



LEDs and Costumes

DESIGN AND TECHNICAL CONSIDERATIONS

Types of Light Emitting Diodes (LEDs)



▶ High Power

- ▶ Car head lights, Theatrical Lighting equipment
- ▶ Higher Amperage = more power consumption
- ▶ Generates high temperatures – Needs external cooling apparatus
- ▶ Not generally used in costumes



▶ Miniature

- ▶ Indicator Lights, Cell phone Flashes, LED strips
- ▶ Low power consumption
- ▶ Cooler operating temperature
- ▶ Comes in multiple colors
- ▶ Standard and pre-wired available
- ▶ Extremely versatile
- ▶ Ideal for Costume Applications



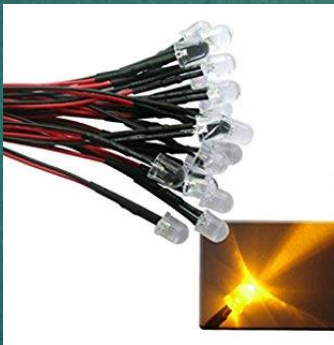
Common Types of Miniature LEDs

- ▶ Single Color
- ▶ Simple RGB/Color changing
- ▶ Flashing
- ▶ Addressable/Digital



Formats

Individual



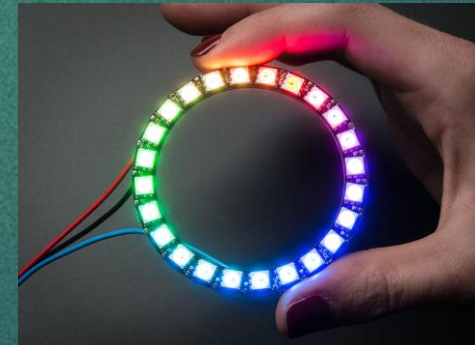
Strips



Bars



Rings



LED Control Systems

- ▶ Simple On/Off switch
- ▶ Dimmer/flash controller
- ▶ RGB color changing dimmer/flash/chase controller
- ▶ Digital/intelligent controller (including DMX)

All are available in wired and Wireless

Wireless Control Methods

- ▶ Radio frequency (RF)
- ▶ Bluetooth
- ▶ WIFI
- ▶ Infrared



Power Sources



Batteries – 12 Volt – Disposable or Rechargeable



Power Sources

Electronics Math

West Virginia Law

w=VA

Watts = Volts x Amps

High density LED strip 3 watts per foot --- 16ft(600 LEDs) x 3 watts = 48 watts

$$48 = 12 \times a$$

$$48/12 = a$$

$$4 = a$$

16ft High Density LED Strip (600 LEDs) need a 4 amp power source.



