

# PoE Lighting and Automation Bootcamp

DESIGN

PROJECT MANAGEMENT

PROGRAMMING AND COMMISSIONING



# PoE Consortium

**INDUSTRY GRADE**

**FOCUSED ON POE TEXAS PRODUCTS**



While the training will use PoE Texas equipment, we will try to make the content as universal as possible.

# FUNDAMENTALS

## OF POE LIGHTING AND AUTOMATION

### Key Components in a PoE Automation System

- PoE Switches

- PoE Nodes or LINC's

- PoE Gateway or Controller

- PoE Enabled/Ready Light Fixtures

### Key Components in a Lighting/Automation System

- Input Controls – Light switches

- Sensors

- Devices – Constant Current/Constant Voltage

# PoE Switches

Considerations: Power, Location, Heat/Temp Management



Per Port Power – Forced?

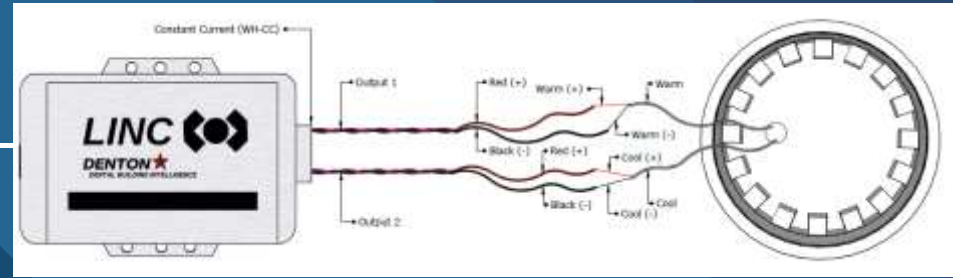
Total Power Budget

Installation Location



## POE Node - LINC

Considerations: Inputs/Outputs, Wiring Method, Markings and Identification



LINC – Local Intelligent Network Controller

- 4x Constant Current or Constant Voltage Outputs
- 4x Universal Inputs – Dry contact, 24 VDC, 0-10 VDC
- Functionality determined by wire harness
- Marked with MAC address – used in discovery

## PoEGateway: COR-TAP

Considerations: Function, Single vs Multiple, Location



● Technology Access Point

● IDF or Field

● Redundant or Distributed

● ●

●

## PoE Enabled/Ready Lights

Considerations: Integrated vs Separate Driver, UL Certification, Constant Current vs Constant Voltage



LINC – Local Intelligent Network Controller

- 4x Constant Current or Constant Voltage Outputs
- 4x Universal Inputs – Dry contact, 24 VDC, 0-10 VDC
- Functionality determined by wire harness
- Marked with MAC address – used in discovery
- UL Certified to replace drivers and maintain Certification

# Key Components

Automated Systems always have  
Inputs, Outputs, and Response Types



## Inputs Types

### Momentary Event

Dry Contact – Contact Closure

### Maintained State

On/Off;

Occupied (24V) / Vacant (0V)

Active / Inactive (ex alarm)

### Level Indicator

0-10 VDC Analog Signal

0 lux to 100 lux light level

40 F to 120 F temp sensor

## Output Types

Constant Voltage – 24 VDC

Constant Current – 500mA

On/Off

Dimmable

Dynamic CCT (warm + cool)

RGBW (color changing)

