PX139-a
PX139-c

LED Driver
3 x OC

INSTRUCTION MANUAL

PXM®

CONTENTS

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

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1. GENERAL DESCRIPTION

The PX139 driver is intended for LEDs control. The built-in DMX signal receiver allows to control 3 channels (R, G, B) directly through DMX protocol. The wide range of feeding voltage and high load capacity allow to control great number of LEDs.

PX139 can be controlled with DMX signal or operate independently. In this case the user has at disposal a fully programmable scene and 19 factory-defined sequences, for these the user can adjust the playing speed and step-to-step fading smoothness.

The driver has a built-in control signal frequency regulation system ("flicker free" technology), what makes it particularly useful in TV industry applications.

Seeing that the RGB LEDs parameters differ notably quite often, it may cause troubles with achieving the white colour (when all the output channels are controlled at 100%). That is why the PX139 driver has the "white balance" feature. By dint of this feature the user may fit the corrected module control of every colour to each set of LEDs, as to achieve white colour at full operation. What is more, this feature allows to correct in a small range the white hue temperature.

PX139 module is manufactured in two versions: *common anode* (PX139-a) - allows to connect the LEDs on a joint anode, and *common cathode* (PX139-c), that allows to connect LEDs on a joint cathode.

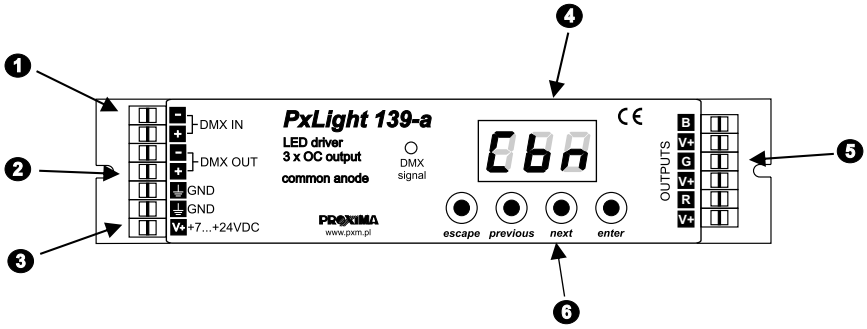
The module accepts PxLink protocol, that allows to remotely set the DMX address to each lamp, without physical interference in the lamps' settings. This protocol has been entirely created by PROXIMA s.c.

2. SAFETY CONDITIONS

PX139 LED Driver 3 x OC is a device powered with safe voltage 24 V; however, during its installation and use the following rules must be strictly observed:

1. The device may only be connected to 7 - 24 V 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 and attestations.
4. Connection of DMX signal can only be made with shielded conductor.
5. All repairs and connections of outputs or DMX signal can only be made with cut off power supply.
6. PX139 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. CONNECTIONS AND CONTROL ELEMENTS DESCRIPTION



❶ DMX-512 input
❷ DMX-512 output
❸ Power supply
❹ Display
❺ Control outputs
❻ Programming keys

4. DISPLAYED MESSAGES MEANING

001	driver's DMX addres - the basic *menu* state
ALL	setting the parameters for all channels concurrently
Ind	setting the parameters individually for each channel
FLP	turning the display readings upside-down
Adr	DMX address setting
CbA	control mode settings (RGB or BRIGHTNESS / COLOUR)
noS	reaction on DMX signal interruption
C-d	MASTER / SLAVE mode settings
2bA	operation in BRIGHTNESS / COLOUR mode
3bA	operation in RGB mode
onA	turning all the outputs on at 100%
oFF	turning all the outputs off
ScA	scene
P17	program no. 17

Ad1 DMX address setting for the first channel

Con turning the MASTER mode on / off

CHn emitted channels number in the MASTER mode

bAL white balance setting

bLr red colour balance

bLG green colour balance

bLb blue colour balance

bCn turning the white balance on / off

SPd program playing speed

FEd program step-to-step fading smoothness

rEd red colour setting during scene programming

Grn green colour setting during scene programming

bLu blue colour setting during scene programming

Fr9 basic brightness control frequency

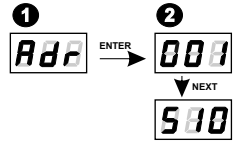
Syn control frequency correction

5. DMX ADDRESS SETTING

PX139 module menu allows to set the device DMX address in a range from 1 to 510. The driver takes up three subsequent DMX addresses, when set to 510, the last channel is set to 512.

