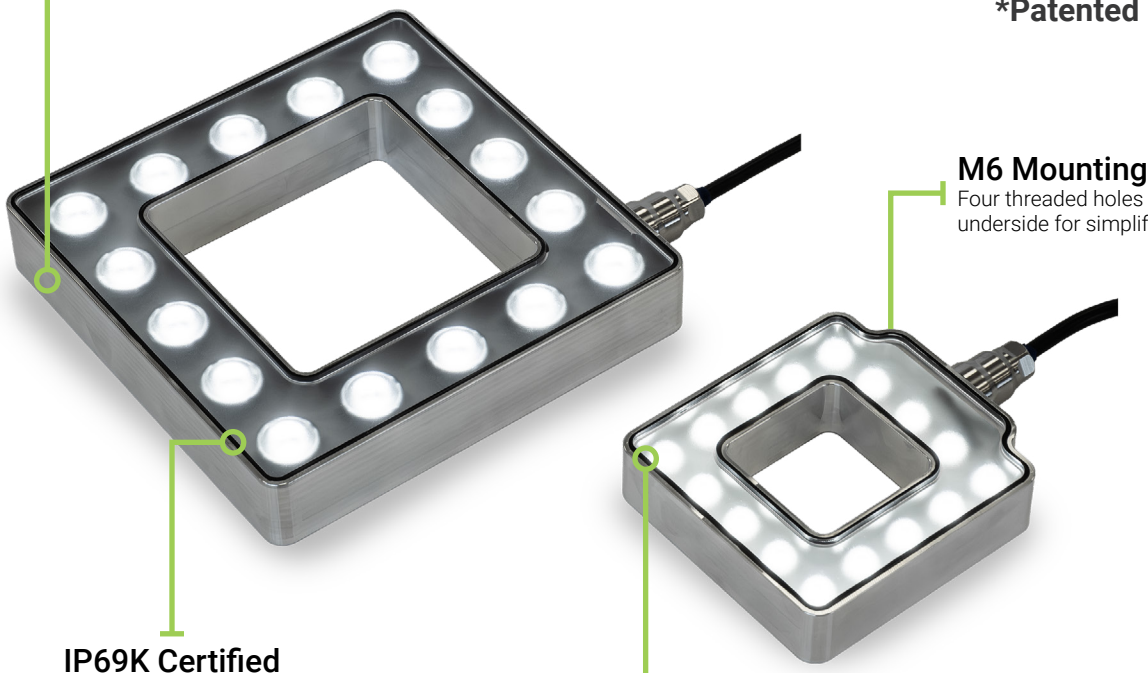
RL322 Series

UltraSeal Ring Lights | Product Datasheet

ADVANCED ILLUMINATION by Exaktera

Caustic Resistant Housing
Configurable with either 316 Stainless Steel or Anodized Aluminum depending on cleaning requirements

***Patented Design**



M6 Mounting Points
Four threaded holes on the underside for simplified installation

IP69K Certified
Engineered to handle the hygenic washdown environments

Virtually Crevice Free
Designed for easy cleaning with no exposed fasteners for minimal chance of bacteria buildup

RL322 Series Description

Engineered for critical hygienic environments, the RL322 Series UltraSeal™ Ring Light provides rugged bright field illumination in 50mm and 100mm opening sizes. Achieving 3rd-party IP69K certification, these lights ensure complete protection against high-pressure, high-temperature steam cleaning.

Their patented, virtually crevice-free design eliminates exposed fasteners to prevent bacteria buildup and simplifies cleaning. This hygienic construction makes them ideal for direct installation in Food & Beverage splash zones, ensuring reliable performance despite constant exposure to water, food debris, and rigorous sanitation protocols. Available in Stainless Steel or Anodized Aluminum to suit specific caustic resistance needs, the RL322 Series can be paired with autoVimation's IP69K Dolphin camera enclosures (an Exaktera family product) for a complete, sanitary machine vision imaging solution.

