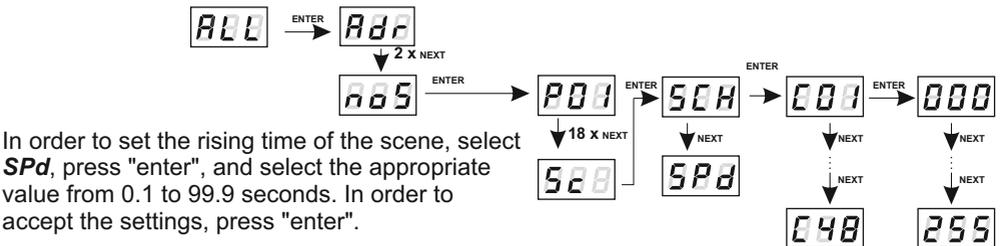
This function is used both to protect the system against the disappearance of DMX signal and to gain the driving of LEDs without connecting an external driver. After it has been activated, in case of the lack of DMX signal, the module will perform the selected function by itself. Reconnecting of DMX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

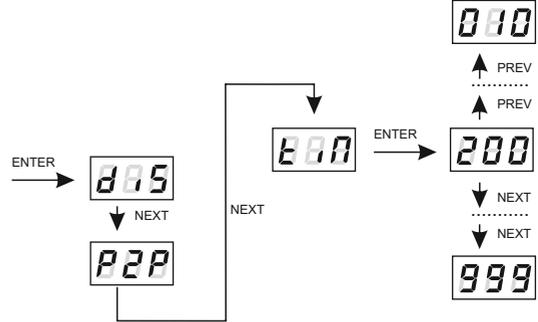


7.4. The smoothing function

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. Two further DMX values sent to the lamp are smoothed linearly between the DMX signal packages in the case of selected P2P option or in the time interval specified in *tim* menu (**EBN**).

Tim time **EBN** smoothing allows you to change the parameter of time, in which further different values of DMX signal sent to the lamp are smoothed between one another. The user can set the time for smoothing by using "previous" and "next" between the minimum value of 10 [ms], and the maximum value of 999 [ms].

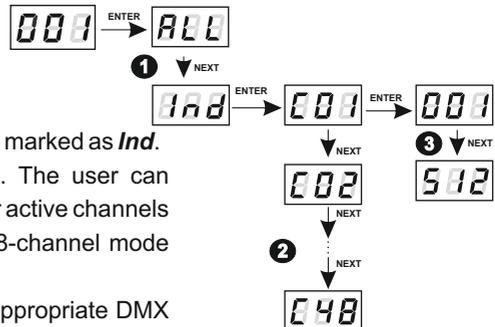
The operating smoothing function can slightly slow down the lamp response to the change of DMX signal, so it is possible to switch off this option. In order to switch off smoothing, select *dis* parameter and confirm the selection with "enter".



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.



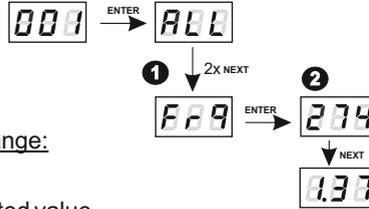
In order to program the individual settings:

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 the available frequency ranges from 274 Hz to 1.33 kHz, the values change progressively, they can be changed by selecting "previous" or "next".

The value of frequency in the upper range (e.g. = 1.37 = 1.37 kHz) avoids the flicker effect visible in the cameras.



In order to set the selected base frequency range:

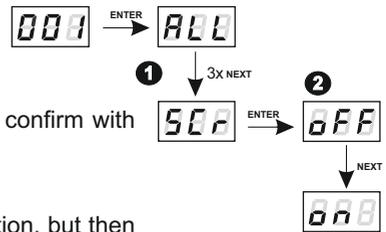
1. Select the **Frq** function.
2. By using "next" or "previous", set the selected value.

10. 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**.

11. ADDITIONAL FUNCTIONS

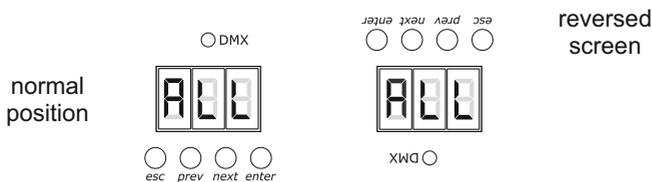
PX163+ has additional features: rotation of the display and possibility to restore the default settings of the device. In addition, the driver signals the integrated memory error.

11.1. Rotation of the display (previous FLP function)

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.

