

# LED Programmable Multi-Level Options

For use with Cree Edge™ Series, 304 Series™, 228 Series™, CPY Series, OSQ Series, VG Series, and IG Series Luminaires

## Performance Summary

Adjustable High and Low Modes – High: 0 to 10V; Low: off to 9.8V

Adjustable Time Delay – 30 seconds, 1 to 30 minutes

Adjustable Cut Off Delay – none, 1 to 59 minutes, 1 to 5 hours

Adjustable Sensitivity – low, med, max, on-fix, off-fix

Adjustable Setpoint – 1 to 250 fc (11 to 2691 lux), disabled, auto

Adjustable Ramp Up and Fade Down Time – 1 to 60 seconds

Photocell – none, 1 to 250 fc (11 to 2691 lux)

Limited Warranty\*: 5 years on sensor

\* See <http://lighting.cree.com/warranty> for warranty terms

Accessories
<b>Hand-Held Remote</b> XA-SENSREM - For successful implementation of the programmable multi-level option, a minimum of one hand-held remote is required

## Product Description

The Cree® programmable multi-level (PML [E]/PML2) option allows for the programming of multiple operating drive currents/input powers for high and low modes remotely through the use of a programmable handheld remote (XA-SENSREM). The drive currents/input powers are conveniently selected to balance LED life, lumen output and energy savings. Multi-level function is designed with all LEDs operating at the same current for maximum and uniform LED life.

The occupancy sensor used in the Cree programmable multi-level option uses passive infrared technology that reacts to changes in infrared energy (moving heat) within the coverage area. During operation if motion is detected within the sensor's coverage area, the relay in the sensor closes and the lighting load is automatically turned on to the selected High Mode setting. When motion is no longer detected for the duration of the Time Delay setting, the relay opens and the lighting load automatically reverts to the selected Low Mode setting and will eventually turn off if programmed to do so. The occupancy sensor includes field-adjustable settings for ambient light (Setpoint and Photocell), motion detection (Time Delay and Cut Off Delay), Sensitivity, Ramp Up Time, Fade Down Time, High and Low Mode – all of which can be changed in the field with the programmable handheld remote.

The High Mode feature is fully adjustable from 0 to 10V and is factory set at 10V, the maximum drive current for the selected luminaire.

The Low Mode feature can be adjusted from an off position to 9.8V. This feature is factory set at 1V.

The Time Delay feature can be adjusted from 30 seconds, or 1 to 30 minutes and is factory set at 5 minutes. The luminaire will switch to the Low Mode setting if no motion is detected by the sensor for the specified time interval.

The Cut Off Delay feature can be set to disabled (fixture never turns off, unless Low Mode is set to off) or set to a period from 1 minute up to 5 hours. The factory setting is 1 hour. This feature allows the luminaire to switch from Low Mode to off after no motion is detected by the sensor for the specified duration of time.

The Sensitivity feature can be set to low, medium or maximum and is factory set for maximum sensitivity to motion within the coverage area of the sensor. In addition, there are the "on-fix" and "off-fix" modes, which will force the luminaire to stay on at the High Mode setting or off, respectively. When in either of these modes, motion detection and ambient light sensing functionality are disabled. These two modes are typically only used for troubleshooting.

The Setpoint feature is factory set at disabled. The Setpoint feature can be adjusted from 1 to 250 fc (11 to 2691 lux). When a numerical value is entered, the sensor will not transition to High Mode from motion if the light level is greater than the Set Point. Otherwise, if the light level is less than the Setpoint, motion will switch the luminaire to High Mode. If Low Mode is set to off or if the Cut Off Delay feature is enabled, then the luminaire will turn off and stay off until the light level falls below the Setpoint. There is also an auto option which is designed to automatically calibrate an appropriate Setpoint value based on the contribution of the luminaire's own light by a process in which the controlled load is turned on for two minutes to warm up the lamp and is then switched off and on eight times. Settings will vary based on application.

