

Project		Catalog #		Type	
Prepared by		Notes		Date	



HALO

ML Flex Series - Canless LED Adjustable Downlighting 2-inch Round & Square Adjustable

The ML Flex Series is a set of striking, high-performance adjustable fixtures available in three sizes (2, 3, and 4-inch). ML Flex Canless adjustable luminaires share a sleek design with reduced glare, 355° rotation and up to a 25° tilt angle. The ML Flex adjustables provide quality light with multiple field replaceable TIR optics to provide the beam angle you want virtually anywhere. Using round and square magnetic trims, makes the ML Flex flexible and perfect for residential, hospitality, retail, and healthcare installations.

The ML Flex 2-inch fixtures are offered with an array of adjustable smooth trims colors and round or square. Control beam angles with interchangeable 25°, 40°, and 55° optics. Customize lighting with selectable lumens and colors with flicker-free dimming to less than 5% in phase cut (120V) or 0-10V (120-277V) versions.

Typical Applications Residential, Hospitality, Healthcare, Retail

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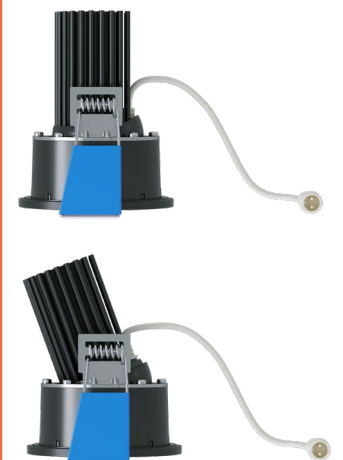


Can be used to comply with California Title 24 High Efficacy requirements.¹
Certified to California Appliance Efficiency Database under JAB.

Top Product Features

- 2" Canless LED Adjustables mount directly to the ceiling (no housing required)
- Use with canless mounting frames for new construction installations
- **Trims:** Flanged adjustable trims in smooth multiple colors and round or square
- **Lens:** Frosted lens that is field removable
- **Field-interchangeable TIR optics:** 25°, 40°, and 55° (ships with 40° TIR optic)
- **Color SeleCCTable™:**
 - 5-color Field-SeleCCTable™ (2700/3000/3500/4000/5000K); 90+ CRI
 - Field-SeleCCTable™ Dim-to-Warm: 3000K-to-1800K or 2700K-to-1800K; 90+ CRI
- **Lumen Select:** Low/Medium/High = 200/400/550 lm (nominal)
- **Dimming Versions:** Dims to less than 5% in either phase cut LE/TE (120V) with compatible dimmers OR 0-10V (UNV 120-277V)
- AIR-TITE, Wet location-listed, IC-rated, IP 64 rated
- 50,000 hrs of maintenance-free operation
- 5-year warranty