- **IP69K Certified**
- **Creavice-free Housings**
- **High Intensity**
- **14 Wavelengths Available**
- **Polarization Available**

General Information

General Specifications

Category	Specification	Detail
Optical	Available Wavelengths	WHI, 365 nm, 375 nm, 385 nm, 395 nm, 405 nm, 455nm, 470 nm, 530 nm, 625 nm, 660 nm, 730 nm, 850 nm, 940 nm
	Available Lensing	**50 mm Unit:** Narrow (12°), Medium (20°), Wide (32°), No Lens **100 mm Unit:** Narrow (14°), Medium (25°), Wide (36°), Extra Wide (55)°, No Lens
	Available Light Conditioning	Homogenizer, Diffuser, Polarizer
Electrical	Power Consumption Info	See Power Requirements on Page 9
	Cable Info	80" -0/+6" Long (2m -0/+150 mm), -105 °C Rated, Foil Shield w/ Drain
Mechanical	Sizing Info	See Page 8 for Details
	Camera Opening	50mm x 50mm & 100mm x 100mm
	Weight Info (Standard)	**50 mm:** 0.72 lbs (~326 g) (aluminum), 2.16 lbs (~979 g) (stainless) **100 mm:** 2.16 lbs (~979 g) (aluminum), 6.3 lbs (~2857 g) (stainless)
	Mounting Info	4X M6 Threaded Holes
	Material Info	Anodized Aluminum or Stainless Steel Housing, Acrylic Window, Stainless Steel Strain Relief, PVC Cable Jacket, Steel Back Oxide Fasteners
Thermal	Operating Case Temperatures	25 °C to 60 °C
	Operating Ambient Temperatures	0 °C to 35 °C
Certification	Compliance	CE, RoHS, IEC 62471
	IP Rating	IP69K Certified
	Lumen Maintenance - White Only	L70 (50,000 Hours)

General Information - Continued

Part Number Key

Model	-	Lens	Inner Opening	-	Peak Wavelength	Connector/ Control	Window/ Diffusion Level	Opt. Light	Finish	-	Opt. Connector
XXX	-	XX	XXX	-	XXX	XXX	X	X	XX	-	XXX
RL322		N (Narrow)	050 (50mm)		365[2,3]	EC	A (Clear)	P (Polarizer)	SS (Stainless)		M8
		M (Medium)	100 (100mm)		375[2,3]	ES	H (Homogenizer)		AL (Anodized Aluminium)		M12
		W (Wide)			385[2,3]	C1	D (Diffuser)				
		Z (Extra Wide[1)])			395[2,3]	C5					
		X (No Lens)			405	IC					
					455	I3					
					470	I3S					
					530	I4					
					625						
					660						
					730[3]						
					850[3]						
					940[3]						
					WHI						
more information on page		4	7		5	9		6			

Example Part Numbers:
RL322-Z100-450C5APSS-M8
RL322-M050-660ICDAL-M12

[1] Not available for 50 mm size.
[2] Only available with M lens for 50mm size.
[2] Only available with N,M,&W lenses for 100mm size.
[2] Not available with diffuser.
[3] Not available with polarizer.

In Stock

Unavailable

Lead Times

Build-to-Order products ship within six to ten weeks (typical).

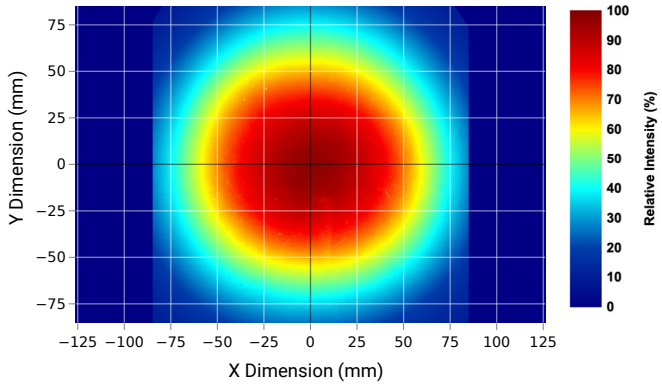
Configurator

Need a build-to-order lighting solution? Advanced Illumination's online configurator helps you tailor our RL322 UltraSeal Series to your specific needs. For a guided configuration of the RL322 UltraSeal Series, visit our online configurator by navegating to the product's webpage and selecting the "Configure" button.

