PX787

DMX / DALI 1x

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

PX787 is a DMX-512 control signal converter for DALI protocol and the DALI line programmer.

DMX / DALI 1x is an advanced converter that allows to combine lighting installations based on the DALI protocol with DMX-512 control system. Using the PX787, you can connect devices working in the DALI protocol to the controller sending the DMX-512 signal.

The device is equipped with two DMX (in / out) ports and one DALI port which allows to connect up to 64 devices – in accordance with the DALI standard. The converter also supports four digital inputs, from which you can set such actions as: turn on / off, set the scene or set the brightness.*

Managing PX787 settings is possible by means of buttons and screen or by means of a built-in Web Server. Changing the settings includes:

- searching for DALI devices,
- change of ballast parameters (e.g.: brightness, address, “fade time”,“fade rate”, etc.),
- changing the conversion settings from DMX to DALI,
- change of converter network settings,
- firmware upgrade.

Moreover, the RDM protocol was implemented in the PX787.

DMX / DALI 1x has been placed in a housing adapted for mounting on a 35mm DIN rail and is supplied with 12 – 24V DC safe voltage. Please note that the DALI line must have external power supply.

* - support for external keys is available from serial number 21030041

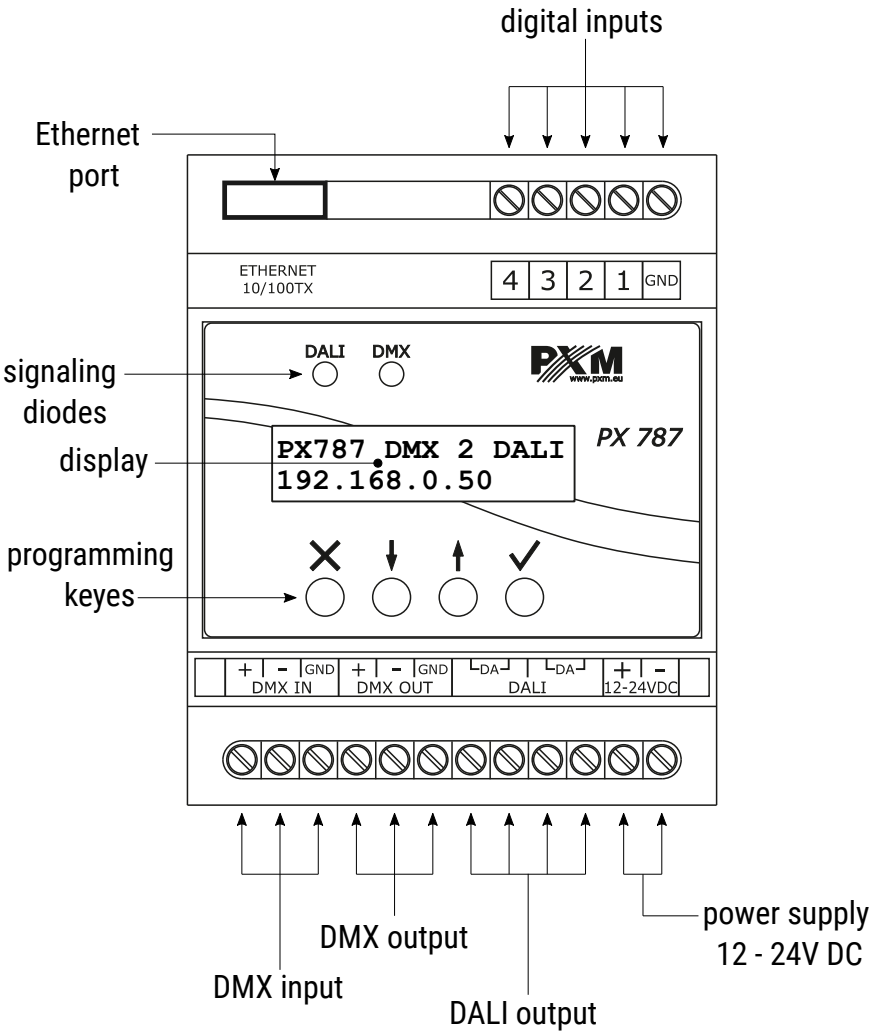
2 Safety conditions

PX787 is a device powered with safe voltage 12 – 24V DC; 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 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. The PX787 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 Programming using buttons

4.1 Navigating the menu

✕ (escape)	- allows to exit the parameter being programmed without saving any changes or to move to a higher menu level
↓ (previous)	- scrolls the menu up or reduces the values to be set
↑ (next)	- scrolls the menu down or increases the values to be set
✓ (enter)	- allows to enter the programming mode and confirm the values set

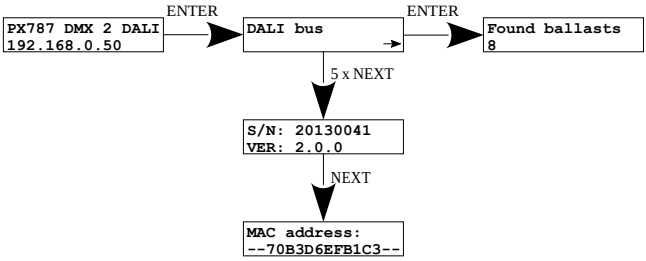
If the parameter is editable, the edit symbol is in the lower right corner, and ✓ causes the transition to the edition of the first field. The field that is being edited is indicated by the arrow ← and the buttons ↓ / ↑ change the value of the field. The ✓ button causes the transition to the next field or saving the value and exiting the parameter edition.

The → symbol informs about the possibility of entering the parameter edition tree.

4.2 Description of information parameters

On-screen menu allows to read information parameters related to the converter, such as:

- converter model and current IP address (if an address is provided by DHCP, an asterisk "*" is added),
- number of ballasts found by PX787 (e.g. 8),
- converter serial number and version number of the software installed,
- individual MAC address of the device.



4.3 Ballast search

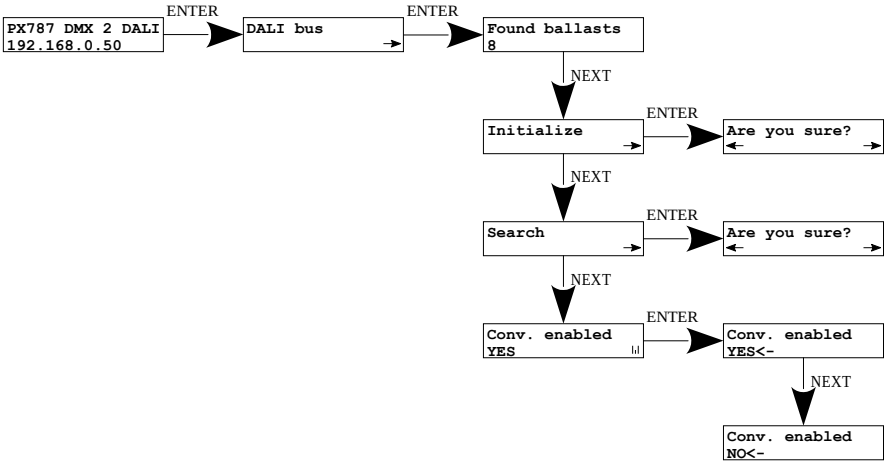
Using the screen and buttons it is possible to search for ballasts.

Following options are available:

- [Initialize] – searching for and re-addressing ballasts connected to the converter,
- [Search] – searching for ballasts connected to the converter without interfering with their address settings,
- [Conv. enabled] – switching on or switching on the conversion of DMX signal to DALI.

NOTE! The [Initialize] option will cause the loss of current ballast addressing.

When the user chooses one of the above-mentioned options, [Are you sure?] will appear on the display. Pressing the ✓ button will confirm the selected option and the device will execute it, while pressing the ✕ button will exit the selected option without searching / re-addressing the devices.

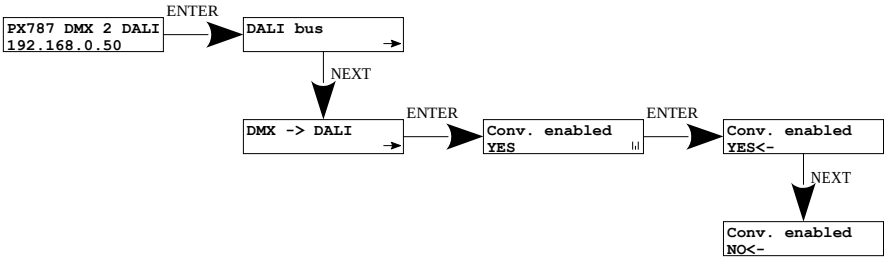


NOTE! After connecting the PX787 to an existing installation (the ballasts are addressed), select the [Search] option – it will not change the ballasts addresses. If the ballasts in the installation do not have assigned addresses – select the [Initialize] option.

4.4 DMX → DALI settings

4.4.1 Signal conversion on / off

In the device menu, it is possible to turn on and on the signal conversion from DMX to DALI.



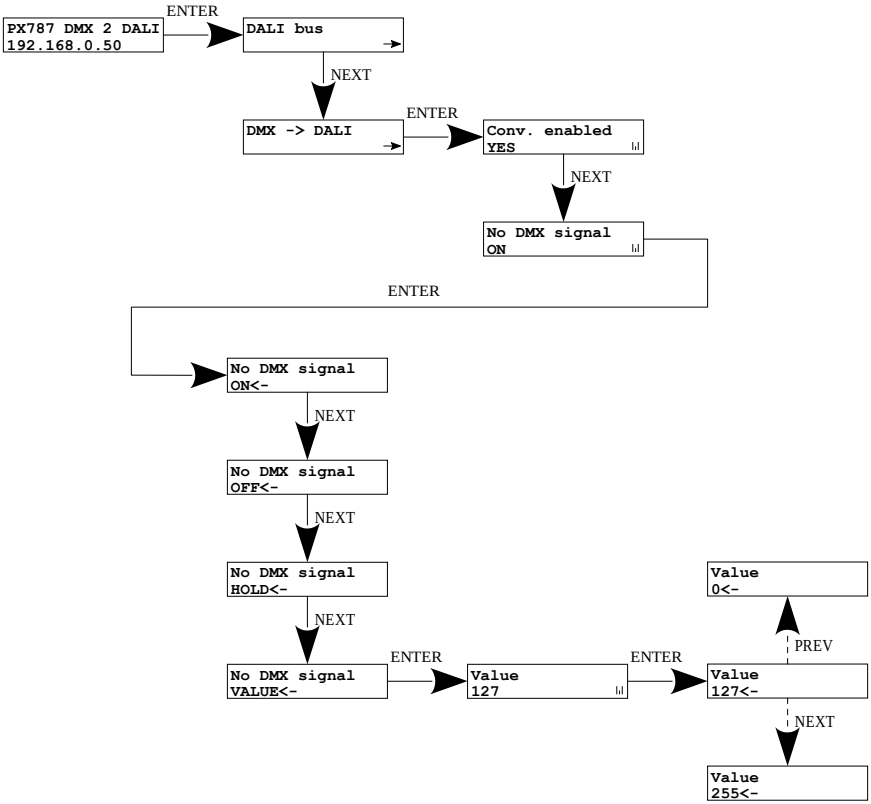
NOTE! After restarting the device, signal conversion is enabled.

4.4.2 No Signal function

In the [No DMX signal] menu, you can set the behavior of the converter in case of DMX signal loss.

Possible options to choose from:

- *ON* – switching on all ballasts at 100%,
- *OFF* – complete switching off of all ballasts,
- *HOLD* – holding the last value before the disappearance of the DMX signal,
- *VALUE* – set value in the range 0 – 255.



Reconnecting the DMX signal will interrupt the option being realized and the device will convert the DMX signal.

NOTE! After reconnecting the DMX signal to the converter, the DALI command will be sent to all devices (*Broadcast*) first, then the groups will be controlled, and finally each ballast individually.

4.4.3 Assigning DMX channels to DALI addresses

In order to assign DMX addresses to DALI addresses, enter the **[DMX → DALI]** option. The selected DMX address can be assigned to a maximum of 4 ballasts or one group or broadcast address.