To set the DMX address:

1. Select the *Adr* menu.
2. With "next" or "previous" buttons set the required DMX address.



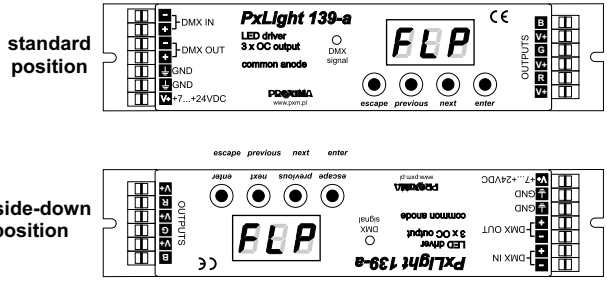
6. FLP FEATURE

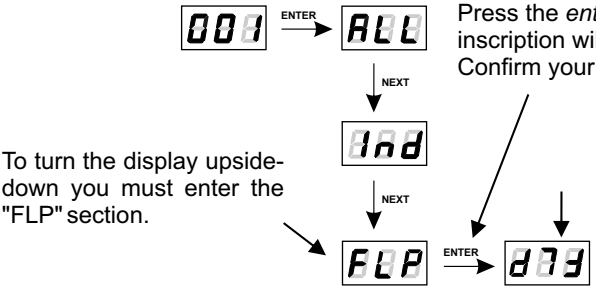
As the module should be installed in a small distance from the controlled LEDs, the lack of space may force the necessity of mounting the device upside-down.

In such case the displayed messages become illegible, that does not have the influence on device operation, but makes the programming much more difficult.

That is why the PX139 driver has a FLP feature available from the main menu.

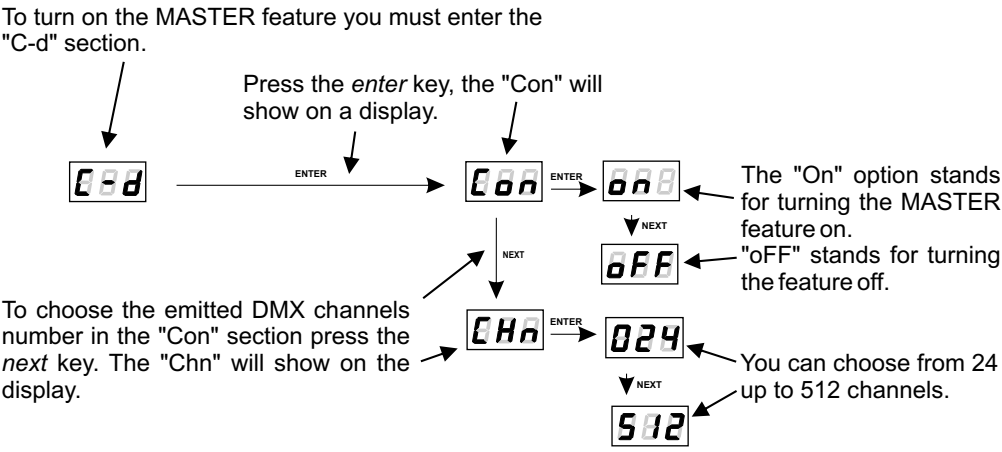
After confirming the settings the displayed messages are turned of 180 grades. The keys order is reversed as well.





