Flexible Linear Lighting Arrays™ (FLLA™)

Low-Voltage Color Changing (RGB/RGBW/TW) LED Elements

Low-Voltage, Full-Color Flexible (LED) lighting elements

Flexible Construction Enables Mounting on Flat or Uneven surfaces

Standard and Water-Resistant Models available

Licensed Patents from Philips Electronics

Small Form Factor Device can be Integrated Easily

Shorter/Customized lengths can be created in the field

Product Description

Background

The Flexible Linear Lighting Arrays (FLLA™) is an ingenious, easy-to-install family of UL/cUL listed color changing/tunable white/monochrome LED elements that are designed to work seamlessly with various + Converging Systems ILC-xxx controllers to generate virtually any color or CCT level (depending upon model) and any dimming level from 100% to .001% without flicker. Most FLLA devices are available in a choice of three configurations (Std./IP20, Water resistant/IP54, and super-water resistant/IP65). All models come with a factory installed/integrated feeder connectors (on both ends) to facilitate in-field cutting of strips enabling up to two separate runs of varying lengths without soldering. Additional solder-on connectors and flying leads are available for additional flexibility.

Operation

Depending upon the front-end ILC-x00 controller, up to 16.7 million colors can be selected along with full CCT control. Tunable White (TW) output (without color) is available from both the ILC-200 and the ILC-400 (in TW mode). Monochrome control is available from both the ILC-100 and the ILC-400 (Mono mode). Expanded TW support is also available from the ILC-300. All popular automation and lighting panels including those from Lutron, Crestron, Elan/NICE, Control4 as well as those from nearly a dozen others support the family of ILC-xxx controllers with the use of the front-end e-Node gateways.

Easy Setup and Configuration

The FLLA's thin form factor enables the lighting devices to be mounted almost anywhere. Typically, up to 18.4' (5.61m.) of RGBW FLLA-luminaires or up to 8.53m (28') of RGB FLLA-luminaries or similar lengths of monochrome or TW FLLA luminaires can be connected to a single ILC-x00™ controller. If additional runs beyond those specified above are required, additional ILC-x00™ controllers can be networked together. ILC-x00™ controllers can be located up to an amazing 4000-(1219m) away with other controllers, automation systems or switches!

Applications

Typical applications include backlighting projection screens, soffit lighting, navigational/accessibility lighting, decorative ambient, focal point, and object of interest illumination. Bi-directional feedback with the ILC-x00 controllers enables automation systems to indicate specific lighting states selected (on touchscreens and iPads). The ILC-x00™ and the FLLA luminaries allow you to be the designer for LED lighting! All popular lighting and home automation systems have developed customized device drivers which enable simple to sophisticated control of scenes and functions. In addition, a family of CS-Bus™ interface adapters is available which enable ILC-x00™ LED lighting controllers to be connected to nearly any type of home, commercial or industrial automation system!

Features

(Model Specific)

- LED energy saving lighting elements
- 16.7 million hues (colors) available
- Compatible with ILC family LED controllers
- Std. IP20 as well as more water resistant IP54 and IP65 modes are available.
- Monochrome, TW and Full color + CCT models are available
- Support ILC-x00 gamma correction algorithms for dimming

- Dimming levels to .001% without flicker.
- Hue accurate dimming (without color shift)
- Low-voltage system **does not** require a commercial electrical license for installation
- 3M™ adhesive backing (silicon fastening straps available for moist locations)
- Can interconnect to controllers and control panels up to 4000' (1209m) away