Up to a 25° Tilt Angle

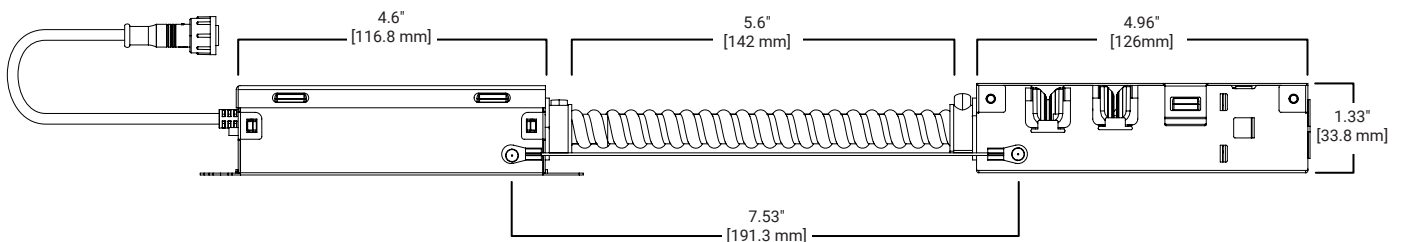
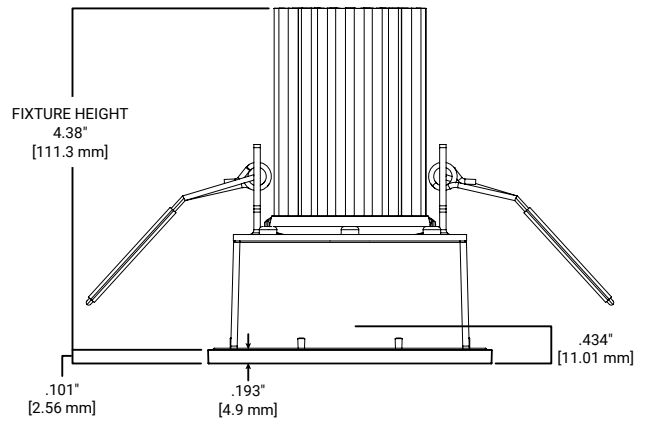
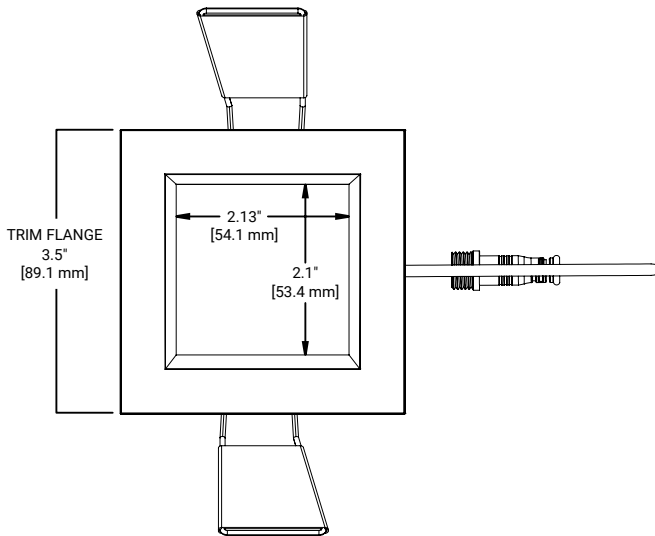
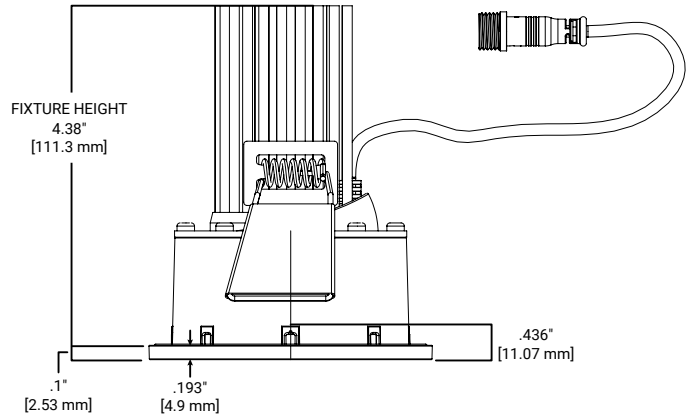
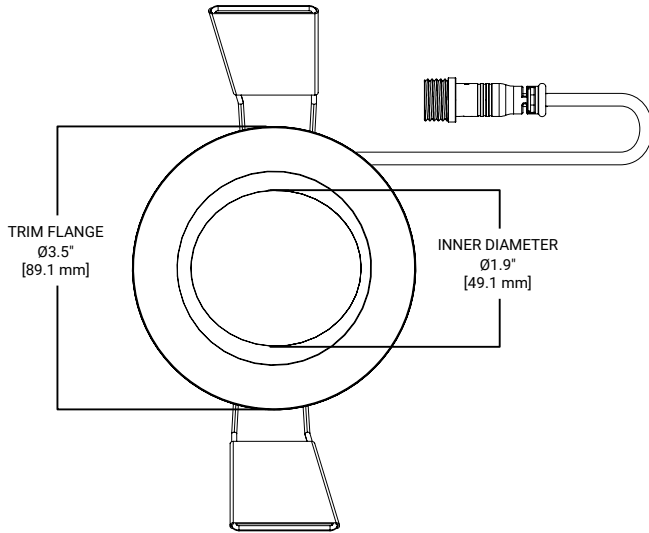


Dimensional and Mounting Details

2" ADJUSTABLE

Cut Out (Templates included in instructions and packaging)

- 2" Round Fixture = 2-5/8" [66.7mm] circle / hole saw
- 2" Square Fixture = 2-5/8" [66.7mm] square



Order Information

Stock: 2" ML Flex Adjustable Fixtures

Stock ML Flex fixtures come fully assembled and include the LED light engine, 40° TIR optic, removable frosted lens, remote driver / junction box, and interchangeable trim. Optional new construction mounting frames, flushmount mud-in rings, interchangeable TIR optics, and driver-to-light engine extension cables are also available.