7. MASTER / SLAVE FEATURE

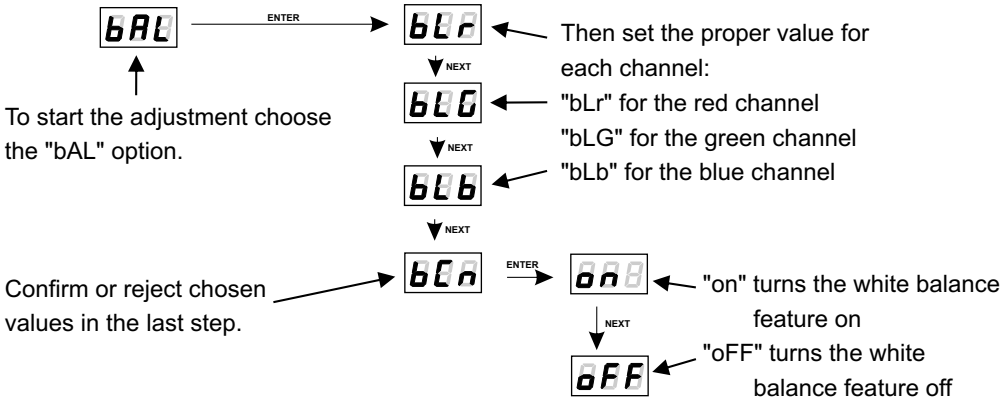
The PX139 module is equipped with DMX-512 signal receiver and can be controlled with any DMX desktop. In addition, the driver has a built-in programmable reaction on DMX signal interruption ("noS"). By dint of 19 factory-defined programs you can obtain interesting effects without the external controller. But in the complex installations a few PX139 modules realizing the same sequence cannot guarantee the full playing synchronization. That is why the PX139 driver is provided with the MASTER feature. When this feature is active, the module becomes the DMX signal transmitter and sends to all the other modules (set as SLAVES, DMX signal receivers) the realized program. By dint of such a solution the precise synchronization, even in very complex installations, is possible.



ATTENTION:
PX139 basically sends three channels (R, G, B), but because the DMX standard defines the minimal emited channels number as 24, these three channels are duplicated eight times. If there is such a necessity, you can multiplicate them up to 512 channels (this setting is not recommended because of the decrease of a transmission speed).

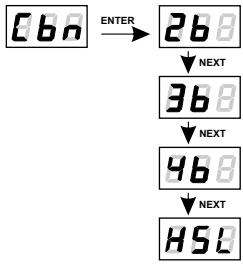
8. WHITE BALANCE

Sometimes troubles with achieving the white colour on RGB LEDs may occur. It can be caused by applying diods of different technical specification. For that reason the PX139 module is provided with the white balance feature. With this feature you can set the right colour temperature for full control of all three outputs (white colour). The maximal value (100) is set by default, the temperature can be adjusted by reducing it to a required level (to 50 maximum).



9. COLOURS' SETTING MODE

PX139 driver can operate in four brightness / colour adjustment modes: HSL, 4-channel, 3-channel and 2-channel. HSL (Hue, Saturation, Lightness) takes up three channels (3 bytes), each channel corresponds with - in turn - colour, saturation and brightness. In 4-channel (4-byte) mode first three channels control three separate colours (R, G and B) and the fourth channel dimms all the outputs. In a 3-channel (3-byte) mode each colour (R, G and B) is adjusted separately. The last, 2-channel (2-byte) mode, allows to adjust brightness and one of 256 predefined colours.



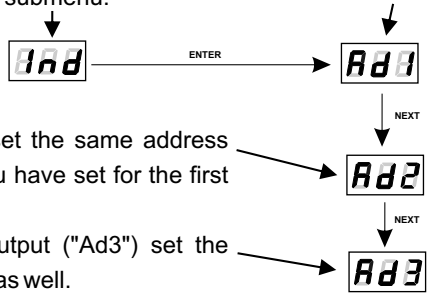
To choose the colours' setting mode select the "Cbn" option in the "ALL" menu and set the required mode: "2b" for 2-bytes mode, "3b" for 3-bytes, "4b" for RGBDimmer or "HSL" mode.

10. INDIVIDUAL SETTINGS

The PX139 module has the individual settings option. For instance, you can set the device to control concurrently three LEDs with one slider only.
The example below illustrates such a case.

To activate the individual settings option enter the "Ind" submenu.

Enter the first output settings, definite as "Ad1".