Technical Specifications

General Specifications/Part Number Assignments

Product Type	CSI Part Number	Vdc	Nominal Watts/ft. (meter)	LEDs elements/ ft. (meter)	Element type	Lengths Available[1]	Wiring Confi.
Full Color + CCT							
24v enh. Brightness RGB IP 20	FLLA-4L-RGB-24-EB-IP20-500	24v	4.39w/ft (14.4w/m)	18.3 /ft. (60/m)	RGB integrated	C type[2]	+ common
24v enh. Brightness RGB IP 54	FLLA-4L-RGB-24-EB-IP54-500	24v	4.39w/ft (14.4w/m)	18.3 /ft. (60/m)	RGB integrated.	C type[2]	+ common
24v enh. Brightness RGB IP 65	FLLA-4L-RGB-24-EB-IP65-500	24v	4.39w/ft (14.4w/m)	18.3/ft. (60/m)	RGB integrated	C type[2]	+ common
24v enh. brightness RGBW IP 20	FLLA-5L-RGBW-24-EB-IP20-500	24v	4.97w/ft (16.32w/m)	36.6 /ft. (120/m)	RGB integrated + W	C type[2]	+ common
24v enh. brightness RGBW IP 54	FLLA-5L-RGBW-24-EB-IP54-500	24v	4.97w/ft (16.32w/m)	36.6 /ft. (120/m)	RGB integrated.+ W	C type[2]	+ common
24v enh. brightness RGBW IP 65	FLLA-4L-RGBW-24-EB-IP65-500	24v	4.97w/ft (16.32w/m)	36.6/ft. (120/m)	RGB integrated. + W	C type[2]	+ common
Monochrome							
24v enh. brightness 2700K IP 20	FLLA-5L-W2700-24-EB-IP20-500	24v	4.39w/ft (14.4w/m)	18.3 /ft. (60/m)	Single Color Diode	C type[2]	+ common
24v enh. brightness 3000K IP 20	FLLA-5L-W3000-24-EB-IP20-500	24v	4.39w/ft (14.4w/m)	18.3 /ft. (60/m)	Single Color Diode	C type[2]	+ common
Tunable White (no color)							
24v enh. Bright. TW 2300~4200K IP 20	FLLA-4L-W23/W42-24-EB-IP20-500	24v	5.00w/ft (16.4w/m)	18.3 /ft. (120/m)	Dual Ch. Diode	C type[2]	+ common
24v enh. Bright. TW 2300~6500K IP20	FLLA-4L-W23/W65-24-EB-IP20-500	24v	5.00w/ft (16.4w/m)	18.3 /ft. (120/m)	Dual Ch. Diode	C type[2]	+ common
24v enh. Bright. TW 1700~5600K IP20	FLLA-5L-W17/W30/W56-24-EB-IP20-500	24v	5.00w/ft (16.4w/m)	18.3 /ft. (120/m)	Tri Ch. Diode	C type[2]	+ common

Notes: devices are trimmable every .1m

[2] Std. Lengths Available= **C Type**= 5.0M

Photometric

Product Type	Approx. Lumens/ft (meter)	Beam Angle	Color Temp (Kelvin)	CRI	λp	CIE(1931) x,y
Full Color + CCT						
24v enh. Brightness RGB IP 20	88 (288)	120°	NA	*		R(0.688, 0.305) G(0.150, 0.712) B(0.132, 0.073)
24v enh. Brightness RGB IP 54	88 (288)	120°	NA	*		R(0.688, 0.305) G(0.150, 0.712) B(0.132, 0.073)
24v enh. Brightness RGB IP 65	88 (288)	120°	NA			R(0.688, 0.305) G(0.150, 0.712) B(0.132, 0.073)
24v enh. brightness RGBW IP 54	798 (1009)	120°	1700-7000K	96+		
24v enh. brightness RGBW IP 54	798 (1009)	120°	1700-7000K	96+		
24v enh. brightness RGBW IP 67	798 (1009)	120°	1700-7000K	96+		
Monochrome						
24v enh. brightness 2700K IP 20	220 (721)	120°	ANSI 2700K	96+		
24v enh. brightness 3000 K IP 20	220 (721)	120°	ANSI 3000K	96+		
Tunable White (no color)						
24v enh. Bright. TW 2300~4200 IP 20	220 (721)	120°	ANSI 3500K	96+		
24v enh. Bright. TW 2300~6500 IP20	44 (144)	120°	1800-7000K	96+		
24v enh. Bright. TW 1700~5600 IP20	44 (144)	120°	1800-7000K	96+		

