INEXPENSIVE BUT CAPABLE

Getting to know the Dig-Uno / Quad / Octa controllers

Tom Hammond - tominohio@gmail.com


A PICTURE IS WORTH A THOUSAND WORDS

About Me

- I.T. for 35 years at The University of Akron
- 12 years of shows
- 64,500 pixels (8,000 network pixels)
- National recognition
  - iTwinkle.org to watch & control show

WHAT YOU WILL LEARN

WHAT ARE THEY? 01

DIG MODELS 02

OTHER LOW-COST CONTROLLERS 03

04 OPERATION MODES

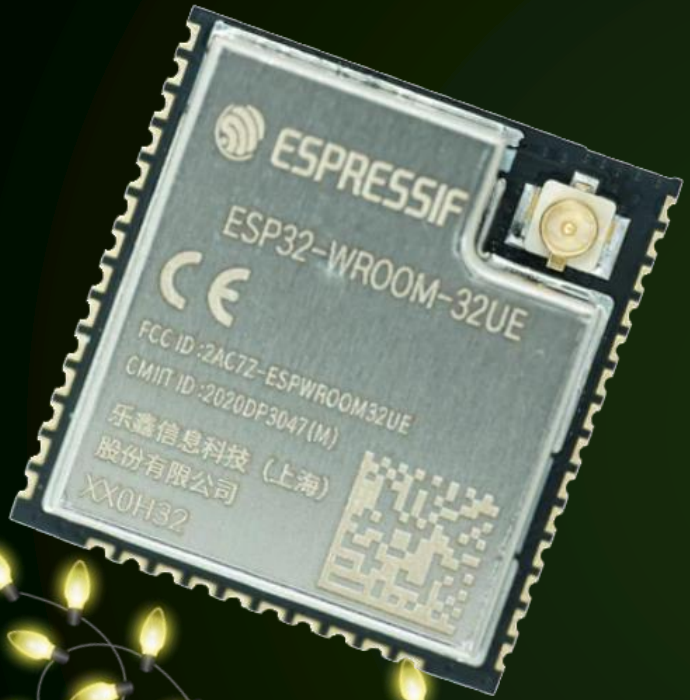
05 HOW TO USE THEM

01

WHAT ARE THEY?

WHAT IS QUIN-LED?

- Andries Fassen in Netherlands
- Into LED, ESP8266, phone chargers, storage solutions, mobile phones, and computer building
- First LED controllers: Arduino > ESP8266 > ESP32
- Parent website: Intermittent Technology blog.quindorian.org



WHAT IS ESP32 ?

- Microcontroller, like Arduino
- Successor to ESP8266 (Pixel Pop)
- 32-bit, 1 - 2 cores, 160 - 240MHz per core
- Low cost, low power
- Wi-Fi & Bluetooth built-in
- Ethernet capable

DIG FEATURES

INEXPENSIVE

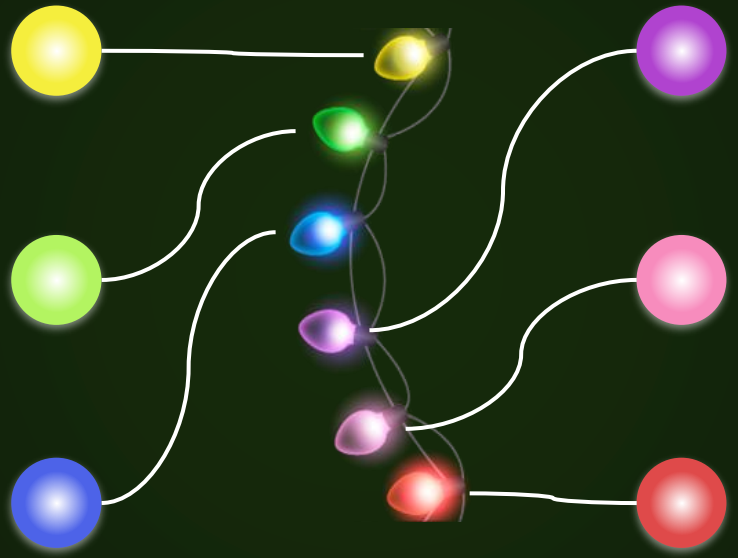
2 - port: $30 - $40

GOOD CAPACITY

2 - 8 ports, 282 - 705 pixels / port

FLEXIBLE COMMS

Wi-Fi and/or Ethernet



STANDALONE

Control with your phone or xLights

FAST

20 - 40+ FPS

RUGGED

No complicated OS, boots instantly

02

DIG MODELS

DIG VARIATIONS

DIG-UNO

DIG-QUAD

DIG-OCTA

COMMON DIG FEATURES

- Inexpensive (modular pricing)
- "Solid-state" (no Linux O/S with thousands of O/S files, boots in seconds)
- User-friendly "WLED" UI for off-season control (year-round lighting, Wi-Fi access point)
- Multiple modes
  - WLED / E1.31 receiver (with DDP support)
  - FSEQ playback (with ESPixelStick v4 firmware)