LED Applications in costumes

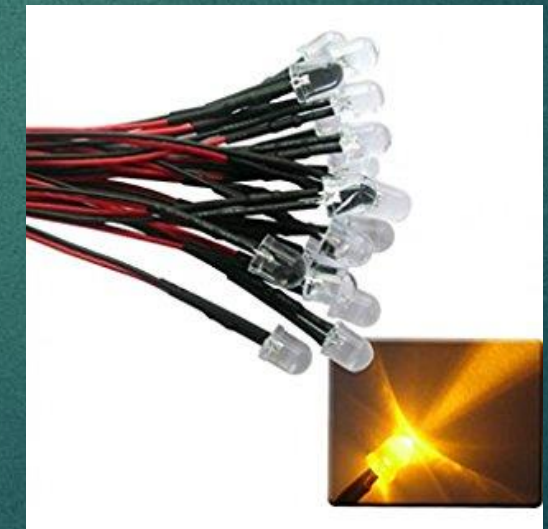
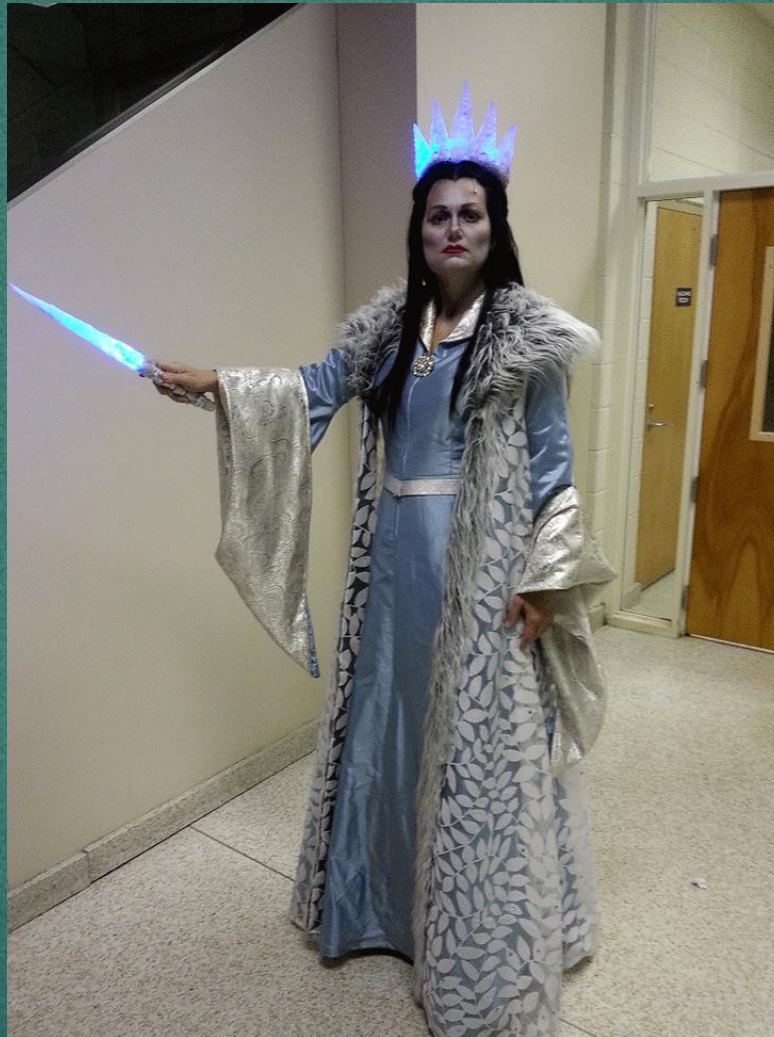


String Lights



LED Applications in costumes

Individual LEDs



LED Applications in costumes



LED Strips



LED Applications in costumes



LED Strips



LED Applications in costumes



LED Strips



LED Applications in costumes

Addressable DMX controlled
LED Strips and Strings



DMX Control



- ▶ Each DMX Universe has 512 addresses
- ▶ Each RGB LED has 3 addresses
- ▶ One Universe can control 170 LEDs
- ▶ To use DMX to control LEDs Wirelessly you need:
 - ▶ A DMX Light board or other control system
 - ▶ A DMX transmitter
 - ▶ A DMX receiver
 - ▶ A power source for both the LEDs and the receiver
 - ▶ A DMX decoder
 - ▶ The LEDs

