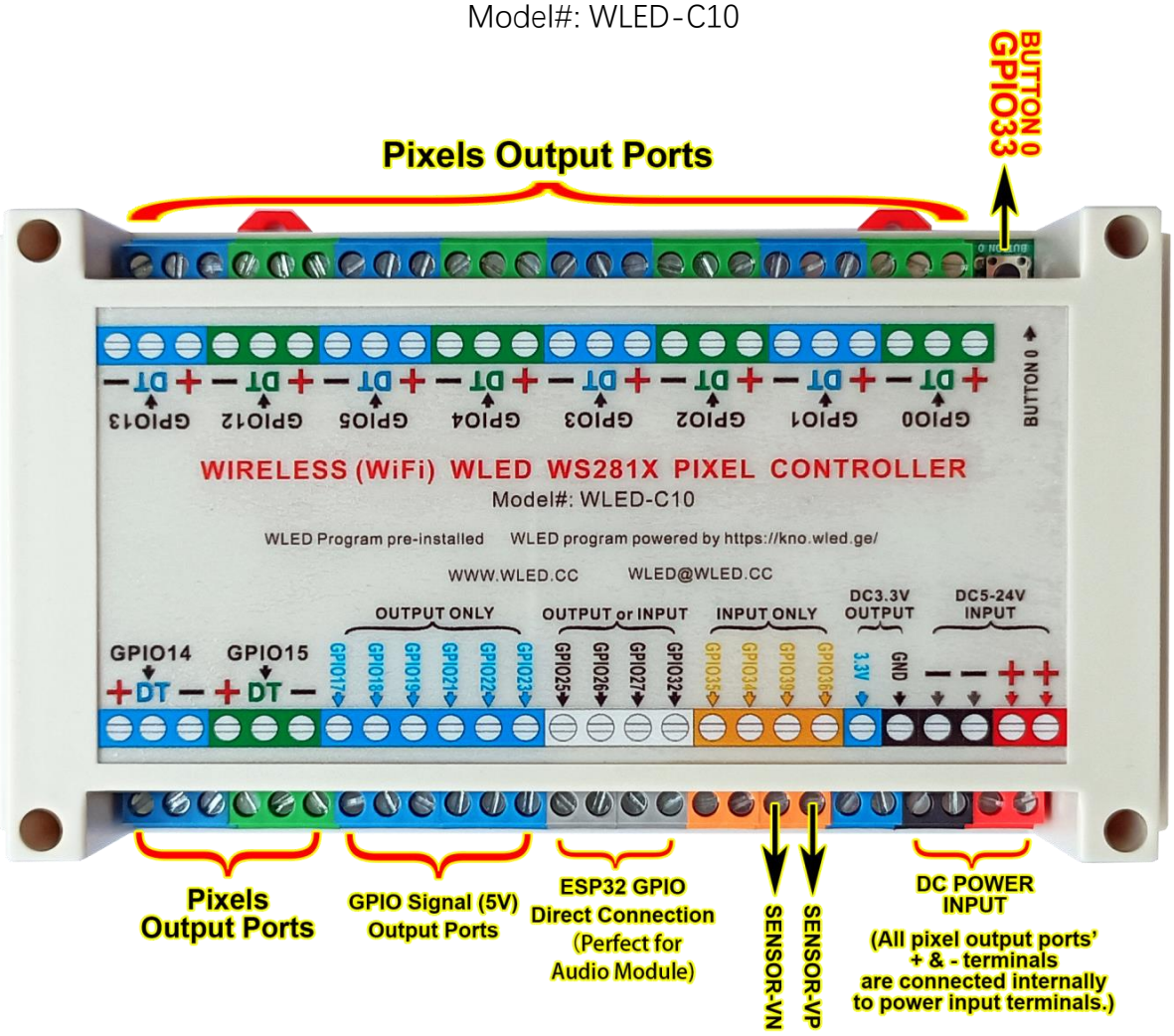
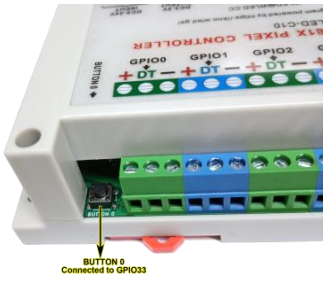
Wireless (WiFi) WLED Controller Manual

Model#: WLED-C10





WLED Controller

Version 1.5
#WLED-C10

1. Specifications

1.1 Overview

- WLED program pre-installed. https://kno.wled.ge/
- Up to 10 pixels output ports for 10240 pixels max.
- DC3.3V output terminals.
- Capable of sound reactive.

