

Thinking about pixels? (They don't plug and play)



Les Willis
WillisChristmasShow.com



My background

- Electrical Engineer - Retired
- Programmer
- Many years experience with
 - Computers
 - Networking
 - DIY

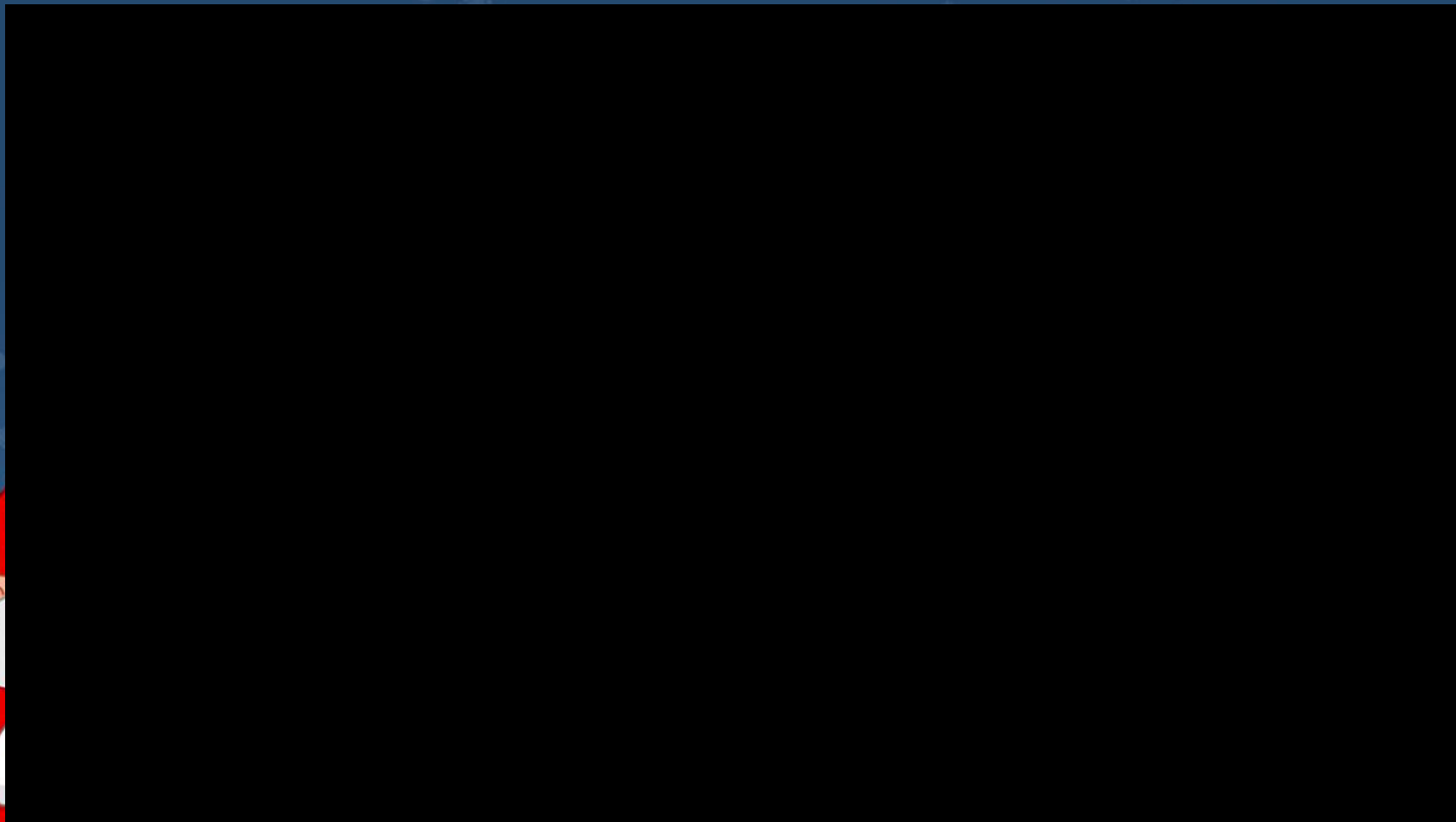


My lighting background

- Always have had a static light display
- 2015 Season I did my first light animation to music (using dumb RGB and incandescent)
 - GCLF
 - Great Christmas Light Fight
 - 2016 took the full plunge into smart RGB pixels