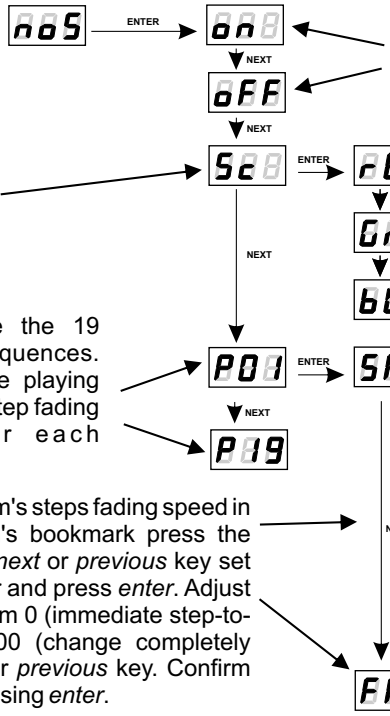
Set the address value. You may choose from 1 to 512 range.

In the "Ad2" set the same address number as you have set for the first output ("Ad1").
In the third output ("Ad3") set the same number as well.

11. REACTION TO DMX SIGNAL INTERRUPTION

During the module operation the DMX signal can disappear. To protect against such a contingency, you can set the device to play automatically one of 19 built-in programs or adjust the scene on your own.

To activate the NO SIGNAL feature you must enter the "noS" option.



"on" stands for turning all the outputs on at 100 %, "oFF" turns all the outputs off.

To define the scenes by your own you must enter the "Sc" option.

The "rEd" denotation is for the red channel.
The "Grn" denotation is for the green channel.
The "bLu" denotation is for the blue channel.
The intensity of each colour is adjusted in a range from 0 to 255.

You can also use the 19 factory-defined sequences. You may adjust the playing speed and step-to-step fading smoothness for each program.

To set the program playing speed in a required program's bookmark press *enter*. The "SPd" will show. Press *enter* again and adjust the value from 0.1 to 99.9 seconds with *next* or *previous* key. Confirm your settings by pressing *enter*.

To adjust the program's steps fading speed in a required program's bookmark press the *enter* key. With the *next* or *previous* key set the "FAd" parameter and press *enter*. Adjust the fading speed from 0 (immediate step-to-step change) to 100 (change completely smooth) with *next* or *previous* key. Confirm your settings by pressing *enter*.

12. PROGRAMS DESCRIPTION

The tables below show values for particular output channels - R, G and B in programs from 1 to 19 (P01 - P19). 255 is for the maximal brightness of a particular channel, 127 - brightness equals 50% and 0 stands for blackout.

		P01	P02	P03	P04	P05	P06	P07	P08	P09	P10
step 1	R	255	0	0	0	255	255	0	255	0	255
	G	0	0	0	0	0	0	255	0	255	0
	B	0	255	0	0	0	0	255	0	0	0
step 2	R	0	0	255	0	255	255	255	0	0	0
	G	255	255	0	0	255	0	0	255	0	0
	B	0	0	0	255	0	255	255	0	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				

		P11	P12	P13	P14	P15	P16	P17	P18	P19
step 1	R	0	0	0	255	0	0	0	0	255
	G	0	0	0	0	255	0	127	0	0
	B	0	0	0	0	0	255	255	0	0
step 2	R	255	0	0	255	127	127	127	255	0
	G	0	255	0	127	255	0	255	255	255
	B	0	0	255	0	0	255	127	255	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		

13. BRIGHTNESS CONTROL FREQUENCY

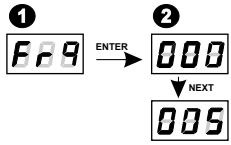
Frq feature allows to set the basic LEDs control frequency. This feature, as well as the frequency correctio (refer to chapter 14 of the present manual) is particularly helpful in the TV industry applications by the use of "flicker free" technology. This technology allows to avoid an unpleasant image flashing effect caused by lack of LEDs control signal synchronization. The table below shows the frequency values corresponding to *Frq* parameter values.