1.2 Size

- 175x90x40cm

1.3 Power rated

- DC5V-24V Input. All + & - terminals are internally connected on PCB.
- Besides injecting DC5-24V power directly to the controller's + & - terminals, you may need to add separate power injection to your LED pixels for large number LED pixels.
- PCB on board power rated to 400W. If you add separate power injection to LED pixels, the total power rated is unlimited theoretically.

1.4 CPU

- ESP32-WROOM-32E from Espressif
- 4 MB flash
- 2 MB PSRAM
- 40 MHz crystal oscillator
- datasheet: https://www.espressif.com/..._datasheet_en.pdf

1.5 WiFi

- 802.11b/g/n
- Bit rate: 802.11n up to 150 Mbps

1.6 Operating ambient temperature

- –40 ~ 85 °C

1.7 Initial start up

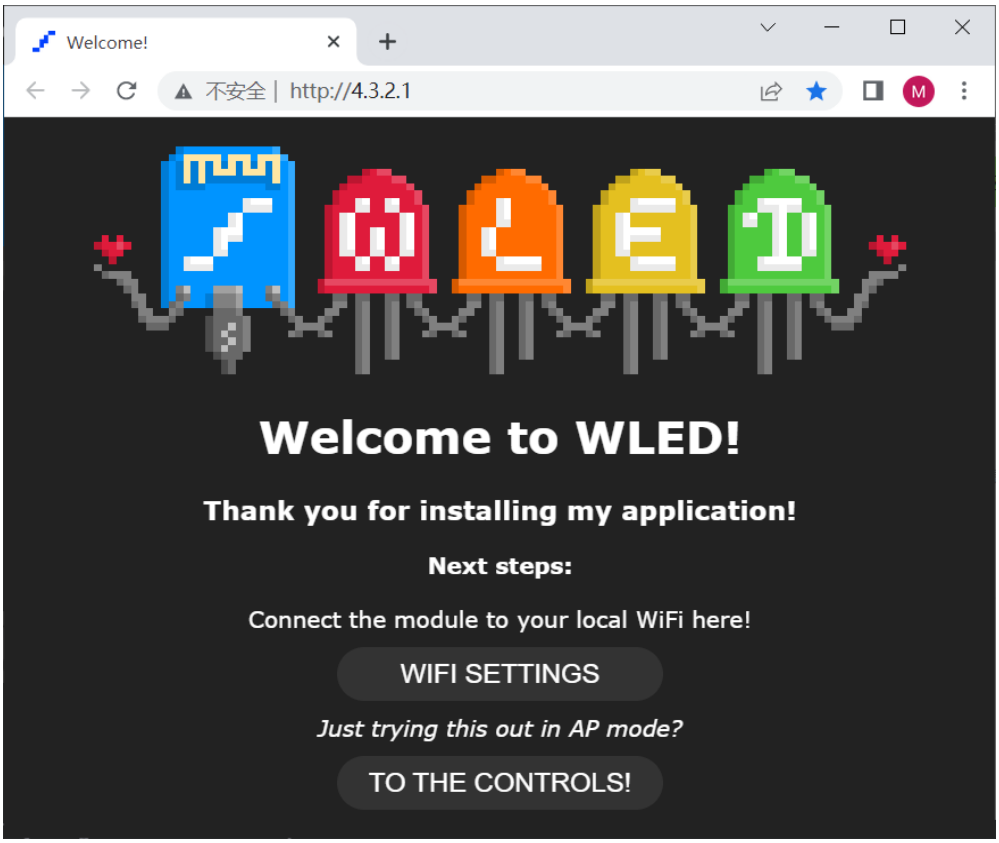
- You need to prepare a DC5V-24V power supply to power the controller. Except the DC3.3V terminals are fixed for DC3.3V output. All + & - terminals could be power input and output terminals as they are internally connected. So your input DC voltage should match your smart pixels' voltage rate.

- Once DC power connected, a red indicator inside the controller should be lit up.