COMMON DIG FEATURES * Except Dig-2Go

- External Wi-Fi antenna option*
- Ethernet option*
- Wi-Fi supports pixel data
- Power injection outputs (not Uno)
- Resistor selectable (249/33-ohm, pixel distance)
- Button / sensor / microphone inputs
- 24V support (floods)*
- Relay support (cut pixel power)
- Helpful support (Discord)

QuinLED

DIG PIXEL CAPACITY

- Website inconclusive
  (2,000 – 3,000 total pixels at 40 FPS)
- WS2811 signaling: 794 pixels / string, Falcon: 704
- Controller overhead
  - WLED effects (most overhead)
  - WLED E1.31 streaming
  - ESPixelStick FSEQ playback
  - Falcon V5 (least overhead)

DIG-UNO

PROS

- Inexpensive ($30 - $40)
- Compact
- 564 - 705 pixels per port
- 1,130 - 1,410 total pixels

CONS

- 2 outputs
- No power outputs (pixel power only)
- Screw terminals

DIG-QUAD

PROS

- Inexpensive ($40 - $50)
- 564 - 705 pixels per port
- 2,256 - 2,820 total pixels
- 7 dedicated power outputs
- 30A continuous power (2 sets of input terminals from same power supply)

CONS

- 4 outputs
- Screw terminals

QuinLED ESP32-AE+

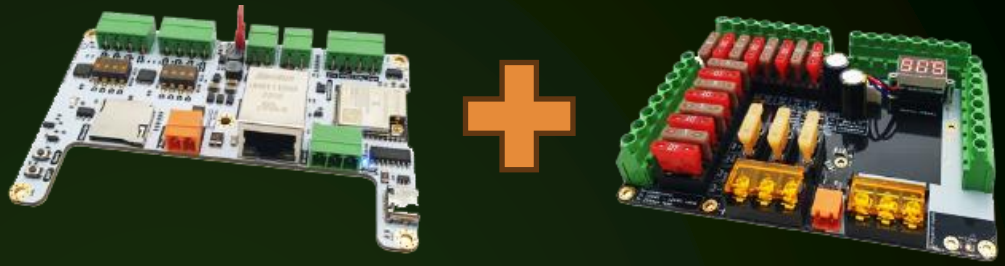
Upgrade for
Dig-Uno and Dig-Quad

- Inexpensive ($16 - $20)
- 3 additional pixel ports
- SD slot for FSEQ playback (standalone)
- Mic, IR receiver, button
- 2nd power input for relay

CONS

- Leftover ESP32 board from original Uno / Quad
- Lose Ethernet option
- 3 ports not fused (Uno)

DIG-OCTA



- Affordable ($66 – $111)
- Separate processor & power boards
- Strong power input & distribution
- Modular / scalable
- Phoenix terminals
- SD card for FSEQ playback (standalone)
- Whip antenna included

DIG-OCTA BRAINBOARD

PROS

- 8 ports
- Stackable
- Dedicated 5V relay output
- Fuses for input & output
- 2 button terminals
- Receives power from "PowerPost"

CONS

- 2,256 - 3,000 total pixels
- 282-375 pixels / port
- No mic, IR receiver

DIG OCTA POWERBOARD

- 3 variations:
  - 50A / 12 power outputs
  - 50A / 16 power outputs
  - 100A / 16 power outputs
- Stackable
- "PowerPost" power connection between boards
- Up to 6 AWG input wires & 14 AWG output wires
- 5A / 10A lighted fuses for strings & power injections
- Multiple input terminals

