

araya[®]

TUNABLE COLOR

CTM2

Tunable Color Round LED Light Engines

24 V DC Input (Constant Voltage)

ALM2

Araya Logic Module

Data Sheet

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DISCONTINUED

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.

MODIFICATION: Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the device.



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1 DESCRIPTION AND PART NUMBERS



CTM2 Family



Araya Logic Module (ALM)

Description

Araya Logic Modules (ALM) connect to tunable color high-power round LED light engines (CTM2) that mix five colors of LEDs to deliver tunable and dimmable white light at 90+ CRI* with color consistency of < 2 step MacAdam ellipse (SDCM) across a tuning range of 1650–8000 K. Delivered light can be dimmed from 100–0.1%** at constant CCT. Gradients of saturated colors from 1–100% can be added to color points within the tuning range.

When the optional Warm/Dynamic Dimming profile (DDM)*** is chosen—which can be set back to Color Tuning (CTM) in the field if desired, but only if connected to DMX-RDM—the light dims from 3050 K at full intensity to 1800 K at 5% intensity, and then maintains 1800 K to 1%.

The ALM is connected to one LED light engine via low-cost ribbon cables, and features on-board driver electronics and the Araya control logic for precise control of LED light output while tuning and dimming. On-board closed loop thermal feedback compensates each color channel for thermally induced variations in light output due to dimming or changes in ambient temperatures. A patented in-line manufacturing process captures and stores the spectral characteristics of each LED on the light engine, rapidly generating a unique color model for each light engine.

The LED light engines are compatible with traditional 0–10 V wired controls, and feature on-board Bluetooth Low Energy (BLE) for commissioning. DMX512-A-RDM can be accessed via an optional control card that connects to an electrically isolated expansion port within the ALM. For simple deployment, scene set allows up to five scenes to be pre-programmed into the LED light engine during production and recalled at the venue using a 0–10 V recommended dimmer or via Bluetooth. Commissioning of the LED light engine and the re-programming of scenes is done via the wireless Araya Tunable Color 2.0 iOS app that connects to the embedded Bluetooth radio.

Key Features

- Tunable range: 1650–8000 K
- 90+ CRI*
- Dimmable from 100%–0.1%** at constant CCT
- Color gamut control: gradients of saturated colors from 1–100% can be added to color points
- Warm/Dynamic Dimming from 3050–1800 K***
- On board thermal feedback for color consistency of < 2 MacAdam ellipse
- In-line spectral capture and storage creates a unique color model for each Zhaga-compliant LED light engine, resulting in consistent CRI and CCT across all light engines
- Compatible with 0–10 V wired controls
- DMX512-A-RDM accessibility via an optional control card that connects to an electrically isolated compartment within the ALM
- DMX slots set by RDM or via wireless Araya Tunable Color 2.0 iOS app
- Scene set enables up to five scenes to be preprogrammed and recalled using a 0–10 V recommended dimmer or via Bluetooth
- On-board thermal turndown
- Light emitting surface (LES): 12 mm, 19 mm, 32 mm (nominal)



Tunable Color 2.0 iOS App

Part Numbers (CTM2 Kits)¹

Input Voltage (DC)	Nominal Wattage	CTM212		CTM219		CTM232	
		Peak Delivered Lumens ²	Part Number***	Peak Delivered Lumens ²	Part Number***	Peak Delivered Lumens ²	Part Number***
24 V	60 W	-	-	-	-	4300	80.002.007.01-C
	35 W	-	-	2000	80.002.102.02-C	-	-
	30 W	1700	80.002.002.02	1700	80.002.005.02-C	-	-
	18 W	1000	80.002.101.02	1000	80.002.003.02-C	-	-

* From 2200–6000 K, down to 5% dim level.

** 100–0.1% dimming is available when connected to 0.1% dimming-capable digital controls. 100–1% dimming is available with analog 0–10 V control.

*** To have units shipped in Dynamic Dimming AKA “Warm Dim” mode of operation, add “-P02” suffix to the end of the part number. For example; order as: ‘xx.xxx.xxx.xx-P02’.

1. Kits include round light engine and ALM as a factory pre-matched set which MUST be kept that way during installation for proper operation and control and CANNOT be separated. The kits include the power cable, but do NOT include ribbon cables, control cables, or the control cards (see separate accessory ordering specifications).

2. Peak delivered lumen values are listed for the light engines tested with the included dome diffuser.

Lumen and wattage range is within +/- 10% of the nominal value. Peak efficacy is not necessarily at typical peak lumens.

2 ELECTRICAL AND CONTROL SPECIFICATIONS

ALM2 – Araya Logic Module

2.1 Electrical Specifications and Photometric Information

Nominal Current Input	24 V: 60 W = 2.5 A; 35 W = 1.5 A; 30 W = 1.3 A; 18 W = 0.75 A
Power Supply Classification	Class 2
Control Options*	0–10 V, DMX512-A-RDM****
CRI (Ra) Across Tuning Range	> 90**
Dimming	100% to 0.1%***
Nominal Color Consistency	< 2 MacAdam ellipse (±0.002 Duv from ANSI C78.377-2008 curve)*
Color Consistency Over Life	Calibration maintains original color points over life*
Lumen Maintenance	L70 (70% of initial lumens) at 50,000 hours

Araya Logic Module (ALM) power dissipation is up to 10% of total power dissipation. Therefore ALM must be provided with adequate heat sink capability when applicable.

* DMX512-A-RDM compatibility requires optional control card.

** From 2200–6000 K, down to 5% dim level.

*** 100–0.1% dimming is available when connected to 0.1% dimming-capable digital controls. 100–1% dimming is available with analog 0–10 V control.

**** Remote Device Management or RDM is a protocol enhancement to DMX512-A that allows bi-directional communication between a lighting or system controller and attached RDM compliant devices over a standard DMX line.

2.2 Control Specifications

CONTROL SYSTEM / PROTOCOL	CTM2 (TUNABLE WHITE & TUNABLE COLOR CONTROL)			
	1 DIMMING*	2 CCT	3 SAT	4 HUE
DMX512-A-RDM ^{1,2}	0.1%	1650–8000 K	Yes	Yes
0–10 V	~1% ³	1650–8000 K	See Note ⁴	See Note ⁴

1. Requires control card connected to ALM.

2. Refer to the separate Araya DMX Lookup Tables for specific programming values and information.

3. 1–10 V signal dims light engine to approximately 1%. In-line power relay required to achieve 0% output.

4. Two 0–10 V lines can be used to control DIM and CCT independently, or program Scenes—in any combination of DIM, CCT, HUE and SAT—and recall them with five 0–10 V presets.

* 100–0.1% dimming is available when connected to 0.1% dimming-capable digital controls. 100–1% dimming is available with analog 0–10 V control.

2.3 DMX512-A-RDM Commissioning and Control Specifications

	RDM PERSONALITIES		DMX ADDRESS (FACTORY DEFAULT START ADDRESS = 1)							
	Suffix*	Description	1	2	3	4	5	6	7	8
8-BIT MODE	Default (None)	Color Tuning 4CH (HSI)	DIM 0–100%	CCT 1700–8000 K	SAT 0–100	HUE 0–60	–	–	–	–
16-BIT MODE	P02	Warm Dim “DDM”	DIM 0–100%	fdim	–	–	–	–	–	–


Download the separate Araya DMX512-A Lookup Tables on the ERP website, for specific programming values and information.