In this menu you can assign a DMX channel to:

- **[DALI Broadcast]** – DMX channel that will control all available ballasts ("broadcast signal"),
- **[DALI Address]**
  - **[Channel] –** an individual DMX channel can be assigned to each DALI address,
  - **[Addr. autoincr.]** – starting from the current DALI address, it addresses the next consecutive DMX channels

*For example, by setting the DMX channel 20 for the DALI address **A04**, the option **[Addr. following]** will work as follows:*

DALI address	A00	A01	A02	A03	A04	A05	A06	A07	A08
DMX channel	-	-	-	-	20	21	22	23	24

- [Clear following] – starting from the current DALI address it will remove the next assigned DMX channels to the DALI addresses

*For example, by setting to the DALI address **A04**, the execution of the [Clear following] option will work as follows:*

DALI address	A00	A01	A02	A03	A04	A05	A06	A07	A08
DMX channel	1	2	3	4	5	-	-	-	-

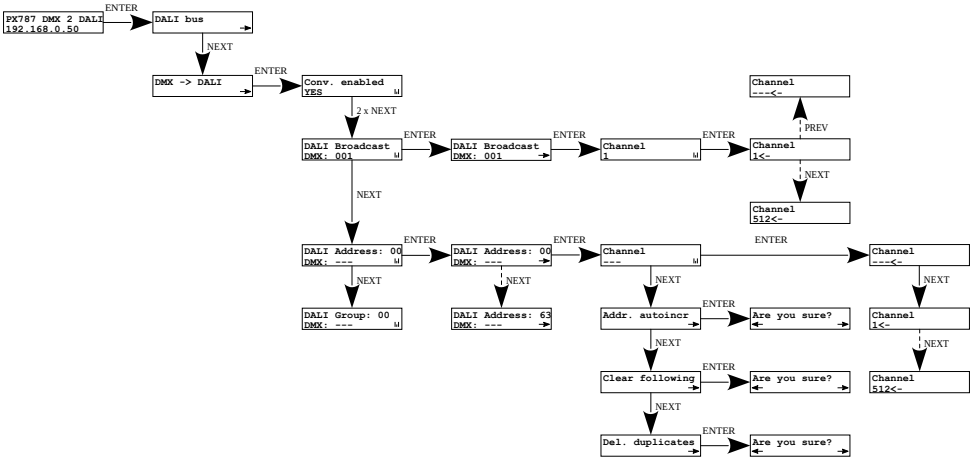
- [Del. duplicates] – will remove assigned DMX addresses from all ballasts where the same DMX address was used as in the selected ballast

*For example, by setting to the DALI address **A04** execution of the option [Del. duplicates] will work as follows (**A02** to **A05** DALI addresses were assigned DMX 3 channel):*

DALI address	A00	A01	A02	A03	A04	A05	A06	A07	A08
DMX channel	1	2	-	-	3	-	7	8	9

- [DALI Group]
  - [Channel] – an individual DMX address for each DALI group,
  - [Addr. autoincr.] – starting from the current DALI group, addresses the next consecutive DMX channels (operation similar to the example [Dali Address]),

- **[Clear following]** – starting from the current DALI group, it will remove the next assigned DMX channels to the DALI groups (operation similar to the example **[Dali Address]**),
- **[Del. duplicates]** – will remove assigned DMX addresses from all groups where the same DMX address was used as in the selected group (operation similar to the example **[Dali Address]**).



When the user chooses one of the above-mentioned options, **[Are you sure?]** will appear on the display. Pressing the ✓ button will confirm the selected option and the device will execute it, while pressing the ✕ button will exit the selected option without executing it.

NOTE! Symbol - - - next to DMX channels informs that no DMX channel has been assigned to the given DALI address, group or broadcast channel.

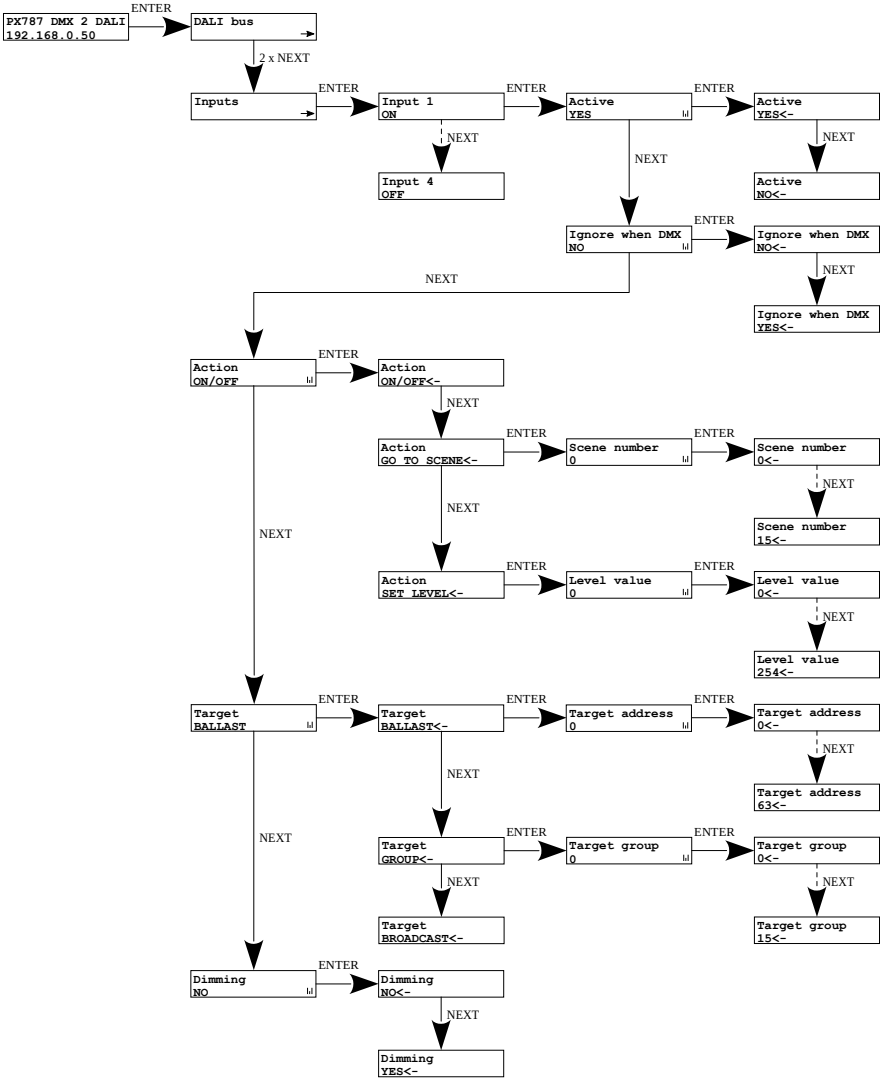
4.5 Digital inputs

Starting from the device with the serial number *21030041*, support for up to 4 digital inputs is available.

In the **[Inputs]** menu, each of the digital inputs can be individually assigned its operating parameters:

- **[Active] –** defines whether the digital input is to be active, two states are *YES / NO*,
- **[Ignore when DMX]** – if this option is on, the digital input works only when the DMX signal is unavailable, two states are *YES / NO*,
- [Action]
  - *ON / OFF* – pressing the button turns on or off the ballast / group / broadcast channel defined in **[Target]** – *Fade time* affects the smoothness of switching on and off. Switching on returns to the state before switching off – memory function.
  - *GO TO SCENE* – pressing the button turns on or off the scene (0 – 15) defined in the **[Target]** ballast / group / broadcast channel,
  - *SET LEVEL* – pressing the button switches on or off the brightness set by the user (0 – 254) defined in the **[Target]** of the ballast / group / broadcast channel,
- [Target]
  - *BALLAST* – the button applies to one ballast (1 of 0 – 63),
  - *GROUP* – the button applies to one of the groups (1 of 0 – 15),
  - *BROADCAST* – the button applies to all selected ballasts,

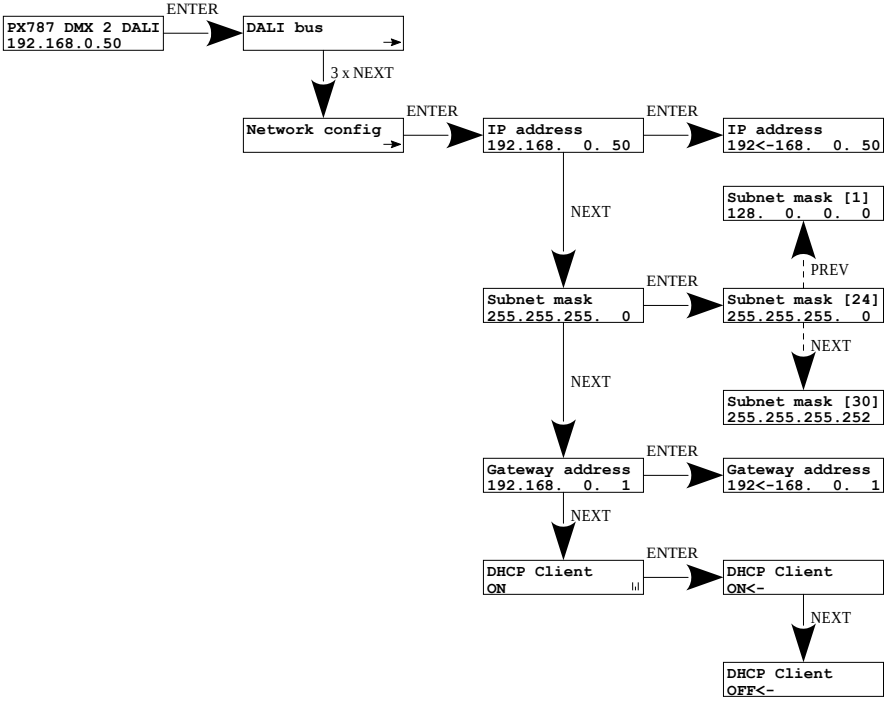
- [Dimming] – if this option is enabled, holding down the button will lighten or darken, two states are *YES / NO*. *Fade rate* affects the smoothness of brightening and dimming.



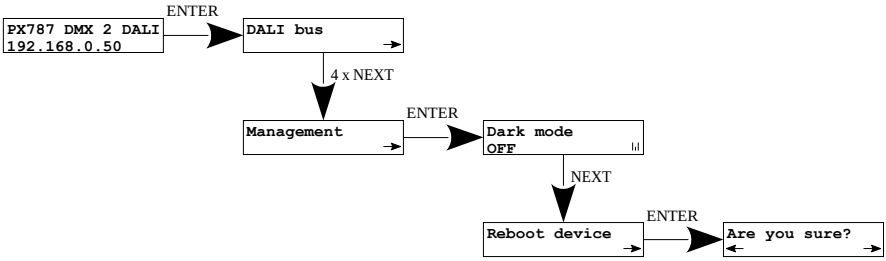
4.6 Converter network settings

PX787 gives you the ability to change network settings in the **[Network config.]** menu. The following parameters can be changed: static IP address **[IP address]**, subnet mask **[Subnet mask]** (subnet mask edited by changing the CIDR in the range of 1 – 30), default gateway **[Gateway address]** and enabling *On* or disabling *Off* support **[DHCP]**.

If DHCP is **turned off**, the converter works according to the static network configuration. If DHCP is **turned on**, the converter will start up using static settings, but will attempt to acquire new network configuration from the DHCP server.



NOTE! After making changes to the network settings, restart the device in the [Management] menu by selecting [Reboot device] – according to the diagram below. The device will restart.



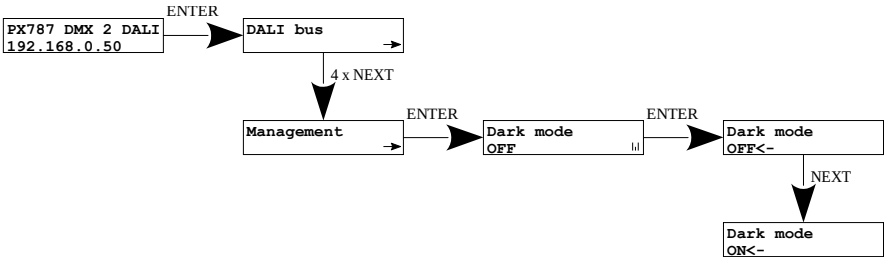
When the user selects this option, [Are you sure?] Appears on the display. Pressing the ✓ button will confirm the selected option and the device will execute it, while pressing the ✕ button will exit the selected restart option.

