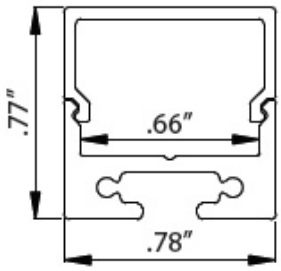
LINEAR.RR



Product Information
The Linear.RR is a sleek, elegant recessed indoor fixture with minimalist appeal.

This LED lighting fixture features aluminum housing.

Applications: Offices, Indoor Walkways and many other indoor lighting application.

Performance Ratings and Certifications
UL 1598
UL 8750
CSA C22.2#250.0
CSA C22.2#250.13

Performance Summary

Lumens:	808 lm per foot
Lumens Per Watt (Typical):	110 LPW
Power Consumption:	7.3 W per foot
Light Engine:	L70 Rated Lifetime of 100,000+ hours.
CRI:	Minimum 70 CRI. Custom CRI available upon request.
CCT (Typical):	3000K, 4000K, 5000K.

Manufactured in the U.S. with parts from U.S. and imported.

Fixture Information

Housing:	Extruded Aluminum
Color:	Silver, Custom Color
Finish:	Powdercoat finish
Lens:	Frosted Acrylic
Mounting:	Pendant Mount
Diffusion:	Frosted
Height:	0.77"
Width:	0.78"
Length:	Available in 2', 4', 6' or 8' lengths

Electrical System Characteristics / Data

AC Input:	120/277 VAC (standard), 480 VAC (upgrade)
FCC:	Title 47, Part 2, Part 15, Class A
EM:	Compliance to EN55015, EN55022 (CISPR22) Class B, EN61000-3-2 Class C (60% load); EN61000-3-3
EM Immunity:	Compliance to EN61000-4-2,3,4,5,6,8,11, EN61547, EN55024, light industry level (surge 4KV), criteria A
Withstand Voltage:	I/P-O/P:3.75KVAC I/P-FG:2KVAC O/P-FG:1.5KVAC
Isolation Resistance:	I/P-O/P, I/P-FG, O/P-FG:100M Ohms / 500VDC / 25 / 70% RH
Power Factor:	PF > 0.98/115VAC, PF > 0.92/277VAC
Total Harmonic Distortion:	THD < 20%
Standard Surge Protection:	All-Around Protection: OVP, SCP, OLP.
Enhanced Surge Protection:	Protects against surges according to IEEE C62.41.2 C and ANSI C136.2
Emergency Batt. Backup:	Optional upgrades available.

Optional Controls

Wireless Controls:	Optional via Pulse Wireless Mesh
Network Dimming:	0-10V, step, line voltage and bi-level available.
Daylight Harvesting Sensor:	Optional
Occupancy Sensor:	Optional

Warranty
Standard limited 5-year warranty, first year includes labor. Optional 10-year warranty available.

911 S. Primrose Ave. - Suite I, Monrovia, California 91016 - **Phone** - (626) 357-0500 - **FAX** (626) 357-0079 **EMAIL**: info@ecads-na.com
www.ecadsledlighting.com

Performance Specifications

Electrical Load				
Light Engine	Drive Current (Amps@120VAC)	Drive Current (Amps@277VAC)	Drive Current (Amps@480VAC)	System Power (Watts)*
LINL-021-B-NW-MT	0.06	0.03	0.02	7.34
				* ideal wattage per foot

Operating Characteristics (Typical @5700K CCT)				
Light Engine	Lumens (Medium Dist)*	Input Power (Watts)	Lumens per Watt	Replaces
LINL-021-B-NW-MT	808	7.34	110.00	15-75W
				*Lumen output per foot

Specifications and Options

Construction
Durable, extruded aluminum housing.

LensOptions
Standard frosted lensavailable.

Optional Finishes
Custom colors available (specify RAL code). Epoxy finish available

Mounting Options
Pendant mounting available.

Electrical System Specifications

Electrical System
Standard AC input of 120 – 277VAC. Optional upgrade to 480VAC. Driver meets maximum harmonic distortion (THD) of 20% and is ROHS compliant. Power Factor = > 0.9. Standard Surge protection according to IEC/EN 61000-4-5 EMC test standard and can protect against up to 4KV transient surge. Optional, enhanced Surge Protection protects Line-Ground, Line-Neutral, and Neutral-Ground. Protects against surges according to IEEE C62.41.2 C(10kA and 10kV) and ANSI C136.2.

