

# araya<sup>®</sup>

THE TRUE AND PERFECT LIGHT

araya<sup>®</sup> LED Light Engine  
CTM 012 CTM 019 CTM 032  
Installation Guide

lumenetix<sup>®</sup>

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# 1 INTRODUCTION

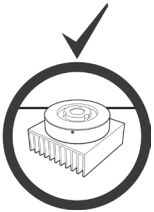
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This Installation Guide covers the following araya® Color Tuning Modules (CTM):

- CTM 012
- CTM 019
- CTM 032

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.**

## 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 light engine has two options for heat sink mounting:

1. Front mount using four 2-56 or M2 screws
2. Rear mount using three M3 screws

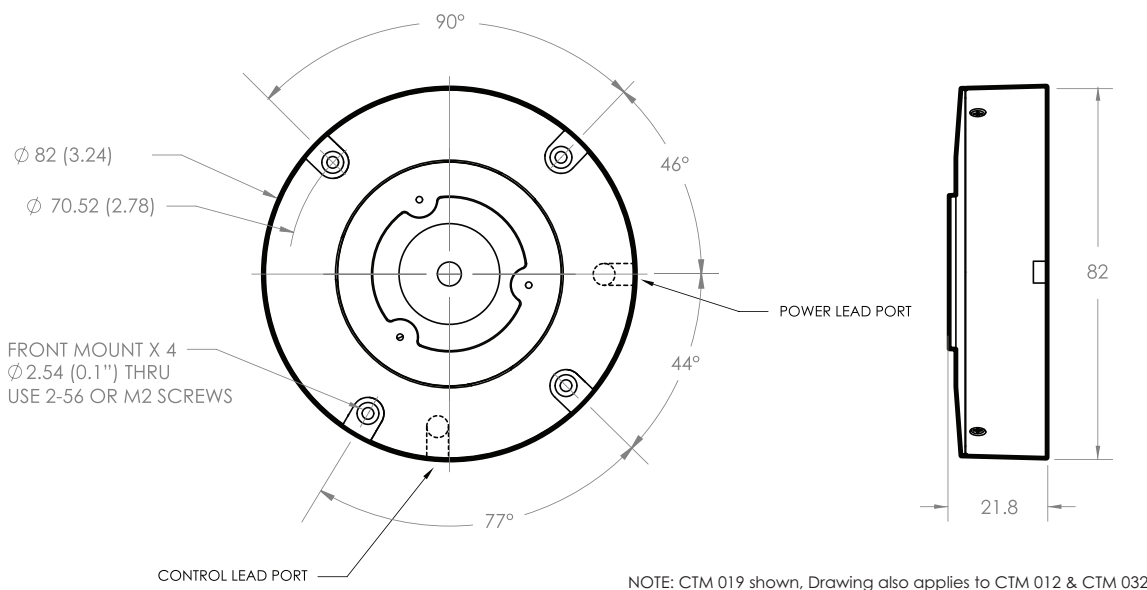


Figure 1: Front Mount of CTM to Heat Sink

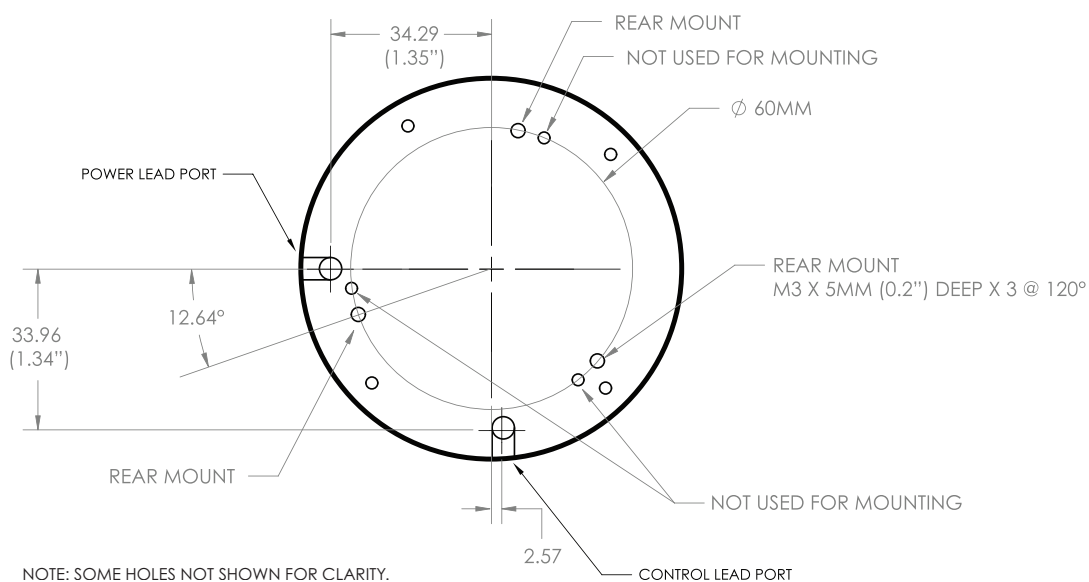


Figure 2: Rear Mount of CTM to Heat Sink

### 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
2700 – 6000K	3600K

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.