DIG SUMMARY

	Dig-Uno	Dig-Quad	Dig-Octa	Falcon F16v5
Price	$30 - $40	$40 - $50	$66 - $111	$260
Ports	2 (+3*)	4 (+3*)	8	16
Pixels port / total**	705 / 1,410	705 / 2,820	375 / 3,000	704 / 11,264 (x3)
Expandable	No	No	Yes	Yes
Pixel volts	5-24V	5-24V	5-24V	**5-12V**
Data comms.	Wired / wireless	Wired / wireless	Wired / wireless	**Wired**
Power outputs	0	7	12-16	**8**
Sensor inputs	6	6	2 + i^2C	**2**
FSEQ playback	Yes*	Yes*	Yes	Yes
Off-season UI	WLED	WLED	WLED	**No**

* With optional ESP32-AE+ addon hat

** @ 40 FPS

03

OTHER LOW-COST CONTROLLERS

OTHER LOW-COST CONTROLLERS

DIG-2GO

Pros

- Cheap ($25)
- Portable
- Full WLED / E1.31 capability
- 40+ FPS capable
- USB-C / power bank input
- Built-in microphone / IR receiver
- Sensor / button support

Cons

- 1 port
- 300 pixels max
- 5V strings only
- Not weather-proof (JST string connector)

OTHER LOW-COST CONTROLLERS

Falcon F-Prop

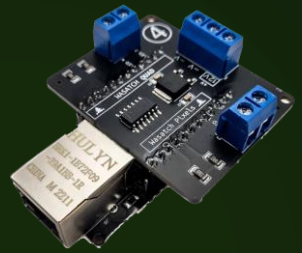
Pros

- Inexpensive ($48)
- 2-ports
- 5V / 12V pixels (2,048 total)
- FSEQ playback
- Onboard & SD card storage
- Audio-out jack
- Sensor / button support
- Integrated vibration sensor
- Time based events triggering
- Good for interactive props, tune-to signs, household lighting

Cons

- No Wi-Fi / Ethernet / WLED

OTHER LOW-COST CONTROLLERS



Wasatch Pixels

Pros

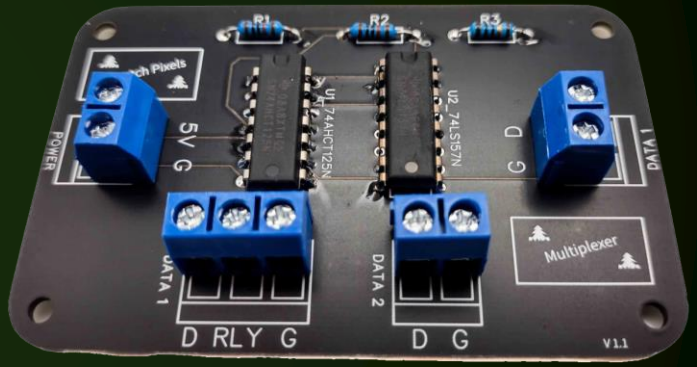
- 2, 4, 6, 8-port models
- Ethernet built-in
- Inexpensive

Cons

- Locked to 5V or 12 / 24V
- No external Wi-Fi antenna
- 2 / 4 / 6 port models:
  no power to strings (data only)

WASATCH MULTIPLEXER

Allows multiple LED controllers to be connected to the same pixel string



wasatchpixels.com/product/wasatch-multiplexer

04

OPERATION MODES

OPERATION MODES

xLights

WLED

FSEQ playback

(via PixelStick firmware)

xLIGHTS

- E131 receiver
  (DMX / WS2811 over Ethernet / Wi-Fi)
- Coexists with other controllers
- Supports 20 FPS (wi-Fi) to
  40+ FPS (Ethernet)

WLED

- Built-in WLED GUI
- Controllable via phone / tablet / computer
- Wi-Fi access point, web interface
- Hundreds of simple effects
- Scheduler
- External triggers
- Smart Home friendly (not Google)

05

HOW TO USE THEM

Instructables

www.instructables.com/Wifi-Controlled-Lights-With-QuinLED-Dig-Uno

or search for “Dig-Uno” on Instructables.com

STEPS AT FIRST POWER-ON

1

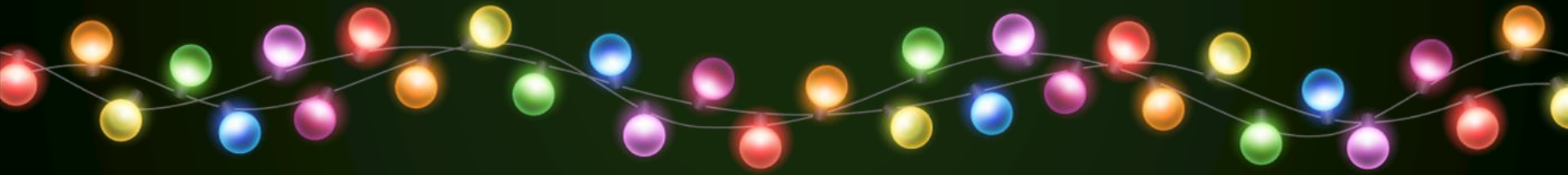
Connect access point

Dig-Uno initially hosts its own Wi-Fi network, SSID is "WLED"