Recommended Controller and External Power Supply Unit (PSU) List

Product Type	Controller	Max. ft. run/ leader cable (m)	Max supported run /controller*	Recommended PSU			
24v enh. Brightness RGB IP 20	ILC-300	16.4 ft (5m)	22.78 ft (6.94m)	Class 2 24v 96~100W output			
24v enh. Brightness RGB IP 54	ILC-300	16.4 ft (5m)	22.78 ft (6.94m)	Class 2 24v 96~100W output			
24v enh. Brightness RGB IP 65	ILC-300	16.4 ft (5m)	22.78 ft (6.94m)	Class 2 24v 96~100W output			
24v enh. brightness RGBW IP 20	ILC-400	16.4 ft (5m)	20.12 ft (6.13)	Class 2 24v 96~100W output			
24v enh. brightness RGBW IP 54	ILC-400	16.4 ft (5m)	20.12 ft (6.13)	Class 2 24v 96~100W output			
24v enh. brightness RGBW IP 65	ILC-400	16.4 ft (5m)	20.12 ft (6.13)	Class 2 24v 96~100W output			
24v enh. brightness 2700K IP 20	ILC-100m or ILC-400	16.4 ft (5m)	22.78 ft (6.94m)	Class 2 24v 96~100W output			
24v enh. brightness 3000 K IP 20	ILC-100m or ILC-400	16.4 ft (5m)	22.78 ft (6.94m)	Class 2 24v 96~100W output			
24v enh. Bright. TW 2300~4200 IP 20	ILC-200 or ILC-400	16.4 ft (5m)	20 ft (6.1m)	Class 2 24v 96~100W output			
24v enh. Bright. TW 2300~6500 IP20	ILC-200 or ILC-400	16.4 ft (5m)	20 ft (6.1m)	Class 2 24v 96~100W output			
24v enh. Bright. TW 1700~5600 IP20	ILC-300	16.4 ft (5m)	20 ft (6.1m))	Class 2 24v 96~100W output			

*Standard practice requires that all power supplies are run with some derating which will reduce this value if used with a Class 2 power supply.

