PX963

Driver LED C.V.

48 x 1000mA

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

PX963 is a 48-channel voltage driver designed for RGB matrix systems, perfect for controlling lighting of large surfaces composed of many modular elements. An example of this are facades – LED screens.

Using the built-in DMX signal receiver, it is possible to control all 48 channels via the DMX protocol. A wide supply voltage range (12 – 24V DC) and high current capacity of the outputs (max. 1A per channel) allow for the connection of large numbers of LEDs – and thus the effect of uniform illumination of the entire surface. The device is equipped with a special high-current connector for connecting the power supply. The interpolated output control resolution of 16 bit makes the brightness control of individual channels completely smooth. An additional advantage is the implementation of modern "flicker free" technology, i.e. the possibility of selecting a 0.125 to 20kHz frequency, with its help the PX963 driver can be successfully used in installations created for the needs of the television industry. In addition, the RDM protocol has been implemented in the PX963. The device is equipped with a large LCD display (2 x 16), an intuitive menu and 4 buttons, which makes configuration easier.

PX963 allows for individual DMX channel addressing and defining an individual control curve for each channel. In the absence of a DMX signal, the user can define one scene. The driver is manufactured in a "common anode" version, which allows for connecting LEDs with a common plus.

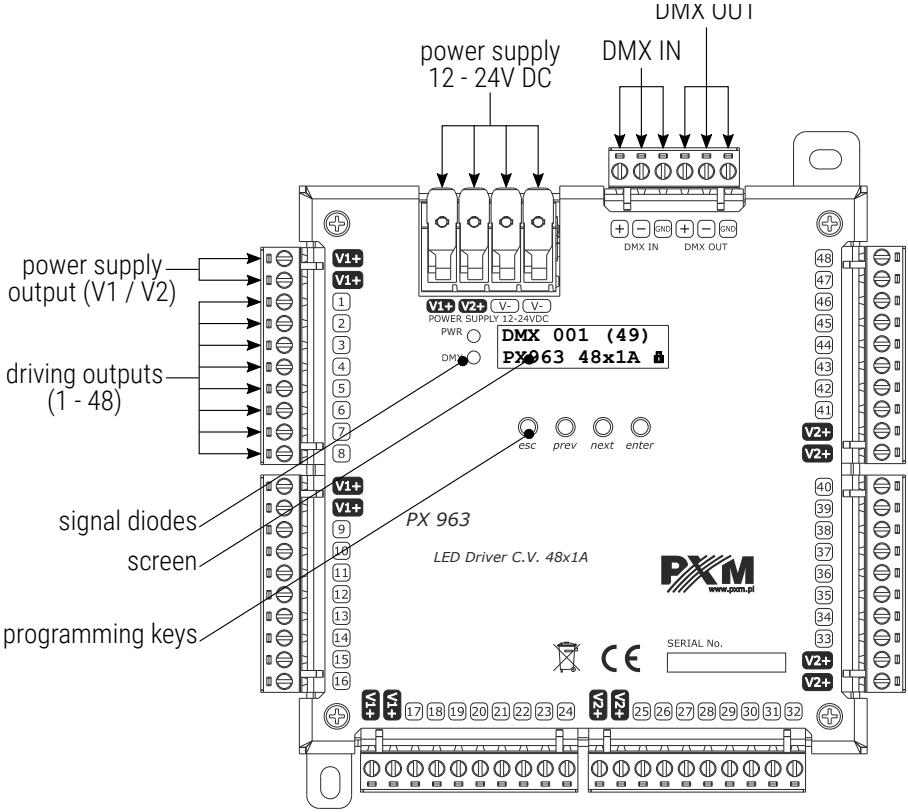
The housing is designed for wall mounting, and screw connectors enable quick and easy installation.

2 Safety conditions

Driver LED C.V. 48 x 1000mA s a device powered with safe voltage up to 48V DC; however, during its installation and use the following rules must be strictly observed:

1. The module should be installed by a person with appropriate qualifications, as described in the instructions.
2. The device may only be connected to 48V DC (stabilized voltage) with current-carrying capacity compatible with technical data.
3. The module is intended for indoor use. For outdoor use, the module must be protected from weather conditions.
4. All the conductors should be protected against mechanical and thermal damage.
5. In the event of damaging any conductor, it should be replaced with a conductor of the same technical data.
6. All repairs and connections of outputs can only be made with cut off power supply.
7. Do not connect a device with visible damage to the power supply.
8. The PX963 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.

3 Connectors and control elements



4 Programming using buttons

4.1 Button features

esc – exits the currently programmed parameter without saving changes or moves to a higher level in the menu

prev – scrolls the menu “up” or decreases the set values

next – scrolls the menu “down” or increases the set values

enter – enters the device programming and confirms the set values

If the parameter is editable, it will flash on the screen. The *prev* / *next* buttons change the field value. The *esc* button moves to the next field or saves the value and exits the parameter edit.