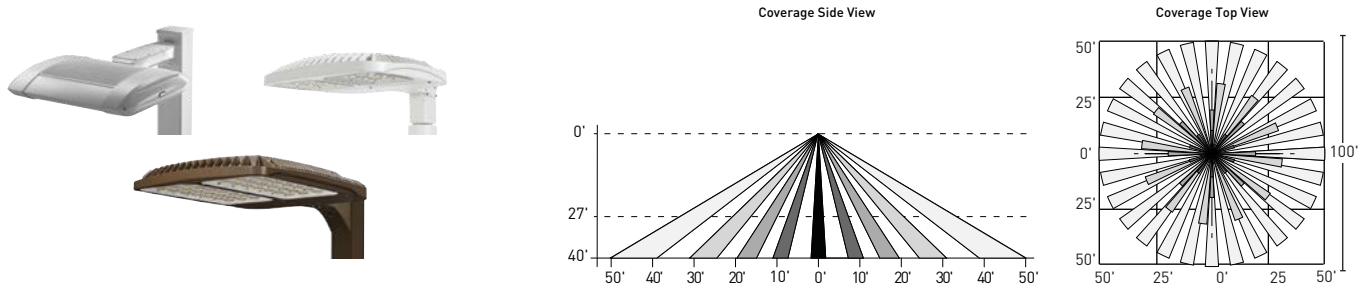
The Ramp Up and Fade Down Time features are factory set at none which means that the lights will switch from Low Mode to High Mode or from High Mode to Low Mode instantly. This feature may be adjusted from 1 to 60 seconds.

The Photocell (Off with Occupancy) feature is factory set at disabled. This feature may be adjusted from 1 to 250 fc (11 to 2691 lux). When this feature is enabled, if the light level is greater than the programmed value, the luminaire will remain off regardless of motion. When this setting is used in combination with the Setpoint feature, there must be at least 10fc (108 lux) of dead band between the two settings to help avoid load cycling. If the luminaire is off, it will turn on in High Mode when the light level decreases below the Setpoint value. If the luminaire is on and the light level is lower than the Photocell value but higher than the Setpoint value, then the luminaire will switch to Low Mode and the sensor will not transition to High Mode from motion.

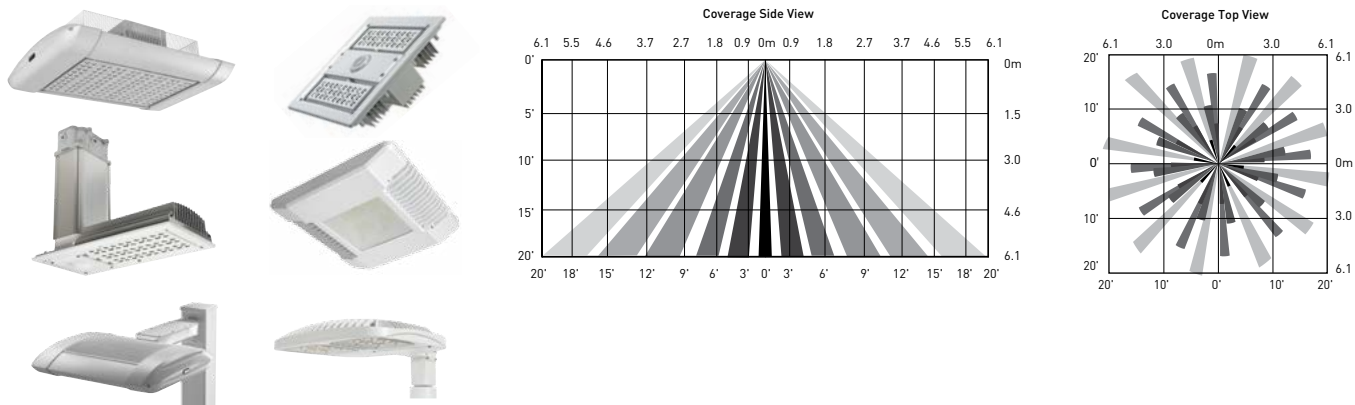
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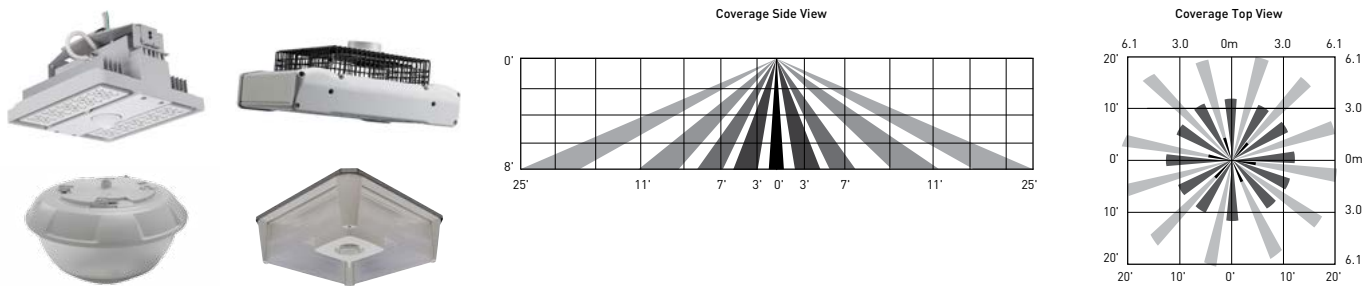
**Figure 1 – Cree edge Area/Flood, OSQ Series Area/Flood, and OSQ-HO Area/Flood Luminaires**



