# ProtoPixel Mapping Tool
## User Manual

ProtoPixel

protopixel.io

# Contents



ProtoPixel Mapping Tool is designed to create functional and emotional moods for your spaces. A tool gives you all the power of high-level lighting software with all the benefits of a short learning curve.

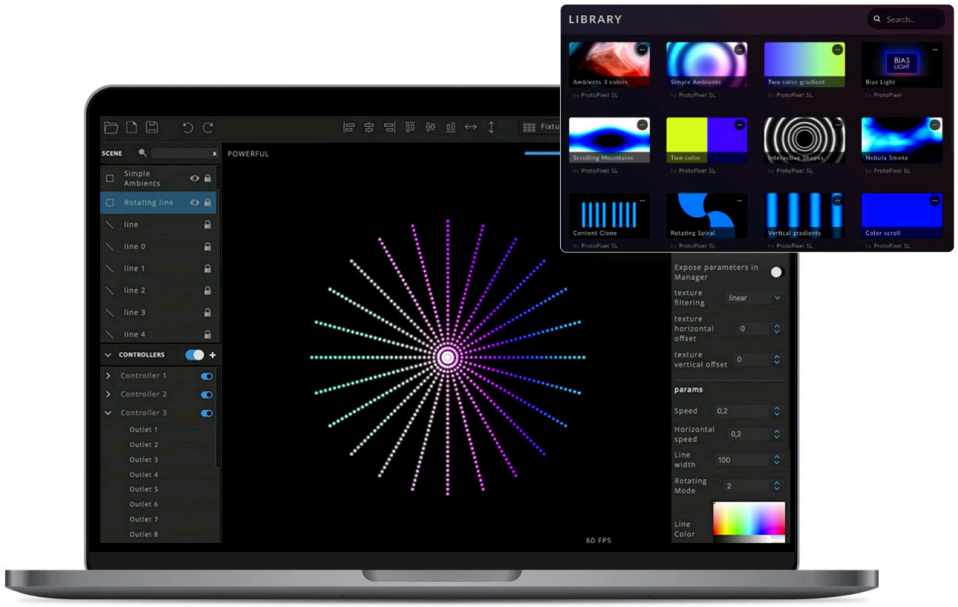
# 01 Overview

# 01

# Mapping Tool Overview

## About

Design functional and emotional moods for your spaces. The ProtoPixel Mapping Tool gives you all the power of high-level lighting software with all the benefits of a short learning curve.




## Features

— Offsite & Onsite mode (any device is needed to start a project)
— Content Library ready to be used
— Compatible with ProtoPixel Controllers as well as Art-Net.
— Lighting Content Preview
— Offline Backup

# 01

# Concepts

## How the ProtoPixel Mapping Tool Works

The ProtoPixel Mapping Tool is a pixel mapping software that helps you map visual content to physical lights in the real world. To do so, you will have to match places in your content to individual lights in the real world. Fortunately, this is very easy with the ProtoPixel Mapping Tool. Some key concepts are needed to understand and use the ProtoPixel Mapping Tool:

### Light

In the ProtoPixel Mapping Tool we use Light to refer to a single controllable point of light, which can only have one color. A Light will typically be an addressable LED. We represent it as a point in space with a given color.

### Content

Anything that produces color that can be mapped into lights is Content. Videos, images, and interactive animations are examples of Content.

### Controller and Outlet

A Controller represents how the physical Fixtures are connected in a particular ProtoPixel Controller. Controllers have several Outlets representing the physical connections where Fixtures can be plugged. A Controller has to be paired to a Device to work in the real world.

### Devices

Devices are how real-world ProtoPixel Controllers are represented in the software. Typically you would set up a Controller, fill in its Outlets, and then pair it to the physical Device. How fixtures are connected to the outlets of the Controller must

### Project

All these elements are placed together in a Project. A Project can be saved in a file for later use.

