

# araya<sup>®</sup>

THE TRUE AND PERFECT LIGHT

araya<sup>®</sup> LED Light Engine  
CTM0 32 CTM0 19 CTM0 12  
DDM0 32 DDM0 19 DDM0 12  
Installation Guide



lumenetix<sup>®</sup>

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# 1 INTRODUCTION

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This Installation Guide covers the following araya® Color Tuning Modules (CTM) and Dynamic Dimming Modules™ (DDM)

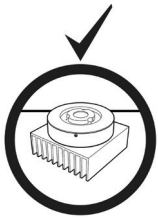
CTM0 32 • DDM0 32

CTM0 19 • DDM0 19

CTM0 12 • DDM0 12

For complete Color Tuning Module specifications, please visit: [www.lumenetix.com/downloads](http://www.lumenetix.com/downloads)

This Installation Guide covers heat sinking, case temperature measurement, secondary optics, power supply and wiring diagrams for wireless operation using the Lumenetix Light Commissioning Tool, industry standard 0-10V wired controls or a hybrid operation that combines hard wired and wireless control.



**For long term, reliable operation, proper heat sinking is critical.**



**The CTM Source diffuser is fragile. Avoid touching the diffuser during handling and assembly.**



**Do not operate the CTM while it is resting face down against a table or other solid surface.**

## 2 HEATSINKING

The CTM light module requires an external heat sink in order to ensure proper operating temperature of the LEDs. The CTM has a conductive aluminum case and an efficient thermal path to the LED array. These features promote efficient thermal management and allow for a simple heat sink design in most applications.

Examples of heat sinking methods are: cast or extruded heat sinks, an aluminum panel or aluminum fixture housing. Both carbon and stainless steel are much less efficient at transferring heat than aluminum and therefore are not recommended as heat sink material. The heat sink mounting surface should be flat and smooth. Metal-to-metal contact surfaces will result in best performance; anodized or unfinished mounting surfaces are recommended. Mounting the CTM on a painted aluminum surface will reduce the performance of the heat sink material.

### 2.1 Compatible Heat Sinks

The following tables list heat sinks models that have compatible form factors and thermal resistance characteristics for use with the CTM. The thermal resistances assume an approximate ambient temperature of 25C. The heat sinks listed here are suggestions only. The heat sink must be evaluated and temperature tested in the fixture application at applicable ambient temperatures.

MechaTronix (round)

Part Number	Dia. (mm)	Height (mm)	Thermal Resistance (°C/W)
LSB9950	99	50	1.3–1.5
LSB9980	99	80	1.2–1.4

Additional product information at [www.led-heatsink.com](http://www.led-heatsink.com)

Nuventix (round)

Part Number	Description	Input Voltage	Dia. (mm)	Height (mm)	Thermal Resistance (°C/W)
HP30S-CALBL-001	Heat Sink		95	39	2.5 (heat sink only)
SPARS-CM005-002 (1)	Cooler	5V			1.0–1.55
SPARS-CM012-002 (1)	Cooler	12V			1.0–1.55

Additional product information at [www.nuventix.com](http://www.nuventix.com)

No current commercial 24V power supply offerings with dual voltage out for Nuventix Synjet cooler (24V out w/ 5V or 12V out). Requires DC/DC voltage adaptor without dual voltage output.

Aavid Thermalloy Heat Sink Extrusions (square/rectangular)

Part Number	Width (mm)	Length	Height (mm)	Thermal Resistance (°C/W)
67590	88	88	31	1.5–1.7
61085	136	85	33	1.4–1.6

Additional product information at [www.aavid.com](http://www.aavid.com)

## 2.2 Mechanical Attachment of the Heat Sink

The CTM/DDM light engine has two options for heat sink mounting:

1. Front mount using four 4-40 or M2.5 screws
2. Rear mount using three M3 screws

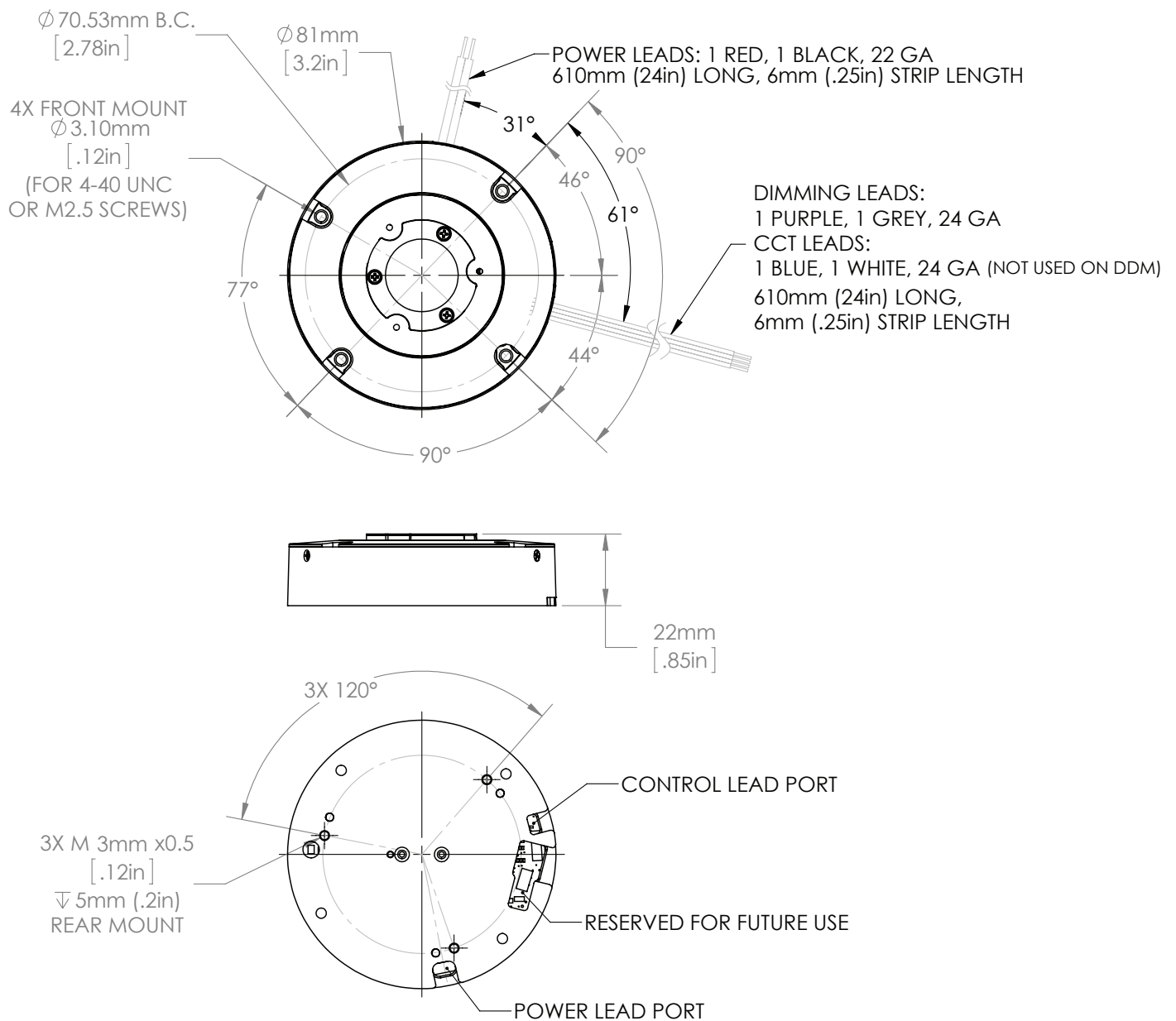


Figure 1: Rear Mount of CTM/DDM to Heat Sink

### 3 CTM CASE TEMPERATURE MEASUREMENT

The thermal management characteristics of the heat sink used with the CTM should be validated by measuring its case temperature. This test should be done with the CTM installed in the fixture at ambient temperature and air flow conditions similar to the end-use installation.

araya® CTMs are available with two ranges: 1600–4000K and 2700–6000K. The power draw of the CTM varies by approximately one watt over the CCT range with peak power draw occurring at the CCT shown in the following table. Depending on the CCT range, the case temperature should be measured at the following CCT setting.