Optical Information

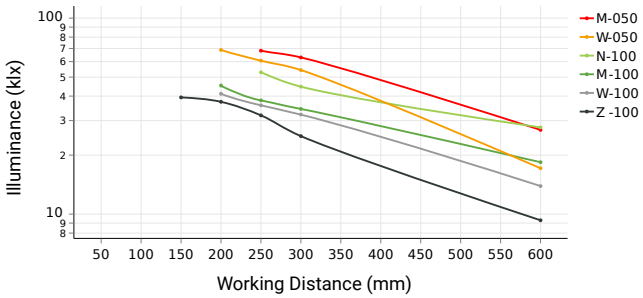
Intensity Characteristics

Intensity Distribution Image at 300 mm Working Distance



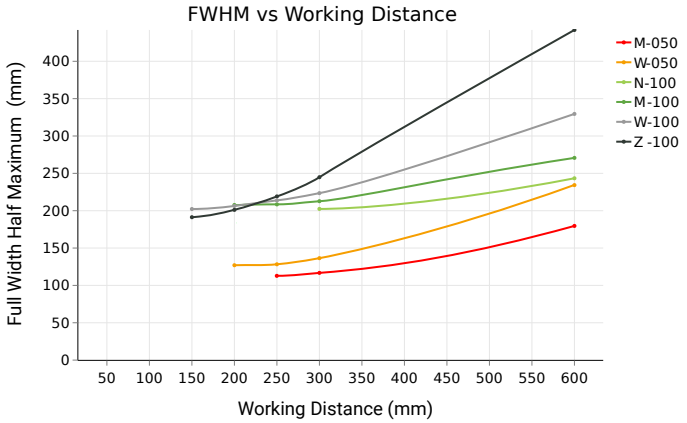
Intensity distribution sample image was taken with a 50mm white medium lensed RL322 unit.

Illuminance vs Working Distance



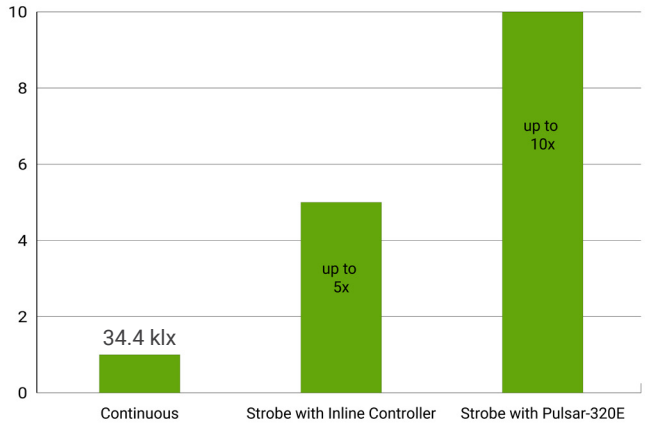
Illuminance data was collected using a white RL322 units.

FWHM vs Working Distance



Full Width Half Maximum (FWHM) data collected using white RL322 units with various lens and size configurations.

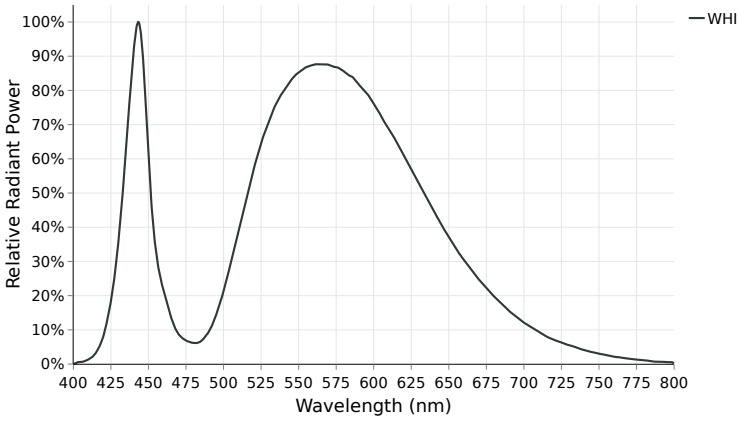
Continuous vs Strobe Intensity



Under continuous operation, an 100 mm white medium lensed RL322 unit will output a **maximum illuminance of 34.4 klx** and a **maximum irradiance of 107.1 W/m²** at a working distance of 300 mm. For applications that require higher output, the RL322 Series has been engineered to be overdrive strobe capable. When configured with AI's strobe enabled Inline or Embedded Controllers (I3, I3S, I4, and ES), the RL322 is capable of outputting up-to 5X continuous levels. When configured with a C5 connector, compatible with AI's Pulsar 320E, a RL322 can be strobed up-to 10X continuous intensity levels.

Optical Information - Continued

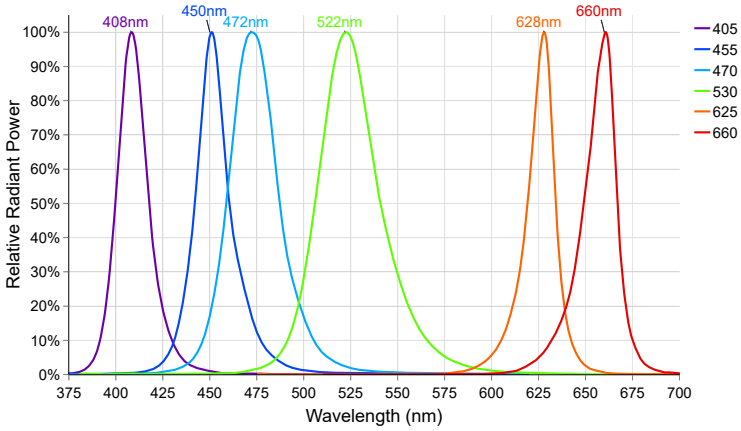
White Spectral Profile



White LED illumination is the most commonly used machine vision lighting configuration. It is often the default choice when specific features of interest do not require color-based highlighting. However, white LEDs can vary in color temperature between different lighting families, which can impact machine vision systems, specifically when matching white light sources.