# 01

# System Requirements

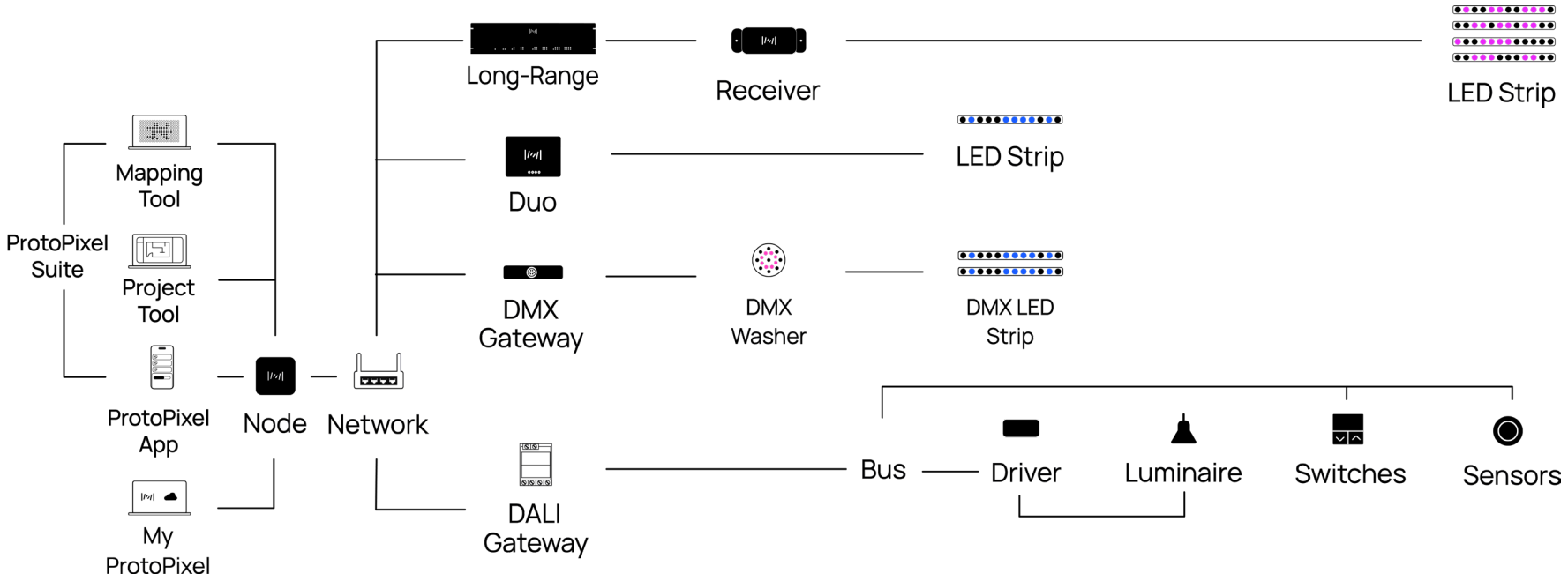
### System Requirements

—A computer with 4GB of RAM or more
—A ProtoPixel Node and/or a ProtoPixel Duo

### Operating Systems

—macOS High Sierra 10.13 or later
—Windows 8 or later

### System Architecture



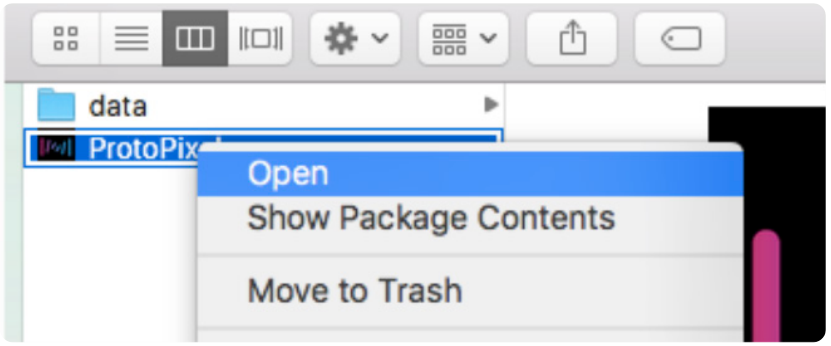
# 01

# Install the ProtoPixel Mapping Tool

**To install the ProtoPixel Mapping Tool, please follow the steps below:**

—Start by downloading the ProtoPixel Mapping Tool from MyProtoPixel. This will ensure you have the latest version of the tool.
— If you are using a MacOS, locate the downloaded dmg file and dou ble-click on it to unzip it. Once unzipped, open the dmg file and drag the ProtoPixel App into the Applications folder.
— For Windows users, simply double-click on the Installer file and follow the on-screen instructions to complete the installation process.
—After the installation is complete, find the ProtoPixel Mapping Tool icon on your MacOS desktop. Double-click on the icon to launch the applica tion.
—On the first launch, you will be prompted to click on “Open” to start using the ProtoPixel Mapping Tool.

Please note that the above instructions are specific to MacOS and Windows op- erating systems. If you encounter any issues during the installation or launching process, refer to the official ProtoPixel documentation or seek assistance from their support team.




**Important: The Mapping Tool must be opened by right-clicking on the application and choosing the Open option. Do not “double click” on the application.**

# 01

# ProtoPixel Mapping Tool Licenses

**To install the ProtoPixel Mapping Tool, please follow the steps below:**

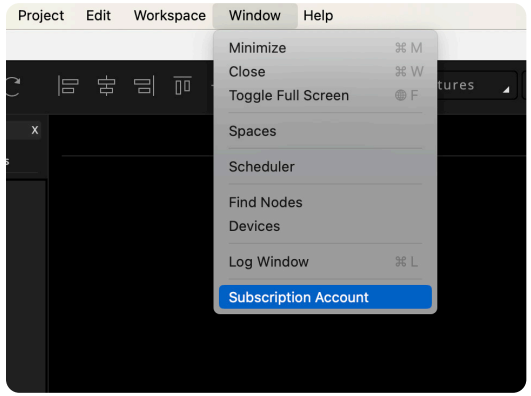
—Access this website, also accesible by going to “Window > Subscription Account”.

—Enter the email address to which the license will be assigned and create a password for it.

— Click on the “Purchase now” button and follow the steps to complete the purchase.

Once you have purchased the license online, you need to add it to your computer. Ensure that you do not close the ProtoPixel Mapping Tool during this process.

To add your **license** to your computer, navigate to Window > Subscription Account.



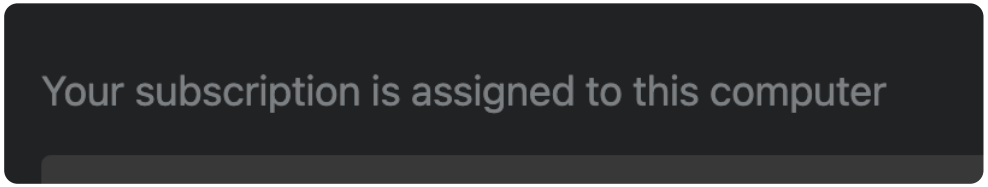

## Activation Token

If you have an Activation Token, you need to your navigation bar and go to “Help > Subscription” Next, add your email and the provided Token. Afterwards, click on “Activate”.

**A license is tied to a single computer. Make sure you follow all these steps on the same computer you will be using the ProtoPixel Mapping Tool.**

A web browser will open where you may be prompted to enter your email address. Please ensure that the email address you provide is the same one used to purchase your license. To assign the license to this computer, click on the “Assign subscription to this Computer” option on the website.


After clicking on the “Assign subscription to this Computer” button, a message will appear stating that “Your subscription is assigned to this computer”. Now you can close and reopen the Mapping Tool to see the license reflected in the software.