4.7 Other parameters

The menu containing the remaining [Management] settings allows to turn the screen and indicator lights [Dark mode] *ON* or *OFF*, restart the device [Reboot device] and restore the factory settings to [Factory defaults].

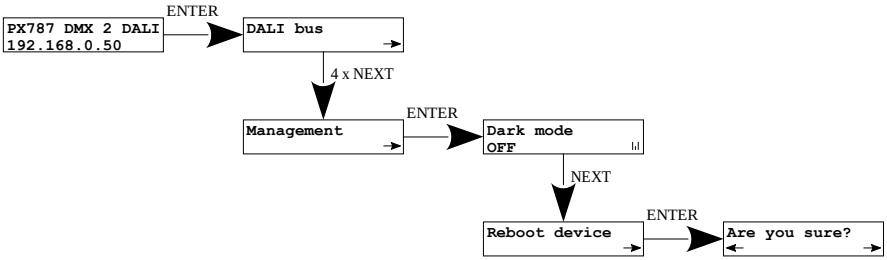
4.7.1 Dark mode

When [Dark mode] is turned on, after 10 seconds of inactivity, the display and indicator lights turn off. The device continues to work without interfering with other parameters. To restore the backlight, press any key.



4.7.2 Reboot the device

[Reboot device] is available, which should be used after making network changes to the device via the built-in LCD and buttons.

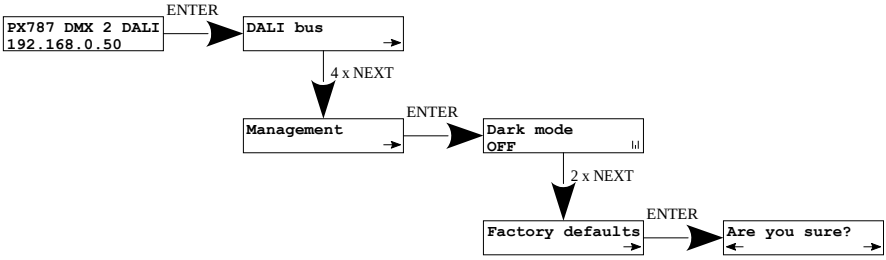


When the user selects this option, the query [Are you sure?]. Pressing the ✓ button will confirm the selected option and the device will execute it, while pressing the ✕ button will exit the selected restart option.

4.7.3 Restore default settings

To restore the default settings, go to the **[Management]** menu and then select **[Factory defaults]**. When restoring factory settings the device will be restart and following changes will be made to the device:

- **IP address**: 192.168.0.50
- **Subnet mask**: 255.255.255.0
- **Gateway address**: 192.168.0.1
- **DHCP**: ON
- **Dark mode**: OFF
- **Input 1 – 4**: OFF
- **clearing** the DALI line addressing settings **table**
- **deleting** saved **ballasts** from the list

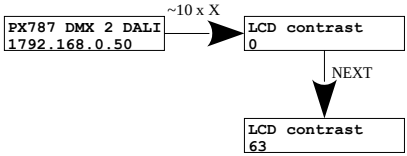


When the user selects this option, **[Are you sure?]** appears on the display. Selecting the ✓ button will confirm the selected option and the device will execute it, while pressing the ✕ button will exit the selected option of restoring factory settings

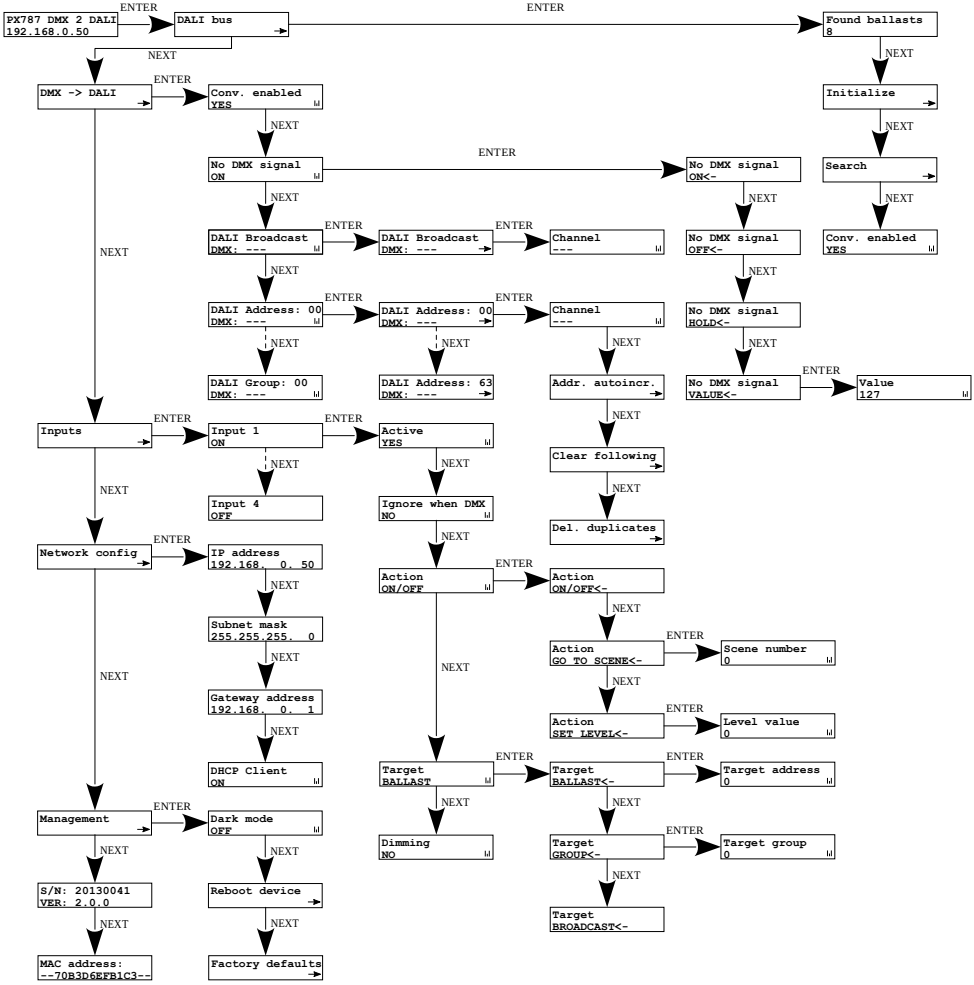
4.8 Setting the display contrast

If the device has a problem with the readability of messages displayed on the screen, it is possible to change its settings. To do this, press the ~10x ✕ button. The contrast can be set in range from 0 to 63. If the screen is illegible and only "▒" characters are visible or the screen is completely white. Being in the contrast menu is signaled by alternating green and blue diodes blinking.

With the ↓ / ↑ find the appropriate value (it is recommended to press the ↑ key to find the value in which the screen becomes readable, and then use the ↓ / ↑ keys to adjust the value to suit your needs). To exit [LCD contrast] menu, press the ✓ key.



4.9 Menu scheme in PX787



5 Connecting to the PC

The module has a built-in Web Server, which allows to change all settings via a web browser. To use the web interface, it is necessary to connect the PX787 module to a computer.

In automatic mode (DHCP), after connecting to the network the converter attempts to get the network configuration from a DHCP server (e.g router). Thanks to this, manual configuration of networks parameters is not needed. In the absence of a DHCP server on the network the converter will operate according to the static configuration (manual setup). When selecting static addressing, configure the network parameters so that the PX787 works in the same subnet as the computer and that there is no conflict of IP addresses (devices must have unique IP addresses in the network).

If the converter obtained the IP address from the DHCP server, unplugging the network cable will cause the loss of the assigned IP address. If PX787 is reconnected to the network, it will try to get a new address from the DHCP server, if it fails to receive the address, it will work according to the saved static settings.

It is recommended to use automatic addressing and connect the converter to the network with a running DHCP server

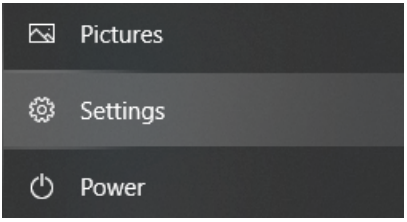
If the converter is connected directly to the computer (no DHCP server), it is necessary to manually set the network parameters of both the computer and PX787 so that they work in one network and connect the devices with a crossover Ethernet cable.

5.1 Change of the computer network configuration

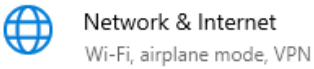
The procedure for changing the computer network configuration varies depending on the operating system. Windows® 7 system is an example here.

Change of the computer network configuration in the Windows® 7 operating system in done in the following:

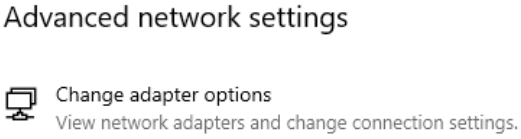
1. Click **[Start]** 
2. Select **[Settings]** tab



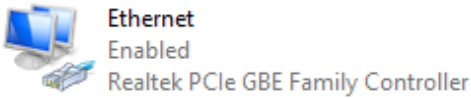
3. Go to **[Network & Internet]** tab



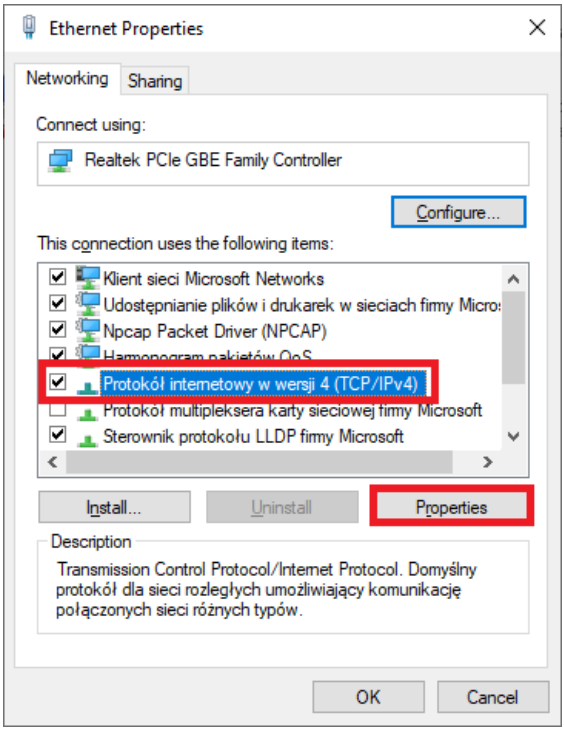
4. Select **[Advanced network settings]**



5. Right-click on the appropriate connection, for example it could be **[Ethernet]** and select **[Properties]**

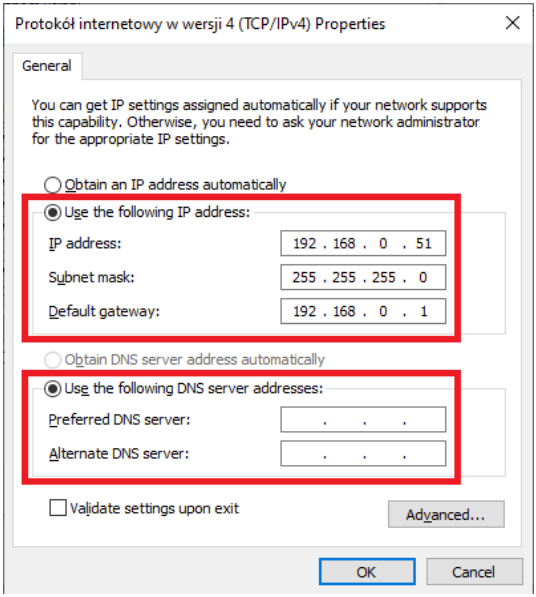


6. In the new window that appears, select **[Internet Protocol Version 4 (TCP/IPv4)]** and then press properties



7. In the next window, select **[Use the following IP address:]**

   To connect directly (computer – driver) with a controller that has a default configuration, use the sample settings:



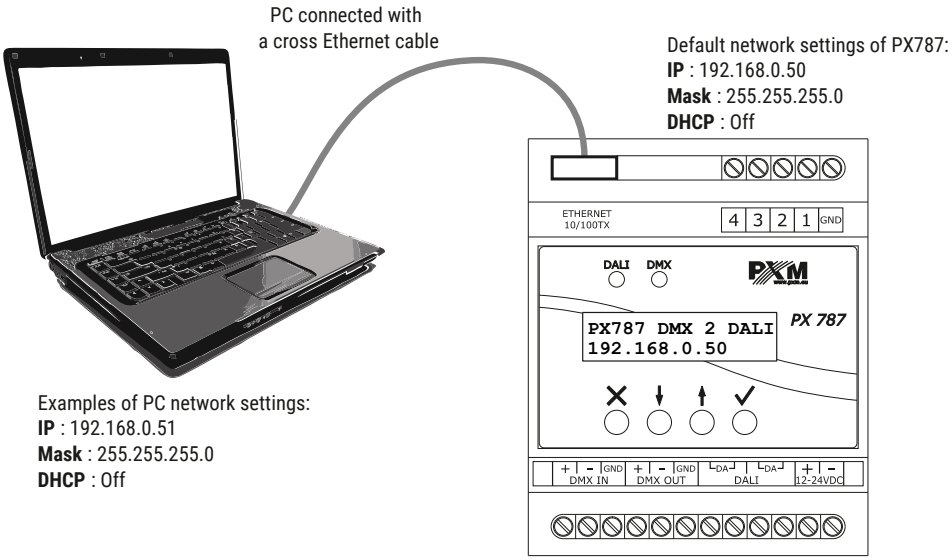
IP address: 192.168.0.51

Subnet mask: 255.255.255.0

Default gateway: 192.168.0.1

5.2 Connecting converter directly to the PC

When connecting the converter directly to a computer it is recommended to use a braided cable. Newer network cards will work both on a braided cable or a non-braided cable, but older ones may require a braided cable.