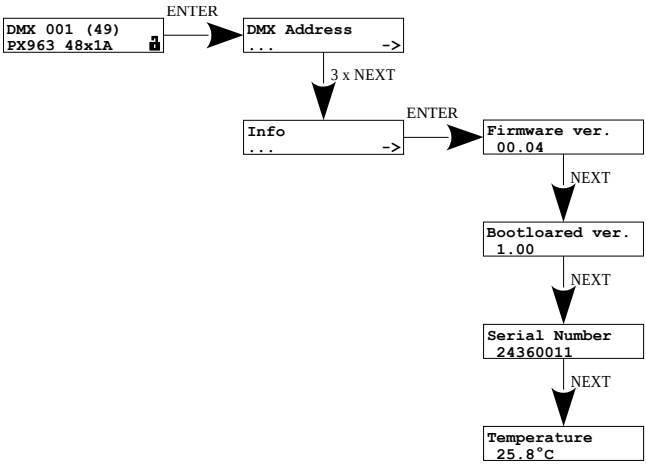
The **->** symbol indicates the possibility of entering the parameter editing tree.

NOTE! In this manual, "flashing" (currently being edited) parameters are shown in gray on the menu diagrams.

5 Description of information parameters

The on-screen menu allows you to read information parameters about the driver, such as:

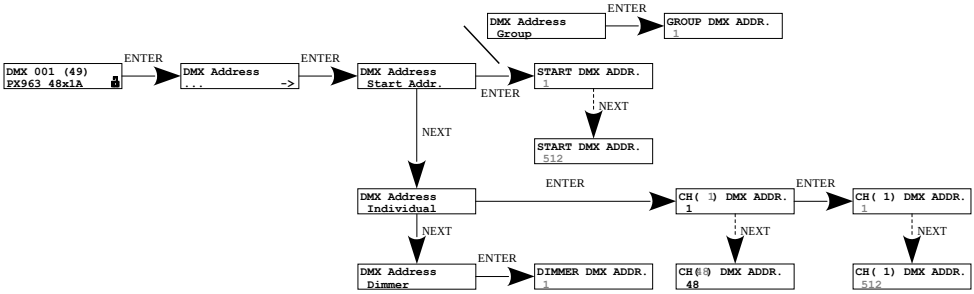
- start DMX address,
- number of DMX channels – depending on the operating mode,
- firmware version,
- bootloader version,
- device serial number,
- temperature.



6 Setting the DMX Address DMX (*DMX Address*)

Depending on the selected mode (7.1. Operation modes (Personality)), the user can set the DMX address:

- in group (***Group***) – one DMX channel (***Group*** 1ch mode),
- DMX start address (***Start Addr.***) – first DMX channel – the next ones will be assigned automatically (***Basic 48ch*** / ***Basic_D 48+1ch*** mode),
- each channel individually (***Individual***) – each DMX channel individually (***Adv 48ch*** / ***Adv_D 48+1ch*** mode),
- dimmer (***Dimmer***) – (***Adv_D 48+1ch*** mode).



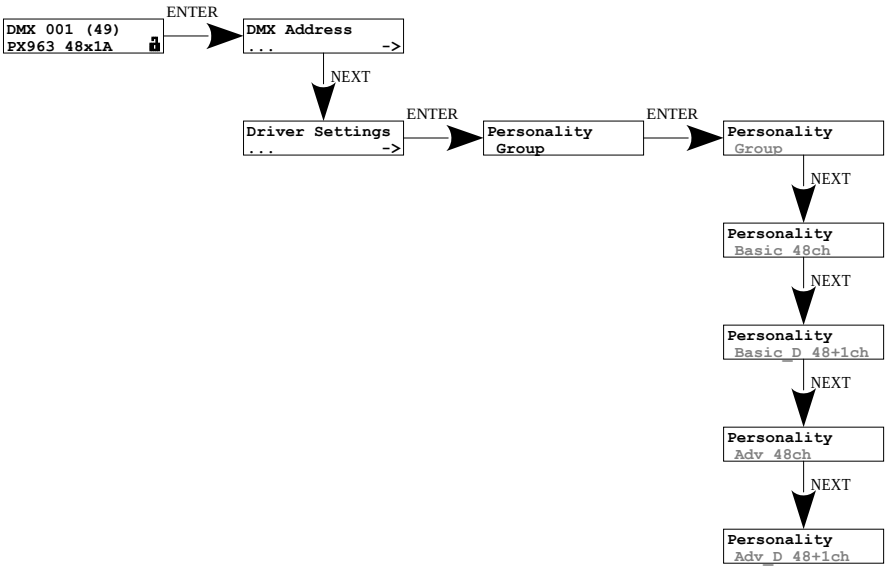
NOTE! If subsequent DMX addresses set automatically would exceed the DMX address pool (>512), they will be assigned to address 512.

7 Device Settings (*Driver settings*)

7.1 Operation modes (*Personality*)

The user-selected operating mode of the device is closely linked to the DMX address settings. The following modes are available:

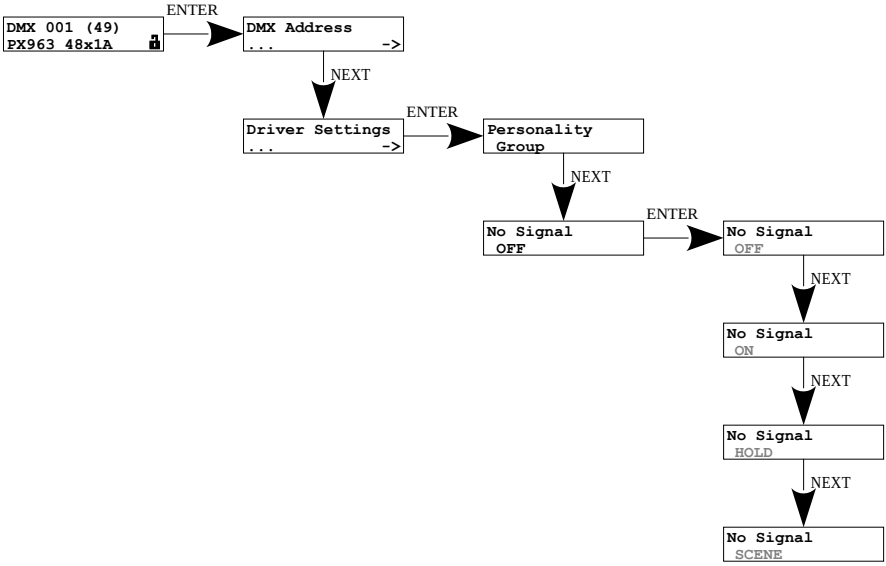
- *Group 1ch* – the user sets one DMX channel that will control all outputs,
- *Basic 48ch* – the user sets the starting DMX address, subsequent channels will be addressed automatically,
- *Basic_D 48+1ch* – the user sets the starting DMX address, subsequent channels will be addressed automatically, additionally the dimmer will be addressed as "49th output",
- *Adv 48ch* – the user sets the starting DMX address, subsequent channels will be addressed automatically, in this mode it is possible to individually assign each output channel to a DMX address,
- *Adv_D 48+1ch* – the user sets the starting DMX address, subsequent channels will be addressed automatically, additionally the dimmer will be addressed as "49th output", in this mode it is possible to individually assign each output channel to a DMX address and individually set the DMX address for the dimmer channel.



7.2 Response to lack of DMX signal (*No 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.

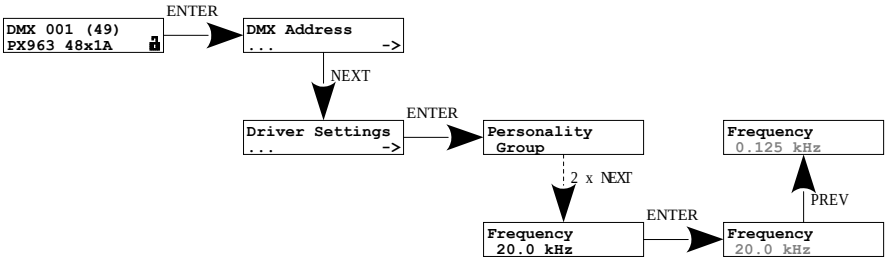
- *OFF* – complete switch-off of outputs,
- *ON* – switching on all outputs at 100%,
- *HOLD* – maintaining the last value on channels before the DMX signal disappears,
- *SCENE* – launching a programmed scene (more in section 8.1. Scene (No Signal)).



7.3 Control frequency (*Frequency*)

This function allows you to set the base frequency of the LED control. This function is extremely useful in applications for the television industry. Using the "*flicker free*" technology, it allows you to avoid the unpleasant effect of image flickering caused by the lack of proper synchronization of the signal controlling the LEDs. The user has a range from 0.125 to 20.0 kHz.

The frequency value in the upper range allows you to avoid the flickering effect visible in cameras.

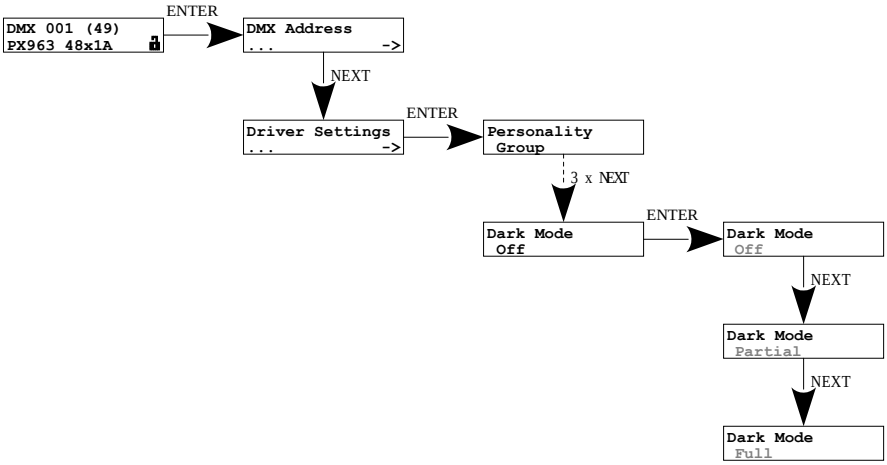


7.4 Dark mode (*Dark Mode*)

When ***Dark mode*** <u>is set to:</u>

- *OFF* – the screen and LEDs are on all the time,
- *Partial* – the screen turns off after 15 seconds, but the LEDs will still light up,
- *Full* – the screen and LEDs turn off after 15 seconds.

The device continues to operate without affecting other parameters. To restore the backlight, press any key.



