DF196

MicroBrite™ Direct Dark Field Ring Light Series

Product Datasheet

ADVANCED ILLUMINATION by Exaktera

M4 Mounting Points

Engineered with four opposing M4 mounting points for highly adjustable positioning

Focused Illumination at a Specific Working Distance

High Intensity LEDs with a focusing lens limited to medium angle Dark Field applications

RGB Output Option

Developed specifically for use with Advanced illumination's multi-channel controllers

High Power LEDs

High Intensity LEDs with a focusing lens limited to medium angle Dark Field applications

DF196 Series Description

The MicroBrite DF196 Series Dark Field ring lights deliver focused, medium angle illumination on target. As with the DF198 Series, they are available in multiple diameters and offer an RGB option.

The DF196 Series lights differ from the DF198 Series in that they were designed to be placed at a set working distance, providing a focused, fixed-size spot on target.

As is typical of Dark Field ring lights, the DF196 lights are best suited for enhancing surface contrast based on topography changes, edges and also surface defects, particualrly on specular reflective surfaces.

- **Dark Field Illumination**
- **High Intensity**
- **Multiple Sizes Available**
- **RGB Available**
- **1-2 Week BTO Lead Times**

General Information

General Specifications

Category	Specification			Detail	
Optical	Available Wavelengths			WHI, 455 nm, 530 nm, 625 nm, RGB	
	Available Lensing			No Lenses	
	Available Light Conditioning			None	
Electrical	Power Consumption Info			See Power Requirements on Page 9	
	Cable Info			80” -0/+6” Long (2 m -0/+150 mm), 105 °C Rated, Foil Shield w/ Drain	
Mechanical	Sizing Info	Standard	Height	1.18”(29.8 mm) to 280: 1.38”(34.9 mm)	See Page 7 for More Details
			Inner Diameter	1.24” (31.6mm) to 10.01”(254.3mm)	
			Outer Diameter	1.97”(50mm) to 11.06”(281.0mm)	
	Weight Info (Standard)			~ 0.19 lbs (~86 g) per DF196-050 Unit, ~ 0.58 lbs (~263 g) per DF196-100 Unit, ~ 1.15 lbs (~521 g) per DF196-180 Unit, ~ 1.72 lbs (~780 g) per DF196-280 Unit,	
	Mounting Info			M4 Mounting Holes	
	Material Info			Anodized Aluminum Housing, Acrylic Window, PVC Cable Jacket, Steel Black 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			IP40	
	Lumen Maintenance - White Only			L70 (50,000 Hours)	

General Information - Continued

Part Number Key

Model	-	Outer Diameter (mm)	Illuminated Field of View (mm)	Connector/Control	-	Alternative Connector
DF196	-	XXX	XX	XX	X	X
DF196		050[2]	455 (royal blue)	C1		M8[1]
		115	520 (green)	C5		M12[1]
		180	625 (red)	IC		
		280	WHI (white)	I3		
			RGB (all colors)[3]	I3S		
				24		
more info on page		8	5	10		6

Example Part Numbers:
DF196-115WHII3
DF196-180625C1

[1] Available with IC, I3, I3S, and 24 options only
[2] Not available in 24 option
[3] Available with C1 connector only

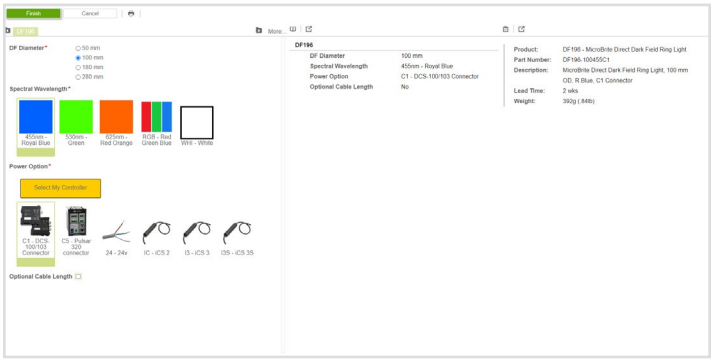
In Stock

Unavailable

Lead Times

Stock products ship within three days.
Build-to-Order custom products ship within one to two weeks.

Configurator

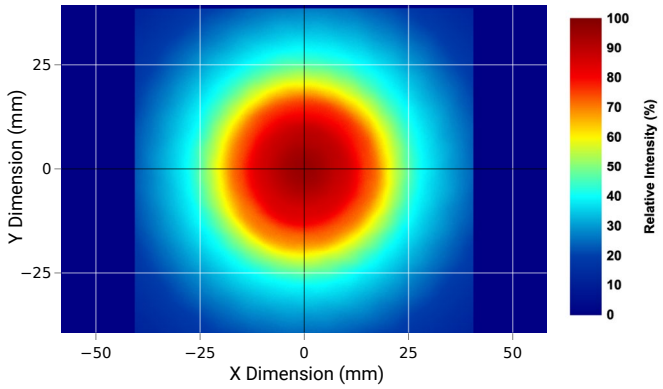


Need a build-to-order custom lighting solution in 2 weeks or less? Advanced Illumination's online configurator helps you tailor our DF196 MicroBrite™ Direct Dark Field Series to your specific needs. For a guided configuration, visit our online configurator.

Optical Information

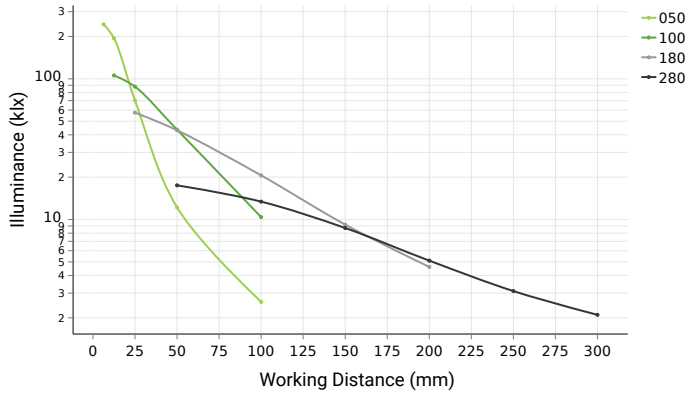
Intensity Characteristics

Intensity Distribution at 50 mm Working Distance



Intensity distribution sample image was taken with a white 100 mm DF196 unit.

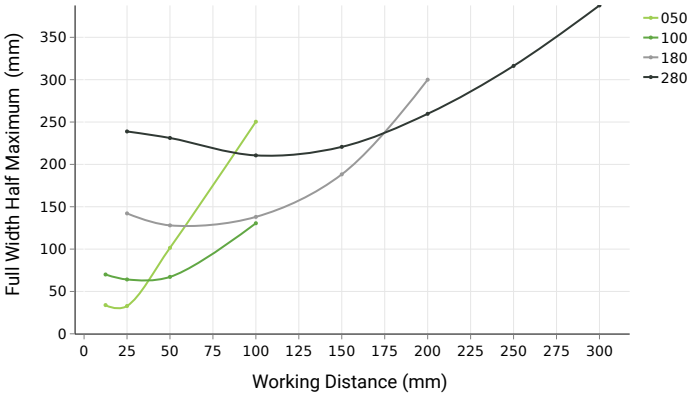
Intensity vs Working Distance



Illuminance data was collected using white DF196 units.

FWHM vs Working Distance

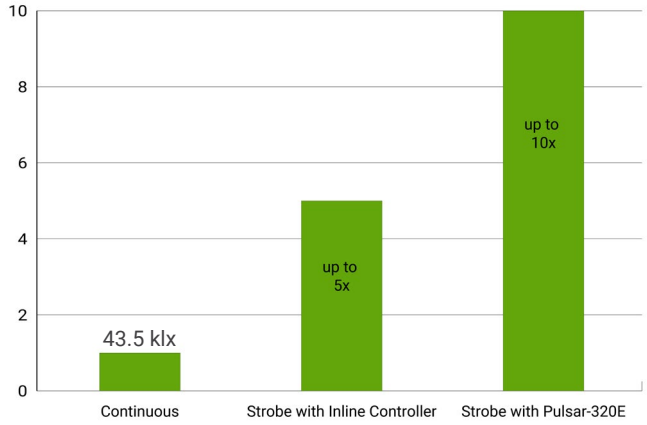
FWHM vs Working Distance



Full Width Half Maximum (FWHM) data collected using white DF196 units of various sizes.

Most focused working distance for each size occures at the local minimum of each FWHM curve.

Continuous vs Pulsed Intensity

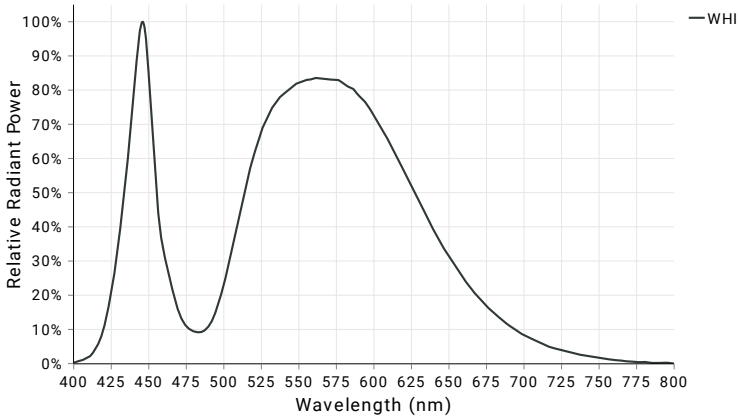


Under continuous operation, a 100 mm white DF196 unit will output an **illuminance of 43.5 klx** and an **irradiance of 144.3 W/m²** at a 50 mm working distance. For applications that require higher output, the DF196 Series has been engineered to be overdrive strobe capable. When configured with AI's strobe enabled Inline Controller (ICS-3 and ICS-3S), the DF196 is capable of outputting up-to 5X continuous levels. When configured with a C5 connector, compatible with AI's Pulsar 320, a **DF196 can be strobed up-to 10X continuous intensity levels.**

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

White Spectral Profile

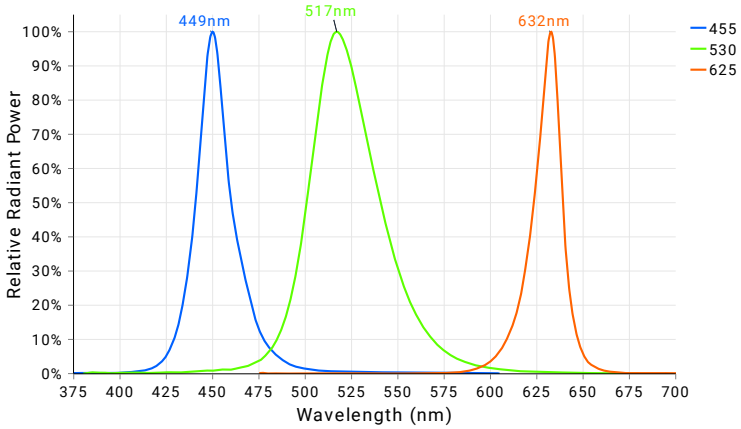


White LED illumination is the most commonly used machine vision lighting configuration. It is often the default choice when specific features of interest do not require color-based highlighting. However, white LEDs can vary in color temperature, which can impact machine vision systems, specifically when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

The DF196 Series white LEDs have a relatively neutral color correlated temperature (CCT) of **5500 K.**

For a more detailed look at the white spectral data, download the csv file of the raw spectral values and refer to our Product Spectra Distribution Charts PDF.

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 DF196 Series is available in **455 nm, 530 nm, and 625nm** configurations.

For a more detailed look at the visible color spectral data, download the csv file of the raw spectral values and refer to our Product Spectra Distribution Charts PDF.

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

Photobiological Risk Factors

Group	Description	Affected Wavelengths (nm)
Exempt	No Photobiological Hazard	N/A
Group 1	No Photobiological hazard under normal behavioral limitations	455, 530, 625, WHI, RGB
Group 2	Does not pose a hazard due to aversion response to bright light or thermal discomfort	N/A

Advanced Illumination's lighting products have been tested and classified to IEC standards by accredited testing services. For more information on photobiological risk factors, please view the following PDF: https://www.advancedillumination.com/wp-content/uploads/2019/04/IEC-040119.pdf

Cleaning Guidelines

To clean our light's optics, it is best to only clean when necessary. Dusting is always the first step in cleaning your optics. Wiping a dusty optic is like cleaning it with sandpaper. So always dust with a canned air duster or compressed and filtered air before wiping any optic. If the dusted optic has no visible stains after you dust it, then remember: "If it's not dirty, don't clean it." Avoid wiping optics when possible.

If dusting did not clean the lens or the lens has stains, use only de-ionized water and mild dish soap with a low lint cloth designed for optics to avoid damage to the optic by any harsh chemicals.

Polarizers, beam splitters and collimated films should never be wiped with any type of cloth or solvent, only use the air dusting method to clean these types of optics.

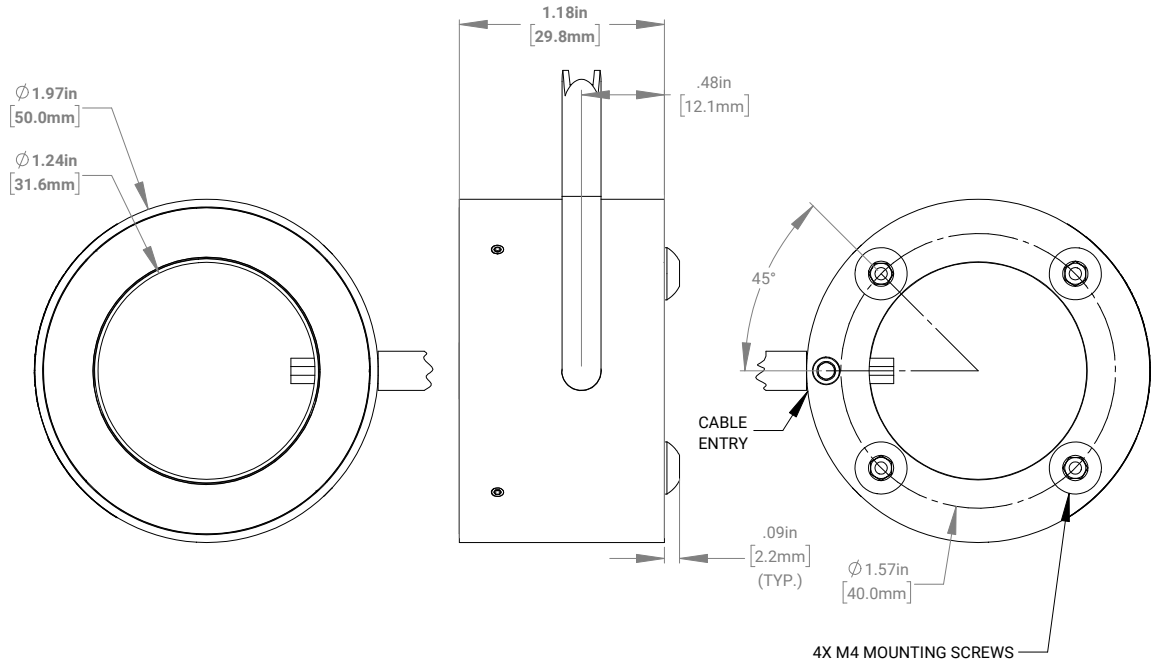
The aluminum housing can be wiped down when dusting is not a sufficient means to thoroughly clean.