**Figure 2 – Cree Edge Area/Flood, Cree Edge™ Canopy, 304 Series™ Canopy, 228 Series™ Canopy, CPY250® Canopy/Soffit Luminaires and OSQ™ Area/Flood Luminaires**



**Figure 3 – Cree Edge™ Parking Structure, 304 Series™ Parking Structure, VG Series Vehicle Garage, and IG Series Parking Structure Luminaires**



Sensor Details			
Figure	Luminaire	PML Option	Coverage Area
1	Cree Edge Area/Flood, OSQ Series Area/Flood, OSQ-HO Area/Flood Luminaires	PML	<b>Lens coverage:</b> 40° [12.2m] optimal mounting height and 100' [30.5m] diameter coverage with a 360° circular pattern. The maximum mounting heights is 40° [12.2m]. Lens mounting height to coverage radius is 1:0.80. <b>Note:</b> When mounting heights are above 30' [9.1m], the sensor only detects large objects such as fork lift trucks or cars.
2	Cree Edge Canopy, 304 Series Recessed Canopy, 228 Series, Recessed Canopy, CPY250 Canopy/Soffit Luminaires	PML	<b>Lens coverage:</b> 20° [6.1m] optimal mounting height and 40° [12.2m] diameter coverage area with a 360° circular pattern. The minimum and maximum mounting heights is 10' [3.0m] and 30' [9.1m] respectively. Lens mounting height to coverage radius ratio is 1:1.
	OSQ Series Area/Flood Luminaires	PML2	
3	Cree Edge Parking Structure, Cree Edge Security, 304 Series Parking Structure, VG Series Vehicle Garage, IG Series Parking Structure Luminaires	PML	<b>Lens coverage:</b> 10° [3.0m] optimal mounting height and 50' [15.2m] diameter coverage area with a 360° circular pattern. The maximum mounting height is 15' [4.6m]. Lens mounting height to coverage radius is 1:2.5.



## LED Programmable Multi-Level Options

Product Availability									
Drive Current	Voltage	Cree Edge™ Series Luminaires				304 Series™			228 Series™
		Area	Canopy	Parking Structure	Security	Parking Structure	Recessed Canopy	Upgrade Kits	Recessed Canopy
350mA	120-277V	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	347-480V	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
525mA	120-277V	80-160 LED <sup>F,P,R</sup>	80-160 LED <sup>F,P,R</sup>	80-100 LED	80 LED <sup>F</sup>	N/A	N/A	40-60 LED	N/A
	347-480V	80-120 LED	N/A	N/A	N/A	N/A	N/A	N/A	N/A
700mA	120-277V	20-60 LED <sup>F,P,R</sup>	40-60 LED <sup>F,P,R</sup>	40-60 LED	20-60 LED <sup>F</sup>	40-60 LED <sup>F</sup>	40-60 LED <sup>F</sup>	N/A	60, 90 LED
	347-480V	20-60 LED	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1000mA	120-277V	N/A	N/A	N/A	N/A	N/A	N/A	N/A	30 LED
	347-480V	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

