

# PHILIPS

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## Architectural Lighting with LEDs

*Scale / Lumens / Content / A Retrospective / Execution*



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The Future is Brighter than Ever

*Unleashing new possibilities with LED Lighting*



# Target Segments

Urban Architecture



Hospitality



Residential



Theatre



Retail



Signage



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## Architectural Lighting with LEDs

*Scale*



# Enhancing existing spaces, buildings and structures

- LEDs can transform an old and familiar face into a vibrant, new space that draws crowds without the expense of a full-scale renovation
- Retrofitting existing light fixtures with long lasting, energy efficient LED systems can significantly reduce energy and maintenance costs.
- Intelligent color changing systems build energy, draw attention and position the building as an innovative landmark



## Make it Large



### Large Size and Scale

Utilizing scalable intelligent control systems, color changing LED fixtures can bring new life and energy to large buildings, structures and landmarks.



### Large ROI

LED fixtures now equal or surpass the capabilities of almost all conventional lighting fixtures, while significantly reducing energy and maintenance costs.



### Large Effect

LED lighting and technology advancements provide an entirely new toolset for designers to combine lighting effects and signage capabilities into architectural structures

# Project Considerations

- What is the design intent?
  - Replacement of existing or new design?
  - RGB or White?
- What is being illuminated?
  - Size of facade?
  - Architectural details?
  - Content?
- What are the constraints of the installation?
  - Setback
  - Height
- What are the control requirements?
  - Triggers from building automation systems
  - Astronomical triggers
  - Date range triggers based on holidays and special events
  - Low resolution animation, scrolling text, video...?



# Project Considerations

- Specifications?
  - Comply with standards?
  - Third-party certified IES files?
  - Warranty
- Physical form
  - Round, linear, square
- Power consumption
- Installation requirements
  - Wiring
  - Mounting – height, depth, weight
  - Access
- Performance
  - Output
  - Lensing/Optical Treatments





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## Architectural Lighting with LEDs

*Lumens*



# Problem with Lumens

- The LED fixture has lower lumen rating than the conventional lighting alternative

- How can I get the LED product specified?

**eW Reach Powercore 250W**  
**4000K / 10,000 Lumen**

**1xCDM-T 150W**  
**12,000 Lumen**

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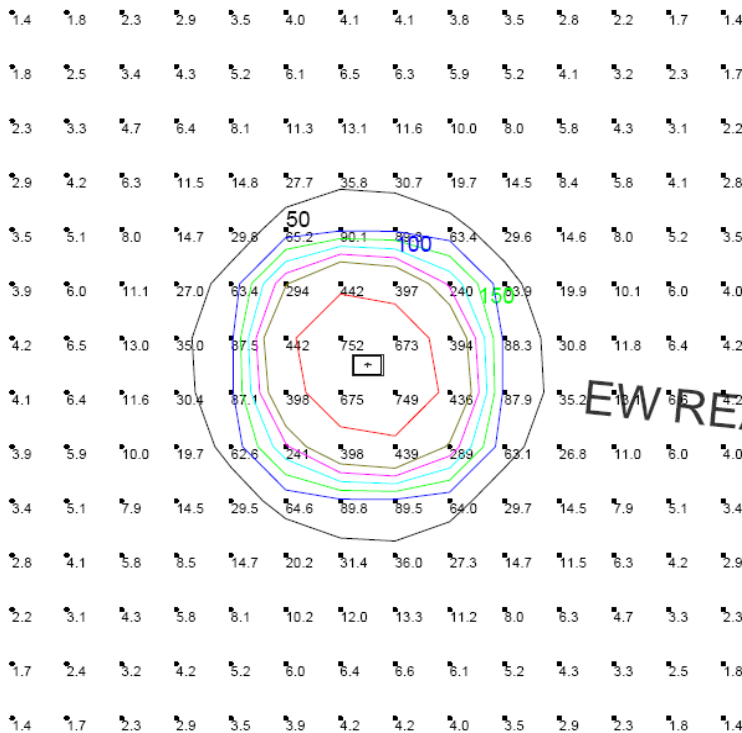
**1xCDM-T 150W**  
**12,000 Lumen**

