

# P2D 1.4.0

## User Guide

<http://sigabort.co/p2d.html>

[m4l@sigabort.co.uk](mailto:m4l@sigabort.co.uk)



# 1 Overview

P2D is an external for Max and Max for Live (M4L) that allows rendering to the Push2 display from Jitter.

P2D comes in two flavours, the standard edition and P2D+. P2D+ allows true screen-sharing with Live allowing you to mix your own displays with that of the standard Live display. The P2D+ functionality is enabled by installing a custom component – this component only interacts with the Push2 display and cannot have any adverse effects on Live itself. Functionality only available in P2D+ will be tagged **P2D+**.

# 2 Installation

## 2.1 P2D Requirements

Live 9.5 or later, Max for Live 6/7.

OSX 10.8+ 32/64-bit

Windows 32/64-bit

## 2.2 P2D+ Requirements

Live 9.5 or later, Max for Live 6/7.

OSX 10.8+ 32/64-bit

Windows 32/64-bit

## 2.3 Installing The Package

Copy the p2d directory into your packages directory:

Windows: Documents\Max\Packages or  
Documents\Max 7\Packages  
  
e.g. C:\Users\lee\Max 7\Packages\lmh\_m4l\_midi

OSX: ~/Documents/Max/Packages or  
~/Documents/Max 7/Packages  
  
e.g. /Users/lee/Documents/Max 7/Packages/lmh\_m4l\_midi

As the install contains externals for Windows and Mac, feel free to delete the .mxo file if you are on Windows, or the .mxe/.mxe64 files if you are on Mac.

## 2.4 P2D+

If you are wishing to use the extended features of P2D+ you will need to install the custom libusb library – if you have purchased a P2D+ product you will already have this component, if not, a separate purchase will soon be available on the website.

**Please make sure you back up your existing file so you can replace it if you have any problems**

### 2.4.1 Windows

Install the provided **libusb-1.0.dll** in the following directory (change the 'Live 9.6 Suite' section to match your installation):

c:\program data\Ableton\Live 9.6 Suite\Program

## 2.4.2 OSX

Install the provided **libusb-1.0.dylib** in the following directory (change the 'Live 9.6 Suite' section to match your installation):

```
/Applications/Ableton Live 9.6 Suite.app/Contents/Plug-Ins/Plug2/Plug2DisplayProcess.app/Contents/Libraries
```

In order to find this directory on OSX you will need to right click on the top level 'Ableton Live 9.6 Suite.app' folder in Applications and select **Show Package Contents**. Do this again for the 'Plug2DisplayProcess.app'.

# 3 Max for Live

To use P2D inside Max for Live, create the `lmh_p2d` object with the `@m4l 1` attribute.

## 3.1 Known Issues

Opening the display on the back of a `live.thisdevice bang` message can cause Push2 to not initialise properly (unlit pads, buttons) – there will be updates for this in the next release all being well – for now it may be best to delay any attempt to open the screen at set load for a couple of seconds. If opening the display is user driven this is unlikely to be an issue.

# 4 Parameters

```
lmh_p2d appname [appversion] [@4ml 1]
```

Parameter	Values	Description
appname	String 8 chars	Name of application that will appear on the on-screen menu.
appversion	String 8 chars	An optional version string that will be displayed on the on-screen menu.  <b>This is purely cosmetic, but I would advise providing it as it gives the user confidence they are running the correct version of your software and can help track down issues.</b>
@m4l	1	Indicates that this app is running inside M4L and will need to take the screen from Live.

# 5 Inlets

## 5.1 Inlet 1 – Commands

### 5.1.1 open

Max – open the display. If this is the first app opening the display it will be set to active, otherwise the app will become available from the selection menu.

M4L – Take the display from Live and switch to the last app being displayed.

### 5.1.2 close

Max – close the display. If the app being closed is currently being displayed, the display will switch to the first app in the list. If this is the last app then the display will be closed.