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

Mechanical Information

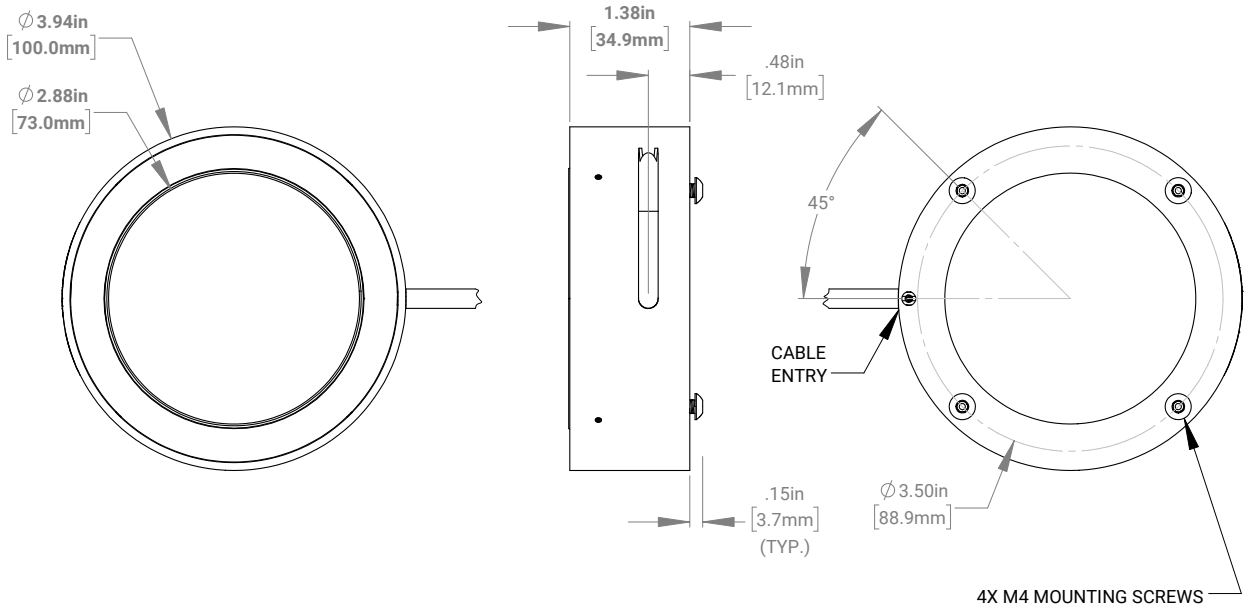
Installation Drawings

DF196-050



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

DF196-100

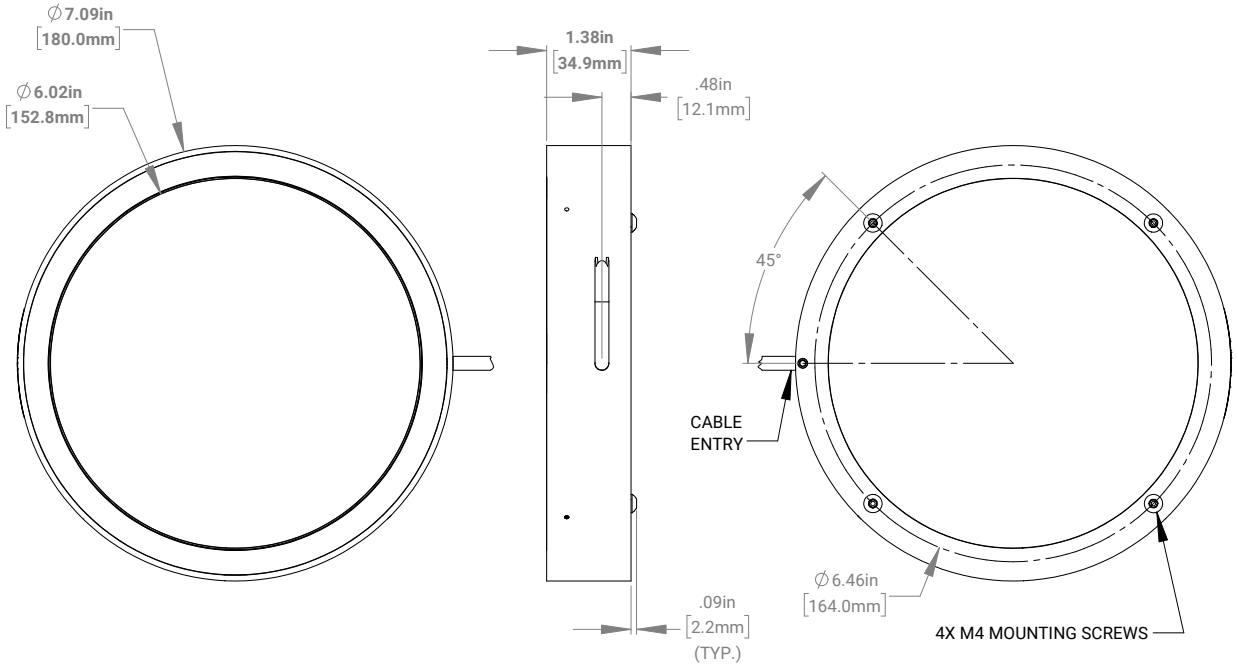


For full installation drawings and complete CAD models of this configuration, please visit the downloads section of the product webpage.

Mechanical Information - Continued

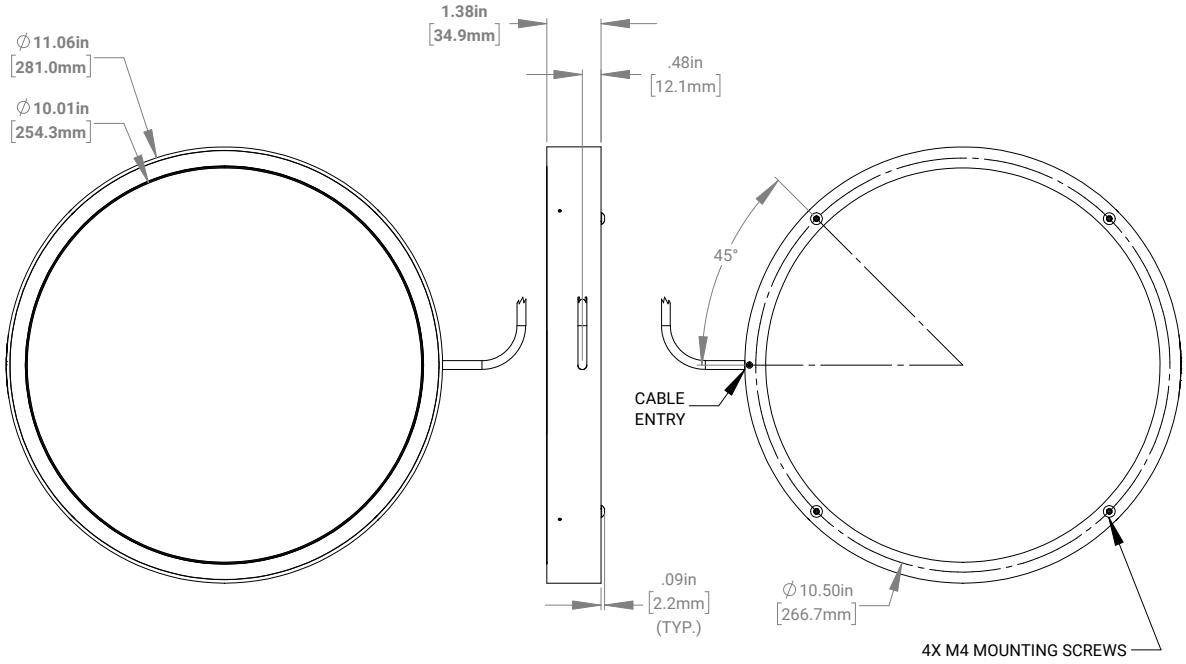
Installation Drawings

DF196-180



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

DF196-280



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

Electrical Information

Power Requirements

Current Required for Power Supply Sizing

Part Number	Wavelengths	Configured w/ 24V Driver	Configured w/ Standard Controller (C1, C5, IC, I3, I3S)
DF196-050	625	N/A	0.16 A Max
DF196-050	455, 530, WHI	N/A	0.27 A Max
DF196-050	RGB	N/A	0.70 A Max
DF196-100	625	0.7 A	0.32 A Max
DF196-100	455, 530, WHI	0.7 A	0.54 A Max
DF196-100	RGB	N/A	2.1 A Max
DF196-180	625	1.25 A	0.58 A Max
DF196-180	455, 530, WHI	1.25 A	0.97 A Max
DF196-180	RGB	N/A	2.9 A Max
DF196-280	625	1.25 A	0.58 A Max
DF196-280	455, 530, WHI	1.25 A	0.97 A Max
DF196-280	RGB	N/A	5.0 A Max

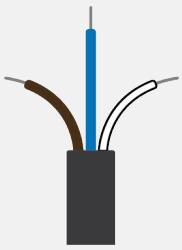
Note: All Advanced Illumination lights and controllers are nominally powered by 24V DC unless otherwise noted. Strobe overdriving with controller based models may require more current and voltage overhead. The values above do not include background current draw from the controller (~100 mA total).

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.	

Electrical Information - Continued

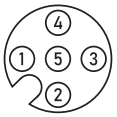
Control Options - Continued

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.	
	**24V Driver - Continuous Only - 24 Configurations** *PN: N/A* 24V option allows lights to operate continuous output with 24V connection and no additional controllers. **Modes:** Continuous, can be wired to some 3rd party controllers or external relays for gated operation **Interface:** Direct cable (flying leads or connector options)	

Electrical Information - Continued

Inline Control Option Wiring Information

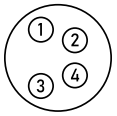
Standard Flying Lead and Optional M12 Connector Pinout Functions

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

5-Position Male Connector

The functions above are only applicable when ordering an 24, IC, I3, I3s, 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 Functions	M8 Pinout
1	BROWN	24V DC	24V DC	24V DC	
2	WHITE	N/A	0-10V Analog Control	Reserved	
3	BLUE	DC GND	DC GND	DC GND	
4	BLACK	N/A	Gate Low	Active High Trigger	

4-Position Male Connector

The functions above are only applicable when ordering an 24, IC, I3, or I3s power configuration with our without an M8 connector. For more wiring information pertaining to strobing and dimming functionality, please download the controller manuals and datasheets.

Accessories

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.
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.

Accessories - Continued

Category	Accessory Image	Accessory Detail
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		**DCS-100E/103E Extension Cable, Dual Light Power Cable - C1 Configuration** *PN: LC-XX-Y* This extension cable was designed for applications requiring two identical lights to be powered through a single controller. These Y cables feature a single male and dual female 7 pin locking connectors (C1) and can be purchased in 3 - 15-meter lengths. See attached spec sheet for compatible light configuration. For more information about our DCS-100E/103E Extension Cable, Split 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 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.
Mounting Brackets		**Mounting Brackets** *PN: LB* For mounting purposes this product is compatible with Fastens to the M4 mounting channel for simplified mounting. Included in product purchase. For more information about our Mounting Brackets, 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, or indirect damages of any kind arising from the sale or use of the products.

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 see our compliancy documentation here: https://www.advancedillumination.com/services/compliance-statements/

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, install and use this product in strict accordance with the instructions in the product documentation.

Customer Service

For information on existing orders, or to make an order adjustment, contact us Monday through Friday 8:00 am to 5:00 pm ET or send an email to orders@advancedillumination.com.

Company Information

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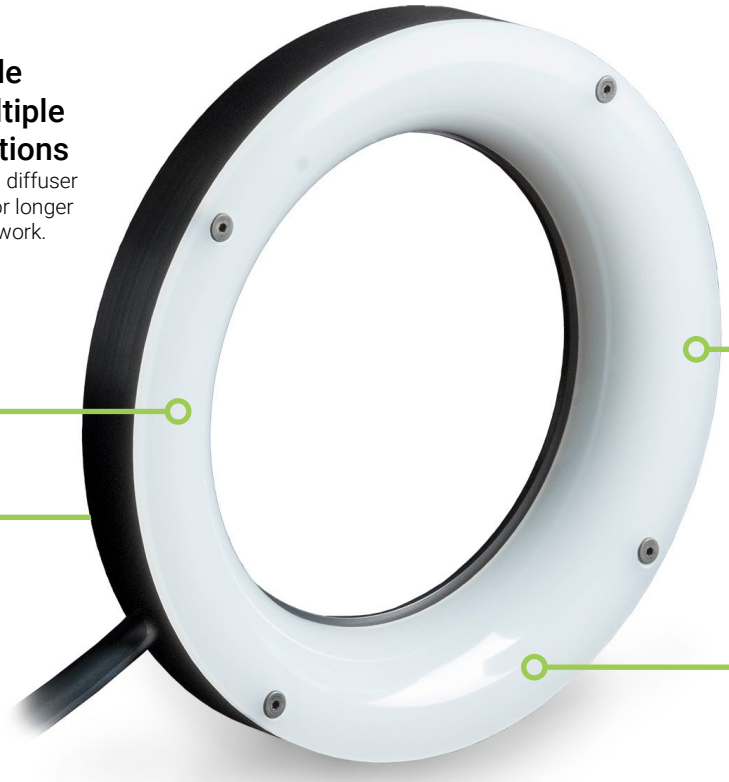
DF198

MicroBrite™ Diffuse Ring Light Series
Product Datasheet

ADVANCED ILLUMINATION by Exaktera

Diffuse Multi-Angle Illumination with Multiple Working Distance Options
High Intensity LEDs with a curved diffuser allowing for close-up Dark Field or longer working distance Bright Field work.

High Power LEDs
Equipped with industrial grade LEDs capable of high output strobe and continuous operation, all while maintaining a long lifespan



M4 Mounting Points
Engineered with four opposing M4 mounting points for highly adjustable positioning

RGB Output Option
Developed specifically for use with Advanced illumination's multi-channel controllers

DF198 Series Description

The MicroBrite DF198 Series Dark Field ring lights are designed to provide diffuse, medium to low angle of incidence illumination when positioned at working distances less than or equal to the light's diameter.

Owing to its curved diffuser, the DF198 Series is also suitable for applications requiring diffuse Bright Field lighting when the light is positioned at working distances longer than its diameter.

The unique combination of 5 available light diameters and a variety of possible working distances offers potential solutions for multiple light geometries and intensity and pattern size on target options in a single light head.

- **Bright Field and Dark Field Illumination**
- **High Intensity**
- **Multiple Sizes Available**
- **RGB Available**
- **1-2 Week BTO Lead Times**

General Information

General Specifications

Category	Specification			Detail	
Optical	Available Wavelengths			WHI, 455nm, 530nm, 625nm, RGB	
	Available Lensing			No Lenses	
	Available Light Conditioning			None	
Electrical	Power Consumption Info			See Power Requirements on Page 10	
	Cable Info			80" -0/+6" Long (2 m -0/+150 mm), -105 °C Rated, Foil Shield w/ Drain	
Mechanical	Sizing Info	Standard	Height	.56" (14.1 mm) to .62" (15.7 mm)	See Page 7 for More Details
			Outer Diameter	1.97" (50.00 mm) to 11.02" (280.0 mm)	
			Inner Diameter	1.24” (31.6mm) to 10.01”(254.3mm)	
	Weight Info (Standard)			~ 0.14 lbs (~63 g) per DF198-050 Unit, ~ 0.28 lbs (~127 g) per DF198-115 Unit, ~ 0.50 lbs (~226 g) per DF198-180 Unit, ~ 0.79 lbs (~358 g) per DF198-280 Unit,	
	Mounting Info			M4 Mounting Holes	
	Material Info			Anodized Aluminum Housing, Acrylic Window, PVC Cable Jacket, Steel Black 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			IP40	
	Lumen Maintenance - White Only			L70 (50,000 Hours)	

General Information - Continued

Part Number Key

Model	-	Outer Diameter (mm)	Illuminated Field of View (mm)	Connector/Control	-	Alternative Connector
DF198	-	XXX	XX	XX	X	X
DF198		050	455 (royal blue)	C1		M8[1]
		095	530 (green)	C5		M12[1]
		115	625 (red)	IC		
		180	WHI (white)	I3		
		280	RGB (all colors)[3]	I3S		
				24[2]		
more info on page		8	5	10		6

Example Part Numbers:
DF198-100WHII3

[1]Available with IC, I3, I3S, and 24 options only
[2]The 24 version will have a lower output intensity by ~10-15% and operate at a temperature ~10-15% higher than other options; not available in 50 mm outer diameter
[3]Available with C1 connector only

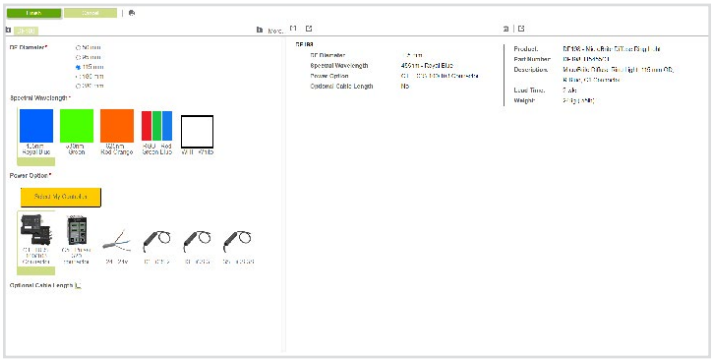
In Stock

Unavailable

Lead Times

Stock products ship within three days.
Build-to-Order custom products ship within one to two weeks.