Lumen based  
comparison is NOT a  
reasonable approach

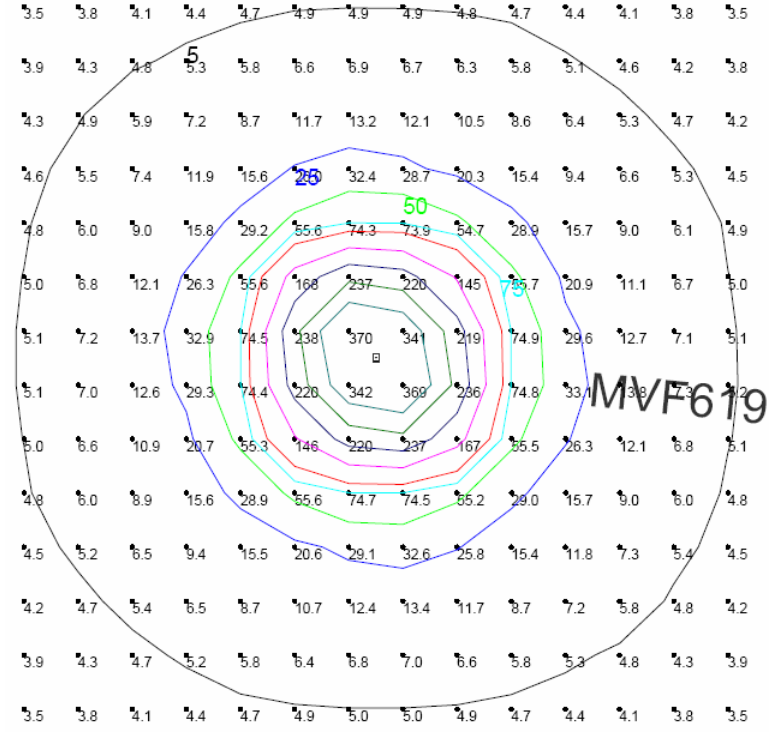
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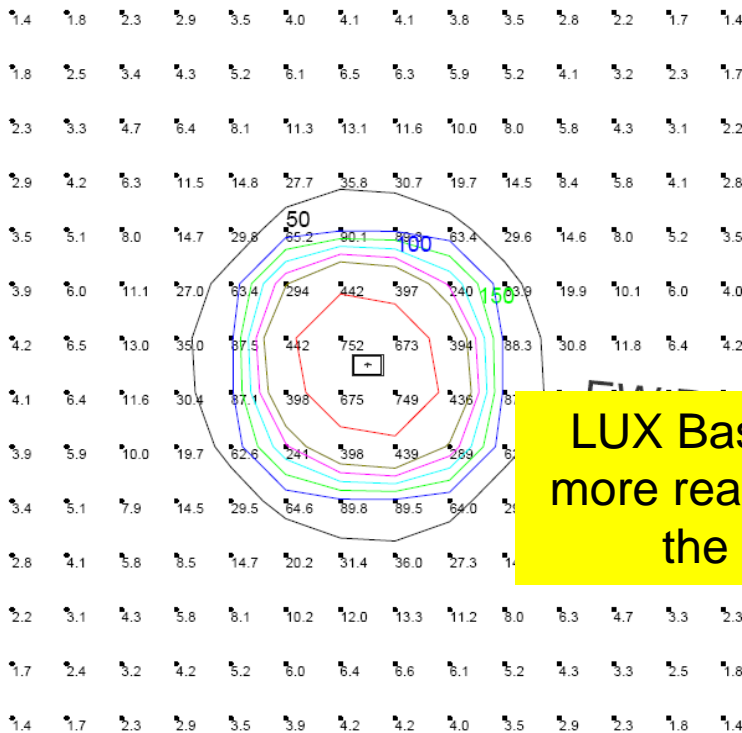
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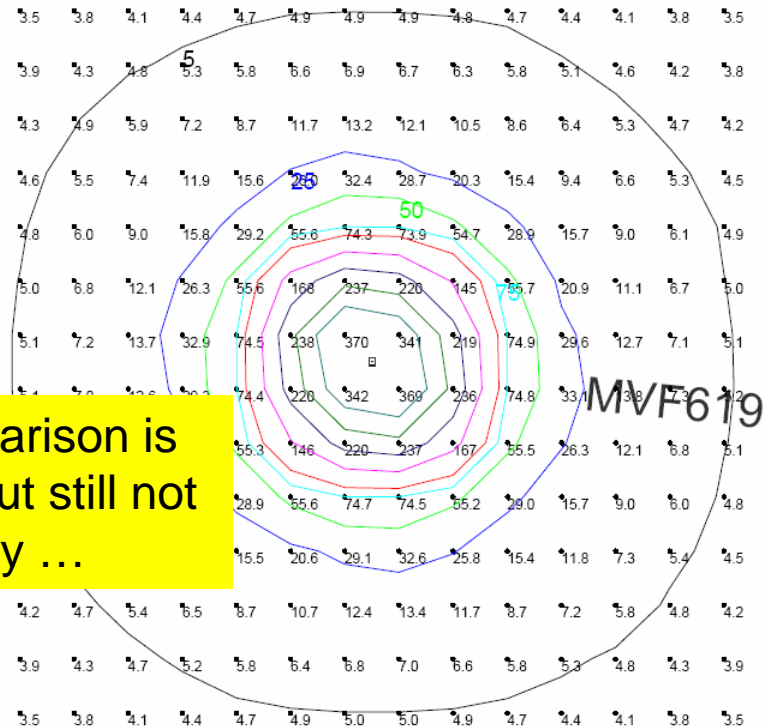
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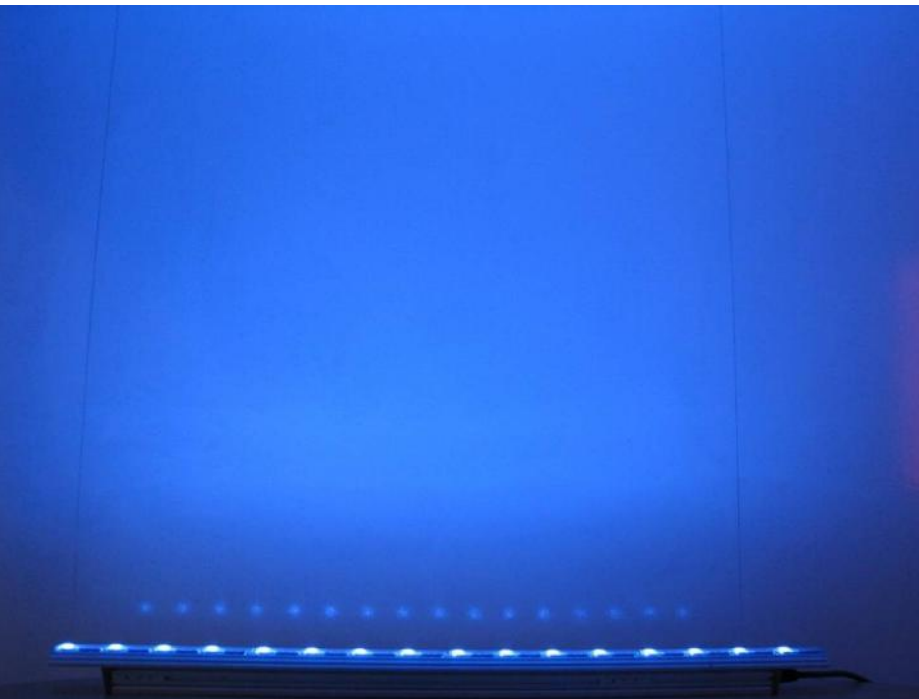