The RL322 Series white LEDs have a relatively neutral color correlated temperature (CCT) of **5500k.**

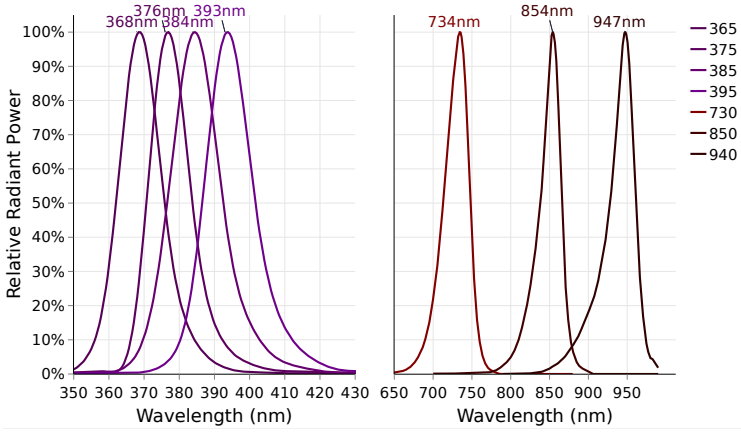
Visible Spectral Profiles



Visible color illumination consists of using wavelengths between 400-700 nm to either create or eliminate contrast on an inspection subject based on differences in a features color hue. When referring to a color wheel, simply remember the following: like colors reflect and brighten surfaces; conversely, opposing colors absorb and darken surfaces.

The RL322 Series is available in **405 nm, 455 nm, 470 nm, 505 nm, 530nm, 590 nm, 625 nm, 660 nm** configurations.

Non-Visible Spectral Profiles



Near-infrared (NIR) and ultraviolet A (UVA) imaging are machine vision techniques that utilize wavelengths outside the visible spectrum. NIR light, with wavelengths between 700-1000 nm, can penetrate certain materials opaque to visible light, making it ideal for detecting overripeness and subsurface defects. In contrast, UVA light, typically ranging between 315-400 nm, interacts with specific substances to induce fluorescence, such as certain molds, fungal toxins, and shell fragments.

The AL325 Series is available in **365 nm, 375 nm, 385 nm, 395 nm, 730nm, 850 nm and 940 nm** configurations.

Disclaimer: The measurements provided above are for approximations only and may vary depending on the method of measurement and the specific configuration being measured.

Optical Information - Continued

RL322 Series Polarization Option

Non-polarized

Polarized

Polarization has various applications, but it is most commonly used to reduce glare on specular surfaces when imaging reflective materials like plastic, metal, glass, or wet surfaces. By placing a linear polarizer over the light source and another over the camera lens, oriented perpendicularly, reflected light that causes glare can be selectively blocked. This allows for the observation of details that would otherwise be obscured by the reflection, such as printed text on packaging. However, since polarization inherently blocks some light, you may need to increase exposure to compensate for the reduced intensity, or consider alternative lighting geometries to lessen glare without polarization.