Configurator

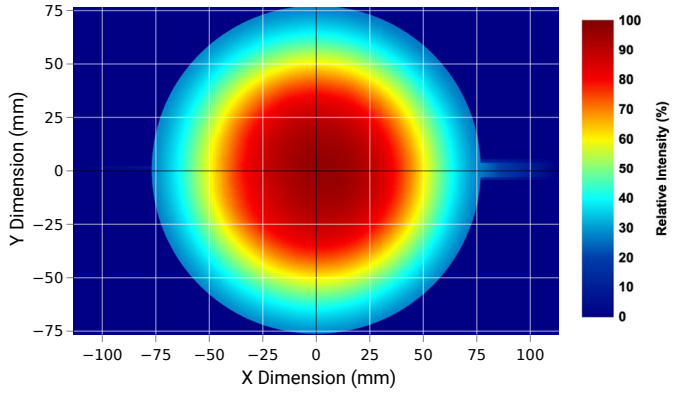


Need a build-to-order custom lighting solution in 2 weeks or less? Advanced Illumination's online configurator helps you tailor our DF198 MicroBrite™ Diffuse Ring Lights to your specific needs. For a guided configuration, visit our online configurator.

Optical Information

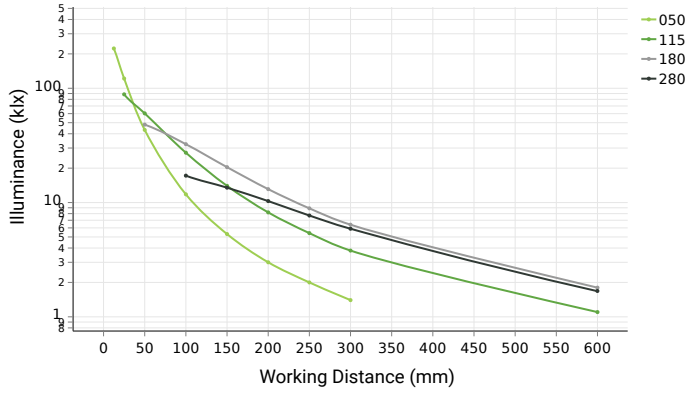
Intensity Characteristics

Intensity Distribution at 50 mm Working Distance



Intensity distribution sample image was taken with a white 115 mm DF198 unit.

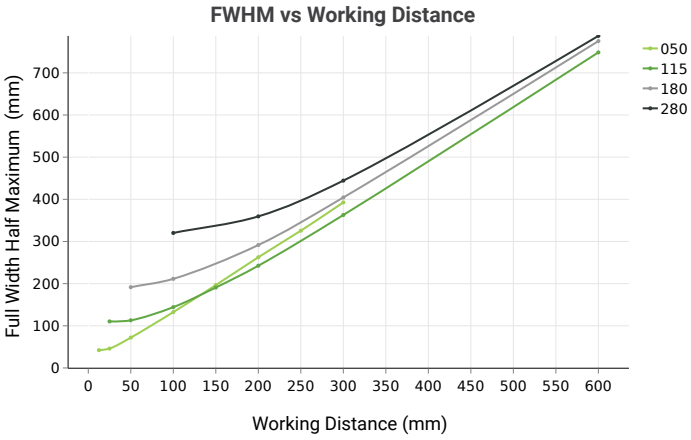
Intensity vs Working Distance



Illuminance data was collected using white DF198 units.

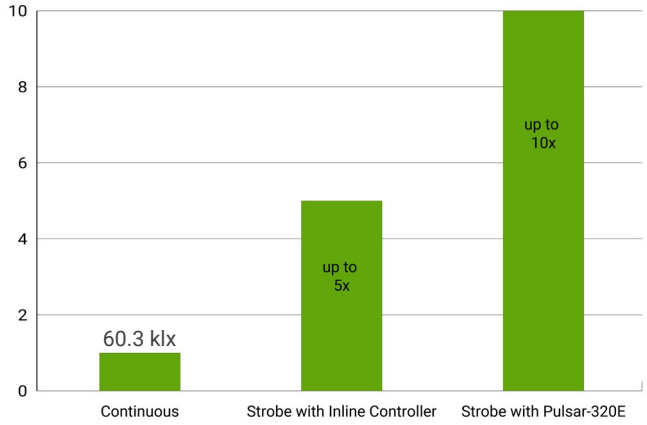
FWHM vs Working Distance

FWHM vs Working Distance



Full Width Half Maximum (FWHM) data collected using white DF198 units of various sizes.

Continuous vs Pulsed Intensity

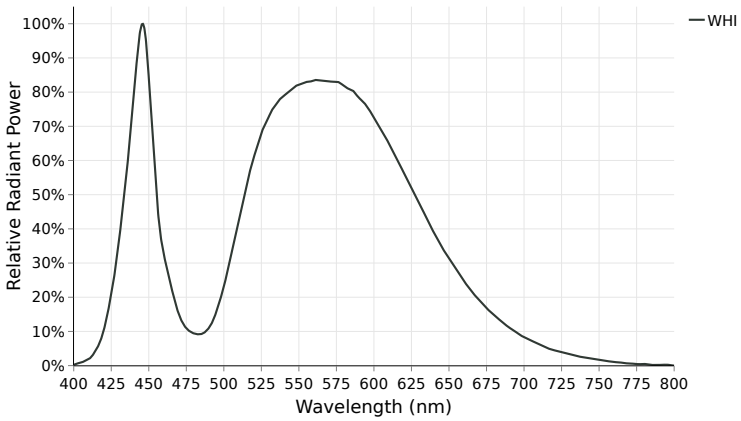


Under continuous operation, a 115 mm white DF198 unit will output an **illuminance of 60.3 klx** and an **irradiance of 190 W/m²** at a 50 mm working distance. For applications that require higher output, the DF198 Series has been engineered to be overdrive strobe capable. When configured with AI's strobe enabled Inline Controller (ICS-3 and ICS-3S), the DF198 is capable of outputting up-to 5X continuous levels. When configured with a C5 connector, compatible with AI's Pulsar 320, a **DF198 can be strobed up-to 10X continuous intensity levels.**

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

White Spectral Profile

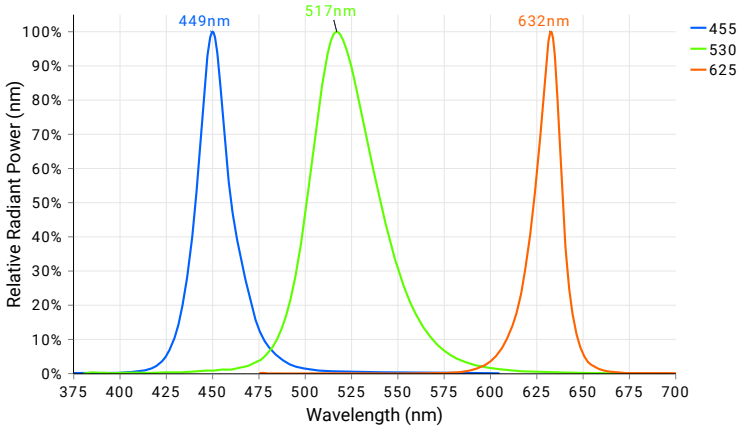


White LED illumination is the most commonly used machine vision lighting configuration. It is often the default choice when specific features of interest do not require color-based highlighting. However, white LEDs can vary in color temperature, which can impact machine vision systems, specifically when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

The DF198 Series white LEDs have a relatively neutral color correlated temperature (CCT) of **5500 K.**

For a more detailed look at the white spectral data, download the csv file of the raw spectral values and refer to our Product Spectra Distribution Charts PDF.

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 DF198 Series is available in **455 nm, 530 nm, and 625 nm** configurations.

For a more detailed look at the visible color spectral data, download the csv file of the raw spectral values and refer to our Product Spectra Distribution Charts PDF.

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

Photobiological Risk Factors

Group	Description	Affected Wavelengths (nm)
Exempt	No Photobiological Hazard	N/A
Group 1	No Photobiological hazard under normal behavioral limitations	455, 530, 625, WHI, RGB
Group 2	Does not pose a hazard due to aversion response to bright light or thermal discomfort	N/A

Advanced Illumination's lighting products have been tested and classified to IEC standards by accredited testing services. For more information on photobiological risk factors, please view the following PDF: https://www.advancedillumination.com/wp-content/uploads/2019/04/IEC-040119.pdf

Cleaning Guidelines

To clean our light's optics, it is best to only clean when necessary. Dusting is always the first step in cleaning your optics. Wiping a dusty optic is like cleaning it with sandpaper. So always dust with a canned air duster or compressed and filtered air before wiping any optic. If the dusted optic has no visible stains after you dust it, then remember: "If it's not dirty, don't clean it." Avoid wiping optics when possible.

If dusting did not clean the lens or the lens has stains, use only de-ionized water and mild dish soap with a low lint cloth designed for optics to avoid damage to the optic by any harsh chemicals.

Polarizers, beam splitters and collimated films should never be wiped with any type of cloth or solvent, only use the air dusting method to clean these types of optics.

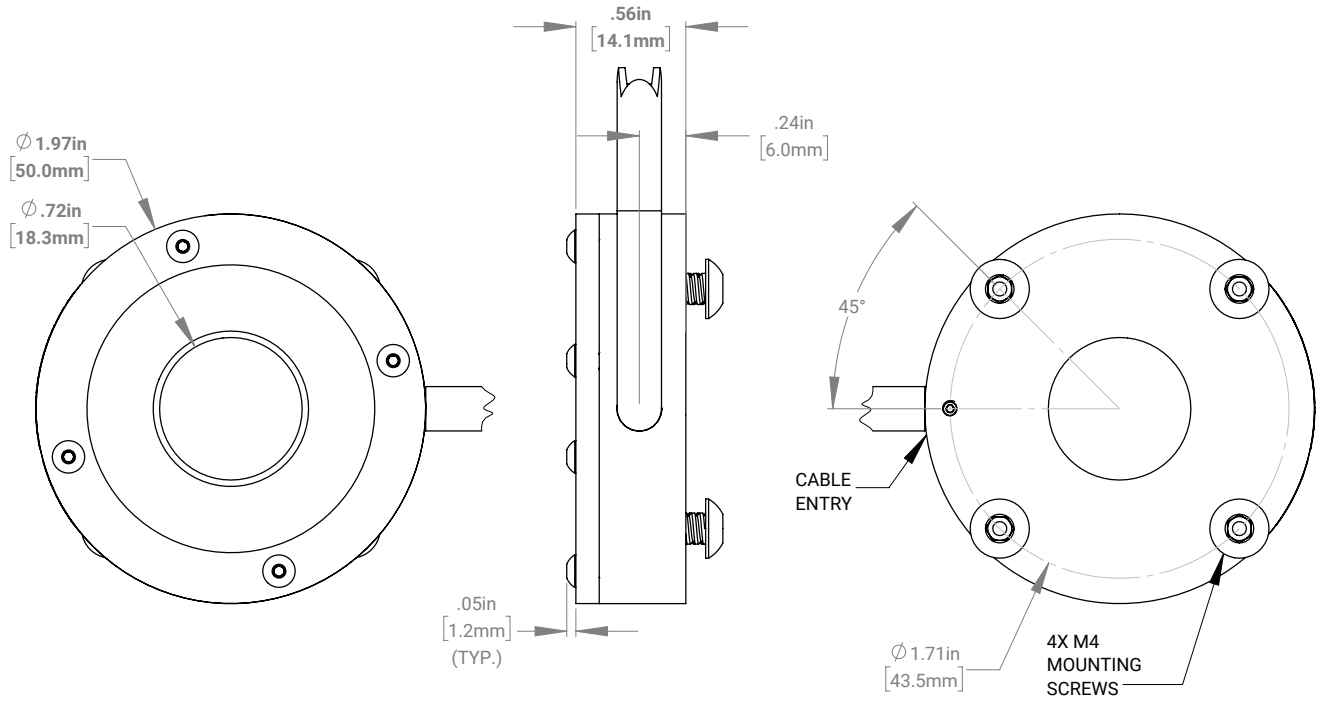
The aluminum housing can be wiped down when dusting is not a sufficient means to thoroughly clean.

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

Mechanical Information

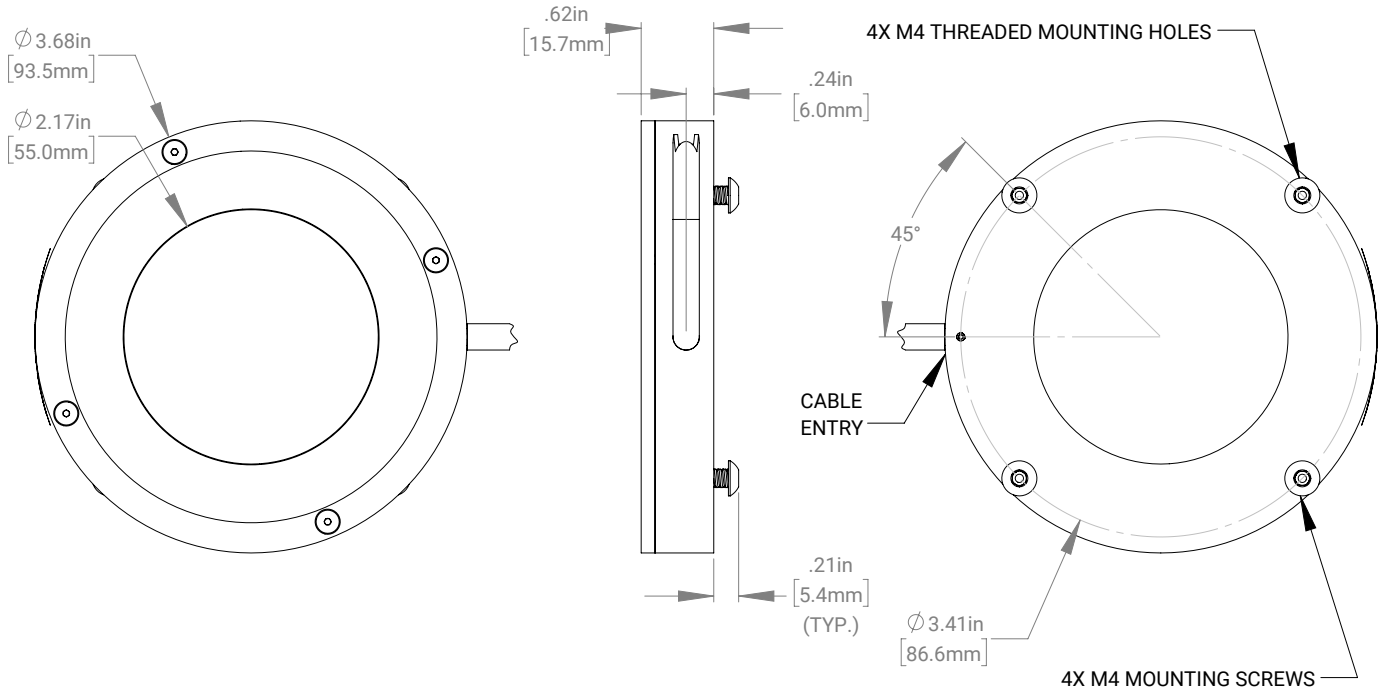
Installation Drawings

DF198-050



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

DF198-095

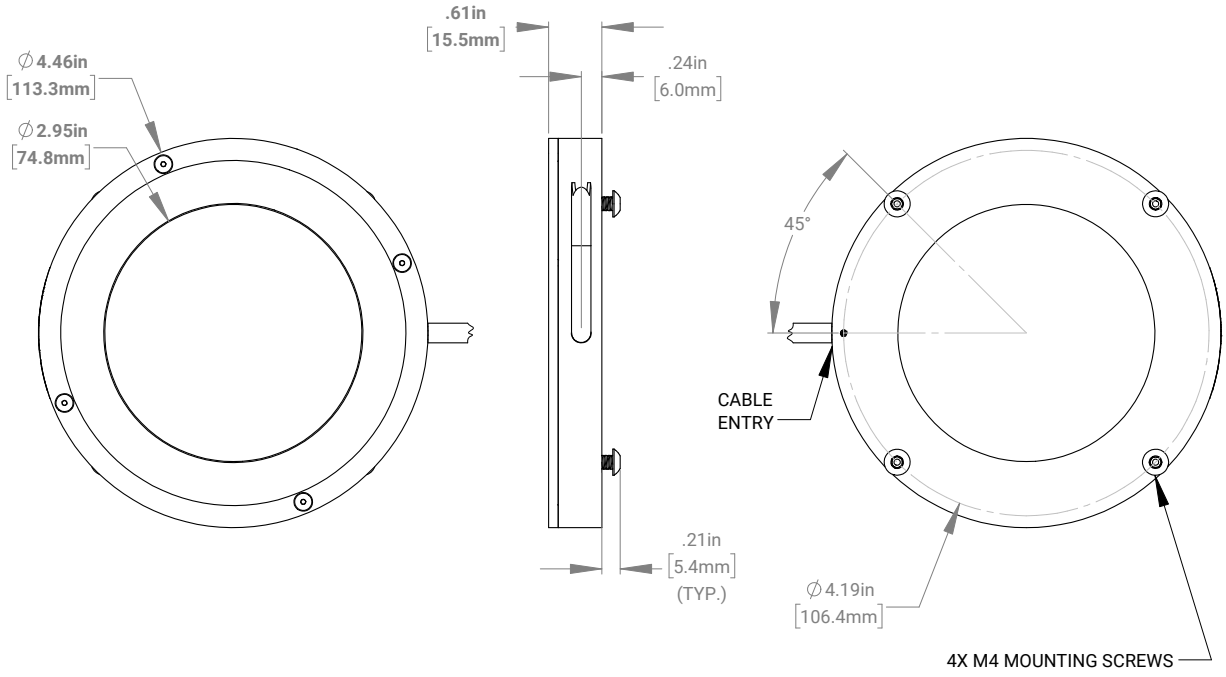


For full installation drawings and complete CAD models of this configuration, please visit the downloads section of the product webpage.