LUX Based Comparison is more reasonable but still not the entire story ...

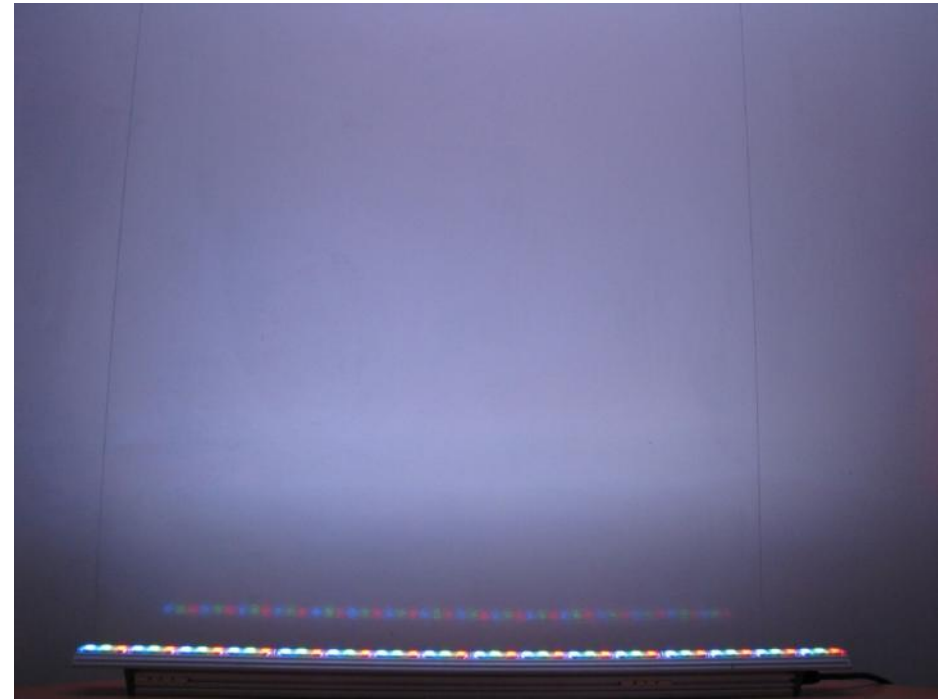
# Problem with Lumens

2.3	3.1	3.7	4.1	3.8	2.9	1.9
2.3	3.5	4.8	5.5	5.0	3.5	2.2
2.4	4.8	7.0	7.9	6.9	4.4	2.2
1.8	4.3	6.8	7.9	6.8	3.8	1.7
1.2	3.5	5.8	6.6	5.5	2.9	1.0

5.9	8.4	9.9	10.8	11.2	10.4	8.6
5.5	8.9	11.5	13.8	14.4	12.6	9.2
4.6	8.9	15.0	18.9	19.0	15.2	9.2
3.1	6.6	13.3	18.0	18.3	13.8	6.8
1.9	4.4	10.6	15.0	14.8	10.5	4.6