- Then use a WiFi device (computer or smart phone) to connect to the access point WLED-AP with the default password wled1234. Then go to the IP http://4.3.2.1 (reminder: not https://) in your browser (Chrome recommended) to control your lights! If you want to control lights via your phone WLED app, you can download the WLED app for Android and iOS via below link -

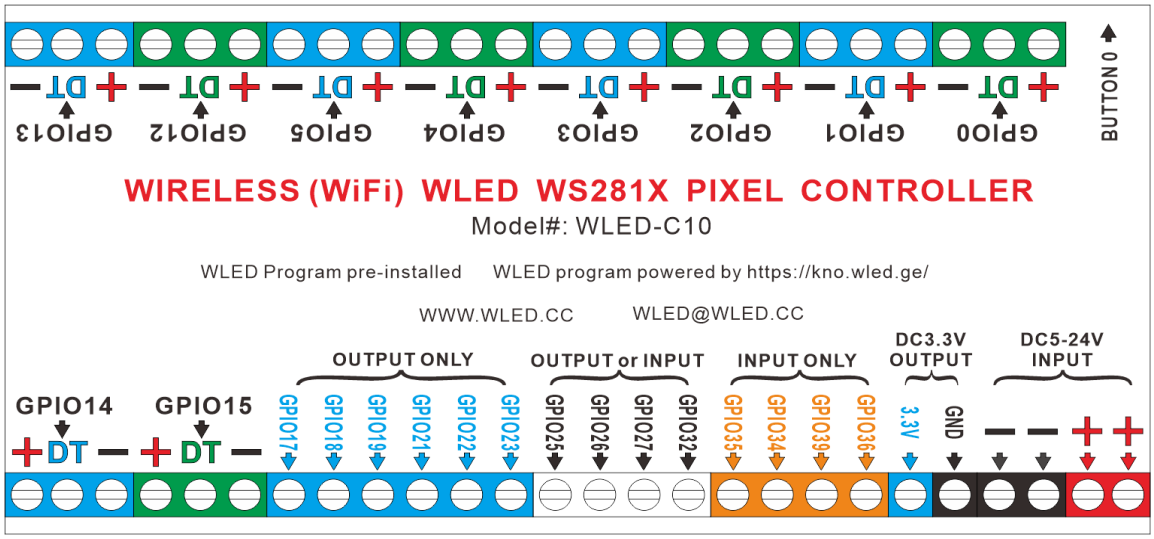
  https://kno.wled.ge/

All units are well tested before shipment.
If you have webpage connection issues, see below FAQ --
https://kno.wled.ge/basics/faq/



2. Terminal Definitions

Please refer to CPU datasheet for more details--
datasheet: https://www.espressif.com/..._datasheet_en.pdf



Types: P: power supply; I: input; O: output

Name	Type	Function
+	P	All 12 + terminals(10 at pixel output ports and 2 at DC INPUTs) are physically the same and internally connected. + termials are for DC positive input/output.
-	P	All 13 - terminals(10 at pixel output ports, 1 at DC3.3V output and 2 at DC INPUTs) are physically the same and internally connected. - termials are for DC negative input/output.
Name	Type	Function
GPIO0	O	Pixels data line output (5V) . Physically connected to GPIO0 of ESP32.
GPIO1	O	Pixels data line output (5V) . Physically connected to GPIO1 of ESP32.
GPIO2	O	Pixels data line output (5V) . Physically connected to GPIO2 of ESP32.
GPIO3	O	Pixels data line output (5V) . Physically connected to GPIO3 of ESP32.
GPIO4	O	Pixels data line output (5V) . Physically connected to GPIO4 of ESP32.
GPIO5	O	Pixels data line output (5V) . Physically connected to GPIO5 of ESP32.
GPIO12	O	Pixels data line output (5V) . Physically connected to GPIO12 of ESP32.
GPIO13	O	Pixels data line output (5V) . Physically connected to GPIO13 of ESP32.
GPIO14	O	Pixels data line output (5V) . Physically connected to GPIO14 of ESP32.
GPIO15	O	Pixels data line output (5V) . Physically connected to GPIO15 of ESP32.

Remark: These 10 terminals are 5V level.

Name	Type	Function
GPIO17	O	Pixels clock line output (5V) . Physically connected to GPIO17 of ESP32.
GPIO18	O	Pixels clock line output (5V) . Physically connected to GPIO18 of ESP32.
GPIO19	O	Pixels clock line output (5V) . Physically connected to GPIO19 of ESP32.
GPIO21	O	Pixels clock line output (5V) . Physically connected to GPIO21 of ESP32.
GPIO22	O	Pixels clock line output (5V) . Physically connected to GPIO22 of ESP32.
GPIO23	O	Pixels clock line output (5V) . Physically connected to GPIO23 of ESP32.

Remark: These 6 terminals are for SPI pixels like WS2801 which needs 4 lines connection: DC+, DC-, data, clock.