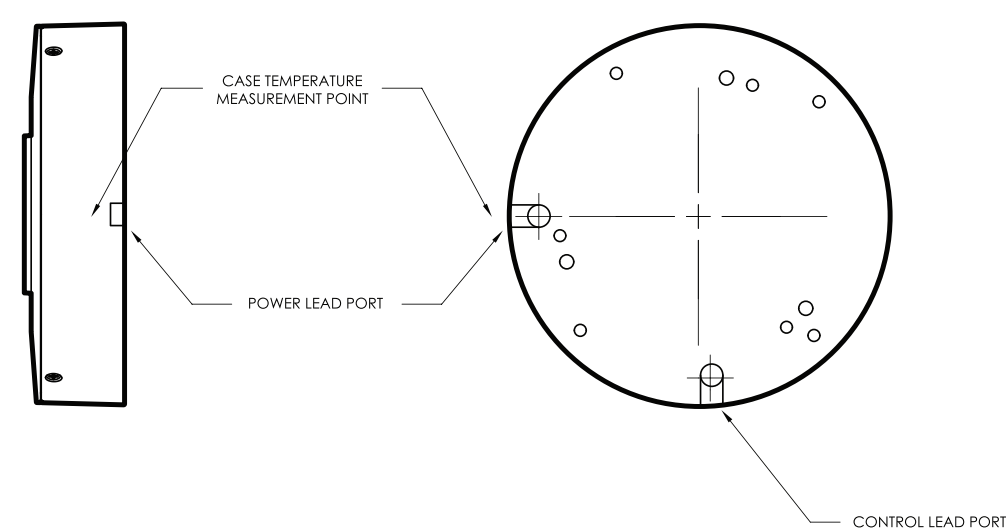


Figure 3: Case Temperature Measurement Point

# 4 SECONDARY OPTICS

## 4.1 CTM 012 Reflectors

The CTM 012 accepts the Lumenetix sReflector and mReflectors and has attachment features to accept other reflectors.

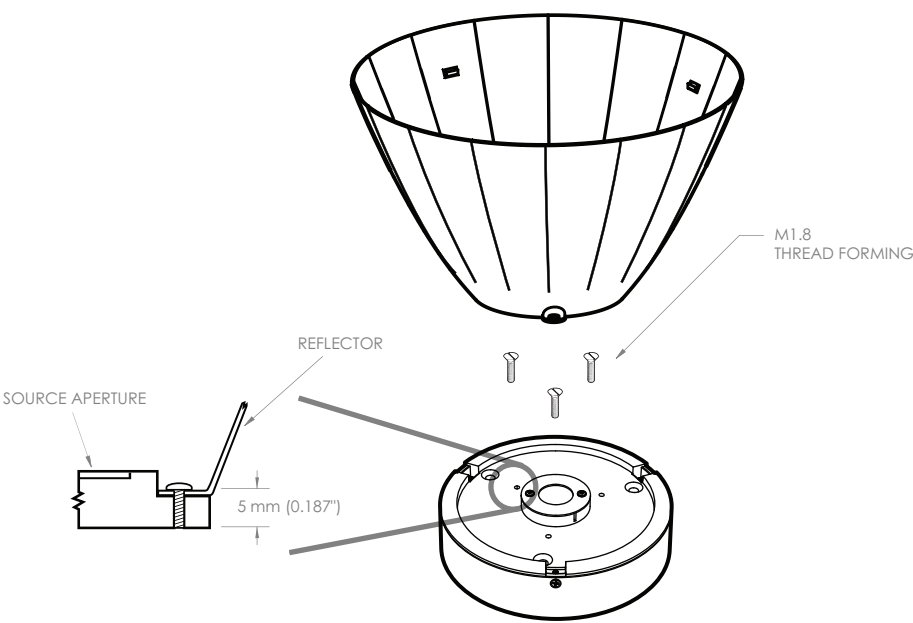
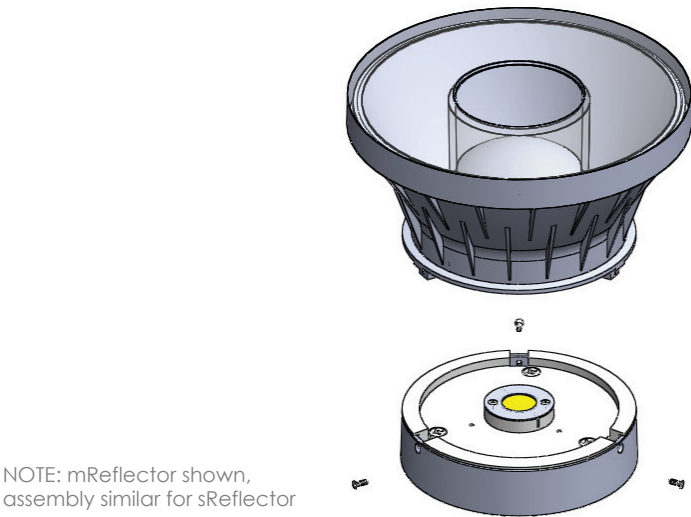