ColorGraze Powercore, Blue channel only  
Total Output - 200 lm



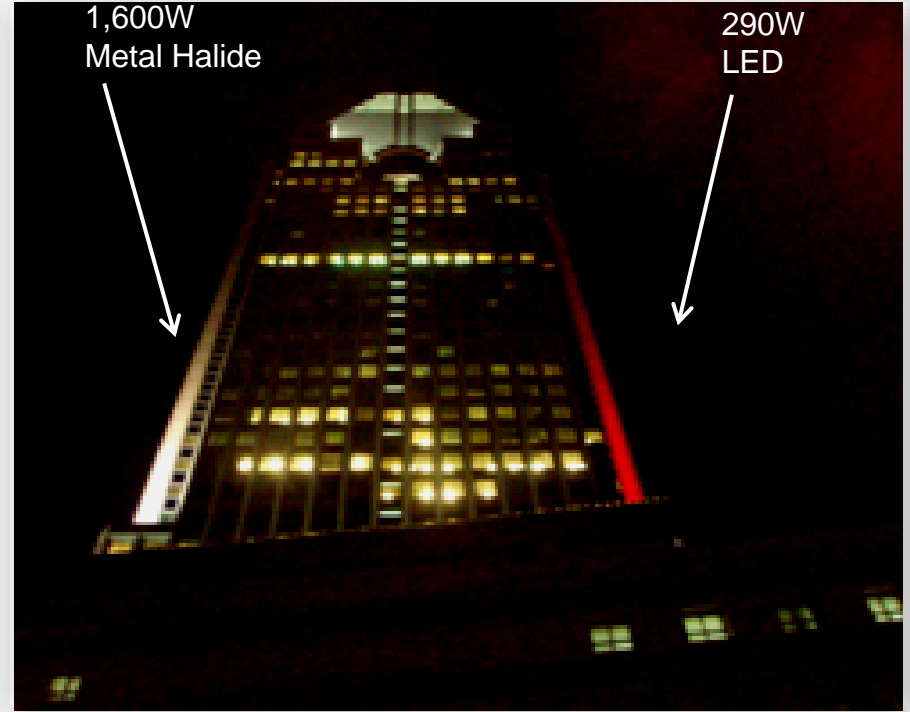
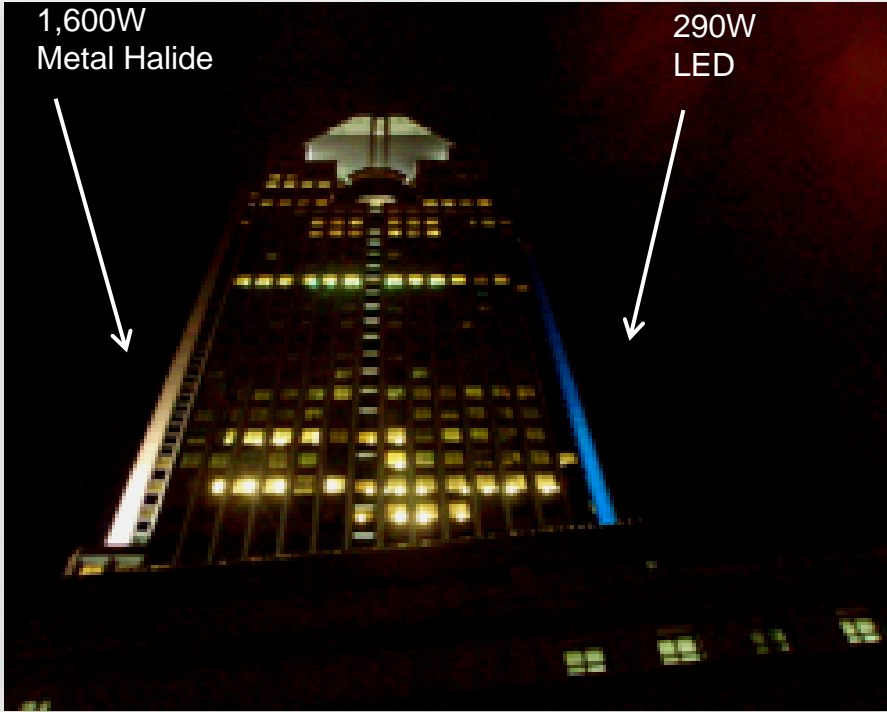
ColorGraze Powercore, full RGB  
Total Output - 550 lm

# So It's not about Lumens !!

- Lumen and Lux are not for colour light
- Color light design cannot simply use Lumen or Illuminance levels (LUX) as same design levels as white light
- Using white light levels can lead to use of too many fixtures resulting in overpriced solution that is too complex and consumes too much power
- Focus on Uniformity of effect
- If 3D model is used in a computer software, look at full RGB light levels even when interest is in monochrome solution