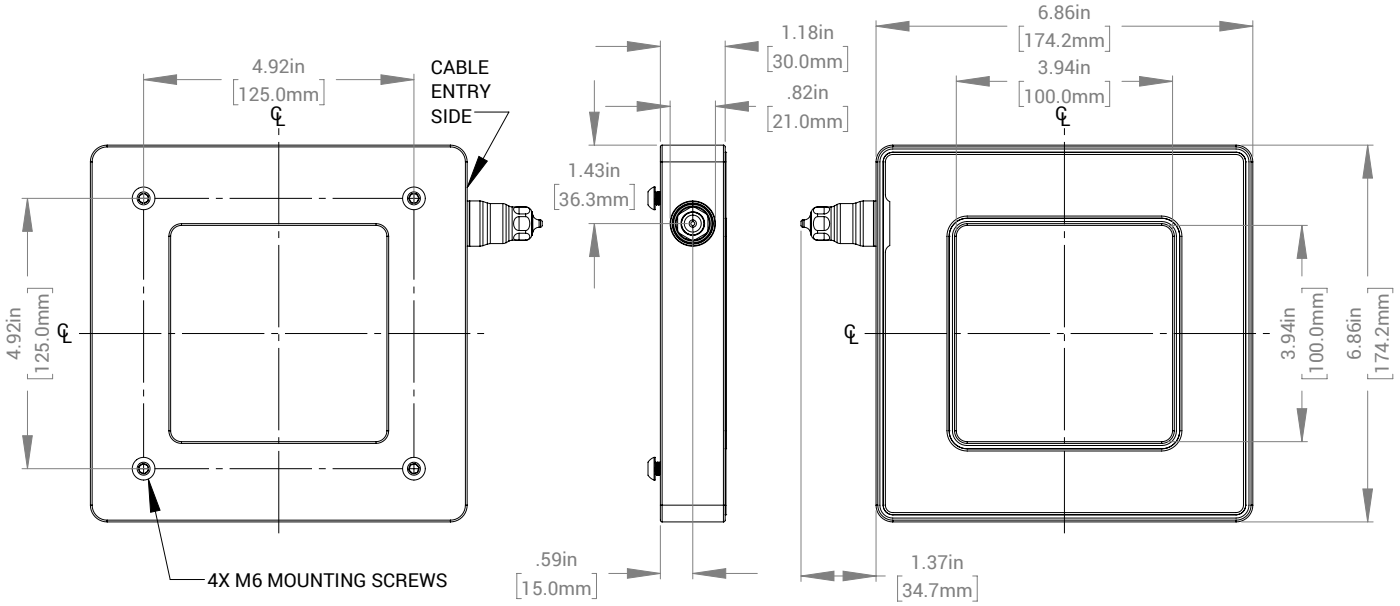
Photobiological Risk Factors

Group	Description	Affected Wavelengths
Exempt	No Photobiological Hazard	not defined
Group 1	No Photobiological hazard under normal behavioral limitations	not defined
Group 2	Does not pose a hazard due to aversion response to bright light or thermal discomfort	not defined

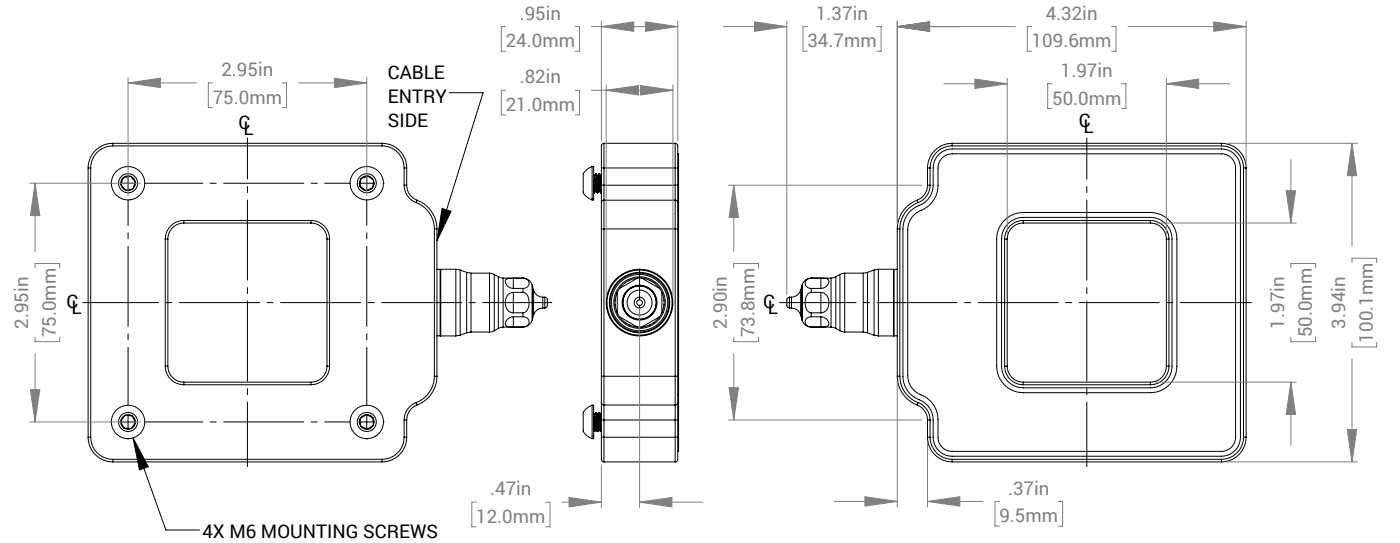
Mechanical Information

Installation Drawings

RL322-100



RL322-050



For full installation drawings and complete CAD models of this non-sealed configuration, please visit the downloads section of the product webpage.

