

PPC4
user manual

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Introduction

Capabilities

Welcome to the manual of the PPC4 pixel controller by ProPixeler. This manual is designed to provide you with an overview of the PPC4's features and functionalities. The PPC4 is a versatile and powerful tool for any pixel-based project. It uses the DDP protocol for pixel data and has a maximum capacity of 12000 channels or 4000 pixels. The controller has 4 pixel output ports, each capable of controlling up to 1000 pixels and supports the ws2811 protocol. The manual will guide you through the installation process and provide you with step-by-step instructions on how to use and configure the PPC4.

summary:

- 1 input port
- DDP protocol
- 2666 or 4000 pixels (depending on operating mode)
- 4 output ports
- 1000 pixels limit per output port

Hardware setup

Connecting power

The power connector provides power to the controller itself and to the pixel output ports. Therefore it is important to match the voltage with the voltage rating of the pixels. So If you use 12Volt pixels also power your controller with 12V. If you use 5Volt pixels power your controller with 5Volt. The controller can handle any voltage between 5 and 12 Volt.



Make sure that the voltage supplied to the controller is the same as the voltage that the pixels need.

The controller has a reverse voltage protection. If you make a mistake and switch + and - on the input a red led will turn on and the controller will not work. Be aware that the pixel outputs are not protected by this.

Network

The PPC4 is intended to work in a network where it receives pixeldata using the DDP protocol. Connect a network cable from a switch or router in your network to the ethernet connector on the PPC4 controller. The default setting of the PPC4 is that it will request an IP using DHCP. You can find out the IP either using the interface of your router or switch, using the PPC configurator or xLights.

Fixed IP or DHCP

With the ppc-configurator it is possible to switch of DHCP and assign a fixed IP address to the PPC4. This will also allow for controlling up to 4000 pixels. With DHCP enabled the PPC4 can handle a maximum of about 2666 pixels in total.

You can disable DHCP by clearing the checkbox and filling in the IP adress and network mask. Press upload configuration and the settings are saved to the controller. After a reboot it will use the new network settings. So make sure you fill in the correct IP adress.

IF DHCP is enabled but there is no DHCP server present the PPC4 will use the ip address 192.168.1.25. Once you have disabled DHCP one time and set the fixed IP adress manually, the PPC4 will use that ip address in case it cannot find a DHCP server once DHCP is enabled again.

Connecting pixels

The PPC4 has 4 output connectors for connecting pixels. The connectors are marked with with V, D and G.

- **V** - Voltage (+12V or +5V depending on what power supply is used for powering the controller)
- **D** - The data line of the pixels.



- **G** - The ground connection of the pixels.

The voltage is protected with a 5 ampere fuse. If more than 5Ampere is flowing through the V connector the fuse will blow and you will need to replace the fuse. The fuseholder accepts either the normal sized blade fuse or the micro size blade fuse.

Configuration

In order to be able to use the controller you need to configure the network settings and the outputs. This is done with the PPC-configurator. This tool can be downloaded from the following location

To start configuring the controller. Connect the controller to the network and provide it with power. Next start the PPC-configurator application. You will see the following screen:

', 'IP address: ---', and 'Netmask: 255.255.255.0'. At the bottom, there is a table with two columns: 'startpixelnumber' and 'amount of pixels', and four rows labeled 'Port 1' through 'Port 4'. A small logo is visible in the bottom right corner of the window." data-bbox="88 229 910 547"/>

To search for controllers on the network, click on the 'Start scan' button. This should detect all PPC controllers. If you can't find any controller, make sure to check your firewall settings. Both incoming and outgoing DDP data use port 4048 for the UDP protocol.

Once the controller is detected, it will show up in a list on the left side of the window. If it has not been configured yet, it will show up as 'NoName.' By clicking on the name of the controller, you can see its current configuration and other information on the right-hand side of the window.

The name of the controller and the output configuration can be modified on this right-hand side part of the window. You can modify the name in the Name box on the right-hand side of the screen. Once you've made your changes, press the 'Update controller' button to send the new configuration to the controller.

Fixed IP or DHCP

The PPC4 can also be set in fixed ip mode. This will allow for a lot more pixels to be controlled. You can disable DHCP by clearing the checkbox and filling in the IP address and network mask. Press upload configuration and the settings are saved to the controller. After a reboot it will use the new network settings. So make sure you fill in the correct IP address.



At the moment there is no default IP address configured so for the very first setup connect the PPC4 to a network with DHCP. Once you set it to a fixed IP you can use a network without DHCP.

Connect with xLights

Unfortunately it is not possible yet to update the configuration of the PPC4 using xLights. Yes we are working on it. :) This does not mean you cannot use xLights at all. This chapter describes how to connect the PPC4 with xLights.

Discover and initial setup

- Connect the PPC4 and your computer with xLights to the same network.
- Start xLights and press the discover button on the controllers tab in xLights.
- Now the PPC4 controller should appear in the controller list.

In order for xlights to correctly work with the PPC some settings need to be set as follows:

- Select "ProPixeler" as vendor and "PPC4" as model.
- Protocol has to be "DDP"
- Make sure the "Keep channel Numbers" checkbox is empty.



Currently xLights does not know ProPixeler as a vendor yet. So either install the ProPixeler controller file in the controllers folder or use the RGB NDB 4 model from Minleon.

Assign props to ports

If everything is setup according to the previous chapter, the visualise button should have become available.

Now you can assign props to the PPC4 controller.

First add some props to the layout. When that is done save the configuration and start the ppc-configurator.