M4L – close the display and hand back to Live.

### 5.1.3 register

M4L – Register an app for display on the screen.

### 5.1.4 unregister

M4L – Unregister an app for display on the screen. If the app being unregistered is currently being displayed, the display will switch to the first app in the list. If this is the last app then the display will be closed and handed back to Live.

### 5.1.5 fill *value*

Fill the screen with a given value – useful for testing.

### 5.1.6 matrix *name*

Render a Jitter matrix to the screen – the matrix must be of the dimensions 960x160 and can be 1, 3, or 4 planes (alpha plane is ignored)

### 5.1.7 mode *value*

Sets the mode of operation:

- 0 – Standard mode
- 1 – Push1 emulation mode (only available in paid/donation versions)
- 2 – Toolbox mode (not yet released) (only available in paid/donation versions)

Each mode is independent and retains its state when switching between them.

### 5.1.8 text [*x*] *y str*

When in push1 mode this is used to set the text on the display.

Providing -1 for x will fill the specified row with the string, providing -1 for y will fill the specified column with the string and using -1 for both will fill the whole display with the specified string.

Sending a `'text clear'` command will clear the display.

## 5.1.9 `snapshot name`

Take a snapshot of the current display buffer and fill a named matrix.

## 5.1.10 `period time`

Refresh period when in M4L and not using P2D+ - 1-1500ms – default 100ms.

## 5.1.11 `P2D+ set_m4l_viewport x y w h xo yo vis`

This sets the viewport used to display P2D on the screen with Live. P2D will only render into this viewport, the rest of the screen will be the standard Live display.

Parameter	Values	Description
viewport	0	Always 0 currently
inuse	1	Always 1 currently
x	0-959	Horizontal offset of the rendering of P2D
y	0-159	Horizontal offset of the rendering of P2D
w	0-960	Width of rendered window
h	0-160	Height of rendered window
xo	0-959	Horizontal offset into rendering buffer
yo	0-159	Vertical offset into rendering buffer
vis	0-63	Visibility (Opacity) – 0 = full Live, 63 = Full P2D



# 6 Outlets

## 6.1 Outlet 0 – General Status

Message	Values	Description
m4l_full	0/1	If using P2D+ this indicates whether the screen can be shared with Live.  If not using P2D+ this is always 0.  You can use the output of this message to restrict certain functionality if the user does not have P2D+ installed.

## 6.2 Outlet 1 – Multi-App State

Message	Values	Description
active	0/1	Whether the app is active, i.e. being display on the screen. Use this to start/stop any processing you need to render the screen
master	0/1	Whether the app is master, i.e. responsible for processing Push2 button presses and routing through to the controlling logic. This is advisory for the developer and is used by the framework code to handle Push2 control messages.  <b>It is recommended that the controlling logic for Max and M4L be left as it is as this will give a consistent user experience across all apps.</b>
option	name val	Sent when an option is changed via Push2.
menu		Sent when menu is shown/hidden.  If menu is being shown a list with a pair of values is sent out for each registered app: <ul style="list-style-type: none"><li>• app name</li><li>• active flag</li></ul> If menu is being hidden the message appears on its own.

## 6.3 Outlet 1 – Trace

Debug/trace info will be sent out of this outlet if they are turned on.

## 6.4 Outlet 2 – Info

# 7 P2D-Multi

P2D-Multi allows for up to 6 Max/M4L applications to share the screen, with the user being responsible for choosing what is display on the screen via an on-screen menu.

The P2D external and supplied patchers allow each app/device to operation in complete isolation with minor processing updates to process when your app is in view or not.

## 7.1 User

For the user the experience is slightly different in Max and M4L due to the fact that in Max the screen is always available, but in Live the screen has to be grabbed from Live.

### 7.1.1 Max

For Max, the on-screen menu is toggled by a quick double press of **SELECT**.