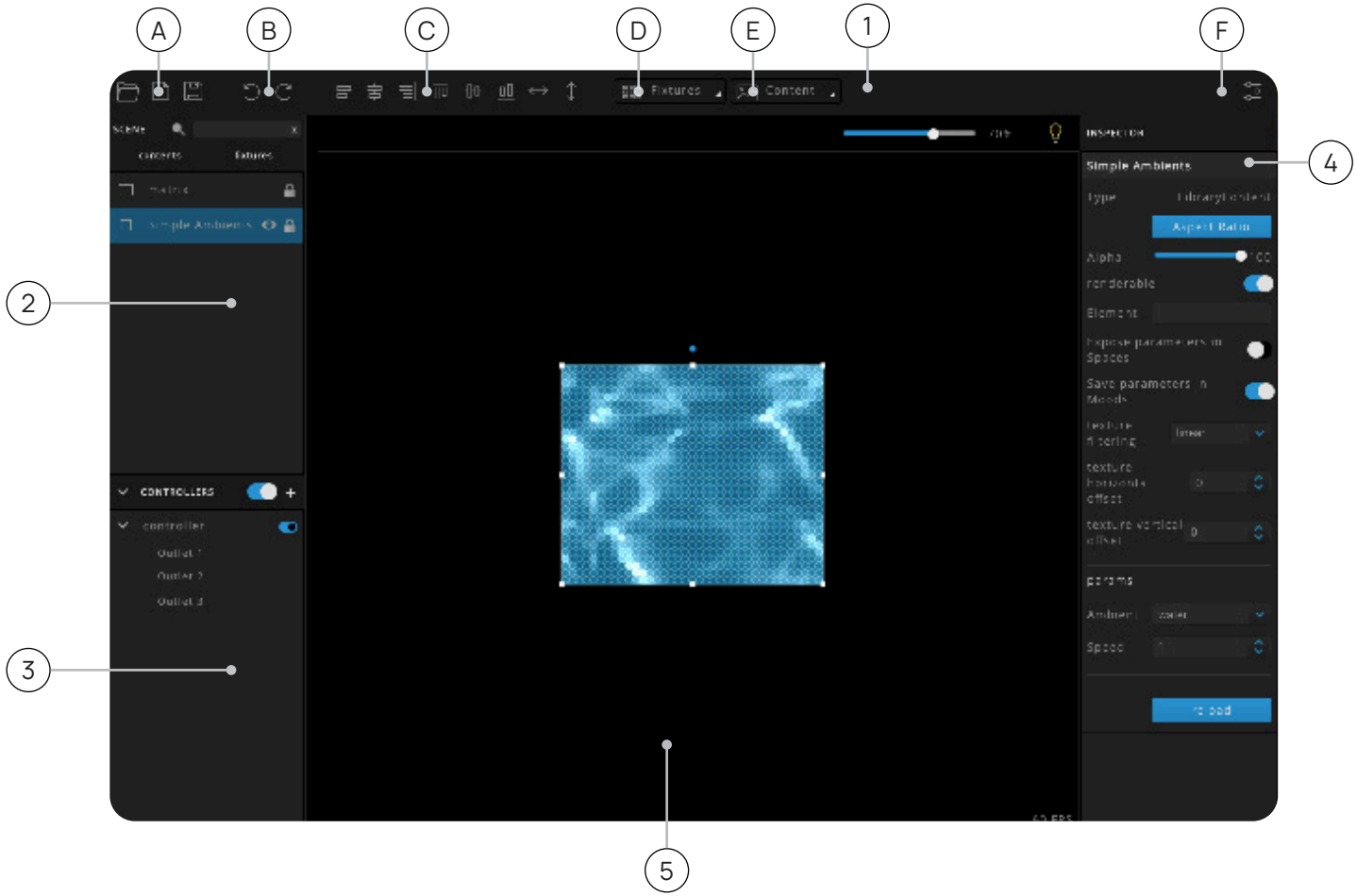


# 01

# ProtoPixel Mapping Tool Interface

The ProtoPixel Mapping Tool user interface is composed by several panels, showing the important information about your project.

1 Toolbar
2 Scene Panel
3 Controllers Panel
4 Inspector Panel
5 Workspace



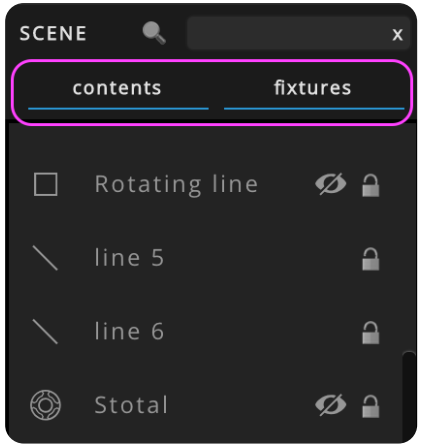

## Toolbar

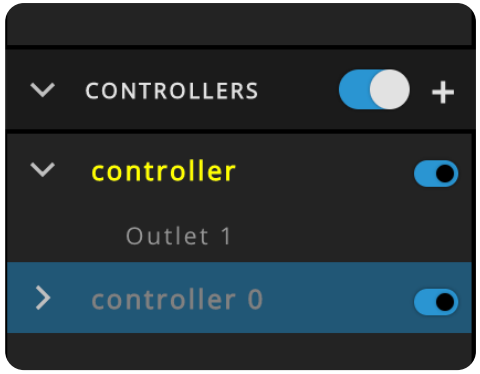
The toolbar has many tools for fast access, these are:

A Project operations: Open, Open Recent, New, Save
B Undo, Redo.
C Alignment Operations: Align Left, Horizontal Center, Right, Top, Vertical Center, Bottom, Spread Horizontally, Spread Vertically.
D New Fixture Menu.
E New Content Menu.
F Global Properties.

# 01

# ProtoPixel Mapping Tool Interface




## Scene Panel

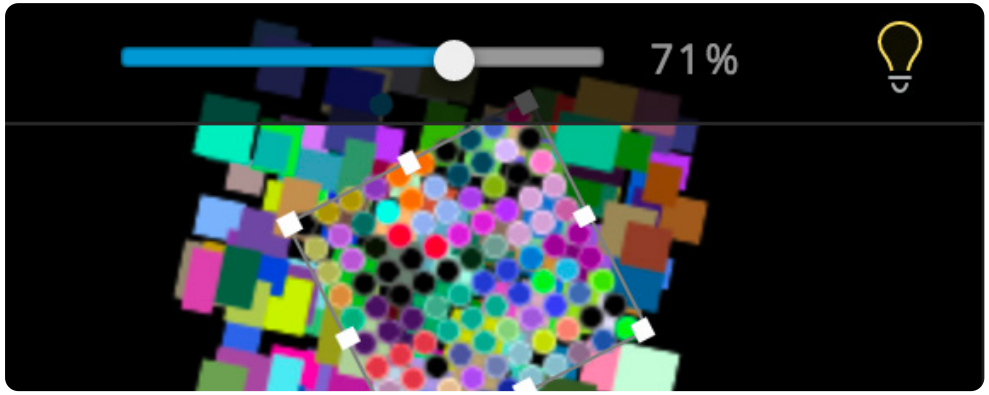
The Scene Panel lists all Entities (Contents and Fixtures) in your Workspace. With it you can:
- Select an Entity (Click).
- Reorder an Entity (Drag & Drop).
- Center your Workspace on an Entity (Double-Click).
- Select multiple Entities (cmd + Click).
- Select a range of Entities (shift + Click).
- Make an Entity non-interactive (Click on the Entity's Lock icon).
- Hide a Content from your Workspace (Click on the Content's Eye icon).
- Filter Entities by Name (type on the top Search Box).

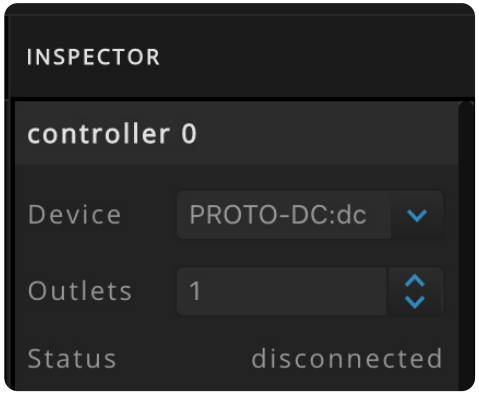
## Controllers Panel

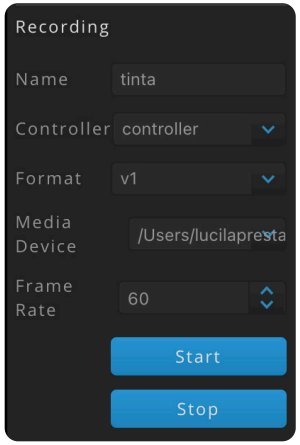
The Controllers Panel lists all Controllers and Outlets in your project. A Controller is just a group of Outlets. You can later bind a Controller to a real Device (see Creating and Configuring a Controller). In the Controllers Panel, you can:
- Add a new empty Controller (Click the + on the Panel title).
- Select a Controller or Outlets (Click it).
- Hide the Outlets of a Controller (Click its V).
- Deactivate a Controller to stop it from sending data (Click its switch).
- Deactivate all Controllers (Click the switch on the Panel title).
- Hide the Controller Panel (Click the v on the Panel title).