Controls
Optional controls include: 0-10V (010V), Step, line voltage and Bi-Level Dimming functionality (not guaranteed to work with all dimming systems). Occupancy and Daylight Harvest Sensors available. Optional Emergency Battery Backup: Nickel-Cadmium Batteries, 5W, 600 Lumens for 90 minutes. Optional Cold Emergency Battery Backup: 23W, 2000 Lumens for 90 minutes. The battery has a 7-10 year lifespan.

Driver
All LED drivers provide constant current to give flicker free lighting. Two different drive currents are provided; A (350 mA) and B (525 mA). Highly reliable. Suitable for dry, damp and wet locations. Compliant to worldwide safety regulations for lighting.

Ambient Temperature
We provide fixtures that can sustain ambient temperature ranging from -40F to 140F (-40C to 60C).

Wireless Control Options
Optional wireless networking using the Noribachi Pulse Wireless controller. Pulse is an Arduino-based hardware platform that provides communication between fixtures and a base station using Digi's XBEE based mesh network. Pulse controls up to 16 independent LED lighting fixtures using an FCC approved 900 MHz frequency with up to 200 Kbps data transmission speed. Transmit power output 50 mW. Data transmission rate is 156.25 kbps. 128 bit AES Encryption.

Occupancy Sensor and Daylight Harvesting
Sensor provides 60' diameter coverage from a 40' height. Time can be set from 30 seconds to 30 minutes.

RGBW Controls
Optional RGBW controls with communication to fixture via DMX512 or DMX256 and four channel controls. Four channel control uses red, green, blue and white (to control intensity). DMX controller optional, either software DMX master (via CD and USB adapter) or a physical DMX master. 2.4 GHz wireless DMX networking optional. Other frequencies available upon request.

Testing Compliance
Noribachi complies with and exceeds standards set forth by UL and CSA. All luminaires comply with UL 1598 (CSA C22.2#250.13), and UL 8750 (CSA C22.2#250.0) standards for safety. Performance testing is done in accordance with LM-79 color measurements and LM-79 distribution measurements, and LM-80 lumen maintenance testing.

Manufacturing
Manufactured in beautiful Harbor City, CA. ARRA Compliant. NAFTA Compliant. Test and burn-in of 100% of all luminaries before shipment. No less than 8-years experience in manufacturing LED-based products.

Warranty
Standard limited 5-year warranty, first year includes labor. Optional 10-year warranty available. See details at www.Noribachi.com.

Note
All safety tests and performance data is done in ambient (STP) conditions. Specifications subject to change without notice. Actual performance may differ as a result of end-user environment application. Actual wattage may differ by +/- 8%. Lumen values may vary within compliance with ANSI C78-377 (unless specifying tight color bins).

Optics Specifications

White LED Optics

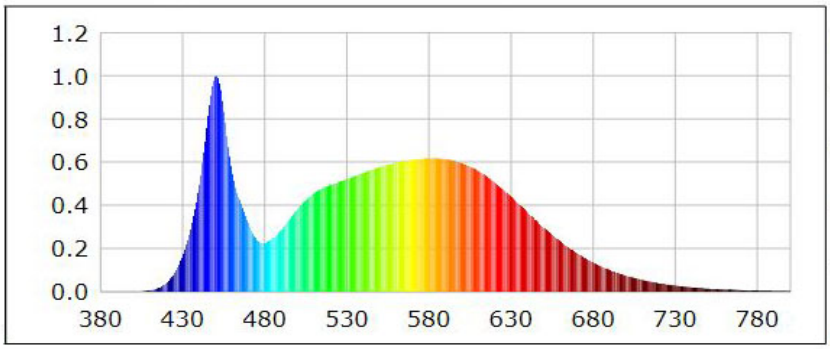
High brightness, high efficiency LEDs. Standard color temperature is Cool White (5000K typical). Neutral White (4000K typical) and Warm White (3000K typical) also available. All with minimum 70 CRI. Tight bins (<+/-50degK variability) also available – recommended for WW installations as the eye is sensitive to variations in this color range. 40deg and 80degbeam angle optional (n/a for RGBW).