## Response Types

Physical

Virtual

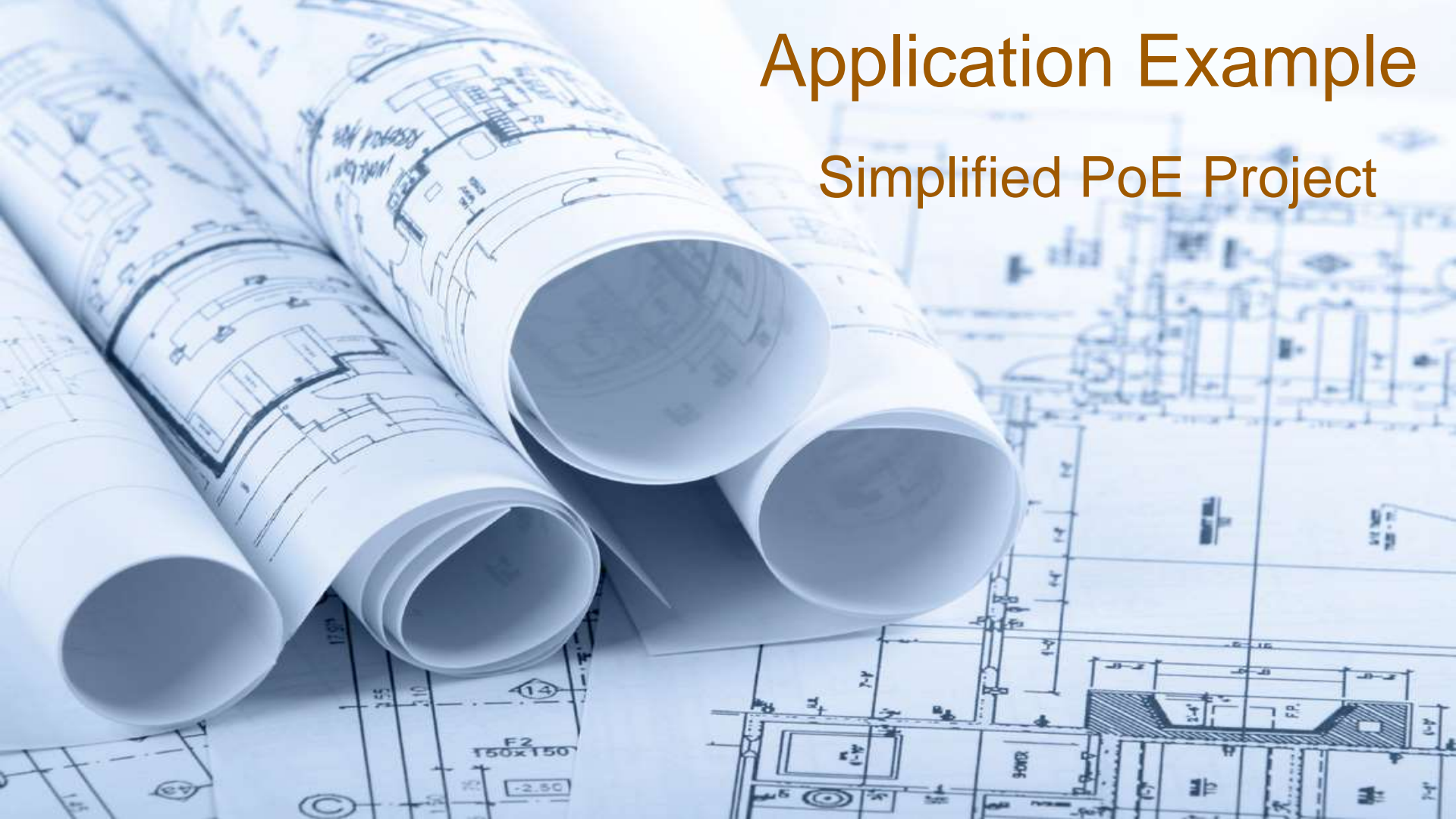
## Advanced Controls

Future Training Course

BACnet, I2C, Modbus, Profibus

# Application Example

## Simplified PoE Project



# DESIGN PHASE

KEY THINGS YOU NEED: REFLECTED CEILING PLANS, DEVICE SCHEDULES, AND CONTROL NARRATIVE

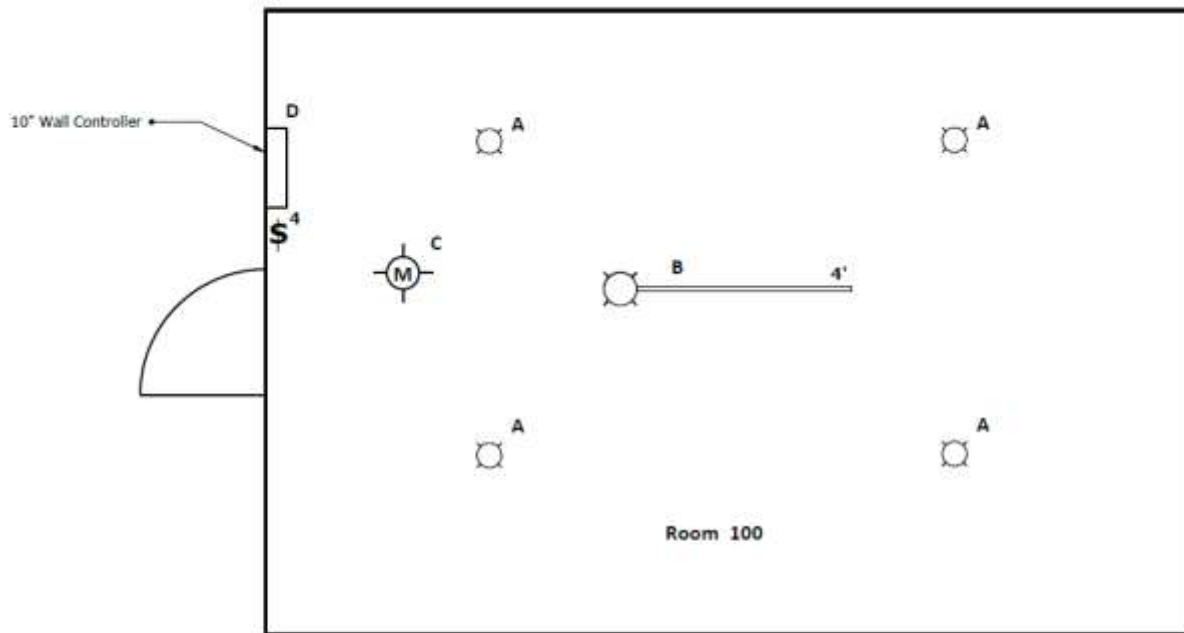
You will provide. . .