# 01

# ProtoPixel Mapping Tool Interface




## Workspace

In the Workspace, you can move and transform Fixtures and Contents by dragging them and using its handlers. Moving two fingers on your trackpad will move the workspace. You can zoom in or out of the Workspace with a pinch gesture or by pressing Cmd + scrolling up or down. The slider on the top right lets you manually control the zoom level and the bulb icon activates and deactivates the *Preview Mode*. In *Preview Mode* all contents are hidden and the lights are rendered in a more realistic way. You will find an FPS indicator in the bottom right corner of the Workspace.

## Inspector

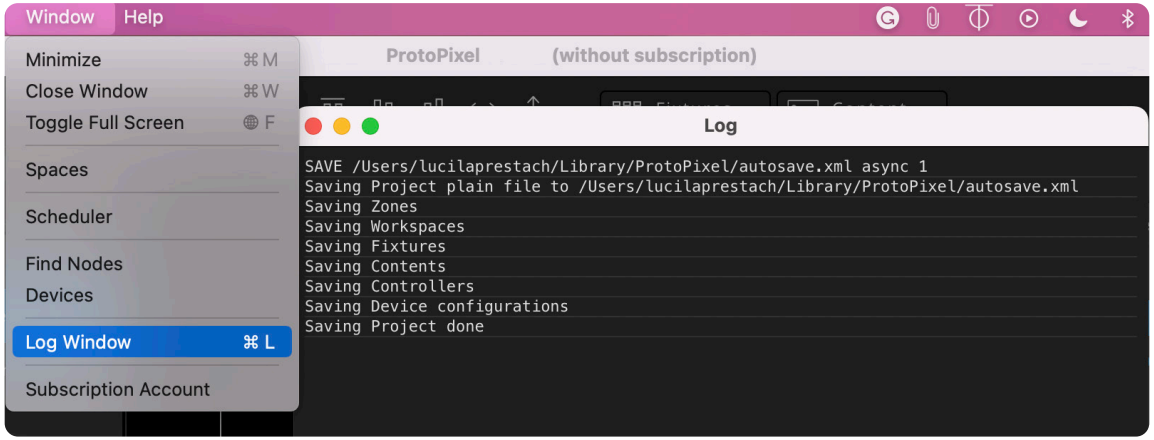
This panel will show all the properties of the selected item. Some of those properties can be changed. The name of the selected item can also be changed just by editing it and pressing Enter. You can also cancel the edit by pressing Esc.

## Recording Input

ProtoPixel Mapping Tool allows the recording of output for two different situations: For a single autonomous controller and for multiple standard ProtoPixel Controllers. These recordings are only useful if you have a ProtoPixel autonomous Controller or a ProtoPixel Player.

# 01

# ProtoPixel Mapping Tool Interface




## The Log Window

The Log Window shows messages from the ProtoPixel Mapping Tool Core. It is useful to debug scripting content. To show the log window go to **Window › Log Window** or press Cmd+L. Also, you can access the menu bar by selecting **Window › Log Window**

# 02 Operational Guide

# 02

# Workspace

### Navigating the Workspace

As you may have noticed, items are created in the center of the Workspace. To navigate through it, you can right-click and drag, use the trackpad, or use the mouse wheel.

To zoom in and out, you can use the pinch gesture or hold the Ctrl key while scrolling vertically.

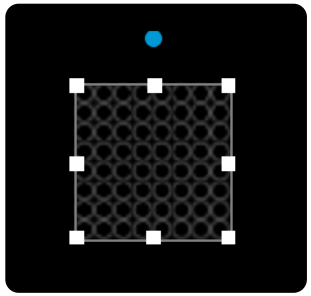
# Elements

### Selecting Workspace Elements

You can select various Workspace Elements (such as Fixtures and Contents) to operate on them simultaneously. To initiate multiple selections, hold **cmd** and click on the elements you want to select, either on the Workspace or the Scene Panel. You can also use square-select by clicking and dragging the pointer across the

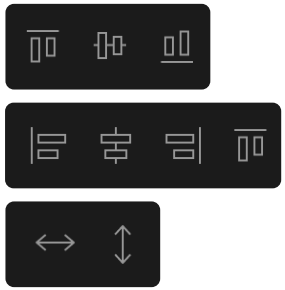
### Configuring and Manipulating an Element

When you click on an element in the workspace, a Gizmo will appear, enabling you to transform it. To move an element, simply drag it using the pointer. To rotate it, drag the rotating handle (blue) (press shift to rotate in 15° steps). To scale it, drag one of the edges of the bounding box. To restore the aspect ratio, use the “Aspect Ratio” button in the Inspector Panel.
You can also select multiple elements to apply these operations collectively. When an element is selected, its properties are displayed in the Inspector Panel.



# 02

# Elements



## Aligning and Distributing Elements

To align the selected elements, you can use one of the Alignment and Distribution tools available in the menu. The alignment tools include vertical and horizontal alignment to the center and edges. The distribution tools work in both vertical and horizontal directions. Alignment is always performed using a selected group of elements as a reference.

## Copying and duplicating Elements

You can copy and paste Elements using cmd+C and cmd+V key combinations, or using the menu (Edit > Copy and Edit > Paste). You can select any number of items to be copied. Pasted items will maintain the properties of the original, with a position offset. Pasted elements get automatically selected.

You can perform a quick copy-paste action by duplicating the items: cmd+D or Edit > Duplicate. performed using a selected group of elements as a reference.

# 02

# Fixtures

## Creating a Fixture

To create a new Fixture, click on the Fixture tool in the toolbar. This will display the different Fixture alternatives available for creation. Select the desired fixture type to create it. The new Fixture will appear selected in the Workspace. Alternatively, you can go to Workspace > New Fixture... > Fixture Type.

## White Functions

There are several ways to extract the white component from an RGB color:

Mix: This method extracts the white component from the color and uses it as the white level. Pure white colors will not use the RGB components. Avoid using this function in a fixture without a white component, as it may result in incorrect colors.

Average: In this method, the white component is calculated as the average of the RGB components. This will yield slightly whiter colors.

## Configuring Fixture Properties

In the inspector panel, you can adjust various properties that will affect how the fixture interprets colors in ProtoPixel. The first set of properties you will encounter are the ones that determine the size, shape, and connection of the fixture. These properties will differ depending on the specific fixture. Following that, you will find a series of parameters (table).

## Color Modes

Here you select how the fixture should use the color from the content:

Original: The original RGB color is used.

Monochromatic: The intensity of the color is used to modulate the Base color.

Color: This will ignore the original RGB color altogether and use the Base Color directly.