Mechanical Information

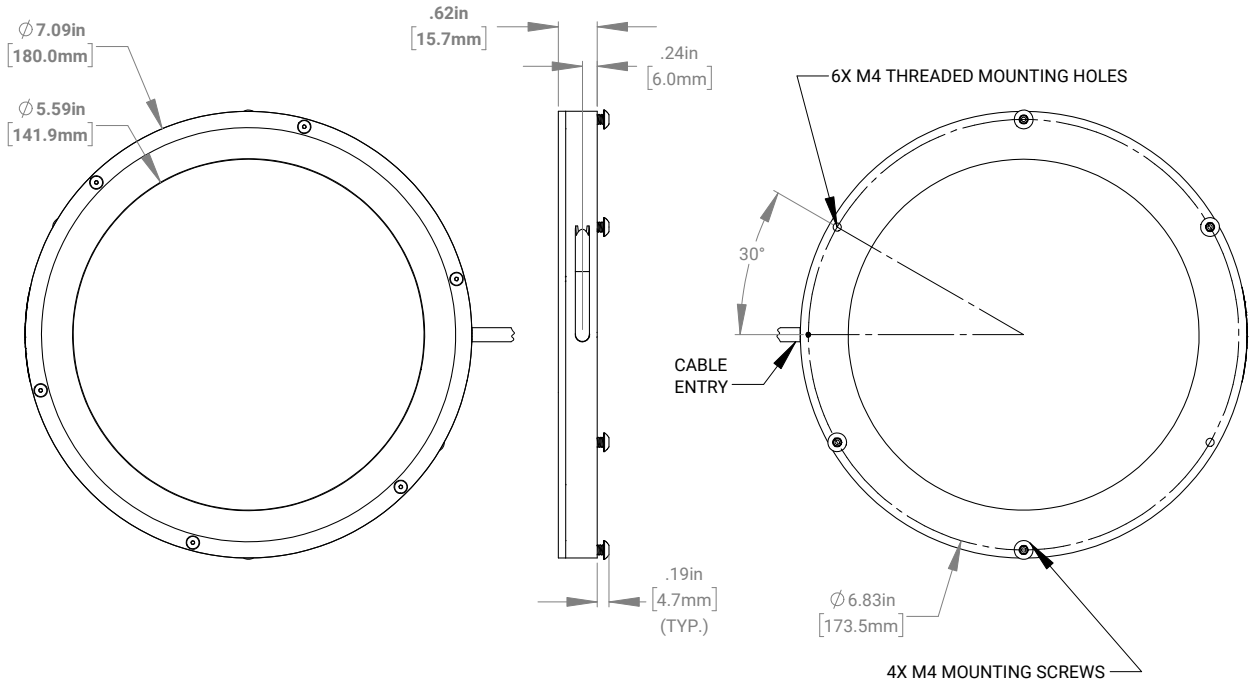
Installation Drawings

DF198-115



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

DF198-180

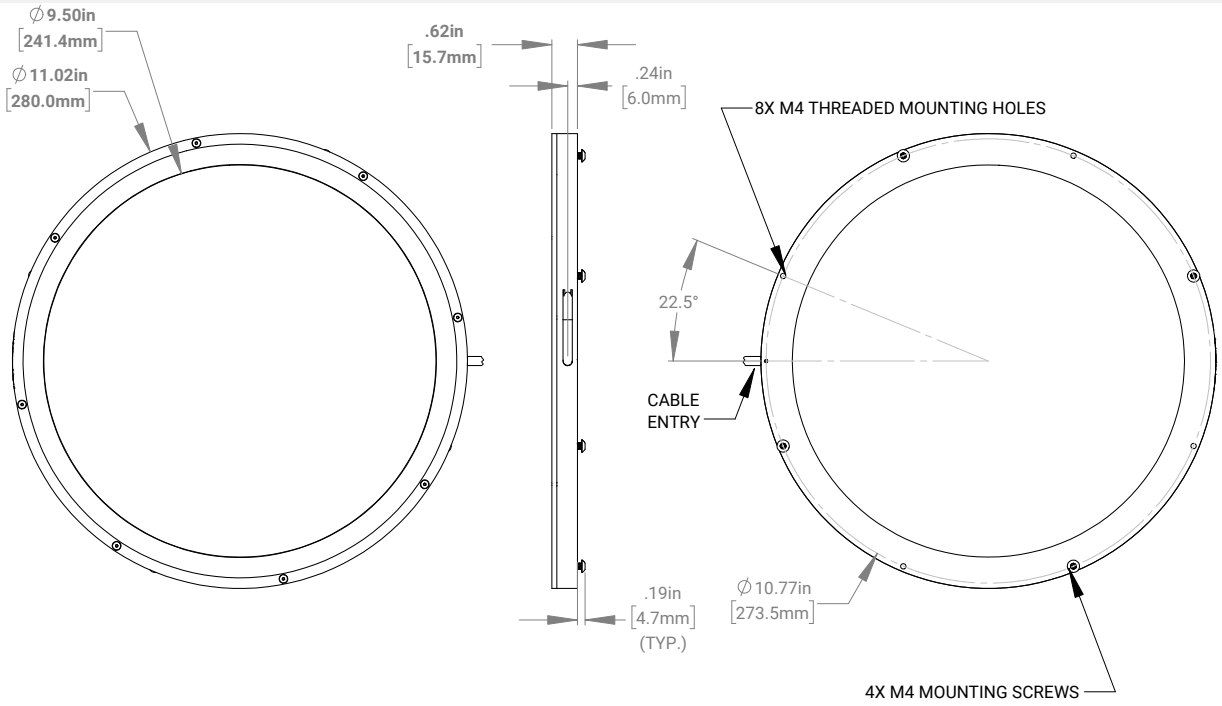


For full installation drawings and complete CAD models of this configuration, please visit the downloads section of the product webpage.

Mechanical Information

Installation Drawings

DF198-280



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

Electrical Information

Power Requirements

Current Required for Power Supply Sizing

Part Number	Wavelengths (nm)	Configured w/ 24V Driver	Configured w/ Standard Controller (C1, C5, IC, I3, I3S)
DF198-050	625	N/A	0.13 A Max
DF198-050	455, 530, WHI	N/A	0.22 A Max
DF198-050	RGB	N/A	0.65 A Max
DF198-115	625	0.32 A	0.32 A Max
DF198-115	455, 530, WHI	0.32 A	0.54 A Max
DF198-115	RGB	N/A	0.95 A Max
DF198-180	625	0.64 A	0.58 A Max
DF198-180	455, 530, WHI	0.64 A	0.97 A Max
DF198-180	RGB	N/A	2.55 A Max
DF198-280	625	0.96 A	0.58 A Max
DF198-280	455, 530, WHI	0.96 A	0.97 A Max
DF198-280	RGB	N/A	3.60 A Max

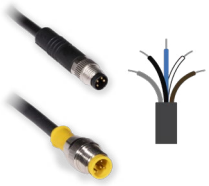
Note: All Advanced Illumination lights and controllers are nominally powered by 24V DC unless otherwise noted. Strobe overdriving with controller based models may require more current and voltage overhead. The values above do not include background current draw from the controller (~100 mA total).

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.	

Electrical Information - Continued

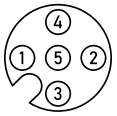
Control Options - Continued

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.	

Electrical Information - Continued

Inline Control Option Wiring Information

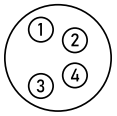
Standard Flying Lead and Optional M12 Connector Pinout Functions

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

5-Position Male Connector

The functions above are only applicable when ordering an 24, IC, I3, I3s, 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 (M12)	Wire Color	24V Functions	IC Functions	I3/I3S Functions	M8 Pinout
1	BROWN	24V DC	24V DC	24V DC	
2	WHITE	N/A	0-10V Analog Control	Reserved	
3	BLUE	DC GND	DC GND	DC GND	
4	BLACK	N/A	Gate Low	Active High Trigger	

4-Position Male Connector

The functions above are only applicable when ordering an 24, IC, I3, or I3s power configuration with our without an M8 connector. For more wiring information pertaining to strobing and dimming functionality, please download the controller manuals and datasheets.

Accessories

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.
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.

Accessories - Continued

Category	Accessory Image	Accessory Detail
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		**DCS-100E/103E Extension Cable, Dual Light Power Cable - C1 Configuration** *PN: LC-XX-Y* This extension cable was designed for applications requiring two identical lights to be powered through a single controller. These Y cables feature a single male and dual female 7 pin locking connectors (C1) and can be purchased in 3 - 15-meter lengths. See attached spec sheet for compatible light configuration. For more information about our DCS-100E/103E Extension Cable, Split 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 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, or indirect damages of any kind arising from the sale or use of the products.

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 see our compliancy documentation here: https://www.advancedillumination.com/services/compliance-statements/

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, install and use this product in strict accordance with the instructions in the product documentation.

Customer Service

For information on existing orders, or to make an order adjustment, contact us Monday through Friday 8:00 am to 5:00 pm ET or send an email to orders@advancedillumination.com.

Company Information

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Email: info@advancedillumination.com
Web: advancedillumination.com

DF241

Small Low Angle Dark Field Ring Lights

Product Datasheet

ADVANCED ILLUMINATION by Exaktera

2 Field-of-View Options
25mm and 35mm field sizes are possible at time of order

Superior Very Low Angle Light Geometry
Evenlite technology's precision LED aiming creates a very low-angle, thin, yet uniform projection

M4 Mounting Points
Engineered with four opposing M4 mounting points for highly adjustable positioning

Very Low Angle Dark Field
High Intensity LEDs with a focusing lens limited to medium angle Dark Field applications

DF241 Series Description

The DF241 very low angle Dark Field ring light was designed for the most demanding surface inspection applications.

It is best suited for use on flat, specular reflective surfaces that require the lowest angle of incidence to contrast minor surface defects, such as scratches or pits. To achieve the proper light geometry, this light head must be positioned no more than 25 mm from the surface for optimal results.

The DF241 ring light differs from the DF196 Dark Field light in that the LEDs are physically focused to a point in space, rather than utilizing a focusing lens. The precision LED aiming produce a thin, yet very uniform slice of light whose footprint on target is quite small compared to the light head diameter.

- **Low Angle Dark Field Illumination**
- **Moderate Intensity**
- **6 Available Wavelengths**
- **1-2 Week BTO Lead Times Typical**

General Information

General Specifications

Category	Specification			Detail	
Optical	Available Wavelengths			White, 395nm, 470nm, 520nm, 625nm, 880nm	
	Available Lensing			No Lenses	
	Available Light Conditioning			None	
Electrical	Power Consumption Info			See Power Requirements on Page 8	
	Cable Info			80" -0/+6" Long (2 m -0/+150 mm), 105 °C Rated, Foil Shield w/ Drain	
Mechanical	Sizing Info	Standard	Length	5.52"(140.2mm)	See Page 7 for More Details
			Width	5.52"(140.2mm)	
			Height	0.56"(14.2mm)	
	Weight Info (Standard)			~ 0.99 lbs (~449 g) per Unit	
	Mounting Info			M4 Mounting Holes , See Page _ for More Details	
	Material Info			Anodized Aluminum Housing, Powder Coated Cold Rolled Steel, PVC Cable Jacket, Steel Black 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			Not Rated	
	Lumen Maintenance - White Only			L70 (50,000 Hours)	

General Information - Continued

Part Number Key

Model	-	Peak Wavelength	Illuminated Field of View (mm)	Connector/Control	-	Alternative Connector
DF241	-	XXX	XX	XX	-	XXX
DF241		395 (UV)[2]	25	C1		M8[1]
		470 (blue)	35	C5		M12[1]
		520 (green)		IC		
		625 (red orange)		I3		
		880 (IR)		I3S		
		WHI (white)		24		
more info on page		5	4	8		10

Example Part Numbers:
DF241-47035C5
DF241-6252513-M12

[1] Available with IC, I3, I3S, and 24 options only
[2] Not available in IC and 24 options

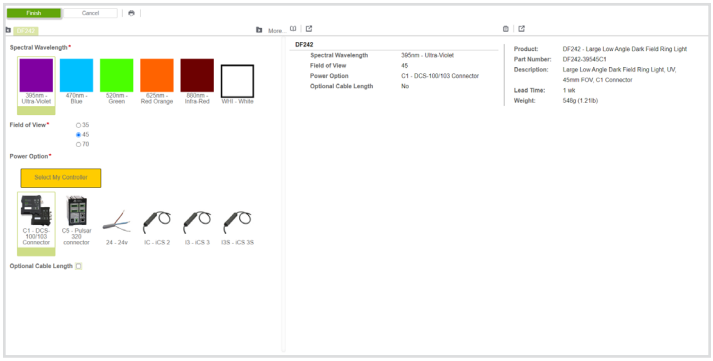
In Stock

Unavailable

Lead Times

Stock products ship within three days.
Build-to-Order custom products ship within one to two weeks.

Configurator

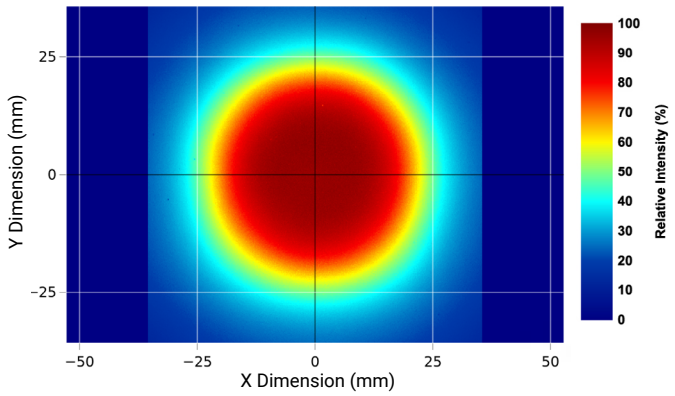


Need a build-to-order custom lighting solution in 2 weeks or less? Advanced Illumination's online configurator helps you tailor our DF241 Small Low Angle Dark Field Ring Lights to your specific needs. For a guided configuration, visit our online configurator.

Optical Information

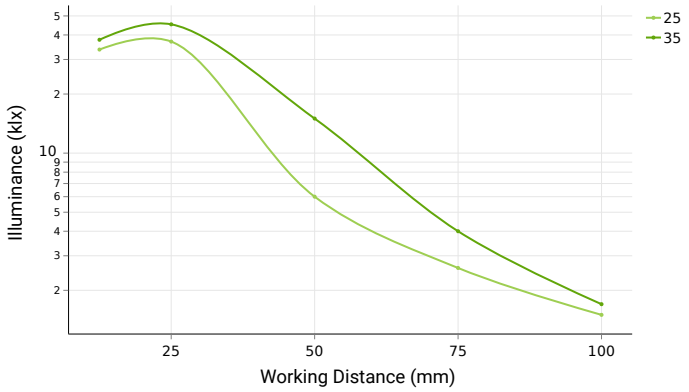
Intensity Characteristics

Intensity Distribution at 25 mm Working Distance



Intensity distribution sample image was taken with a DF241-WHI35I3 unit.

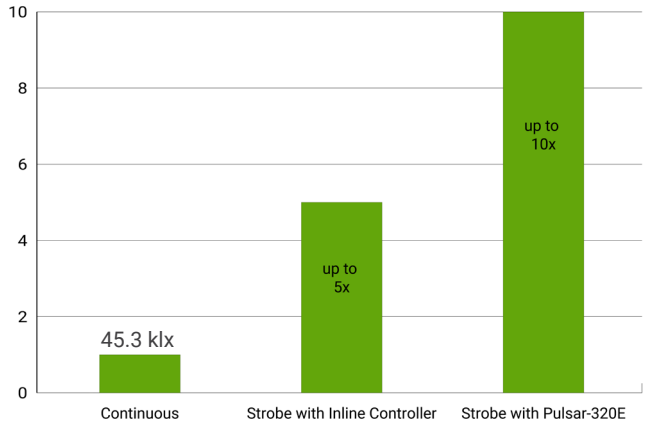
Intensity vs Working Distance



Illuminance data was collected using white DF241 units.