Phase Cut LE/TE Dimming, 120V Input

Catalog Number	Description	Lumens	CRI / CCT	Dimming / Driver	Trim Finish
ML2ALSFS1ERMW	2" Round Smooth LED Adjustable	Lumen Selectable 200/400/550 LM	90+ CRI, 5-color Field-SeleCCTable™ CCT: 2700/3000/3500/4000/5000K	≤5% Phase Cut LE/TE Dimming, 120V 60Hz	Matte White
ML2ALSFS1ERMB	2" Round Smooth LED Adjustable	Lumen Selectable 200/400/550 LM	90+ CRI, 5-color Field-SeleCCTable™ CCT: 2700/3000/3500/4000/5000K	≤5% Phase Cut LE/TE Dimming, 120V 60Hz	Matte Black
ML2ALSFS1ESMW	2" Square Smooth LED Adjustable	Lumen Selectable 200/400/550 LM	90+ CRI, 5-color Field-SeleCCTable™ CCT: 2700/3000/3500/4000/5000K	≤5% Phase Cut LE/TE Dimming, 120V 60Hz	Matte White
ML2ALSFS1ESMB	2" Square Smooth LED Adjustable	Lumen Selectable 200/400/550 LM	90+ CRI, 5-color Field-SeleCCTable™ CCT: 2700/3000/3500/4000/5000K	≤5% Phase Cut LE/TE Dimming, 120V 60Hz	Matte Black
ML2ALSD2W1ERMW	2" Round Smooth LED Adjustable	400 lm	90+ CRI, Field-SeleCCTable™ Dim-to-Warm 3000-to-1800K or 2700-1800K	≤5% Phase Cut LE/TE Dimming, 120V 60Hz	Matte White
ML2ALSD2W1ERMB	2" Round Smooth LED Adjustable	400 lm	90+ CRI, Field-SeleCCTable™ Dim-to-Warm 3000-to-1800K or 2700-1800K	≤5% Phase Cut LE/TE Dimming, 120V 60Hz	Matte Black

0–10V, Universal Voltage 120–277V (Commercial)

Catalog Number	Description	Lumens	CRI / CCT	Dimming / Driver	Trim Finish
ML2ALSFSE010RMW	2" Round Smooth LED Canless Downlight	Lumen Selectable 200/400/550 LM	90+ CRI, 5-color Field-SeleCCTable™ CCT: 2700/3000/3500/4000/5000K	≤5% 0–10V Dimming, UNV 120–277V 50Hz/60Hz	Matte White
ML2ALSFSE010RMB	2" Round Smooth LED Canless Downlight	Lumen Selectable 200/400/550 LM	90+ CRI, 5-color Field-SeleCCTable™ CCT: 2700/3000/3500/4000/5000K	≤5% 0–10V Dimming, UNV 120–277V 50Hz/60Hz	Matte Black

Made to Order: 2" ML Flex Adjustable Fixtures

Made to order ML Flex Adjustable fixtures include the LED light engine, 40° TIR optic, removable frosted lens, remote driver / junction box, and interchangeable trim. Optional new construction mounting frames, interchangeable TIR optics, and driver-to-light engine extension cables are also available.

Module	Lumens (nominal) ⁽¹⁾	CRI/CCT	Driver	Shape	Trim Type	Trim Color
ML2A = 2" LED Adjustable Light Engine	LS = Lumen Selectable 200/400/550 lm	FS = 90+ CRI, 5-color Field-SeleCCTable™ CCT: 2700/3000/3500/4000/5000K D2W = 90+ CRI, Field-SeleCCTable™ Dim-to-Warm 3000-to-1800K or 2700-1800K ⁽¹⁾⁽²⁾	1E = ≤5% Phase Cut LE/TE Dimming, 120V 60Hz E010 = ≤5% 0–10V Dimming, UNV 120–277V 50Hz/60Hz ⁽³⁾	R = Round S = Square	Blank = Smooth Magnetic Trim	MW = Paintable Matte White SL = Silver MB = Matte Black
Notes	Notes	Notes	Notes	Notes	Notes	Notes
	1. D2W versions are 400 lumens (not lumen selectable)	1. D2W versions are 400 lumens (not lumen selectable) 2. D2W versions are not compatible with E010 driver option	3. D2W versions are not compatible with E010 driver option			

Optional Accessories

Catalog Number	Description
Optics	
TIR1D25NFL	25° narrow flood optic (fits 1" & 2" ML Flex fixtures)
TIR1D40FL	40° flood optic (fits 1" & 2" ML Flex fixtures)
TIR1D55WFL	55° wide flood optic (fits 1" & 2" ML Flex fixtures)

Extension Cables	
Fixture-to-Junction Box Extension Cable (order separately) Use HALO Canless Extension Cables in applications where junction boxes need to be installed further away from the fixture – either for convenience or to save on line-voltage wire. (Co-locating junction boxes makes adjustments and maintenance fast and easy.)	
HLB06FSEC	6 ft. extension cable
HLB12FSEC	12 ft. extension cable
HLB20FSEC	20 ft. extension cable