CCT Setting for Case Temperature Measurement

CTM CCT range	CCT Setting to Measure Tcase
1600 – 4000K	2800K
2800 – 6000K	4400K

The proper case temperature measurement location is next to the exit for the power leads, see Figure 3. The temperature reading should be made after the unit has reached steady state, where the case temperature levels out. It is recommended to design for a case temperature of 70° C at maximum ambient temperature conditions

The CTM color tuning module has built-in over-temperature protection. It is designed to turn down the current to the LED array when the case temperature reaches 75° C. This ensures the LEDs don’t exceed their maximum rated temperature.

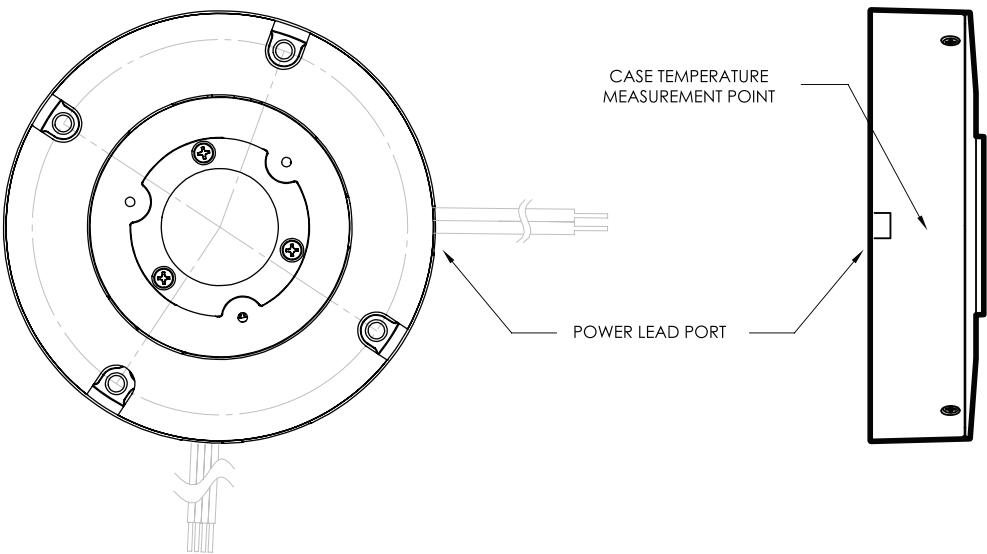


Figure 2: Case Temperature Measurement Point

# 4 SECONDARY OPTICS

## 4.1 CTM0 12 Reflectors

The CTM0 12 accepts the Lumenetix sReflector and mReflectors and has attachment features to accept other reflectors.