2

Open website

Dig-Uno hosts a webserver, go to 4.3.2.1 in web browser



3

Set SSID or IP address

If you want it on your home network

4

pixels on each string

Define the length of each string

Welcome to WLED!

Thank you for installing my application!

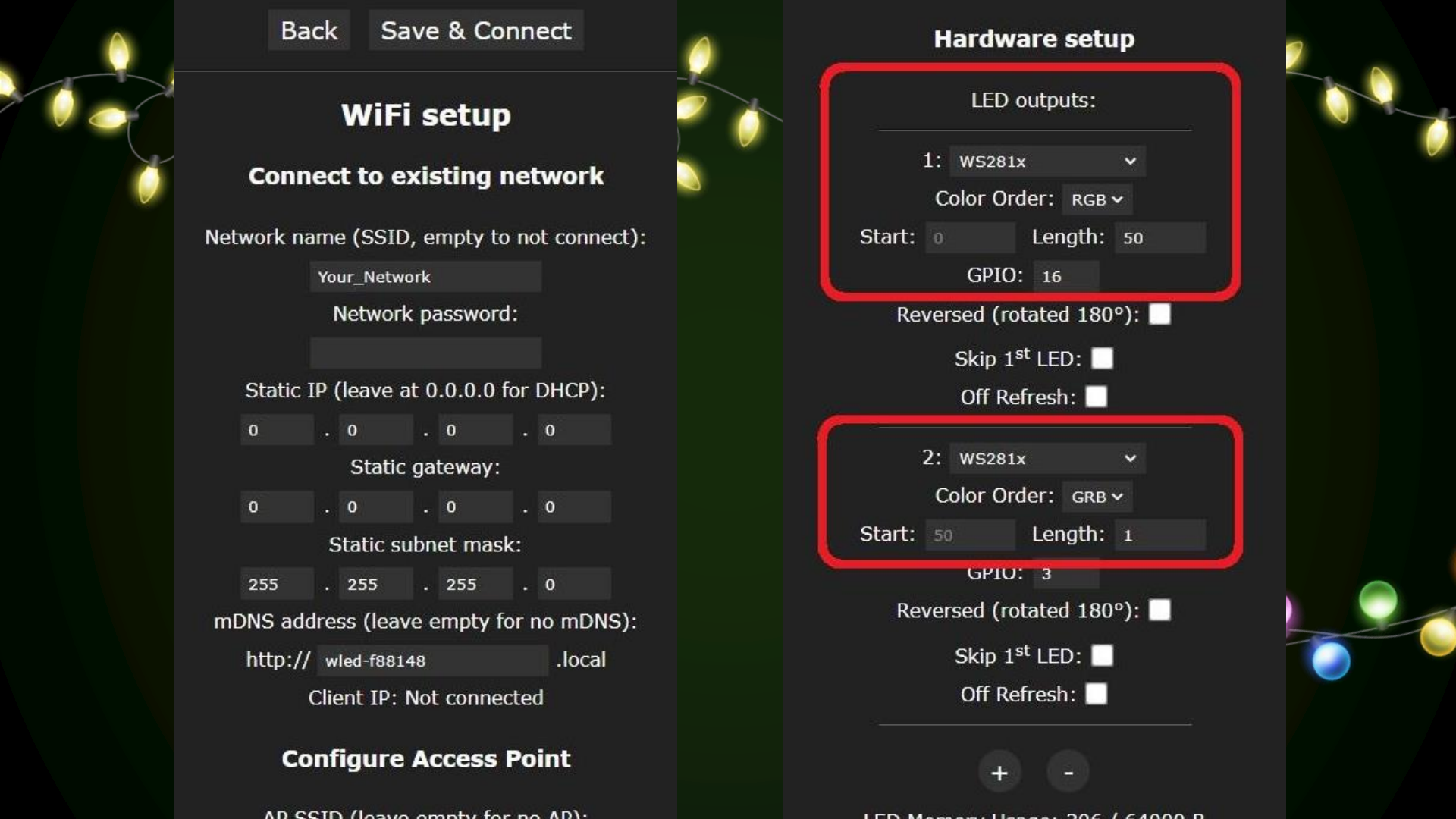
Next steps:

Connect the module to your local WiFi here!