8 Channel settings (*Ch. Settings*)

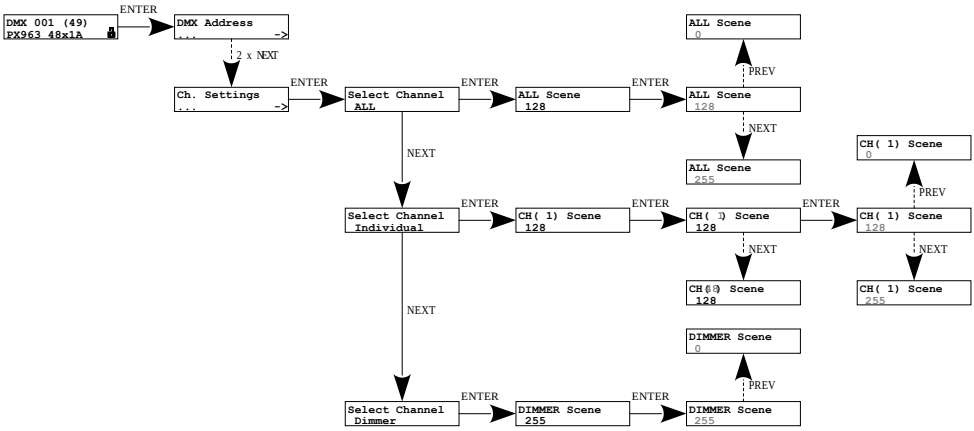
The user can change the settings of individual channels individually or as a group.

- *ALL* – group parameter setting for all output channels,
- *Individual* – individual parameter setting, separately, for each output channel,
- *Dimmer* (only available in mode *Basic_D 48+1ch or Adv_D 48+1ch*).

NOTE! Group settings overwrite the individually set values on channels. If the saved settings would overwrite the individual ones, a message will appear informing you about this. In the *ALL* parameters, if `---` is visible, it means that the parameter has been modified in the individual settings.

8.1 Scene (*No Signal*)

The user can set scene values for ***SCENE*** mode in the ***No Signal*** menu ranging from 0 to 255. A scene can be set as a group or individually for each channel.

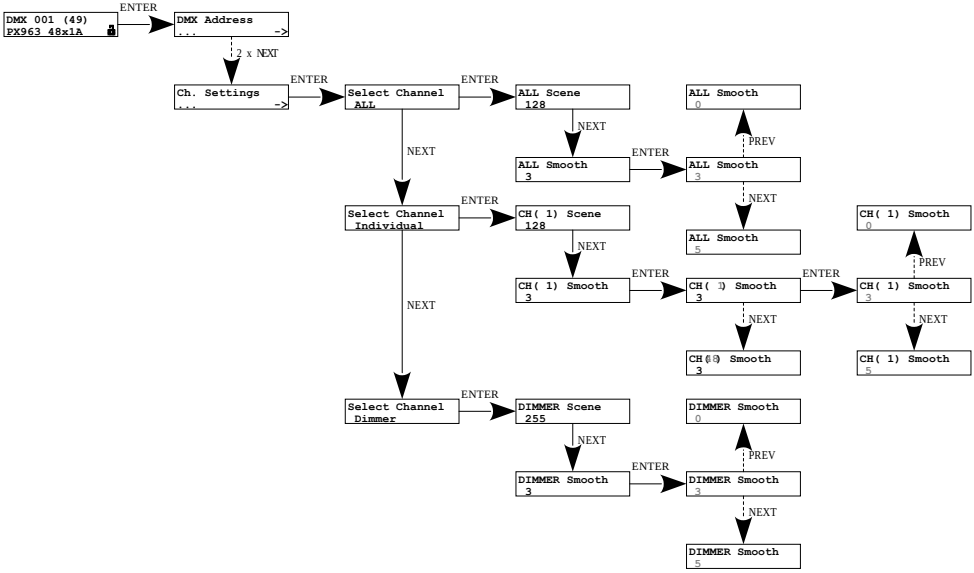


While editing a scene, the DMX indicator LED lights magenta.

8.2 Smoothing function (*Smooth*)

Option that allows you to change smoothing parameters, when the function is active, the brightness changes without visible jerks, which prevents the "light vibration" effects occurring in lighting installations (set in the range 0 – 5):

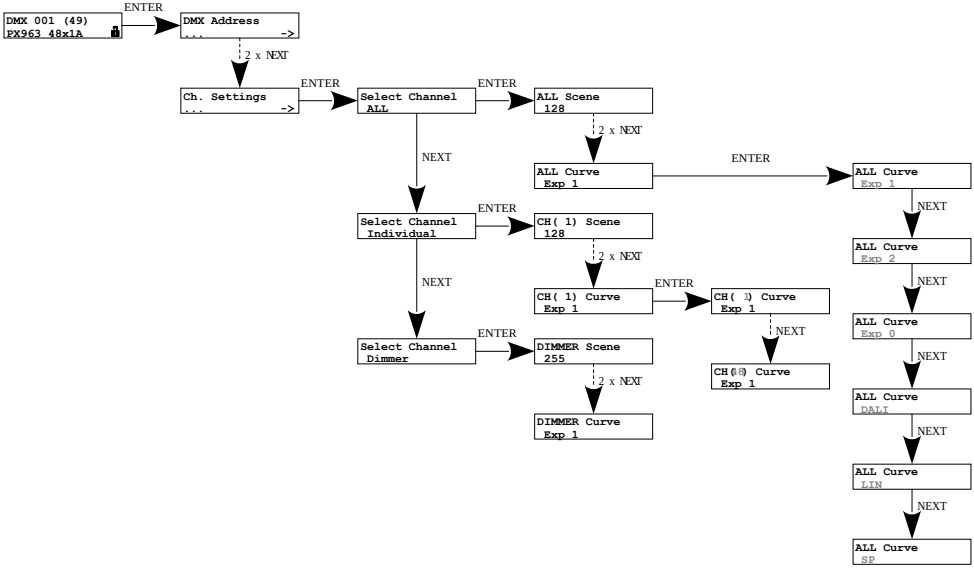
- *0* – smoothing disabled,
- *1* – lowest smoothing,
- *5* – highest smoothing.