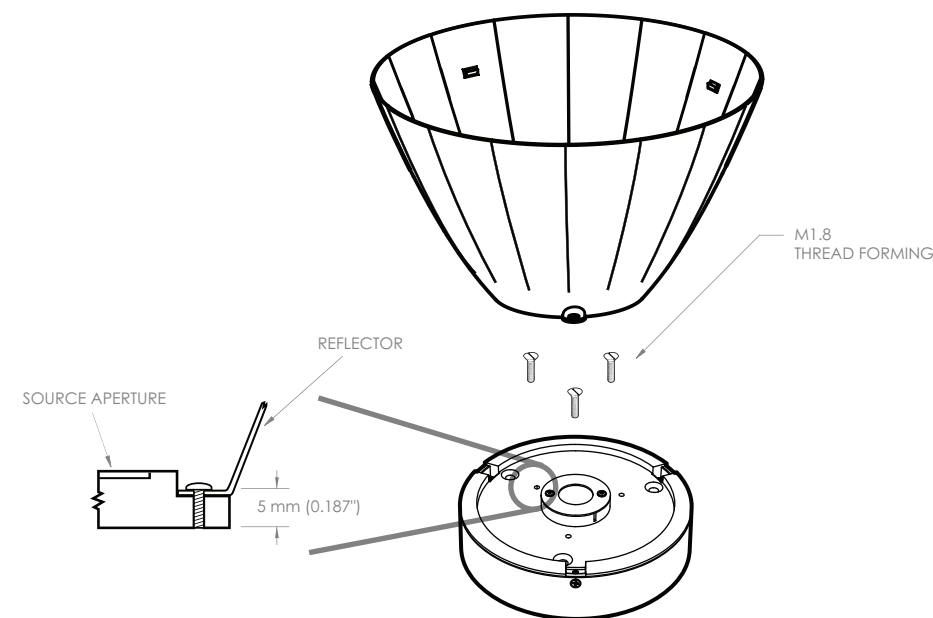


Figure 3: CTM0 12 Front Attaching Reflectors

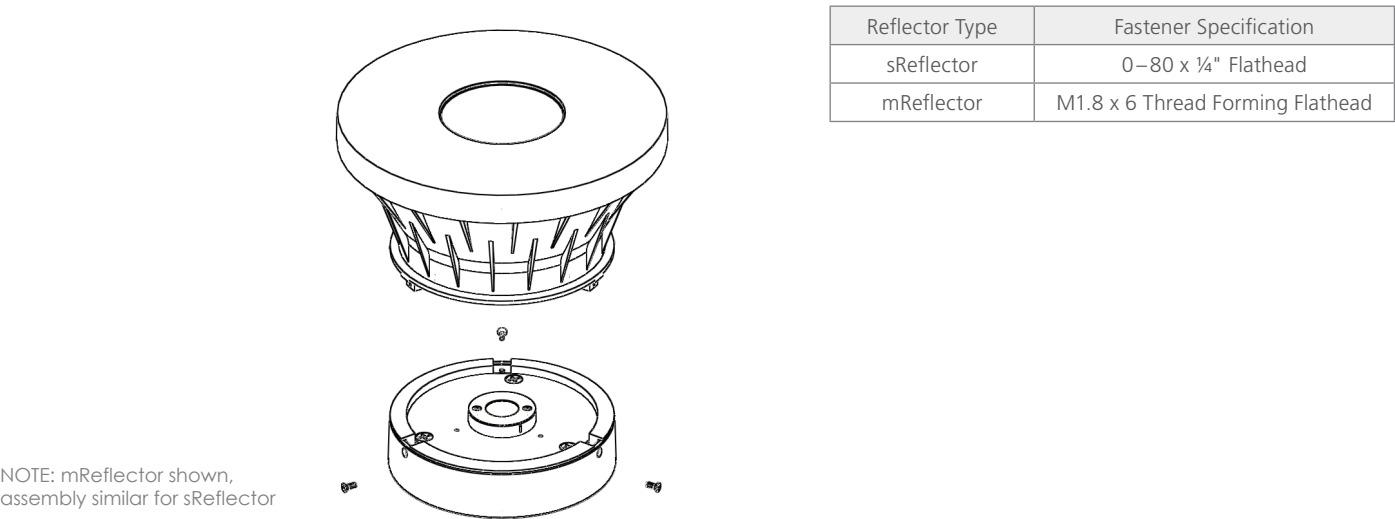


Figure 4: Side Mount Attachment of the sReflector and the mReflector

## 4.2 CTM0 19 Reflectors

### 4.2.1 Attaching Reflectors

The CTM0 19 accepts the twist-to-lock reflectors with an attachment collar. The module also has provisions for front mount reflectors. The fastener specifications are shown in the following table while mounting hole locations are shown in Figures 6 & 7.

#### CTM0 19 Secondary Optics Fastener Specifications

CTM0 19 Reflector	Fastener specifications	Screw length
Twist Lock w/ Collar	2 - 28 x 3/16, M1.8 x 5	5 mm (3/16")
Front Mount	2 - 28, M1.8	5 mm (3/16") or 10 mm (3/8")