Sizing Information

Available in two models, the RL322-050 (109.6 mm x 100.1 mm) and the RL322-100 (174.2 mm x 174.2 mm), both sizes can be equipped with M6 mounting points, allowing users to use the same fasteners for consistent mounting and easy interchangeability.

Each version offers a distinct inner opening size to fit around different machine vision cameras and inspection requirements. The 50 mm version is better suited for close-up working distances, delivering concentrated, high-intensity illumination due to its higher LED density, while the 100 mm version is better suited for larger targets and longer working distances, providing more uniform illumination and extended coverage.

Electrical Information

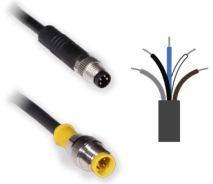
Power Requirements

Current Required for Power Supply Sizing

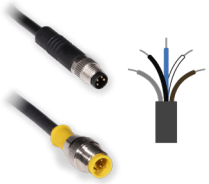
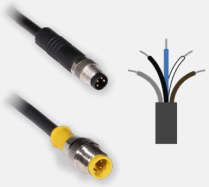
Wavelengths	Configured w/ Standard Controller (IC, I3, I3S, I4, EC, ES, C1, C5)	Configured w/ Voltage Drive (24V)
365 nm, 375 nm, 385 nm, 395 nm	900 mA / 600 mA (100 mm / 50 mm)	350 mA / 275 mA (100 mm / 50 mm)
WHI, 455 nm, 470 nm, 525 nm	900 mA / 600 mA (100 mm / 50 mm)	350 mA / 275 mA (100 mm / 50 mm)
625 nm, 660 nm, 730 nm	750 mA / 450 mA (100 mm / 50 mm)	250 mA / 175 mA (100 mm / 50 mm)

Note: All Advanced Illumination lights and controllers are nominally powered by 24V DC unless otherwise noted. Strobe overdriving with controller based models may require more current and voltage overhead. The values above do not include background current draw from the controller (~100 mA total).

Control Options

Controller Image	Controller Details	Connector Image
	**DCS Single Output Controller - Compatible with C1 Configurations** *PN: DCS-100E* The DCS-100E is a compact, din-rail mounted general-purpose external controller with one C1 output connector, wired with three channels. Capable of providing single channel control or multi-channel control for RGB compatible lights. **Output Power:** 90 W Max Continuous, 540 W Max Pulsed (Overdrive Strobe) **Output Current:** 4.5A Max Continuous, 15 A Max Pulsed **I/Os:** 3 External Trigger Inputs **Interface:** 10/100 Ethernet with Software and browser-based GUIs. SDKs are also available. For more information about our DCS-100E, please visit the controller product page.	
	**DCS Triple Output Controller - Compatible with C1 Configurations** *PN: DCS-103E* The DCS-103E is a din-rail mounted general-purpose multi-light controller with three C1 output connectors. Capable of driving three lights in sync or asynchronously. **Output Power:** 30 W Max Continuous / Output, 180 W Max Pulsed / Output **Output Current:** 1.5A Max Continuous / Output, 5 A Max Pulsed / Output **I/Os:** 3 External Trigger Inputs **Interface:** 10/100 Ethernet with Software and browser-based GUIs. SDKs are also available. For more information about our DCS-103E, please visit the controller product page.	
	**Embedded Controller - Continuous Only - EC Configurations** *PN: N/A* The EC is an embedded controller (within the light head) engineered for continuous or gated continuous operation. Allows for analog dimming functionality. **I/O:** 0 V - 10 V (10% to 100% intensity) Analog Dimming Input 2.5V Min - 30V Max, <=5mA Gating Signal Input for Gated Continous Operation **Interface:** Direct Cable (flying leads or optional M12 or M8 connectors)	
	**Embedded Controller - Strobe and Continuous - ES Configurations** *PN: N/A* The ES is an embedded controller (within the light head) engineered for both continuous and overdrive strobe operation, depending on the control functions operated. Allows for analog dimming functionality. **I/O:** 0 V - 10 V (10% to 100% intensity) Analog Dimming Input 2.5V Min - 30V Max, <=5mA Gating Trigger Signal Input for Gated Strobe Operation **Interface:** Direct Cable (flying leads or optional M12 or M8 connectors)	