3 ACCESSORIES

3.1 Power Cable Assembly (Included)

Description	Part Number
2-wire Input Power Cable. Nominal 24" Length. 	28.030.001.01

3.2 Control Cable Assembly (Ordered Separately)


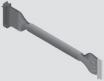
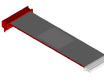
Description	Part Number
4-Wire 0–10 V Control Cable Assembly. Nominal 24" Length. 	28.002.002.02

3.3 Control Cards (Ordered Separately)*

Description	Part Number
DMX512-A-RDM Control Card	80.003.002.01

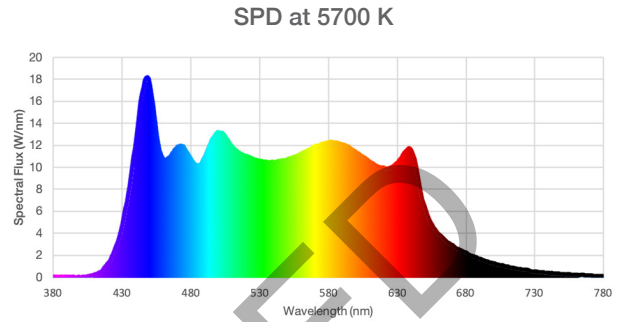
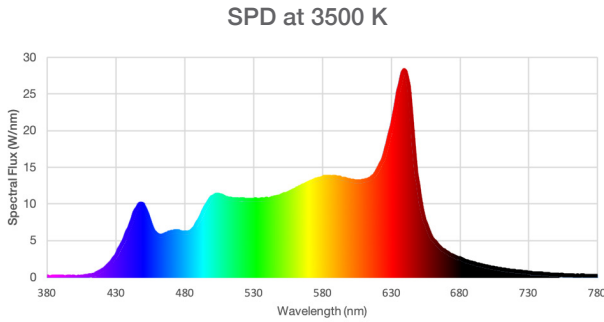
*The control card is shipped pre-attached to the ALM, & cannot be shipped individually.
Control cards for different controls should NOT be interchanged in the field. This will void the ERP Power warranty.

3.4 Ribbon Cables (Ordered Separately)

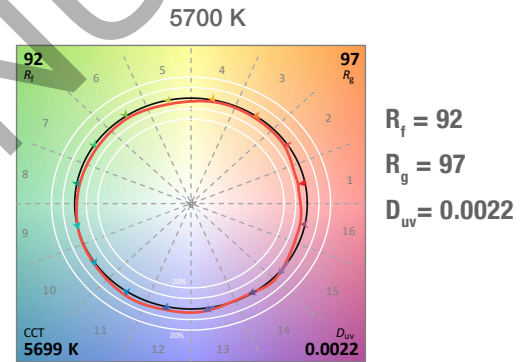
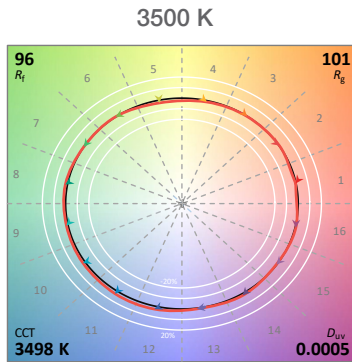
Description	Part Number
Flexible tape-wrapped 16-pin ribbon cable. Nominal 18" Length. 16-pin Tyco Connector at one end, 20-pin JST connector at other end. For connecting ALM to round light engine. 	28.700.004.02
Jacketed/round 16-pin ribbon cable. Nominal 18" Length. 16-pin Tyco Connector at one end, 20-pin JST connector at other end. For connecting ALM to round light engine. 	28.700.003.03
Flat 16-pin ribbon cable. Nominal 18" Length. 16-pin Tyco Connector at one end, 20-pin JST connector at other end. For connecting ALM to round light engine. 	28.700.001.05

4 COLOR / DIMMING PERFORMANCE DATA

4.1 Typical Spectral Power Distribution (SPD) Curves



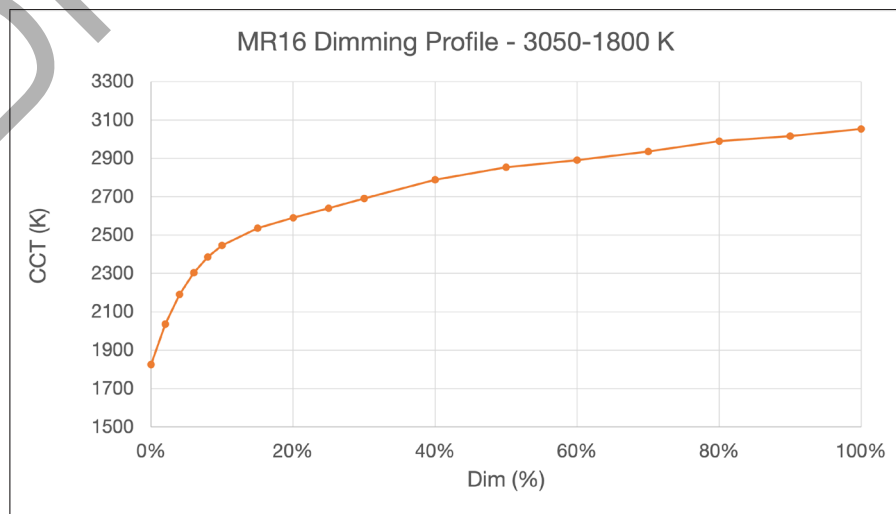
4.2 Typical TM-30 Data



4.3 Warm/Dynamic Dimming

Warm/Dynamic Dimming mimics the dynamic dimming characteristics of conventional MR16 halogen (3050–1800 K) lamps, wherein dimming the intensity of the lamp lowers its CCT.

When the optional Warm/Dynamic Dimming profile (DDM)** is chosen—which can be set back to Color Tuning (CTM) in the field if desired, but only if connected to DMX-RDM—the light dims from 3050 K at full intensity to 1800 K at 5% intensity, and then maintains 1800 K to 1%.



5 POWER SUPPLY REQUIREMENTS

ALM2 – Araya Logic Module

Recommended Power Supplies (Constant Voltage)

Input Voltage - 24 V DC (Constant)						
Manufacturer	Part Number	Rated Power	CTM2 (18 W)	CTM2 (30 W)	CTM2 (35 W)	CTM2 (60 W)
ERP	VLM40W-24	40 W	✓	✓		
ERP	VLM60W-24	60 W	✓	✓	✓	
ERP	VLM100W-24	96 W	✓	✓	✓	✓