Name	Type	Function
GPIO25	I/O	GPIO25, DAC_1, ADC2_CH8, RTC_GPIO6, EMAC_RXD0
GPIO26	I/O	GPIO26, DAC_2, ADC2_CH9, RTC_GPIO7, EMAC_RXD1
GPIO27	I/O	GPIO27, ADC2_CH7, TOUCH7, RTC_GPIO17, EMAC_RX_DV
GPIO32	I/O	GPIO32, ADC1_CH4,TOUCH9

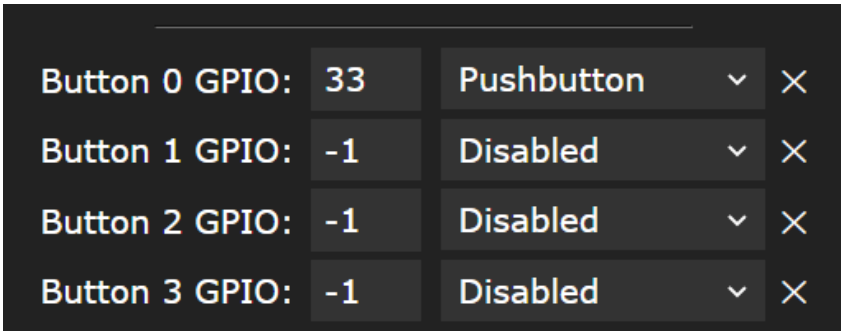
Remark: These 4 terminals are 3.3V level.

Name	Type	Function
GPIO35	I	GPIO35, ADC1_CH7, RTC_GPIO5
GPIO34	I	GPIO34, ADC1_CH6, RTC_GPIO4
GPIO39	I	GPIO39, ADC1_CH3, RTC_GPIO3
GPIO36	I	GPIO39, ADC1_CH3, RTC_GPIO3

Remark: These 4 terminals are 3.3V level.

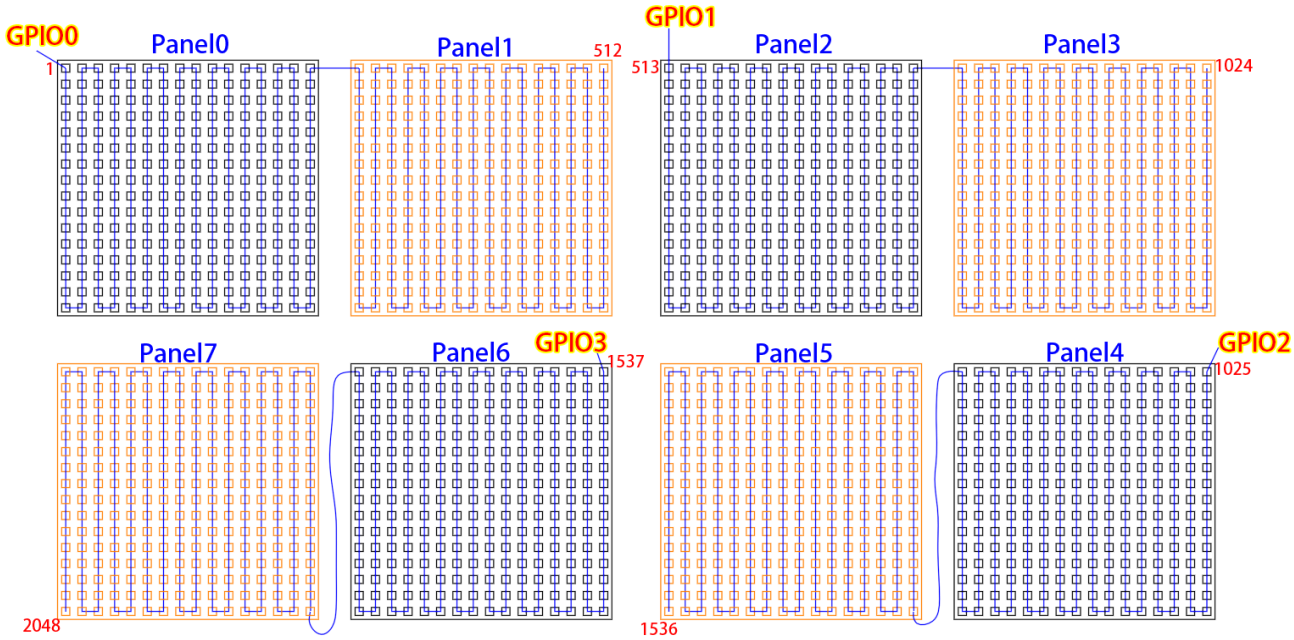
Name	Type	Function
3.3V	O	DC3.3V positive output only.
GND	P	DC negative. Physically connected to all - terminals.