Figure 4: CTM 012 Front Attaching Reflectors



NOTE: mReflector shown, assembly similar for sReflector

Reflector Type	Fastener Specification
sReflector	0–80 x ¼" Flathead
mReflector	M1.8 x 6 Thread Forming Flathead

Figure 5: Side Mount Attachment of the sReflector and the mReflector

## 4.2 CTM 019 Reflectors

### 4.2.1 Attaching Reflectors

The CTM 019 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.

#### CTM 019 Secondary Optics Fastener Specifications

CTM 019 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")

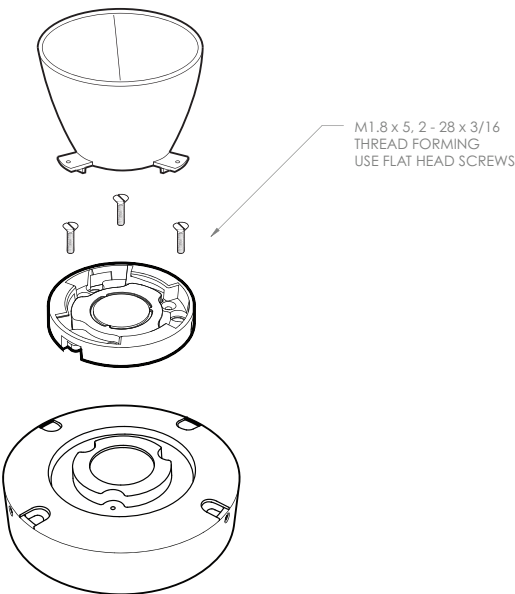


Figure 6: CTM 019 Twist-Lock Style Reflectors with attachment collars

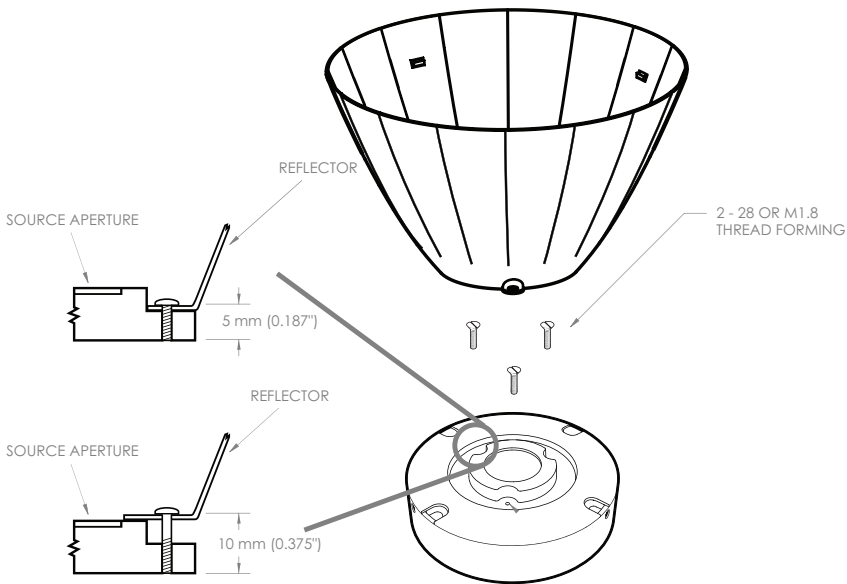


Figure 7: CTM 019 Front Attaching Reflectors

### 4.2.2 Compatible Reflectors

#### CTM 019 Recommended Twist-Lock Reflectors

Vendor: Diffractive Optics

Part Number	Beam Angle (degrees)
P4769	40
P6643	20
P6680	40
P6645	60
P6762	40
P6764	60
P7076	20
P8669	25