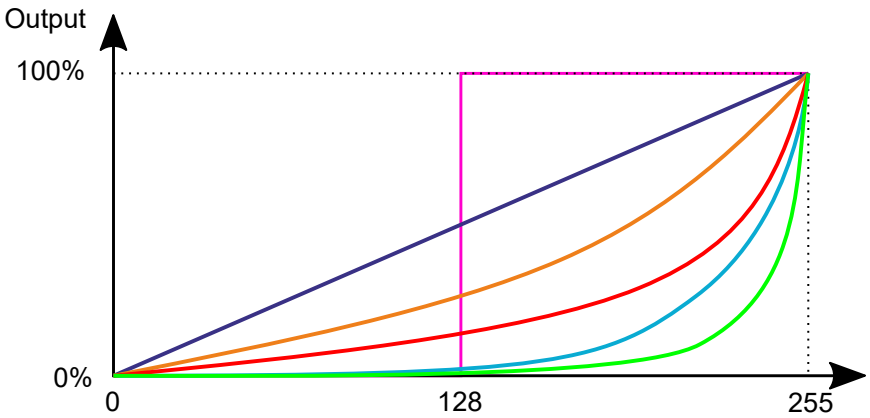


8.3 Control curve (*Curve*)

The user can choose which control curve to use. This parameter can be set as a group or individually for each channel – each channel can have a different control curve assigned:

- *Exp 1* – exponential curve with exponent 2,
- *Exp 2* – exponential curve with exponent 3,
- *Exp 0* – curve compatible with older PXM device models,
- *DALI*,
- *LIN* – the output value is linearly proportional to the control value,
- *SP* – curve operating on the On / Off principle, DMX limit value is 128.





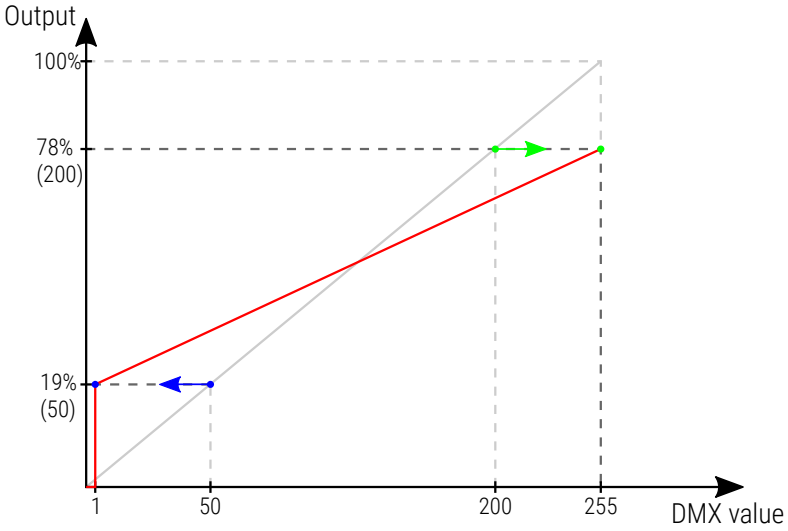
Curves:

- linear (*LIN*)
- E1 (*Exp 0*)
- E1u (*Exp 1*)
- E2u (*Exp 2*)
- *DALI*
- *SP*

8.4 Channel limitations (*Min. / Max. Level*)

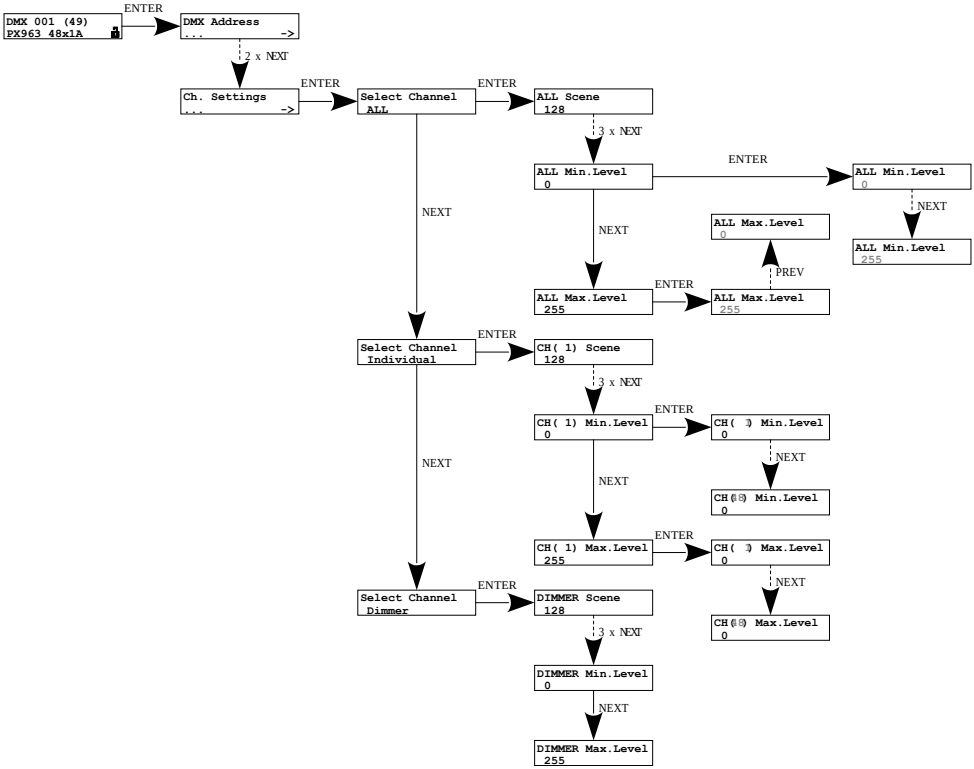
The user can group or individually limit the minimum and maximum output levels. The entered channel limit values are the actual DMX control values.