F - PML option available with Fusing option  
P - PML option available with Photocell option  
R - PML option available with NEMA® Photocell Receptacle option

Product Availability						
Voltage	CPY Series		VG Series	OSQ Series	IG Series	OSQ-HO Series
	Canopy/Soffit		Vehicle Garage	Area/Flood	Parking Structure	Area/Flood
120-277V (UL)	Version A - D Input Power Designator	Version B - A, B, C, E & F Input Power Designators	A Input Power Designator	A, B, J, K, S, T & U Input Power Designators <sup>F,R</sup>	A & J Input Power Designators	40L & 50L Lumen Packages <sup>F,Q,R</sup>
347-480V (UH)	N/A	N/A	A Input Power Designator <sup>1</sup>	NB, K, T & U Input Power Designators <sup>F,R</sup>	A & J Input Power Designators <sup>2</sup>	40L & 50L Lumen Packages <sup>F,Q,R</sup>

F - PML option available with Fusing option  
Q - PML option available with Field Adjustable Output option  
R - PML option available with NEMA® Photocell Receptacle option  
1 - Must specify voltage  
2 - 347V only

### PML High & Low Mode Multipliers – 525mA Drive Current

For use with Cree Edge Canopy Luminaires to 160 LEDs, Cree Edge Parking Structure Luminaires to 100 LEDs, 304 Series Parking Structure and Canopy Luminaires and 228 Series Recessed Canopy Luminaires

0-10V	Drive Current (mA)	System Watts Multiplier	Lumen Multiplier
<= 1.3	75	0.15	0.15
2.1	125	0.26	0.27
2.5	150	0.31	0.31
2.8	175	0.36	0.37
3.6	225	0.45	0.45
4.4	275	0.55	0.53
5.1	325	0.64	0.62
5.5	350	0.67	0.70
6.7	425	0.83	0.80
7.5	475	0.92	0.89
≥ 8.7	525	1.00	1.00

### PML High & Low Mode Multipliers – 700mA Drive Current

For use with Cree Edge Canopy and Parking Structure Luminaires to 60 LEDs, 304 Series Parking Structure and Recessed Canopy Luminaires and 228 Series Recessed Canopy Luminaires

0-10V	Drive Current (mA)	System Watts Multiplier	Lumen Multiplier
<= 1.2	75	0.11	0.12
1.7	125	0.19	0.21
2.0	150	0.23	0.25
2.3	175	0.26	0.29
2.8	225	0.32	0.35
3.4	275	0.40	0.42
4.0	325	0.47	0.49
4.2	350	0.50	0.56
5.1	425	0.62	0.63
5.6	475	0.68	0.70
6.2	525	0.76	0.79
6.5	550	0.80	0.80
6.8	575	0.83	0.84
7.3	625	0.90	0.91
≥ 8.4	700	1.00	1.00

### PML High & Low Mode Multipliers – 1050mA Drive Current

For use with 228 Series Recessed Canopy Luminaires to 30 LEDs

0-10V	Drive Current (mA)	System Watts Multiplier	Lumen Multiplier
<= 1.0	105	0.07	0.19
1.4	150	0.11	0.23
1.6	175	0.13	0.25
1.7	200	0.15	0.27
2.1	250	0.20	0.31
2.5	300	0.24	0.35
2.9	350	0.29	0.39
3.2	400	0.33	0.43
3.6	450	0.38	0.47
4.0	500	0.42	0.51
4.2	525	0.44	0.53
4.3	550	0.47	0.55
4.7	600	0.51	0.59
5.1	650	0.56	0.63
5.4	700	0.60	0.67
5.8	750	0.65	0.71
6.2	800	0.69	0.75
6.5	850	0.74	0.79
6.9	900	0.78	0.83
7.3	950	0.83	0.87
7.6	1000	0.87	0.91
≥ 8.0	1050	1.00	1.00



## LED Programmable Multi-Level Options

### PML High & Low Mode Multipliers – CPY Series

For use with Version A CPY250® Canopy/Soffit Luminaires with D Input Power Designator

