

PX282

Driver LED

C.V. 3 x 6A

User manual



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

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1 Description

The PX282 driver is designed to control LEDs. The device has been placed inside DIN rail housing. The built-in DMX receiver allows for activating 3 channels (R, G, B) by using directly the DMX protocol. A wide range of supply voltage and a high level of current-carrying capacity (6A) enable activating large quantities of LEDs.

The PX282 can be controlled by the DMX signal or it can work independently. In such operation mode, the user has access to a fully programmable scene and 18 default sequences for which he can also change the playback speed and the smoothness of transition of particular steps. Thanks to the interpolated resolution of the output control at the 14 bit level at a PWM frequency of 1.5kHz, the control of the parameters of individual channels is completely smooth. Moreover, the driver offers an effect control mode which allows for controlling the programs that are built into the device and, at the same time, changing such parameters as speed, brightness and fade settings using the DMX-512 signal sent from an external controller.

PX282 also supports DMX-RDM protocol with its extension of DMX-512 protocol.

The driver offers a built-in control signal frequency tuning system ("*flicker free*" technology), which makes it useful in applications for the television industry. As LEDs from the RGB series often differ in parameters, problems in receiving white color may occur (triggering 100% at all channels). This is why the PX282 has been equipped with a very useful feature called 'white balance.' With this feature, each set of LEDs can be adjusted so that the control of

individual colors by the module enables achieving white color at full activation.

What is more, this feature allows for adjusting color temperature of white output color.

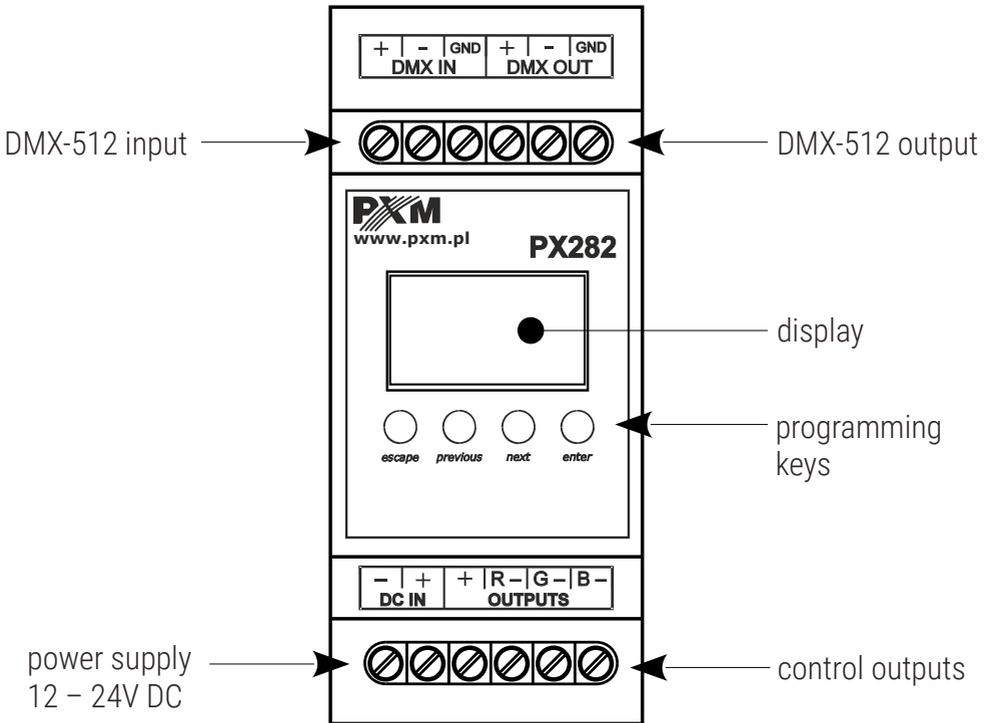
2 Safety conditions

PX282 Driver LED C.V. 3 x 6A is a device powered with safe voltage 12 – 24V; however, during its installation and use the following rules must be strictly observed:

1. The device may only be connected to 12 – 24V DC with current-carrying capacity compatible with technical data.
2. All the conductors should be protected against mechanical and thermal damage.
3. In the event of damaging any conductor, it should be replaced with a conductor of the same technical data.
4. Connection of power supply can only be made with a conductor of minimum cross-section area of 2,5mm² and DMX signal with shielded conductor.
5. All repairs and connections of outputs or DMX signal can only be made with cut off power supply.
6. PX282 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. Clean with damp duster only.