For *Frq* values between 0 and 2 the PWM fulfillment of the LED is exponential:

0	244.1 Hz - 488.3 Hz	(SYn increment = 1.9 Hz)
1	488.3 Hz - 976.6 Hz	(SYn increment = 3.81 Hz)
2	976.6 Hz - 1.953 kHz	(SYn increment = 7.63 Hz)

For *Frq* values between 3 and 5 the PWM fulfillment of the LED is linear:

3	1.953 kHz - 3.9 kHz	(SYn increment = 15.26 Hz)
4	3.9 kHz - 7.81 kHz	(SYn increment = 30.52 Hz)
5	7.81 kHz - 15.62 kHz	(SYn increment = 122.1Hz)

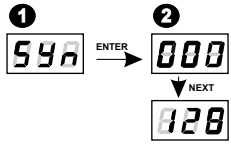


To set the range of a basic frequencies:

1. Enter the *Frq* menu.
2. With "next" or "previous" keys select the required value.

14. CONTROL FREQUENCY FINE TUNING

SYn feature allows to tune precisely the frequency selected in *Frq* menu. It is adjusted in a range between 0 and 128 - when *SYn* parameter is set to 0, the frequency adopts the minimal value in a particular range, when *SYn* is set to 128, the frequency adopts a maximal value in a range.



To precisely tune the previously selected basic frequency:

1. Enter the *SYn* menu.
2. With "next" or "previous" keys set the required value.

15. CONNECTIONS SCHEME

Because the active-type DMX in PX139 module is applied, there is no need to employ the terminators.

Such a solution allows to connect any number of PX139 drivers to a DMX controller.

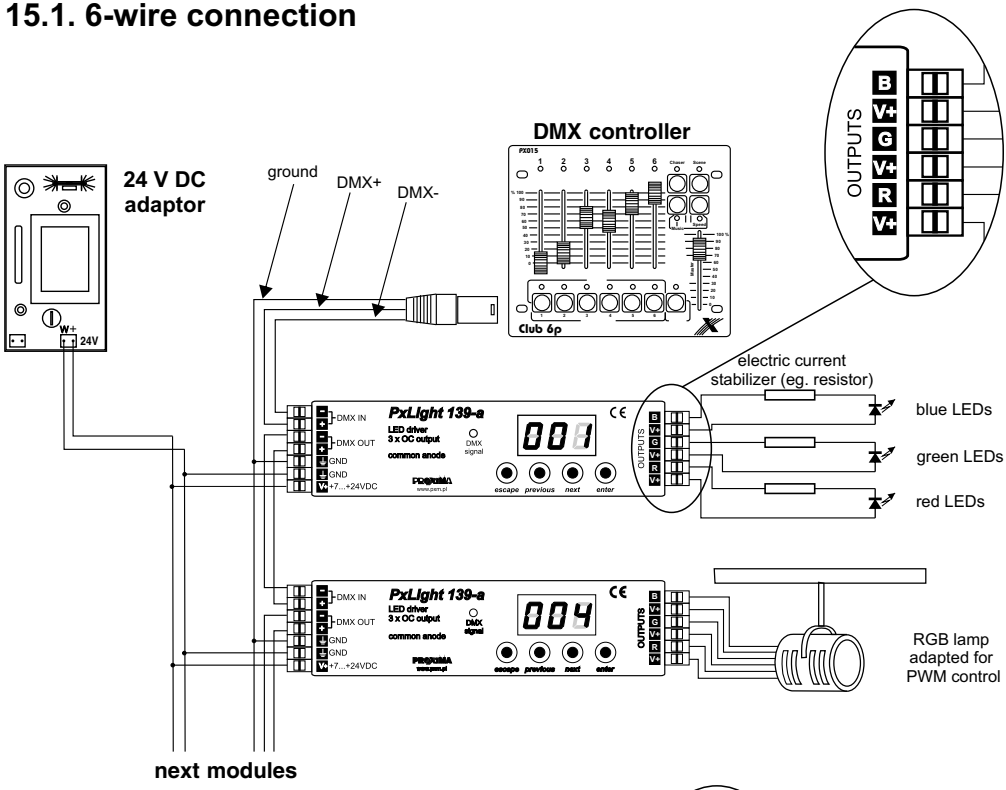
The connections have to be made with wires of appropriate gauge.

The proper connection lowers the risk of damaging the driver and improves its reliability.