#### CTM 019 Recommended Front Mount Reflectors

Vendor: Alum-Luxar

Part Number	Beam Angle (degrees)
XLC 100	16
XLC 400	28
XLC 1000	14
XLC 1100	27
XLC 200 Diffuse	18
XLC 500	28
XLC 800	14
XLC 1100	27
XLC 1300	22
XLC 1400	25



## 5 POWER SUPPLY REQUIREMENTS

### Recommended Power Supplies

Vendor: Philips

Part Number	Qty of CTMs Powered	Input Voltage	Connection type
LED120A0024V14F	1	120 V	Flying leads
913700625082	1	207V – 264V	Flying leads
LED120A0024V18F	1	120V	Terminal block
INTA0024V28FLO	2	120V – 277V	Flying leads
INTA0024V41FO	3	120V – 277V	Flying leads

Notes:

1. Philips does not offer a 120V – 277V driver to power one (1) CTM
2. At the time of document release, Philips does not offer a cooler with dual voltage out for (24V out w/ 5V or 12V out). Requires DC/DC voltage adaptor without dual voltage output.

Vendor: Osram Sylvania

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

# 6 WIRING DIAGRAMS

## 6.1 Wiring diagrams for Wireless

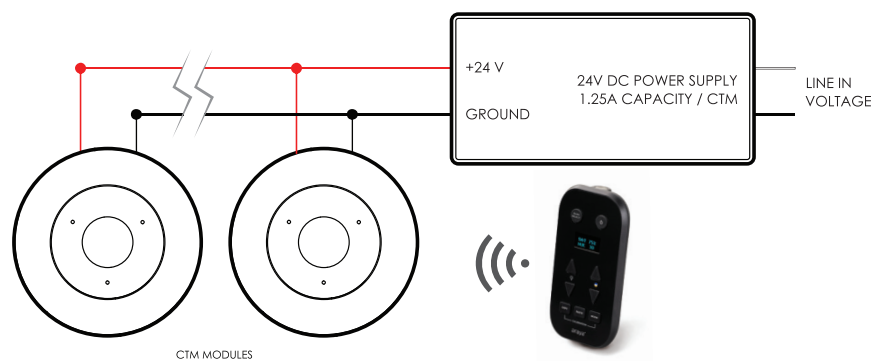


Figure 8: Wireless Operation Using the Light Commissioning Tool (LCT)

## Lead Color and Input

Lead Color	Input
Red	+24V DC
Black	-24V DC
Purple	0-10V CCT
Gray	Common
Blue	0-10V Dimming
Green	Unit Syncing - Tx
Brown	Unit Syncing - Rx

## 6.2 Wiring diagrams for Wireless with Unit Syncing

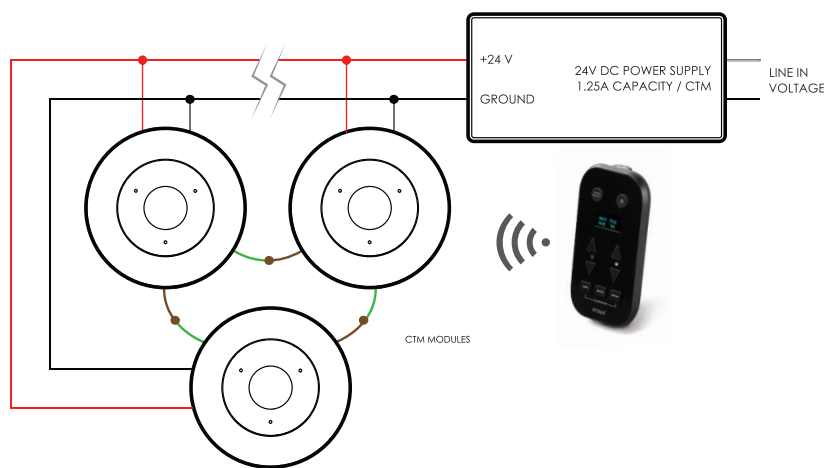


Figure 9: Wireless Operation Using the LCT, Syncing 3 or more units.