3 Connectors and control elements



4 Designation of displayed messages

	DMX address of a device – a basic item in the MENU
	setting parameters for all channels simultaneously
	setting parameters for each channel individually
	DMX address setting
	control method selection (RGB, Lightness / Color, etc.)
	no DMX signal response method selection
	Master / Slave mode settings
	selection of the control curve
	setting the linear control curve
	setting the DALI control curve
	setting the exponential control curve with exponent 2
	Lightness / Color control mode
	RGB control mode
	RGB Dimmer control mode
	HSL control mode – Hue / Saturation / Lightness
	effect control mode
	dynamic white mode
	all outputs at 100%
	all outputs off
	scene
	program no. 17

ABB.	DMX address settings for first channel
QBA.	Master mode on / off
QHA.	number of channels being sent in the Master mode
BAR.	white color balance setting
BAR.	red balance
BBB.	green balance
BBB.	blue balance
BCA.	white color balance on / off
SPD.	program playback speed
FAD.	level of steps change smoothness in the program
FEA.	red color during scene programming
GBA.	green color during scene programming
BBB.	blue color during scene programming
FBA.	basic frequency of brightness control
SCA.	screen blanking
EPA.	memory error message
DBA.	restore default device settings menu
BOA.	message about overloading Red channel when start address is set to 001
GOA.	message about overloading Green channel when start address is set to 001
BOB.	message about overloading Blue channel when start address is set to 001
AOB.	message about overloading all RGB channels
OPA.	Temperature inside the device



Dot in the lower right corner of the screen:

- off – no DMX signal,
- blinks twice every 0.5Hz – DMX signal is received
- blinking every 0.25Hz – master function active

5 Button features

esc – goes back to the previous MENU level or discards changes made

prev – scrolls to the previous feature on the same MENU level
or decreases the parameter's value

next – scrolls to the next feature on the same MENU level or increases
the parameter's value

enter – enters the next MENU level and confirms changes made

6 Group DMX address settings

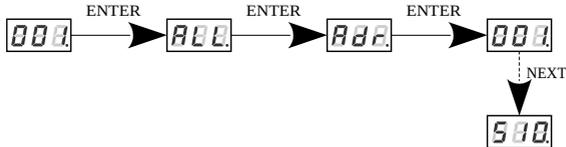
The menu of the PX282 driver allows for setting the DMX address within a range between 1 and 506 – 511 depending on work mode of device.

For example in RGB mode it occupies three consecutive DMX addresses.

If start address is set to 510, the last channel is occupied by address 512.

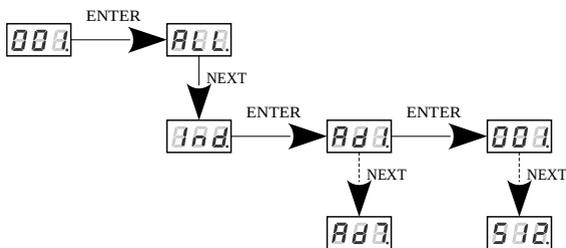
To set the DMX address:

1. Set the **Adr** function.
2. Use the “*next*” or “*prev*” buttons to set the selected DMX address.
3. Push the “*enter*” button to confirm choose.

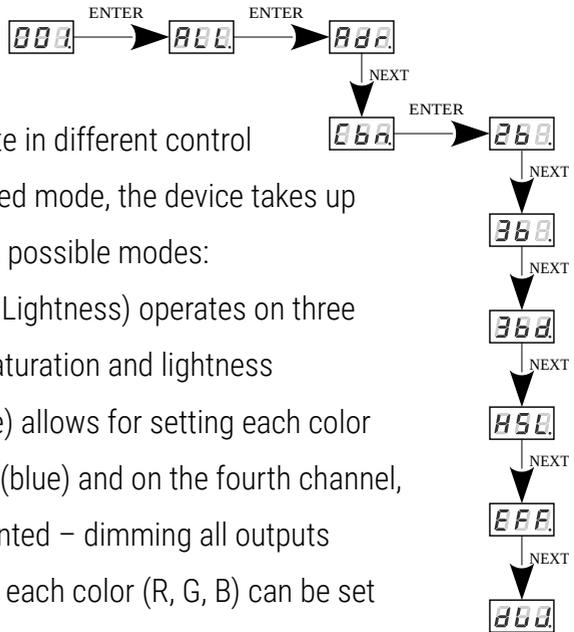


7 Individual DMX address settings

The PX282 module has an option that allows for changing individual settings. It enables assigning any DMX address to every output channel. The simplest example of implementation of this function is to control the lightness of one-color LEDs connected to all outputs. In such case, the same address must be assigned to all channels so that all outputs are controlled by one slider on the control panel.