DMX Control



Light Console

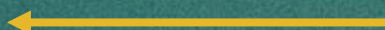
DMX



DMX Wireless



5v



DMX



5v Transformer



Power Source



12v



12v



12v



Smart Pixel LEDs



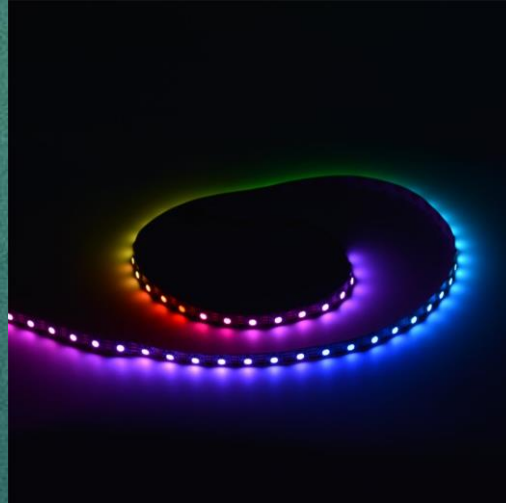
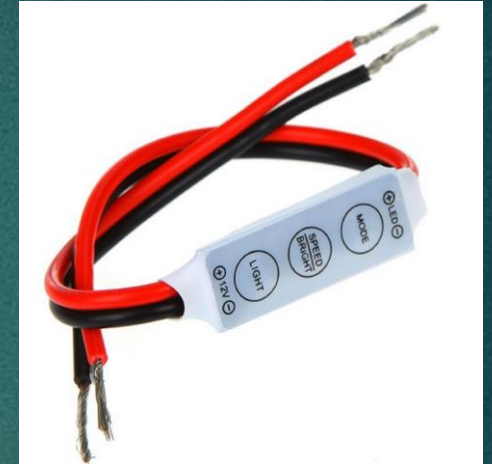
Data signal



DMX Decoder

LED supply resources

Amazon.com



LED supply resources

Holidaycoro.com



Smart / Pixel LED RGB Strip 60 LEDs/m 60 Pixels/m Waterproof Tube (16ft-6in/5 meter Roll) - 12v / INK1003 (WS2811 clone) - White PCB



EasyPix Controller / DMX to SPI Smart Pixel Decoder V2

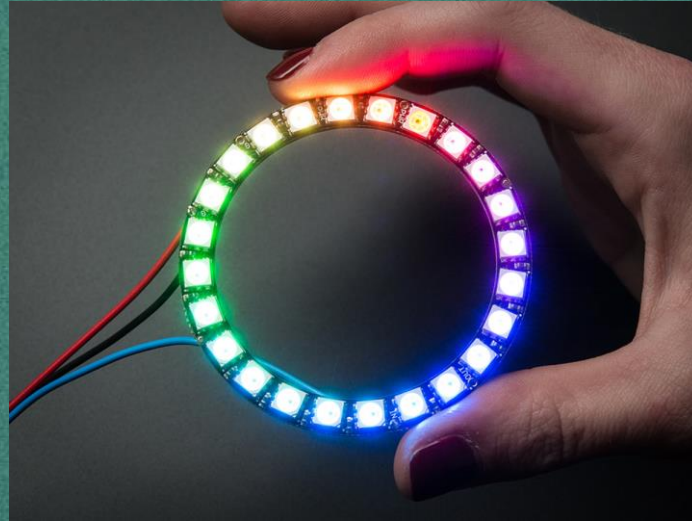
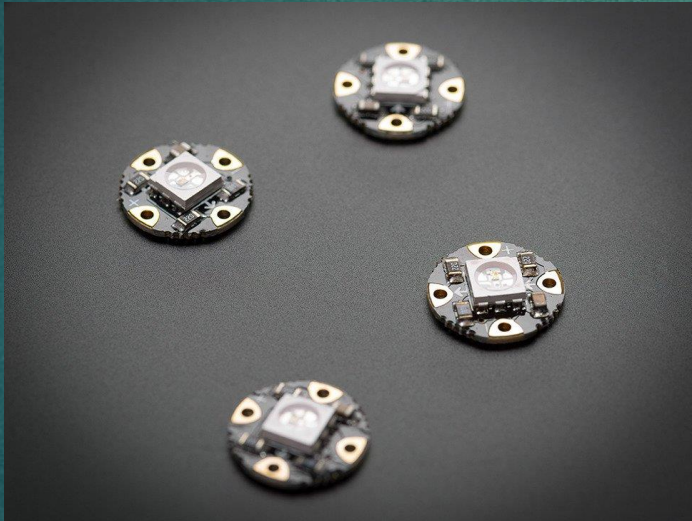


Smart / Pixel LED RGB 8mm/12mm Square/Lay-Flat Node - 12v / 2811 / 50 Node String



LED supply resources

adafruit.com



Products to avoid

El Wire



IR Controllers



Pre-made LED Costumes

