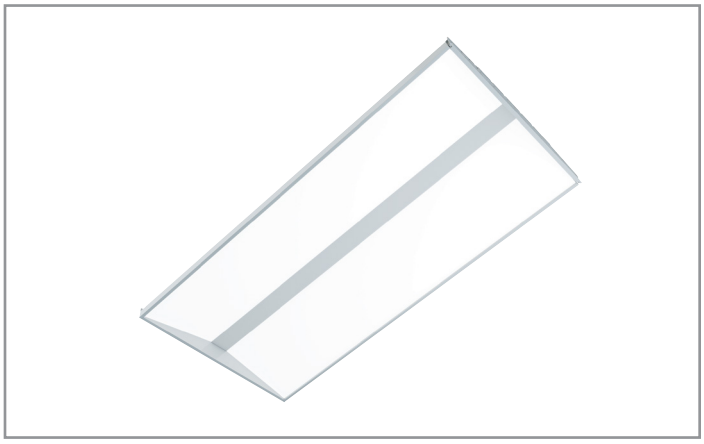
Project		**Catalog #**		**Type**	
Prepared by		**Notes**		**Date**	



Metalux

Encounter 24EN LED

2' x 4' Troffer LED Module
Specification Grade Troffer

Typical Applications

• Commercial Office Spaces • Schools • Hospitals • Retail
• Other Indoor Ambient Applications

Interactive Menu

Product Certification

CERTIFIED · DLC LISTED · DLC LISTED PREMIUM · damp location · IC RATED · IP40 · ISTA CERTIFIED

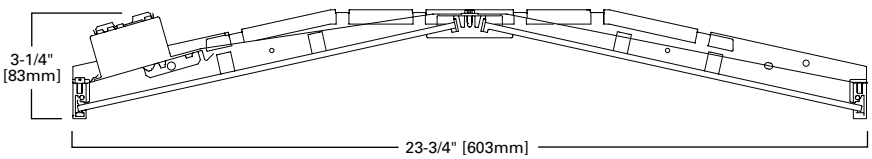
Product Features

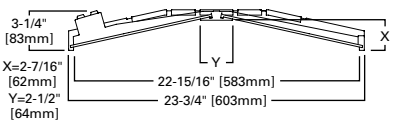
WaveLinx LITE · WaveLinx PRO · VividTune color tuning solutions · BAA · BABA · LINEAR DISCONNECT Designed to provide safe and convenient means of disconnecting power · MWS MODULAR WIRING SYSTEM CLICK HERE

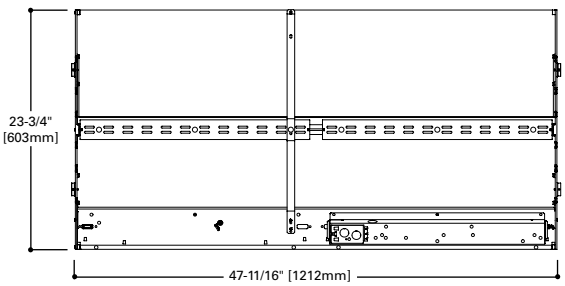
Top Product Features

- Available in 1' x 2', 1' x 4', 2' x 2' and 2' x 4' recessed versions
- Leverages our patented WaveStream Technology with AccuAim™ optics
- Four CCT options: 3000K, 3500K, 4000K, and 5000K at 80+CRI or 90 CRI
- White tuning solutions available, either 3000K - 5000K or 2700K - 6500K
- Efficacy up to 124 lumens per watt
- Options to meet Build America, Buy America, Buy American and other domestic preference requirements

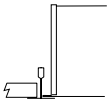
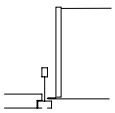
Dimensional and Mounting Details







Ceiling Compatibility

G Grid/Lay-in Standard	G or T 9/16" or 15/16" Slot Grid	F Drywall Frame Kit
		

Ceiling Type	Trim Type
Exposed Grid	G
Concealed T	G or T
Slot Grid	G or T
Flange	*

Notes:
*See Drywall Frame Kit Accessory in Ordering Information section.
**Fixture construction is suitable for use in Air-handling and plenum rated spaces in accordance with Section 300.22 (C) of the National Electrical Code, Section 4.3.11.2.6.5 of NFPA 90A and Section 602.2.1.4 of ICC.