Construction/Suitability/Certifications

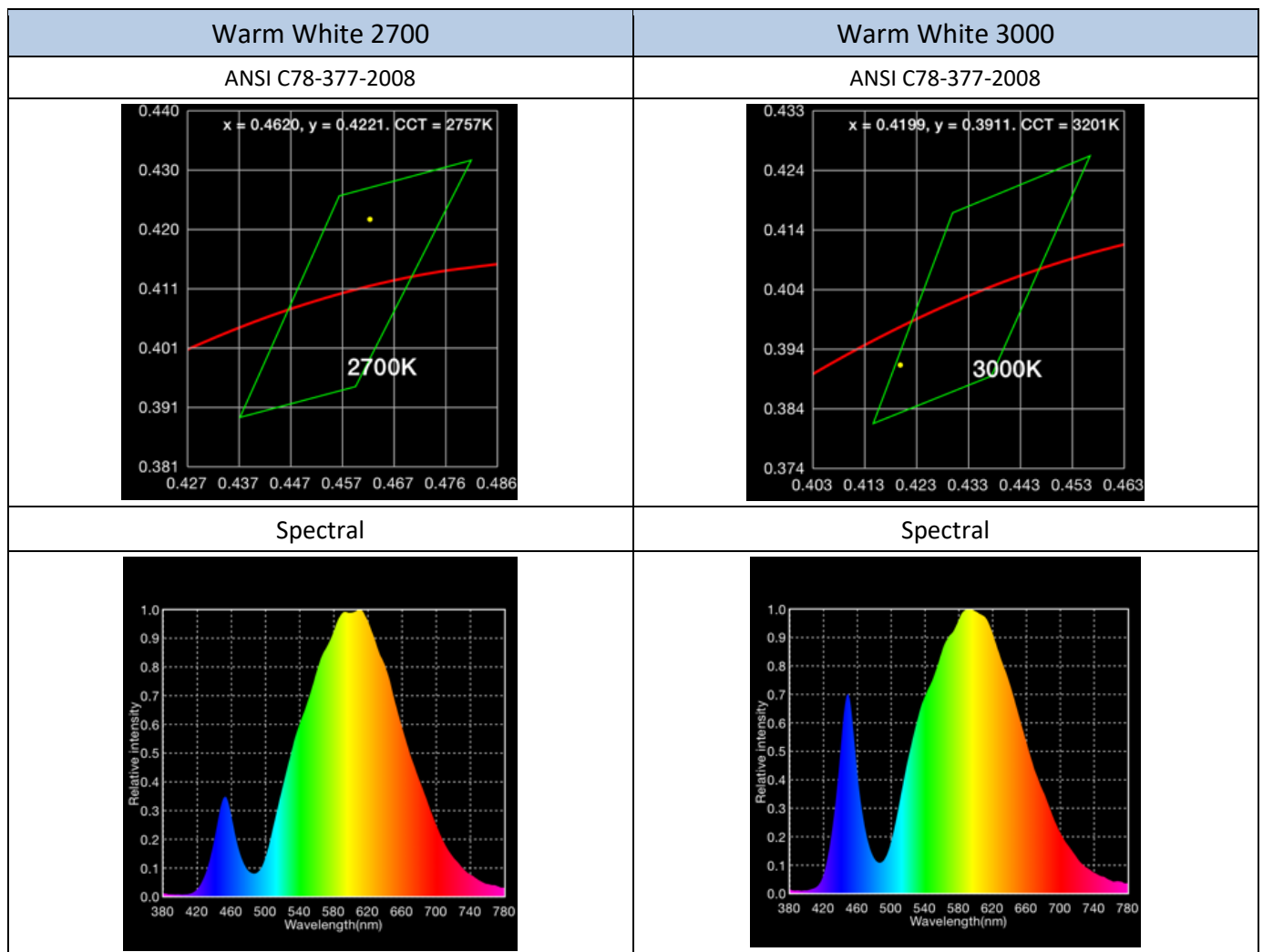| Product Type	Safety Rating[3]	Compliance	Philips Lic.[1]	IP Rating[2]	Integrated connectors	Width	Height	Weight
Full Color + CCT								
24v enh. Brightness RGB IP 20	UL/cUL LIsting	RoHS	✓	IP 20	4 Pin F power 4 Pin M feeder	0.39" (10mm)	0.08" (2mm)	0.43 oz/ft (39.69 g/m)
24v enh. Brightness RGB IP 54	UL/cUL LIsting	RoHS	✓	IP 54	4 Pin F power 4 Pin M feeder	0.39" (10mm)	0.08" (2mm)	0.43 oz/ft (39.69 g/m)
24v enh. Brightness RGB IP 65	UL/cUL LIsting	RoHS	✓	IP 65	4 Pin flying leads 4 Pin flying leads	0.48" (12mm)	0.16" (4mm	0.79 oz/ft (73.71 g/m)
24v enh. Brightness RGBW IP 20	UL/cUL LIsting	RoHS	✓	IP 20	5 Pin flying leads (x2)	0.47" (12mm)	0.13" (2mm)	0.43 oz/ft (39.69 g/m)
24v enh. brightness RGBW IP 54	UL/cUL LIsting	RoHS	✓	IP 54	5 Pin flying leads (x2)	0.47" (12mm)	0.13" (2mm)	0.43 oz/ft (39.69 g/m)
24v enh. brightness RGBW IP 65	UL/cUL LIsting	RoHS	✓	IP 65	5 Pin flying leads (x2)	0.55" (14mm)	0.16" (4mm)	0.43 oz/ft (39.69 g/m)
Monochrome								
24v enh. brightness 2700K IP 20	UL/cUL LIsting	RoHS	✓	IP 20	2 Pin flying leads (x2)	0.31" (8mm)	0.08" (2mm)	0.43 oz/ft (39.69 g/m)
24v enh. brightness 3000 K IP 20	UL/cUL LIsting	RoHS	✓	IP 20	2 Pin flying leads (x2)	0.31" (8mm)	0.08" (2 mm)	0.79 oz/ft (73.71 g/m)
Tunable White								
24v enh. Bright. TW 2300~4200 IP 20	UL/cUL LIsting	RoHS	✓	IP 54	3 Pin flying leads (x2	0.39" (10mm)	0.04" (1mm)	0.43 oz/ft (39.69 g/m)
24v enh. Bright. TW 2300~6500 IP20	UL/cUL LIsting	RoHS	✓	IP 67	3 Pin flying leads (x2)	0.39" (10mm)	0.04" (1mm)	0.43 oz/ft (39.69 g/m)
24v enh. Bright. TW 1700~5600 IP20	UL/cUL LIsting	RoHS	✓	IP 54	4 Pin flying leads (x2)	0.39" (12mm)	0.08" (2mm)	0.43 oz/ft (39.69 g/m)