## Parameters Table

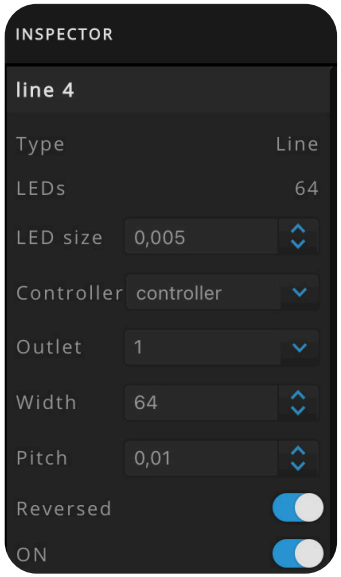
| Parameter | Function |
|---|---|
| ON | Switch on and off output for this fixture |
| Level | Intensity of the light of the fixture |
| ProtoPixel Gamma Correction | Apply the gamma correction to the color |
| ProtoPixel Temporal Dithering | Try to get fine grade colors by adding some noise |
| ProtoPixel Double Points | Every pixel of the fixture should be sent twice |
| Force Channel | Select the adress for DMX luminaries |
| Fixture Type | List of preset byte orders. This will depend on the fixture hardware |
| Custom Ordening | Define the ordering manually according to the fixture |
| White Function | Select average or mix |
| Color Mode | Select original, monochromatic, or color. |
| Base Color | Color used as a base, depending on the Color |
| Base Color Transition Time | Set up the transition time of the colors on dynamic contents |
| Transition Delay | Set up delay transition |
| Element / Zone | Name the fixture or group of fixtures |

# 02

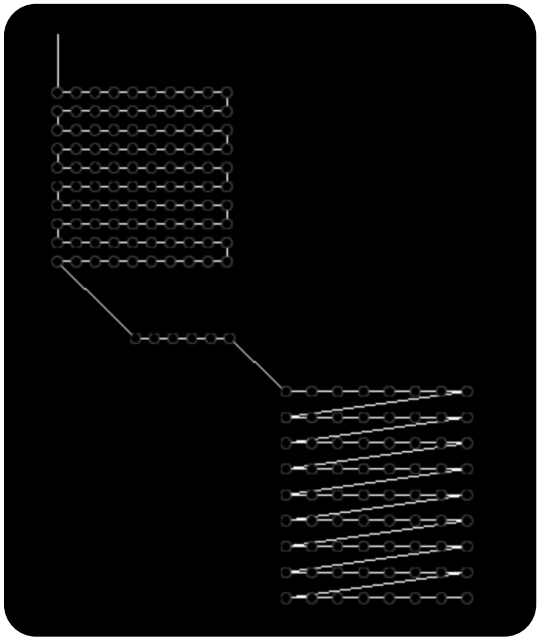
# Controllers

## Configuring Fixture Properties

To establish communication with real-world fixtures and send them lighting information, we need to establish a connection with the physical ProtoPixel Controller and specify how the fixtures are connected to the device. To add a controller, navigate to the Controllers Panel tab and click on the add icon. A new controller will be created with a default number of outlets. You can modify the number of outlets in the Inspector.
There are two remaining actions:
- Adding fixtures to the outlets.
- Connecting the controller to a device.
average of the RGB components. This will yield slightly whiter colors.




Inspector Window:
Line Section



Outlet lines and order

## Adding Fixtures to Outlets

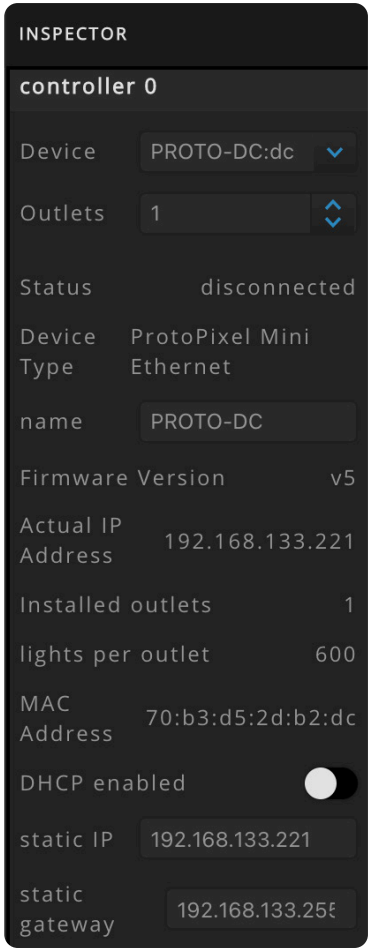
ProtoPixel Controllers do not have any information about how fixtures are connected to them. Therefore, we need to describe this information in the software. This allows the software to send the color information to the Controller in the correct order. To begin, we need to add the Fixture to the appropriate Outlet. To do this, first, select the Fixture. This will display its properties in the Inspector. Then, use the list to change the assigned controller and outlet. If multiple fixtures are added to the same outlet, it is necessary to define the correct order in which they are connected to match the physical setup. To do this, select the *Outlet* in the Controller Panel and use the inspector to drag and rearrange the fixtures. As you select the outlet, a preview of its wiring will appear on the workspace. The starting point of the outlet is represented by a vertical line.

# 02

# Controllers

## Connecting a Controller to a Device

Now that we have added Fixtures to Outlets, we need to connect your Controller to an actual Device. ProtoPixel Controllers are automatically detected when they are connected to the same network as your computer. To pair a controller with one of the detected devices, select the Controller (this will display its properties) and choose the device from the list. This will also display the Device's properties in the Inspector.




Inspector Window: Devices

## Best Practices

👉 If the Controller cannot connect to the device, its name will appear in red in the Controller Panel until it reconnects again. You might be interested in the DUO Controller documentation.

👉 This typically occurs when the device is on a different subnetwork. Make sure that all controllers are on the same subnetwork as the computer running ProtoPixel Mapping Tool, and that the network mask allows for connectivity.

👉 Some Controllers may be inaccessible depending on their connection. While ProtoPixel Mapping Tool may be able to detect them, it may not be able to establish a connection or send data to them. In such cases, a warning with relevant information will be displayed next to their current IP property.

👉 You can modify certain parameters of the device in the inspector, depending on its capabilities. Refer to the table in the "Configuring the controller" section for more details.

👉 Depending on the type of LEDs being used, you may need to adjust their RGB order to accurately represent colors in the real world. To do this, select all affected fixtures and modify their "PPx RGB ordering" property.

# 02

# Content

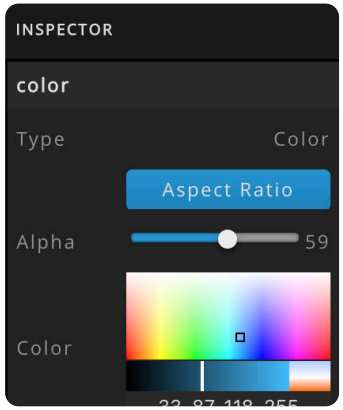
## Adding Content

Now that we have Fixtures in the Workspace and have mapped them to real-world Fixtures, we can begin mapping content into them. To create content in the workspace, we can either press the Content menu in the Toolbar or use the Workspace › New Content… › Menu. We then select the desired type of content. Some content types require a file to function (such as images, videos, and scripts). These contents can be created by simply dragging the file directly into the workspace. As an example, we could create a Test content to verify if everything is set up correctly. This content consists of four squares of different colors rotating.

The ProtoPixel Mapping Tool includes several bundled types of content:

1 Color
2 Image
Video
4 Script
5 Syphon
6 Test

**All types of content have an Alpha parameter that can be adjusted to change their transparency. Also, some contents can be configured to determine their alignment.