The graph below shows the effect of this option for an example of ***Min.Level*** limiting to 50 (DMX) and ***Max.Level*** to 200 (DMX) with a linear control curve. gray shows the linear control curve without channel limiting, while red shows the linear curve with the output limiting 50 – 200.



NOTE! If ***Min.*** is greater than ***Max.*** then the operating characteristic is reversed.

NOTE! If the user sets ***Min.*** to 50 for example, this value will be reached at a DMX value of 1, while a DMX value of 0 always turns the output off.


DMX 001 (49)
PX963 48x1A
ENTER
DMX Address
...
2 x NEXT
Ch. Settings
...
ENTER
Select Channel
ALL
ENTER
ALL Scene
128
3 x NEXT
ALL Min.Level
0
ENTER
ALL Min.Level
0
NEXT
ALL Min.Level
255
NEXT
ALL Max.Level
255
ENTER
ALL Max.Level
255
PREV
ALL Max.Level
0
NEXT
Select Channel
Individual
ENTER
CH(1) Scene
128
3 x NEXT
CH(1) Min.Level
0
ENTER
CH( ) Min.Level
0
NEXT
CH(18) Min.Level
0
NEXT
CH(1) Max.Level
255
ENTER
CH( ) Max.Level
0
NEXT
CH(18) Max.Level
0
NEXT
Select Channel
Dimmer
ENTER
DIMMER Scene
128
3 x NEXT
DIMMER Min.Level
0
NEXT
DIMMER Max.Level
255

9 Others

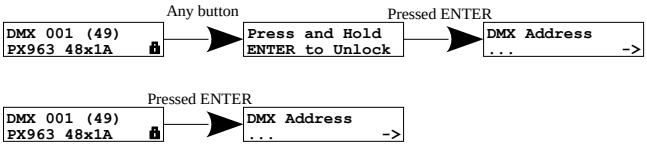
9.1 Screen lock

The device has been protected against accidental clicking of keys. Being in the main window (with the device name) after 15 seconds the screen is automatically locked and a closed padlock symbol appears in the lower right corner.

If the screen is locked and any button is pressed, the following message will appear:

```
Press and Hold
ENTER to Unlock
```

To unlock the screen, press and hold the *enter* key, after unlocking the screen you will go straight into the menu tree. If the screen is unlocked, the unlocked padlock symbol is displayed in the lower right corner.



The user can also lock the screen themselves by holding the esc button on the main screen. The device will signal locking by flashing the screen and a closed padlock will be displayed in the lower right corner.

9.2 Channel test

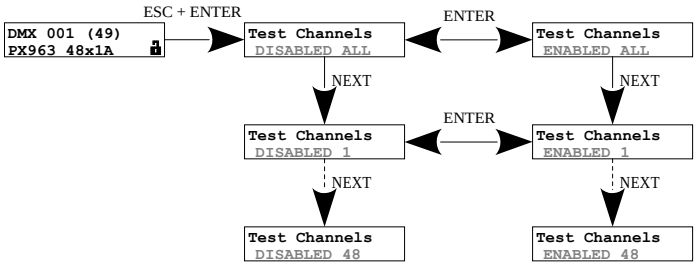
The user can test all outputs by setting them to 100% in groups – all, and individually.

To test channels, be in the main window and simultaneously click and hold the *esc* and *enter* keys (the screen may be locked).

Exiting the channel test menu is also done by clicking and holding the *esc* and *enter* keys simultaneously. In addition to the ***Test Channels*** message being displayed on the screen, the DMX signal diode lights up magenta.

- ***ALL*** – test all channels,
- ***1*** – ***48*** – test of individually selected channel.

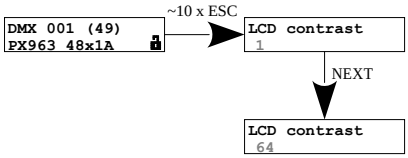
The *enter* key changes the output state (***ENABLED*** / ***DISABLED***).



9.3 Setting the display contrast

If the device has a problem with the readability of messages displayed on the screen, it is possible to change its settings. The screen may be unreadable, only the characters "▒" may be visible, or the screen may be completely white. To do this, press the *esc* button ~10x (the screen does not have to be unlocked). The contrast can be set from 1 to 64. Being in the contrast menu is signaled by the screen flashing.