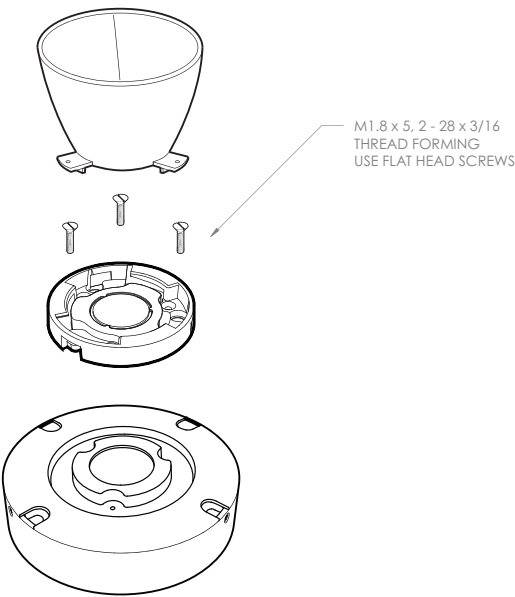


Figure 5: CTM0 19 Twist-Lock Style Reflectors with attachment collars

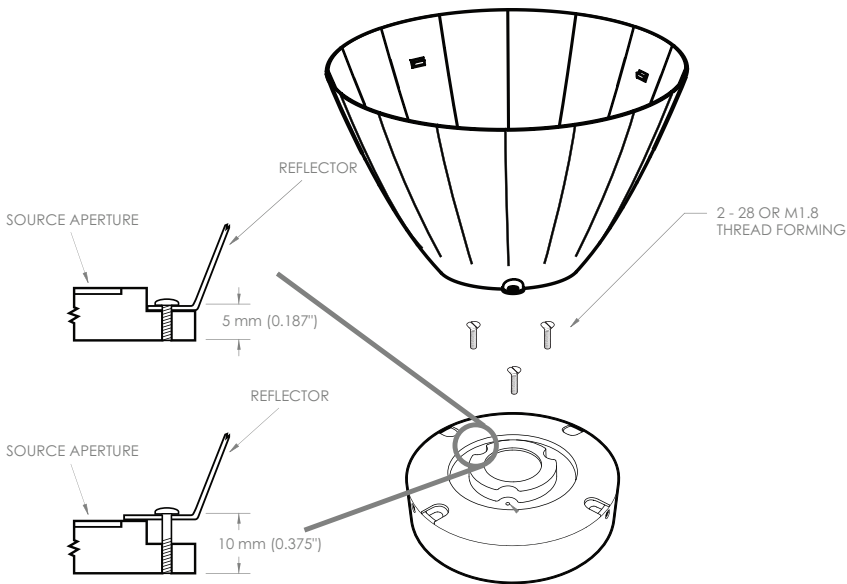


Figure 6: CTM0 19 Front Attaching Reflectors

### 4.2.2 Compatible Reflectors

#### CTM0 19 Compatible Twist-Lock Reflectors

Vendor: Diffractive Optics, [www.diffractive-optics.com](http://www.diffractive-optics.com)

Part Number	Beam Angle (degrees)
P6680	40
P6645	60
P7879	40
P6764	60

#### CTM0 19 Compatible Front Mount Reflectors

Vendor: Alux-Luxar, [www.alux-luxar.com](http://www.alux-luxar.com)

Part Number	Beam Angle (degrees)
XLC 400	28
XLC 500	26
XLC 800	42
XLC 1100	27
XLC 1300	22
XLC 1400	25
XLC 1500	53



## 5 POWER SUPPLY REQUIREMENTS

### General Requirements

Description	CTM, DDM 25W	DDM 20W
Voltage Output	24V DC	24V DC
Current Output	1.25 A per module	1.0 A per module
Component Listing	Class 2	Class 2

### Recommended Power Supplies

Vendor: Philips

Part Number	Qty of Units Powered	Input Voltage	Connection type
LED120A1400C24F	1	120V	Terminal block
LED120A0024V18F	1	120V	Terminal block
913700625082	1	207V – 264V	Flying leads
INTA0024V28FLO	2	120V – 277V	Flying leads
INTA0024V41FO	3	120V – 277V	Flying leads
LED120A0024V10F*	1	120V	Terminal block