MDF/IDF Requirement

Emergency Lighting Info

Take/off - Pricing





Notes: (Note briefly what you immediately notice about this design)

DATE:  
October 14, 2022

TITLE:  
RCP

DRAWING NUMBER:

A

### Lighting and Device Schedule

| Device | Description                                   | Manufacturer<br>Part Number     | Size   | Qty | Power ea (watts) | Budgeted Power (Watts) |
|--------|---|---------------------------------|--------|-----|------------------|------------------------|
| A      | 4" Color Tuning Gimbal Down Fixtures - White  | PoE Texas<br>DWN-4-RDG-WH       | 4"     | 4   | 30               | 120                    |
| B      | 4 foot Color Tuning Suspended Fixture - White | PoE Texas<br>DENT-LTG-LR-4'-6   | 4'     | 1   | 40               | 40                     |
| C      | IR Motion Detector - White                    | PoE Texas<br>DENT-OCC-LV-P-Z-CM | 3"     | 1   | 3                | 3                      |
| D      | 10" Wall Mounted Wallstation Controller       | PoE Texas<br>DENT-TAS-10        | 10"    | 1   | 12               | 12                     |
| E      | 4 Button Momentary Pushbutton Switch          | PoE Texas<br>DENT-WS-54         | 1 gang | 1   | 3                | 3                      |

Notes: (Note briefly what you immediately notice about this design)

PoE Lighting Bootcamp  
Template

3616 Far West Blvd  
Suite 117-294  
Austin TX 78731

DATE:  
October 19, 2022

TITLE:  
DEVICE  
SCHEDULE

DRAWING NUMBER:

**B**

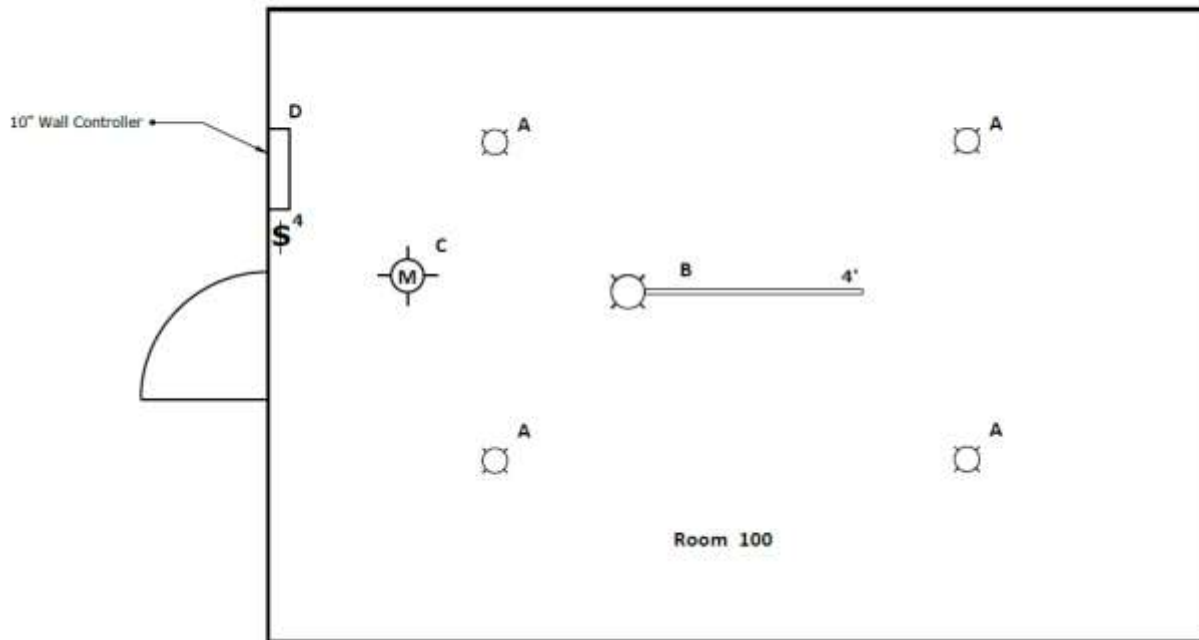
**Sequence of Operations:**

- 4 button switch:
  - a) Top button shall increase the brightness of all fixtures by 20%
  - b) Second button shall decrease the brightness of all fixtures by 20%
  - c) Third button shall increase the color temperature by 20%
  - d) Fourth button shall decrease the color temperature by 20%
- Motion Detector:
  - a) When the space is occupied, the occupant must turn on the lights manually
  - b) 20 minutes after the space is unoccupied, lights shall dim to 30% of maximum
  - c) 30 minutes after the space is unoccupied the lights shall turn off
- Customized Wallcontroller
  - 1) Shall be able to operate 4" downlights as a group
  - 2) Shall be able to operate 4' pendant light levels independently
  - 3) Shall be able to produce an alarm

**Notes: (Note briefly what you immediately notice about this design)**

DATE:  
October 19, 2022TITLE:  
CONTROLS  
NARRATIVE

DRAWING NUMBER:



**Steps:**

How many LINC's will you need for this space? Please mark how many LINC's are needed for this space by drawing them in

Mark where you will install the LINC's (you can choose server room) then draw onelines for how you will run the wiring

**Considerations:**

- LINC's have four inputs and four outputs
- LINC's have a total power budget of 80 watts

Fixture A requires two outputs because it is color tuning - 1x for warm light and 1x for cool light

Each button on the 4 button switch needs its own input. All LINC's have 4x inputs so select the most convenient one

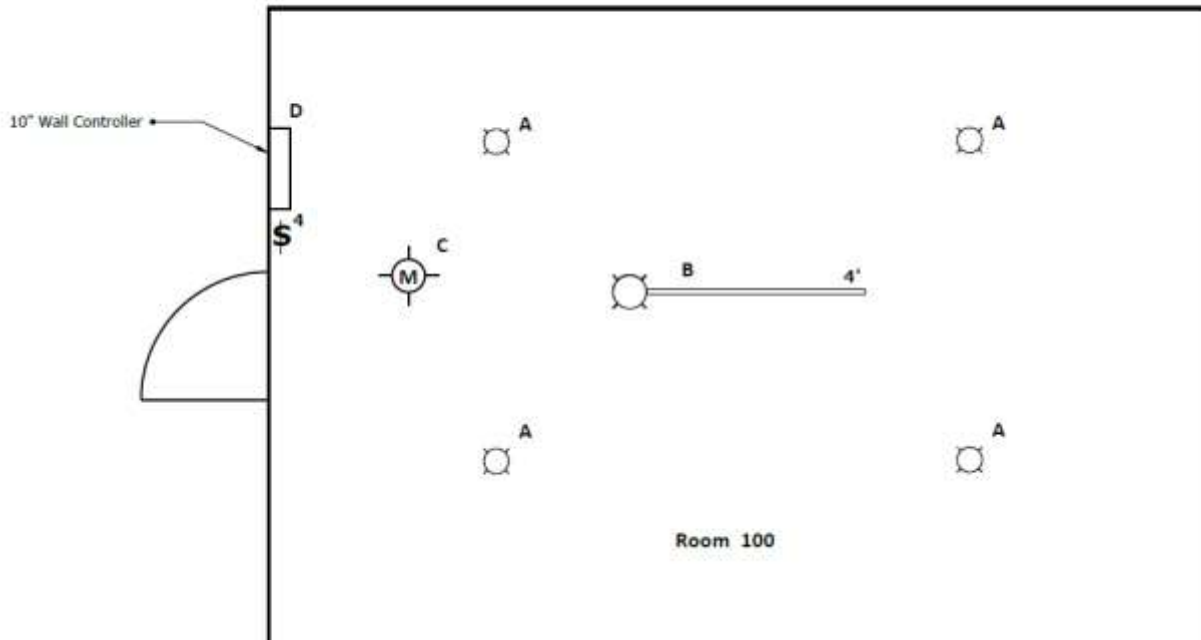


DATE:  
October 19, 2022

TITLE:  
PoE LIGHTING

DRAWING NUMBER:

**D**



**Steps:**

Based on the drawings what other devices are in the system besides the lights and light switch? Which ones are PoE?