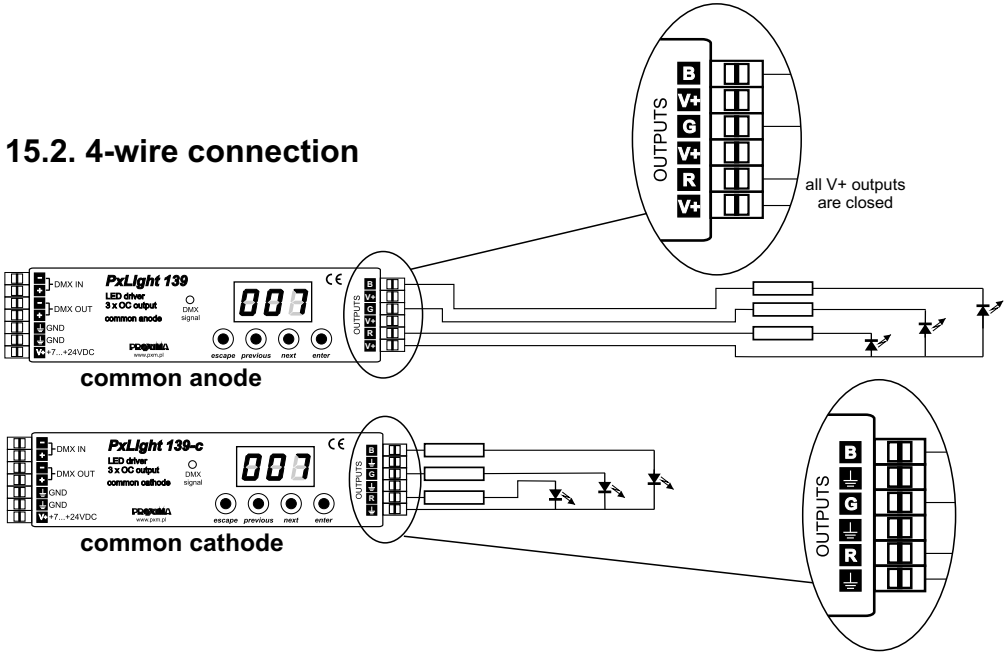
For DMX signal connection use the shielded conductors only.

ATTENTION: In case of voltage disappearance on one of the modules in chain, this one and the subsequent ones will not respond to a DMX signal.