Order Information

SAMPLE ORDER NUMBER: **24EN-LD2-67-UNV-L835-CD1-WPN-U**

Domestic Preferences [1]	Rating	Series [3]	Air	Lamp Type	Lumen Outputs	Voltage [7]
[Blank]=Standard **BAA**=Buy American Act **TAA**=Trade Agreements Act **BABAF**=FHWA and FTA projects funded through October 1, 2026	**[Blank]**=Standard **ATW-SW4**=Chicago Rated [2]	**24EN**=2' x 4' Encounter Series	**[Blank]**=Standard **A**=Air (Vented) [4]	**LD2**=LED 2.0	**Stock** **45**=4500 Lumens **54**=5400 Lumens **67**=6700 Lumens **MTO** **30**=3000 Lumens [5], [6] **34**=3400 Lumens [5], [6] **40**=4000 Lumens **49**=4900 Lumens **58**=5800 Lumens **70**=7000 Lumens [5] **74**=7400 Lumens [5]	**UNV**=Universal Voltage 120-277 **347V**=347 Volt [8] **120V**=120 Volt [9] **277V**=277 Volt [9]
Notes (1) Only product configurations with these prefixes are built to be compliant with the Buy American Act of 1933 (BAA), Trade Agreements Act of 1979 (TAA), or the Build America Buy America Act (BABA). BABA is the minimum Government compliance requirement for the Build America Buy America standards which is part of the Infrastructure and Investment Jobs Act (IIJA). Individual Government Agencies may have more stringent compliance standards. BABAF designates the product will meet the standards set for FHWA and FTA. As noted, these must be funded by October 1, 2026. Please refer to DOMESTIC PREFERENCES website or consult the CLS Domestic Preferences team for more information. Components shipped separately may be separately analyzed under domestic preference requirements.	**Notes** (2) Chicago rated version does not allow for row mounting.	**Notes** (3) DesignLights Consortium® Qualified and classified for both DLC Standard and DLC Premium, refer to www.designlights.org for details.	**Notes** (4) Air version is vented but does not meet air handling requirements.		**Notes** (5) Step-dim driver not available with 3000, 3400, 7000 and 7400 lumen options. (6) 5LTD DALI option not available with 3000 and 3400 lumen packages.	**Notes** (7) Products also available in non-US voltages and frequencies for international markets. (8) 347V emergency option not available. (9) Must specify voltage as 120V or 277V when ordering GTR2 option.