NOTE! Remember that the PX787 converter and the computer should be in the same network and there is no conflict of IP addresses.

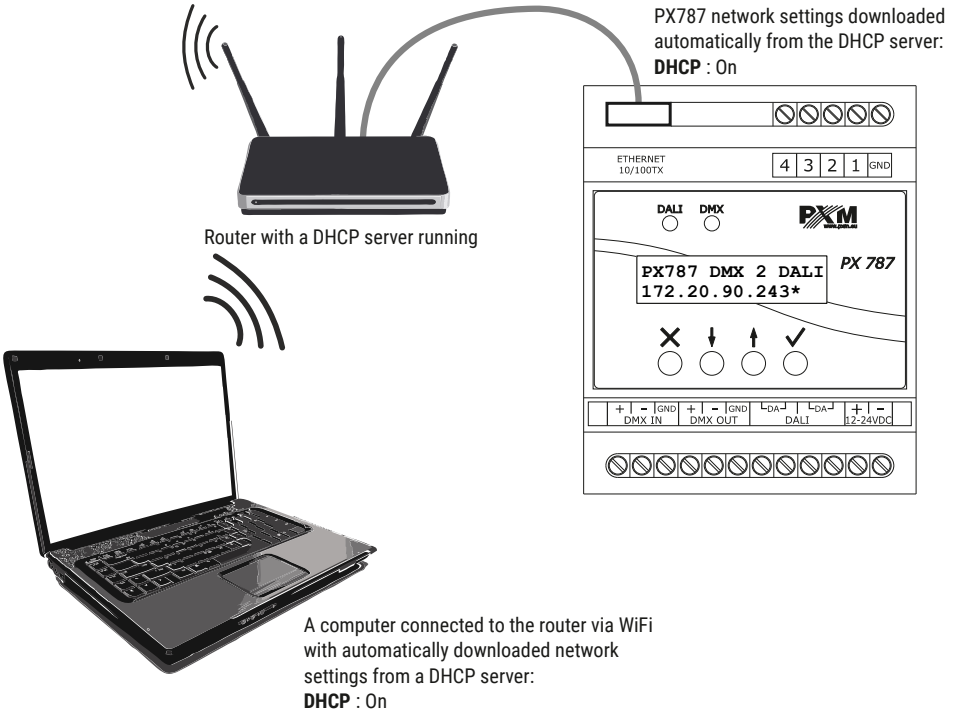
5.3 Connecting the converter using a router

When connecting the converter to the router, there are two options for network settings. The first of these is the use router with a DHCP server running, the network configuration on all devices in the network is set automatically. The second option is to connect the converter and PC to a switch or router that does not support DHCP server, in this case all devices in

the network must have manually configured network settings in such a way that each device operates in the same network and has a unique IP address.

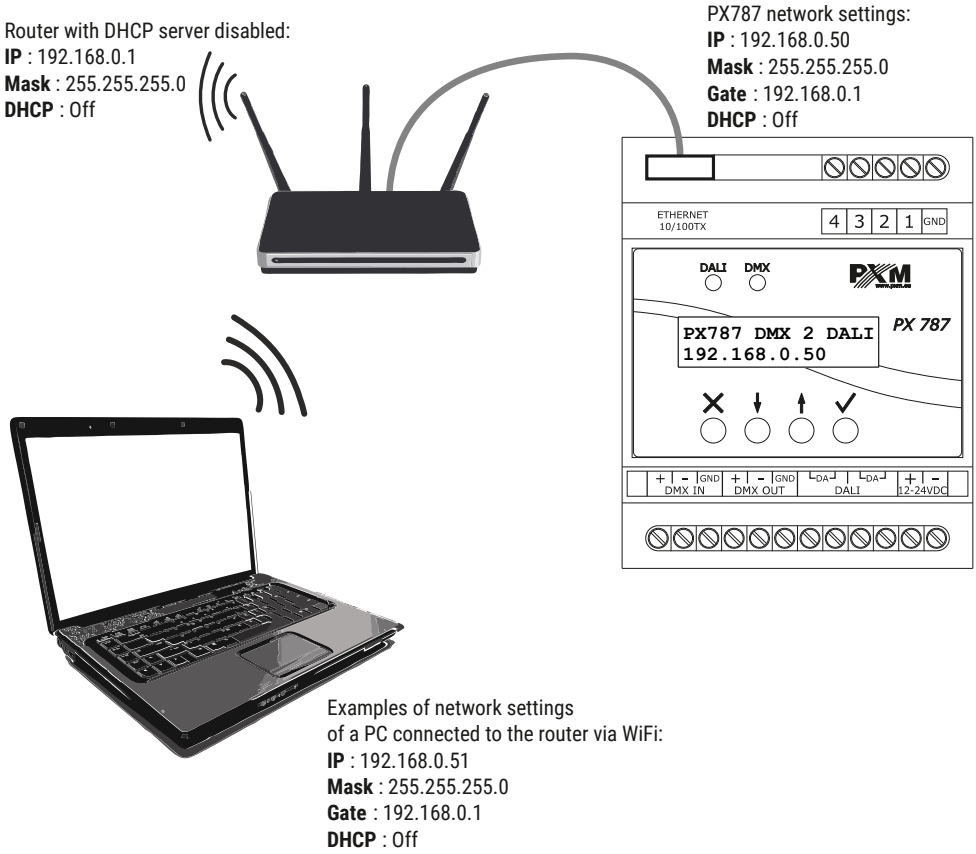
5.3.1 Automatic addressing

The diagram below shows the connection of the device with the router on which the DHCP server operates:



5.3.2 Static addressing

Below is an example diagram of network settings of the converter, router and PC, in the case when the DHCP server in the network is not running:



The advanced converter connection from the external network is described in section 7 Remote connection.

6 WWW interface

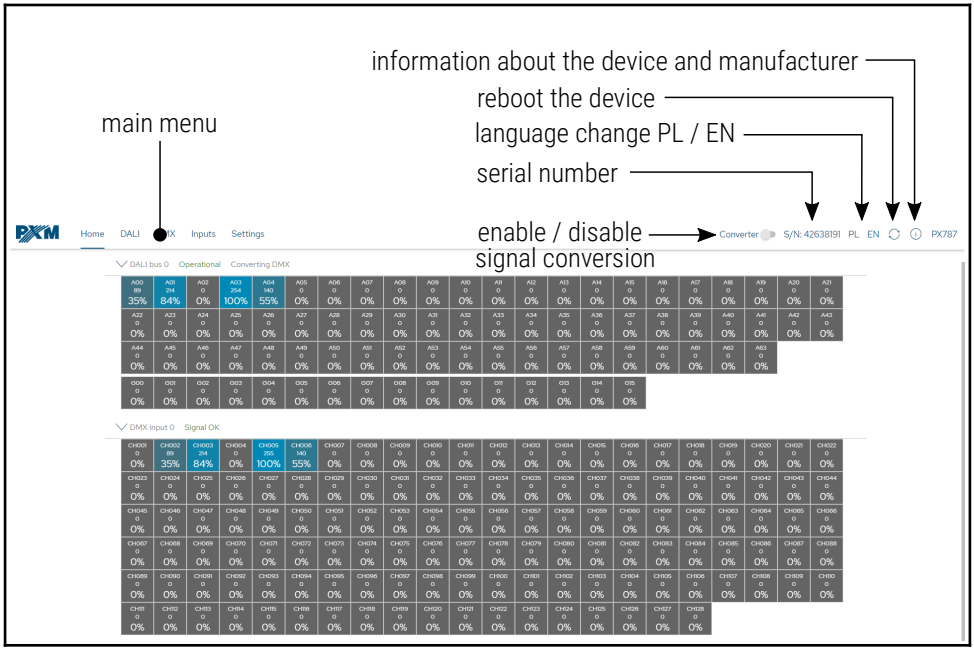
The device has a built-in Web Server that starts with the device. To open the PX787 management panel, enter the device's IP address in the browser (default is 192.168.0.50).

NOTE! Pay special attention if the PX787 is in the same network as the device on which the browser is running or in the router there are redirects configured accordingly.

Supported browsers:

- *Google Chrome* – from version *79.0.3945.117*
- *Mozilla Firefox* – from version *72.0.2*
- *Opera* – from versions *66.0.3515.44*
- *Edge* – from versions *79.0.309.71*

6.1 WWW window structure

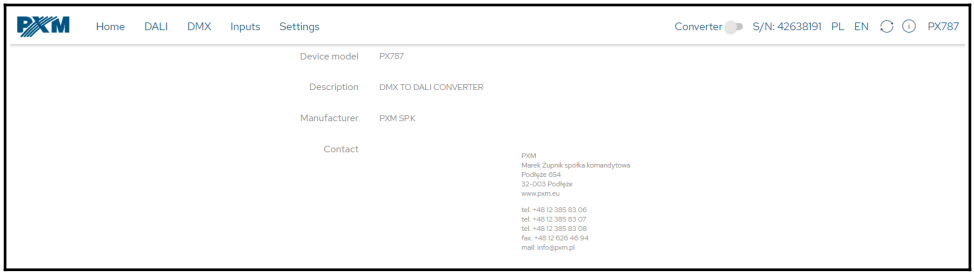


The following tabs are available in the *main menu*:

- ***Home*** – graphic representation of all DALI output channels and all DMX input channels,
- ***DALI*** – displays all found ballasts, in this tab it is possible to edit their parameters (if signal conversion is disabled),
- ***DMX*** – the tab responsible for addressing DALI channels, groups and broadcast channel on individual DMX input channels,
- ***Inputs*** – configuration of digital inputs,
- ***Settings*** – is used for local device name changes, network settings and software updates,

The following options are in the upper right corner:

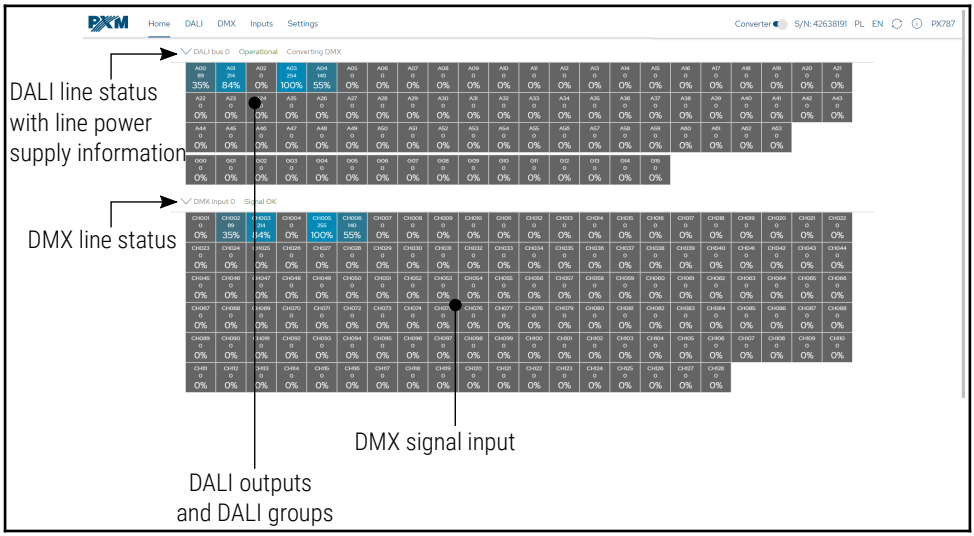
- turning on / off DMX → DALI signal conversion,
- device serial number,
- language change (EN / PL),
- restarting the device,
- diagnostic information,
- device and manufacturer information:



6.2 Preview of DALI and DMX channels

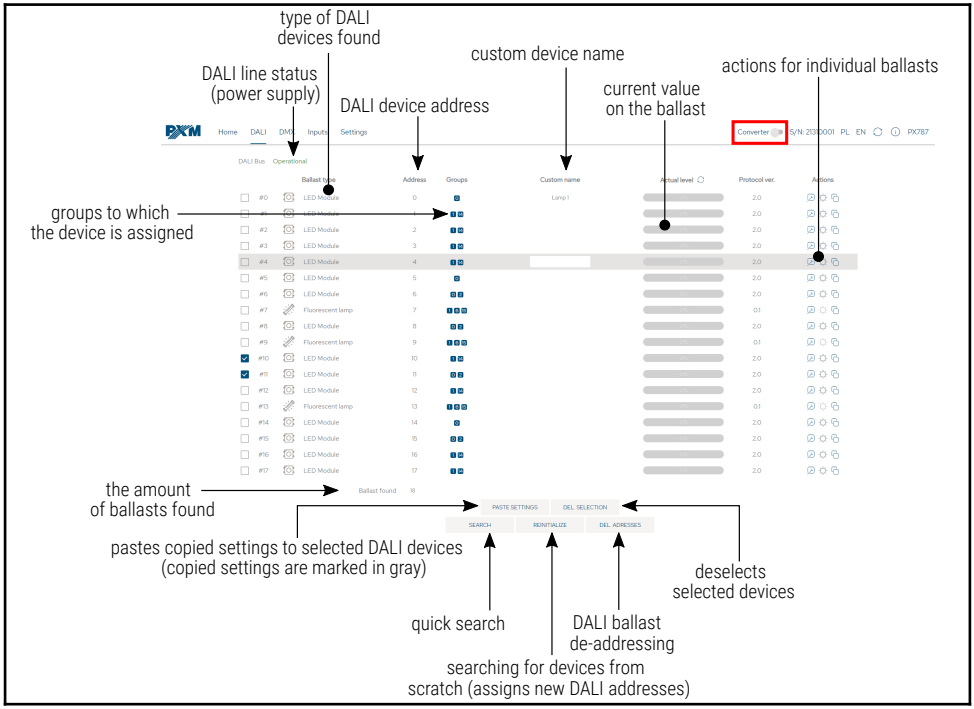
After entering the converter website, the first tab is *Home*. In this tab you can read:

- DALI line status (*Operational* / *No power supply*),
- DMX line status (*Signal OK* / *No signal*),
- values sent on the DALI line to all possible 64 devices and 16 groups,
- values received at the DMX input from all received channels.



6.3 DALI

The *DALI* tab allows to manage found ballasts on the DALI line. It is possible to quickly search for devices or initiate a search for devices that were not previously in the PX787 memory. Changing the DALI ballast parameters and searching for them is possible only when the DMX → DALI signal conversion is disabled.



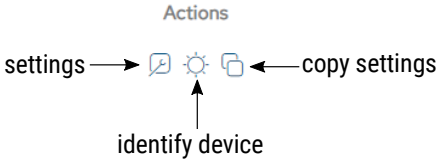
Description of displayed parameters:

- *DALI Bus* – if the line is powered from an external source and works correctly, the message *Operational* is displayed, in the event of a power failure of the DALI line the message *No power supply* is displayed,
- *Ballast found* – amount of ballasts found on the line,
- *Ballast type* – type of ballast found (*Fluorescent lamp, Emergency lighting, Discharge lamp, Low Voltage Halogen, Supply Voltage Regulator, DALI to 0-10V, LED Module, Relay, Color control, Sequencer*),
- *Groups* – group numbers to which the ballast is assigned,
- *Address* – address to which the ballast is assigned,
- *Name* – custom ballast name (saved locally),
- *Actual level* – power with which the ballast is currently working,
- *Search* – searching for devices on the line again,
- *Reinitialize* – searching for devices on the line again (associated with changing the DALI address settings and deleting the custom name assigned to devices previously configured),
- *Del. Adresses* – deletion of assigned DALI addresses to all ballasts,
- *Del. Selection* – resets the DALI device selection,
- *Paste settings* – pastes the settings previously copied to the marked ballasts (more information in chapter 6.3.2 Copy settings),

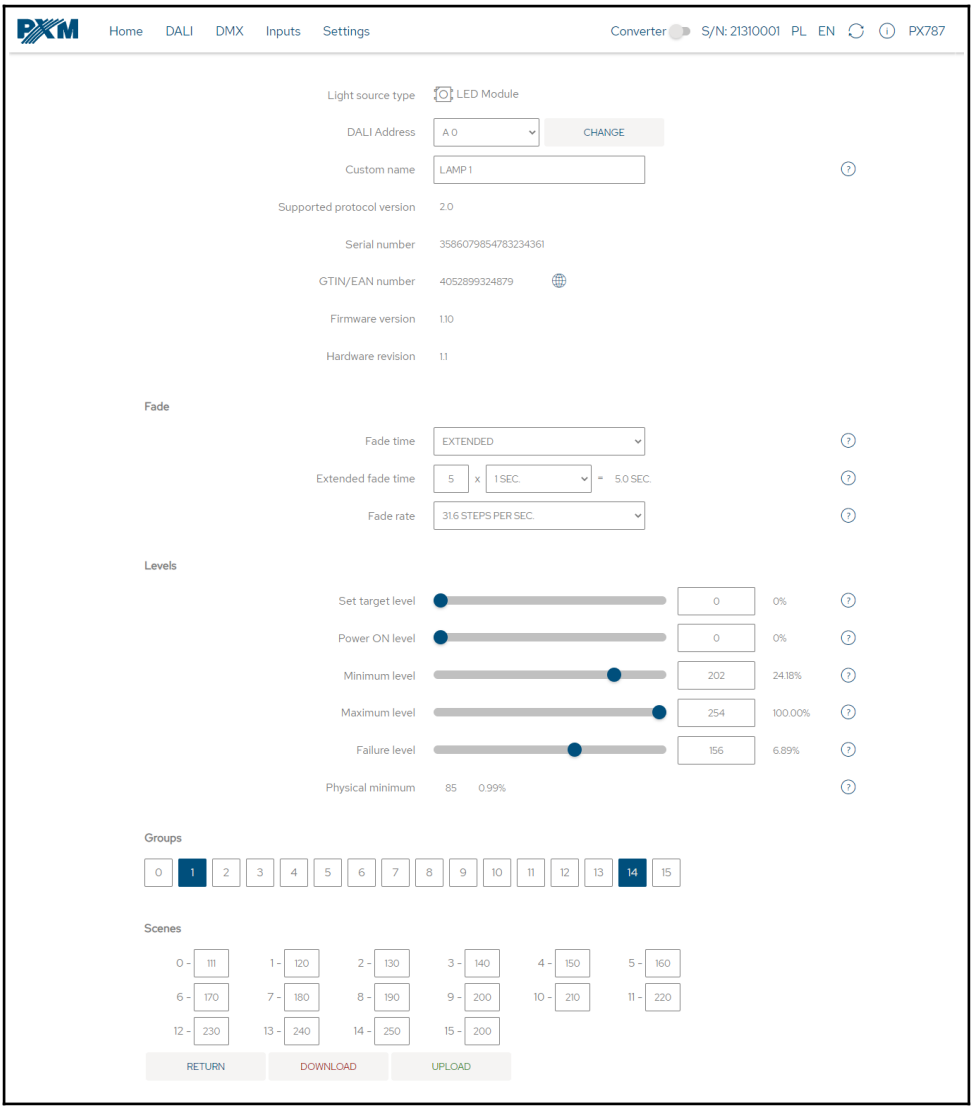
NOTE! After connecting the PX787 to the existing installation (the ballasts are addressed), select the *Search* option – it will not change the ballasts addresses. If the ballasts in the installation do not have assigned addresses – select the *Reinitialize* option.

6.3.1 Actions available for ballasts

For each device found on the DALI line via PX787 it is possible to select an action.



- *Identify device* – when pressed, the device brightens and darkens for identification – the duration is ~10s,
- *Copy settings* – copies settings, which can then be pasted into selected devices (for more information see chapter 6.3.2 Copy settings),
- *Edit options* – goes to the ballast parameters configuration.


Home
DALI
DMX
Inputs
Settings
Converter
S/N: 21310001
PL
EN
PX787
Light source type
LED Module
DALI Address
A 0
CHANGE
Custom name
LAMP 1
Supported protocol version
2.0
Serial number
358607985478323436l
GTIN/EAN number
4052899324879
Firmware version
1.10
Hardware revision
1.1
Fade
Fade time
EXTENDED
Extended fade time
5
x
1 SEC.
= 5.0 SEC.
Fade rate
31.6 STEPS PER SEC.
Levels
Set target level
0
0%
Power ON level
0
0%
Minimum level
202
24.18%
Maximum level
254
100.00%
Failure level
156
6.89%
Physical minimum
85
0.99%
Groups
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Scenes
0 - 111
1 - 120
2 - 130
3 - 140
4 - 150
5 - 160
6 - 170
7 - 180
8 - 190
9 - 200
10 - 210
11 - 220
12 - 230
13 - 240
14 - 250
15 - 200
RETURN
DOWNLOAD
UPLOAD

Available parameters of DALI devices:

- ***Light source type*** – information on the type of ballast (*Fluorescent lamp, Emergency lighting, Discharge lamp, Low Voltage Halogen, Supply Voltage Regulator, DALI to 0-10V, LED Module, Relay, Color control, Sequencer*),
- ***Address*** – device address on the DALI line, to change it, click the *Change* button,

NOTE! If a device with this address already exists on the DALI line, it will be "de-addressed". To make the device visible again, search for devices on the DALI line again. The "de-addressed" device will receive the first available DALI address.

- ***Custom name*** – individual ballast name, the name is stored in the PX787 memory,
- ***Firmware version***,
- ***Supported protocol version*** (DALI),
- ***GTIN/EAN number*** – ballast identification number,
- ***Fade time*** – time determining the speed of transition between brightness levels,
- ***Extended fade time*** – time that determines how quickly it changes between user-defined brightness levels,
- ***Fade rate*** – number of steps per second determining the speed of transition between brightness levels,
- ***Set target level*** – brightness level for which the ballast is to be set in the range 0 – 254,

- *Power ON level* – default brightness after ballast on,
- *Minimum level* – minimum ballast brightness,
- *Maximum level* – maximum ballast brightness,
- *Failure level* – ballast brightness in the event of a DALI line failure,
- *Physical minimum* – minimum brightness level factory set in the ballast,
- *Groups* – assigning ballast to selected group / groups,
- *Scenes* – brightness level of scenes, the value of 255 means that ballast will ignore this scene (16 scenes).

NOTE! Changes made can be canceled by selecting the *Return* button. The settings can be downloaded from the ballast by clicking the *Download* button. The changes made should be sent to the device by clicking *Upload*.

6.3.2 Copy settings

The web interface allows to copy the configured ballast settings to other devices on the DALI line. This option speeds up the configuration of many ballasts (if they are to have the same parameters).

To do this, first configure the device, and then in the *DALI* tab select the icon in the *Actions* column.