WIFI SETTINGS

Just trying this out in AP mode?

TO THE CONTROLS!


Back
Save & Connect
WiFi setup
Connect to existing network
Network name (SSID, empty to not connect):
Your_Network
Network password:
Static IP (leave at 0.0.0.0 for DHCP):
0 . 0 . 0 . 0
Static gateway:
0 . 0 . 0 . 0
Static subnet mask:
255 . 255 . 255 . 0
mDNS address (leave empty for no mDNS):
http:// wled-f88148 .local
Client IP: Not connected
Configure Access Point
Hardware setup
LED outputs:
1: WS281x
Color Order: RGB
Start: 0 Length: 50
GPIO: 16
Reversed (rotated 180°):
Skip 1st LED:
Off Refresh:
2: WS281x
Color Order: GRB
Start: 50 Length: 1
GPIO: 3
Reversed (rotated 180°):
Skip 1st LED:
Off Refresh:
+
-

xLIGHTS CONFIGURATION

1

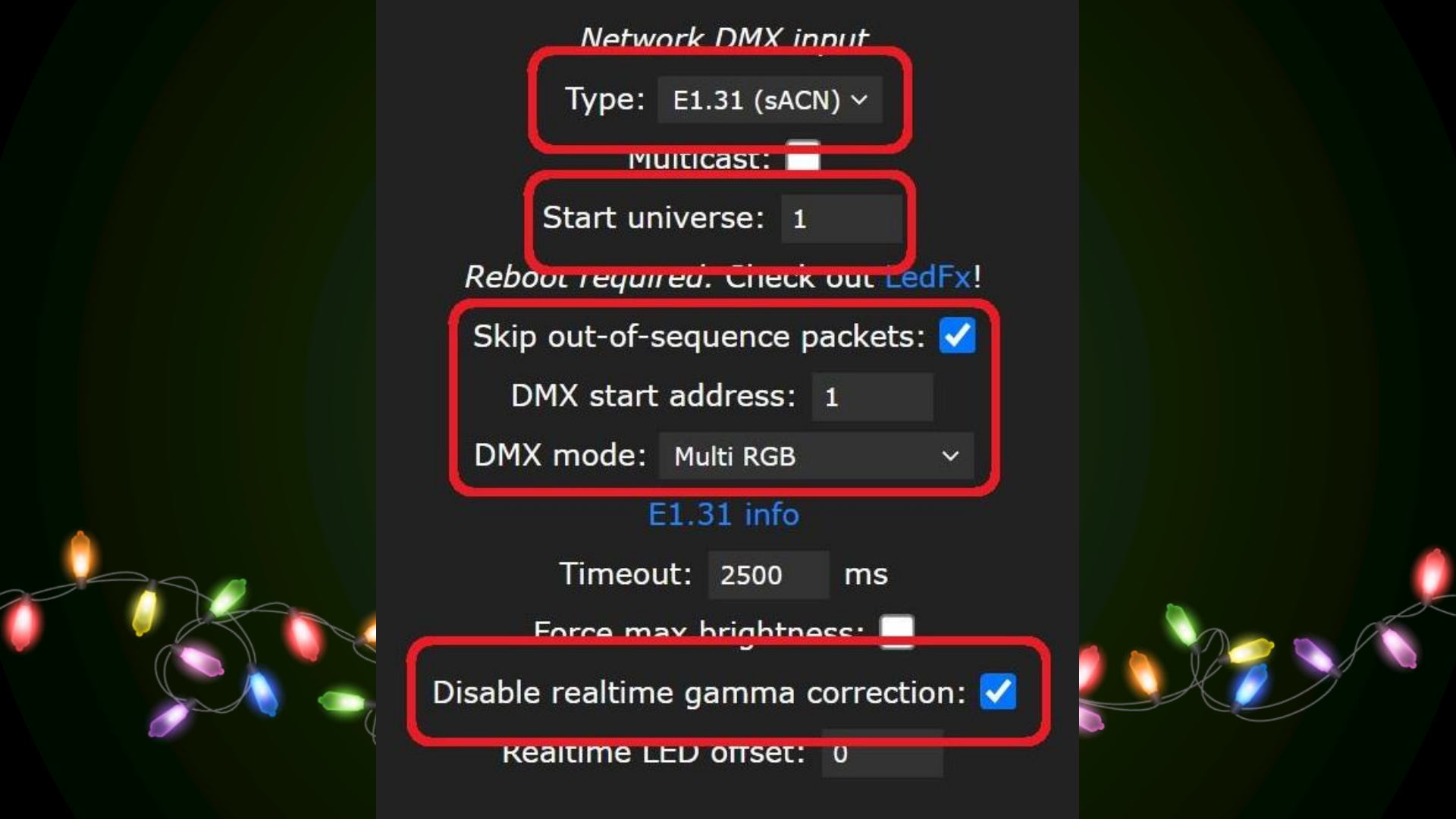
WLED (Sync page)