Emergency Optionsx	CCT	Flex	Driver Type
EL7W=7-watt 120V-277V emergency battery pack [10] **EL10W**=10-watt 120V-277V emergency battery pack [10] **EL14W**=14-watt 120V-277V emergency battery pack [10] **EL10WSD**=10W emergency battery pack with self-diagnostic installed [10], [13] **EL14WSD**=14W emergency battery pack with self-diagnostic installed [10], [13] **GTR2**=Bodine Generator Transfer Relay [11], [12] **ETRD**=Emergency Transfer Relay with dimming control [11]	**L830**=80+CRI, 3000K **L835**=80+CRI, 3500K **L840**=80+CRI, 4000K **L850**=80+CRI, 5000K **L930**=90CRI, 3000K **L935**=90CRI, 3500K **L940**=90CRI, 4000K **L950**=90CRI, 5000K **L83050**=80CRI 3000K-5000K White Tuning [14] **L93050**=90CRI 3000K-5000K White Tuning [14] **L82765**=80CRI 2700K-6500K White Tuning [14] **L92765**=90CRI 2700K-6500K White Tuning [14]	**A3/8-4/18GDIM**=3/8" Flex with 0-10V Dimming Leads Multiple other configurations available. See below for details. **A3/8-5/18GDIM**=Flex with 0-10V Dimming leads and Blue for alternate wiring. See below for details.	**CD**=0-10V Driver (1%-100% Dimming) **5LTD**=DALI Driver (5%-100% Dimming) [17] **5LTHD**=DALI Driver (1%-100% Dimming) [16] **SD**=Step Dimming Driver (50% or 100% Dimming) [15] **LH**=Lutron HiLume (LDE1 series) 1%-100% EcoSystem Driver with Soft-on Fade to Black dimming [F] **W2A**=White Tuning, 2ch, Intensity and CCT Control [18] **SR**=Sensor-ready Driver (1%-100% Dimming)
Notes (10) Factory installed with integral test switch/indicator/laser test. For approximate delivered lumens multiply the lumens per watt of the desired fixture by the wattage of the emergency battery pack (100 lm/W x 7=700 lumens). IES-format photometry for luminaire under emergency operation available. Battery option increases total height by 1 inch. (11) Used to bypass local control during outage. Must be used in conjunction with UL 1008 device (provided by others). GTR2 option includes 2 relays on fixtures with dimming drivers. ETRD option only requires one relay when used on a dimming fixture. (12) Must specify voltage as 120V or 277V when ordering GTR2 option. (13) EL10WSD and EL14WSD not available with 347V.	**Notes** (14) White tuning provides correlated color temperatures (CCT) between 3000K (warm) to 5000K (cool) or 2700K (warm) to 6500K (cool). Must be used in conjunction with W2A driver only. Must be used with two (2) 10V dimming control channels, 1 color, 1 intensity.	**Flexible Metal Conduit Options** Flex options available for 0-10V dimming control, DALI dimming control, emergency and night light functions. 72-inch factory-installed and pre-wired to driver, fitted to luminaire housing access plate with 90° enclosed FMC connector. Not all options may be combined and installation ratings vary by type. **A3/8-4/18GDIM series notes:** Factory installed dimming option 3/8" flexible metal conduit with 2-#18 power and ground wires and 2-#18 UL-listed jacketed 0-10V +/- control wires. Meets UL 66, 83, 1479, 1569, 1581, 2556. NEC® 250.118, 300.22(C), 392, 396, 330, 501, 502, 503, 530, 504, 505, 518, 520, 530, 645, 72; Federal Specification A-A-59544 (formerly J-C-30B); all applicable OSHA and HUD Requirements. UL Classified 1-, 2-, and 3-hour through penetration with applicable fire stop product (not included). May be surface mounted, fished and/or embedded in plaster. Cable tray and approved raceway rated, install per NEC®; Environmental Air-Handling Space Installation per NEC® 300.22(C).	**Notes** (15) Step-dim (SD) driver not available with 3000, 3400, 7000 and 7400 lumen options. (16) Two drivers required for DALI (5LTHD) option for 6700 lumens and up. (17) DALI (5LTD) option not available with 3000 and 3400 lumen packages. (18) White tuning provides correlated color temperatures (CCT) between 3000K (warm) to 5000K (cool) or 2700K (warm) to 6500K (cool). Must be used in conjunction with W2A driver only. Must be used with two (2) 10V dimming control channels, 1 color, 1 intensity. Integrated options must be used in conjunction with the associated system and may not be compatible with other options or accessories. Please refer to the following: (F) Consult Marketplace Options - Lutron system pages for additional details and compatibility. Compatible only with driver series shown, and may require two or more drivers. Requires field commissioning to operate or dim. Contact Lutron at www.lutron.com.