11.2. Default settings and memory error

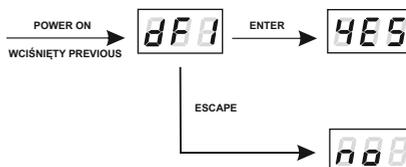
The device has been equipped with the option of restoration of the default settings.

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 - program 1,
- smoothing function (smooth) - switched off,
- frequency - 686 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.

12. 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.

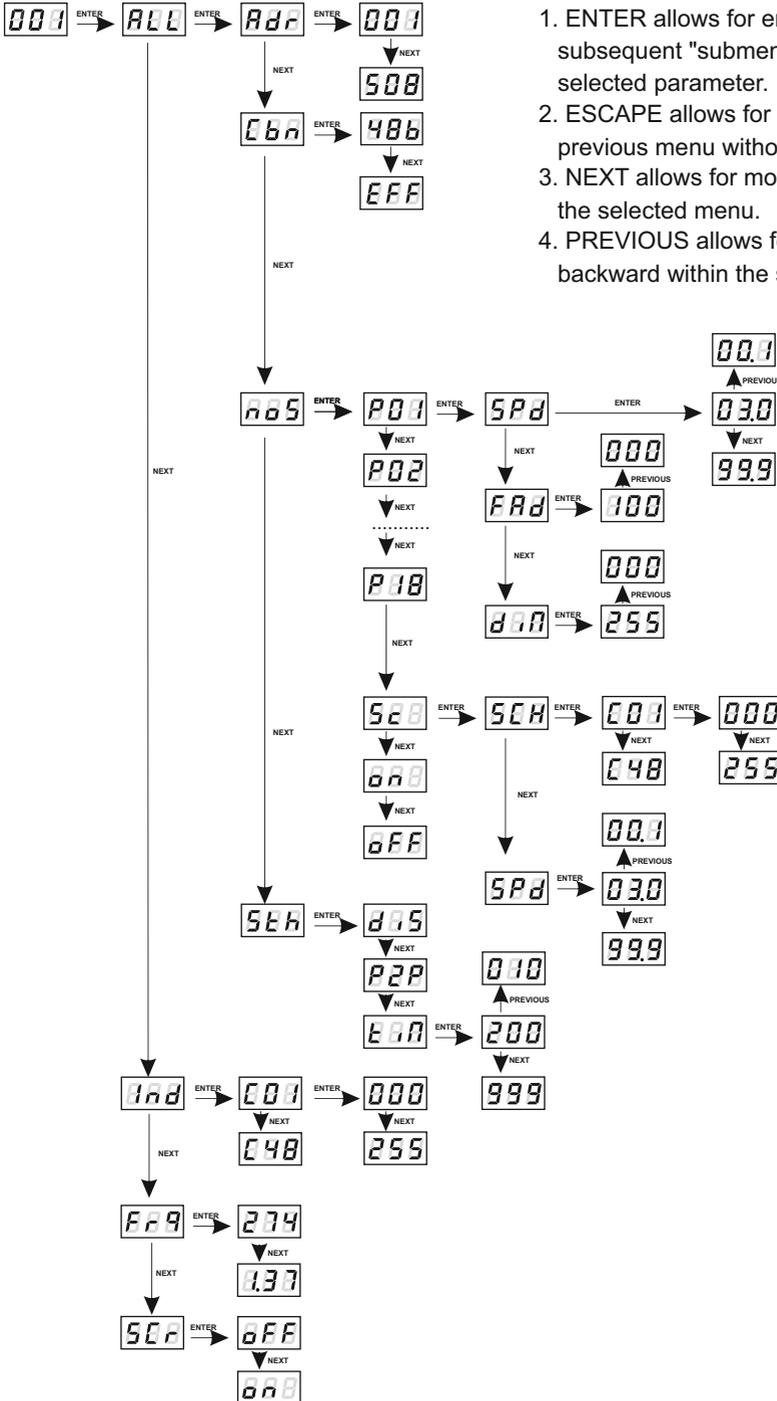
Below is a list of RDM parameters supported by the PX163+:

Parameter name	PiD	Description
PARAMETER_DESCRIPTION	0x0051	description of additional parameters
DEVICE_INFO	0x0060	information concerning the device
SOFTWARE_VERSION_LABEL	0x00C0	firmware version of the device
DMX_START_ADDRESS *	0x00F0	DMX starting address of the device; Range 1-464 or 1-508, depending on the operating mode.
IDENTIFY_DEVICE *	0x1000	device identification; Two states are possible: identification is off (0x00 value) and identification is on (0x01 value).
STATUS_MESSAGES	0x0030	information about device status
DEVICE_MODEL_DESCRIPTION	0x0080	device description, e.g. name
MANUFACTURER_LABEL	0x0081	manufacturer description, e.g. name
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
DMX_PERSONALITY_DESCRIPTION	0x00E1	description of individual operational modes
DEVICE_HOURS	0x0400	information concerning the working time of the device counted in hours
SMOOTH_TIME *	0x801B	smoothing time for TIM (time) function selected in the above point; Unit expressed in [ms]. Minimum parameter value is 10 and maximum is 2000 [ms]. Default value is 200 [ms].

Parameter name	PiD	Description
NO_SIG_P1- 18 SC_19 ON_20 OFF_21	0x801C	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 *	0x8024	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 *	0x8025	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 *	0x8026	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 *	0x8028	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 *	0x8038	inverting the meter display 180 degrees; The minimum value is 0, and the maximum is 1. The default value is 0.
PROGRAM_DIMMER *	0x8032	setting the value of dimming; The minimum value is 0, and the maximum is 255. The default value is 255.
SERIAL_NUMBER	0x8030	device serial number

* - parameter editable

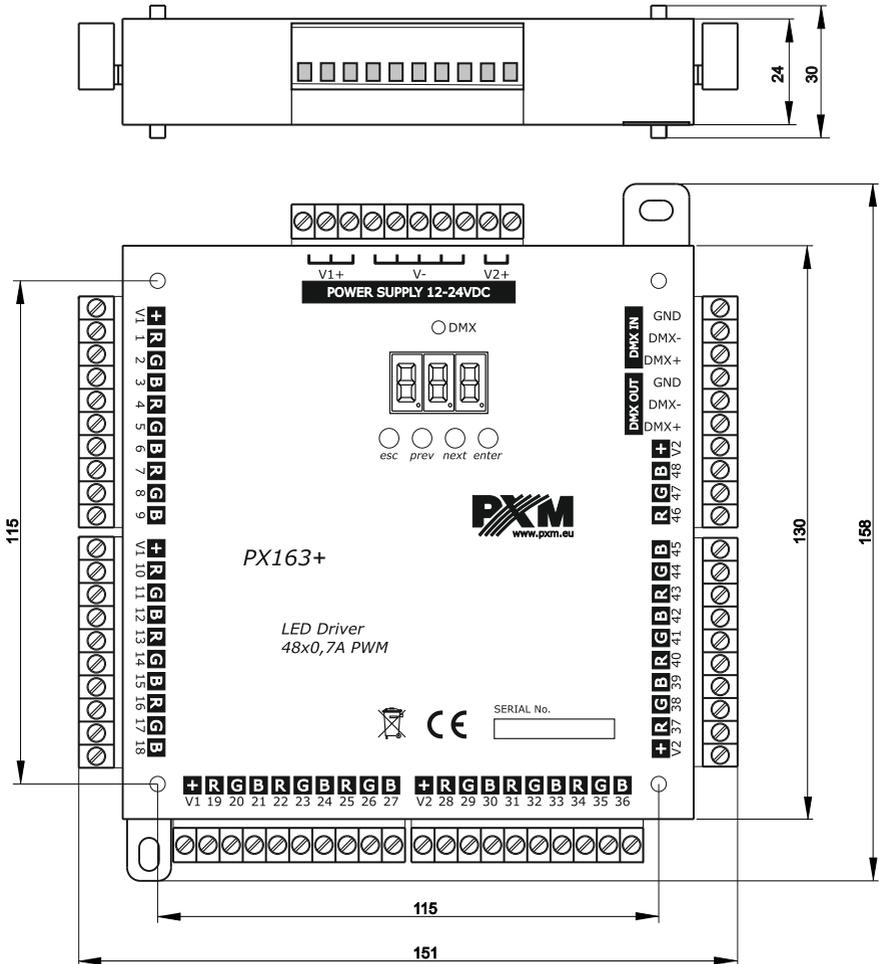
13. PROGRAMMING



NOTES:

1. ENTER allows for entering a subsequent "submenu" and saving a selected parameter.
2. ESCAPE allows for returning to the previous menu without saving changes.
3. NEXT allows for moving forward within the selected menu.
4. PREVIOUS allows for moving backward within the selected menu.

14. DIMENSIONS



15. 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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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.



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Kraków, 17.08.2015

mgr inż. Marek Żupnik.