\* DDM 20W only

Vendor: Osram Sylvania

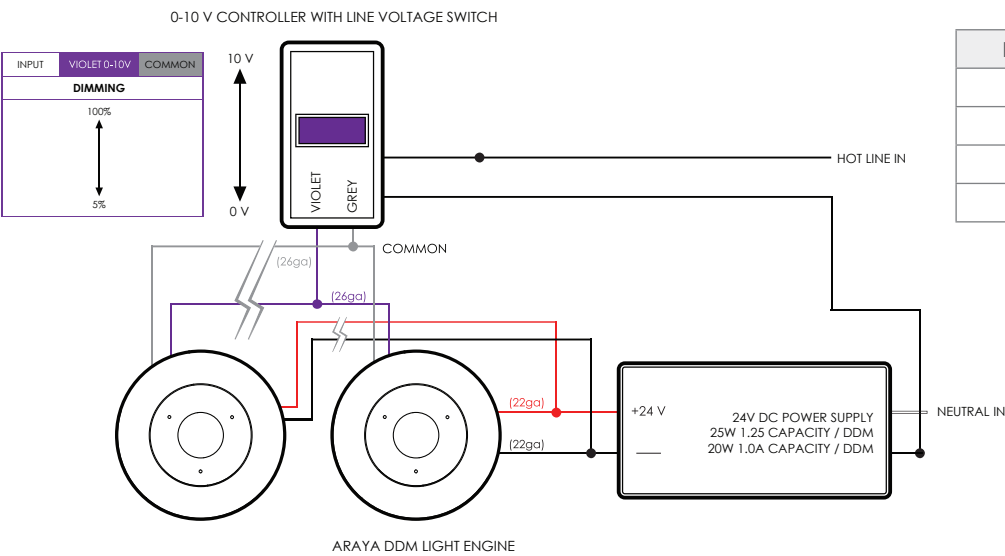
Part Number	Qty of Units Powered	Input Voltage	Connection type
OT30/120/24	1	120V	Flying leads
OT75W/24V/UNV	2	120–277V	Flying leads
OT96W/24V/UNV	3	120–277V	Flying leads

Vendor: Tridonic

Part Number	Qty of Units Powered	Input Voltage	Connection type
LED 035/24 E020	1	108V – 264V	Terminal block

# 6 DDM WIRING DIAGRAMS

## 6.1 0-10V Control of Dimming / On/Off Line Voltage Switching



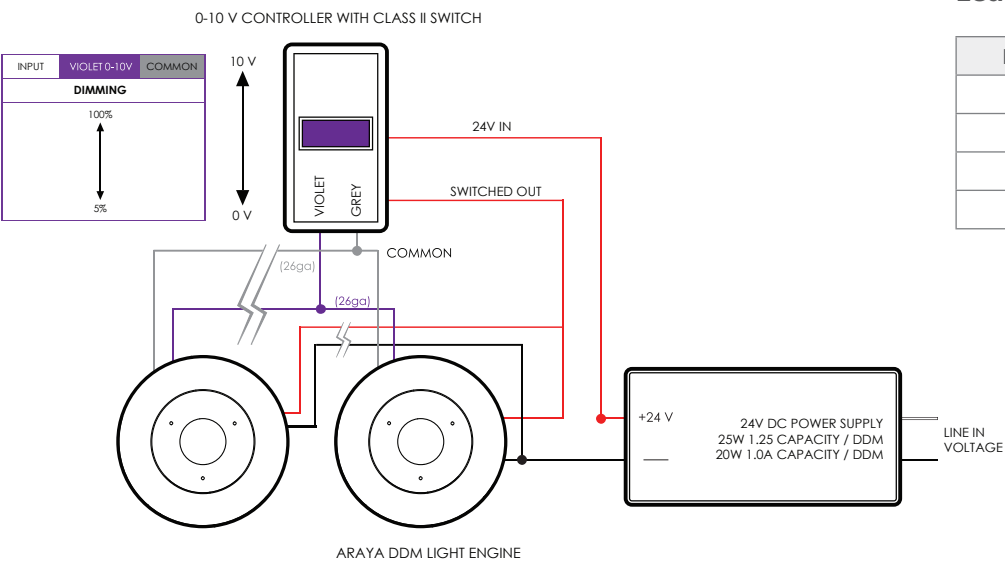
### Lead Color and Input

Lead Color	Input
Red	Positive 24V
Black	Negative
Violet	0-10V Dimming
Gray	Common