Notes:

[1]System comprised of ILC-x00™ and FLLA luminaries includes a license to use LED color mixing and LED dimming technology without risk of patent infringement from Philips Electronics

[2], IP20 is most common and easiest to work with FLLA, IP 54 is rated for moist locations, IP65 is rated for super moist locations

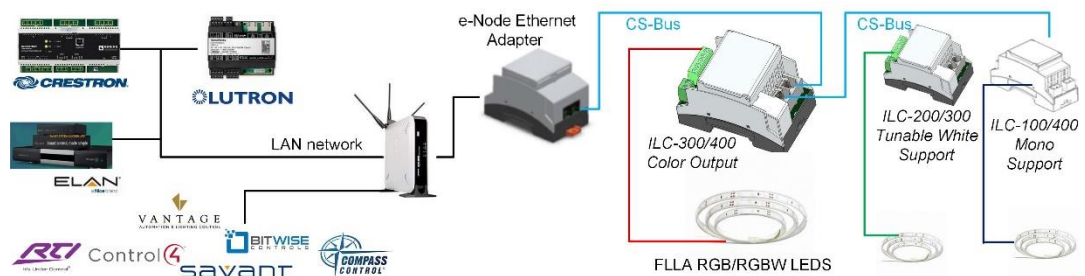[3] Rated to work with UL rated Category 2 power supplies

Operating Temperature Range

Product Type	Operating Temp (Ambient) Range	Reserved
All Models	-4°F to 113°F (-20°C to -45°C)	
All Models		
All Models		

Warm White 2700	Warm White 3000
ANSI C78-377-2008	ANSI C78-377-2008
Spectral	Spectral

System Design

Overview

Application

The Flexible LED elements (luminaires) and the ILC-x00™ family of LED controllers are ideal for a variety of applications. They are widely used in a variety of application areas where *precise color settings, Precise binning*, *3rd-party lighting and automation control, networkable functionality, expandability* and *bi-directional feedback* are demanded. You application may be easily adapted from our core technology. Contact us for more information.

➢ Backlighting Projection Screens
➢ Soffit and Alcove Lighting
➢ Navigational/Exit Lighting
➢ Object of Interest Illumination
➢ Motor Automation
➢ Cabinet Lighting

➢ Marine/Boat applications
➢ Energy savings applications
➢ Heat sensitive application
➢ Enhanced functionality for Lighting Panels
➢ Space saving requirement
➢ Stair and Stumble-Proof Applications