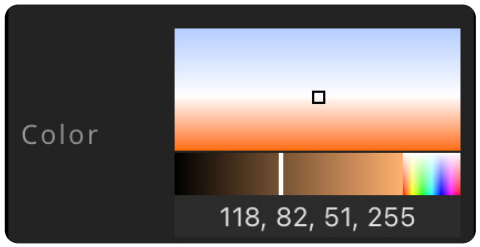



Inspector Window: Color

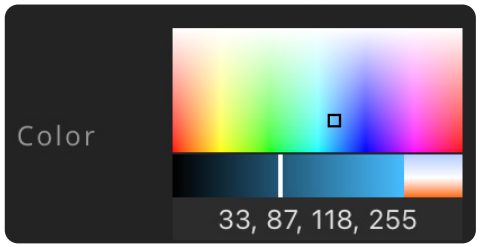
| Parameter | Meaning |
|---|---|
| Texture Filtering | Define if the pixels should blur between them |
| Texture Horizontal | Offset move the content texture horizontally |
| Texture Vertical | Offset move the content texture vertically |

## Content Types: Color

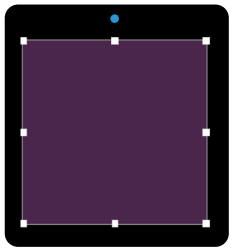
This content defines a solid color. Adjust the color and temperature using the palette.




Tunable White




Full Spectrum



Color Content

# 02

# Content

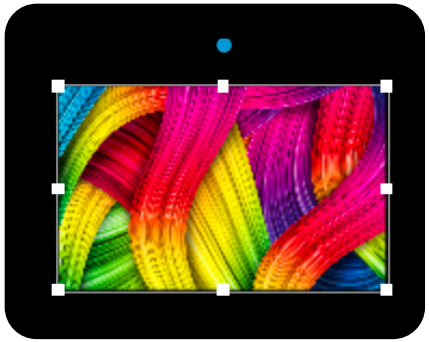
## Image

This content imports an image. It supports the following formats:

.tiff

.jpg

.png



## Video

Plays a video and maps it with the lights. The Inspector provides controls to play and stop the video. You can also adjust the volume and enable video looping.
Although the ProtoPixel Mapping Tool is capable of playing many video formats, we recommend using the following specifications:

- Container: mp4 (MPEG-4)
- Resolution: 1280x720 or lower
- Codec: H.264

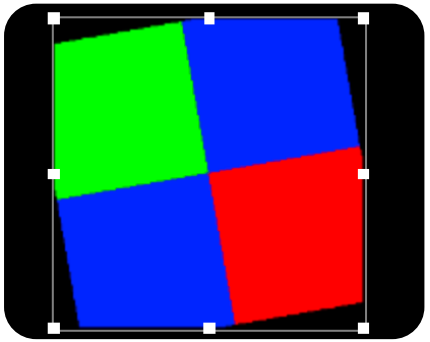
You might find the Video Codec Specifications for Node article interesting.

More info on Video Codecs here.

## Test

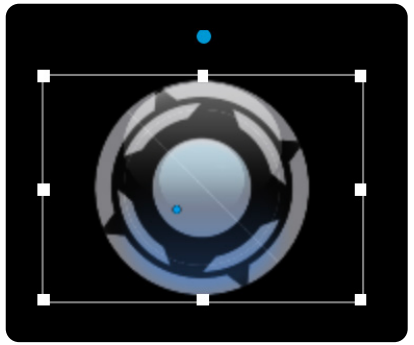
This content provides a quick way to test content on fixtures. It consists of an endless video featuring rotating RGB squares of different colors.

You might be interested in Content from Library



## Syphon

You can create interactive content with software like Resolume, Modul8, Millumin, or even audiovisual interactive tools like Processing. By using Syphon technology, you can import image content directly into ProtoPixel. To do this in the ProtoPixel Mapping Tool, activate the Syphon output in the software you want to use. Next, add a Content › Syphon and select the desired application from the Source drop-down menu in the Inspector panel. The content will appear in the view and can be mapped like any other content.



# 02

# Content

## Script

The ProtoPixel Mapping Tool offers scripting capabilities for creating interactive content. It is based on the Python programming language and incorporates bindings to open Frameworks, a popular creative coding library. To familiarize yourself with ProtoPixel Scripts, you can refer to the provided examples. We recommend using a Python-aware editor, such as pyCharm or Sublime Text with Python addons, to edit the scripts externally. When saved, the programs will automatically reload in ProtoPixel.

For advanced graphics generation in scripts, you can also use the pyOpenGL bindings after installing them separately.
To use a Script Content, create a python file and import it into the ProtoPixel Mapping Tool. Any errors in scripted programs will be displayed in the Log Window.
During execution, you can add various input elements to the properties of your script. The Mapping Tool will check for new inputs each time you click on the script content.

## Content Library

With the Mapping Tool, you have access to various default content options that you can customize to unleash your imagination and create incredible new content. Library contents in the Mapping Tool.

## Shaders

- Make sure that you have installed a text editor on your machine.
- These instructions only work for the Mapping Tool (formerly known as Create) 3.0 or higher versions.

## Steps for importing shaders into the ProtoPixel Mapping Tool

**1. Go to the file package** that you have downloaded, which contains the MappingTool.dmg file.

a. Open the 'examples' folder.
b. Open the 'scripting' folder.
c. Drag and drop the shader.py. Python file onto the Mapping Tool workspace canvas.

**2. Select the shader** you want to import.
a. Go to your browser and search for the desired shader in a repository, such as shadertoy
b. Identify the suitable shader for your project.
c. Copy the code of the shader.
d. Paste the code into a text code editor.
e. Save the file on your machine.

**3. Import your shader** into the Mapping Tool:

a. In the Mapping Tool, select the shader object (represented as a transparent square).
b. From the inspector panel, select the shader path where you have stored the code.

Please ensure that your chosen shader does not have any external dependencies (check the information available in the 'iChannel'). If it does, it might not work in the Mapping Tool because those external sources would not be embedded.

# 02

# Export Projects

## How to Export

Once the project is correctly mapped in the ProtoPixel Mapping Tool, from the menu bar select the option **Project > Export** select a location, and name it. The file will be saved with the extension **.ppxexp.**
There are two kinds of projects:

1. The **bare project** is a file with a .ppxproj extension. It is created when you **save** a project. It only contains the essential parts for it to run on your computer.
- The **bundled** project is a file that also has a **.ppxexp** extension. It is created when you **export** a project. It contains a bundle of all assets needed to run your project on any computer (videos, scripts, ...). this is the necessary extension to upload a project to the Node.

To export your project go to Project > Export, or use cmd+E.

# 02

# Recordings and Duo Controller

## Create a Recording

In order to use the Duo in standalone mode you will first need to make content for the Duo to playback. This is done using the ProtoPixel Mapping Tool software which will allow you to make recordings that can be uploaded to the Duo.