8 Color settings mode



The PX282 driver can operate in different control modes. Depending on the selected mode, the device takes up a different numbers of channels, possible modes:

The **HSL** mode (Hue, Saturation, Lightness) operates on three channels, responsible for hue, saturation and lightness

The **3bd** mode (4-channel, 4-byte) allows for setting each color individually: R (red), G (green), B (blue) and on the fourth channel, the Dimmer function is implemented – dimming all outputs

The **3b** mode (3-channel, 3-byte) each color (R, G, B) can be set separately

The **2b** mode (2-channel, 2-byte) consists in selecting lightness and one of the 256 colors define by the manufacturer

The **dW** – dynamic white – control of channel: cold white + warm white, by means of two DMX channels. The first DMX channel is responsible for color temperature and the other channel – for lightness.

The **EFF** mode – effects control – it is available on 7 DMX channels and allows to choose the right effect and parameters (description of the **EFF** mode is on the next page)

Description guide of *EFF* mode settings

CHANNEL 1 RED	CHANNEL 2 GREEN	CHANNEL 3 BLUE	CHANNEL 4 MODE	CHANNEL 5 SPEED	CHANNEL 6 FADE	CHANNEL 7 BRIGHTNESS
-	-	-	<0-7> Program 1	X	X	X
-	-	-	<8-15> Program 2	X	X	X
-	-	-	<16-23> Program 3	X	X	X
-	-	-	<24-31> Program 4	X	X	X
-	-	-	<32-39> Program 5	X	X	X
-	-	-	<40-47> Program 6	X	X	X
-	-	-	<48-55> Program 7	X	X	X
-	-	-	<56-63> Program 8	X	X	X
-	-	-	<64-71> Program 9	X	X	X
-	-	-	<72-79> Program 10	X	X	X
-	-	-	<80-87> Program 11	X	X	X
-	-	-	<88-95> Program 12	X	X	X
-	-	-	<96-103> Program 13	X	X	X
-	-	-	<104-111> Program 14	X	X	X
-	-	-	<112-119> Program 15	X	X	X
-	-	-	<120-127> Program 16	X	X	X
-	-	-	<128-135> Program 17	X	X	X
-	-	-	<136-143> Program 18	X	X	X
-	-	-	<144-151> OFF	-	-	-
X	X	X	<152-169> Strobo 10%	X	-	X
X	X	X	<170-199> Strobo 20%	X	-	X
X	X	X	<200-229> Strobo 50%	X	-	X
X	X	X	<230-255> RGBD	-	-	X

Channel 1 – red color

Channel 2 – green color

Channel 3 – blue color

Channel 4 – operating mode selection

Channel 5 – speed settings (higher value – quicker changes)

Channel 6 – fade settings (higher value – smoother transition)

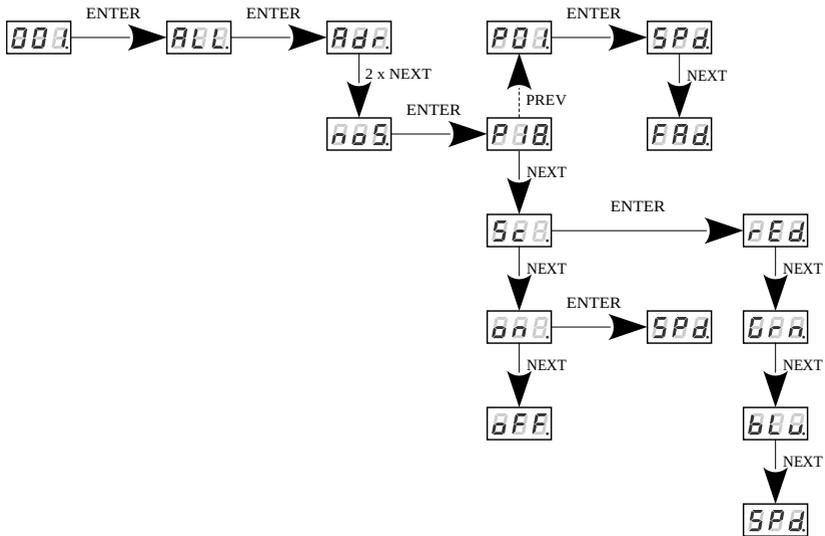
Channel 7 – lightness settings (higher value – stronger glow)

sign "x" – possibility to control a given parameter of a selected mode

sign "-" – no possibility to control a given parameter of a selected mode

9 No DMX signal response

This function is used both to protect the installation against the DMX signal loss and to obtain control over LEDs without connecting an external controller. Once it is activated, if there is no DMX signal the module will realize a desired function independently. Reconnecting the DMX signal will automatically break the realized function and the module will once again follow the commands transmitted via the DMX line.