The DF241 produces an uniform intensity distribution over the part number specified illuminated FOV when placed at a 25 mm working distance. This is achievable with Advanced Illumination's proprietary LED aiming technique.

Continuous vs Pulsed Intensity

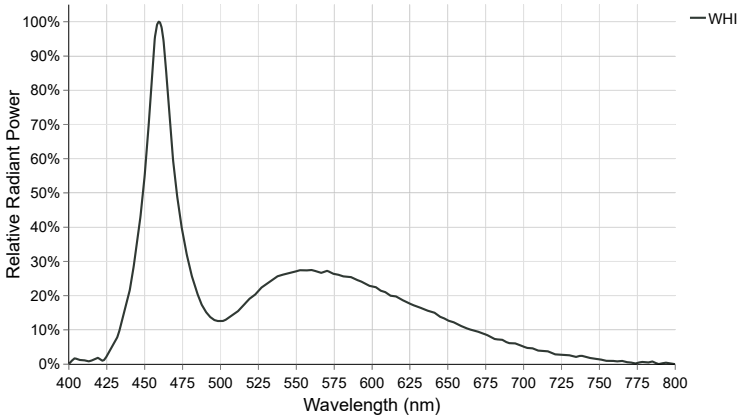


Under continuous operation, a DF241-WHI35I3 unit will output an **illuminance of 45.3 klx** and an **irradiance of 156 W/m²** at 25 mm working distance. For applications that require higher output, the DF241 Series has been engineered to be overdrive strobe capable. When configured with AI's strobe enabled Inline Controller (ICS-3 and ICS-3S), the DF241 is capable of outputting up-to 5X continuous levels. When configured with a C5 connector, compatible with AI's Pulsar 320, a **DF241 can be strobed up-to 10X continuous intensity levels.**

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

White Spectral Profile

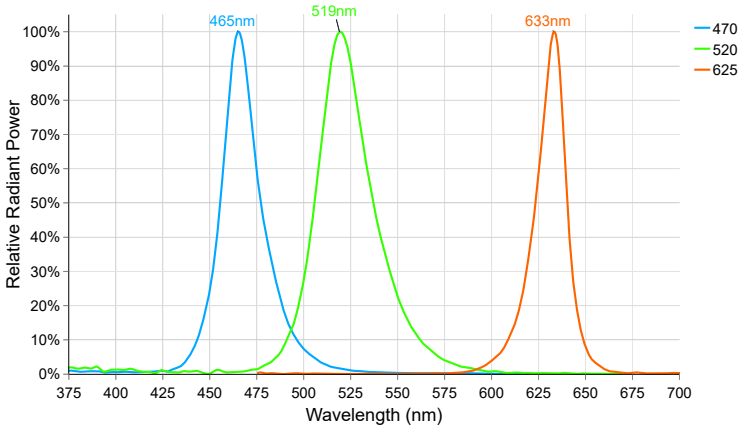


White LED illumination is the most commonly used machine vision lighting configuration. It is often the default choice when specific features of interest do not require color-based highlighting. However, white LEDs can vary in color temperature, which can impact machine vision systems, specifically when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

The DF241 Series white LEDs have a relatively cool color correlated temperature (CCT) of **6000 K.**

For a more detailed look at the white spectral data, download the csv file of the raw spectral values and refer to our Product Spectra Distribution Charts PDF.

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 DF241 Series is available in **470 nm, 520 nm, and 625 nm** configurations.

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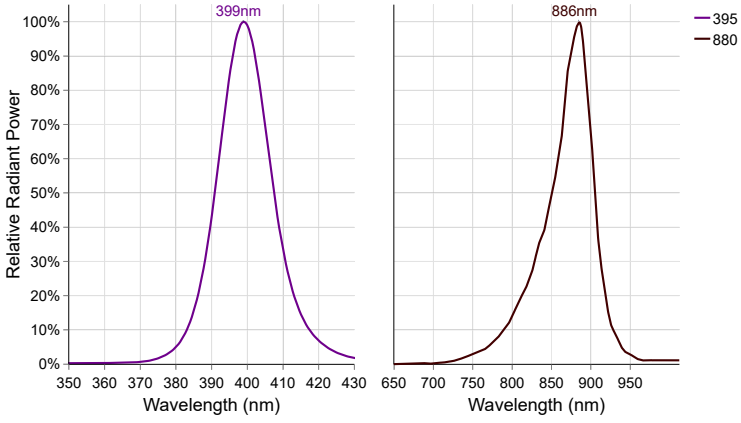
Non-Visible Spectral Profiles



Near-infrared (NIR) imaging is a machine vision technique using longer wavelengths of 700-1000 nm to penetrate specific materials that are otherwise opaque to under the visible spectrum. When paired with a NIR camera, a NIR light can be ideal for applications such as fill level inspection, circuit board inspection, food safety inspection, and medical imaging.

The DF241 Series is available in **365 nm and 880 nm** configurations.

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Optical Information - Continued

Photobiological Risk Factors

Group	Description	Affected Wavelengths (nm)
Exempt	No Photobiological Hazard	880
Group 1	No Photobiological hazard under normal behavioral limitations	470, 520, 625, WHI
Group 2	Does not pose a hazard due to aversion response to bright light or thermal discomfort	395

Advanced Illumination's lighting products have been tested and classified to IEC standards by accredited testing services. For more information on photobiological risk factors, please view the following PDF: https://www.advancedillumination.com/wp-content/uploads/2019/04/IEC-040119.pdf

Cleaning Guidelines

To clean our light's optics, it is best to only clean when necessary. Dusting is always the first step in cleaning your optics. Wiping a dusty optic is like cleaning it with sandpaper. So always dust with a canned air duster or compressed and filtered air before wiping any optic. If the dusted optic has no visible stains after you dust it, then remember: "If it's not dirty, don't clean it." Avoid wiping optics when possible.

If dusting did not clean the lens or the lens has stains, use only de-ionized water and mild dish soap with a low lint cloth designed for optics to avoid damage to the optic by any harsh chemicals.

Polarizers, beam splitters and collimated films should never be wiped with any type of cloth or solvent, only use the air dusting method to clean these types of optics.

The aluminum housing can be wiped down when dusting is not a sufficient means to thoroughly clean.

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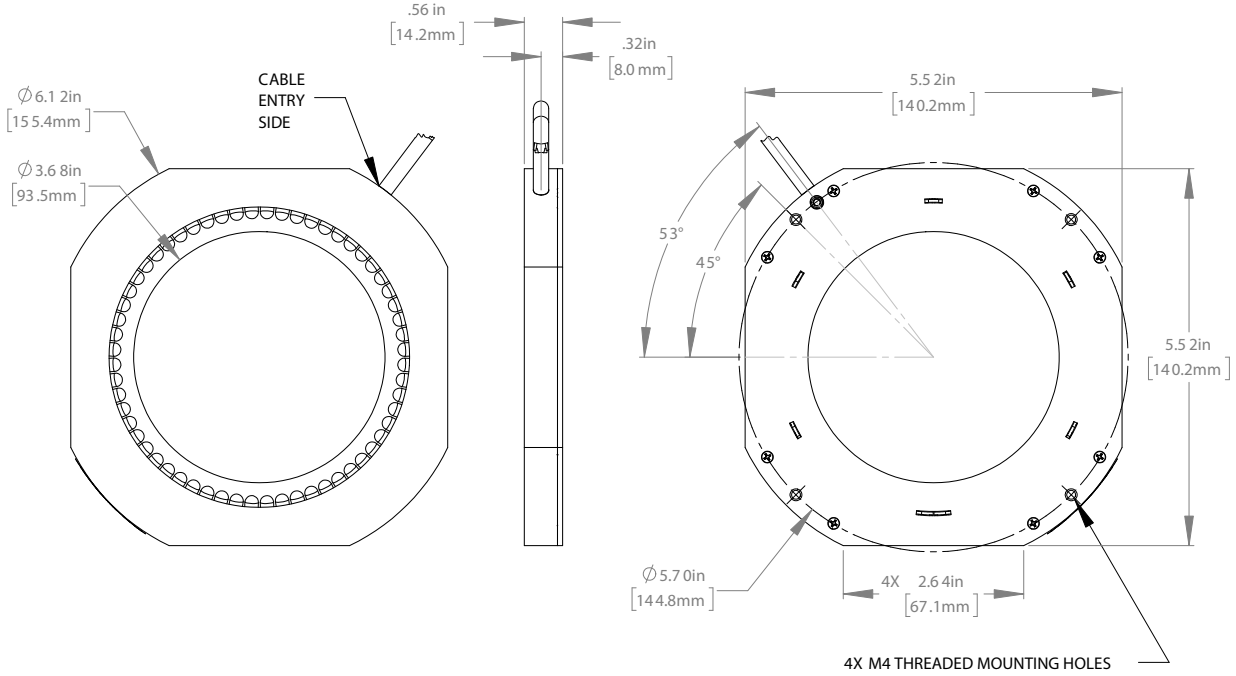
Mechanical Information

Installation Drawings



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

Electrical Information

Power Requirements

Current Required for Power Supply Sizing

Wavelengths (nm)	Configured w/ Voltage Drive (24)	Configured w/ Standard Controller (C1, C5, IC, I3, I3S)
WHI, 395, 470, 520	0.240A	0.180A
625, 880	0.360A	0.270A

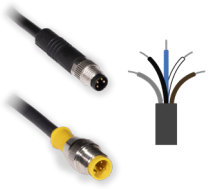
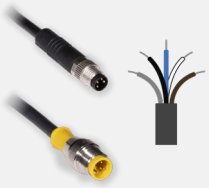
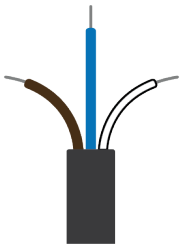
Note: All Advanced Illumination lights and controllers are nominally powered by 24V DC unless otherwise noted. Strobe overdriving with controller based models may require more current and voltage overhead. The values above do not include background current draw from the controller (~100 mA total).

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.	
	**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.	

Electrical Information - Continued

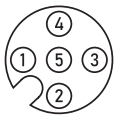
Control Options - Continued

Controller Image	Controller Details	Connector Image
	**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.	
	**24V Driver - Continuous Only - 24 Configurations** *PN: N/A* 24V option allows lights to operate continuous output with 24V connection and no additional controllers. **Modes:** Continuous, can be wired to some 3rd party controllers or external relays for gated operation **Interface:** Direct cable (flying leads or connector options)	

Electrical Information - Continued

Inline Control Option Wiring Information

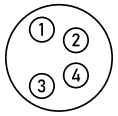
Standard Flying Lead and Optional M12 Connector Pinout Functions

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

5-Position Male Connector

The functions above are only applicable when ordering an 24, IC, I3, I3s, 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 Functions	M8 Pinout
1	BROWN	24V DC	24V DC	24V DC	
2	WHITE	N/A	0-10V Analog Control	Reserved	
3	BLUE	DC GND	DC GND	DC GND	
4	BLACK	N/A	Gate Low	Active High Trigger	

4-Position Male Connector

The functions above are only applicable when ordering an 24, IC, I3, or I3s power configuration with our without an M8 connector. For more wiring information pertaining to strobing and dimming functionality, please download the controller manuals and datasheets.

Accessories

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.
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.

Accessories - Continued

Category	Accessory Image	Accessory Detail
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		**DCS-100E/103E Extension Cable, Dual Light Power Cable - C1 Configuration** *PN: LC-XX-Y* This extension cable was designed for applications requiring two identical lights to be powered through a single controller. These Y cables feature a single male and dual female 7 pin locking connectors (C1) and can be purchased in 3 - 15-meter lengths. See attached spec sheet for compatible light configuration. For more information about our DCS-100E/103E Extension Cable, Split 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 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.
Mounting Brackets		**Mounting Brackets** *PN: LB* For mounting purposes this product is compatible with Fastens to the M4 mounting channel for simplified mounting. Included in product purchase. For more information about our Mounting Brackets, 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, or indirect damages of any kind arising from the sale or use of the products.

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 see our compliancy documentation here: https://www.advancedillumination.com/services/compliance-statements/

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, install and use this product in strict accordance with the instructions in the product documentation.

Customer Service

For information on existing orders, or to make an order adjustment, contact us Monday through Friday 8:00 am to 5:00 pm ET or send an email to orders@advancedillumination.com.

Company Information

Advanced Illumination
440 State Garage Road, Rochester, VT 05767
Phone: +1 (802) 767 3830
Fax: +1 (802) 767 2636
Email: info@advancedillumination.com
Web: advancedillumination.com

DF242

Large Low Angle Dark Field Ring Lights
Product Datasheet

ADVANCED ILLUMINATION by Exaktera

3 Field-of-View Options
25mm, 35mm and 70mm field sizes are possible at time of order

Superior Very Low Angle Light Geometry
Evenlite technology's precision LED aiming creates a very low-angle, thin, yet uniform projection

M4 Mounting Points
Engineered with four opposing M4 mounting points for highly adjustable positioning

Very Low Angle Dark Field
High Intensity LEDs with a focusing lens limited to medium angle Dark Field applications

DF242 Series Description

The DF242 ring light is designed to function like the DF241 light in that it also produces a thin slice of light for very low angle surface defect detection. The positioning requirements and application envelope is similar to that of the DF241.

The DF242's larger diameter allows an additional LED aim that projects a 2x larger spot size on target compared with the DF241 light.

The DF242 ring light differs from the DF196 Dark Field light in similar fashion as the DF241. Namely, aimed LEDs, rather than a central focusing lens, that produces a relatively smaller spot projection at close working distance compared with medium angle Dark Field ring lights.

- **Low Angle Dark Field Illumination**
- **Moderate Intensity**
- **6 Available Wavelengths**
- **1-2 Week BTO Lead Times Typical**

General Information

General Specifications

Category	Specification			Detail	
Optical	Available Wavelengths			WHI, 395 nm, 470 nm, 520 nm, 625 nm, 880 nm	
	Available Lensing			No Lenses	
	Available Light Conditioning			None	
Electrical	Power Consumption Info			See Power Requirements on Page 8	
	Cable Info			80" -0/+6" Long (2 m -0/+150 mm), 105 °C Rated, Foil Shield w/ Drain	
Mechanical	Sizing Info	Standard	Length	7.02"(178.3mm)	See Page 7 for More Details
			Width	7.02"(178.3mm)	
			Height	0.56"(14.2mm)	
			Inner Diameter	4.78"(121.4mm)	
	Weight Info (Standard)			~ 1.21 lbs (~548 g) per Unit	
	Mounting Info			M4 Mounting Holes	
	Material Info			Anodized Aluminum Housing, Powder Coated Cold Rolled Steel, PVC Cable Jacket, Steel Black 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			Not Rated	
	Lumen Maintenance - White Only			L70 (50,000 Hours)	

General Information - Continued

Part Number Key

Model	-	Peak Wavelength	Illuminated Field of View (mm)	Connector/ Control	-	Alternative Connector
DF242	-	XXX	XX	XX	-	XXX
DF242		395 (UV)[2]	35	C1		M8[1]
		470 (blue)	45	C5		M12[1]
		520 (green)	70	IC		
		625 (red orange)		I3		
		880 (IR)		I3S		
		WHI (white)		24		
more info on page		5	4	8		10

Example Part Numbers:
DF242-39545I3-M12
DF242-52035C1

[1] Available with IC, I3, I3S, and 24 options only
[2] Not available in IC and 24 options

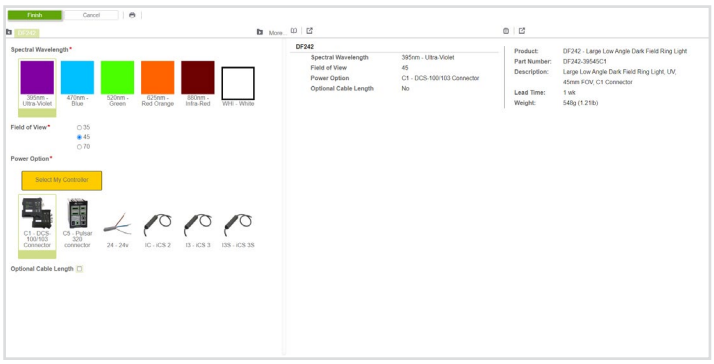
In Stock

Unavailable

Lead Times

Stock products ship within three days.
Build-to-Order custom products ship within one to two weeks.