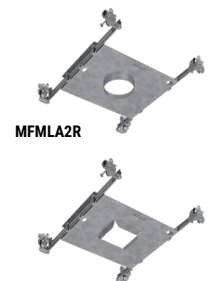
Emergency Accessories

Emergency accessories are ordered separately

Emergency Power Accessories	
Catalog Number	Description
INVM-10W-AD	Single Phase 0-10V Auto Dimming (can power up to 6 ML Flex 2" fixtures)

Catalog Number	Description
Mud-in Ceiling Mounts These installation plaster-frame accessories allow the fixture's flange to recess flush with the ceiling surface for a clean ceiling.	
2MAAFMR	2" Round Flushmount Mud Ring
2MAAFMS	2" Square Flushmount Mud Ring

ML Flex New Construction Mounting Frames	
Designed to ensure the proper placement and alignment of canless LED downlights in new construction projects. It features adjustable hanger bars, and pre-installed nails for easy installation and compliance with local code requirements.	
MFMLA2R	2" Round ML Flex New Construction Mounting Frame (Use with ML Flex Adjustables Only)
MFMLA2S	2" Square ML Flex New Construction Mounting Frame (Use with ML Flex Adjustables Only)



MFMLA2S

Continued on next page

Order Information

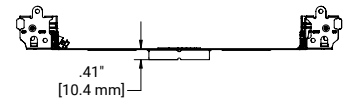
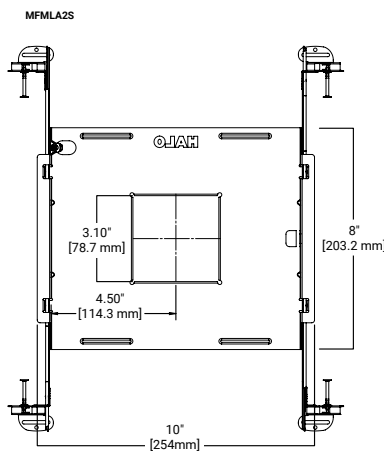
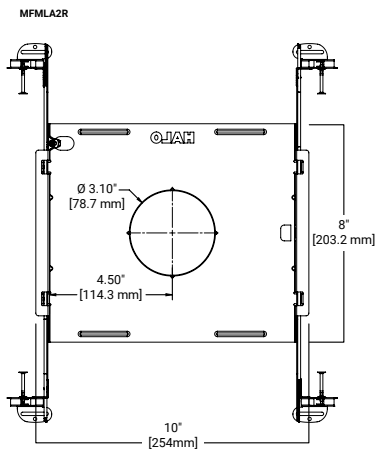
Controls Accessories

Emergency accessories are ordered separately

Catalog Number	Description
WTA	Field Installed WaveLinX PRO Tilemount Sensor Kit ⁽⁶⁾
WTK	Field Installed WaveLinX LITE Tilemount Sensor Kit ⁽⁷⁾
Notes	
<p>6. WTA = WaveLinX PRO tilemount sensor kit for daylight dimming, PIR motion sensing, and optional RLTS - Real Time Location Services, use with E010 versions only (Refer to WaveLinX specifications)</p> <p>7. WTK = WaveLinX LITE tilemount sensor kit for daylight dimming, PIR motion sensing, use with E010 versions only (Refer to WaveLinX LITE specifications)</p>	

Dimensional and Mounting Details

MOUNTING PLATE



Summary

	2"	3"	4"
CCT	2700K/3000K/3500K/4000K/5000K		
Warming Dimming (option)	1800K-3000K or 1800K-2700K		
Lumens	200/400/550	300/500/750	600/800/1000
Optics	25°/40°/55° TIR Optics		
Maximum Tilt Angle	25°	30°	35°
Wattage	9W	11.5W	16W
Input Voltage	120V or 120V-277V		
Dimming	Phase 120V or 0-10V 120V-277V		
Warm Dimming	1800K-3000K		
Optical Accessories		Honeycomb Louver Clear Glass Prismatic Spread Linear spread Diffuse Sand Blasted Soft Focus Red Dichroic Filter Blue Dichroic Filter Green Dichroic Filter	
Trim Finishes	Matte Black Matte White Silver		
Trim Shapes	Round or Square		
Trim Options	Round Smooth Square Smooth		
Ceiling Applications	Flange Flushmount Mud-in (coming soon) Mouting Frames		
Standards	UL/ Title 24 JA8 ⁽¹⁾		
Ratings	Wet location, Airtight when lens is installed (default)		
LED Lifetime	L70 to 50,000 hrs		
Warranty	5 years		