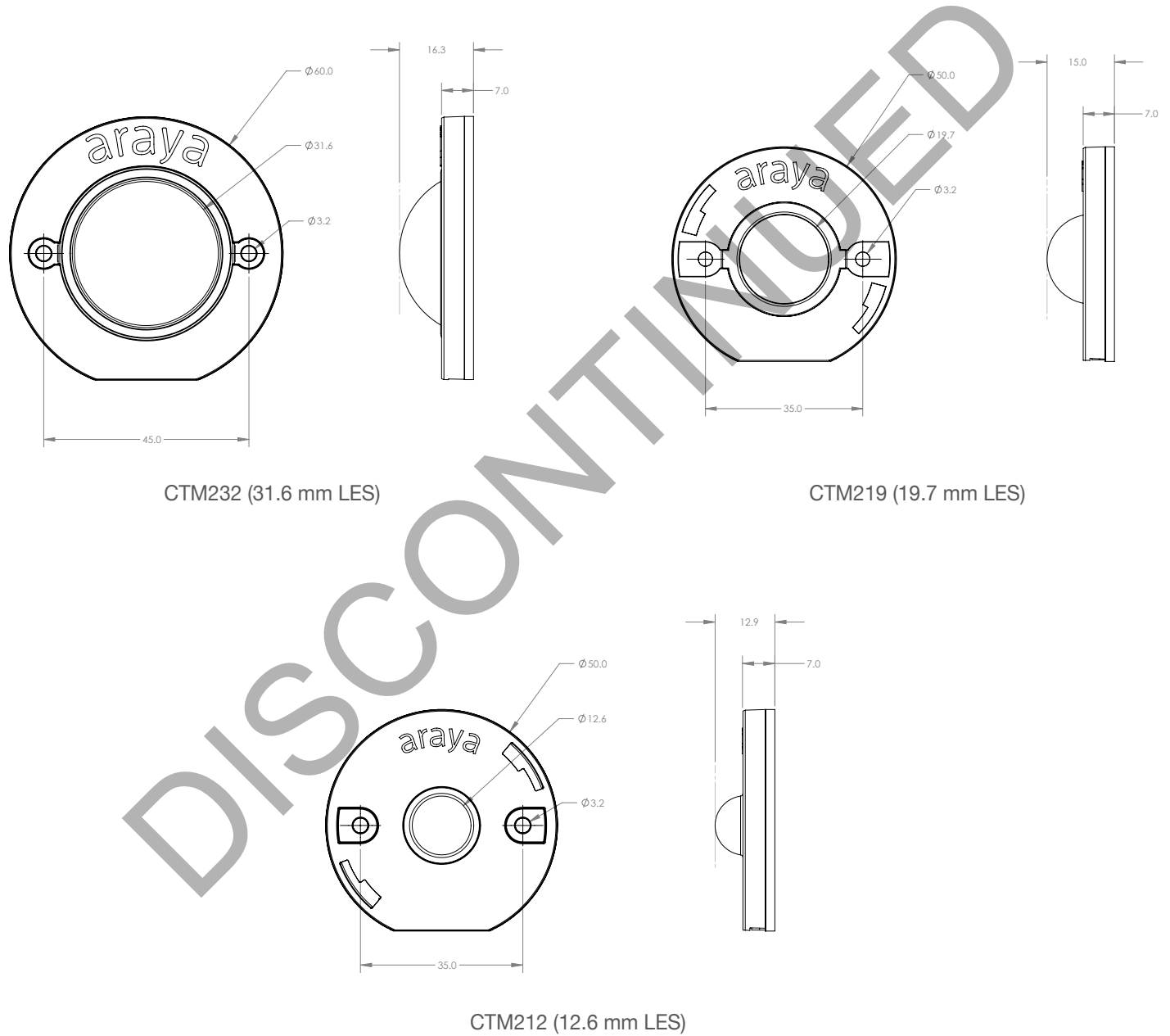
NOTES:

- Recommendations are subject to change. Consult your ERP representative for the most updated list.
- The Araya Logic Module (ALM) has on-board drive electronics, including dimming. **DO NOT** use a dimming driver.
- Using a constant current power supply will damage the light engine, and will void the ERP warranty.
- Using a triac or dimming driver will damage the light engine, and will void the ERP warranty.
- The power supply **MUST** be evaluated with the light engine(s) that it will be operated with.
- If unqualified power supplies are used in a fixture, it will void the ERP warranty.
- It is the responsibility of the fixture manufacturer to ensure that the power supply performance does not change over time. The ERP warranty is void if problems occur as a result of such changes.
- A power supply that is not part of the above list should be submitted for testing to ERP (during the design-in phase) to ensure compatibility.
- **DO NOT** hot plug the light fixtures.

6 CTM2 MECHANICAL SPECIFICATIONS

Light Engine Dimensions (LES; Diameter 'D'; Height 'H')	LES = 31.6 mm (nominal 1.24 in.)	D = 60 mm (nominal 2.36 in.); H = 16.3 mm (nominal 0.64 in.)
	LES = 19.7 mm (nominal 0.78 in.)	D = 50 mm (nominal 1.97 in.); H = 15 mm (nominal 0.59 in.)
	LES = 12.6 mm (nominal 0.50 in.)	D = 50 mm (nominal 1.97 in.); H = 12.9 mm (nominal 0.51 in.)

LES = Light Emitting Surface.



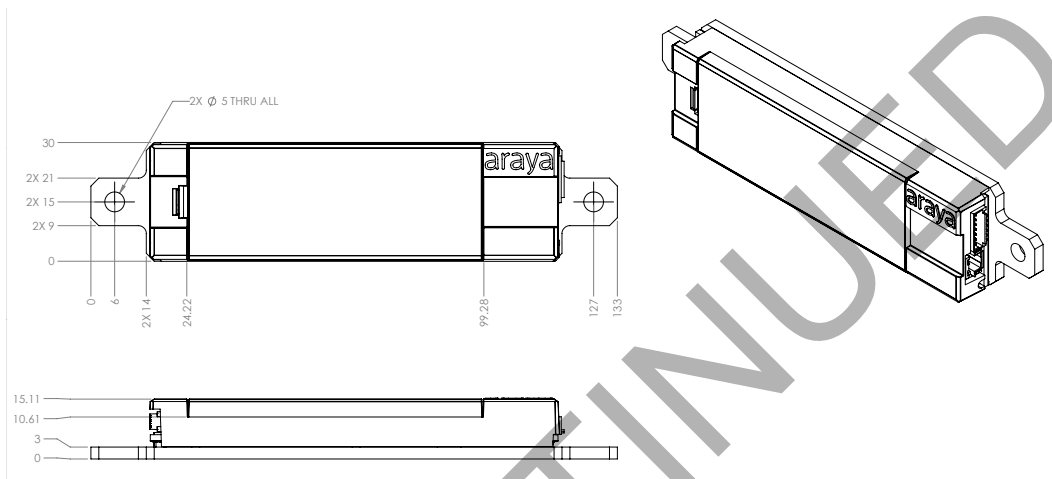
All dimensions are in millimeters.