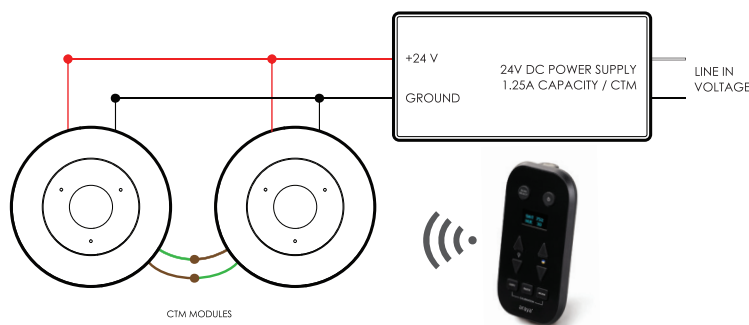


Figure 10: Wireless Operation Using the LCT, Syncing 2 units.

### 6.3 Wired and Hybrid (wireless and wired) Operation

### Lead Color and Input

Lead Color	Input
Red	+24V DC
Black	-24V DC
Purple	0-10V CCT
Gray	Common
Blue	0-10V Dimming
Green	Unit Synching - Tx
Brown	Unit Synching - Rx

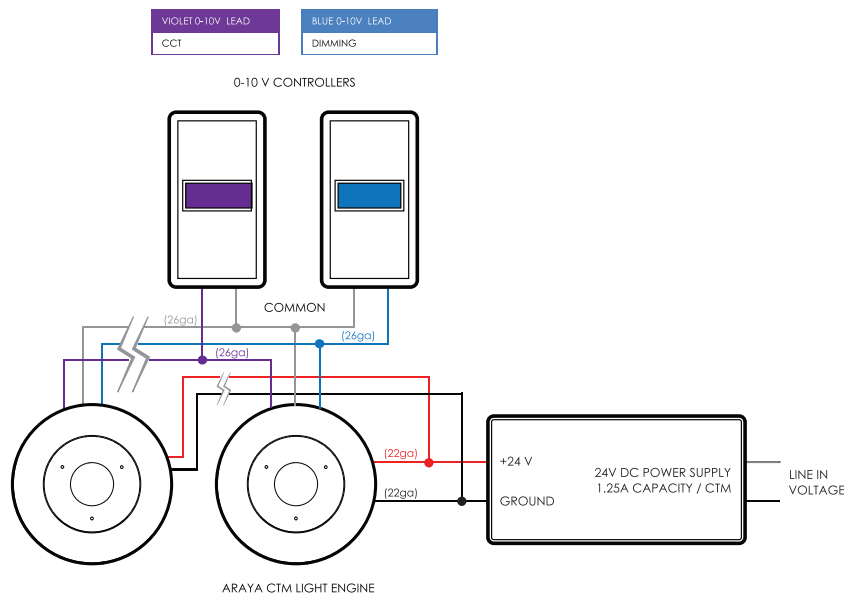


Figure 11: Wired Operation Using 0-10V Wired Controls

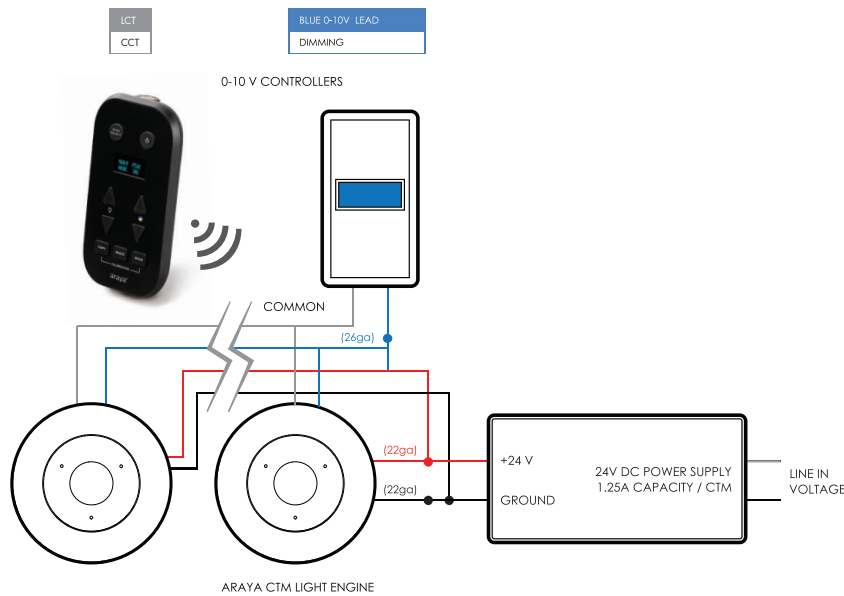


Figure 12: Hybrid Operation, Wireless Control of CCT, 0-10V Control of Dimming

## Federal Communication Commission Interference Statement

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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.

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 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.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

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- (2) this device must accept any interference received, including interference that may cause undesired operation.

**FCC ID: Q8A-CTM**





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