**Considerations:**

At a minimum each deployment must have a COR-TAP controller

The 10" wall controller is Power Over Ethernet

The "M" device is a motion detector with a 0-10 volt range



DATE:  
October 19, 2022

TITLE:  
ACCESSORIES

DRAWING NUMBER:

E

### Lighting and Device Schedule

| Device | Description                                   | Manufacturer Part Number        | Size   | Qty | Power es (watts) | Budgeted Power (Watts) |
|--------|---|---------------------------------|--------|-----|------------------|------------------------|
| A      | 4" Color Tuning Gimbal Down Fixtures - White  | PoE Texas<br>DWN-4-RDG-WH       | 4"     | 4   | 10               | 10                     |
| B      | 4 foot Color Tuning Suspended Fixture - White | PoE Texas<br>DENT-LTG-LR-4'-6   | 4'     | 1   | 40               | 40                     |
| C      | III Motion Detector - White                   | PoE Texas<br>DENT-OCC-LV-F-Z-CM | 3"     | 1   | 3                | 3                      |
| D      | 10" Wall Mounted Wallstation Controller       | PoE Texas<br>DENT-TAB-10        | 10"    | 1   | 12               | 12                     |
| E      | 4 Button Momentary Pushbutton Switch          | PoE Texas<br>DENT-WS-54         | 1 gang | 1   | 3                | 3                      |

| Device |      |      |            | Controls       |                 |                      |
|--------|------|------|------------|----------------|-----------------|----------------------|
| Room   | Type | Size | Power(max) | Node Name      | Output or Input | MAC address (last 4) |
| 100    | A    | 4"   | 10         | F100A_1_2      | 1_2             | 00:AC                |
| 100    | A    | 4"   | 10         | F100A_3_4      | 3_4             | 00:AC                |
| 100    |      |      |            |                |                 |                      |
| 100    | A    | 4"   | 10         | F100_3_4       | 3_4             |                      |
| 100    | B    | 4'   | 40         | F100B_1        | 1               | 00:A1                |
| 100    | C    |      | 3          | S100C_1        | 1               | 00:AC                |
| 100    | D    | 10"  | 12         | WS100          | N/A             | N/A                  |
| 100    | E    |      | 3          | SW100D_1_2_3_4 | 1_2_3_4         |                      |
|        |      |      |            |                |                 |                      |

**Steps:**

Complete the PoE Schedule by adding a fixture A to row 3 and adding the MAC address from your kit in the 3x blank MAC address fields

**Considerations:**

You want to identify each device and how much power it draws so you can create a power schedule for your networking hardware

You are also starting to use labeling. Either match the device labeling scheme provided by the owner or you can use ours developed over many projects:

F [Type of Device] 100 [Room number] A [Device schedule] \_1\_2 [Channels] 00:AC [Last 4 MAC]

The LINC MAC address is a unique identifier. You can choose to add them now or add them later

- F - Light fixture
- SW - Light switch
- M - Motion detector
- WS - Wallstation
- S - Sensor (Various)
- SH - Shade



**PoE Lighting Bootcamp Template**

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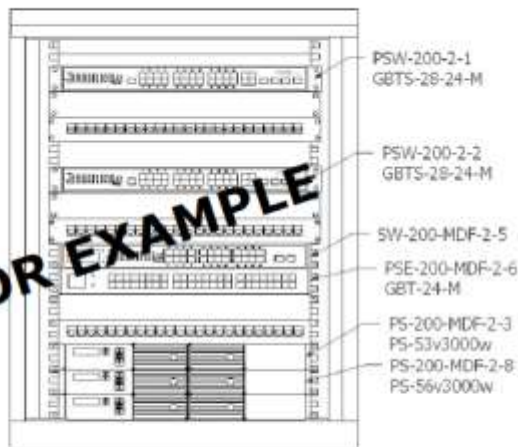
DATE:  
October 19, 2022