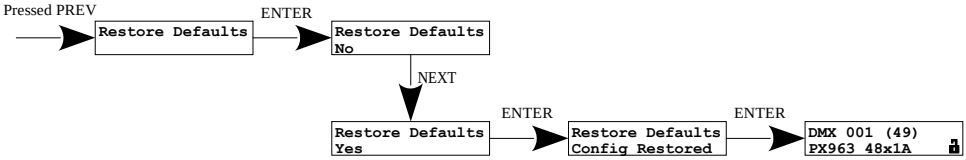
Use the *prev* and *next* keys to find the appropriate value (it is recommended to press the *next* key to find the value at which the screen becomes readable, and then use the *prev* and *next* keys to adjust the value to your needs). To exit the ***LCD contrast*** menu, press the *enter* key.



9.4 Restoring default settings

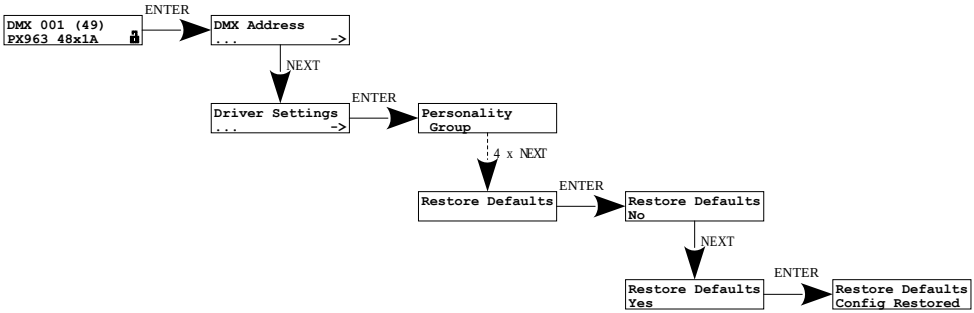
The user can restore the default settings in two ways:

- by pressing the *prev* button while turning on the power,



To use this option, disconnect power from the PX963. Before reconnecting power, press and hold the *prev* button.

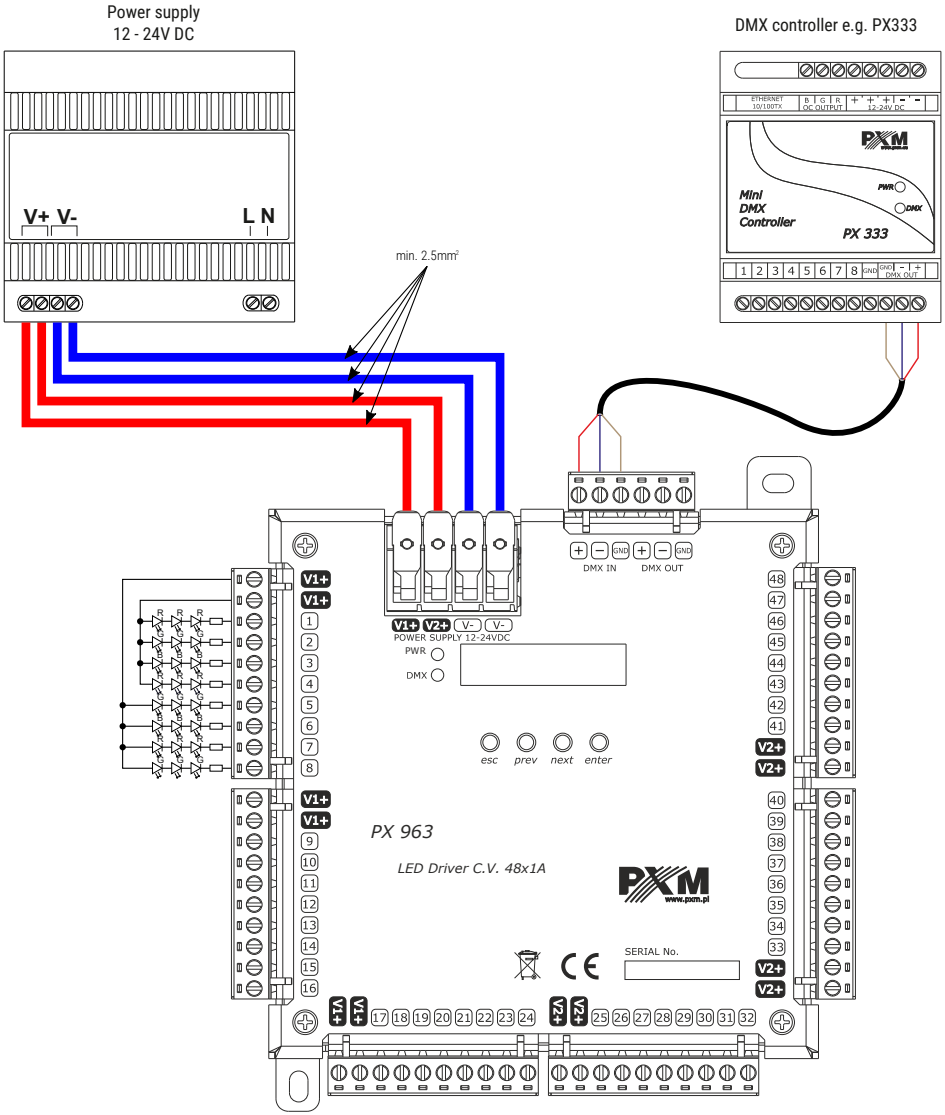
- by selecting the ***Restore Defaults*** function in the device menu.