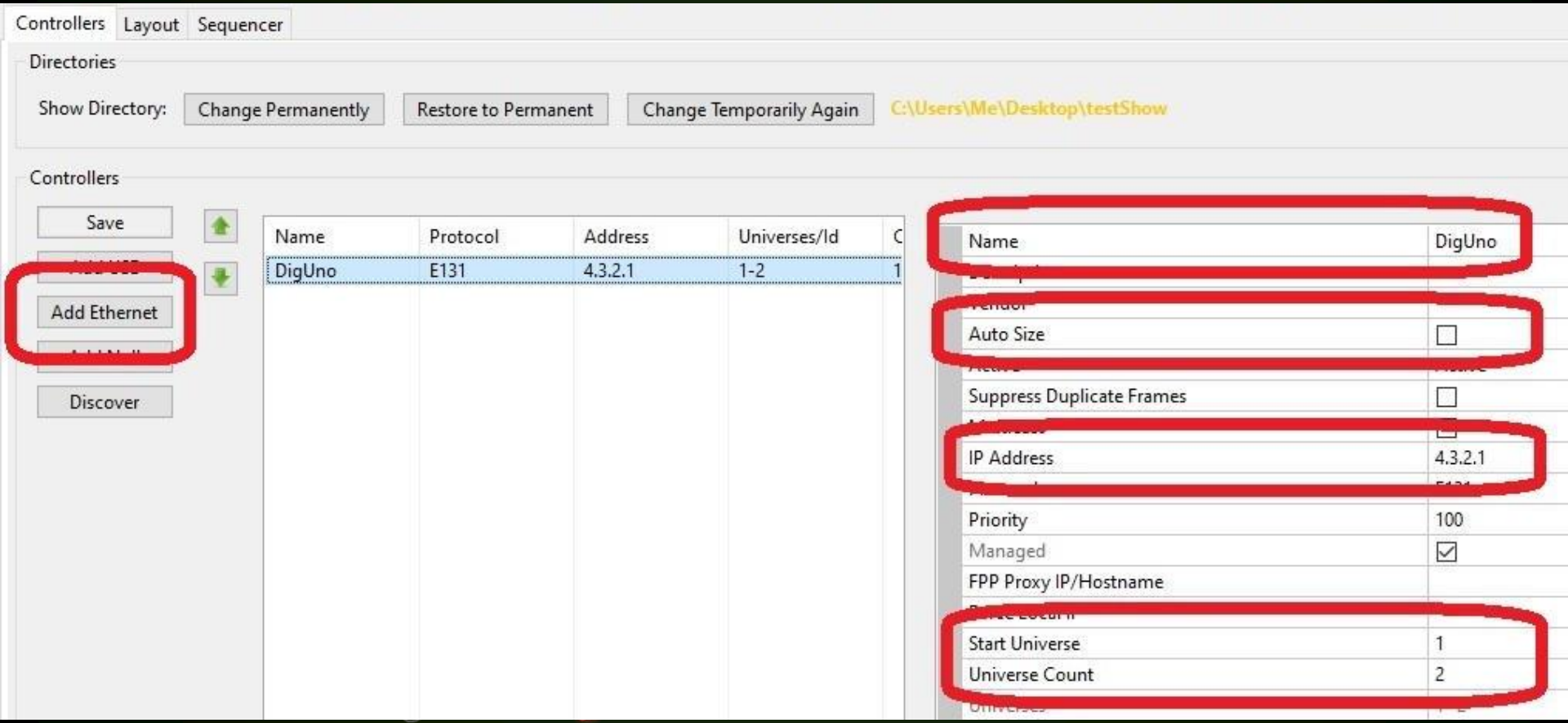
- Type: E1.31 (sACN)
- Start universe

2

xLIGHTS (controllers tab)