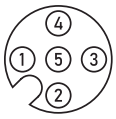
Electrical Information - Continued

Controller Image	Controller Details	Connector Image
	**Pulsar 320E High Current Controller - Compatible with C5 Configuration** *PN: Pulsar 320E* The Pulsar 320E is a high-power, dual output, pulse-only controller geared for overdriving driving lights at very short flash durations with very high current. **Output Power:** 2500 W Max Pulsed / Output **Output Current:** 50 A Max Pulsed / Output **I/Os:** 2 External Trigger Inputs **Interface:** 10/100 Ethernet with Software GUI. SDKs are also available. For more information about our Pulsar 320E, please visit the controller product page.	
	**Inline Controller - Continuous Only - IC Configurations** *PN: N/A* The IC is an inline, cable-mounted continuous-only controller configured/wired directly for the ordered light head. **Output Power:** 25 W Max Continuous **Output Current:** 1.25 A Max Continuous **I/O:** 1 0-10 V Analog Dimming Input **Interface:** Direct Cable (flying leads or optional connector) For more information about our IC Controller please visit the controller product page.	
	**Inline Controller - Strobe and Continuous - I3 & I3S Configurations** *PN: N/A* The I3 and I3S are inline, cable-mounted continuous and pulse (overdrive strobe) capable controllers configured/wired directly for the ordered light head. When operated in pulsed mode, the I3 is a default-on device on power up, whereas the I3S is default-off, requiring a trigger to illuminate. **Output Power:** 25 W Max Continuous, 125 W Max Pulsed **Output Current:** 1.25 A Max Continuous, 8 A Max Pulsed (Load Dependent) **I/Os:** 1 Gated Trigger Signal, 1 0-10 V Analog Dimming Input **Interface:** Direct Cable (flying leads or optional connector) For more information about our I3/I3S Controller, please visit the controller product page.	
	**Inline Controller - Strobe and Continuous - I4 Configurations** *PN: N/A* The I4 is an inline, cable-mounted continuous and pulse (overdrive strobe) capable controller configured/wired directly for the ordered light head. The I4 can either be operated with a PNP or NPN trigger signal. **Output Power:** 50 W Max Continuous, 150 W Max Pulsed **Output Current:** 2.1 A Max Continuous, 8 A Max Pulsed (Load Dependent) **I/Os:** 1 Gated Trigger Signal, 1 0-10 V Analog Dimming Input **Interface:** Direct Cable (flying leads or optional connector) For more information about our IC Controller please visit the controller product page.	

Electrical Information - Continued

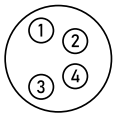
Embedded and Inline Control Option Wiring Information

Standard Flying Lead and Optional M12 Connector Pinout Functions

Pin (M12)	Wire Color	24V Functions	IC Functions	I3/I3S/EC/ES Functions	I4 Functions	M12 Pinout
1	BROWN	24V DC	24V DC	24V DC	24 V DC	 5-Position Male Connector
2	WHITE	N/A	0-10V Analog Control	Reserved	NPN/Active Low Trigger	
3	BLUE	DC GND	DC GND	DC GND	DC GND	
4	BLACK	N/A	Gate Low	PNP/Active High Signal	PNP/Active High Trigger	
5	GRAY	N/A	N/A	0-10V Analog Control	0-10 V Analog Dimming	

The functions above are only applicable when ordering an 24, IC, I3, I3S, EC, ES, or I4 power configuration with our without an M12 connector. For more wiring information pertaining to strobing and dimming functionality, please download the controller manuals and datasheets.

Optional M8 Connector Pinout Functions

Pin (M8)	Wire Color	24V Functions	IC Functions	I3/I3S/EC/ES Functions	I4 Functions	M8 Pinout
1	BROWN	24V DC	24V DC	24V DC	24 V DC	 4-Position Male Connector
2	WHITE	N/A	0-10V Analog Control	Reserved	Active Low Trigger	
3	BLUE	DC GND	DC GND	DC GND	DC GND	
4	BLACK	N/A	Gate Low	Active High Signal	Active High Trigger	

The functions above are only applicable when ordering an 24, IC, I3, I3S, EC, ES, or I4 power configuration with our without an M12 connector. For more wiring information pertaining to strobing and dimming functionality, please download the controller manuals and datasheets.

Accessories

Advanced Illumination offers a variety of accessories designed to pair with our lighting and control products. Below you will find a table of accessories which are compatible with many configurations of the RL322 Series.