Product Specifications

Construction

- Magnetic Polycarbonate trims for Adjustables
- Regressed painted smooth trims
- High impact lens provides airtite and wet location

Module

- The LED canless adjustable consists of a Chip on Board LED array, optical assembly, driver, and trim
- Achieves L70 at 50,000 hrs in IC (insulation contact) and non-IC applications

Selectable System

- Use the CCT select switch to choose between 2700K, 3000K, 3500K, 4000K, and 5000K CCT
- Use the Dim-to-Warm select switch option to choose between 3000K to 1800K or 2700K to 1800K, the light will have a warmer color temperature as the fixture dims
- Factory default is set to 3000K
- Use the 3-position Lumen Select switch to choose the brightness level (Low, Medium, High)
- Lumen Select factory default is to the highest lumen option

Optics

- Field installable TIR optics with a smooth beam, no media necessary
- Color and softening lenses are options for the 3" and 4" adjustable.
- Available in 25° spot, 40° flood, 55° wide flood optics
- Up to 1 optical media accessories can be used in the 3" and 4" adjustable while still maintaining maximum tilt angle

LED Array

- LED COB provides a uniform light source with high efficiency and no pixilation
- 90+ CRI minimum, R9 greater than 50
- Color accuracy is 3 SDCM at the end points and 4 in the middle providing color consistency and uniformity
- Color Temperature (CCT) is set to a factory default of 3000K

Junction Box

- Die formed metal driver/ junction box with captive hinged junction box cover
- Listed for (6) #12 AWG 90°C splice conductors, 2-in, 2-out plus (2) ground
- 3" and 4" fixtures - (4) ½" conduit pry-outs
- 2" fixtures – (3) ½" conduit pry-outs
 - Accepts 14-2, 14-3, 12-2, 12-3 U.S. and 14-2, 14-3, 12-2 Canadian NM Cable
- (2) Slide-N-Side™ non-metallic (NM) wire traps accept
 - Accepts 14-2, 14-3, 12-2, 12-3 U.S. and 14-2, 14-3, 12-2 Canadian NM Cable
- (3) 4-port push wire nuts with clear caps for quick and reliable mains voltage connections

Driver

- Available in 120V 60Hz or 120V-277 50/60Hz, constant current driver provides noise-free, high-efficiency operation
- **Dimmable:** Continuous, flicker-free dimming from 100% to 5% with:
 - Compatible leading or trailing edge (LE/TE) 120V phase cut dimmers; (See Dimming Guide for compatible dimmers.)
 - Optional 0-10V 120V-277V dimmers; (See Dimming Guide for compatible dimmers)
 - **Tip:** For optimal dimming performance, consider dimmers with low-end trim adjustment; Note that some dimmers require a neutral wire in the box.
- **Wiring:** Includes quick connect push connectors for mains power connections.
- Plenum rated inline electrical quick connect provides low voltage connection to fixture fitting, CMP/FT6 rated

Installation

- Can be installed in 3/8" to 1-1/2" thick ceilings
- Round or Square ceiling cutout
- Heat treated springs hold fixture fitting securely in the ceiling eliminating light leaks
- Can be removed from below the ceiling for service or replacement

Mounting Frame

- Galvanized steel mounting frame with offset aperture and integral bar hanger receivers
- Locking screws provide positive horizontal locking
- 3/8" drywall collar included to improve hole locating and drywall cutting process
- Collar is notched at 90° intervals for laser centering
- GOT NAIL! Gen 3 bar hangers adjust from 8" to 24" wide
- Pass thru feature allows shortening without removal
- Captive nail penetrates standard and engineered lumber
- Mounting flange levels platform with ceiling
- Integral clip attaches directly to tee-bar.

Airtite

- The Adjustable meets Airtight ASTM-E283 requirements with included gasket and lens included in trim (default)

Trim Options

- Magnetic Round and Square polycarbonate trims are available in multiple colors
 - Matte White
 - Satin Nickel
 - Matte Black
- Trim cut off to reduce glare

Emergency Mini Inverter

- Provides 90 minutes of 10VA emergency power to lighting fixtures
- 0-10V Auto dimming allows up to 50VA max dimmable load
- 10VA max non-dimmable load
- Automatic 120VAC or 277VAC output power to driver or ballast means easy field install

- UL924 and CSA 22.2 No.141 listed for field or factory installation
- Remote mounting up to 250 feet
- Maintenance free lithium-ion battery
- See Mini Inverter Spec Sheet for more information