Configurator

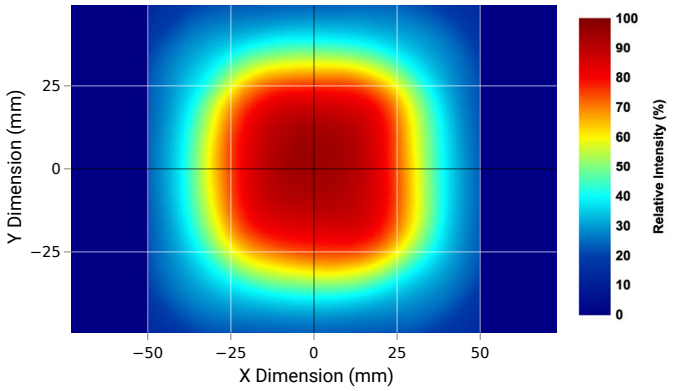


Need a build-to-order custom lighting solution in 2 weeks or less? Advanced Illumination's online configurator helps you tailor our DF242 Large Low Angle Dark Field Ring Lights to your specific needs. For a guided configuration, visit our online configurator.

Optical Information

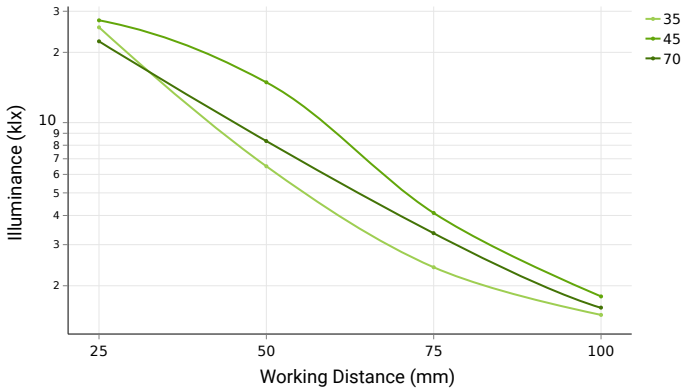
Intensity Characteristics

Intensity Distribution at 25 mm Working Distance



Intensity distribution sample image was taken with a DF242-WHI70I3 unit.

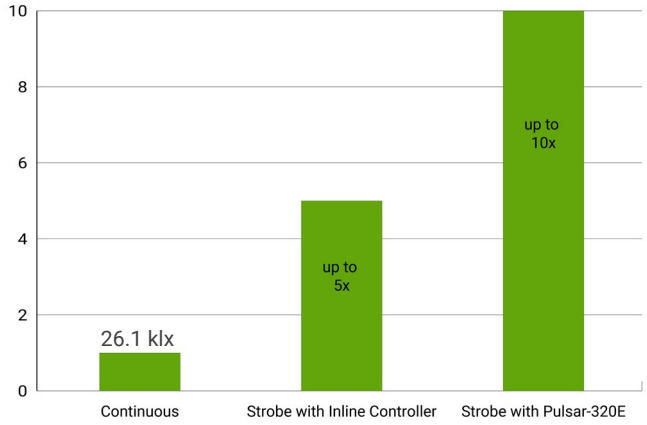
Intensity vs Working Distance



Illuminance data was collected using white DF242 units.

The DF242 produces an uniform intensity distribution over the part number specified illuminated FOV when placed at a 25 mm working distance. This is achievable with Advanced Illumination's proprietary LED aiming technique.

Continuous vs Strobe Intensity



Under continuous operation, a DF242-WHI35I3 unit will output an **illuminance of 26.1 klx** and an **irradiance of 93.1 W/m²** at a 25mm working distance. For applications that require higher output, the DF242 Series has been engineered to be overdrive strobe capable. When configured with AI's strobe enabled Inline Controller (ICS-3 and ICS-3S), the DF242 is capable of outputting up-to 5X continuous levels. When configured with a C5 connector, compatible with AI's Pulsar 320, a **DF242 can be strobed up-to 10X continuous intensity levels.**

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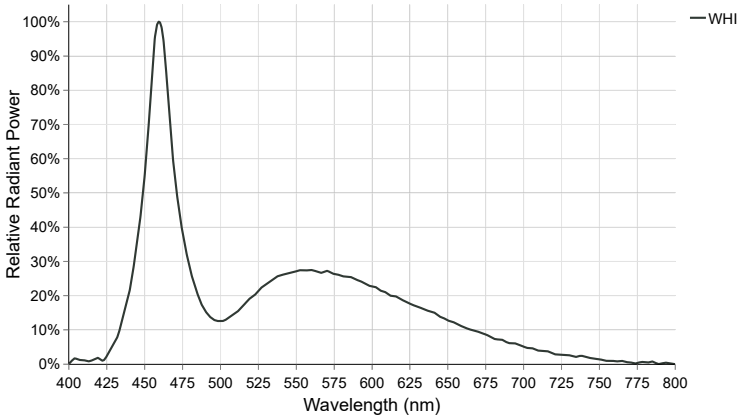
Optical Information - Continued

White Spectral Profile



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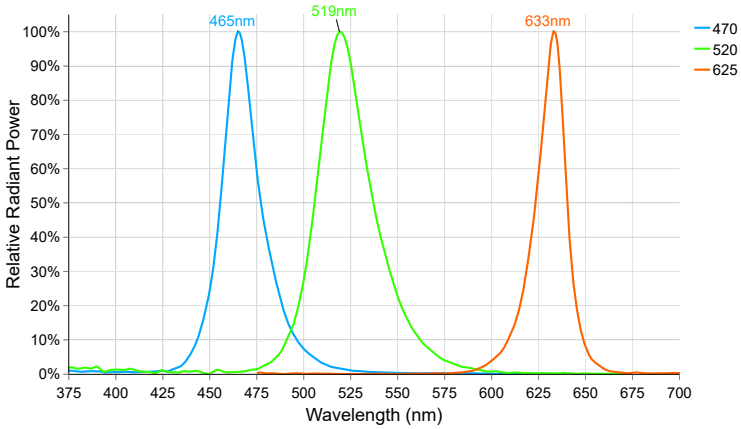

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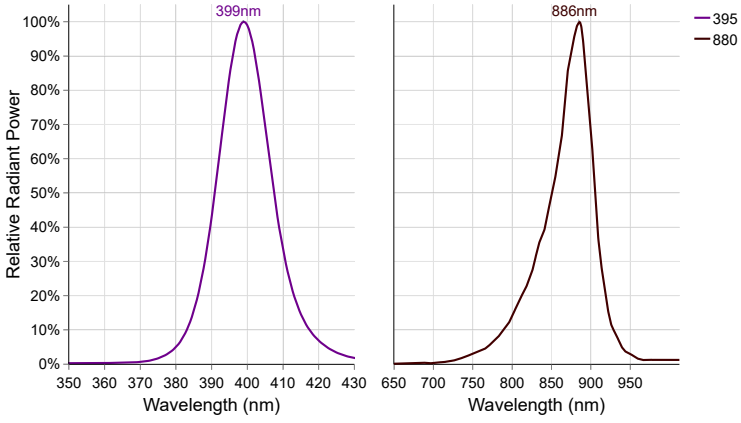
Non-Visible Spectral Profiles



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Optical Information - Continued

Photobiological Risk Factors

Group	Description	Affected Wavelengths
Exempt	No Photobiological Hazard	880
Group 1	No Photobiological hazard under normal behavioral limitations	470, 520, 625, WHI
Group 2	Does not pose a hazard due to aversion response to bright light or thermal discomfort	395

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Polarizers, beam splitters and collimated films should never be wiped with any type of cloth or solvent, only use the air dusting method to clean these types of optics.

The aluminum housing can be wiped down when dusting is not a sufficient means to thoroughly clean.

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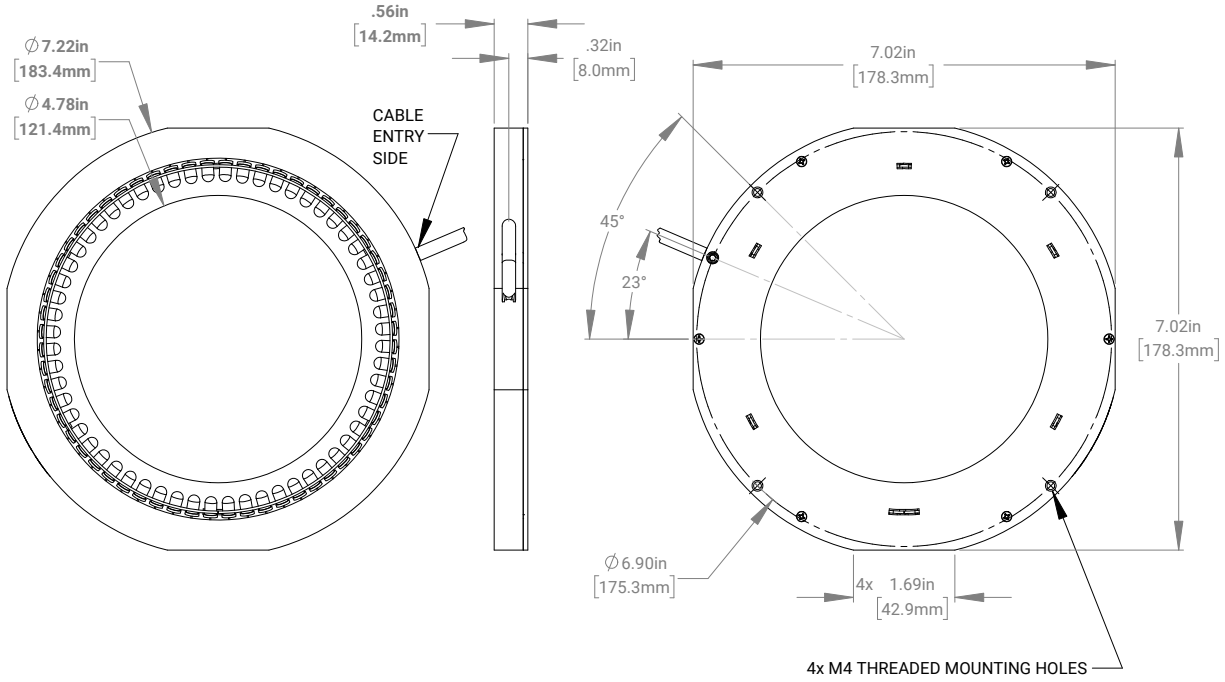
Mechanical Information

Installation Drawings



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

Electrical Information

Power Requirements

Current Required for Power Supply Sizing

Wavelengths (nm)	Configured w/ Voltage Drive (24)	Configured w/ Standard Controller (C1, C5, IC, I3, I3S)
WHI, 395, 470, 520	0.240A	0.180A
625, 880	0.360A	0.270A

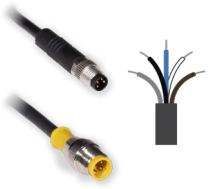
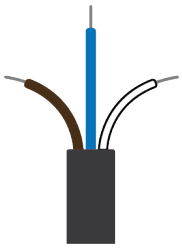
Note: All Advanced Illumination lights and controllers are nominally powered by 24V DC unless otherwise noted. Strobe overdriving with controller based models may require more current and voltage overhead. The values above do not include background current draw from the controller (~100 mA total).

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.	
	**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.	

Electrical Information - Continued

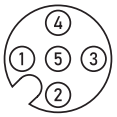
Control Options - Continued

Controller Image	Controller Details	Connector Image
	**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.	
	**24V Driver - Continuous Only - 24 Configurations** *PN: N/A* 24V option allows lights to operate continuous output with 24V connection and no additional controllers. **Modes:** Continuous, can be wired to some 3rd party controllers or external relays for gated operation **Interface:** Direct cable (flying leads or connector options)	

Electrical Information - Continued

Inline Control Option Wiring Information

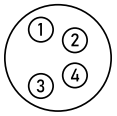
Standard Flying Lead and Optional M12 Connector Pinout Functions

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

5-Position Male Connector

The functions above are only applicable when ordering an 24, IC, I3, I3s, 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 Functions	M8 Pinout
1	BROWN	24V DC	24V DC	24V DC	
2	WHITE	N/A	0-10V Analog Control	Reserved	
3	BLUE	DC GND	DC GND	DC GND	
4	BLACK	N/A	Gate Low	Active High Trigger	

4-Position Male Connector

The functions above are only applicable when ordering an 24, IC, I3, or I3s power configuration with our without an M8 connector. For more wiring information pertaining to strobing and dimming functionality, please download the controller manuals and datasheets.

Accessories

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.
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.

Accessories - Continued

Category	Accessory Image	Accessory Detail
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		**DCS-100E/103E Extension Cable, Dual Light Power Cable - C1 Configuration** *PN: LC-XX-Y* This extension cable was designed for applications requiring two identical lights to be powered through a single controller. These Y cables feature a single male and dual female 7 pin locking connectors (C1) and can be purchased in 3 - 15-meter lengths. See attached spec sheet for compatible light configuration. For more information about our DCS-100E/103E Extension Cable, Split 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 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.
Mounting Brackets		**Mounting Brackets** *PN: LB* For mounting purposes this product is compatible with Fastens to the M4 mounting channel for simplified mounting. Included in product purchase. For more information about our Mounting Brackets, 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, or indirect damages of any kind arising from the sale or use of the products.

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 see our compliancy documentation here: https://www.advancedillumination.com/services/compliance-statements/

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, install and use this product in strict accordance with the instructions in the product documentation.

Customer Service

For information on existing orders, or to make an order adjustment, contact us Monday through Friday 8:00 am to 5:00 pm ET or send an email to orders@advancedillumination.com.

Company Information

Advanced Illumination
440 State Garage Road, Rochester, VT 05767
Phone: +1 (802) 767 3830
Fax: +1 (802) 767 2636
Email: info@advancedillumination.com
Web: advancedillumination.com

RL2115

Compact Aimed Dark Field

Product Highlights

- The RL2115 is characterized as a Compact Aimed Dark Field ring light.
- Precisely aimed LEDs provide a specific and repeatable light pattern on the imaging plane.

General Specifications

Electrical Specifications	Color	24V Current	All Other Controls
	625, 660, 880	0.09A	0.067A Max
	395, 470, 520, WHI	0.06A	0.045A Max
Normal Operating Temperature	0 - 60°C		
Weight	57.2g (2.02oz)		
Standard Cable Information	2 m long -0/+150 mm (80" -0/+6") - 105°C rated PVC jacket, foil shield with drain.		
Photobiological Risk Factor	Exempt Applicable Wavelengths: 880 Group 1 (Low-Risk) Applicable Wavelengths: 470, 520, 625, 660, WHI Group 2 (Moderate-Risk) Applicable Wavelengths: 395		
Compliance	CE, RoHS, IEC 62471		
IP Rating	Not Rated		
Lumen Maintenance	L70 = 50,000 Hours		

Part Number Key

Model	–	Peak Wavelength	Connector/ Control	–	Alternative Connector
RL2115	–	XXX	XX	–	XXX
RL2115		395 (UV)[2]	C1		M8[1]
		470 (blue)	C5		M12[1]
		520 (green)	IC		
		625 (red orange)	I3		
		660 (red)	I3S		
		880 (IR)	24		
		WHI (white)			

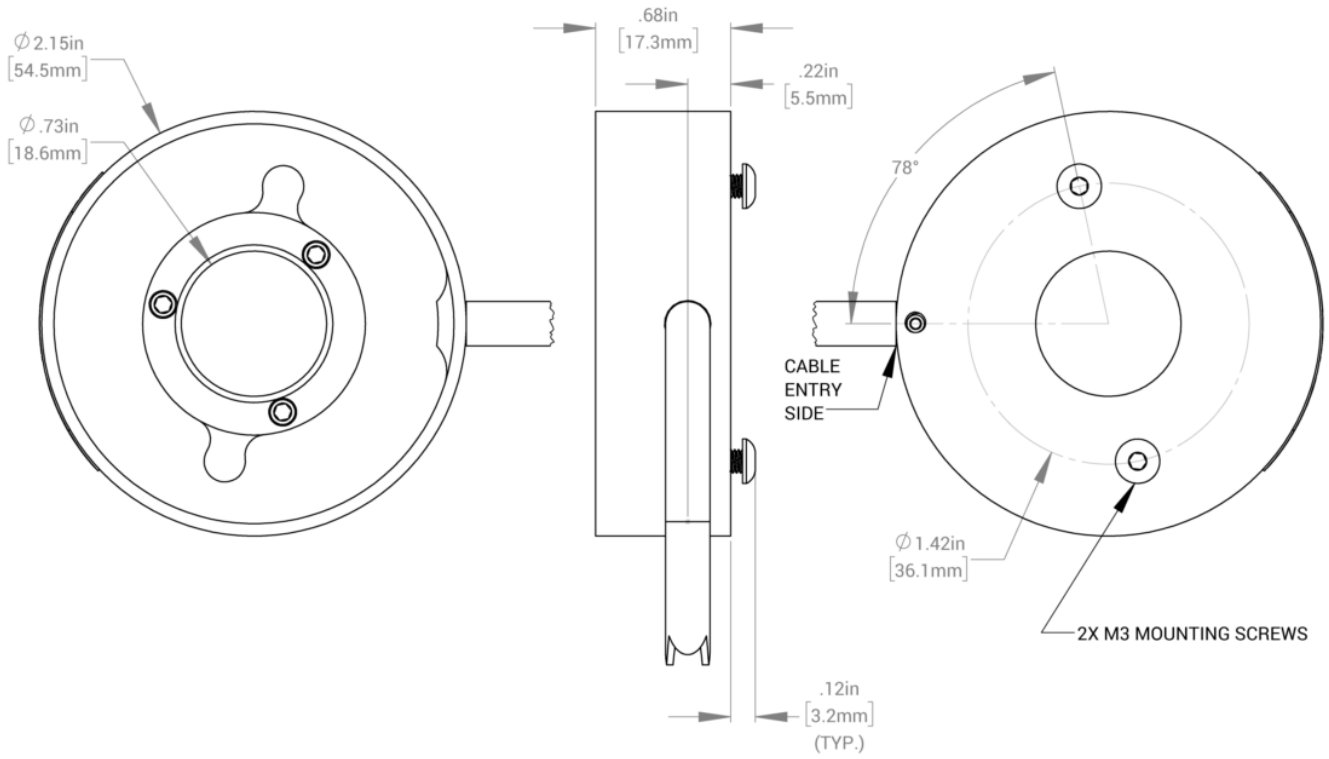
EX:
RL2115-395C1
RL2115-625I3-M12

[1] Available with IC, I3, I3S, and 24 V options only
[2] Not available in IC or 24 V option

See website product page for in-stock product numbers.