*It's about Lighting Effect*

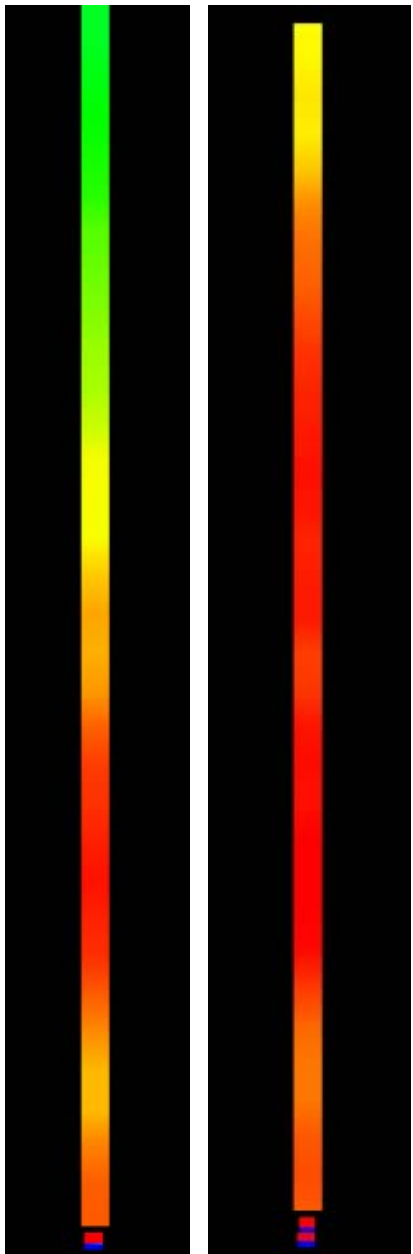
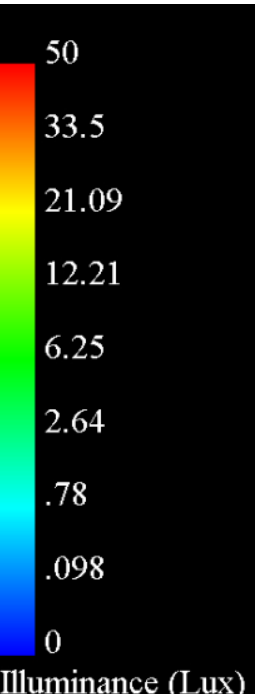
# It's about Lighting Effects



This 40-story building illuminates the 12th to 40th floors.  
The fixture is positioned 4 feet from the building and uses a 8° lens on both sections.



AGI Simulations 35m



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# It's about Lighting Effects



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## Architectural Lighting with LEDs

*Content / Effects*



# Today's designers are Content Creators

# Today's designers are Content Creators

## 4) CONTROLLERS & PROGRAMMING:

- A. Niche Lights: The installation should be designed to operate as an on/off switch.
- B. Mesh Grazer Lights: The installation shall give a grazing effect on the wire mesh up to a vertical distance of 7M. Lux plot for the installation should be submitted and practical levels shall be measured for White Color i.e. Full RGB ON.

The Controller shall have software programming system with on-board factory presets as well as custom show authoring capabilities.

The Controller should be capable of addressing the LED fixtures directly

The programming software should have flexibility to create and manage light shows using fully customized effects, multi-track editing, effect stacking and custom transition styles

The system shall create mood, interest and impact of color as per the desired program.

- Streak (animated visual effect),
- Sparkle (Flashes foreground color at random),
- Chasing (Bars of repeated color moving in one direction),
- Colored Bars (Bars effect randomly displayed),
- Ripple (display rings of moving color over a solid background),
- Burst (circles of concentric color originating in the centre and moving towards the outer edge of a group),
- Image Fade (visual sequence where one image morphs gradually into a second image),
- Random Colors (series of randomly generated solid colors at specific intervals),
- Sweep (progressive transition of a solid background color across a background color in a sweeping motion),
- Spiral (arcs of color originating in the centre of a group and moving in a clockwise direction),
- Text (scrolling of text message across a solid background)

The effects programmed should be stored in removable memory device e.g. USB or D or CD/DVD

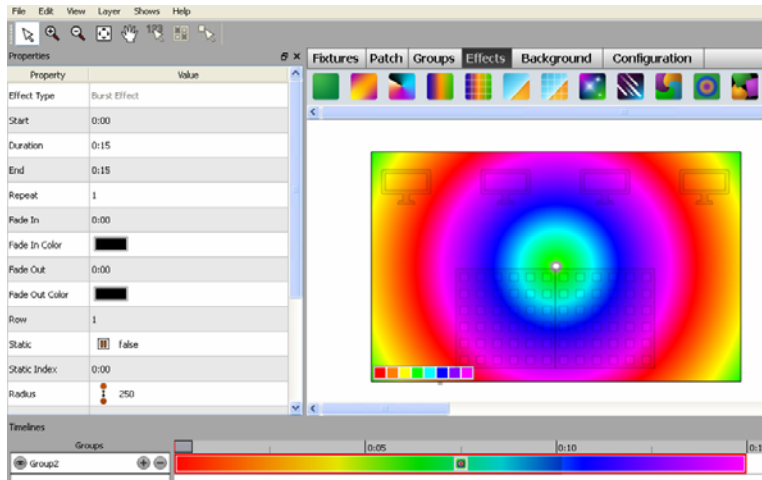
. Media Screen: The system shall have automatic show playback facility. It shall have Set Alarm to automatically trigger show playback based on a specific date (1st January, 26th January, 1st May, 15th August), day of the week (Sunday through Saturday), Week Days (Sun Rise / Sun Set) or festival day / season (Holi, Diwali, Christmas, etc.) which can be programmed for each year.

