



P# Panels & Beyond

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Light Up Ohio 2019

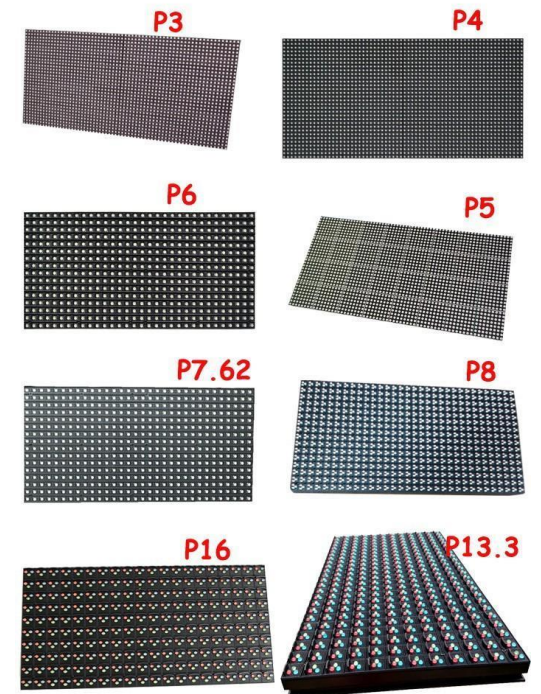
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What are P10, P5, etc Panels

It's a type of panel used in the construction of video walls, matrix displays and scrolling signs. There are interior and exterior rated panels.

The "P" refers to the pitch or spacing between each LED. The "10" refers to the actual spacing between the LED's in millimeters.



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Do I need P10 panels in my display?

Simple answer, No.

This is a personal preference and depending on what your needs are if you want to build P5/10 matrix.

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Uses for Panels

- Informational sign
- Tune to sign
- Incorporate into your show.
- The sky is the limit.

I use mine for all the above.

2 hrs before the show starts and 1 hour after the show ends it displays the show days and hours.

During the show I will use it for effects and occasionally display radio frequency and show hours.

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How many panels do I need?

I base my panel model and size on viewers focal point. It's like a TV resolution, the closer you are to it the more detail you can see and less number of panels needed. The farther away the bigger the spacing between LEDS and more panels are needed.

My P10 matrix is 52" x 28" it has 16 panels. 4 across and 4 rows. It sits on a platform on the front porch which is 75' from the street. It does a good job but due to size constraints on the porch, I couldn't go any wider.

I do have in the works for 2 additional P5 matrixes that will be 4 panels each, 2 across and 2 rows. This will be just for Tune to, show hours and informational to not block driveways, etc. This will be located within 10' from viewers.

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Which panel do I need?

When purchasing panels, look at the scan rate. There are many different scan rates. FPP supports 1/8 scan on 32x16 panels. 1/16 scan on 32x32, 64x32, and 64x64 panels. When you purchase panels always purchase 1-2 additional panels so they are all from the same lot. Colors may be off if purchased later.

Where to purchase these?
Crockett Fantasy of Lights
Wired Watts
Ray Wu
Daniel Zhang

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Beside panels, what else do I need?

- 5v power supply(s) (Each P10 panel is approx. 2A or 10w. Never run power supplies 100% calculate 80% rule.)
- Enclosure (This can be made out of anything from wood to metal, plastic, etc. Since these panels are majority indoor use, you need to waterproof the enclosure.)
- Controller
 - Beagle Bone (Black, Green, or Pocket) w/octoscroller hat (64 panels max)
 - Raspberry Pi w/Ron's matrix adapter Pihat or nano matrix Pihat, etc. (12 panels max)
 - ColorLight 5a-75 or Linsn commercial boards (these boards can handle very large amounts of panels. Arena, stadium, ball parks, billboards, etc.) (hundred of thousands panels)

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Beside panels, what else do I need?

- Mounting brackets to mount panels and Beagle Bone in enclosure. (3D print, Boscoyo Matrix Connectors, or make your own from metal or wood.
- Fuse panel to separate groups of panels from the power supply
- Falcon Player OS for the Raspberry Pi or Beagle Bone
- You may need longer HUB75 cables. These are the cable for the data to flow panel to panel



For the 16 panels in my enclosure I have a 5 amp fuse for every pair of panels and BBB has it's own 2 amp fuse and network switch.

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Wiring the panels

Assuming you have a working install of FPP on BBB or Pi and I'll demo using a Beagle Bone with an octoscroller.

The octoscroller has 8 output ports for a total of 64 panels or 4/5 P5 panels for a max total 40 panels.