Number of Drivers	Integrated Sensing Systems	Packaging	Accessories (order separately) [21]
1=1 Driver **2**=2 Drivers	**[Blank]**=No Sensor **WLS (formerly WAB)**=WaveLinx LITE Wireless Sensor, Occupancy w/ photocell, Independent & Networked [20], (B) **WPS (formerly WAA)**=WaveLinx PRO Wireless Sensor, Occupancy w/ photocell, Networked [19], (A) **WLN**=WaveLinx LITE Wireless Control Node, without sensor [20], (B) **WPN**=WaveLinx PRO Wireless Control Node, without sensor [19], (A)	**U**=Unit Pack **PALC**=Job Pack, in carton	**T3A END E.Q. BRACKET PARTS BAG** (Standard with fixture) **DF-24W-U**=2' x 4' Drywall Frame Kit **SMK-24-W**=2' x 4' Shallow Surface Mount Kit **SK-24-WT**=4" Tall Surface Mount Kit, 2' x 4'
	Notes (19) WPS sensor and WPN node to be used with CD or W2A driver. Consult factory for WPN with tunable white W2A driver. (20) WAB sensor and WLN node to be used with CD driver. Integrated options must be used in conjunction with the associated system and may not be compatible with other options or accessories. Please refer to the following: (A) Consult WaveLinx PRO system pages for additional details and compatibility. (B) Consult WaveLinx LITE system pages for additional details and compatibility.		**Notes** (21) Accessories sold separately will be separately analyzed under domestic preference requirements. Consult factory for further information. Integrated options must be used in conjunction with the associated system and may not be compatible with other options or accessories.

Product Specifications

Construction
- Shallow 3-1/16" deep housing extruded aluminum frame
- Injected molded composite end plates
- End plates screws for strength, rigidity and gap eliminations
- End plates accessory grid-lock feature adds safety
- Four auxiliary fixture end suspension points
- Large access plate for supply connection

Controls
- 0-10V dimming to 1% standard
- Integrated WaveLinx options provide wireless individual fixture control and enable code compliance, increased energy savings, grouping of fixtures, and connection to WaveLinx control systems
- DALI 2.0, Lutron, and step-dimming available

Electrical
- LED's available in 3000K, 3500K, or 4000K at 80+CRI or 90 CRI minimum
- Color accuracy ≤3-Step MacAdam ellipse (SDCM)
- TM21 life at 60,000 hours up to L92 and calculated L70 exceeds 288,000 hrs
- Drivers available in 120-277V and 347V
- Tunable white options available with Cooper Lighting's VividTune

Emergency Battery Pack Options
- 120V-277V integral emergency battery pack comes in 7-watts, 10-watt, or 14-watts
- Self-diagnostic emergency battery available in 10 or 14-watts (NFPA 101® Life Safety Code®)
- Constant power to the LED system for controlled, predictable discharge
- Integrated test switch/indicator light visible from floor
- Min. 90-minute backup period for code compliance
- Integral emergency transfer relay available for generator equipped power systems

Finish
- High reflectance baked matte white enamel finish

Optics
- Precision formed optical assembly
- Positively retained high optical grade acrylic lenses
- WaveStream technology provides a visually comfortable fully luminous surface

Compliance
- Components are UL recognized
- cULus Damp Location listed for 25C ambient indoor environments
- Complies with IESNA LM-79 and LM-80 standards
- DesignLights Consortium® Qualified and classified for DLC Standard and DLC Premium (refer to www.designlights.org)

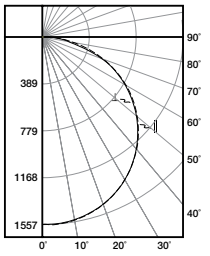
BABA Domestic Preference Compliance
- FHWA and FTA agencies are utilizing their BAA rules for BABA compliance. Cooper's products with a BAA designation are manufactured in the US and utilize a BAA COTS exemption rule for compliance. To verify a configured product with specific accessories and options meet BABA Domestic Preference Requirements; submit this catalog number to Cooper Lighting Quotation team for validation by our Engineering and Manufacturing teams. Please refer to the DOMESTIC PREFERENCES website or consult the CLS Domestic Preferences team for more information. Components shipped separately may be separately analyzed under domestic preference requirements.