P01 – P18 – choosing a ready program provided in the device software. For each program it is possible to set the speed (**SPd**) of the effects reproduction on range **0,1 – 99,9s** and smoothness of change of steps (**FAd**) in range **0 – 100**, where **0** is a step transition, and **100** completely smooth.

Sc –self-programmed scene in which it possible to set values for RGB colors (**rEd, Grn, bLu**) in range **0 – 255** for each color separately. Additionally can set the scene entry time (**SPd**) after decay DMX signal in range **0,1 – 99,9s**.

on – activation of all outputs at 100% with the possibility of setting the switch-on time (**SPd**) all outputs after decay DMX signal

oFF – disabling all outputs after DMX signal loss

9.1 Descriptions of programs

The following tables show the values for each output channel (*R*, *G*, *B*) in programs from 1 up 18 (*P01* – *P18*). The value **255** corresponds to the maximum lightness level on a given channel, **127** – 50% of power level, **0** – full channel blanking.

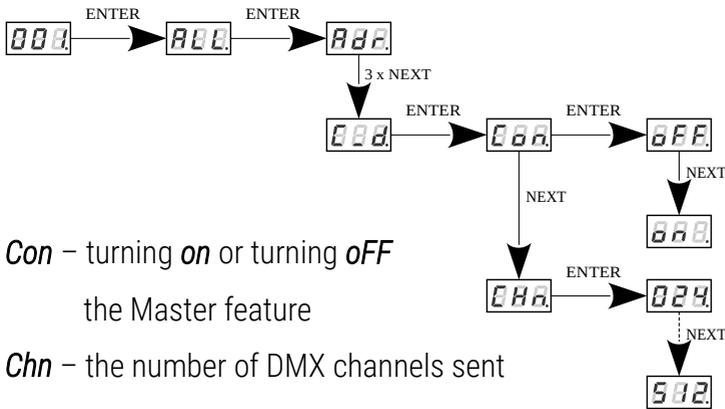
		P01	P02	P03	P04	P05	P06	P07	P08	P09
Step 1	R	255	0	0	0	255	255	0	0	255
	G	0	0	0	0	0	0	255	255	0
	B	0	255	0	0	0	0	255	0	0
Step 2	R	0	0	255	0	255	255	255	0	0
	G	255	255	0	0	255	0	0	0	0
	B	0	0	0	255	0	255	255	255	255
Step 3	R	0	255	0	0	0	0	255		
	G	0	0	0	0	255	0	255		
	B	255	0	0	0	0	255	0		
Step 4	R			0	0	0	0			
	G			255	255	255	255			
	B			0	0	255	255			
Step 5	R			0	0	0	0			
	G			0	0	0	255			
	B			0	0	255	0			
Step 6	R			0	255	255	255			
	G			0	0	0	255			
	B			255	0	255	0			

		P10	P11	P12	P13	P14	P15	P16	P17	P18
Step 1	R	255	0	0	0	255	0	0	0	0
	G	0	0	0	0	0	255	127	127	0
	B	0	0	0	0	0	0	255	255	0
Step 2	R	0	255	0	0	255	127	127	127	255
	G	0	0	255	0	127	255	0	255	255
	B	255	0	0	255	0	0	255	127	255
Step 3	R					255	0	0	255	
	G					0	255	0	127	
	B					0	0	255	0	
Step 4	R					255	0	0	127	
	G					0	255	127	0	
	B					127	127	255	127	

10 Master / Slave function

The PX282 module has a built-in DMX-512 receiver and can be controlled from any desktop or controller running in this standard. Moreover, it is equipped with a programmable function of response to no DMX signal (*noS*). With 18 built-in default programs, it is possible to obtain interesting effects without an external controller. However, in larger installations, several PX282 drivers implementing the same program cannot provide a full playback synchronization. Therefore, PX282 has a Master feature. When it is activated, the module changes from a DMX receiver into a transmitter of this signal and sends programs to the other modules (which are set as Slave).