Configure outputs

The output configuration of the PPC4 pixel controller is pixel-based. This means you need to enter the starting number of the pixel and the number of pixels for each output. To illustrate, if you have a star of 50 pixels on output one, you will enter 1 as the starting pixel and 50 as the number of pixels. The next output will start with 51 and so on.

To apply your configuration, fill in all eight fields and click on the 'Update controller' button. The controller will be updated with the new configuration. In some cases, the controller may require a reboot. In such a situation, click on the 'Reboot controller' button, and the controller will restart



with the new configuration.

Whenever you upload a new configuration, it is stored in the permanent memory of the controller. This means that it will survive a power cycle, ensuring that your settings remain intact even after a power outage.

Power-on test and status

With firmware 2.2.0 and above, a power-on selftest and a status indicator is introduced. The first three pixels of each output are used for this.

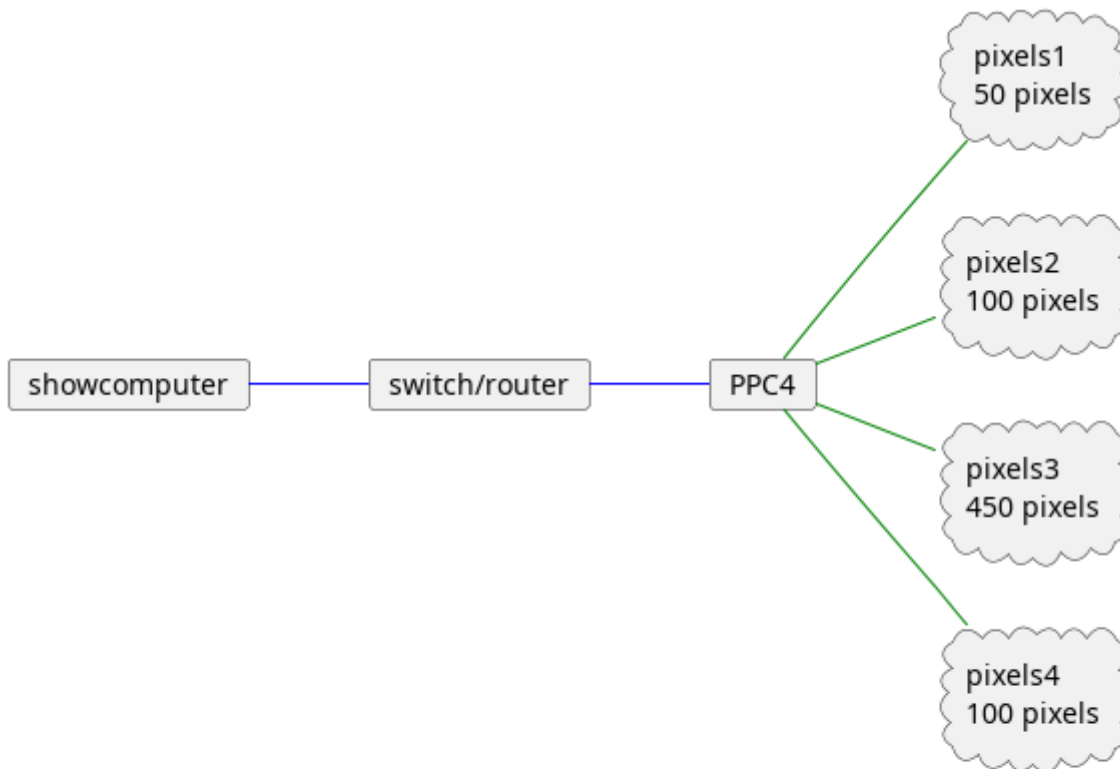
The first three pixels get a color as indicated in the tables below. There colors are slightly different depending on the pixels being used. Below are two tables to show the differences when using either RGB or GRB pixels. The pixels 2 and 3 are the 1st and third color. So in the table for RGB pixels these pixels will color Red and Blue. For GRB pixels these will color Green and Blue. The first pixel is the status pixel.

Status (RGB pixels)	Pixel 1	Pixel 2	pixel 3
Startup	Blue	Red	Blue
Waiting for dhcp	Orange	Red	Blue
ip retrieved from dhcp	Yellow	Red	Blue
fixed ip	Cyan	Red	Blue
end	off	off	off

Status (GRB pixels)	Pixel 1	Pixel 2	pixel 3
Startup	Blue	Green	Blue
Waiting for dhcp	Orange	Green	Blue
ip retrieved from dhcp	Yellow	Green	Blue
fixed ip	Purple	Green	Blue
end	off	off	off

After 10 seconds or if data is received, the pixels will turn off.

Example setup



Line color	Type
	ethernet (local network)
	pixeldata

See the picture above. In this picture you see a showcomputer. This can be your laptop/pc with xLights or a Raspberry pi running FPP. The output configuration for this controller will be as followed:

	start pixel	number of pixels
Out 1	1	50
Out 2	51	100
Out 3	151	450
Out 4	601	100



Firmware update

Because the PPC4 is still in development and more and more features and performance improvements will be added in the (near) future, we added a mechanism to update the firmware of the PPC4.

Update using SD-card

To perform the update follow the following steps:

- Download the latest firmware from...
- Put the *.fwi file on an sd card. Make sure there is only one fwi file on it.
- Put the sd card in the sd card slot of the controller
- Press the 'PRG' button on the controller and turn the controller on.
- wait 30 seconds
- reboot the controller (power cycle) Now the controller should have the new firmware.

You can check this by looking in the PPC configurator tool. In the information screen the firmware version is shown.