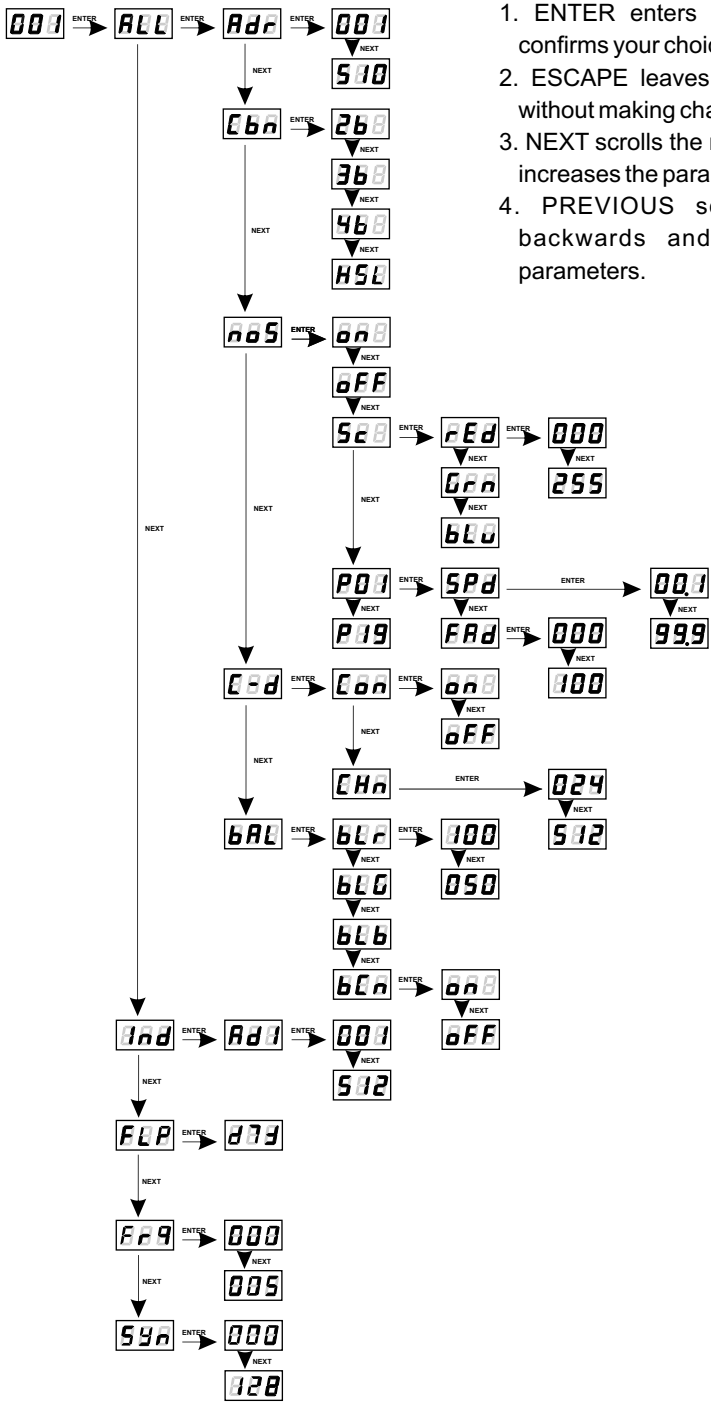
15.1. 6-wire connection



15.2. 4-wire connection



16. PROGRAMMING



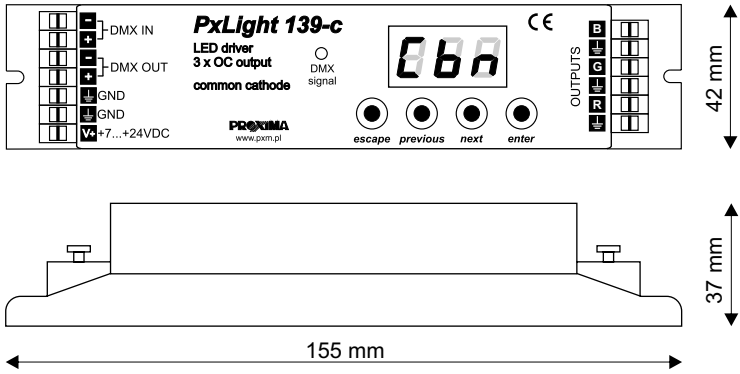
REMARKS:

1. ENTER enters the submenu and confirms your choice.
2. ESCAPE leaves the current menu without making changes.
3. NEXT scrolls the menu forwards and increases the parameters.
4. PREVIOUS scrolls the menu backwards and decreases the parameters.

17. PxLink PROTOCOL

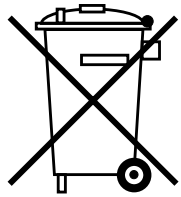
PxLink protocol, designed by PROXIMA s.c., allows to remotely program the lamps through the DMX line (eg. setting the DMX address for each lamp separately).
This feature is particularly helpful in inconvinient circumstances, for instance when the access to the lamp is burdensome (eg. because of the mounting place).
The PxLink protocol can be applied by proxy of a proper controller, as PX133 for instance.
PxLink is a registered trademark. **(it's available only to the 0.37 firmware)**

18. DIMENSIONS



19. TECHNICAL SPECIFICATION

- DMX channels	512
- power supply	7 - 24 V DC
- current consumption	7.5 A max.
- no-load current consumption	300 mA
- output channels number	3
- control accuracy	16 bit
- programmable scenes	1
- built-in programs	19
- outputs load capacity	2.5 A / channel
- output sockets	quick connectors
- PxLink	YES (to the 0.37 firmware)
- MASTER mode	YES
- dimensions:	
- lenght	155 mm
- width	42 mm
- height	37 mm



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DECLARATION OF CONFORMITY
according to guide lines 89/336/EWG

Name of producer: PXM s.c.

Address of producer: ul. Przemysłowa 12
30-701 Kraków

declares that the product:

Name of product: **LED Driver 3 x OC**

Type: **PX139-a**
PX139-c

answers the following product specifications:

EMC: **PN-EN 55103-1**
PN-EN 55103-2

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

PXM S.C.
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Kraków, 01.06.2006

Marek Żupnik M.Sc.