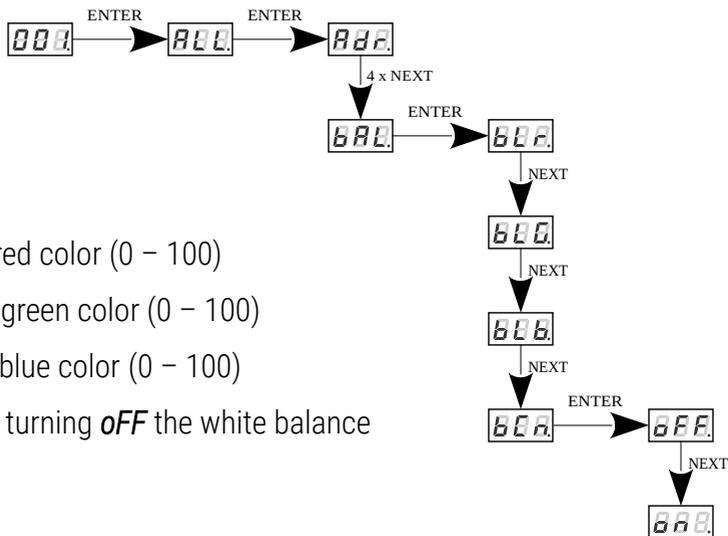
With this solution, it is possible to make a precise synchronization even in very large installations without using an external controller.



In case when Master feature is active dot in the lower right corner starts to blink with 0,25Hz frequency. When the PX282 is receiving DMX-512 signal it starts to blink with 2-times bigger frequency (0,5Hz).

11 White balance

Sometimes, there can be problems with getting white color on the RGB series LEDs. This may be a result of using diodes with different technical parameters. For this reason, the PX282 module is equipped with a white balance function. This option allows for choosing a correct color temperature for full activation of all 3 outputs (white color).



bLr – value for the red color (0 – 100)

bLG – value for the green color (0 – 100)

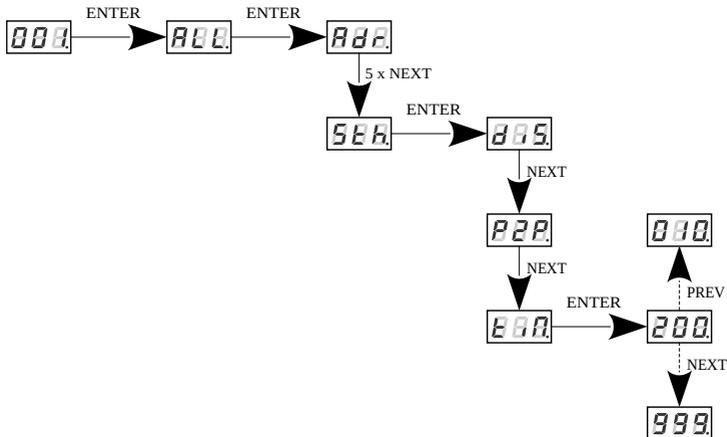
bLb – value for the blue color (0 – 100)

bCn – turning *on* or turning *oFF* the white balance

12 Smooth

The driver is equipped with a smooth option. Smooth feature allows for smooth changes in lightness and color. When it is set to On the transition between successive DMX values sent to the lamp (e.g. corresponding to changes in lightness) are smooth with no visible twitches, which prevents the common light “vibrations” effect. Two consecutive DMX values sent to the lamp are smoothed linearly between the DMX signal packets for the selected **PPP** option or the time interval set in the **BBB** menu in range 10 – 999ms.

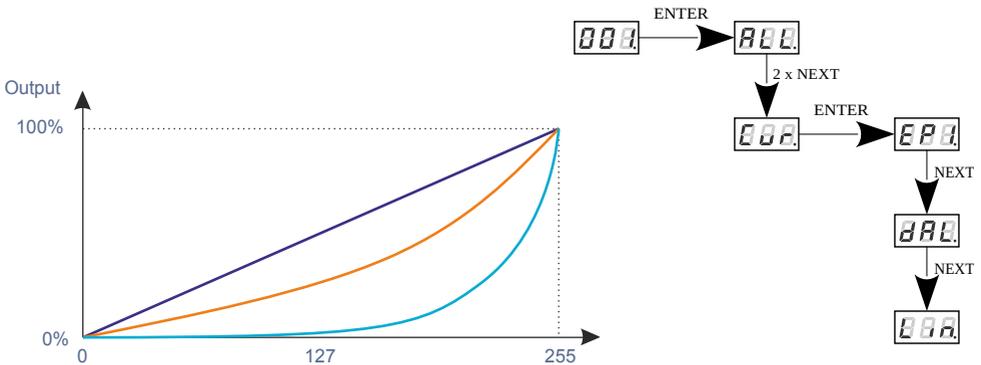
The smooth function may slightly slow down the lamp's response rate to changes in the DMX signal; therefore, it is possible to disable this option. This can be done by checking the **BB5** parameter and confirming the selection by pressing “enter”.