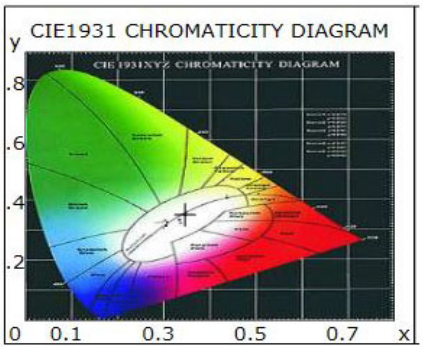
RGBW Light Engine Optics

RGBW light engine also available, compatible with DMX controller. RGBW colors, to allow changing from pure white light to any hue available. Multiple channels of LEDS produce a full spectrum of light anywhere from deepest red to farthest violet. CRI greater than 75 in the 2700K – 4000K range.

Single color light engines also available. Red=630 nanometers, Green=525 nanometers. Blue=475 nanometers.

Photometric Data for White LED Light Engine



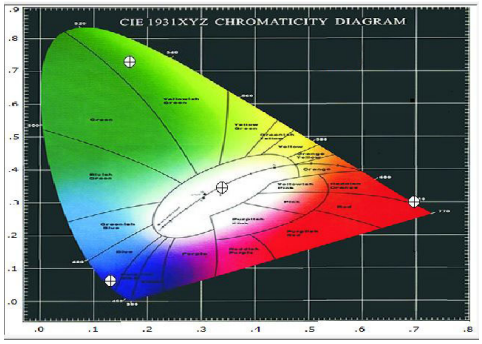


Chromaticity coordinates: x=0.3467 y=0.3550 u(u')=0.2112 v=0.3244 v'=0.4866
CCT: Tc=5000K (duv=0.00107) Color Ratio: R=0.159 G=0.797 B=0.044
Peak Wavelength: 450.5nm Half Bandwidth: 21.5nm
Dominant Wavelength: 572.3nm Color Purity: 0.106
Color Render Index: Ra= 83.2, avgR(1~14)= 76.2, avgR(1~15)= 76.2

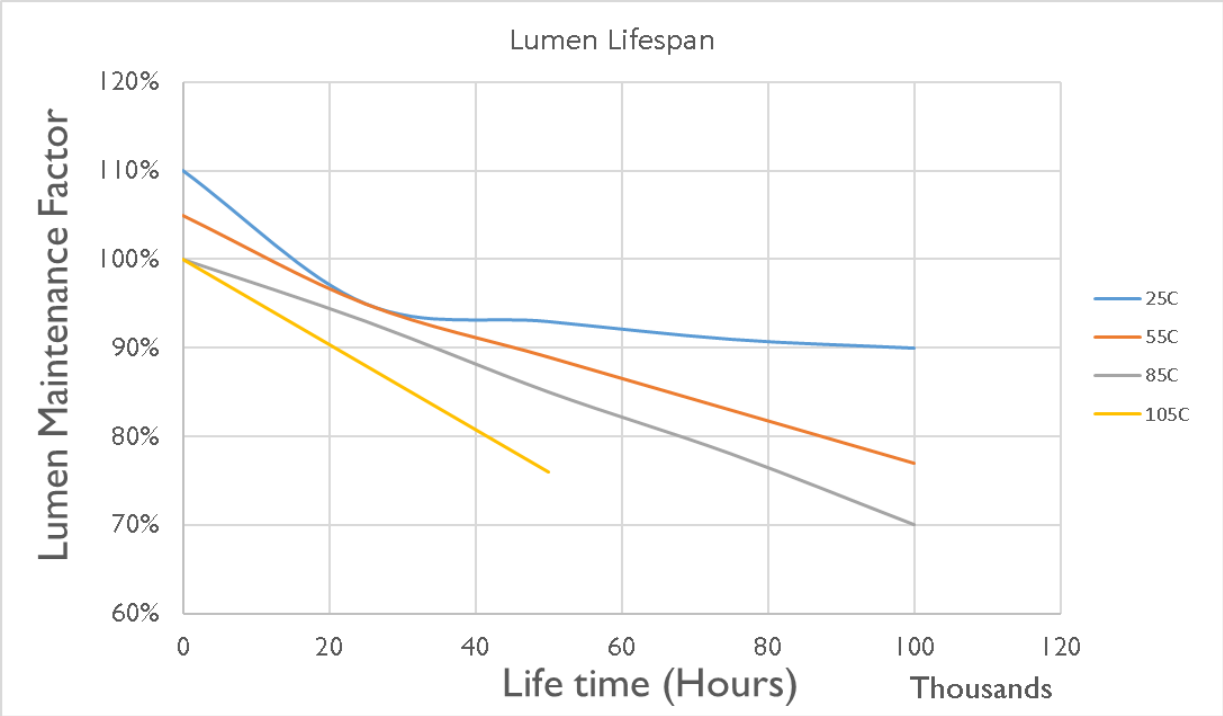
R1 =81	R2 =88	R3 =92	R4 =83	R5 =82	R6 =83	R7 =88	R8 =69
R9 =12	R10=71	R11=81	R12=59	R13=83	R14=96	R15=77	