### 7.1.2 M4L

For M4L, the display is toggled between Live and P2D by holding **SHIFT** and then pressing **SELECT**. Whilst the screen is displaying P2D, the on-screen menu can be toggled by a quick double press of **SELECT**.

## 7.2 Developer

The example patches show how to wire up your apps for Max and M4L. They are mostly the same with a slight difference at initialisation time.

When coding a patch to this specification you only need worry about your own patch – the interaction with the on-screen menu is handled by the P2D external and the input helper patch that is provided (**p2d\_multi\_midi.maxpat** for Max, **p2d\_multi\_live.maxpat** for M4L).

### 7.2.1 Max

At load time (**loadbang**) an **open** message should be sent to P2D. This will register the app and open the display (if necessary).

If you wish to remove the app from processing you can send a **close** message. This will be done automatically on patch close so is not necessary unless you wish to programmatically wish to make the app unavailable.

### 7.2.2 M4L

At load time (**loadbang/live.thisdevice**) a **register** message should be sent to P2D. This will register the app and make it available from the on-screen menu when this display is opened.

If you wish to remove the app from processing you can send an **unregister** message. This will be done automatically on patch close so is not necessary unless you wish to programmatically wish to make the app unavailable.

In M4L the open and close messages to physically open and close the display (i.e. take from Live and hand back to Live) are handled by the framework code (p2d\_multi\_live.maxpat) and should not be altered if you wish your app to play nice with others using this framework.

## 7.3 On-Screen Menu

The on-screen menu allows simple options to be chosen by the user. Several types of input are supported and multiple pages of options can be provided.

See the examples patchers for examples of setting up menu options.

### 7.3.1 *options page details*

This command is used to specify the options available to the user.

The page number determines which page of options you are specifying – pages are numbered from 0. Using a page number of -1 indicates that pages are not to be used and a single set of 8 options is available.

Note: If using multiple pages the first option becomes the Page menu item so will be ignored.

Following the page number 8 options can be specified and take the following form:

option\_name option\_type reserved [params]

Type	Values	Params	Description
0 – Toggle	0/1	N/A	Toggles between on and off
1 – Momentary	1	N/A	A button which always outputs 0.
3 – Multi	0-n	List of options	The multi type allows the user to cycle through a number of options. The list of options should be provided as a list of names, e.g. “Opt1 Opt2 Opt3”
4 - Multi-Zero	0-n	List of options	Same as Multi type but an option of “Off” will have its title greyed out

#### 7.3.1.1 Empty Options

If you wish to leave a blank space in the menu specify the option as:

<empty> -1 0

### 7.3.2 *set\_option\_val option val*

Sets the specified option value. Use this if you wish to additionally control your options via a UI or set defaults at startup.

# 8 Push1 Emulation Mode

In Push1 emulation the display is rendered as a 68x4 text display as the Push1 was, including the custom character set.



The contents of the display can be updated either by sending a sysex string to the same spec as that provided by Push1, or by using the `text` command.

When using the `text` command the display is rendered either as 8 blocks of 8 characters (when sending an x and y value into the command) or more accurately as 4 blocks of 17 characters (when only supplying a y value).

# 9 Moving from previous versions

Perform the following steps on your current patches to move to the new version of P2D.

- Add an app name and version number to each **lmh\_p2d** object (before the @m4l 1 attribute for M4L)
- Any processing of the first outlet for open status should be moved to the second outlet routed through an **active** selector
- Add any applicable options for your app

If you wish your app to interoperate with P2D-Multi:

- Add and wire up the **p2d\_multi\_midi** or **p2d\_multi\_live** patcher

Additional steps for M4L devices:

- Change the **open** message to **register\_app**

Please refer to the example patchers which have all been updated.

# 10 Toolbox Mode

Toolbox mode will provide a toolkit of general functions to provide basic rendering functionality to those people not familiar or not desiring to learn Jitter.

More to follow.

# 11 Examples

A number of example patchers are provided to demonstrate various aspects of the usage of P2D. These have all been updated to show the new patching requirements.