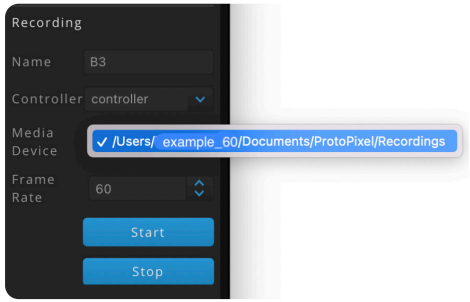
## Step 1: Lighting Fixtures

First define the fixtures in the Mapping Tool that you to control using the Duo. Make sure that you have a controller with 1 or 2 outputs configured and that these are assigned to the corresponding fixtures that you intend to make the recording for. The recording will capture the all of the information generated when you run the content in the Mapping Tool and "hit record", this includes which output the fixtures are connected to.

## Step 2: Lighting Content

You can now start designing and laying out the content in the Mapping Tool that you wish to capture with the recording process.

👉 If you think that you may upgrade your install to use a ProtoPixel Node to control the DUO in the future now is a great time to export the project




## Step 3: Recording Storage

In the Mapping Tool inspector panel, you will find the Recording section. Here you need to define the recording name, select your controller and the path where you want to store the recording. By default, the recordings will be saved in your Documents folder *(e.g. on Windows: C:\Users\YourName\Documents\ProtoPixel\Recordings)* You will also need to define the frame rate you want your recording to be saved.

👉 TIP: Add a suffix in your recording name indicating the frame rate (e.g. "_60fps"). It will be useful when uploading the file to your Duo with the Player WebApp.

👉 Note that the format you must select from the recording panel in the Mapping Tool for the Duo is V1.

## Step 4: Record

Once you have completed steps 1, 2 and 3 you are ready to record. Run the content sequence that you wish to capture then click on the "Start" button to record. Once your content sequence is done you need to click the "Stop" button. Your recordings will be automatically saved to the path you defined in step 3.

👉 A REC hint will appear in the Mapping Tool canvas (bottom right) to show when you are recording

# 02

# Global Settings

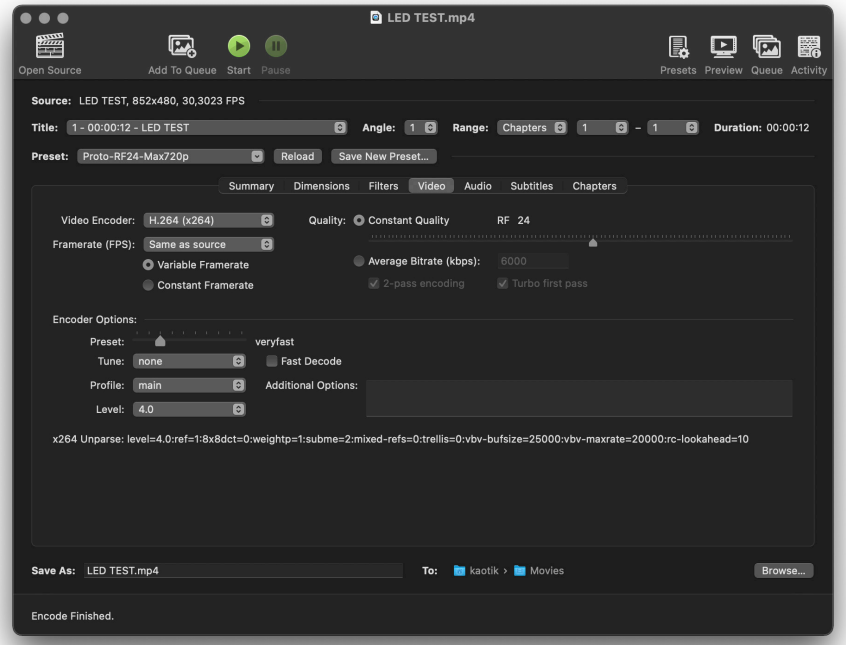
There are several global settings that can be accessed through the global settings button in the Toolbar. Here is a description of each setting:

| | |
|---|---|
| Installation Name | This name is used to notify you about expiring subscriptions or other installation-related events. |
| Starting Project | Specifies the path to a project that will automatically load when running the ProtoPixel Mapping Tool. This is useful for autonomous installations. |
| Async Rendering | It is recommended to keep this option activated for better performance. However, some older systems may actually perform better with it deactivated. |
| Autosave | The program periodically saves your work so that you can recover it in case of an outage or a crash. If a backup project is found when starting the application, a dialog will prompt you to recover it. |
| Process Sound | Enables sound processing for scripts that require it. |
| Global Framerate | Sets the maximum framerate for the entire application. |
| Preview Quality | Limits the quality of the preview in the ProtoPixel Mapping Tool. This does not affect the quality of the LED output, but reducing it can improve performance. |
| Manual Artner Devices | Refers to recording output for a single SD Controller |
| Scheduler | Refers to the scheduler feature. |
| Recording | Refers to recording output for a ProtoPixel Player. |

# 02

# Video Codecs

To avoid issues with projects that include video files, ensure that the video codec is correct.




To use them, you will need to import the presets from the table in the following way:

1. Download the file Proto-RF24-Max720p (1).json.
2. Open Handbrake
3. Click on 'Presets'.
4. Click on 'Import'.

If you are using the ProtoPixel Mapping Tool on Windows, a pop-up will appear during the installation process suggesting the installation of the codec pack. This message typically appears when you open the Mapping Tool for the first time on Windows, as well as when you try to add video content.

If you have ignored the suggestion, you can download the codec pack here.

You can find more info and resources here.

# 02

# Spaces

Spaces is a tool for controlling various types of lighting, from everyday environments like offices to immersive experiences. This guide will demonstrate how ProtoPixel Spaces serves as the configuration co-pilot of the ProtoPixel platform, providing a control interface for users. It seamlessly integrates with other components of the suite, including the advanced lighting design software, ProtoPixel Mapping Tool, and the hardware device, ProtoPixel Node. Spaces enable users to create and manage their lighting environments, utilising moods, widgets, and rules for everyday use.

You can use Spaces as if you were on your mobile phone, but directly from the Project Mapping Tool. To do this, go to Window - Spaces. When Spaces is enabled, you will see an “Spaces enabled” alert at the bottom of the canvas, indicating that the installation is being controlled with Spaces.

For detailed instructions on how to use Spaces, please refer to its manual.

# 03 Integrations

# 03

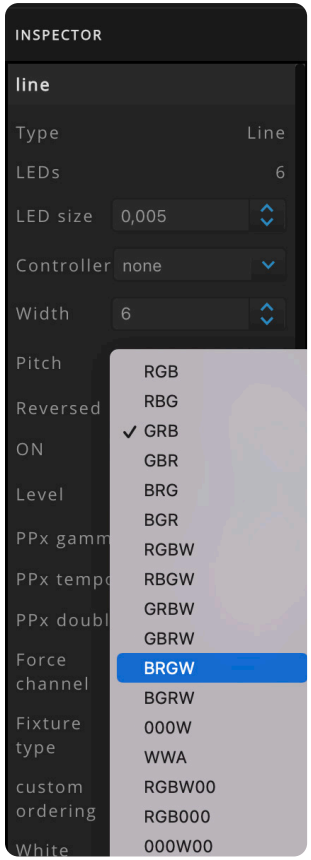
# DMX

## Property Editing

To use DMX, you have to edit the properties of the fixture (imagine that you created a fixture type line, which are several light points in a row). In the inspector, you will see the “PPx RGB Ordering” property.