Best performance is to use 5 or less outputs to give better refresh rate when possible.



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Setting up FPP for panels

Assuming you have a working install of FPP on BBB or Pi.

Channel Output – LED Panel Tab

Panel Layout size: i.e. 4x4

Single Panel Size: 32x16 (P10), 32x32 or 64x32 (P5)

Model Start Corner: Bottom Left

Brightness: (running in the daylight will be 10
but at night 5 or lower)

Connection: Hat/Cap, ColorLight, Linsn

Orientation: Use arrows to match panels.

**Enable Panel Output, restart FPPD and test using
FPP Display Testing**

Enable LED Panel Output:

Panel Layout (WxH): 4x4 ▾

Single Panel Size (WxH): 32x16 1/4 Scan ▾

Model Start Corner: Bottom Left ▾

Brightness: 5 ▾

Panel Gamma: 1

Panel Interleave: 4 Pixels ▾

Color Depth: 8 Bit ▾

Connection: Hat/Cap/Cape ▾

Start Channel: 1

Channel Count: 24576

Default Panel Color Order: RGB ▾

Wiring Pinout: Standard v1.x ▾

(this will save changes to BBB tab & LED Panels tab)

LED Panel Layout:
View Config from front? (save any changes before changing view)

Back View			
O-1 ▾ P-1 ▾ C-Def ▾	O-1 ▾ P-2 ▾ C-Def ▾	O-1 ▾ P-3 ▾ C-Def ▾	O-1 ▾ P-4 ▾ C-Def ▾
O-2 ▾ P-1 ▾ C-Def ▾	O-2 ▾ P-2 ▾ C-Def ▾	O-2 ▾ P-3 ▾ C-Def ▾	O-2 ▾ P-4 ▾ C-Def ▾
O-3 ▾ P-1 ▾ C-Def ▾	O-3 ▾ P-2 ▾ C-Def ▾	O-3 ▾ P-3 ▾ C-Def ▾	O-3 ▾ P-4 ▾ C-Def ▾
O-4 ▾ P-1 ▾ C-Def ▾	O-4 ▾ P-2 ▾ C-Def ▾	O-4 ▾ P-3 ▾ C-Def ▾	O-4 ▾ P-4 ▾ C-Def ▾

- O-# is physical output number.
- P-# is panel number on physical output.
- C-(color) is color order if panel has different color order than default (C-Def).
- Arrow ↕ indicates panel orientation, click arrow to rotate.

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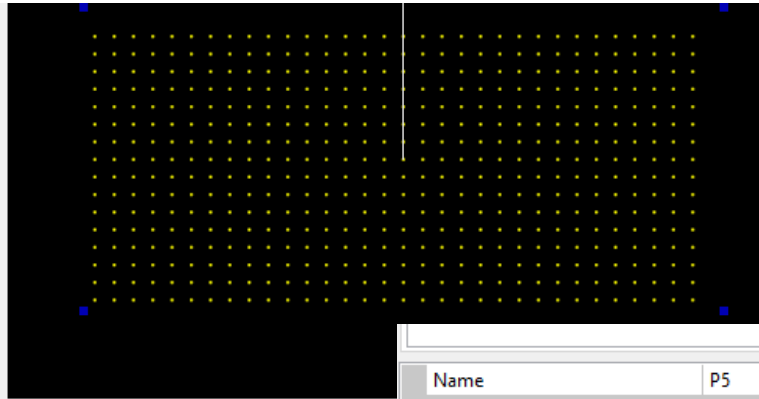
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Setting up xLights for panels

Name	P10
Matrix	
Direction	Horizontal
# Strings	16
Nodes/String	32
Strands/String	1
Starting Location	Bottom Left
Indiv Start Chans	<input type="checkbox"/>
Start Channel	1
Description	