Button 0	Physically connected to GPIO33 of ESP32 as a pushbutton.



3. How to set up a pixel matrix

For instance, below pixel panels connection chart shows the setup for 8 panels of 16x16 standard WS2812 matrix (total 2048 pixels). In this instance, only 4 GPIO output terminals are used(each port for 512 pixels of 2 panels)



STEP 1: we enter the main menu Config, then choose LED Preference -

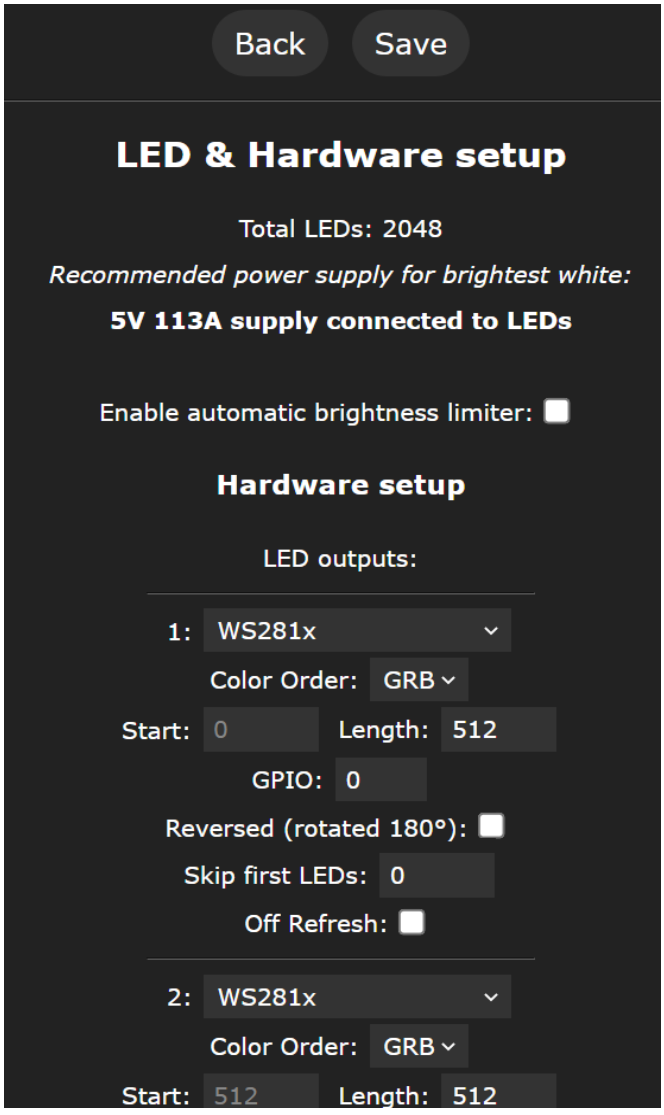
You can see the screenshot in the next page. We set 4 LED outputs in this instance -