7 ALM2 MECHANICAL SPECIFICATIONS

7.1 Araya Logic Module (ALM2)

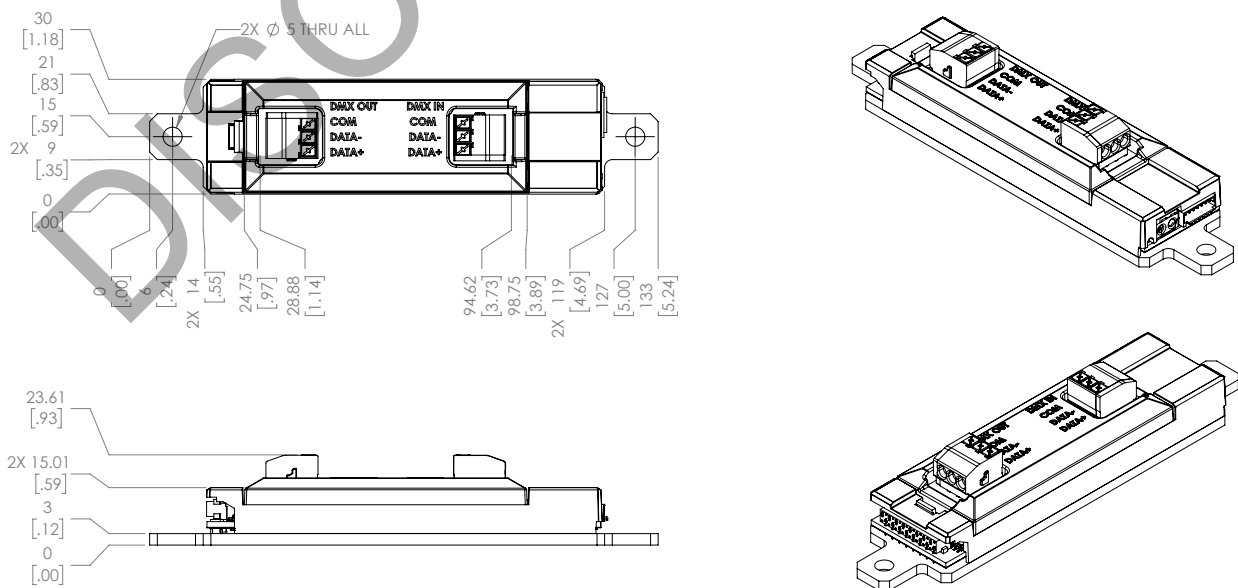
Dimensions (H x W x L)	H = 15.11 mm (0.60 in.); W = 30 mm (1.18 in.); L = 133 mm (5.24 in.)
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Dimensions provided are for the ALM2 without optional control cards.



7.2 ALM2 with DMX512-A-RDM Control Card (WAGO CONNECTORS)

Dimensions (H x W x L)	H = 23.61 mm (0.93 in.); W = 30 mm (1.18 in.); L = 133 mm (5.24 in.)
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Dimensions outside parentheses are in millimeters. Dimensions within parentheses are in inches. The mounting holes are 5 mm in diameter.

8 HEAT SINKING RECOMMENDATIONS

The Tunable Color Round Light Engines requires an external heat sink in order to ensure proper operating temperature of the LEDs.

The CTM2 has a conductive aluminum case and an efficient thermal path to the LED light engine. 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. Both carbon and stainless steel are much less efficient at transferring heat than aluminum and therefore are not recommended as heat sink materials. 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.

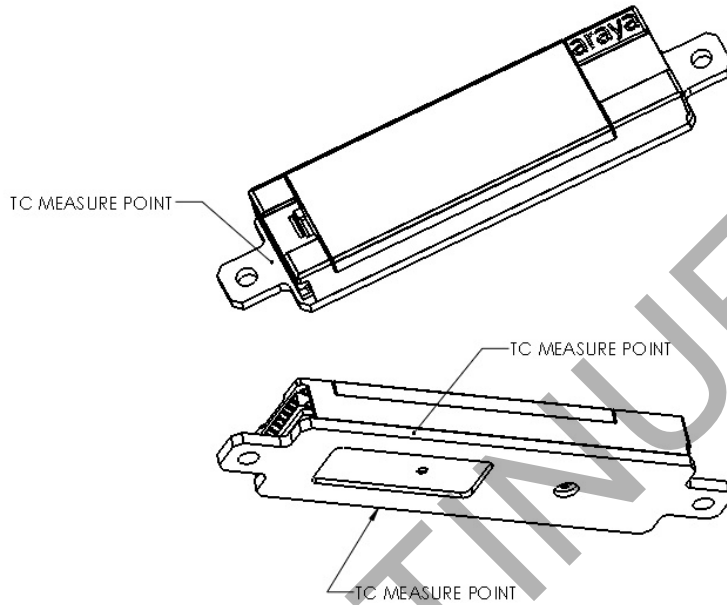
In many fixtures, the air flow to the heat sinks is obstructed or the heat sink is in an enclosed container with no path to reject heat. The thermal design of the fixture must be optimized so that the maximum temperature is less than the $T_{c_{max}}$ (maximum case temperature) as indicated in the drawings in the following section. If the $T_{c_{max}}$ is exceeded in the application, the junction temperature of the LEDs will be higher than that required to meet the L70 life, and the ERP Power warranty will be void.

IMPORTANT: Most heat sinks are qualified in “free air” at an approximate ambient temperature of 25 °C. If the CTM is installed in an insulated can fixture (IC Can), the light engine may exceed the recommended operating temperature. The heat sink must be evaluated and temperature tested in the fixture at applicable ambient temperatures for the desired application.

9 CASE TEMPERATURE MEASUREMENT POINTS

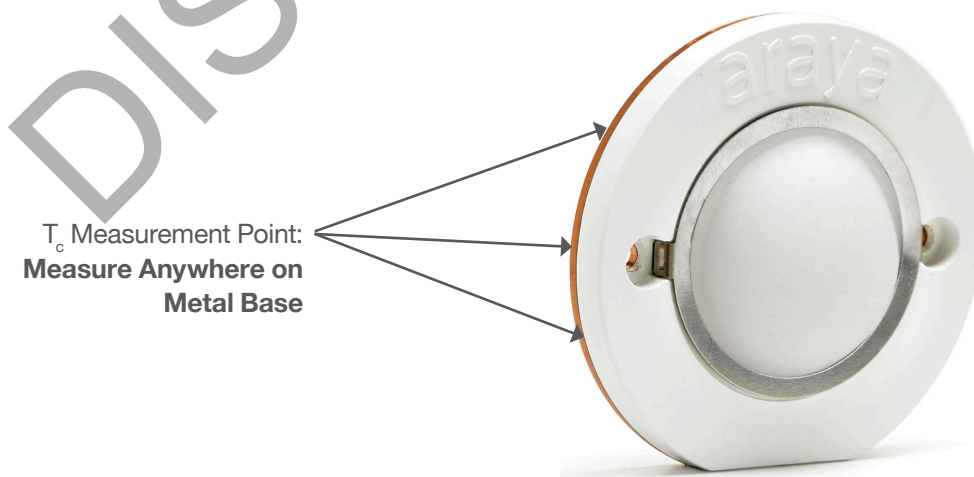
ALM2 – Araya Logic Module

9.1 Araya Logic Module (ALM) Case Temperature (T_c) Measurement Points



MAXIMUM CASE TEMPERATURE (T_c) FOR ALM: 70 °C

9.2 Round LED Light Engine Case Temperature (T_c) Measurement Point



MAXIMUM CASE TEMPERATURE (T_c) FOR ROUND LED LIGHT ENGINE: 90 °C

10 SECONDARY OPTICS

10.1 Attaching Compatible Reflectors

The round LED light engines with 19 mm LES (Light Emitting Surface) accept twist-to-lock reflectors with an attachment collar. The fastener specifications are shown in the following table while mounting hole locations are shown in Figures 1, 2 and 3.