Overlap checks enabled

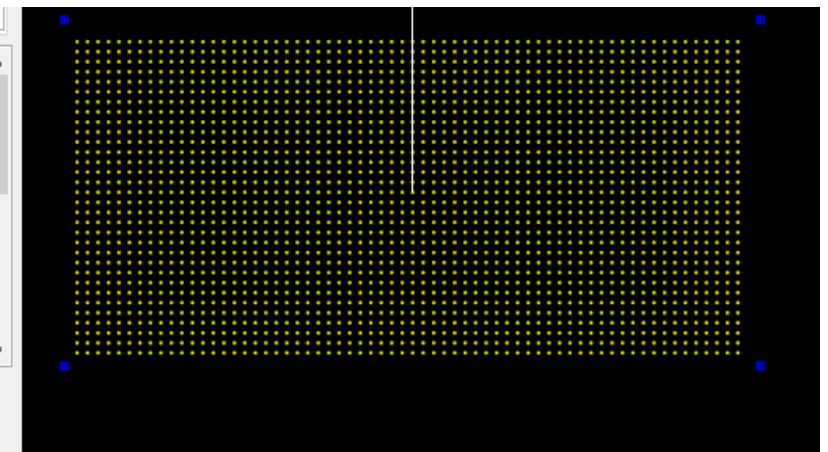
Save



Name	P5
Matrix	
Direction	Horizontal
# Strings	32
Nodes/String	64
Strands/String	1
Starting Location	Bottom Left
Indiv Start Chans	<input type="checkbox"/>
Start Channel	#4:1
Description	

Overlap checks enabled

Save



Models

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Demo

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Questions????

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Thank You!!

Power Injection



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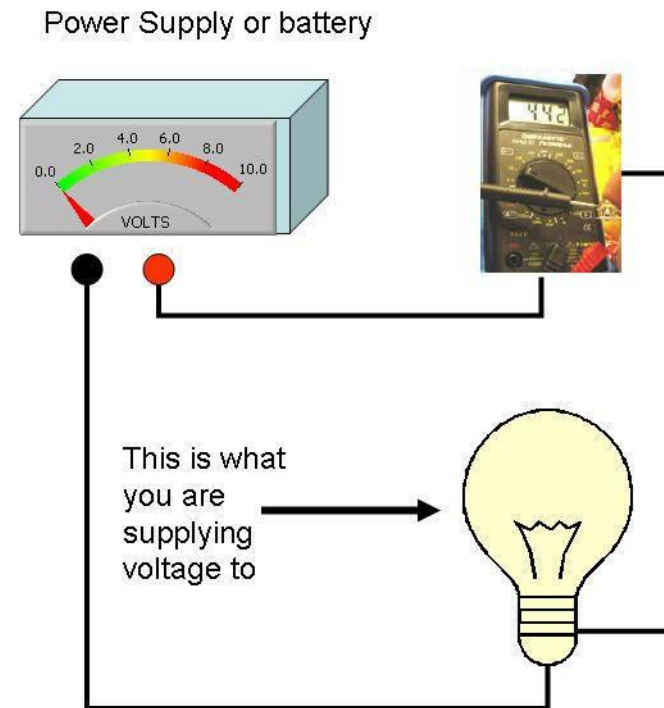
Misc. Information

Convert Amps to Watts Calculator: [https://www.rapidtables.com/calc/electric/Watt to Amp Calculator.html](https://www.rapidtables.com/calc/electric/Watt_to_Amp_Calculator.html)

Voltage Drop Calculator: <http://www.calculator.net/voltage-drop-calculator.html>

Led Resistor Calculator: <http://led.linear1.org/1led.wiz>

Measuring DC current



1. Set your meter To "AMPS" or "DC Current"
2. Move your probes to the correct holes on the meter. This is the most common mistake- people don't realize that the wiring probes need to be different for measuring amps than they are for measuring Ohms and Voltage.
3. NOTE- Do not exceed the current rating of your meter – it will blow a fuse. Most meters can handle 10 Amps

Power Injection

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Power Supply: 17v DC
Length of Cat5e wire: 128'
Current Load: 4.25 Amps
Needed Voltage: 5v DC

Voltage Drop Calculator

Result

Voltage drop: **5.85**
Voltage drop percentage: **34.44%**
Voltage at the end: **11.15**

Please note that the result is an estimation based on normal condition. The actual voltage drop can vary depend on the condition of the wire, the conduit being used, the temperature, the connector, the frequency etc. But, in most cases, it will be very close.

Wire Material	<input type="text" value="Copper"/>
Wire Size	<input type="text" value="22 AWG (0.642 kcmil)"/>
Voltage	<input type="text" value="17"/>
Phase	<input type="text" value="DC"/>
Number of conductors	<input type="text" value="3 conductors per phase in parallel"/>
Distance*	<input type="text" value="128"/> <input type="text" value="feet"/>
Load current	<input type="text" value="4.25"/> Amps
<input type="button" value="Calculate"/>	

* Please use one-way distance to the load. Not round trip distance.



Web Forums

- Australian Christmas Lighting: <http://auschristmaslighting.com/forums/>
- Do It Yourself Christmas .Com: <http://doityourselfchristmas.com/forums/>
- Do It Yourself Christmas .Org: <http://www.diychristmas.org/>
- DIY Light Animation: <http://www.diylightanimation.com>
- Falcon Christmas: <http://falconchristmas.com/forum/>