Compliance

- cULus certified for US and Canada
- Wet location listed with included lens
- Airtight per ASTM-E283
- Suitable for use in clothes closets when installed in accordance with the NEC 410.16 spacing requirements
- EMI/RFI emissions per FCC 47CFR Part 15 consumer limits
- Contains no mercury or lead and RoHS compliant⁽¹⁾
- Photometric testing in accordance with IES LM-79-08
- Lumen maintenance projections in accordance with IES LM-80-08 and TM-21-11
- Can be used for State of California Title 24 high efficacy LED compliance under JA8⁽¹⁾, reference Modernized Appliance Efficiency Database System (MAEDBS) for 2022 JA8 High Efficacy Lighting

Warranty

- Five year limited warranty, consult website for details. www.cooperlighting.com/warranty

Controls

Connected Lighting System

Two WaveLinx connected solutions. Refer to WaveLinx website for details

www.cooperlighting.com.

[WaveLinx PRO Tilemount Sensor Kit](#)

- WaveLinx PRO WTA tilemount sensor kit offers daylight dimming, PIR motion sensing, scene and zone configuration, automatic commissioning; and optional RLTS - RealTime Location Services available.

[WaveLinx LITE Tilemount Sensor Kit](#)

- WaveLinx LITE WTK tilemount sensor kit offers daylight dimming and PIR motion sensing, scene and grouping configuration.

WaveLinx Tilemount Kits Application:

- The WTA and WTK tilemount kits include a control module mounted on the luminaire junction box via 1/2" knock-out, and a tilemount sensor on 54-inch whip; for ceiling installation by direct-mount spring clips or via mounting bracket in octagon ceiling boxes.
- The WTA and WTK tilemount kits may be ordered as factory installed on the luminaire, or ordered separately as a field installed accessory kit.
- **Note: WaveLinx PRO devices are only compatible with the WaveLinx PRO system.**
- **Note: WaveLinx LITE devices are only compatible with the WaveLinx LITE system.**

Energy Data

ML2 Triac (High Lumen)	120V
Input Power (W)	7.69
Input Current (A)	0.066
PF	>0.9
THDi (%)	< 20
Inrush Current (A)	0.63
Inrush Duration (µs)	36
Sound (dBA)	< 22

ML2 Triac (Mid Lumen)	120V
Input Power (W)	6.22
Input Current (A)	0.053
PF	>0.9
THDi (%)	< 20
Inrush Current (A)	0.59
Inrush Duration (µs)	38
Sound (dBA)	< 22

ML2 Triac (Low Lumen)	120V
Input Power (W)	3.63
Input Current (A)	0.033
PF	>0.9
THDi (%)	< 25
Inrush Current (A)	0.58
Inrush Duration (µs)	39
Sound (dBA)	< 22

ML2 D2W (High Lumen)	120V
Input Power (W)	6.19
Input Current (A)	0.056
PF	>0.9
THDi (%)	< 20
Inrush Current (A)	0.3
Inrush Duration (µs)	120
Sound (dBA)	< 22

ML2 0-10V (High Lumen)	120V	277V
Input Power (W)	7.21	7.55
Input Current (A)	0.061	0.03
PF	>0.9	>0.89
THDi (%)	< 20	< 23
Inrush Current (A)	0.67	1.23
Inrush Duration (µs)	12	13
Sound (dBA)	< 22	< 22

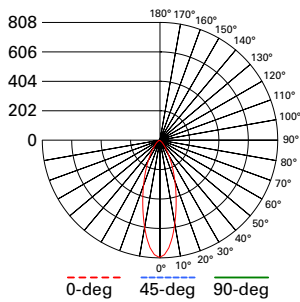
ML2 0-10V (Mid Lumen)	120V	277V
Input Power (W)	5.59	5.93
Input Current (A)	0.052	0.015
PF	>0.9	>0.85
THDi (%)	< 20	< 30
Inrush Current (A)	0.69	1.3
Inrush Duration (µs)	11	15
Sound (dBA)	< 22	< 22

ML2 0-10V (Low Lumen)	120V	277V
Input Power (W)	2.72	3.12
Input Current (A)	0.025	0.014
PF	>0.9	>0.75
THDi (%)	< 20	< 58
Inrush Current (A)	0.7	1.4
Inrush Duration (µs)	12	14
Sound (dBA)	< 22	< 22

Photometric Data

[View IES files](#)