CTM2 Secondary Optics Fastener Specifications:

Attachment Type	Fastener specifications	Screw length	Notes
Twist-Lock (with Adaptor Ring)	M3 x 6; quantity of two	6 mm (1/4")	Pan head screws
Twist-Lock (with Adaptor Ring & Adaptor)	M3 x 6; quantity of two	6 mm (1/4")	Pan head screws
TE Type 2 Clip	M3 x 10; quantity of two	10 mm (3/8")	Rounded head screws

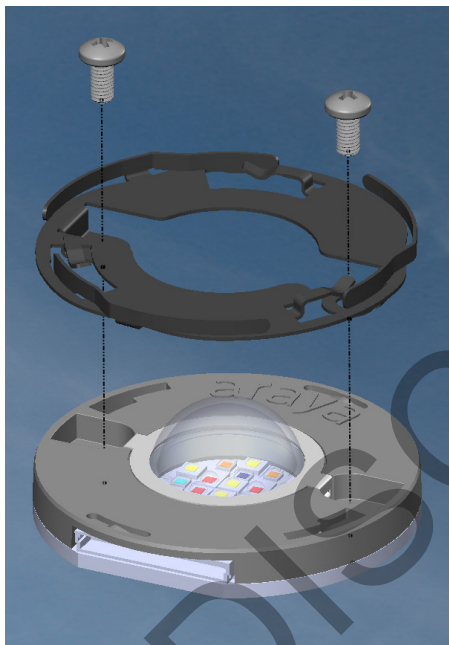


Figure 1: Round LED Light Engine with XSA-242 Adaptor Ring (by Xicato)

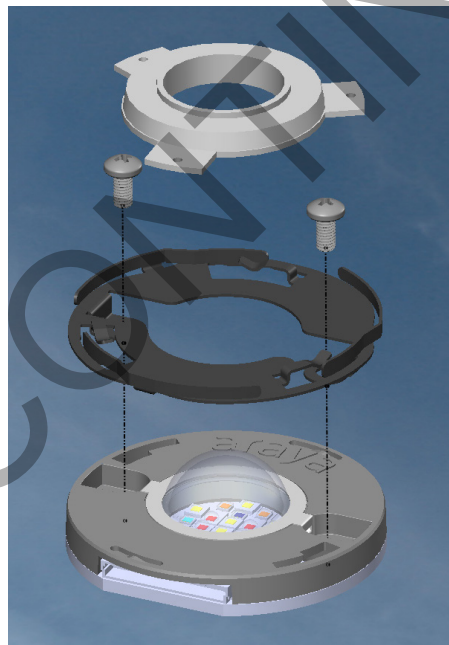


Figure 2: Round LED Light Engine with XSA-242 Adaptor Ring (by Xicato) with Adaptor, used for Reflectors by Diffractive Optics (p/n: P14008) or Khatod (p/n: KE1950W)

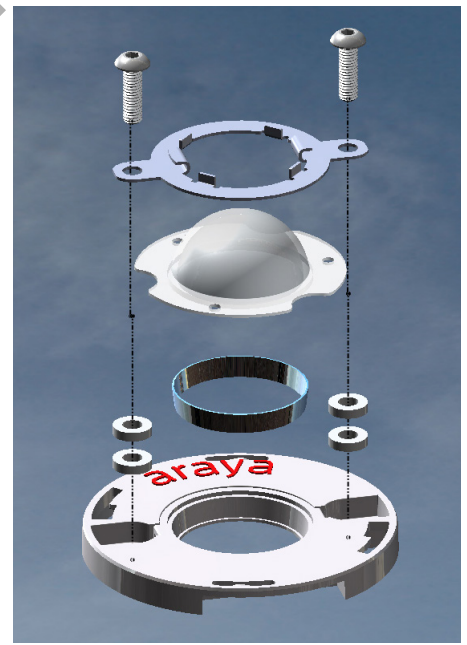


Figure 3: Round LED Light Engine with Lumawise Z50 Type 2 Clip (by TE)

10 SECONDARY OPTICS

10.2a Compatible Reflectors List (CTM219) - continued on next page

Manufacturer	M. Part Number	beam angle (deg)	outer dim (mm)	height (mm)	optical finish	optical finish 2	attach method
Diffraction Optics	P13302 (XSA-220)	40	50	29	specular	none	XSA242
Diffraction Optics	P13004 (XSA-221)	40	49.3	28.6	specular	faceted	XSA242
Diffraction Optics	P13008 (XSA-223)	40	54.1	42.3	specular	none	XSA242
Diffraction Optics	P13010 (XSA-224)	20	70	42	specular	none	XSA242
Diffraction Optics	P13016 (XSA-227)	20	94.3	83	specular	faceted	XSA242
Diffraction Optics	P13825	10-15	69	33	specular	superfacet, diamond	XSA242 + P14008
Diffraction Optics	P13827	20	69	33	specular	superfacet, diamond	XSA242 + P14008
Diffraction Optics	P13829	30	69	33	specular	superfacet, diamond	XSA242 + P14008
Diffraction Optics	P13765	10-15	75	42.3	specular	superfacet, diamond	XSA242 + P14008
Diffraction Optics	P13767	20	75	42.3	specular	superfacet, diamond	XSA242 + P14008
Diffraction Optics	P13831	30	75	42.3	specular	superfacet, diamond	XSA242 + P14008
Diffraction Optics	P13769	10-15	85	43.3	specular	superfacet, diamond	XSA242 + P14008
Diffraction Optics	P13771	20	85	43.3	specular	superfacet, diamond	XSA242 + P14008
Diffraction Optics	P13833	30	85	43.3	specular	superfacet, diamond	XSA242 + P14008
Diffraction Optics	P13773	10-15	92	43.3	specular	superfacet, diamond	XSA242 + P14008
Diffraction Optics	P13775	20	92	43.3	specular	superfacet, diamond	XSA242 + P14008
Diffraction Optics	P13781	30	92	43.3	specular	superfacet, diamond	XSA242 + P14008
Diffraction Optics	P13713	20	75	37	specular	faceted	XSA242 + P14008
Diffraction Optics	P13715	35	75	37	specular	faceted	XSA242 + P14008
JORDAN	11324 10 10101	25	111	66	specular	super facet	none
JORDAN	11324 00 10101	40	111	66	specular	super facet	none
Khatod EASY	KCLP 1858CR	12	72	52	combination	none	Zhaga Screw 35mm
Khatod EASY	KCLP 1858ME	30	72	52	honeycomb lens	none	Zhaga Screw 35mm
Khatod EASY	KCLP 1858WI	50	72	52	bugeye lens	none	Zhaga Screw 35mm
Khatod EASY	KCLP 1859CR	12	110	61	combination	none	Zhaga Screw 35mm
Khatod EASY	KCLP 1859ME	30	110	61	honeycomb lens	none	Zhaga Screw 35mm
Khatod EASY	KCLP 1859WI	50	110	61	bugeye lens	none	Zhaga Screw 35mm
Khatod EASY	KCLP 1799 CR	asym			specular	none	Zhaga Screw 35mm
Khatod	KCLP 1682 CR (1429CR)	11	65	35	specular	none	TE Type II / XSA242 + KE1950W
Khatod	KCLP 1682 ST (1429ST)	20	65	35	diffuse	none	TE Type II / XSA242 + KE1950W
khatod	KCLP 1683 CR (1430CR)	26	65	35	specular	none	TE Type II / XSA242 + KE1950W
khatod	KCLP 1683 ST (1430ST)	24	65	35	diffuse	none	TE Type II / XSA242 + KE1950W
khatod	KCLP 1431 CR		65	35	specular	none	TE Type II / XSA242 + KE1950W
khatod	KCLP 1432 CR		65	35	specular	none	TE Type II / XSA242 + KE1950W
khatod	KCLP 1685 ST (1432ST)	32	65	35	diffuse	none	TE Type II / XSA242 + KE1950W
khatod	KCLP 1684 ST	28	65	35	diffuse	none	TE Type II / XSA242 + KE1950W
khatod	KCLP 1686 CR	44	65	35	specular	none	TE Type II / XSA242 + KE1950W
khatod	KCLP 1687 CR	27	65	35	specular	none	TE Type II / XSA242 + KE1950W
khatod	KCLP 1687 ST	31	65	35	diffuse	none	TE Type II / XSA242 + KE1950W
khatod	KCLP 1688 CR	37	65	35	specular	none	TE Type II / XSA242 + KE1950W
khatod	KCLP 1688 ST	38	65	35	diffuse	none	TE Type II / XSA242 + KE1950W
khatod	KCLP 1689 ST	42	65	35	diffuse	none	TE Type II / XSA242 + KE1950W
khatod	KCLP 1690 ST	50	65	35	diffuse	none	TE Type II / XSA242 + KE1950W
khatod	KCLP 1691 ST	56	65	35	diffuse	none	TE Type II / XSA242 + KE1950W
khatod	PLJT 1866	n/a			diffuse ball		XSM242

NOTE: Beam angles listed above have been taken from the reflector manufacturers' data sheets. Reflectors have been recommended based on independent optical tests conducted by ERP, and should be used as guidelines. Final reflector evaluation should be made by fixture manufacturers with all optics in place.