Warranty
- Five year limited warranty standard. Optional ten year limited warranty available.

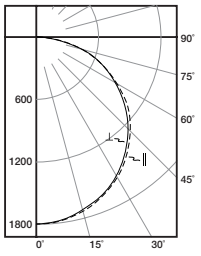
Driver Access
- Drivers can be accessed via plenum

Photometric Data

View IES files



24EN-LD2-45-UNV-L835-CD1-U
Electronic Driver
Linear LED 3500K
Spacing criterion: (II) 1.29 x mounting height, (⊥) 1.29 x mounting height
Lumens: 4562
Input Watts: 38W
Efficacy: 120 lm/W
Test Report: 24EN-LD2-45-UNV-L835-CD1-U.IES



24EN-LD2-54-UNV-L835-CD1-U
Electronic Driver
Linear LED 3500K
Spacing criterion: (II) 1.3 x mounting height, (⊥) 1.3 x mounting height
Lumens: 5301
Input Watts: 43W
Efficacy: 123 lm/W
Test Report: 24EN-LD2-54-UNV-L835-CD1-U.IES

Energy and Performance Data

Stock or MTO	Catalog Number	Delivered Lumens	Watts	lm/W	Glare Performance	
					UGR (1)	Max Luminance (1)
MTO	24EN-LD2-30-UNV-L835-CD1	3054	24.6	124	18.3	1554
MTO	24EN-LD2-34-UNV-L835-CD1	3537	28.7	123	18.8	1799
MTO	24EN-LD2-40-UNV-L835-CD1	4119	33.9	122	19.4	2095
STOCK	24EN-LD2-45-UNV-L835-CD1	4562	38.0	120	19.7	2321
MTO	24EN-LD2-49-UNV-L835-CD1	4996	42.2	118	20.0	2542
STOCK	24EN-LD2-54-UNV-L835-CD1	5301	43.0	123	20.2	2697
MTO	24EN-LD2-58-UNV-L835-CD1	5721	47.0	122	20.5	2910
STOCK	24EN-LD2-67-UNV-L835-CD1	6596	56.1	118	21.0	3356
MTO	24EN-LD2-70-UNV-L835-CD1	6882	60.2	114	21.1	3501
MTO	24EN-LD2-74-UNV-L835-CD1	7334	63.6	115	21.4	3731

Notes:
(1) UGR values per CIE 190:2010 with 4H, 8H, Reflectance: 70% Ceiling, 50% Wall, 20% Ref. Plane.

Luminance measured at 45-90 degrees from nadir.

UGR and Luminance values that meet WELL v2 L04 requirements for Managing Glare are shown with green highlighted cell (UGR < 16, Luminance < 6,000).

UGR and Luminance values that meet LEED v4.1 requirements for Glare Control are shown with green text (UGR < 19, Luminance < 7,000).

Key

	Meets WELL v2
TEXT	Meets LEED v4.1

Lumen Calculator

CCT Multiplier	80+CRI/90 CRI
3000K	0.99
3500K	1.00
4000K	1.03
5000K	1.02

Example of Lumen Adjustment Calculation

24EN-LD2-45-UNV-L835-CD1-U
at 90CRI at 3500K

Lumen Adjustment Factor = 1.00

Total Light Output = 4,562 lm x 1.00 = 4,562 lm

Efficacy = $\frac{4{,}562\ lm}{38W}$ = 120 lm/W

Lumen Maintenance

Ambient Temperature	TM-21 Lumen Maintenance (60,000 hours) (1)	Theoretical L70 (Hours) (2)
25°C	> 90%	> 155,000

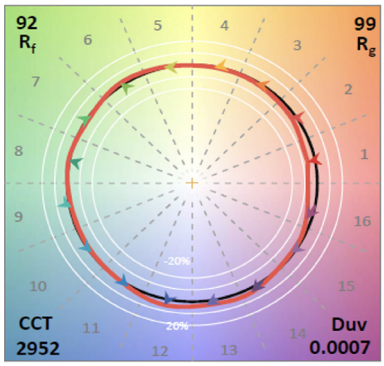
Notes: (1) Supported by IES TM-21 standards. (2) Theoretical values represent estimations commonly used; however, refer to the IES position on LED Product Lifetime Prediction, IES PS-10-18, that explains proper use of IES TM-21 and LM-80.