This ordering must reflect the DMX channel distribution. In that case, the DMX fixture does not use a pre-defined layout, a custom layout can be created by selecting “Custom” in “PPx RGB Ordering”, and filling out the “custom ordering” section. For instance, if your fixture accepts 10 channels, the first one being intensity, the next 3 being RGB color, and the rest being various effects that you want to leave to 0, the layout would result in:

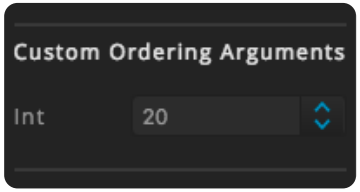
```
Int,R,G,B,0,0,0,0,0,0
```



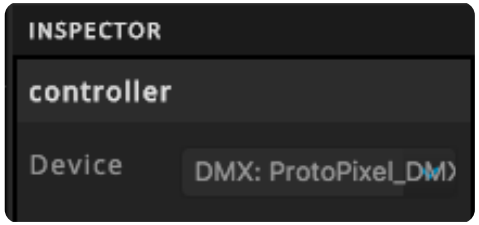

## Possible Values for DMX

| Letter | Meaning |
|---|---|
| R | Red |
| G | Green |
| B | Blue |
| C | Cyan |
| M | Magenta |
| Y | Yellow |
| W | White |
| <other> | Custom |

If you add a symbol that is not on this table, it will be created a parameter on the panel, so you can manually change its value.




The fixture DMX addresses will start with 1 and accumulate the number of channels in the layout: 1,11,21,31 ...
Then you have to connect with the Art-Net device (with DMX output); first make sure it is connected to the network or directly wired to the computer. Add a Controller, and assign the fixture to outlet 1 (= universe 0). In the Controller, you should be able to select the Art-Net device from the menu. In case the Art-Net device is not detected, you can add manually one. Just follow the next section.




To manually add an Art-Net device first, you have to check that you have manual Art-Net devices activated in the Global Settings. Then, select the controller and assign to it the manual Art-Net device. This device works exactly the same as the Art-Net detected devices, with the difference that you can manually specify the IP address.

# 03

# OSC Interface

## Property Editing

ProtoPixel has a native Open Sound Control interface exposed in port 2345.

You can affect contents in your project by sending OSC messages to this port. The OSC address schema is like follows:

```
/<type>/<name>/<param> <value>
/<type>/<name>/<param>
```

With those parameters:

**<type>** is the entity type, and at the moment it can only be Content.

**<name>** is the name of the entity

**<param>** is the parameter of the entity to be modified. You can see those parameter names by accessing the Content section in the WebApp.

**<value>** is the new value of the parameter. It can be omitted if the parameter is a button.

👉 If the parameter is inside a parameter group, you can use / to separate the group from the parameter name. See the examples.

## OSC Messages Examples

```
# enable content
/Content/mycontent/enabled 1

# disable content
/Content/mycontent/enabled 0

# play video content
/Content/rainbow.mp4/params/play

# stop video content
/Content/rainbow.mp4/params/stop

# change color for a color content (R, G, B, A)
/Content/color/params/color 255 100 100 255
```

## Custom OSC bindings

Custom OSC bindings are also available in scripts. See custom_osc.py example in the examples/scripting folder for more details.

# 03

# Integration OSC & events

## Controlling Standard Contents

You can affect the contents in your project by sending OSC messages to this port. The OSC address schema is like follows:

```
/<type>/<name>/<param> <value>
/<type>/<name>/<param>
```

With those parameters:

**<type>** is the entity type, and at the moment it can only be Content.

**<name>** is the name of the entity

**<param>** is the parameter of the entity to be modified. You can see those parameter names by accessing the Content section in the WebApp.

**<value>** is the new value of the parameter. It can be omitted if the parameter is a button.

## Getting all parameters from a Content

```
CONTENT_NAME="color"
curl -H "Content-Type: application/json" -X POST \\
        --data '{"command":"getSimpleConfContent", "args":["$CONTENT_NAME"]}'
        <http://localhost:8181/api/v1/core/get> | python -m json.tool

{
    "result": {
        "Zone": "",
        "color levels": [
            255,
            255,
            255,
            255
        ],
        "enabled": true,
        "lock_gui": false,
        "params": {
            "color": [
                33,
                87,
                118,
                255
            ]
        },
        "params_in_manager": false,
        "projection parameters": {
            "height": 1,
            "width": 1
        },
        "projection type": "flatsimple",
        "python script": "lib/programs/color.py",
        "reload": null,
        "renderable": true,
        "save_params_in_mood": true,
        "texture filtering": "linear",
        "texture horizontal offset": 0,
        "texture vertical offset": 0,
        "uid": "4218023060"
    }
}
```

## Sending OSC to Custom Scripts

Inside a custom script, you can register an OSC endpoint like this:

```
@content.OSC("/acc")
def acceleration(x, y, z):
    """
    This function handles OSC user input in address "/acc", with 3 arguments: x,y,z.
    Use pl.OSC decorator to define handles like this. Multiple scripts can listen to
    the same address simultaneously.
    """
    global color2
    r = normalize(x)
    g = normalize(y)
    b = normalize(z)
    color2 = ofColor(r, g, b)
```

Please take into account that if the number of arguments sent does not match the function signature, the message will not be delivered.

## Sending events to Spaces

ProtoPixel Spaces can integrate with other elements such as presence sensors via its API. For more information consult here.

# 03

# UPD

## Interface

There is also a UDP interface in port 2344. The mechanics are the same as the OSC Interface. The messages are composed like the following:

```
/<type>/<name>/<param> <JSON-encoded value>
```

For instance:

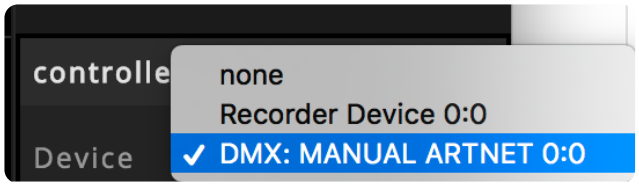
```
# enable content
/Content/mycontent/enabled 1

# change color for a color content (R, G, B, A)
/Content/color/params/color [255 100 100 255]
```

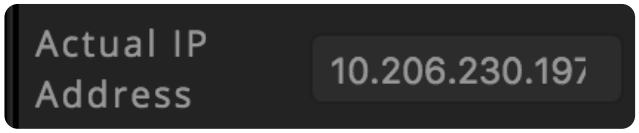
# Art-Net

## Manual Art-Net Configuration

To manually add an Art-Net device, first check if you have enabled manual Art-Net devices in the Global Settings. Next, select the controller and assign. the manual Art-Net device to it.




This device functions identically to the Art-Net detected devices, with the distinction that you have the ability to manually specify the IP address.



For more information and inquiries, contact us at protopixel.io

ProtoPixel