10 SECONDARY OPTICS

10.2b Compatible Reflectors List (CTM219) - continued from previous page

Manufacturer	M. Part Number	beam angle (deg)	outer dim (mm)	height (mm)	optical finish	optical finish 2	attach method
Nata	3990-E	24	75	43	diffuse	super facet	none
Nata	3991-E	36	75	43	diffuse	super facet	none
Nata	3993-E	40	85	50.5	diffuse	super facet	none
Nata	2-1050A	25	65	44	satın	none	XSA242
Nata	2-1131E	18	68	51	m-diffuse	facets	XSA242
Nata	2-1132E	30	68	51	m-diffuse	super facet	XSA242
Nata	2-1133E	45	68	51	m-diffuse	super facet, flare	XSA242
Nata	4-1150E5	39	111	65	m-diffuse	super facet	none
Nata	4-1405E	16	98	66.4	specular	facets	none
Nata	4-1406E				diffuse	super facet	none
Nata	2-1535E				m-diffuse	super facet	none
Nata	4-1536E	20	110	65.3	m-diffuse	super facet	none
Nata	4-1537E	30	110	62	diffuse	super facet	none
Nata	4-1664E	24	111	65	m-diffuse	super facet	none / 3 tabs
Nata	4-1666E	38	111	65	diffuse	super facet	none / 3 tabs
Nata	4-1667E	45	111	61.3	m-diffuse	super facet	none
Nata	4-1820E	60	111	65	diffuse	super facet	none / 3 tabs
Nata	3-1901M	28	79	51	m-diffuse	super facet	XSA242
Nata	3-1903M	40	79	51	m-diffuse	super facet	XSA242
Nata	4-1966E	7	111	65	m-diffuse	super facet	XSA242
Widegerm	1009T-XC	38	49	30.5	specular	faceted	XSA242
Widegerm	1010T-XC	55	50	30.5	specular	none, trumpet	XSA242
Widegerm	208x-XM		71.5	54	satın	lightfaceted	XSA242
Widegerm	2201T-XM	19	72	44	m-diffuse	faceted	XSA242
Widegerm	2202T-XM	35	72	44	m-diffuse	faceted	XSA242
Widegerm	3150T-XM	17	75	48	m-specular	faceted	XSA242
Widegerm	3204T-XM	27	82	46	m-diffuse	faceted	XSA242
Widegerm	3205T-XM	36	82	46	specular	faceted	XSA242
Widegerm	3207T-XC	-	82	46	satın	none	XSA242
Widegerm	4219T-XM	20	111	36	diffuse	faceted	XSA242
Widegerm	4220T-XM	37	111	36	m-specular	faceted	XSA242
Widegerm	4221T-XM	47	111	36	m-specular	faceted	XSA242
Widegerm	4301T-XM	36	111	69	m-diffuse	faceted	XSA242
Widegerm	4401T-XM	43	111	69	m-diffuse	faceted	XSA242

NOTE: Beam angles listed above have been taken from the reflector manufacturers' data sheets. Reflectors have been recommended based on independent optical tests conducted by ERP, and should be used as guidelines. Final reflector evaluation should be made by fixture manufacturers with all optics in place.

10 SECONDARY OPTICS

ALM2 – Araya Logic Module

10.3 Compatible Reflectors List (CTM232)

Manufacturer	M. Part Number	beam angle (deg)	outer dim (mm)	height (mm)	optical finish	optical finish 2	attach method
Jordan	11324 10 10101	25	111	66	specular	super facet	none
Jordan	11324 00 10101	40	111	66	specular	super facet	none
Nata	4-1150E5	39	111	65	m-diffuse	super facet	none
Nata	4-1536E	20	110	65.3	m-diffuse	super facet	none
Nata	4-1666E	38	111	65	diffuse	super facet	none / 3 tabs
Nata	4-1667E	45	111	61.3	m-diffuse	super facet	none
Nata	4-1820E	60	111	65	diffuse	super facet	none / 3 tabs

NOTE: Beam angles listed above have been taken from the reflector manufacturers' data sheets. Reflectors have been recommended based on independent optical tests conducted by ERP, and should be used as guidelines. Final reflector evaluation should be made by fixture manufacturers with all optics in place.

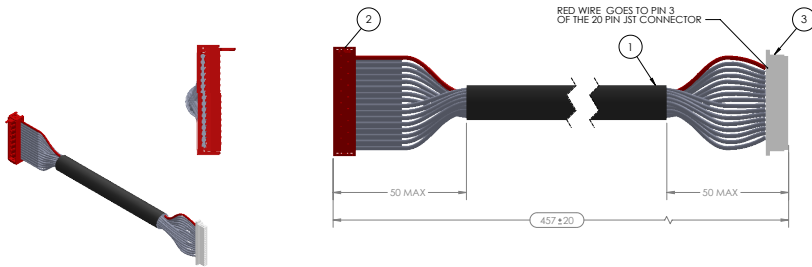
DISCONTINUED

11 RIBBON CABLE ASSEMBLIES

11.1 Flexible Tape-Wrapped 16-Pin Ribbon Cable (Nominal 18" Length)

Part Number:
28.700.004.02

16-pin Tyco Connector at one end, 20-pin JST connector at other end; for connecting ALM to round light engine.

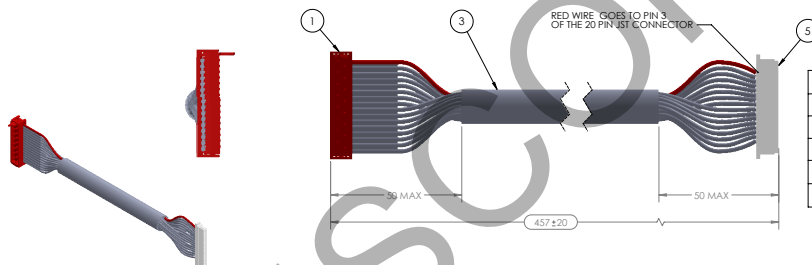


ITEM NO.	PART NUMBER	QTY.
1	16 PIN RIBBON CABLE 3M 3365-16 WRAPPED WITH BLACK ACETATE CLOTH TAPE	1
2	16 PIN CONNECTOR 1-215083-6 TE CONNECTIVITY	1
3	CONNECTOR SHR-20V-S-B JST	1
4	CRIMP SSSH-003T-PO.2-H JST	16

11.2 Jacketed / Round 16-Pin Ribbon Cable (Nominal 18" Length)

Part Number:
28.700.003.03

16-pin Tyco Connector at one end, 20-pin JST connector at other end; for connecting ALM to round light engine.