TITLE:  
PoE SCHEDULE

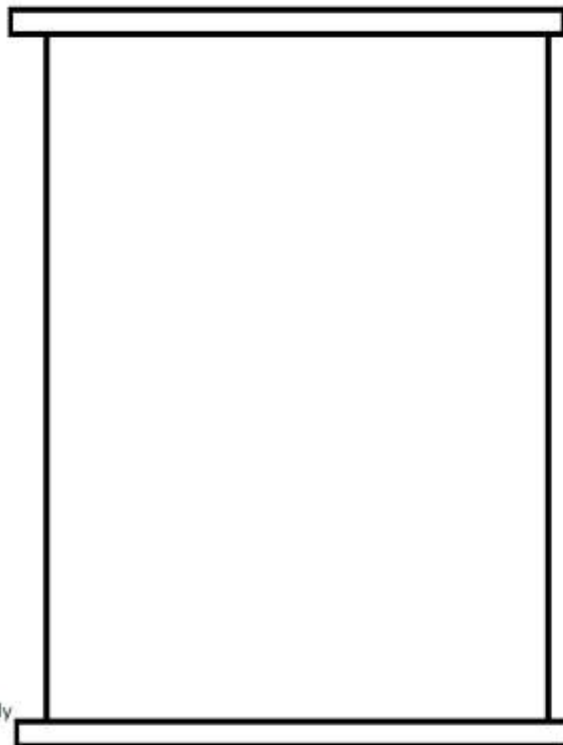
DRAWING NUMBER:

**F**





FOR EXAMPLE



**Steps:**

Free hand draw your rack schedule - Add your GBTS-28-24-M and a power supply

**Considerations:**

The 1x GBTS-28-24-M can be powered by 1x PS-53v3000w on 120VAC for a total budget of 2,160 watts  
or 2x GBTS-28-24-M can be powered by 1x PS-53v3000w on 240VAC for a total power budget each of 2,160 watts

Allow rack space for proper ventilation around switches and power supplies

How many AC circuits at what amp do you need for this rack? Watts/Volts AC = Amps AC

DATE:  
October 19, 2022

TITLE:  
RACK/SWITCH  
SCHEDULE

DRAWING NUMBER:

# PRE-CONSTRUCTION

You'll provide submittals and procure your materials



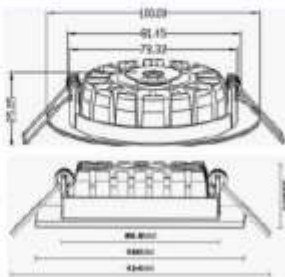
Lessons Learned:

Be on site at dry-in | Benchtest | Kitting and planning

## DENT-LTG-DWN

### Features

- CREE LED, high lumen
- 28mm (~ 1" ) thin profile
- 900+ Lumens
- UGR<19
- Several lensing options
- 90+ CRI
- 10W @ 90lm/W
- Constant Current: 200mA, 36-42VDC
- 2700K—5000K selectable via software
- Beam Angle 38°
- Weight 146g
- Operating Temp -10°- 40° C
- Dimming in 0.4% increments



### 4" Style Options (DENT-LTG-DWN-4-**<shape>**-**<color>**)



| Shape | Description   |
|-------|---------------|
| -RDF- | Round Flat    |
| -RDG- | Round Gembal  |
| -SQF- | Square Flat   |
| -SQG- | Square Gembal |

312-479-0317

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## DENT-LTG-DWN

## Denton Linear Suspended Fixtures

### DENT-LTG-LS

### Features

- Narrow 1.3" width
- 2', 4' length options
- All models support lumen control on up-light and downlight independently
- Low voltage PoE CC driver interface
- CRI Ra > 80
- 150 deg upright beam angle
- Power - 10W/ft
- 110lm/W ;
- 900-1200 lm/ft (depending on optics)
- 5 yr. warranty (longer options available)



### Ordering Options

(DENT-LTG-LS-**<length>**-**<cut>**-**<optics>**-**<mount>**)



### Physical Sizes



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## PoE Lighting Bootcamp Template

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Aurich TX 78731

### Steps:

Mark the submittals as how you would submit them to the client. On DENT-LTG-DWN, circle the color that matches the color of the fixture in your lab kit.

### Considerations:

Identify selections of color, length, power, type. The better you identify them now the less risk you have later.

DATE:  
October 19, 2022

TITLE:  
SUBMITTAL  
PACKAGE

DRAWING NUMBER:



## INSTALLATION

We will shift to the lab section now.

Face-to-Face : Break for lunch

Zoom : Please head to the break out session with Joshua



**Zoom: Please note your timeslot and have your information handy.**

**Face-To-Face: Please move to Joe.**