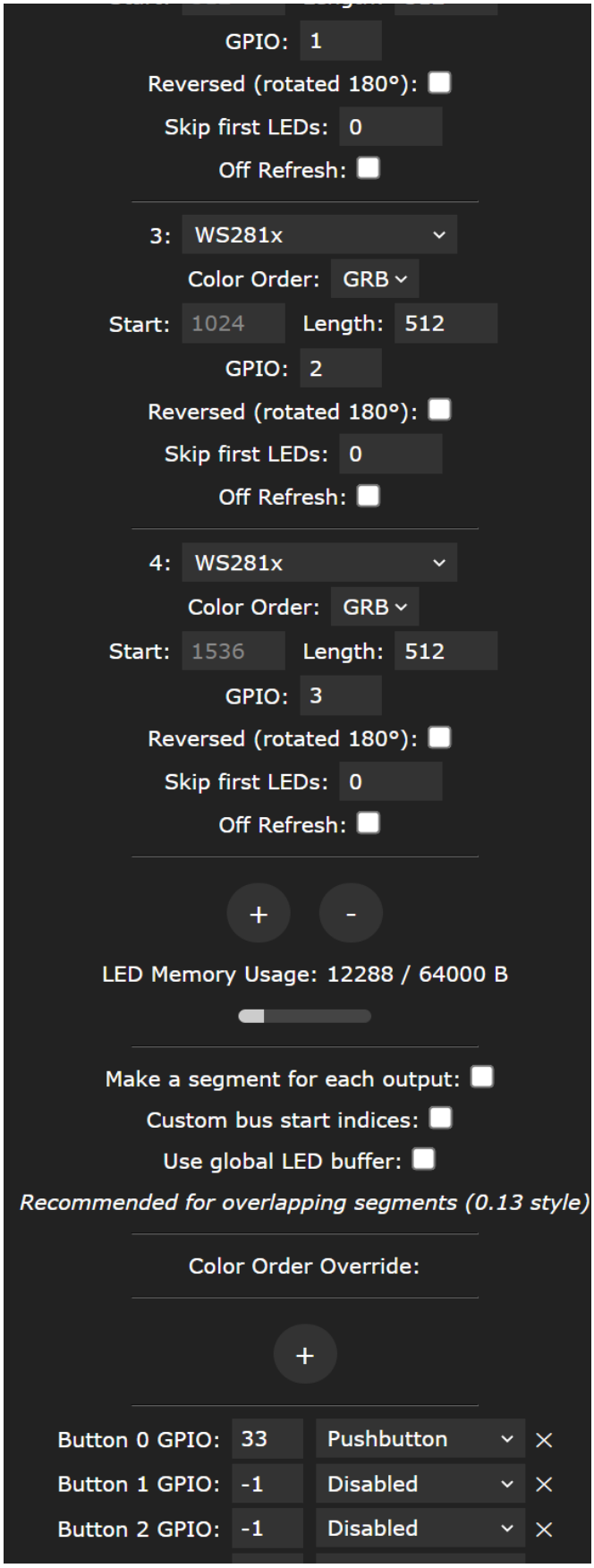
1:	We choose WS281x in this instance to match our panel's pixels.
	Length: we enter 512 because this output port will control 2 panels (512 pixels), the start pixel's channel is automatically set to 0.
	GPIO: we set to 0 = GPIO0 port.
	Physically, we connect panel0's data in line to terminal GPIO0. And connect panel0's data out line to panel1's data in line. Panel1's data out line connects to nothing.

2:	We choose WS281x in this instance to match our panel's pixels.
	Length: we enter 512 because this output port will control 2 panels (512 pixels), the start pixel's channel is automatically set to 512.
	GPIO: we set to 1 = GPIO1 port.
	Physically, we connect panel2's data in line to terminal GPIO1. And connect panel2's data out line to panel3's data in line. Panel3's data out line connects to nothing.

3:	We choose WS281x in this instance to match our panel's pixels.
	Length: we enter 512 because this output port will control 2 panels (512 pixels), the start pixel's channel is automatically set to 1024.
	GPIO: we set to 2 = GPIO2 port.
	Physically, we connect panel4's data in line to terminal GPIO2. And connect panel4's data out line to panel5's data in line. Panel5's data out line connects to nothing.

4:	We choose WS281x in this instance to match our panel's pixels.
	Length: we enter 512 because this output port will control 2 panels (512 pixels), the start pixel's channel is automatically set to 1536.
	GPIO: we set to 3 = GPIO3 port.
	Physically, we connect panel6's data in line to terminal GPIO3. And connect panel6's data out line to panel7's data in line. Panel7's data out line connects to nothing.