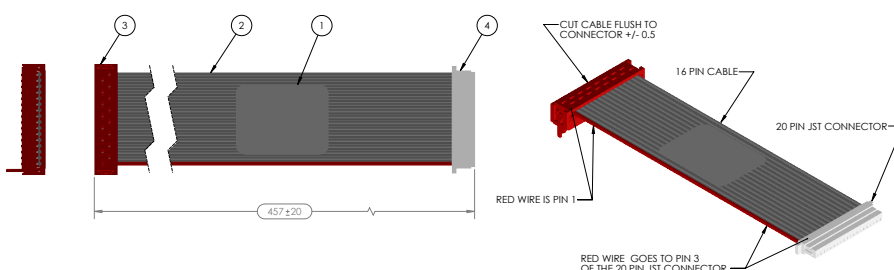


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	16 PIN CONNECTOR 1-215083-6	CONNECTOR 16 PIN 1-215083-6	1
2	476.011 CRIMP SSSH-003T-PO.2-H		16
4	3M ROUND JACKED FLAT CABLE 3759-16	3M ROUND JACKED FLAT CABLE 3759/16	1
5	460.042 CONNECTOR SHR-20V-S-B	CONNECTOR SHR-20V-S-B	1
6	LABEL, LUMENETIX, PART#, DESCRIPTION, REVISION	LUMENETIX, P/N, DESCRIPTION, REVISION	1

11.3 Flat 16-Pin Ribbon Cable (Nominal 18" Length)

Part Number:
28.700.001.05

16-pin Tyco Connector at one end, 20-pin JST connector at other end; for connecting ALM to round light engine.



1	LABEL, LUMENETIX, PART#, DESCRIPTION, REVISION	1
2	16 PIN RIBBON CABLE 3M 3365-16	1
3	16 PIN CONNECTOR c-1-215083-6-t-3d	1
4	460.042 CONNECTOR SHR-20V-S-B	1
5	CRIMP SSSH-003T-PO-2	16

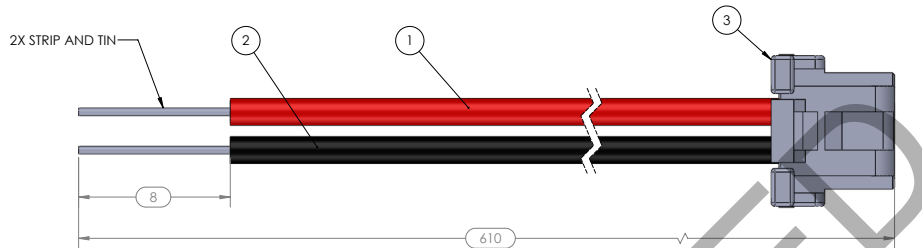
Note: All dimensions are in millimeters.

12 POWER / CONTROL CABLE ASSEMBLIES

12.1 Power Cable Assembly (Nominal 24" Length)

Required for connecting each light engine to DC power. Included with all versions of ALM2.

Part Number:
28.030.001.01

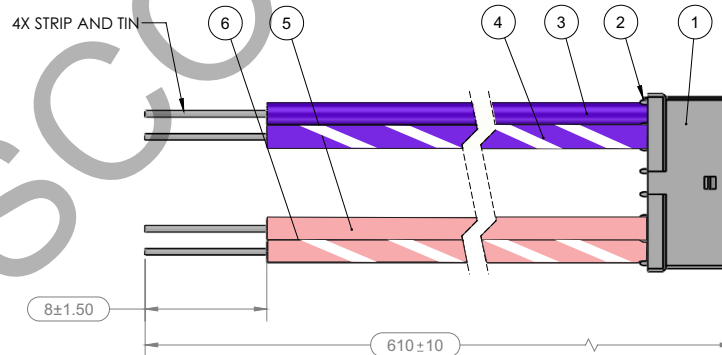


Item Number	Part Number	Description	Input	Quantity
1	Red Wire 24 AWG	Hook-up Wire Stranded 7/32 24 AWG Red	Power DC (+)	1
2	Black Wire 24 AWG	Hook-up Wire Stranded 7/32 24 AWG Black	Power Common (-)	1
3	Connector Molex 5023510200		N/A	1
4	Crimp Molex 0503728000		N/A	2

12.2 Control Cable Assembly (Nominal 24" Length)

Required for connecting each light engine to 0–10 V control.

Part Number:
28.002.002.02



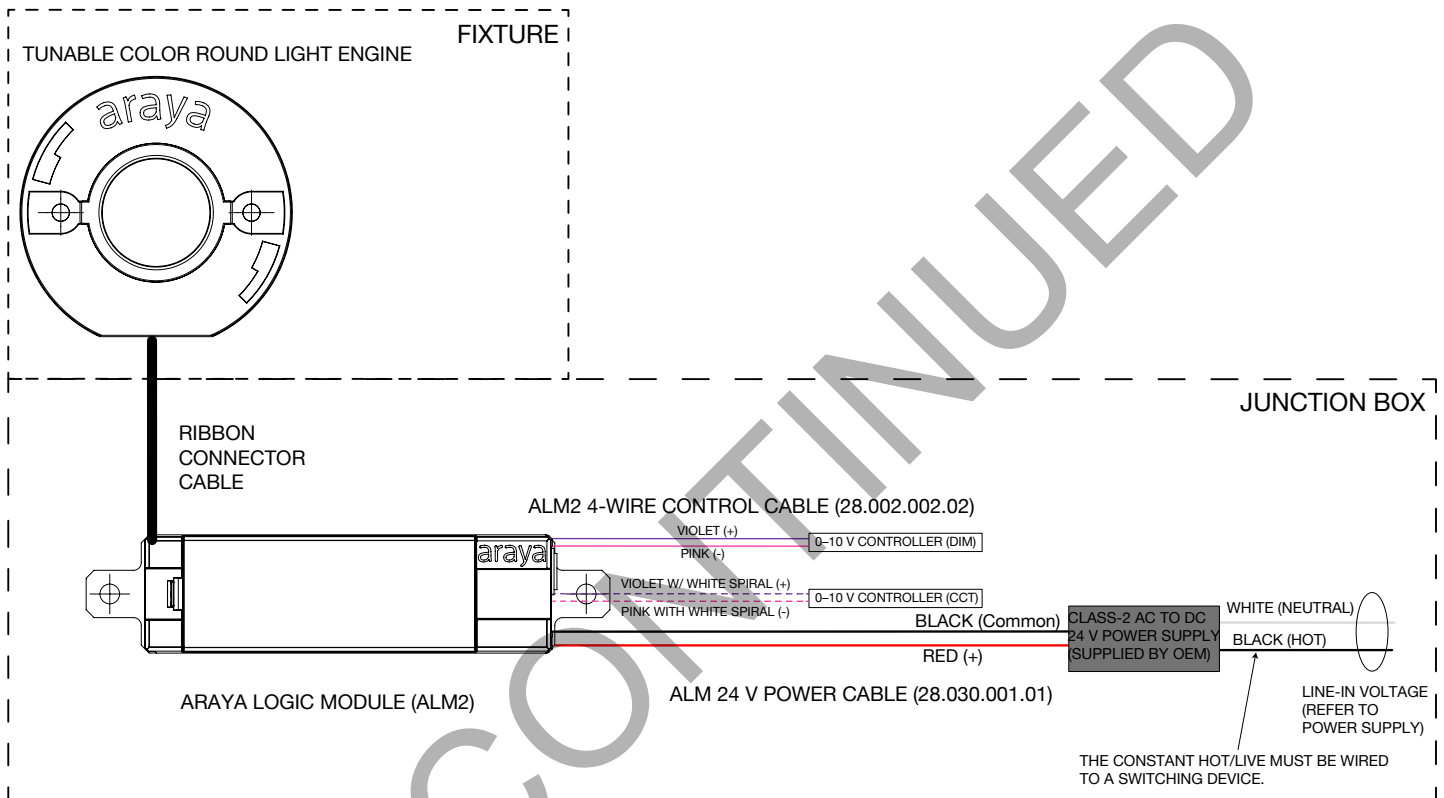
Item Number	Part Number	Manufacturer	Description	Input	Quantity
1	874390700	Molex	Connector 7-Pin	N/A	1
2	874210000	Molex	Connector Crimp	N/A	4
3	UL 1061	Any	Wire Stranded Tinned 24 AWG 7-32 Violet	0–10 V Dimming (+)	1
4	UL 1061	Any	Wire Stranded Tinned 24 AWG 7-32 Violet with White Spiral*	0–10 V Color (+)	1
5	UL 1061	Any	Wire Stranded Tinned 24 AWG 7-32 Pink*	0–10 V Dimming (-)	1
6	UL 1061	Any	Wire Stranded Tinned 24 AWG 7-32 Pink with White Spiral*	0–10 V Color (-)	1