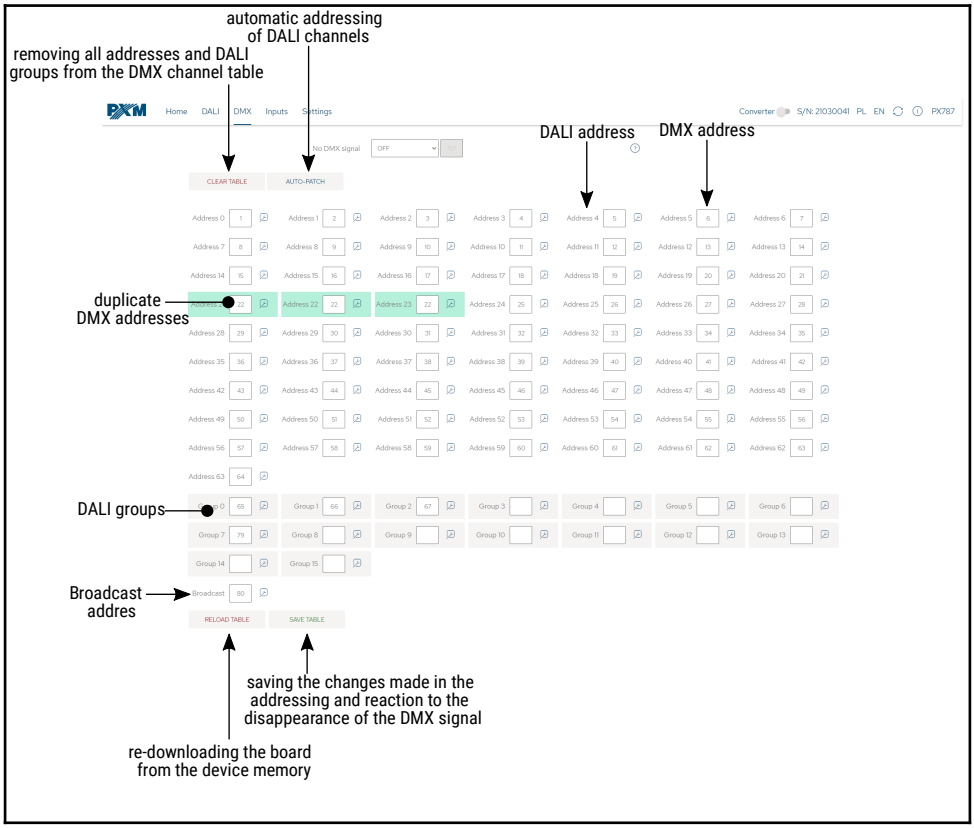
The device from which the parameters were copied will be highlighted in gray. After copying the parameters, select the devices on the left to which they are to be pasted.

If the parameters have been copied and the devices to which they are to be pasted are selected, the *Reset and Paste settings* settings buttons become active. The *Reset* button removes all selections, while *Paste settings* starts the process of copying the settings to the selected ballasts.



6.4 DMX

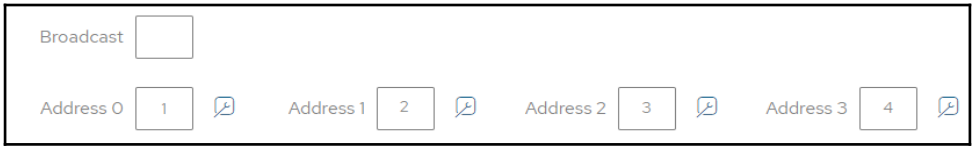
This tab is responsible for assigning DALI addresses to specific DMX input channels, defining the response to the disappearance of DMX signal and possibly setting the DALI broadcast address, which is responsible for sending values to all ballasts.



In order to address any DALI channel or group, enter the DMX address. To remove the assigned DMX channel to the selected DALI address, remove the number from the cell or enter "0".

Duplicate DMX channels assigned to DALI addresses will be marked in green. The selected DMX address can be assigned to the max. 4 ballasts or 1 group or broadcast address. Addresses that do not meet these limits are highlighted in red.

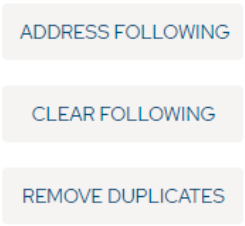
Automatic addressing is also possible by selecting the *Auto-patch* button, DMX address 1 will be assigned to the first DALI channel, subsequent DMX channels will be assigned to the next DALI addresses.



In this tab, it is also possible to react to the disappearance of the DMX signal. The possible behaviors of the converter are:

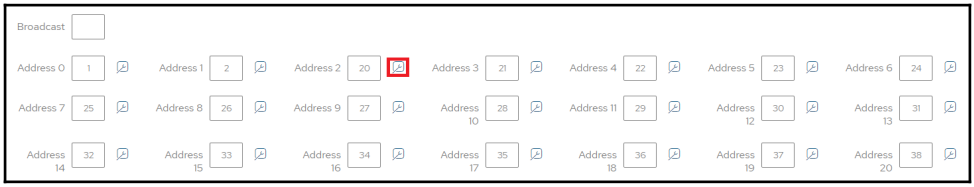
- *ON* – switching on all ballasts at 100%,
- *OFF* – complete switching off of all ballasts,
- *HOLD* – maintaining the last value of the DMX signal,
- *VALUE* – switching on all ballasts with a value set by the user in the range 0 – 255.

By clicking on the settings symbol next to the field for entering a DMX channel to the DALI address, additional options will appear:



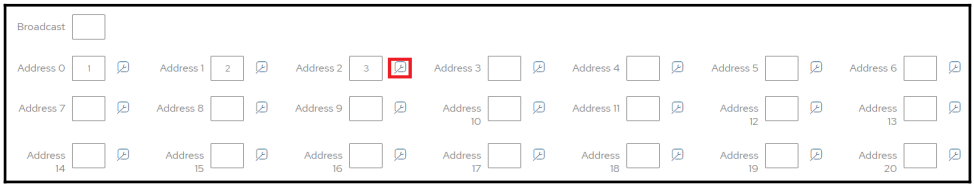
- ***Address following*** – starting from the current DALI address, it addresses the next consecutive DMX channels

For example, by selecting an option on the DALI A02 address on which the DMX 20 channel is set, the option will work as follows:



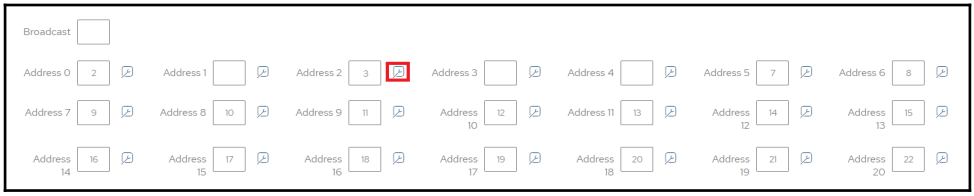
- ***Clear following*** – starting from the current DALI address it will remove the next assigned DMX channels to the DALI addresses

For example, by selecting an option on the DALI A02 address on which the DMX 20 channel is set, the option will work as follows:



- ***Remove duplicates*** – starting from the current DALI address, the next assigned DMX channels will be removed to the DALI addresses in which the DMX channel was duplicated

*For example, by setting to the DALI address **A04**, the execution of this option will work as follows (DALI addresses from **A01** to **A04** had the DMX 3 channel assigned):*

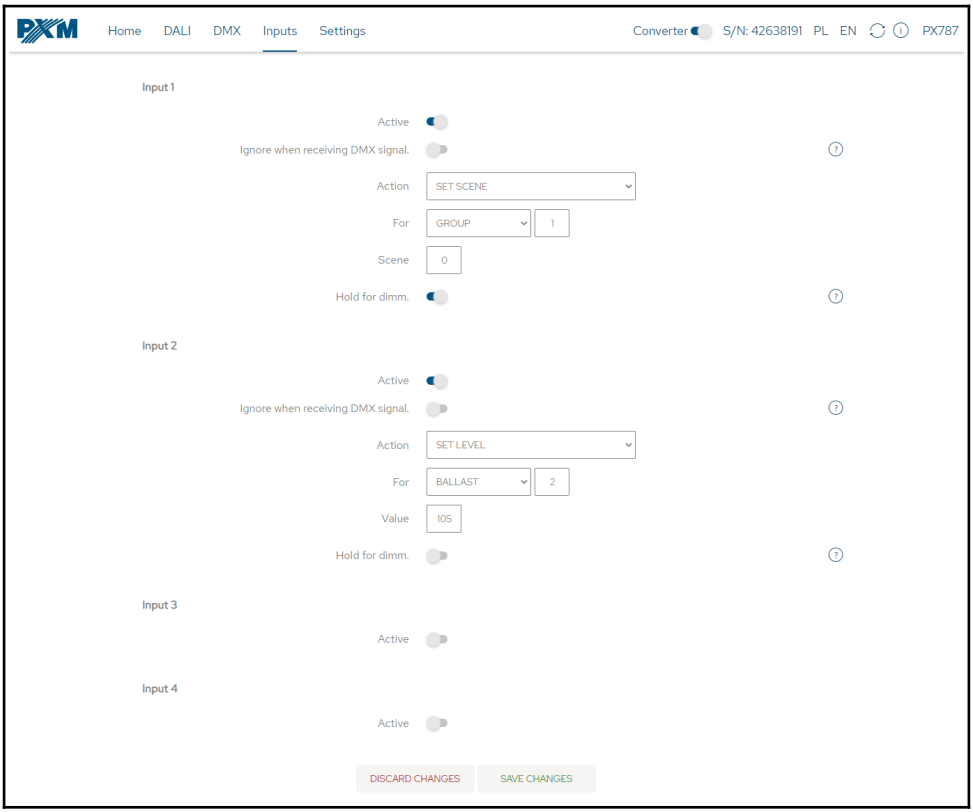


NOTE! After making changes manually or after automatic assigning of addresses and DALI groups to DMX channels, save the changes by selecting the *Save table* button. If the table is saved correctly, a message *Patch table sent to device* with a green background will appear at the top of the page.

6.5 Inputs

From the device with the serial number *21030041*, support for up to 4 digital inputs is available. Each of the digital inputs in the converter can:

- be turned on or off,
- ignore digital input if DMX signal is received,
- perform one of the three Actions:
    - *ON / OFF* – each subsequent press of the button will enable or disable the ballast / group / all ballasts (*Broadcast*) – *Fade time* affects the smoothness of switching on and off. Switching on returns to the state before switching off – memory function.
    - *Set scene* – each subsequent press of the button will turn on or off the given scene in the ballast / group / all ballasts (Broadcast),
    - *Set level* – each subsequent press of the button will turn on or off the brightness set by the user in the ballast / group / all ballasts (Broadcast),
- have enabled the option *Hold for dimm.* – holding the button will lighten or darken. *Fade rate* affects the smoothness of brightening and dimming.

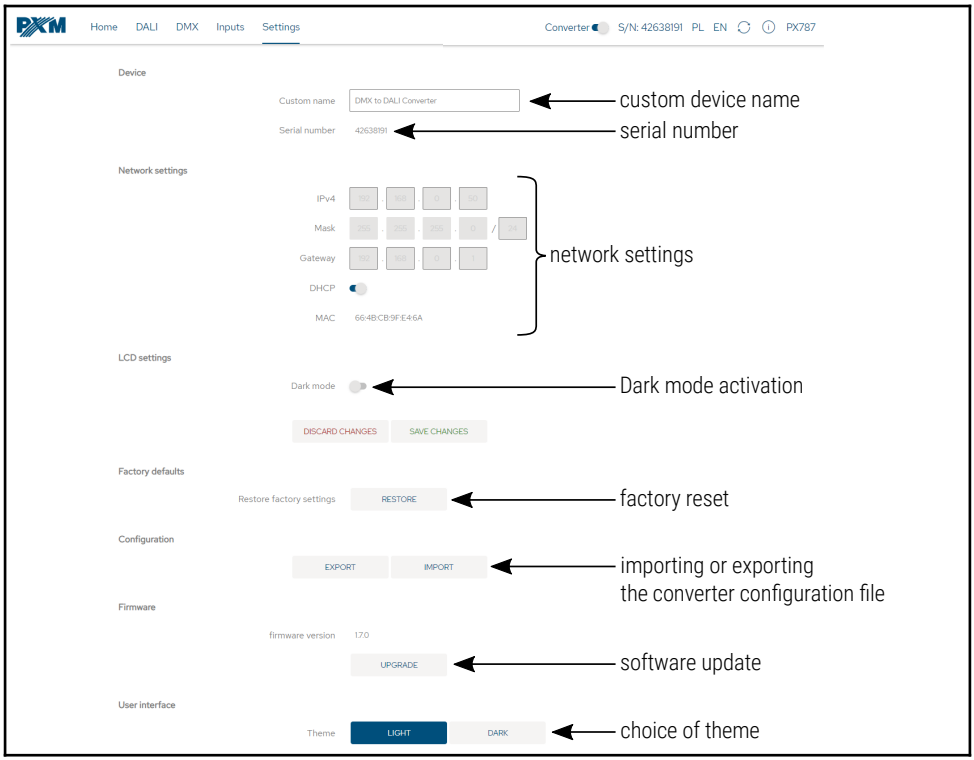


NOTE! After making changes, save the changes by selecting the *Save changes* button. If it is saved correctly, a message *The changes have been sent to the device* with a green background will appear at the top of the page.