Shipping Data

Catalog No.	Weight (lbs)	Units per Pallet 49"L x 52"W x 55"H
24EN-LD2	28	18

TM-30 DATA FOR 90 CRI (3000K)

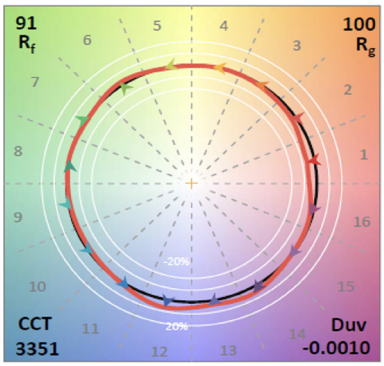
ANSI/IES TM-30-18 Color Rendition Report



Reference Illuminant — Test Source

TM-30 DATA FOR 90 CRI (3500K)

ANSI/IES TM-30-18 Color Rendition Report



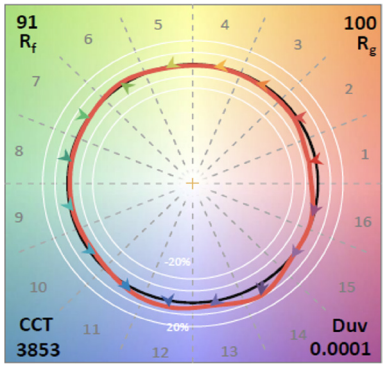
Reference Illuminant — Test Source

TM-30 data is extrapolated from LM-79 integrating sphere tests. Contact factory for specific TM-30 data.

CRI	CCT	CRI	R_f	R_g	R9
80+	3000K	93	92	99	53
	3500K	93	91	100	58
	4000K	93	91	100	63
	5000K	94	91	101	70

TM-30 DATA FOR 90 CRI (4000K)

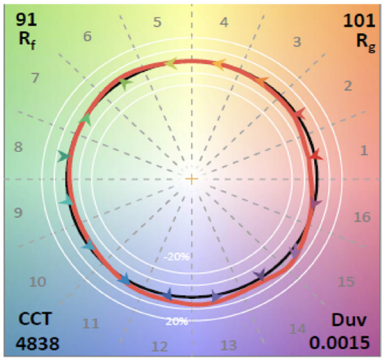
ANSI/IES TM-30-18 Color Rendition Report



Reference Illuminant — Test Source

TM-30 DATA FOR 90 CRI (5000K)

ANSI/IES TM-30-18 Color Rendition Report



Reference Illuminant — Test Source

Control Solutions

- WaveLinx LITE wireless
- WaveLinx PRO wireless
- WaveLinx CAT wired
- WaveLinx Wired

WaveLinx Digital Lighting Control Solutions

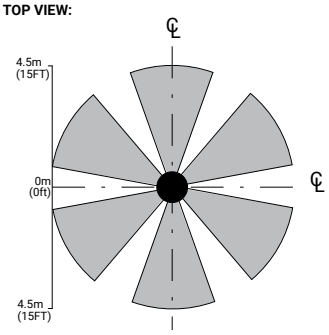
The Encounter with WaveLinx offers no-hassle lighting control with multiple luminaire level control solutions.

WaveLinx PRO is a wireless lighting control solution, for connected spaces, that significantly reduces a building's energy consumption. From a single floor to an entire campus, WaveLinx PRO connects more than lighting assets; it shares aggregated sensor data with the WaveLinx CORE platform and other building systems, so building owners can improve operations, spaces environment, and tenants' experience. WaveLinx PRO offers a rich portfolio of wireless devices, WaveLinx PRO-enabled luminaires, and an intuitive WaveLinx mobile app for office, education, warehouse, and parking garage applications.