* Some previous versions of this cable assembly may be shipped with differently colored leads.

Note: All dimensions are in millimeters.

13 0–10 V WIRING DIAGRAM

Refer to the separate Araya 0–10 V Specifications guide on the ERP website, for more detailed information.

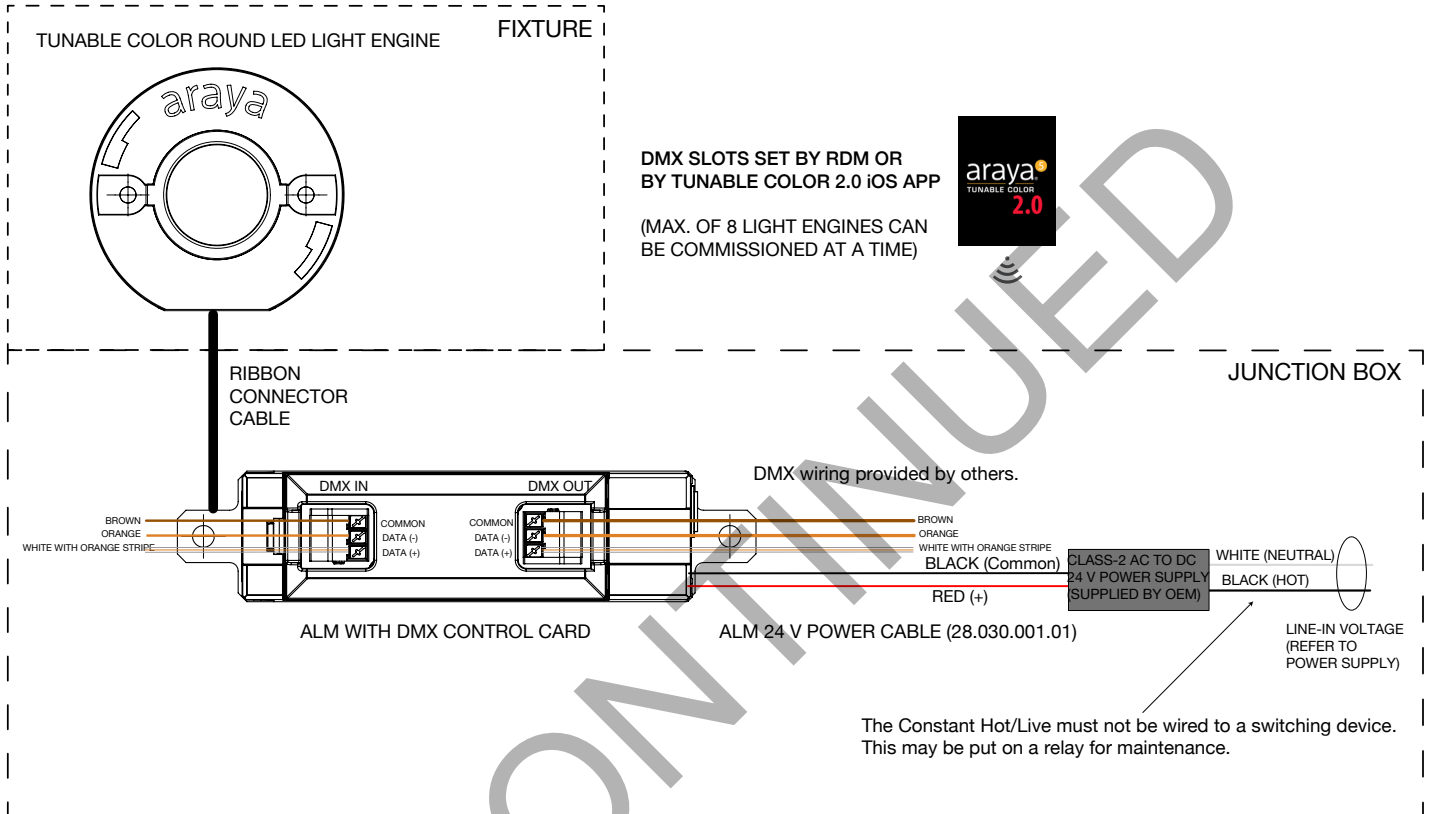


Notes:

1. Align the index tab on the ribbon cable with the index slot on the ALM header.
2. 24 V power (red/black) is Class-2 rated.

14 DMX512-A-RDM WIRING DIAGRAM

Please download the Araya DMX512-A Specifications guide on the ERP website, for more detailed information.



Notes:

1. 24 V power (red/black) is Class-2 rated.
2. Align the index tab on the ribbon cable with the index slot on the ALM header.
3. The DMX control system should first be powered OFF, and only light engines that are connected to the DMX system should be powered on.
4. If more than one line of DMX is needed, then a DMX Splitter must be used to create multiple independent branches of a DMX signal and/or to extend the usable distance of each branch. Each of the splitter's 4, 6, 8, or 16 output ports generates an independently protected DMX signal.
5. The serial numbers on the labels of both the ALM2 and the light engine(s) must match exactly.
6. Bluetooth operation is only for commissioning the light engines, NOT for controlling them.

15 PRE-INSTALLATION NOTES

ALM2 – Araya Logic Module

TUNABLE COLOR ROUND LED LIGHT ENGINES

- **Exercise caution** when connecting the ribbon cables to the LED light engines. Do not press the domed lens against a hard surface (like a table or workbench) as they can be damaged. Do not break off the indexing tabs.

RIBBON CABLE CONNECTORS

- The ribbon cable connector slot is located on one side of the round LED light engine.

ARAYA LOGIC MODULE

- Mount the ALM to the fixture with 6 mm – 8 mm (M2.5 – M4) screws in desired location.

Test-fit all components prior to installation. Mark edges for correct alignment.

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ERP Power LLC
2625 Townsgate Road, Suite 106
Westlake Village, CA 91361
805.517.1300
erp-power.com

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