Default settings in PX963:

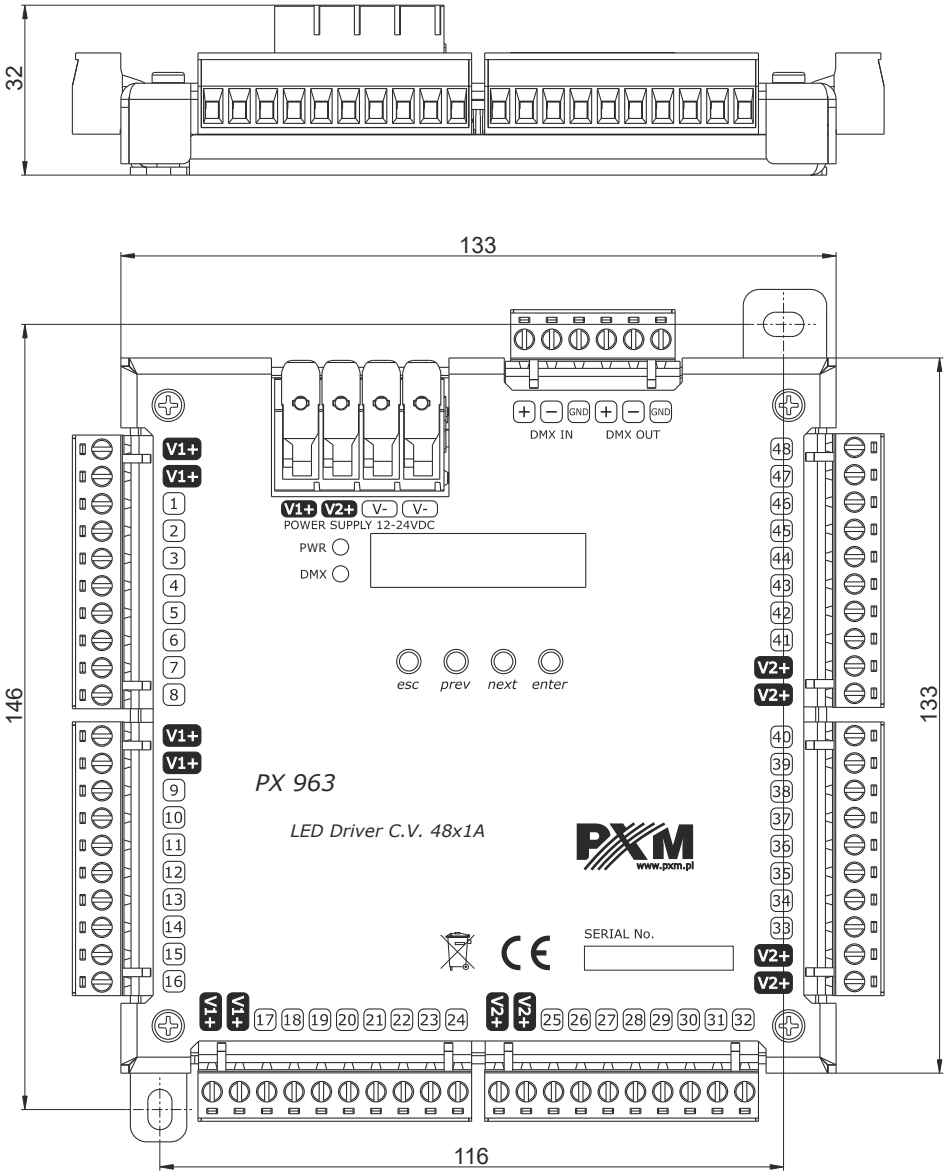
- DMX Address: *1*
- Personality: ***Basic 48ch***
- No Signal: *OFF*
- Frequency: *3.2 kHz*
- Dark Mode: *Partial*
- ALL Scene: *128*
- ALL Smooth: *3*
- ALL Curve: *Exp 1*
- ALL Min.Level: *0*
- ALL Max.Level: *255*

10 Connection scheme



NOTE! A maximum of four circuits can be connected to one power connector (*V1+* / *V2+*) as shown in the figure above.

11 Dimensions



12 Technical data

type	PX963
power supply	12 – 24V DC
DMX channels	512
RDM protocol support	yes
number of output channels	48
power consumption	max. 48A
power consumption without load	0.7W
interpolated output control resolution	16 bit
control frequency	0.125 – 20kHz
output load capacity	max. 1A / channel
DMX connectors	screw terminals: max. 2.5mm^2
power connectors	solid wire: 2.5 – 10mm^2 stranded wire: 2.5 – 10mm^2 stranded wire with ferrule: 2.5 – 6mm^2
output connectors	screw terminals: max. 2.5mm^2
weight	0.4kg
dimensions	width: 133mm height: 133mm depth: 32mm

Podłęże, 13.12.2024

DECLARATION OF CONFORMITY

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

we declare that our product:

Product name:	Driver LED C.V. 48 x 1000mA
Product code:	PX963

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 harmonization of the laws of the Member States relating to electromagnetic compatibility (recast)
Text with EEA relevance.

2014/35/UE DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 26 February 2014 on the harmonization of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits

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