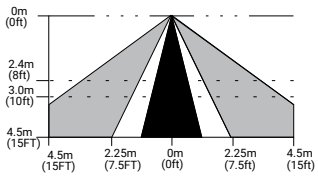
WaveLinx LITE is a cost effective, wireless digital lighting control solution, with out-of-the-box functionality, that saves energy and meets code. It's designed for applications that require occupancy-based, daylighting, or manual light control. Customize installations for office, education, warehouse and parking garages using the secure, simple mobile app.

Integrated Sensor Coverage Pattern

TOP VIEW:

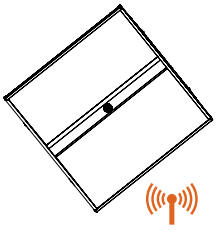


SIDE VIEW:

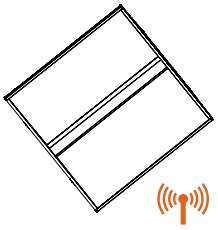


***Note**: Installation of integrated sensors within 3-ft (1m) of HVAC air vents is not recommended. The pattern shown is intended solely as a general guide and is not to scale.*

With Integrated WaveLinx Sensor



With Integrated WaveLinx Node



Add a hidden WaveLinx sensor node (WPN, WLN) to your space lighting design!

Allows to:

- Keeps luminaire aesthetics
- Connect fixtures without the realestate to include sensor option such as downlights
- Connect sealed fixtures without a standard sensor option such as products for clinical space.

Integrated Controls Options

Option	Out of the Box Functionality	Luminaire Level Lighting Control (LLLC)	Automatic Dimming Photocell	Occupancy Sensing	CCT Control*
WLS	X	X	X	X	
WLN		X			
WPS		X	X	X	X
WPN		X			X

Note: *WaveLinx utilizes scenes to allow users to change an area's fixtures Correlated Color Temperature (CCT) and intensity using a commissioned wireless wallstation scene controller. To enable CCT adjustments through WaveLinx, include WPS or WPN devices in addition to VividTune or BioUp technologies for integrated fixture control. WPS with CCT controls the intensity of the fixture; an additional, externally mounted control device is needed to control the CCT. See RSP-P-010-347

The WNPS option is available with WLS or WPS sensors. Must be specified when ordered. Also note that WLS and WPS are also compatible with ESP-L-010-347 and ESP-P-010-347, respectively. Learn more about WaveLinx EM here.

Systems comparison chart

Cooper Lighting Solutions provides many lighting system solutions designed to satisfy code requirements and meet the unique needs of any project.