The controller should also cater to the information required on a media screen. The feeding of new information and the storage should be taken care of.

# Today's designers are Content Creators



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## Architectural Lighting with LEDs

*A Retrospective*





# A Retrospective – Case Study



At the Goodman Theatre, Chicago's oldest and largest non-profit theater, the show begins before you even step foot in the door.

This Chicago landmark comes to life with the help of Color Kinetics full spectrum digital lighting.

The front side of the three-story building, located at 170 North Dearborn Parkway, is comprised of 96 windows each containing two Color Kinetics® ColorBlast® fixtures radiating rich colors and color-changing effects.

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## Architectural Lighting with LEDs

*Execution*



# Execution Requirements

- Considerations when installing large scale LED Lighting Systems
- New small, flexible form factor products
- Robust, weatherproof designs
- Dynamic control
- Content management and manipulation
- Logic based event handling
- Wired and wireless networking

# LED Lighting System

*White Light No Control*

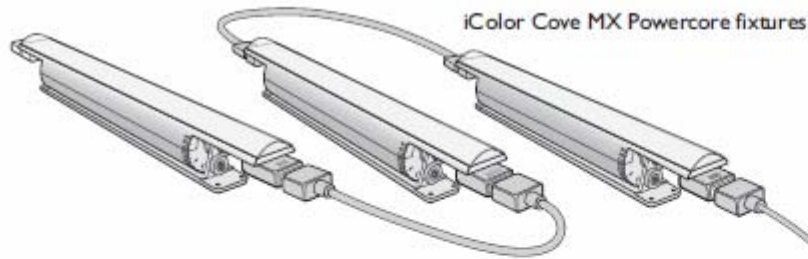


# LED Lighting System

## *Color Changing, No Programming*



### Fixtures



### Control Interface



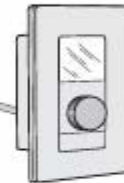
Data Enabler Pro

### User interface & Controller

PoE Port  
Ethernet Switch



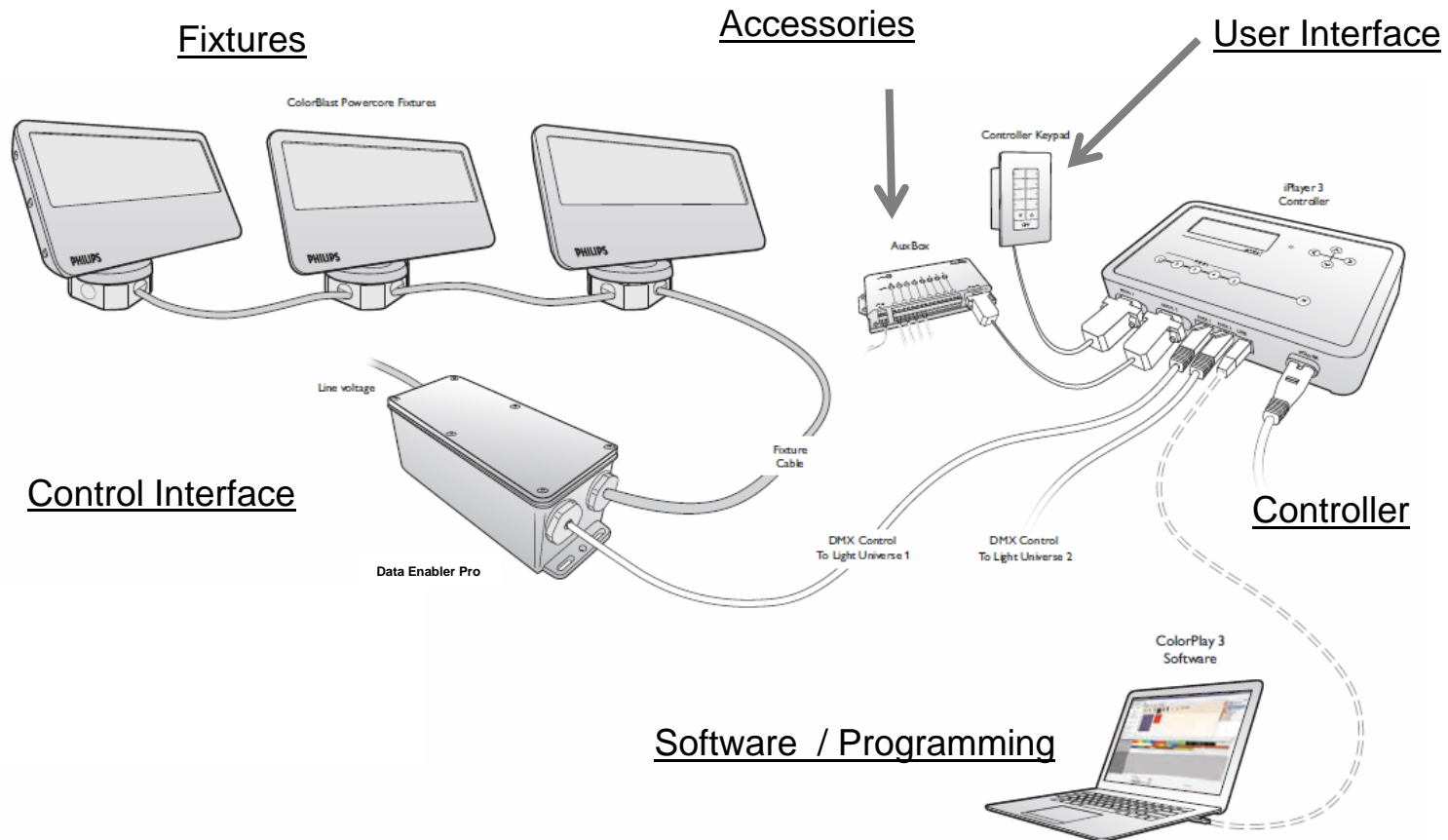
ColorDial Pro



### Accessories

# LED Lighting System

## *Color Changing With Programming*

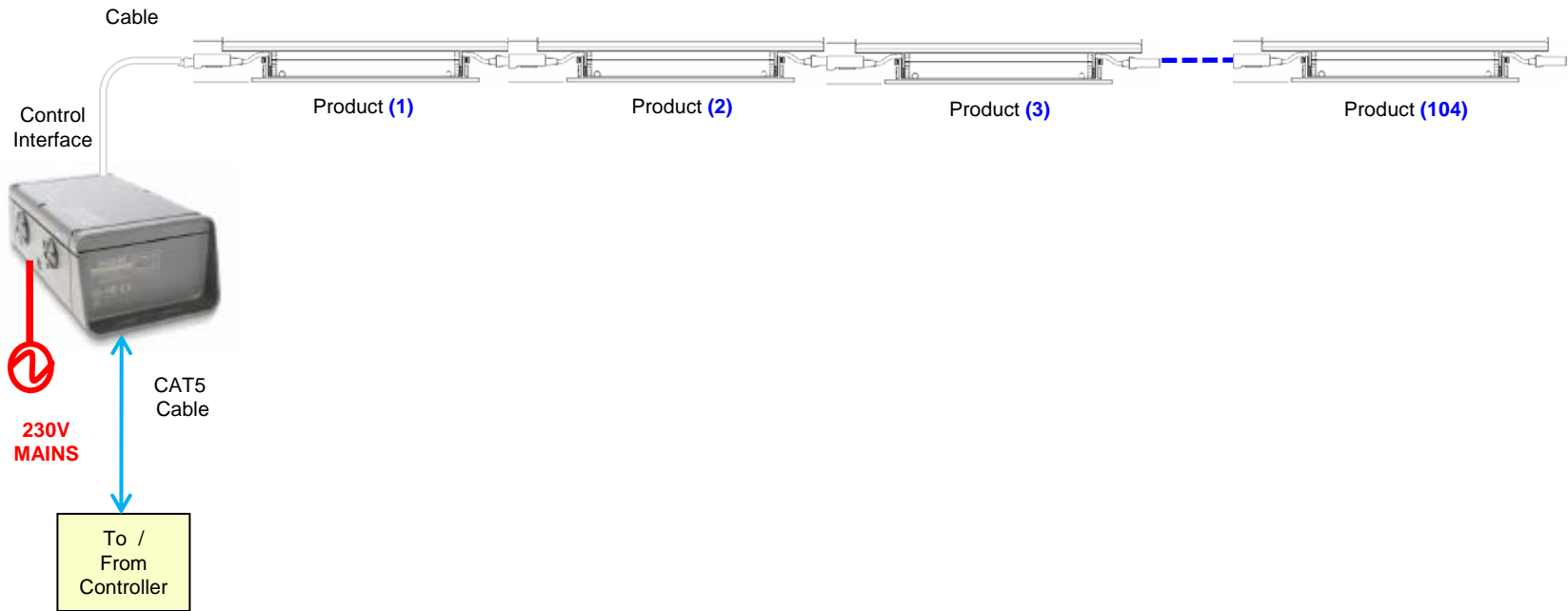


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Make Selection

## Make Selection

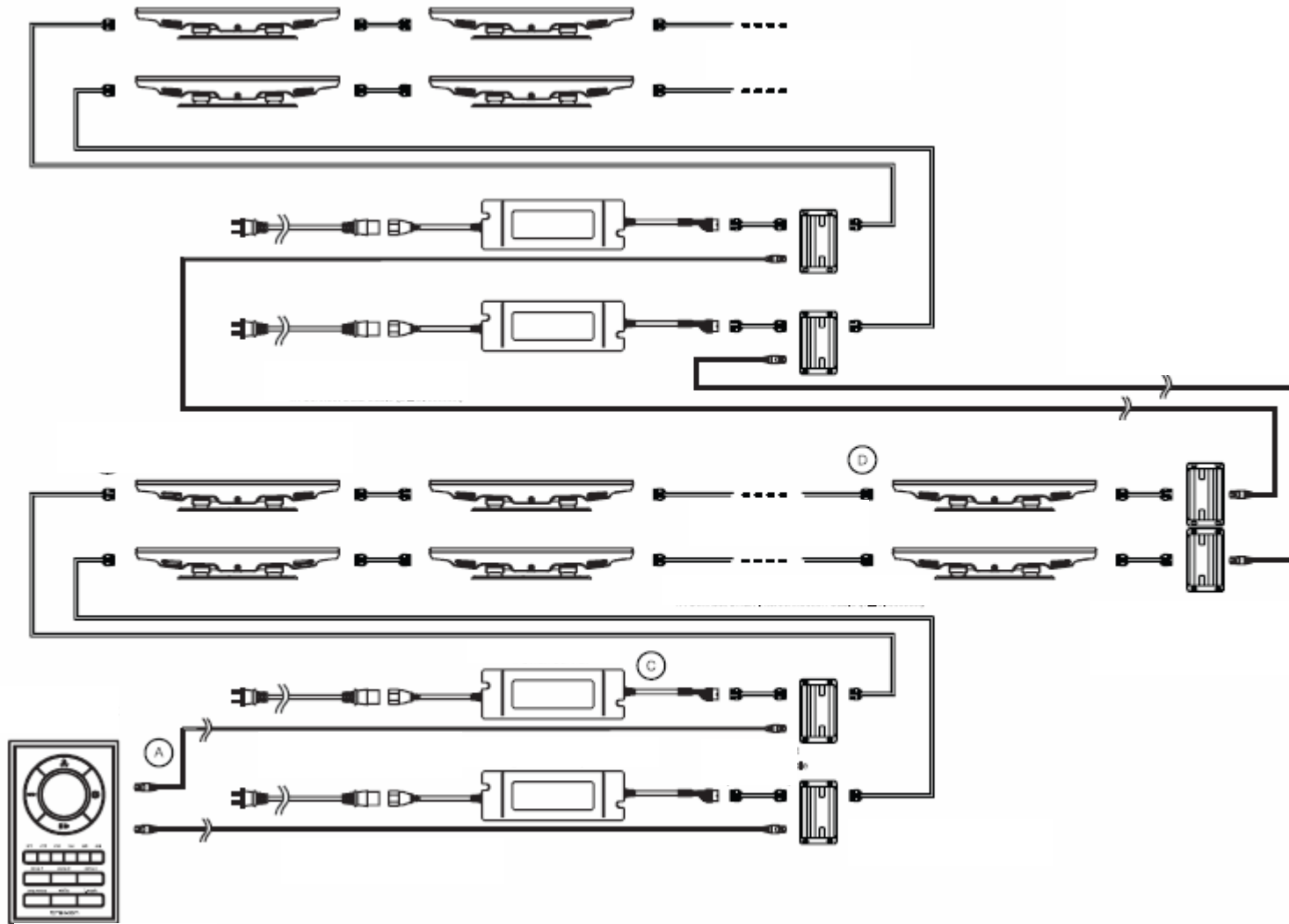
### Typical Wiring Diagram for Make 1



Upto **30 meters** of product can be connected on single 20A circuit.



## Typical Wiring Diagram for Make 2



Upto **5 meters** of product can be connected on single 20A circuit.

# Make Selection – Typical BOQ

Make 1			Make 2		
Sr.No.	Product	Qty	Sr.No.	Product	Qty
1	Product	10	1	Product	10
2	Cable	1	2	Interconnect Cable	1
3	Control Interface	1	3	Interconnect Cable	9
			4	Power / Data Injector	1
			5	Power Supply	1
			6	Sub-Controller	1
			7	Data Cable	1
			8	AC Cable	1

Note - More the BOQ items, more the inventory, more the storage space required, difficult the maintenance.

## Make 1

Use Very Less Accessories

Simpler BOQ

Easy To Install

Easy To Maintain

# In Summary...

- Go for LEDs in Large Scale Architectural Lighting
- “It’s not about the Lumens”
- Design, content and control is critical
- Good installation with quality product allows true lifetime to be achieved