Shipping:
Stock Products: within three days
Build-to-Order Products: within one to three weeks

Mechanical Specs

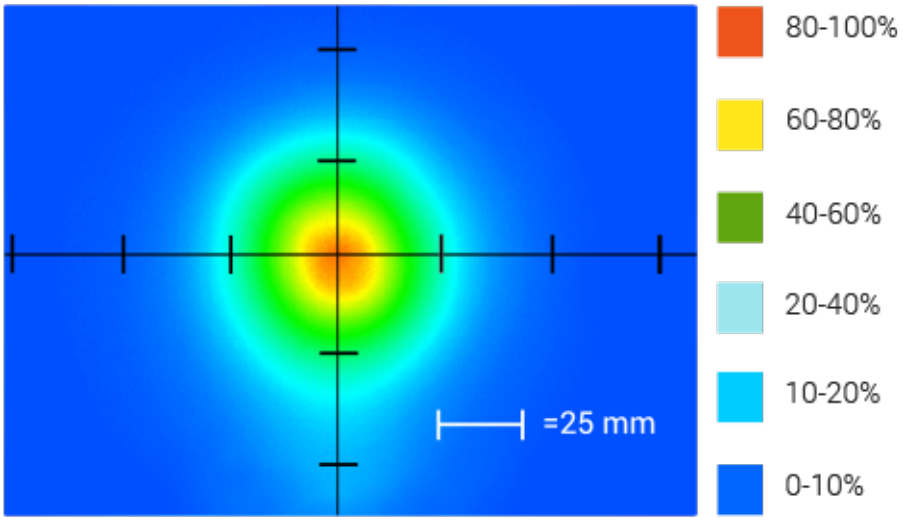


Control Specs

C1 Connector	C5 Connector	ICS 2 (IC)	ICS 3 (I3)	ICS 3S (I3S)	24
For use with: **DCS Series Controllers**	*For use with:* **Pulsar 320 Strobe Controller.**	Continous in-line controller *Powered with:* **24V power supply**	Combination strobe/continous in-line controller *Powered with:* **24V power supply**	Default-OFF strobe/continous in-line controller *Powered with:* **24V power supply**	Flying/tinned leads *Powered with:* **24V power supply**

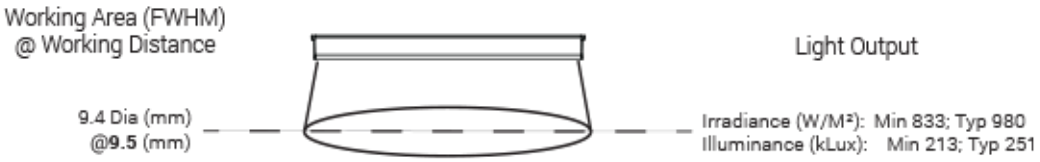
Optical Specs

Intensity Distribution



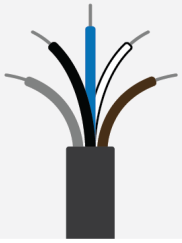
Optical measurement taken using RL2115-WHII3 @ 9.5 mm

Area of Illuminance & Intensity



Electrical Specs

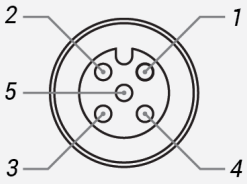
Standard Flying Lead Functions for 24V, IC, I3 and I3S Control Options



COLOR	24V FUNCTIONS	IC FUNCTIONS	I3/I3S FUNCTIONS
BROWN	24 V DC	24 V DC	24 V DC
WHITE	N/A	0-10 V ANALOG DIMMING	RESERVED
BLUE	DC GND	DC GND	DC GND
BLACK	N/A	PNP/ACTIVE LOW GATE	PNP/ACTIVE HIGH TRIGGER
GRAY	N/A	N/A	0-10 V ANALOG DIMMING

*The functions listed above are applicable when this product is configured with built-in 24V, IC, I3, or I3S control, **without** the optional A-coded 5-position Male M12 or A-coded 4-position Male M8 connector.*

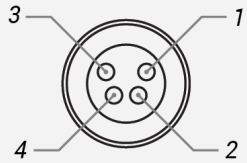
M12 Connector Pinout Functions for 24V, IC, I3 and I3S Control Options



PIN	24V FUNCTIONS	IC FUNCTIONS	I3/I3S FUNCTIONS
1	24 V DC	24 V DC	24 V DC
2	N/A	0-10 V ANALOG DIMMING	RESERVED
3	DC GND	DC GND	DC GND
4	N/A	PNP/ACTIVE LOW GATE	PNP/ACTIVE HIGH TRIGGER
5	N/A	N/A	0-10 V ANALOG DIMMING

*The functions listed above are only applicable when this product is configured with built-in 24V, IC, I3, or I3S control, **with** an A-coded 5-position Male M12 connector.*

M8 Connector Pinout Functions for 24V, IC, I3 and I3S Control Options



PIN	24V FUNCTIONS	IC FUNCTIONS	I3/I3S FUNCTIONS
1	24 V DC	24 V DC	24 V DC
2	N/A	0-10 V ANALOG DIMMING	0-10 V ANALOG DIMMING
3	DC GND	DC GND	DC GND
4	N/A	PNP/ACTIVE LOW GATE	PNP/ACTIVE HIGH TRIGGER

*The functions listed above are only applicable when this product is configured with built-in 24V, IC, I3, or I3S control, **with** an A-coded 4-position Male M8 connector.*

For details on operating configurations without built-in control (C1, C5, Q1, and Q4 control, when available), please refer to Advanced illumination's controller manuals.

Warranty Information

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, or indirect damages of any kind arising from the sale or use of the products.

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, install and use this product in strict accordance with the instructions in the product documentation.

Customer Service

For information on existing orders, or to make an order adjustment, contact us Monday through Friday 8:00 am to 5:00 pm ET or send an email to orders@advancedillumination.com.

Company Information

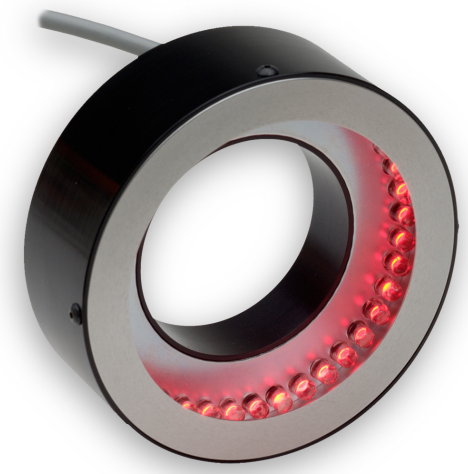
Advanced Illumination
440 State Garage Road, Rochester, VT 05767
Phone: 802.767.3830
Fax: 802.767.2636
Email: info@advancedillumination.com
Web: advancedillumination.com

RL3940

Folded Beam Dark Field

Product Highlights

- The RL3940 is characterized as a Folded Beam Dark Field ring light.
- Precisely aimed LEDs, along with an aluminum beam folder, provide a specific and repeatable light pattern on the imaging plane.



General Specifications

Electrical Specifications	Color	24V Current	All Other Controls
	625, 660, 880	0.24A	0.18A Max
	395, 470, 520, WHI	0.16A	0.12A Max
Normal Operating Temperature	0 - 60°C		
Weight	246.8g (8.71 oz) for standard mounting option		
Standard Cable Information	2 m long -0/+150 mm (80" -0/+6") - 105°C rated PVC jacket, foil shield with drain.		
Photobiological Risk Factor	Exempt Applicable Wavelengths: 880 Group 1 (Low-Risk) Applicable Wavelengths: 470, 520, 625, 660, WHI Group 2 (Moderate-Risk) Applicable Wavelengths: 395		
Compliance	CE, RoHS, IEC 62471		
IP Rating	Not Rated		
Lumen Maintenance	L70 = 50,000 Hours		

Part Number Key

Model	Mounting Options	–	Peak Wavelength	Connector/ Control	–	Alternative Connector
RL3940	X	-	XXX	XX	-	XXX
RL3940	S (Standard) B (Barrel)		395 (UV)[2] 470 (blue) 520 (green) 625 (red orange) 660 (red) 850 (IR) WHI (white)	C1 C5 IC I3 I3S 24		M8[1] M12[1]

EX:
RL3940B-395C1
RL3940S-625I3-M12

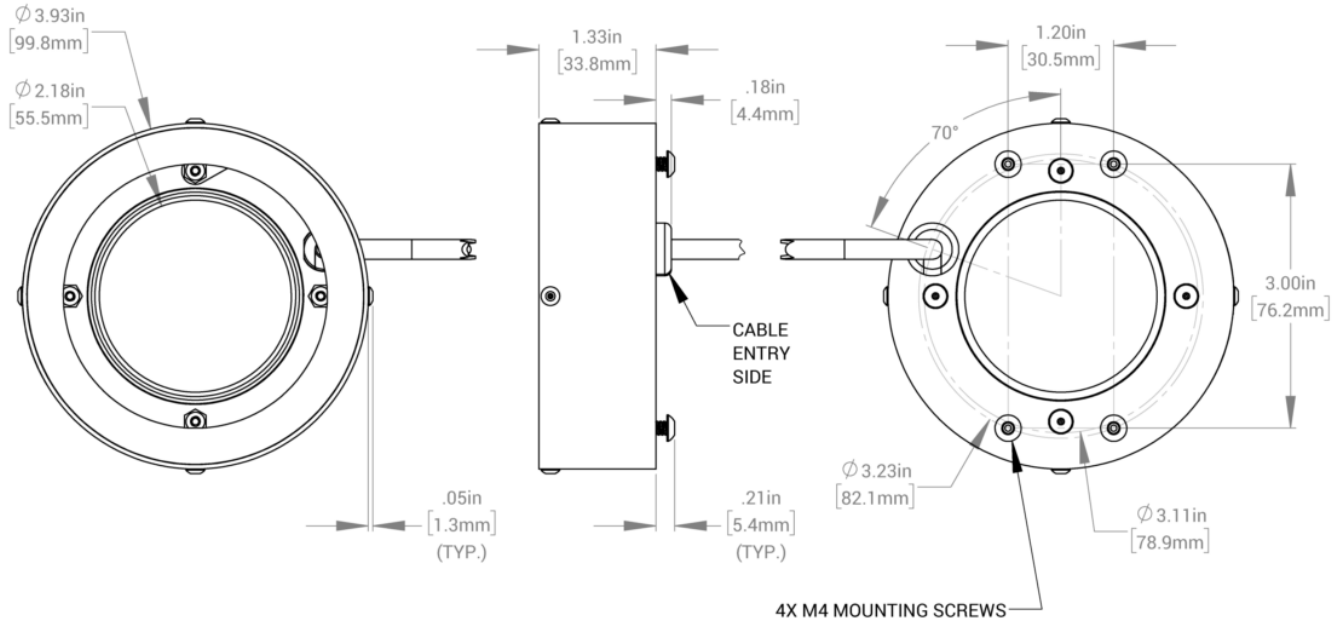
[1] Available with IC, I3, I3S, and 24 V options only
[2] Not available in IC or 24 V option

See website product page for in-stock product numbers.

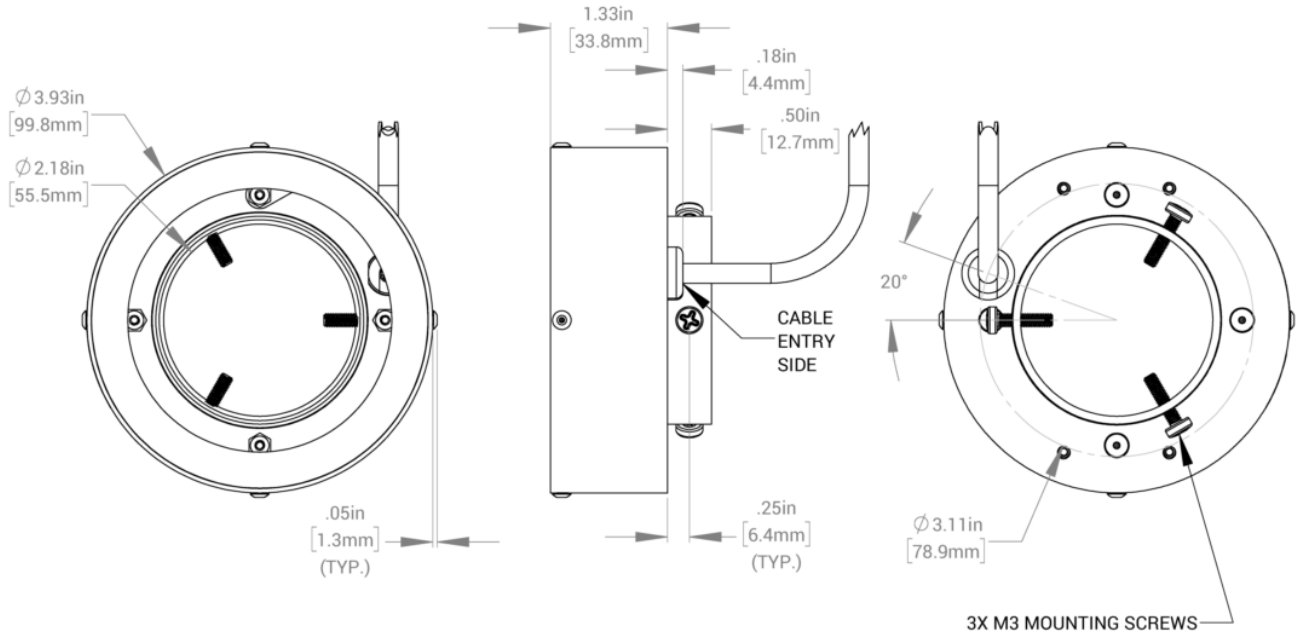
Shipping:
Stock Products: within three days
Build-to-Order Products: within one to three weeks

Mechanical Specs

[RL3940 - STANDARD MOUNTING OPTION]



[RL3940 - MOUNTING OPTION B]