13 Selection of control curve

The driver has implemented the option of choosing one of three output control curves:

- linear **Lin** – the output values is linearly proportional to the control value
- DALI **dAL**
- exponential **EP1** with exponent 2



Curves:

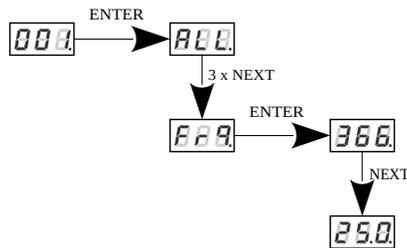
- linear
- exponential with exponent 2
- DALI

NOTE! The option is available from firmware version 3.09.

14 Light control frequency

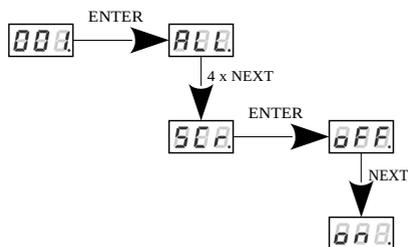
The *Frq* function allows for setting the basic control frequency for the LEDs. This function is extremely useful in applications for the television industry. By applying the "flicker free" technology, it is possible to avoid the unpleasant flickering effect which is caused by improper signal synchronization that controls the LEDs. The user can choose from the available frequency range from 366Hz up to 25.0kHz which can be smoothly changed using the "prev" or "next" buttons and selecting a different value.

The frequency value in the upper range (e.g. 1.50 = 1.5kHz) helps to avoid the flickering effects that are visible in video cameras.



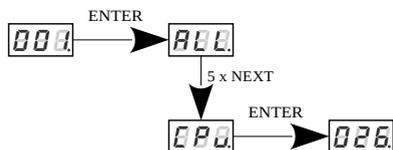
15 Screen saving (screen blanking)

The device is equipped with a feature that allows for turning off the backlight. This option is marked with the **ScR** sign. With this feature, the display is turned off after about 60s (if the keys of the device are not pressed). Of course, the device continues its operation without interfering with other parameters. Press any key to restore the backlight.



16 CPU temperature

The PX282 has a built in processor temperature measurement function. If the temperature exceeds 70°C, the temperature limitation is activated linearly decreasing the current on the outputs from the device. After reaching of the 82°C the total exclusion of all outputs is taking place. To check the current CPU temperature You should go to the "CPU" menu.



17 Default settings and device errors

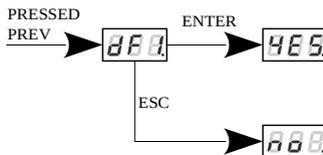
If you have any difficulty accessing the device menu, e.g. it is not possible to enter a particular menu level or it is necessary to restore the device to its default settings, follow the instructions below.

In the first case, when a particular menu level cannot be accessed or menu items are displayed incorrectly, this may indicate that a saving-in-memory error has occurred. In such a case, try to restore the device to its default settings before sending the PX282 to the service center. If, after restoring to its default settings, the device still does not operate correctly, please send it to our service center.

17.1 Restore default settings

To restore the device to its default settings, press and hold the “*prev*” key while switching on the device. One of the messages that will be displayed will say *dFl*, which means successful restoring to default settings (the “*prev*” key has to be held down while powering on the device, until the *dFl* message is displayed).

If this message is accepted by pressing “*enter*”, the default settings will be restored. The user can also exit this menu level without restoring the default settings. In order to do this, press the “*esc*” key.



Please note that after restoring to default settings, all the operating parameters of the device will revert to the following ones:

- **DMX address:** 1
- **driver operating mode:** RGB (3b – 3 byte)
- **master mode:** off
- **number of sent DMX channels:** 128
- **white balance:** off
- **no signal operating mode:** program 1
- **smooth function:** off

17.2 Error message

The device is equipped with a built-in memory work control function. If there are problems with the memory operation on the PX282 display, the **Err** message appears – memory error.