Photometric Data for RGBW LED Light Engine

Chromaticity coordinates:
White x = 0.3405, y = 0.3459
Green x = 0.1687, y = 0.7296
Red x = 0.6968, y = 0.3024
Blue x = 0.1316, y = 0.0636



Lumen Performance



Lumen Maintenance Factors (B Drive)					
T_J (Junction Temp)	INITIAL LMF	25K HR PROJECTED LMF	50K HR PROJECTED LMF	75K HR PROJECTED LMF	100K HR PROJECTED LMF
25°c	1.10	0.95	0.93	0.91	0.90
55°c	1.05	0.95	0.89	0.83	0.77
85°c	1.00	0.93	0.85	0.78	0.70
105°c	1.00	0.88	0.76	N/A	N/A

Each temperature has an independent initial value. In accordance with IESNA TM021011, Projected Values represent interpolated value based on time durations that are within six times (6X) the IESNA LM-80-08 total test duration (in hours) for the device under testing (DUT) i.e. the packaged LED chip). In accordance with IESNA TM-21-11, Calculated Values represent time durations that exceed six times (6X) the IESNA LM-80-08 total test duration (in hours) for the device under testing (DUT) i.e. the packaged LED chip)

Lumen Multiplier	
AMBIENT TEMPERATURE	LUMEN MULTIPLIER
10°C	1.032
15°C	1.021
25°C	1.000
40°C	0.968
50°C	0.946

How to Order

Sample Order Code: Only include the optional upgrades you need.

LIRR	-	LINL	-	042	-	B	-	NW	-	MT	-	COL-5004	-	OS	-
Fixture (required)		Light Board (required)		Number of Diodes (required)		Drive Current (required)		LED Color Temperature (required)		Voltage (required)		Custom Fixture Color (optional)		Occupancy Sensor (optional)	

DHS	-	EPOXY	-	BLD[50]	-	SGR1	-	PUL
Daylight Harvest Sensor (optional)		Coating (optional)		Dimming (optional)		Surge Protection (optional)		Controller (optional)

Numbering Order	Specification	Required or Optional	Allowed Values	Description
1	Fixture	Required	LIRR	For Linear.RR
2	Light Board	Required	LINL	For Linear.RR
3	Number of Diodes	Required	042	For LINL-042 models
			063	For LINL-063 models
			126	For LINL-126 models
			168	For LINL-168 models
4	Drive Current	Required	B	B (525mA) drive current
5	LED Color Temperature	Required	NW	Standard Neutral White LEDs (4000K)
			CW	Cool White LEDs (5000K)
			WW	Warm White LEDs (3000K)
			[Specific degree Kelvin]	Specific color temp LEDs [Specific degree Kelvin]
			TB1 [Specific degree Kelvin]	Tight Bin LED Color [Specific degree Kelvin]
			TB2 [Specific degree Kelvin]	Tight Bin LED Color[Specific degree Kelvin] for > 150W
			RGBW	Red/Green/Blue/White light engine
			SCOL-[R,G,B]	Single color Red, Green or Blue light engine
6	Voltage	Required	MT	Standard AC input: 120VAC - 277VAC
			HV1	High Voltage (480VAC) option for up to 150W
			HV2	High Voltage (480VAC) option for over 150W
7	Custom Fixture Color	Optional	COL-[RAL]	Custom Fixture Color (RAL code)
8	Occupancy Sensor	Optional	OS	Occupancy Sensor
9	Daylight Harvest Sensor	Optional	DHS	Daylight Harvest Sensor
10	Coating	Optional	EPOXY	Epoxy Coating
11	Dimming	Optional	010V	0 - 10V dimming
			STEP100	Step dimming (100-299W)
			STEP300	Step dimming (>300W)
			BLD[%]	Bi-level dimming
			LVDIM	Line Voltage Dimming
12	Surge Protection	Optional	SRG1	Enhanced surge protection for 120-277VAC
			SRG2	Enhanced surge protection for 480VAC
13	Controller	Optional	PUL	Pulse Wireless Controller