6.6 Settings

The converter network settings, renaming, exporting and importing settings to and from the file, as well as the firmware update can be set in the *Settings* tab.

NOTE! After making any changes to network settings, restart the device (button).



- *Device label* – custom device name set by the user
- *Serial number*
- *IPv4* – setting the IP address
- *MAC* – individual MAC address of the network card
- *Gateway* – default gateway setting
- *Mask* – setting the subnet mask
- *DHCP* – enable or disable DHCP support
- *Dark mode* – screen and indicator lights off after 10 seconds,
- *Factory settings*:
    - IP address: 192.168.0.50
    - Mask: 255.255.255.0
    - Gateway: 192.168.0.1
    - DHCP: On
    - Reaction to no DMX signal: ON
    - Dark Mode: disabled
    - Inputs 1 – 4: disabled
    - clearing the DALI line address settings table
    - removing from the list of saved ballasts

By selecting *Export* you can save the settings of network settings, DALI line addressing and digital inputs to a file, by clicking *Import* you can load the configuration from the file.

Software update is possible after selecting the *Upgrade* button and then selecting the update file.

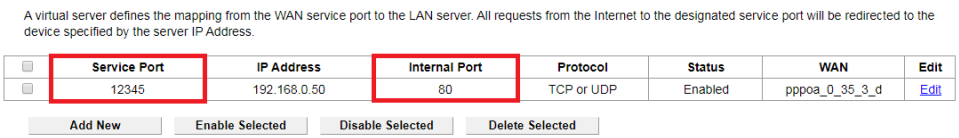
7 Remote connection

The converter allows to log in to device from an external network via the internet, for this purpose it should be:

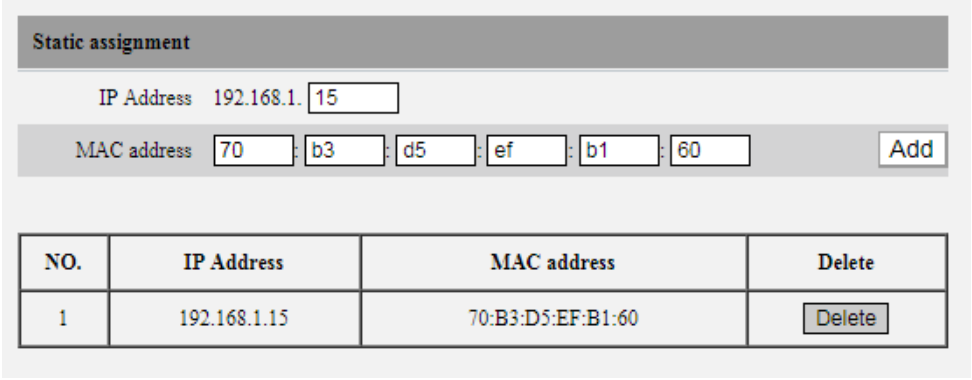
- have an external IP address on the router assigned by the internet provider and be able to establish connection from outside (incoming packets are not blocked by the provider's and router's firewall)
- redirect port 80 to the IP address of the converter working in the local network (so-called forwarding port)
- unblock selected port in the router's firewall
- the address of the converter / converters in the local network can not change (the converter must have a static IP address set or the DHCP server must assign the same addresses to the same devices each time)

NOTE! The destination port of the device is always port 80, for added security it is recommended to redirect other ports from the external network to port 80 in the local network.

Example: by sending a query to the external IP address of a router with port number 12345 (e.g. 66.77.88.99:12345), the router will forward this query to the address of the device with port number 80 (e.g. 192.168.0.50:80).



NOTE! In most routers available on the market, you can set a static IP address by the DHCP server based on the MAC address of the device. For example, for a device with the MAC address 70:B3:D5:EF:B1:60 the IP address 192.168.1.15 will always be assigned by the DHCP server (example below).



Most routers available on the market usually have several parameters in port forwarding options:

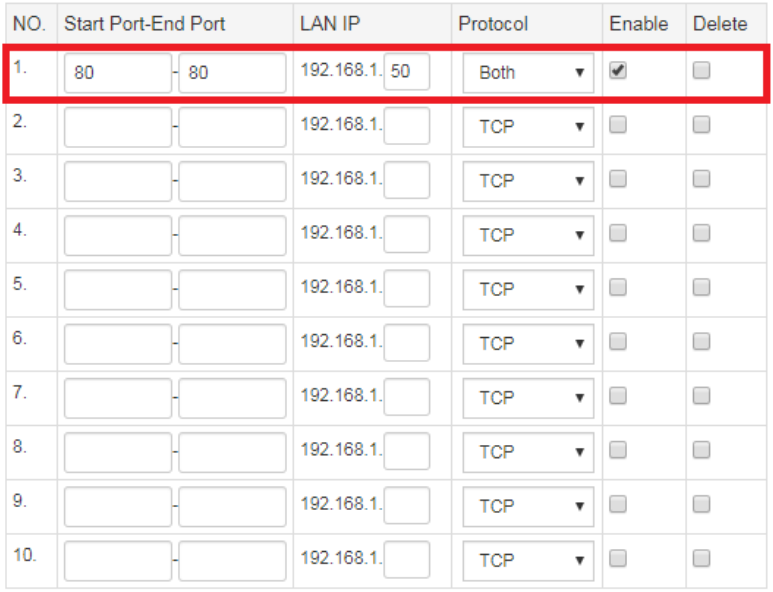
- forwarding number
- port or port range for redirection
- the IP address of the device to be redirected to
- protocol type (TCP / UDP or both)
- attach / delete diversion

7.1.1 One converter in the internal network

Examples of network settings:

- external IP address: 66.77.88.99 (example address)
- converter IP address: 192.168.1.50
- mask: 255.255.255.0
- target device port: 80
- protocol: TCP or TCP/UDP (in this case option "*Both*")

Below is the screen of the example setting in the router:



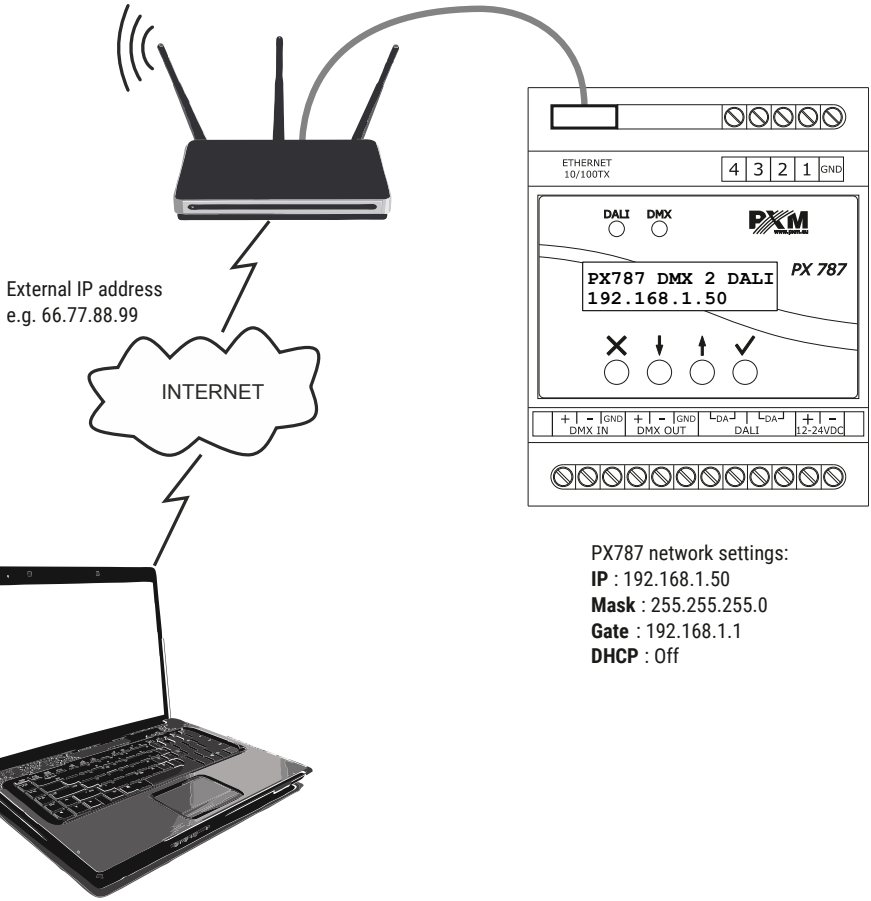
NO.	Start Port-End Port	LAN IP	Protocol	Enable	Delete
1.	80 - 80	192.168.1. 50	Both	☑	☐
2.	-	192.168.1.	TCP	☐	☐
3.	-	192.168.1.	TCP	☐	☐
4.	-	192.168.1.	TCP	☐	☐
5.	-	192.168.1.	TCP	☐	☐
6.	-	192.168.1.	TCP	☐	☐
7.	-	192.168.1.	TCP	☐	☐
8.	-	192.168.1.	TCP	☐	☐
9.	-	192.168.1.	TCP	☐	☐
10.	-	192.168.1.	TCP	☐	☐

If the router does not have the option to set up one port forwarding, create a range (from 80 to 80). If everything is correctly configured to open the web interface, enter the external IP address in the browser window (e.g. 66.77.88.99) or if you have redirected another port to internal port

number 80 (e.g. 66.77.88.99:12345) – described in detail in section 7 More than one converter in the internal network.

Example of connection without using other ports:

Router network settings:
IP : 192.168.1.1
Mask : 255.255.255.0
DHCP : Off
Port 80 forwarding
to the device address (192.168.1.50)



PX787 network settings:
IP : 192.168.1.50
Mask : 255.255.255.0
Gate : 192.168.1.1
DHCP : Off

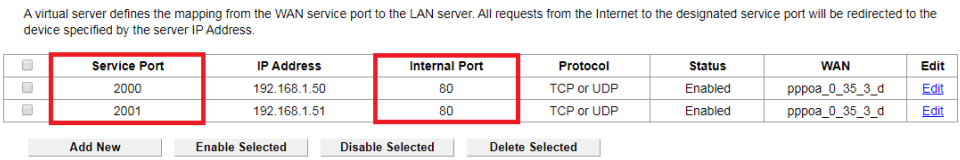
A computer connected to the internet

7.1.2 More than one converter in the internal network

Examples of network settings:

- external IP address: 66.77.88.99 (example address)
- IP address of the first converter: 192.168.1.50
- IP address of the second converter: 192.168.1.51
- mask: 255.255.255.0
- target device port: 80
- protocol: TCP or TCP/UDP (in this case option "*Both*")

Below is a screen with examples of settings in the router (port forwarding 2000 and 2001 to the appropriate IP address of the converter and port 80):


A virtual server defines the mapping from the WAN service port to the LAN server. All requests from the Internet to the designated service port will be redirected to the device specified by the server IP Address.