**Note:**  
1. CTM sources current to 0-10V control at 0.2mA nominal capacity.

Figure 7

## 6.2 0-10V Control of Dimming / On/Off Class II Switching



### Lead Color and Input

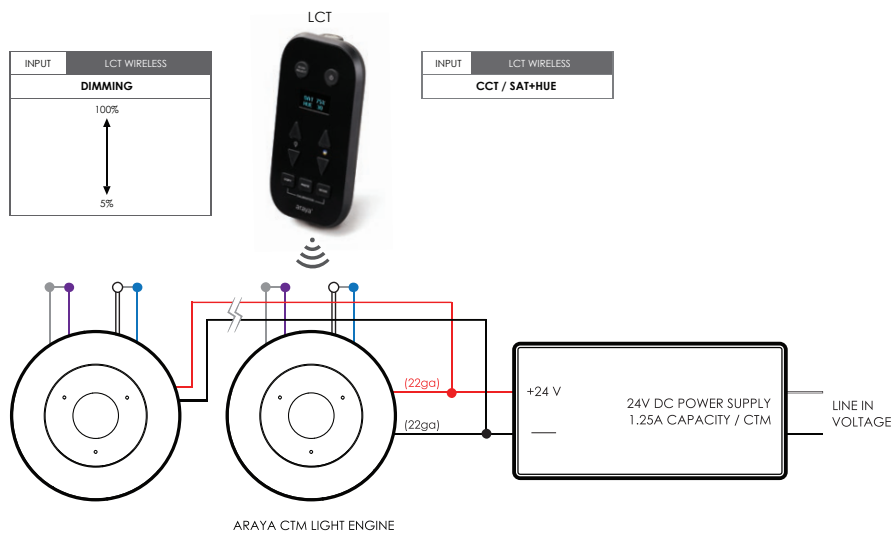
Lead Color	Input
Red	Positive 24V
Black	Negative
Violet	0-10V Dimming
Gray	Common

**Note:**  
1. CTM sources current to 0-10V control at 0.2mA nominal capacity.

Figure 8

## 7 CTM WIRING DIAGRAMS

### 7.1 Wireless Operation of Dimming, CCT, Saturation and Hue

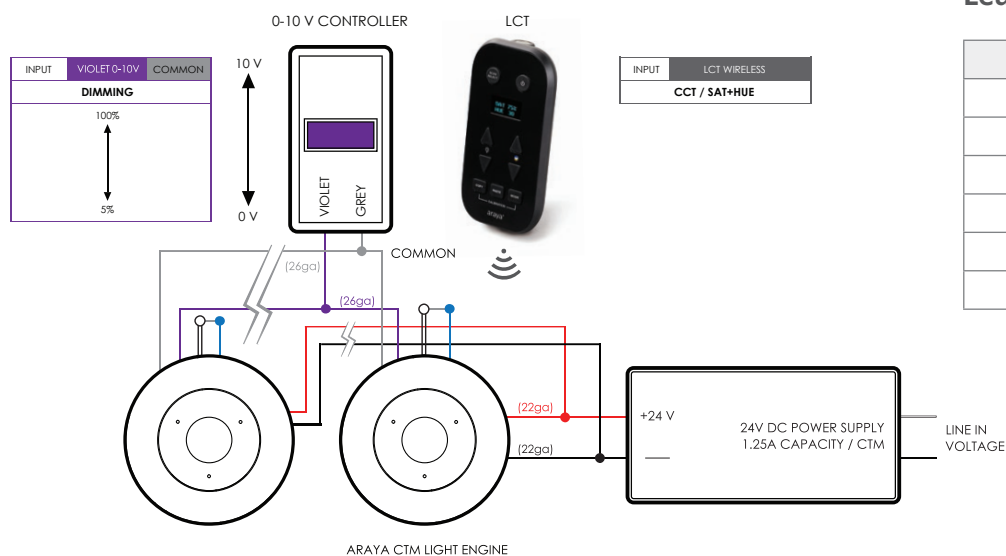


#### Lead Color and Input

Lead Color	Input
Red	Positive 24V
Black	Negative
Violet	Ground to Common
Gray	Common
White	Common
Blue	Ground to Common

Figure 9

### 7.2 0-10V Control of Dimming / Wireless Operation of CCT, Saturation and Hue



#### Lead Color and Input

Lead Color	Input
Red	Positive 24V
Black	Negative
Violet	0-10V Dimming
Gray	Common
White	Common
Blue	Ground to Common