CPY Series Version A – Input Power Designator D		
0-10V	System Watts Multiplier	Lumen Multiplier
</= 1.0	0.12	0.13
1.6	0.18	0.17
1.9	0.21	0.21
2.2	0.25	0.25
2.8	0.33	0.34
3.4	0.41	0.43
3.9	0.47	0.49
4.2	0.51	0.54
5.1	0.64	0.66
5.7	0.71	0.73
6.3	0.79	0.81
6.6	0.83	0.85
6.9	0.86	0.87
7.5	0.95	0.96
>= 8.0	1.00	1.00

### PML (E) High & Low Mode Multipliers – CPY Series

For use with Version B CPY250® Canopy/Soffit Luminaires with A, B, C, E & F Input Power Designators

CPY250 Series – Input Power Designator A		
0-10V	120-480V	
	System Watts Multiplier	Lumen Multiplier
</= 1.0	0.09	0.10
1.6	0.17	0.17
1.9	0.21	0.22
2.2	0.25	0.25
2.8	0.32	0.32
3.4	0.39	0.40
3.9	0.44	0.47
4.2	0.48	0.50
5.1	0.59	0.62
5.7	0.67	0.70
6.3	0.75	0.78
6.6	0.79	0.82
6.9	0.83	0.87
7.5	0.93	0.95
10.0	1.00	1.00

CPY250 Series – Input Power Designator B		
0-10V	120-480V	
	System Watts Multiplier	Lumen Multiplier
</= 1.1	0.13	0.14
1.6	0.19	0.20
2.0	0.24	0.26
2.3	0.29	0.31
2.9	0.38	0.40
3.0	0.40	0.42
3.4	0.46	0.49
3.8	0.50	0.53
4.2	0.58	0.61
5.2	0.74	0.77
5.8	0.83	0.85
6.4	0.93	0.93
>/= 6.9	1.00	1.00
7.5	0.93	0.95
10.0	1.00	1.00

CPY250 Series – Input Power Designator C		
0-10V	120-480V	
	System Watts Multiplier	Lumen Multiplier
</= 1.0	0.19	0.17
1.3	0.26	0.21
1.8	0.32	0.29
2.1	0.35	0.34
2.5	0.42	0.40
2.6	0.45	0.42
3.0	0.52	0.48
3.3	0.55	0.53
3.7	0.61	0.59
4.2	0.68	0.67
5.2	0.84	0.82
5.3	0.87	0.84
5.8	0.94	0.91
>/= 6.5	1.00	1.00
10.0	1.00	1.00



## LED Programmable Multi-Level Options

### PML (E) High & Low Mode Multipliers – CPY Series

For use with Version B CPY250® Canopy/Soffit Luminaires with A, B, C, E & F Input Power Designators

CPY250 Series – Input Power Designator E		
0-10V	120-480V	
	System Watts Multiplier	Lumen Multiplier
<= 1.0	0.10	0.11
1.6	0.16	0.17
1.9	0.20	0.21
2.2	0.23	0.24
2.8	0.32	0.33
3.4	0.40	0.42
3.9	0.46	0.48
4.2	0.50	0.52
5.1	0.62	0.65
5.7	0.69	0.72
6.3	0.79	0.80
6.6	0.82	0.84
6.9	0.85	0.85
7.5	0.94	0.95
>= 8.0	1.00	1.00

CPY250 Series – Input Power Designator F		
0-10V	120-480V	
	System Watts Multiplier	Lumen Multiplier
<= 1.0	0.14	0.14
1.3	0.16	0.17
1.6	0.21	0.22
1.8	0.25	0.25
2.1	0.29	0.30
2.6	0.36	0.38
3.0	0.44	0.44
3.3	0.47	0.48
3.7	0.56	0.58
4.2	0.64	0.64
5.2	0.80	0.80
5.3	0.84	0.84
5.8	0.91	0.90
>= 6.5	1.00	1.00