- Add Ethernet
- Name
- Auto Size: Disable
- IP Address
- Start Universe
- Universe Count


Network DMX input
Type: E1.31 (sACN)
Multicast:
Start universe: 1
Reboot required. Check out LedFx!
Skip out-of-sequence packets:
DMX start address: 1
DMX mode: Multi RGB
E1.31 info
Timeout: 2500 ms
Force max brightness:
Disable realtime gamma correction:
Realtime LED offset: 0


Controllers
Layout
Sequencer
Directories
Show Directory:
Change Permanently
Restore to Permanent
Change Temporarily Again
C:\Users\Me\Desktop\testShow
Controllers
Save
Add Ethernet
Discover
Name
Protocol
Address
Universes/Id
DigUno
E131
4.3.2.1
1-2
Name
DigUno
Auto Size
Suppress Duplicate Frames
IP Address
4.3.2.1
Priority
100
Managed
FPP Proxy IP/Hostname
Start Universe
1
Universe Count
2

WLED USAGE

COLOR WHEEL

Change to a solid color

EFFECTS

Over 100 basic effects

kno.wled.ge/features/effects

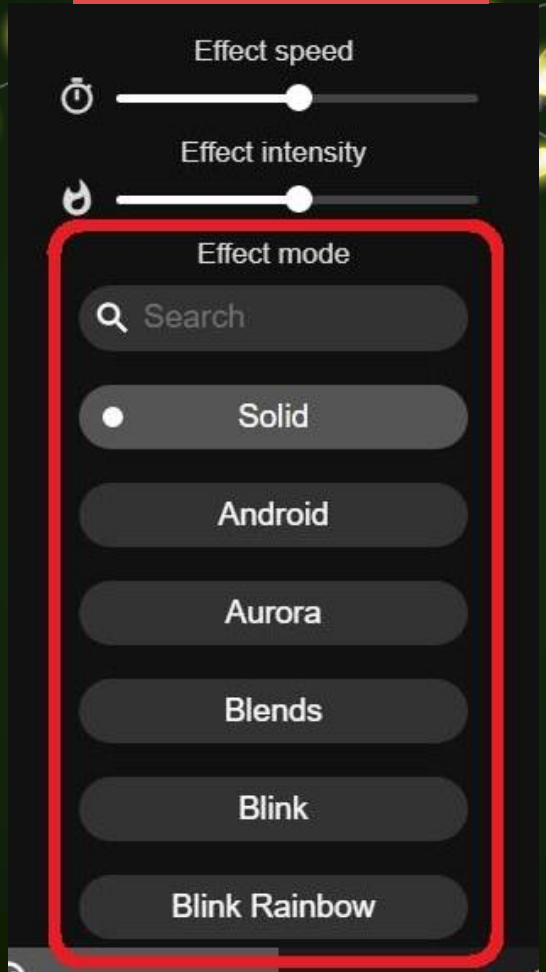
PALETTE

Changes the color scheme of the currently running effect

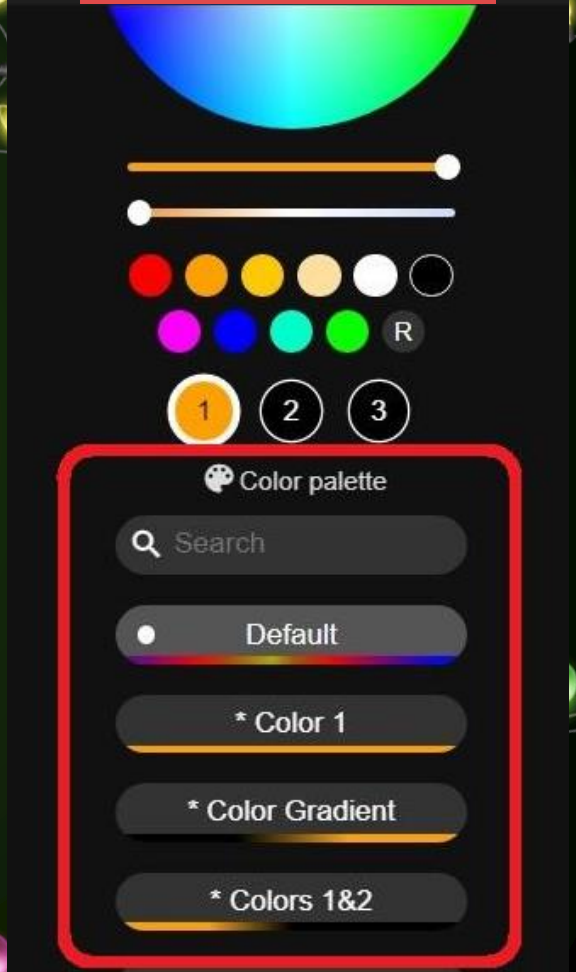
kno.wled.ge/features/palettes