Category	Accessory Image	Accessory Detail
Power Supply		**24 Volt DC Power Supply** *PN: PS24-TL* This convenient power source is a universal AC input switching power supply with a regulated output DC current. The power supply comes with an LED Power Indicator, tinned leads marked Positive (+) and Negative (-) and 2 WAGO connectors for simplified assembly. For more information about our 24 Volt DC Power Supply, please visit this webpage.
Dimmer		**Manual Dimming Accessory for the IC, I3 and I3s** *PN: DCS-MP* The DCS-MP is a 30-position potentiometer, detented for precision level control and provides repeatable dimming with cable inline controllers. Features include DIN-rail mountable, a flip up cover to prevent accidental adjustments, spring clamp wiring terminal for flying leads or an M12 connector for use with the IC or I3/I3S Inline Controllers. For more information about our Manual Dimming Accessory please visit this webpage.

Electrical Information - Continued

Category	Accessory Image	Accessory Detail
Dimmer		**Manual Dimming Accessory for the IC** *PN: MP-ICS* The MP-ICS is a dimmer which is designed for use on lights with the IC Inline Controller. This unit provides for 0 – 100% intensity control. It is NOT COMPATIBLE with LLI37, BLI38, LLI67, and BLI68 "IC" Lights or lights built with the "24v controller" option. For more information about our Manual Dimming Accessory, please visit this webpage.
Extension Cable		**DCS-100E/103E Extension Cable, Single Light Power Cable - C1 Configuration** *PN: LC-XX-S* This extension cable was designed for applications requiring power cables longer than the standard 2 meters provided with Ai lights. This single light cable features a single male and single female 7 pin locking connector (C1) and can be purchased in 3 - 15-meter lengths. For more information about our DCS-100E/103E Extension Cable, Single Output, please visit this webpage.
Extension Cable		**Pulsar 320E Extension Cable - C5 Configuration** *PN: LC-XX-S-C5* This extension cable was designed for applications requiring power cables longer than the standard 2 meters provided with Ai lights. This single light cable features a single male and single female Pulsar 320 connector (C5) and can be purchased in 3 - 15 meter lengths. For more information about our Pulsar 320E Extension Cable, please visit this webpage.
Adaptor Cable		**Cognex Gen2 Inline Controller Adaptor Cable** *PN: AD-I3-CGX2* This cable adaptor is for connecting I3/I3S/EC/ES configured lights with Cognex Gen2 Cameras, and comes with a male to female M12 connectors. For more information about our Cognex Gen2 Inline Controller Adaptor Cable, please visit this webpage.
Filters		**Camera Lens Band Pass FIlters** *PN: BPXXX-YYY* Eliminating all but a narrow band of light (+/- 40nm) centered on the specified wavelength, band pass filters are used to enhance colors, or to stop unwanted ambient light from reaching the camera. Filtering can replace existing shrouds, simplifying the physical set up of an inspection site. Ai offers 635nm and 660nm band pass filters to fit several different lens sizes. For more information about our Camera Lens Band Pass FIlters, please visit this webpage.

Additional Information

Warranty

Every Advanced illumination, Inc. (Ai) product is thoroughly inspected and tested before leaving the factory. Products are warranted to be free of defects in workmanship and materials for a period of FIVE YEARS from the original date of purchase. Should a defect develop during this period, customers may return the complete product, freight prepaid, to one of Ai's distributors or to the Ai factory. All product warranty returns require a Return Merchandise Authorization (RMA) number which is obtained from Customer Service. The RMA number must be clearly marked on the outside of the package. Ai will inspect the unit, and if a defect is found will, at our option, repair or replace the product without charge. Ai disclaims liability for any implied warranties, including implied warranties of "merchantability" and "fitness for a specific purpose." For products under warranty that have since been discontinued, Ai will make an effort to replace with equivalent parts; for circumstances that do not allow for equivalent replacement, Ai reserves the right to repair or replace these products with an updated version. Ai cannot be held responsible for the unauthorized or inappropriate use of its products. Any unauthorized repair or modifications will result in a voided warranty. No Liability for Consequential Damages: In no event shall Ai be liable for any consequential, special, incidental,

Compliancy

Our lighting products are designed and tested to meet CE, RoHS, and IEC standards. As a global ISO 9001 certified company, we understand the importance of compliance and perform accelerated testing on every product before shipment. For more information on our compliance standards, please

Electromagnetic Compatibility

This product was tested and complies with the regulatory requirements and limits for electromagnetic compatibility (EMC) as stated in the product specifications. These requirements and limits are designed to provide reasonable protection against harmful interference only when the product is operated in its intended industrial electromagnetic environment. To minimize the potential for electromagnetic interference or unacceptable performance degradation,