In this situation, select the “**enter**” key. The device will reload the default configuration and upload it to the memory. If after this operation, the **Err** message remains on the screen, the memory is permanently damaged and the unit must be sent to the service point.

17.3 Overloading the device

Driver has built-in protection against exceeding the permissible load of 6 A per channel. In the case of exceeding the permissible load on the display starts to display a flashing sign **r** when the load is exceeded on the R (red), **G** for channel G (green) and **b** for channel B (blue).

Starting from firmware version 2.03 there has been introduced an update that any overload or short circuit on the output channel causes channel shut down and than a slow and smooth transition to a previously predetermined value. The result of this is achieving of maximum at this output (the channel to which might be connected e.g. LEDs) in about 15 – 20 seconds.

Below are some examples of messages displayed by the device for overloaded individual channels during the operation of the PX282.

1 channel is overloaded (R)



2 channel is overloaded (G)



3 channel is overloaded (B)



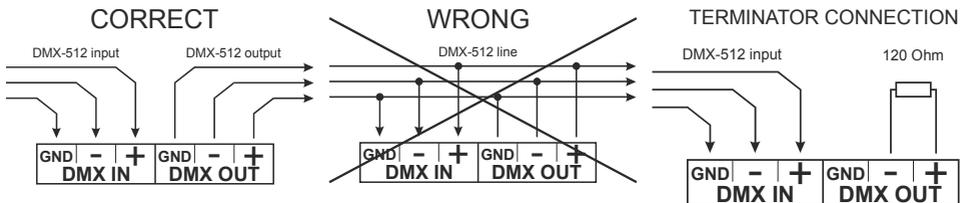
All of 3 channels are overloaded



18 DMX signal connecting

PX282 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 PX282 and later, directly from **DMX OUT** pins to the next device in DMX chain.

If the PX282 is the last DMX chain receiver there should be terminator (resistor 120 Ohm) mounted between "**DMX+**" and "**DMX-**" pins of **DMX OUT** section.



19 RDM – available parameters

The PX282 supports the DMX-RDM protocol. DMX protocol allows only of a one-way data transmission, while its extension the RDM protocol can transmit information in two directions. This makes possible to simultaneously send and receive information, and hence the possibility of monitoring activities of the compatible devices. Thanks to RDM some available settings of compatible devices may be programmed using this protocol.

List of RDM parameters supported by the PX282:

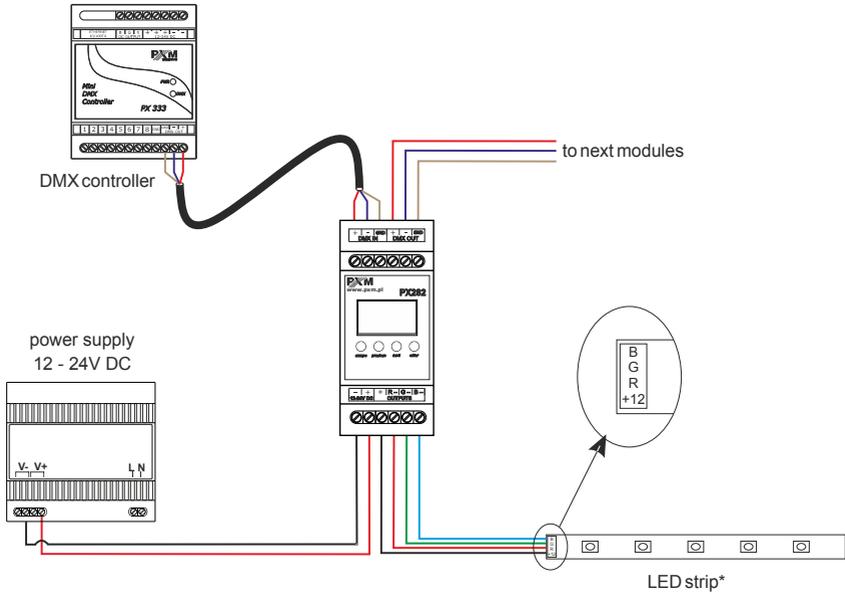
Parameter name	PiD	Description
SUPPORTED_PARAMETERS	0x0050	all supported parameters
PARAMETER_DESCRIPTION	0x0051	description of additional parameters
DEVICE_INFO	0x0060	information concerning the device
SOFTWARE_VERSION_LABEL	0x00C0	firmware version of the device
DMX_START_ADDRESS *	0x00F0	DMX starting address of the device; Range 1 – 512
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