Luminaire with standalone sensor

Standalone Spaces WaveLinx LITE

Standalone Spaces WaveLinx CAT

Networked Spaces WaveLinx PRO

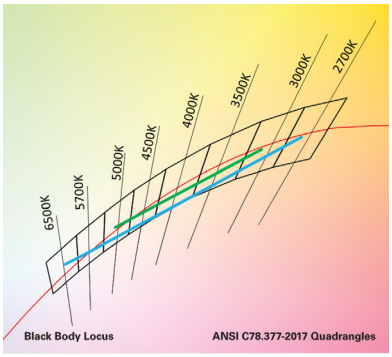
Enterprise WaveLinx CORE

	Luminaire with standalone sensor	Standalone Spaces WaveLinx LITE	Standalone Spaces WaveLinx CAT	Networked Spaces WaveLinx PRO	Enterprise WaveLinx CORE
Occupancy	Yes	Yes	Yes	Yes	Yes
Daylighting	Yes	Yes	Yes	Yes	Yes
Wallstations	–	Yes	Yes	Yes	Yes
Gateways	–	–	–	1 WAC	300 WACs
Devices (MAX)	–	40 per Area (1120 per space)	40 per Area	200 per WAC2	32,500 per CORE Enterprise
Software	–	WaveLinx LITE Mobile App	WaveLinx CAT Mobile App	WaveLinx Mobile App	CORE
Areas	–	28 per Space	Unlimited	50 per WAC2	up to 3,000
Zones	–	16 per Area	16 per Area	16 per Area	up to 9,000
Scheduling	–	–	–	Local	Global
VividTune™	–	–	–	Yes	Yes
Plug-Load Control	–	Yes	Yes	Yes	Yes
Low-Voltage Power	–	–	Yes	Yes	Yes
Integration	–	–	–	–	BACnet, API
Dashboards	–	–	–	–	Energy, Occupancy
Configuration	–	Installer	Installer	Technician	Technician / IT

VividTune color tuning solutions

24EN LED with VividTune Tunable White

VividTune tunable white luminaires from Cooper Lighting Solutions deliver high-quality light in a broad range of continuously variable color temperatures and intensities. Create a dynamic environment by adjusting the ambient light warmer or cooler to influence mood, support the task at hand, or create a dramatic ambience. The ability to control correlated color temperature and intensity separately using simple controls is the next evolution of LED lighting for the commercial, educational, healthcare and hospitality space. The unparalleled flexibility and number of available lighting environments enable users to find the right light with tunable white.



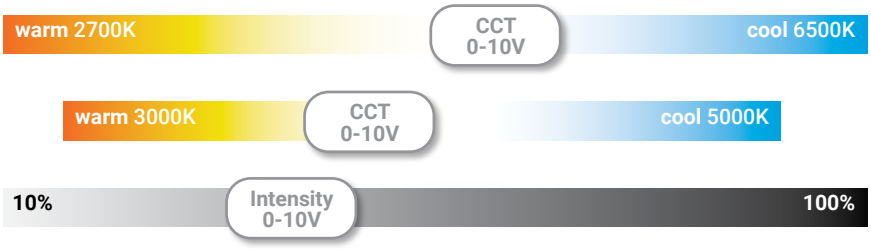
Performance Data*

Tunable White - Lumen Adjustment Factors (example only)				
CCT	3000K-5000K		2700K-6500K	
	80 CRI	90 CRI	80 CRI	90 CRI
2700K	-	-	0.894	0.738
3000K	0.968	0.809	0.903	0.762
3500K	0.984	0.827	0.932	0.779
4000K	0.988	0.860	0.919	0.814
4500K	1.002	0.864	0.946	0.808
5000K	1.003	0.868	0.945	0.829
6500K	-	-	0.949	0.850

2' x 4' Encounter LED - Example of Approximate Lumen Calculation			
	Standard Catalog #	VividTune 80 CRI Catalog #	VividTune 90 CRI Catalog #
CCT Setting	24EN-LD2-45-UNV-L835-CD1-U	24EN-LD2-45-UNV-L83050-W2A1-U	24EN-LD2-45-UNV-L93050-W2A1-U
3000K	-	4508	3765
3500K	4656	4582	3853
4000K	-	4601	4002
4500K	-	4663	4023
5000K	-	4668	4042

Controlling VividTune Tunable White

VividTune luminaires make tunable white more accessible by using simple and familiar controls. From wall dimmers to wireless controls, VividTune tunable white luminaires are compatible with industry standard 0-10V dimming controls. A single 0-10V dimming input is used to control intensity (brightness) while a second 0-10V dimming input is used to adjust CCT. For suggested control configurations, click here for tunable white application guides.



Example of Lumen Adjustment Calculation

24EN-LD2-45--UNV-L83050-W2A1-U
at 80 CRI tuned to 3500K

Adjusted Lumen =
published lm x adjusted lm factor

*Adjusted Lumen = 4656 * 0.984*

Adjusted Lumen = 4582 lm

** Lumen adjustment factors are for reference and may be different for each product selected. Refer to IES files for actual performance data on each.*

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