#### Note:

1. CTM sources current to 0-10V control at 0.2mA nominal capacity.

Figure 10

### 7.3 0-10V Control of Dimming and Preset Scenes of CCT, Saturation and Hue

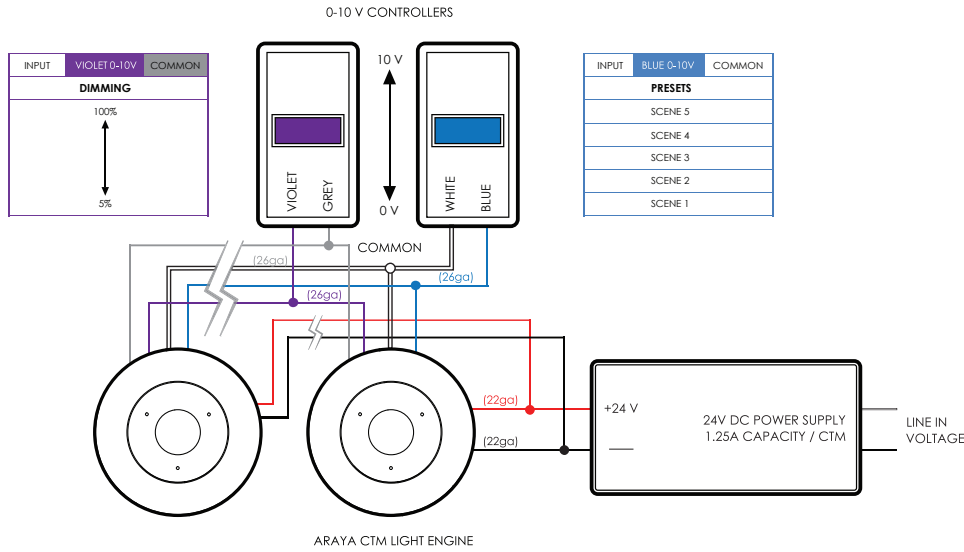


Figure 11

### 7.4 0-10V Control of Dimming and Continuous CCT

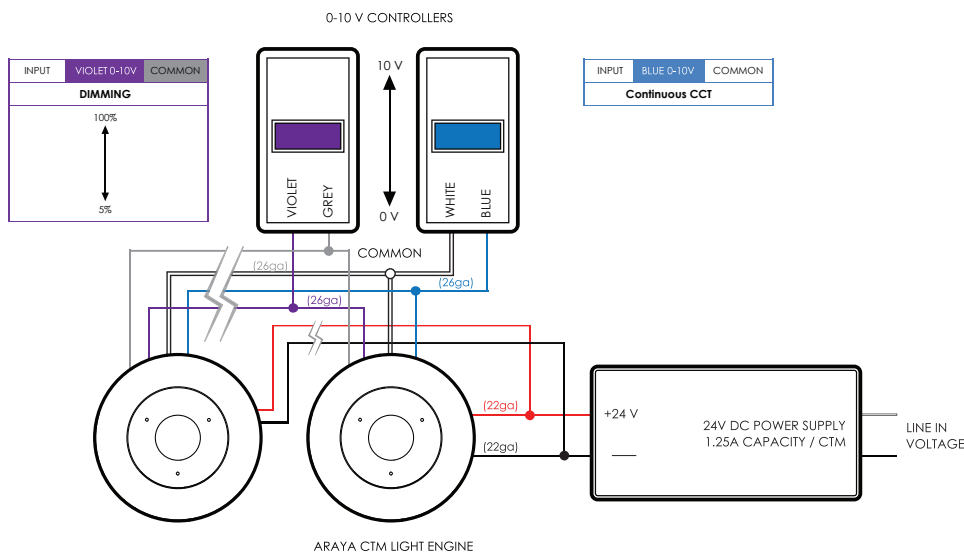


Figure 12

### Lead Color and Input

Lead Color	Input
Red	Positive 24V
Black	Negative
Violet	0-10V Dimming
Gray	Common
White	Common
Blue	0-10V Presets

#### Notes:

1. Preset scenes are commissioned and activated using the LCT. See LCT operating instructions.
2. If 0-10V control is not being used for dimming, the violet control lead must be grounded to gray common lead.
3. CTM sources current to 0-10V control at 0.2mA nominal capacity.

### Lead Color and Input

Lead Color	Input
Red	Positive 24V
Black	Negative
Violet	0-10V Dimming
Gray	Common
White	Common
Blue	0-10V CCT

#### Notes:

1. If no preset scenes are activated using the LCT, the CTM defaults to 0-10V control of the continuous CCT range.
2. If 0-10V control is not being used for dimming, the violet control lead must be grounded to gray common lead.
3. CTM sources current to 0-10V control at 0.2mA nominal capacity.



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Revised 01.24.14  
Specifications subject to  
change without notice

## **FCC Warning statement**

For FCC 15b devices

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

You are cautioned that changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) this device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation

### **FCC RF Radiation Exposure Statement**

1. This Transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
2. This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.