Parameter name	PiD	Description
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	operating time counted in hours
BALANCE_RED *	0x8011	value of control level of red channel balance
BALANCE_GREEN *	0x8012	value of control level of green channel balance
BALANCE_BLUE *	0x8013	value of control level of blue channel balance
SMOOTH_DIS_0/P2P_1/TIM_2 *	0x801A	the choice of options relating to the Smooth function
SMOOTH_TIME *	0x801B	Smooth time for <i>t/N</i> function chosen in subsection above
NO_SIG_P1-18 SC_19 ON_20 OFF_21 *	0x801C	choice of work mode for No DMX signal
SCENE_RED *	0x801D	settings of red channel value for scene saved in PX282
SCENE_GREEN *	0x801E	settings of green channel value for scene saved in PX282
SCENE_BLUE *	0x801F	settings of blue channel value for scene saved in PX282

Parameter name	PiD	Description
SCREENSAVER_ON/OFF *	0x8022	settings of screensaver (display backlight in PX282)
PROGRAM_SPEED *	0x8025	programs playback speed settings (playing next steps of program)
PROGRAM_FADE *	0x8026	settings of smooth transition between following steps of a program
BALANCE ON/OFF *	0x8027	to activate or deactivate the balance of output channels
PWM_FREQUENCY *	0x8028	LEDs refresh frequency
SERIAL_NUMBER *	0x8030	device serial number

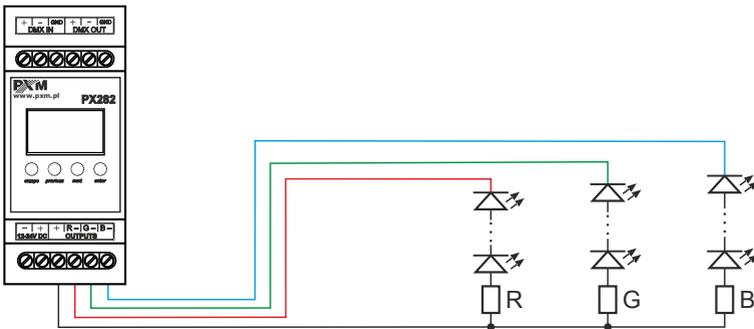
* - editable parameter

21 Connection scheme

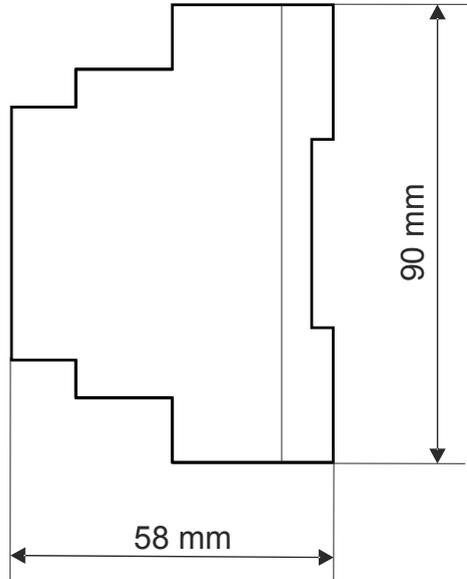
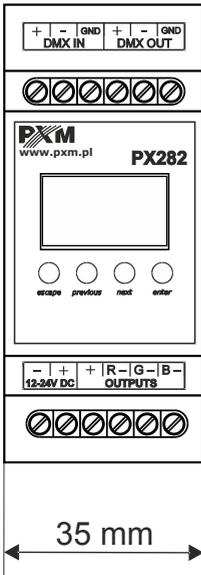


* typical LED strips are supplied with 12V DC – then the PX282 has to be connected also the 12V DC power supply with adequate power, in the case of using LED strips supplied with 24V DC, the PX282 has to be connected to 24V DC power supply that power is matched to the length of the strip.

Schematic connection of LEDs



22 Dimensions



23 Technical data

type	PX282
DMX channels	512
RDM protocol support	yes
power supply	12 – 24V DC
max. current consumption	18A
power consumption without load	max. 0.8W
output channel number	3
PWM frequency	1.5 – 25kHz
interpolated resolution of output control	14 bit (at PWM 1.5kHz)
programmable scenes	1
built-in programs	18
outputs current capacity	6A / channel
output sockets	screw connectors
Master mode	yes
weight	0.1kg
dimensions	width: 35mm (2 DIN rail modules) height: 90mm depth: 58mm

DECLARATION OF CONFORMITY

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

we declare that our product:

Product name: Driver LED C.V. 3 x 6A

Product code: PX282

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.