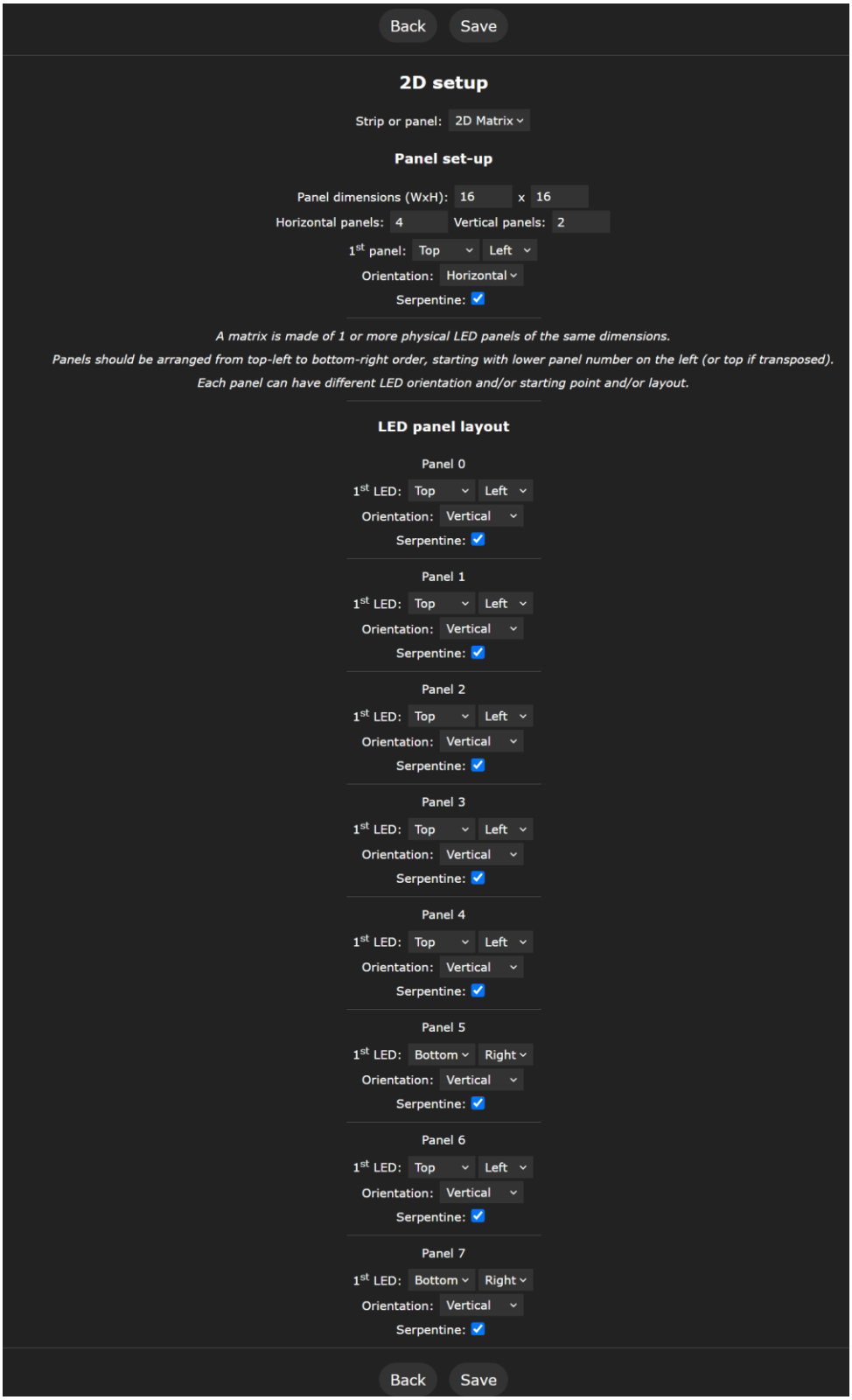




Now the GPIO outputs setting is done.

STEP 2: we enter the main menu Config, then choose 2D Configuration -

Set the 8 panels as below screenshot.
Each panel can have different LED orientation and/or starting point and/or layout.



Don't forget to click Save!

4. How to set up a mic module for sound reactive

In this instance, we use INMP441 module.

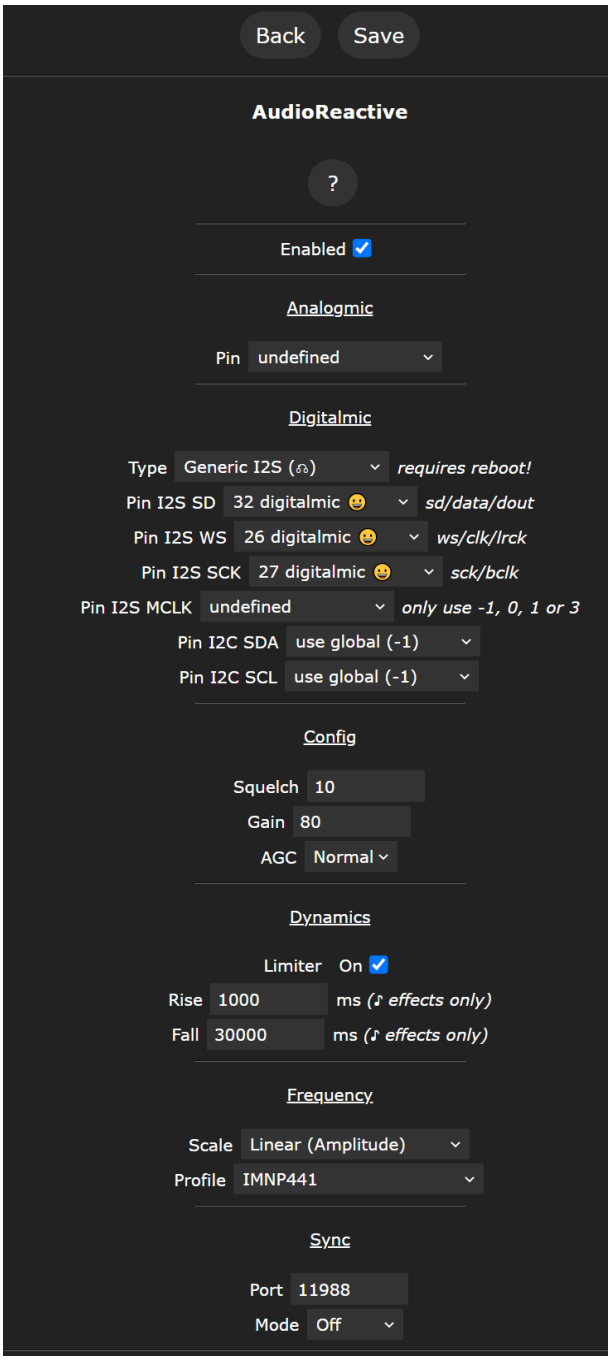
https://invensense.tdk.com/wp-content/uploads/2015/02/INMP441.pdf