I Heard the Bells on Christmas Day



What do we mean by pixels

- Individually addressable
- Contain 3 LEDs (Red, Green, Blue)
- Millions of color combinations
- Require special controllers
- Low DC voltage

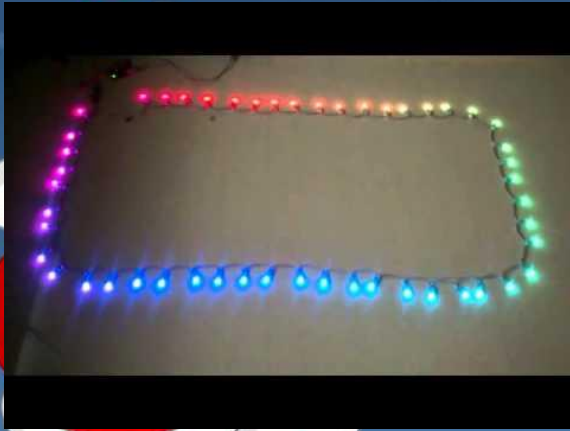
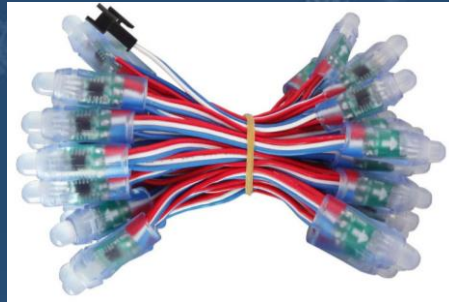


Objective

To help understand the various specifications when it comes to smart nodes/pixels. So that you can make an informed decision regarding your pixel choices.

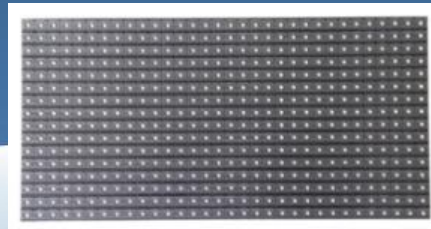


Smart pixel examples



- Pixels
- Bullet nodes
- Beads
- Ribbons
- Floods

Smart pixel examples



- Pixel Module
- Drops/Icicles
- Mesh/Nets
- Fairy lights
- C9's
- P10's



There are no standards (but lots of options)

- LED driver circuits
- Shapes and sizes
- Node Spacings
- Power consumption
- Connectors
- Voltages



LED Driver Circuits

- WS2801 / WS2803
WS2811 / WS2812 / TM1804 / TM1803 / TM1809 /
TM1812 / SM16715 / INK1003
TLS3001 / TLS3002 / CY3005
LPD6803 / D705 / LPD1101 / USC6909 / UCS6912
GE Color Effects (GECE)
LPD880X
APA 102
1903
SM16716
LX1203”



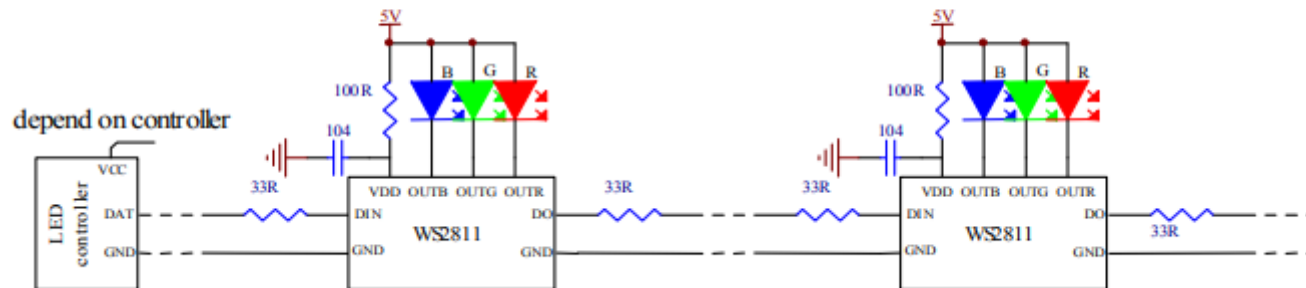
WS2811/2812

- The number refers to the integrated circuit (IC) being used to control the LEDs



Typical application circuit:

1. power supply is 5V with 1 LED and constant current (18.5mA) driving



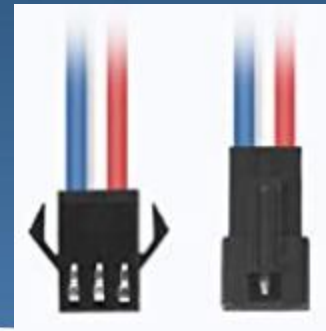
Styles and spacings

- Spacing between pixels for straight runs
- Drops/Icicles and Peace stakes
 - Spacing between drops
 - Spacing along drops
- Length of pigtails
- Wire color (Green, Black, White, RWB)



Connectors

- Various controllers 3 and 4 pin
- Xconnect 13.5 mm
- Ray Wu 13.5 mm
- Paul Zhang 18 mm
- LOR/DIY 15 mm
- JST style



Connectors

	Three Popular Types Connector Options (3 CORE)		
Type	Ray Wu Type (13.5mm connector)	Paul Zhang Type (18.5mm connector)	Xconnect connector
Image			
standard pinout diagram	 <p data-bbox="338 1242 685 1349"> Positive(+)—Brown cable Negative(—)—Blue cable DATA———Yellow cable </p>	 <p data-bbox="801 1242 1149 1349"> Positive(+)—Brown cable Negative(—)—Blue cable DATA———Yellow cable </p>	 <p data-bbox="1265 1242 1613 1349"> Positive(+)—Red cable Negative(—)—Black cable DATA———Yellow cable </p>

Store NO:4478030



Voltages – 5V and 12 V are most common but pay attention



DC24V 20W
WS2811 RGB...



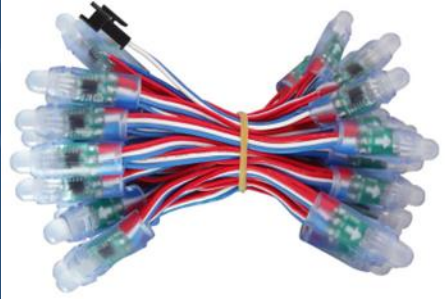
DC12V 30W RGB
WS2811 LED...



1000pcs 5V 12v
Ws2811 Ic Rgb Fu...



Confirm your product specifications!



Product Specifications

- **Node Voltage:** 12V DC
 - Regulator
- **Node Color:** RGB
- **Node Protocol:** WS2811
- **Node Spacing:** 10cm / ~4"
- **Lead Length:** 150mm / ~6"
- **Node Type:** Smart Bullet
- **Nodes Per. String:** 50



Example for Drops

Addressable 6 nodes*10 clusters LED Pixel Icicles;DC12V(regulated type) or DC5V input WS2811 controlled;all black wire;IP68;60 nodes/set;with 13.5mm 3 core black color pigtail

Main Spec:

input voltage: DC12V input or DC5V input

IC type: WS2811,256gray scale;24bit for RGB color

LED type: 8mm round hat fosed led,each led is 0.7W when at full white color

wire: all black color wire;20AWG

total nodes: 6 nodes*10 drops =60 nodes

max power: 42W/set

Protection Level: IP68;epoxy resin filled

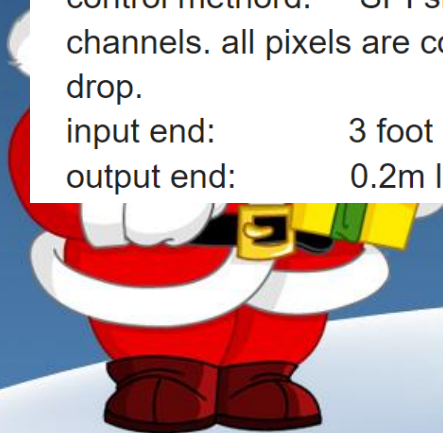
Standard connection: 6-6-6-6-6-6-6-6-6 (they are the number of pixels for each cluster)

strandard spacing: 4inch(10cm) spacing between nodes of each drop/clauster; 3 foot (92cm) spacing between each drop/clauster

control method: SPI signal input;each led works as one pixel, so total 50pixels for each sets, and tatal 150 dmx channels. all pixels are connected in series, there is a signal coming back from each drop's end to the start of next drop.

input end: 3 foot (92cm) long 3pin black wire 13.5mm male connector

output end: 0.2m long 3pin black wire 13.5mm female connector



Questions?