COLOR WHEEL

EFFECTS



PALETTES



WLED USAGE

SEGMENTS

Pixels can be arranged into segments that have independent effects and colors

Works across multiple controllers

kno.wled.ge/features/segments

GROUPS

Pixels can be arranged into "groups" where multiple pixels act as one

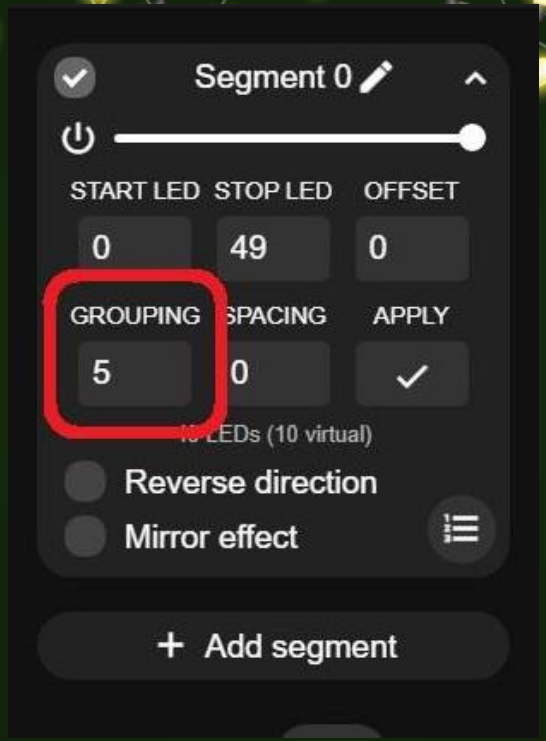
PRESETS

Save your current colors, effects, and segments into a "preset" that can be activated later

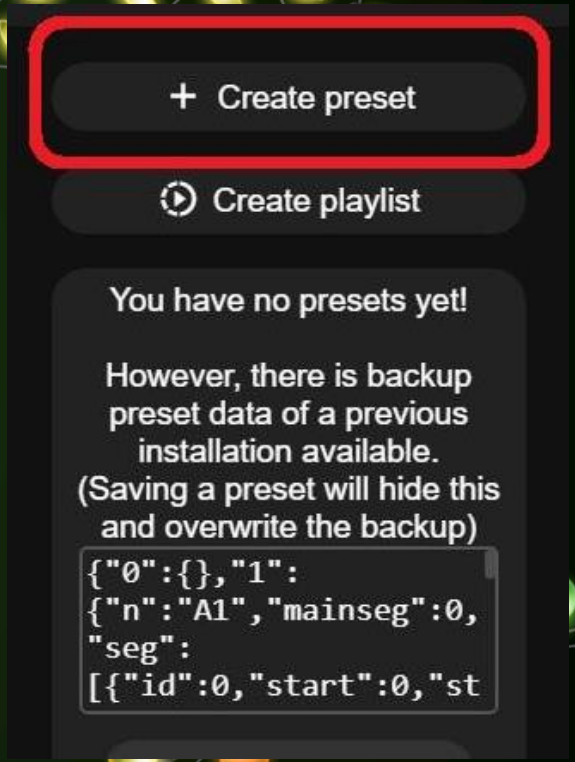
kno.wled.ge/features/presets/

SEGMENTS

GROUPS



PRESETS



FOR MORE INFORMATION

Learn more
quinled.info

Detailed product overview
youtube.com/watch?v=VYZBkMEqvCY

Where to buy
quinled.info/pre-assembled-boards

Pixel capacities
quinled.info/2021/03/23/max-amount-of-addressable-leds

Power supply relays
quinled.info/2020/06/12/quinled-dig-uno-using-a-power-supply-relay

Support (via Discord)
discord.gg/WdbAauG

ESPixelStick v4
forkineye.com
youtube.com/watch?v=S9NcJOeuHBY

THANKS!

QUESTIONS?

tominohio@gmail.com
330-658-3872
iTwinkle.org
facebook.com/tominohio1