### PML/PML2 High & Low Mode Multipliers – OSQ Series

For use with OSQ™ Luminaires with A, J & S Input Power Designators

OSQ Series – A, J & S Input Power Designators		
0-10V	System Watts Multiplier	Lumen Multiplier
<= 1.1	0.12	0.15
1.6	0.18	0.24
2.0	0.22	0.30
2.2	0.27	0.35
2.9	0.34	0.43
3.5	0.41	0.51
4.0	0.48	0.59
4.2	0.50	0.61
4.7	0.57	0.68
5.4	0.64	0.73
5.8	0.71	0.80
6.3	0.78	0.85
7.2	0.85	0.91
7.4	0.90	0.94
7.7	0.95	0.98
10.0	1.00	1.00

### PML/PML2 High & Low Mode Multipliers – OSQ Series

For use with OSQ™ Luminaires with B, K & T Input Power Designators

0-10V	System Watts Multiplier	Lumen Multiplier
<= 0.7	0.15	0.13
1.3	0.17	0.19
1.6	0.22	0.24
1.8	0.25	0.28
2.1	0.31	0.33
2.5	0.38	0.40
2.6	0.40	0.42
3.0	0.46	0.48
3.3	0.50	0.53
3.7	0.58	0.59
3.9	0.61	0.63
4.2	0.68	0.67
4.6	0.71	0.74
5.3	0.84	0.84
5.5	0.90	0.87
5.9	0.91	0.91
6.4	0.99	0.98
>= 6.5	1.00	1.00

### PML/PML2 High & Low Mode Multipliers – OSQ Series

For use with OSQ™ Luminaires with U Input Power Designator

OSQ Series – U Input Power Designator		
0-10V	System Watts Multiplier	Lumen Multiplier
<= 1.0	0.09	0.12
1.3	0.10	0.14
1.8	0.16	0.21
2.1	0.20	0.26
2.4	0.25	0.30
2.6	0.27	0.33
3.0	0.32	0.39
3.3	0.36	0.44
3.5	0.39	0.46
3.9	0.44	0.52
4.0	0.45	0.53
4.2	0.48	0.56
4.6	0.53	0.61
5.1	0.60	0.68
5.3	0.62	0.70
5.8	0.69	0.76
5.9	0.71	0.77
6.3	0.75	0.82
6.5	0.80	0.84
6.9	0.83	0.88
7.2	0.89	0.92
7.7	0.96	0.96
10.0	1.00	1.00



## LED Programmable Multi-Level Options

### PML High & Low Mode Multipliers – VG Series

For use with VG Series Luminaires with A Input Power Designator

0-10V	System Watts Multiplier	Lumen Multiplier
</= 0.8	0.15	0.12
1.3	0.19	0.17
1.7	0.23	0.23
2.0	0.27	0.27
2.4	0.31	0.33
2.7	0.35	0.39
3.2	0.41	0.45
3.7	0.46	0.52
4.4	0.55	0.60
5.1	0.64	0.68
5.7	0.72	0.76
6.5	0.82	0.86
7.1	0.90	0.91
10.0	1.00	1.00

### PML High & Low Mode Multipliers – IG Series

For use with IG Series Luminaires with A & J Input Power Designators

0-10V	System Watts Multiplier	Lumen Multiplier
</= 0.8	0.17	0.14
1.3	0.19	0.17
1.7	0.24	0.22
2.0	0.27	0.26
2.4	0.32	0.35
2.7	0.36	0.44
3.2	0.42	0.51
3.7	0.47	0.55
4.4	0.56	0.67
5.1	0.65	0.75
5.7	0.73	0.83
6.5	0.83	0.86
7.1	0.90	0.90
10.0	1.00	1.00

### PML High & Low Mode Multipliers – OSQ-HO Series

For use with OSQ-HO Luminaires with 40L & 50L Lumen Packages

OSQ-HO Area Luminaires – 40L/50L		
0-10V	System Watts Multiplier	Lumen Multiplier
</= 1.0	0.11	0.13
1.7	0.17	0.20
2.1	0.21	0.25
2.4	0.25	0.30
3.0	0.32	0.39
3.5	0.39	0.46
3.9	0.44	0.51
4.2	0.49	0.56
4.8	0.55	0.63
5.3	0.62	0.70
5.8	0.70	0.76
6.3	0.77	0.82
6.9	0.85	0.89
7.2	0.90	0.92
7.6	0.95	0.96
>/= 8.0	1.00	1.00