ML2ALSFL9FS1E with 0° Tilt



ML2ALSFL9FS1E

Optic: TIR1D25NFL

Trim: TL2RDMW

Spacing criterion: (0-180) 0.53
(90-270) 0.53
(Diagonal) 0.6

CCT: 3000K

Lumens: 413 Lm

Input Watts: 7.6 W

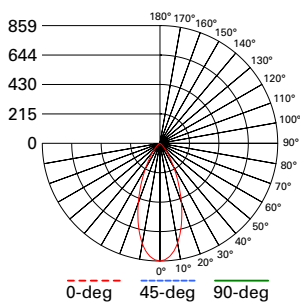
Efficacy: 54.3 Lm/W

Test Report: P990568

Zonal Lumen	Lumens	% Lumens
0-30	291	70.5
0-40	351	85
0-60	400	96.9
0-90	413	100

TM-30-15	Rf = 94.4
	Rg = 100.8
CRI/CIE	Ra = 96.1
	R9 = 74.1

Candela Table	
Angle	0°
0	808
5	745
15	446
25	220
35	94
45	40
55	19
65	8
75	3
85	1
90	0



ML2ALSFL9FS1E

Optic: TIR1D40FL

Trim: TL2RDMW

Spacing criterion: (0-180) 0.67
(90-270) 0.67
(Diagonal) 0.69

CCT: 3000K

Lumens: 532 Lm

Input Watts: 7.6 W

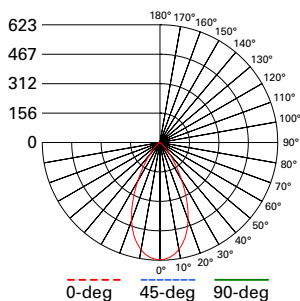
Efficacy: 70.1 Lm/W

Test Report: P990603

Zonal Lumen	Lumens	% Lumens
0-30	390	73.3
0-40	470	88.3
0-60	520	97.6
0-90	532	100

TM-30-15	Rf = 94.4
	Rg = 100.8
CRI/CIE	Ra = 96.1
	R9 = 74.1

Candela Table	
Angle	0°
0	859
5	828
15	609
25	320
35	124
45	43
55	17
65	8
75	3
85	1
90	0



ML2ALSFL9FS1E

Optic: TIR1D55WFL

Trim: TL2RDMW

Spacing criterion: (0-180) 0.82
(90-270) 0.82
(Diagonal) 0.81

CCT: 3000K

Lumens: 521 Lm

Input Watts: 7.6 W

Efficacy: 68.6 Lm/W

Test Report: P990638

Zonal Lumen	Lumens	% Lumens
0-30	355	68.2
0-40	451	86.4
0-60	508	97.5
0-90	521	100

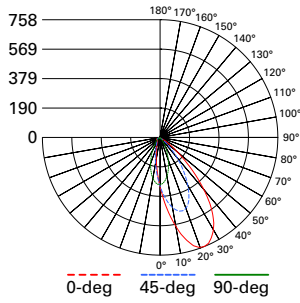
TM-30-15	Rf = 94.4
	Rg = 100.8
CRI/CIE	Ra = 96.1
	R9 = 74.1

Candela Table	
Angle	0°
0	623
5	612
15	522
25	339
35	150
45	50
55	18
65	9
75	3
85	0
90	0

Photometric Data

[View IES files](#)

ML2ALSFL9FS1E with 25° Tilt



ML2ALSFL9FS1E

Optic: TIR1D40FL
Trim: TL2RDMW

Spacing criterion: (0-180) 1.48
(90-270) 0.69
(Diagonal) 1.03

CCT: 3000K
Lumens: 452
Input Watts: 7.6 W
Efficacy: 59.4 Lm/W
Test Report: P990598

Candela Table			
Angle	0°	45°	90°
0	301	301	301
5	433	384	291
15	686	489	216
25	750	446	123
35	596	279	58
45	306	119	27
55	98	36	14
65	23	8	7
75	2	2	3
85	0	0	1
90	0	0	0

Zonal Lumen	Lumens	% Lumens
0-30	229	50.7
0-40	335	74.2
0-60	430	95.1
0-90	452	100