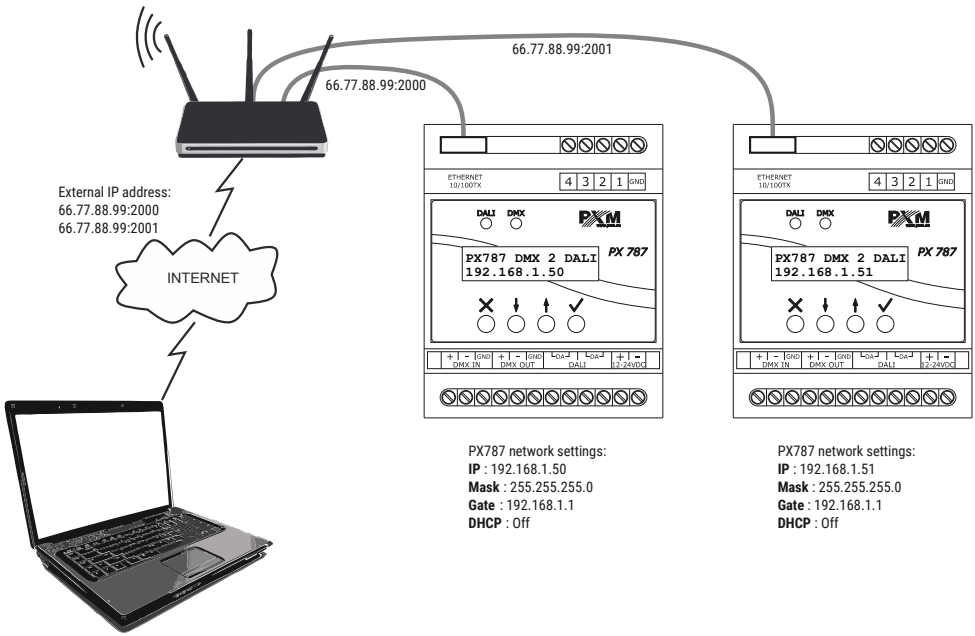
	Service Port	IP Address	Internal Port	Protocol	Status	WAN	Edit
☐	2000	192.168.1.50	80	TCP or UDP	Enabled	pppoa_0_35_3_d	Edit
☐	2001	192.168.1.51	80	TCP or UDP	Enabled	pppoa_0_35_3_d	Edit

Add New | Enable Selected | Disable Selected | Delete Selected

In this case, port 2000 indicates a device with IP address 192.168.1.50 and sends a query to port 80 in the internal network. The query sent to port 2001 will send a query to the other device with the address 192.168.1.51.

Example of connecting more than one converter with port forwarding:

Router network settings:
IP : 192.168.1.1
Mask : 255.255.255.0
DHCP : Off
Port 2000 forwarding to the device address (192.168.1.50:80)
Port 2001 forwarding to the device address (192.168.1.51:80)



PX787 network settings:
IP : 192.168.1.50
Mask : 255.255.255.0
Gate : 192.168.1.1
DHCP : Off

PX787 network settings:
IP : 192.168.1.51
Mask : 255.255.255.0
Gate : 192.168.1.1
DHCP : Off

A computer connected to the internet

8 RDM – available parameters

The PX787 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 supported RDM parameters by PX787:

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; Range 1 – 512
IDENTIFY_DEVICE *	0x1000	device identification; Two states are possible: identification disabled (value 0x00) and identification enabled (value 0x01)
DEVICE_MODEL_ DESCRIPTION	0x0080	device description, e.g. name
MANUFACTURER_LABEL	0x0081	manufacturer description, e.g. name

Parameter name	PiD	Description
DEVICE_LABEL *	0x0082	additional device description; It is possible to enter an additional device description using up to 32 ASCII characters
FACTORY_DEFAULTS	0x0090	device default settings
DMX_PERSONALITY	0x00E0	DMX operational mode
DMX_PERSONALITY_ DESCRIPTION	0x00E1	description of individual operational modes
RESET_DEVICE	0x1001	restarting the device
DEVICE_UPTIME	0x8000	time since last power on
SERIAL_NUMBER	0x8010	device serial number
CURRENT_IPV4_ADDRESS	0x8080	current device IP address
CURRENT_IPV4_GATEWAY	0x8081	current gateway address
CURRENT_IPV4_SUBNET	0x8082	current subnet (mask)
ETHERNET_MAC	0x8083	device MAC address
DHCP_ENABLE *	0x8084	DHCP settings; Disabled (value 0x00) and enabled (value 0x01)
STATIC_IPV4_ADDRESS *	0x8085	IP address settings; Text input, e.g. 192.168.1.100
STATIC_IPV4_GATEWAY *	0x8086	gate settings; Text input, e.g. 192.168.1.1
STATIC_IPV4_SUBNET *	0x8087	subnet settings (mask); Text input, e.g. 255.255.255.0

* - editable parameter

9 Indication lights

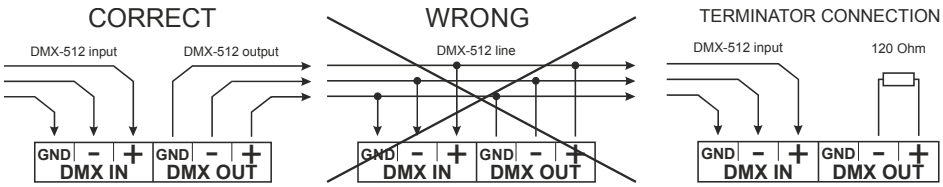
Converter is equipped with 2 indicators signaling:

Indicator	Action	Function
green DALI	flashing / steady on	communication on the DALI line
	is off	the converter does not send any commands on the line
blue DMX	flashes	receiving DMX signal
	is off	no DMX signal

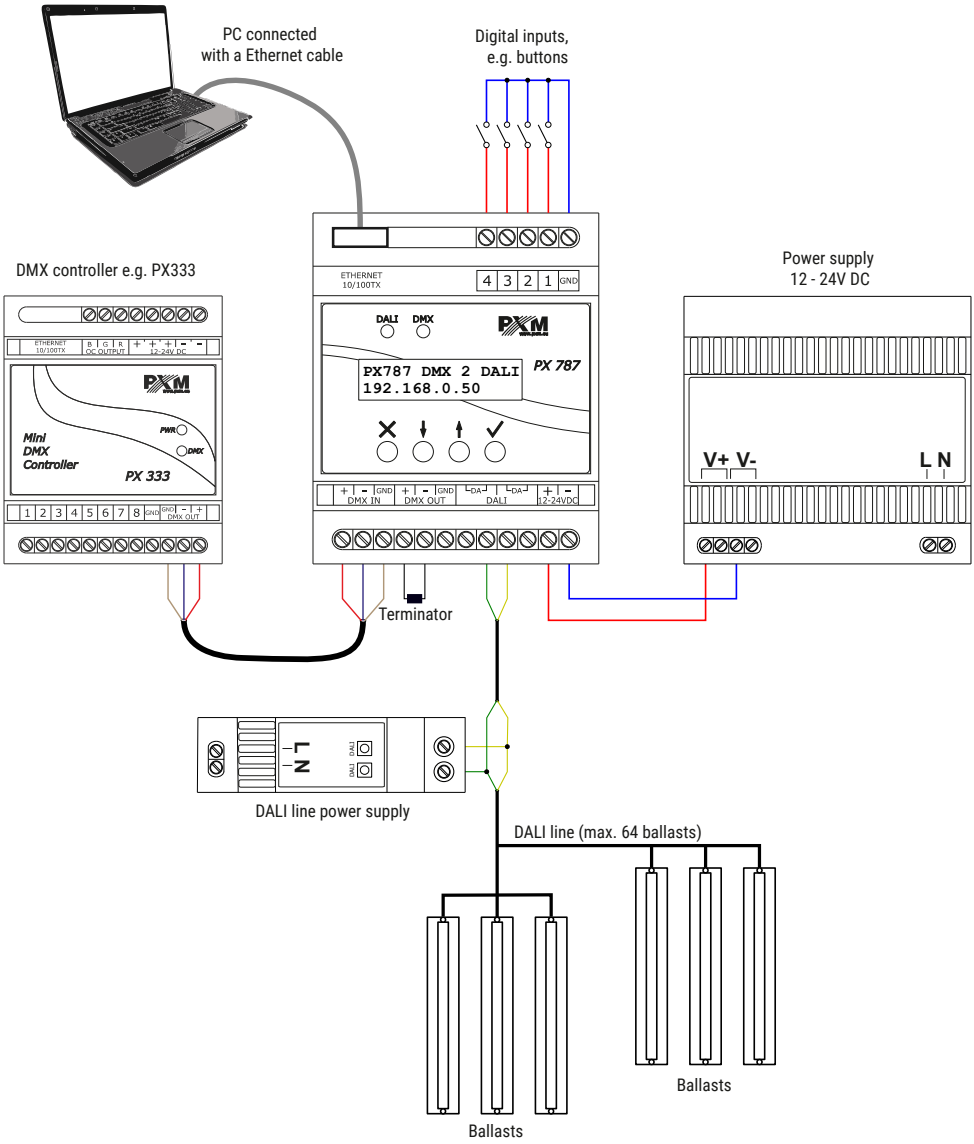
10 DMX signal connecting

PX787 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 PX787 and later, directly from ***DMX OUT*** pins to the next device in DMX chain.

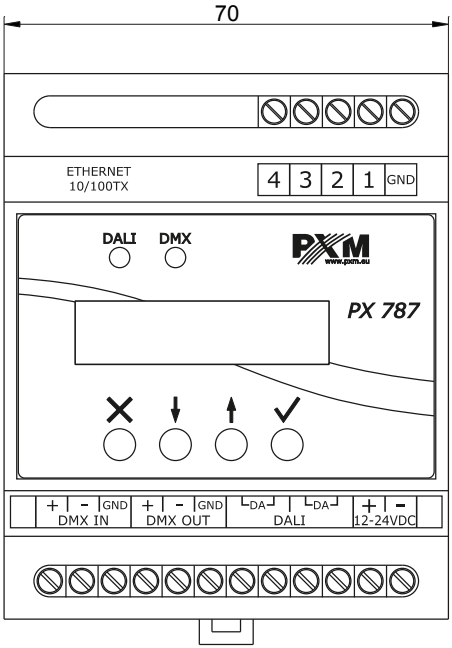
If the PX787 is the last DMX chain receiver there should be terminator (resistor 120 Ohm) mounted between "**+**" and "**-**" pins of ***DMX OUT*** section.

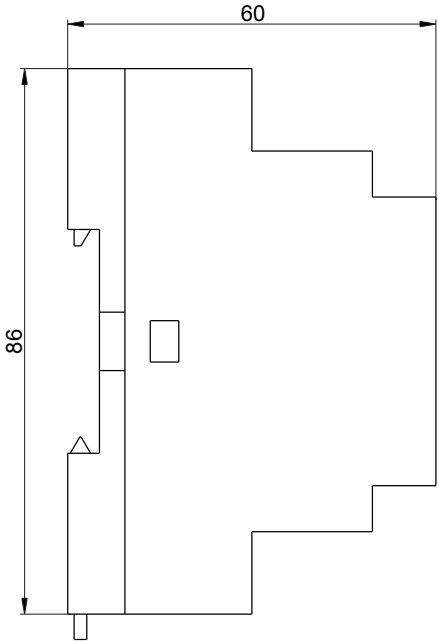


11 Connection scheme



12 Dimensions





13 Technical data

type	PX787
power supply	12 – 24V DC
power consumption	max. 1W
DMX input / output	1 / 1
DALI ports	1
Ethernet ports	1
outputs to digital buttons*	4
DMX channels	512
support for RDM protocol	yes
number of supported DALI devices	64
programming	LCD display 2 x 16 and 4 buttons Web Server
version of the DALI protocol	1.0
weight	0.15kg
dimensions	width: 70mm height: 86mm depth: 60mm

* - available from serial number 21030041

Podłęże, 25.01.2021

DECLARATION OF CONFORMITY

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

we declare that our product:

Product name:	DMX/DALI 1x
Product code:	PX787

meets the requirements of the following standards, as well as harmonised standards:

PN-EN IEC 63000:2019-01	EN IEC 63000:2018
PN-EN 62386-101:2015-06	EN 62386-101:2014
PN-EN 62386-102:2015-06	EN 62386-102:2014
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.

PXM
Marek Żupnik spółka komandytowa
32-003 Podłęże, Podłęże 654
NIP 677-002-54-53



mgr inż. Marek Żupnik.