Note: INMP441 needs I/O ports. Input-only ports doesn't work.

So we choose below GPIO ports:

Pin SD	to	GPIO32
Pin WS	to	GPIO26
Pin SCK	to	GPIO27
Pin VDD	to	3.3V
Pin GND	to	GND

Remember in main Menu - Info to enable AudioReactive function.



You can find more info/tutorials from WLED program's website --
https://kno.wled.ge/

5. How to update the WLED firmware

WLED firmware is always in updates time by time.

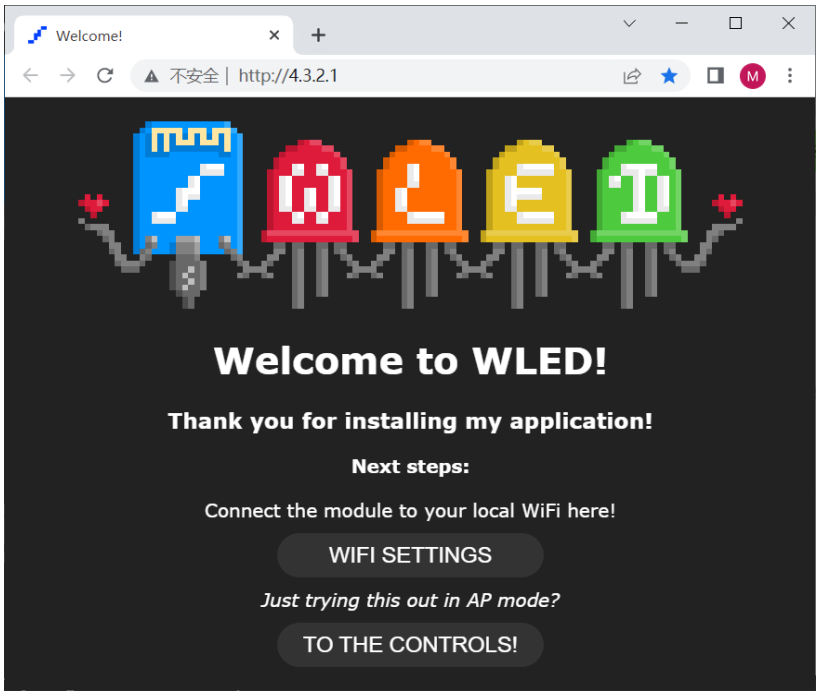
The unit is flashed firmware with 8 pixel output ports as factory default.
If you need max 10 pixel output ports, you can easily update the firmware from below link - Any bin file version above 0.14 for ESP32 will work.
https://github.com/Aircoookie/WLED/releases

Firstly, go to below link and download a ESP32 bin file and save it to your disk.
https://github.com/Aircoookie/WLED/releases

Secondly, you need to log in the unit via AP (Access Point) mode --
Power the unit, wait to its access point WLED-AP appear in your internet AP list (sometimes it needs above 1 minute to show up)

Then connect access point WLED-AP and log in the unit via internet webpage such as Chrome via: http://4.3.2.1 (Note: not https://).

Then click TO THE CONTROLLER



The you can choose Menu Config - Update - Enable OTA update -
Pick the bin file you downloaded to update the firmware.

For detailed firmware OTA update, you can refer to below video tutorial -
https://www.youtube.com/watch?v=n5MlhoyCsPM

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