TM-30-15	Rf = 94.4
	Rg = 100.8
CRI/CIE	Ra = 96.1
	R9 = 74.1

CCT Multipliers – 90CRI

2700K	3000K	3500K	4000K	5000K
0.96	1.00	1.03	1.05	1.10

Multipliers may be used to determine other relative CCT values

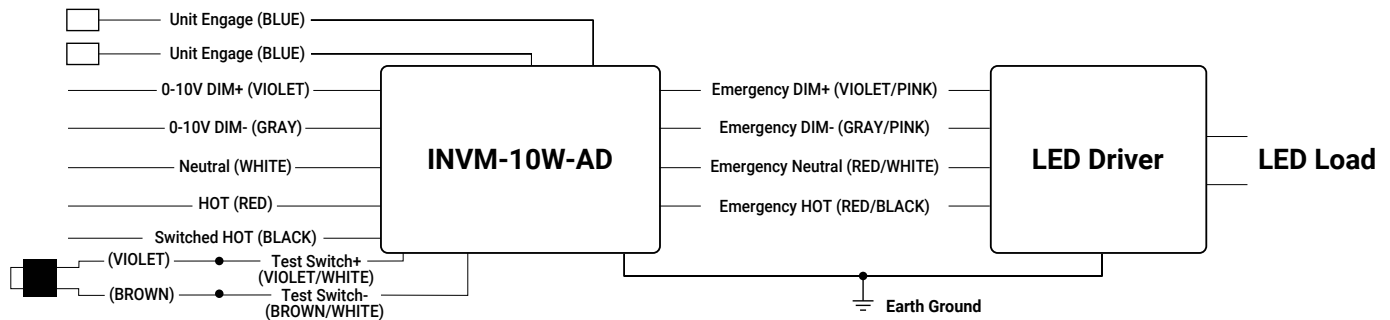
Color Finish Multipliers

Finish code	MW	SL	MB
Finish	Matte White	Metallic Silver	Matte Black
Multiplier	1.00	1.00	0.97

Multipliers may be used to determine relative lumen values with other cone color finishes

Emergency Power

Mini Inverter Schematic



Connected Systems

WaveLinx LITE - WTK Tilemount Sensor

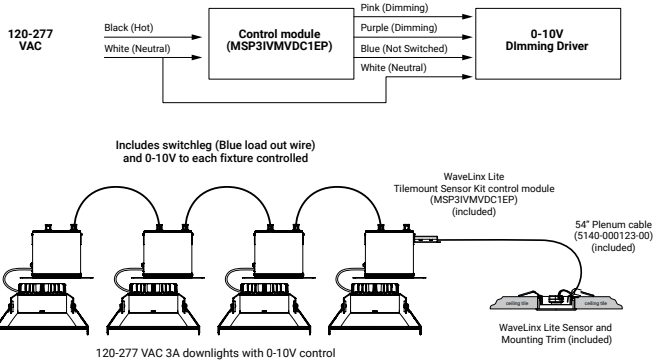
WaveLinx LITE devices only compatible with the WaveLinx LITE system.



- Intuitive Android™ or Apple® iOS® app for basic system code compliant set up and configuration via Bluetooth
- Up to 28 unique areas per project site (WaveLinx LITE Bluetooth network)
- Up to 50 devices for an area, any one of 16 control zones, up to 6 occupancy sets, and custom lighting scenes
- Automatic occupancy or vacancy, sensor sensitivity, daylight dimming, etc. configurable through the app
- Refer to the WaveLinx system specifications for details



WaveLinx LITE WTK Tilemount Wiring Diagram



WaveLinx LITE Bluetooth Enabled System



WaveLinx PRO Wireless – WTA Tilemount Sensor

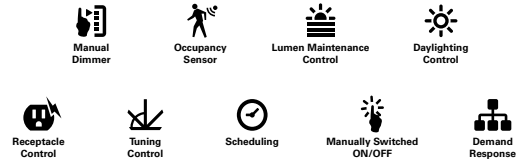
WaveLinx PRO devices only compatible with the WaveLinx PRO system.



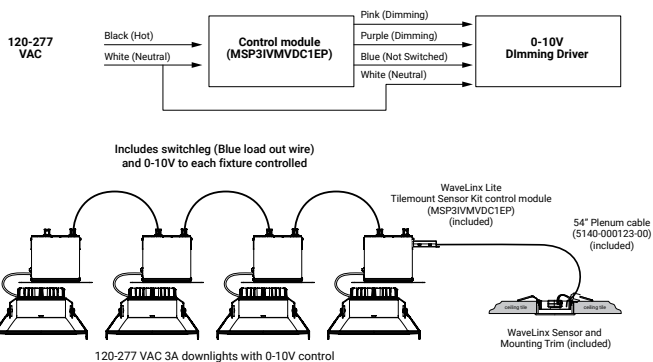
- WaveLinx PRO Wireless functionality configures zones and customizes settings from one secure mobile app
- Automatic code commissioning that meets the strictest codes
- Fixtures and sensors integrate with Wireless Area Controller, Wall Stations, and Control Devices
- Stand-Alone Offices or Entire Building Network Installations



WaveLinx mobile app settings



WaveLinx PRO WTA Tilemount Wiring Diagram



WaveLinx CORE Building Management Integration