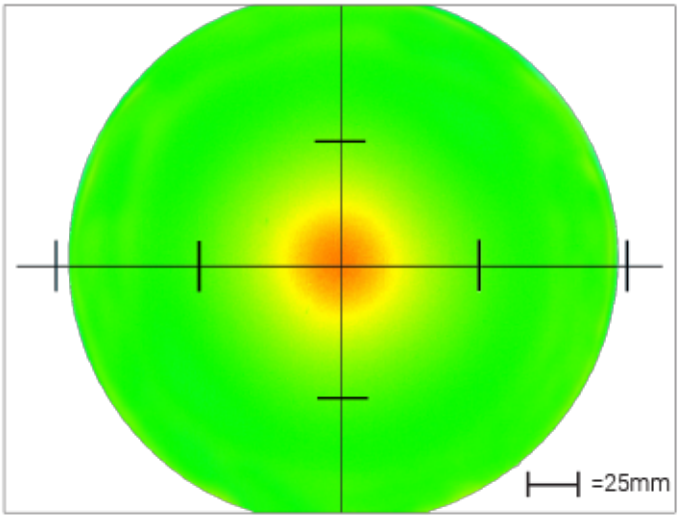


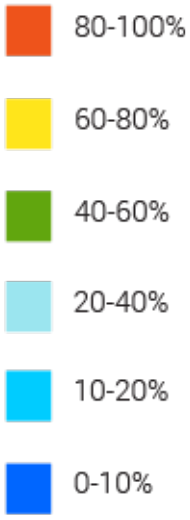
Control Specs

C1 Connector	C5 Connector	ICS 2 (IC)	ICS 3 (I3)	ICS 3S (I3S)	24
For use with: **DCS Series Controllers**	*For use with:* **Pulsar 320 Strobe Controller.**	Continous in-line controller *Powered with:* **24V power supply**	Combination strobe/continous in-line controller *Powered with:* **24V power supply**	Default-OFF strobe/continous in-line controller *Powered with:* **24V power supply**	Flying/tinned leads *Powered with:* **24V power supply**

Optical Specs

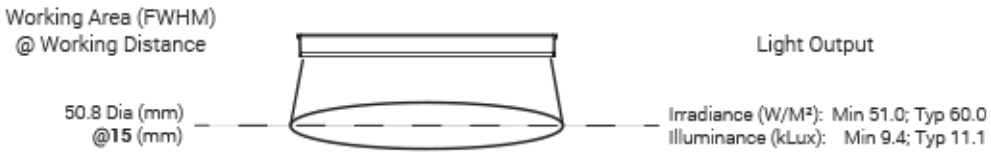
Intensity Distribution





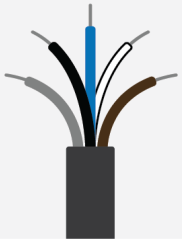
Optical measurement taken using RL3940-625I3 @ 15mm

Area of Illuminance & Intensity



Electrical Specs

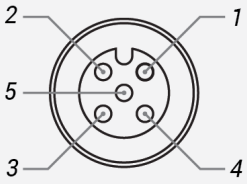
Standard Flying Lead Functions for 24V, IC, I3 and I3S Control Options



COLOR	24V FUNCTIONS	IC FUNCTIONS	I3/I3S FUNCTIONS
BROWN	24 V DC	24 V DC	24 V DC
WHITE	N/A	0-10 V ANALOG DIMMING	RESERVED
BLUE	DC GND	DC GND	DC GND
BLACK	N/A	PNP/ACTIVE LOW GATE	PNP/ACTIVE HIGH TRIGGER
GRAY	N/A	N/A	0-10 V ANALOG DIMMING

*The functions listed above are applicable when this product is configured with built-in 24V, IC, I3, or I3S control, **without** the optional A-coded 5-position Male M12 or A-coded 4-position Male M8 connector.*

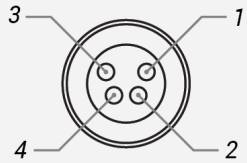
M12 Connector Pinout Functions for 24V, IC, I3 and I3S Control Options



PIN	24V FUNCTIONS	IC FUNCTIONS	I3/I3S FUNCTIONS
1	24 V DC	24 V DC	24 V DC
2	N/A	0-10 V ANALOG DIMMING	RESERVED
3	DC GND	DC GND	DC GND
4	N/A	PNP/ACTIVE LOW GATE	PNP/ACTIVE HIGH TRIGGER
5	N/A	N/A	0-10 V ANALOG DIMMING

*The functions listed above are only applicable when this product is configured with built-in 24V, IC, I3, or I3S control, **with** an A-coded 5-position Male M12 connector.*

M8 Connector Pinout Functions for 24V, IC, I3 and I3S Control Options



PIN	24V FUNCTIONS	IC FUNCTIONS	I3/I3S FUNCTIONS
1	24 V DC	24 V DC	24 V DC
2	N/A	0-10 V ANALOG DIMMING	0-10 V ANALOG DIMMING
3	DC GND	DC GND	DC GND
4	N/A	PNP/ACTIVE LOW GATE	PNP/ACTIVE HIGH TRIGGER

*The functions listed above are only applicable when this product is configured with built-in 24V, IC, I3, or I3S control, **with** an A-coded 4-position Male M8 connector.*

For details on operating configurations without built-in control (C1, C5, Q1, and Q4 control, when available), please refer to Advanced illumination's controller manuals.

Warranty Information

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, or indirect damages of any kind arising from the sale or use of the products.

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, install and use this product in strict accordance with the instructions in the product documentation.

Customer Service

For information on existing orders, or to make an order adjustment, contact us Monday through Friday 8:00 am to 5:00 pm ET or send an email to orders@advancedillumination.com.

Company Information

Advanced Illumination
440 State Garage Road, Rochester, VT 05767
Phone: 802.767.3830
Fax: 802.767.2636
Email: info@advancedillumination.com
Web: advancedillumination.com

RL3536

Aimed Dark Field

Product Highlights

- The RL3536 is characterized as an Aimed Dark Field ring light.
- Precisely aimed LEDs provide a specific and repeatable light pattern on the imaging plane.

General Specifications

Electrical Specifications	Color	24V Current	All Other Controls
	625, 660, 880	0.18A	0.162A Max
	395, 470, 520, WHI	0.12A	0.108A Max
Normal Operating Temperature	0 - 60°C		
Weight	249.5g (8.80oz)		
Standard Cable Information	2 m long -0/+150 mm (80" -0/+6") - 105°C rated PVC jacket, foil shield with drain.		
Photobiological Risk Factor	Exempt Applicable Wavelengths: 880 Group 1 (Low-Risk) Applicable Wavelengths: 470, 520, 625, 660, WHI Group 2 (Moderate-Risk) Applicable Wavelengths: 395		
Compliance	CE, RoHS, IEC 62471		
IP Rating	Not Rated		
Lumen Maintenance	L70 = 50,000 Hours		

Part Number Key

Model	Mounting Options	–	Peak Wavelength	Connector/ Control	Light Conditioning Option	–	Alternative Connector
RL3536	X	–	XXX	XX	X	–	XXX
RL3536	S (Standard) B (Barrel)		395 (UV)[2] 470 (blue) 520 (green) 625 (red orange) 880 (IR) WHI (white)	C1 C5 IC I3 I3S 24	D (Diffuser) P[3] (Polarizer)		M8[1] M12[1]

EX:
RL3536B-395C1D
RL3536B-625I3P-M12

[1] Available with IC, I3, I3S, and 24 V options only
[2] Not available with IC or 24 V option
[3] Not available with 395 (UV) option; 470 (blue) will reduce the life of the polarizer

See website product page for in-stock product numbers.

Shipping:
Stock Products: within three days
Build-to-Order Products: within one to three weeks

Change Notice

PCN No: 166

Date Issued: May 5, 2023
Notice Type: Product Change
Product Type: 660nm Wavelength on traditional 5mm Lights Discontinuation

Change Notification Summary

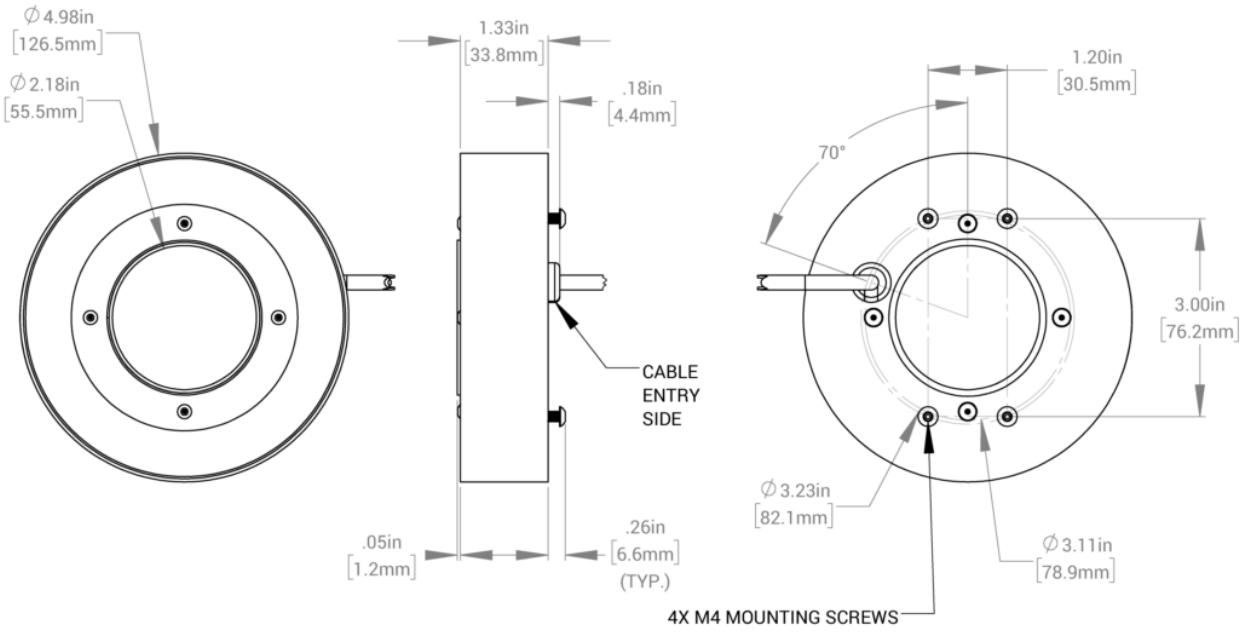
Advanced illumination (Ai) will be ending the manufacture of the 660nm color option on our classic aimed lights due to the LEDs being discontinued from the manufacturer. We expect to have six months of inventory to fulfill orders, after that we suggest purchasing the same light but with the 625nm wavelength.

Please contact your Ai Sales Representative if you have any questions.

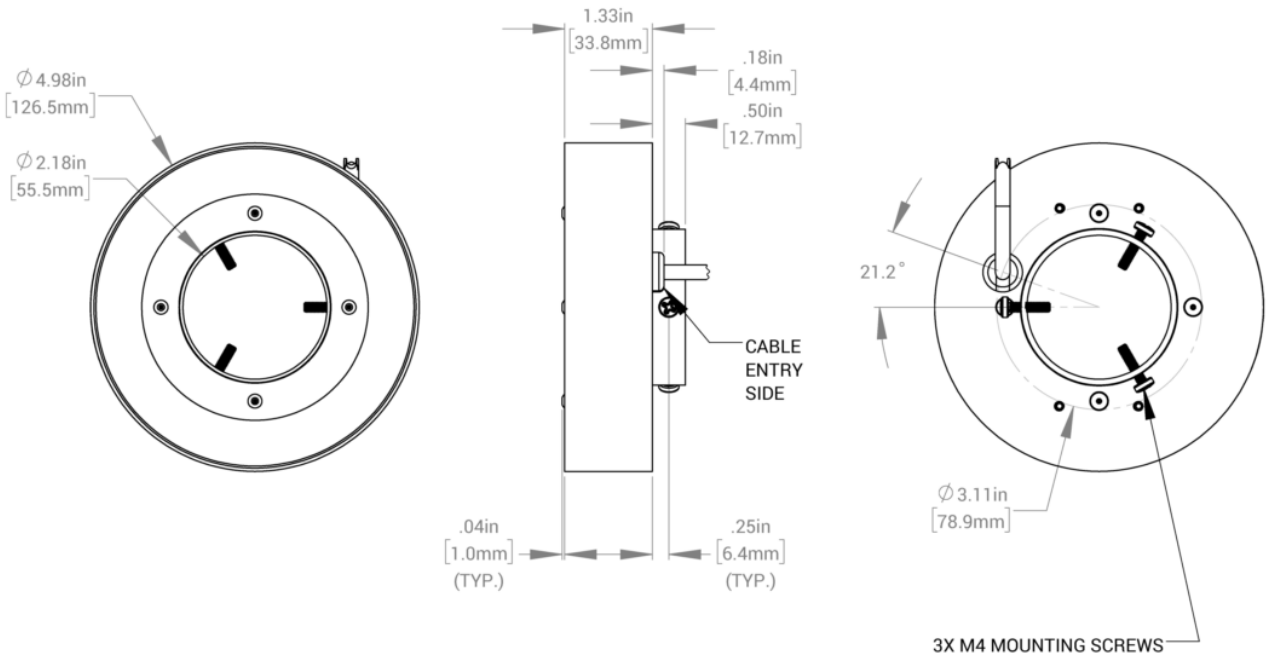
PCN 166

Mechanical Specs

[RL3536 - STANDARD MOUNTING OPTION]



[RL3536 - MOUNTING OPTION B]

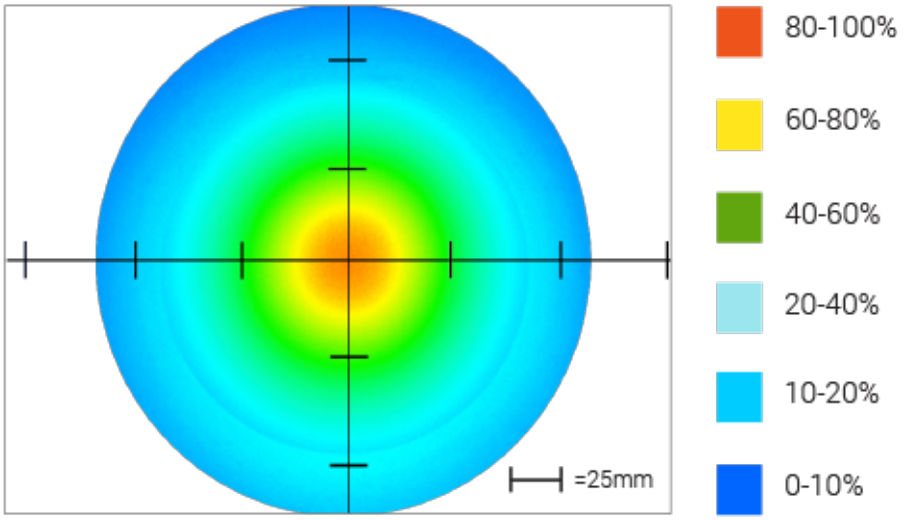


Control Specs

C1 Connector	C5 Connector	ICS 2 (IC)	ICS 3 (I3)	ICS 3S (I3S)	24
For use with: **DCS Series Controllers**	*For use with:* **Pulsar 320 Strobe Controller.**	Continous in-line controller *Powered with:* **24V power supply**	Combination strobe/continous in-line controller *Powered with:* **24V power supply**	Default-OFF strobe/continous in-line controller *Powered with:* **24V power supply**	Flying/tinned leads *Powered with:* **24V power supply**

Optical Specs

Intensity Distribution

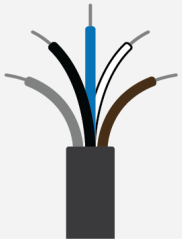


Optical measurement taken using RL3536-625I3 @ 75mm

Area of Illuminance & Intensity

Electrical Specs

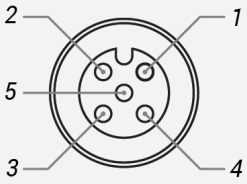
Standard Flying Lead Functions for 24V, IC, I3 and I3S Control Options



COLOR	24V FUNCTIONS	IC FUNCTIONS	I3/I3S FUNCTIONS
BROWN	24 V DC	24 V DC	24 V DC
WHITE	N/A	0-10 V ANALOG DIMMING	RESERVED
BLUE	DC GND	DC GND	DC GND
BLACK	N/A	PNP/ACTIVE LOW GATE	PNP/ACTIVE HIGH TRIGGER
GRAY	N/A	N/A	0-10 V ANALOG DIMMING

*The functions listed above are applicable when this product is configured with built-in 24V, IC, I3, or I3S control, **without** the optional A-coded 5-position Male M12 or A-coded 4-position Male M8 connector.*

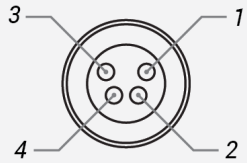
M12 Connector Pinout Functions for 24V, IC, I3 and I3S Control Options



PIN	24V FUNCTIONS	IC FUNCTIONS	I3/I3S FUNCTIONS
1	24 V DC	24 V DC	24 V DC
2	N/A	0-10 V ANALOG DIMMING	RESERVED
3	DC GND	DC GND	DC GND
4	N/A	PNP/ACTIVE LOW GATE	PNP/ACTIVE HIGH TRIGGER
5	N/A	N/A	0-10 V ANALOG DIMMING

*The functions listed above are only applicable when this product is configured with built-in 24V, IC, I3, or I3S control, **with** an A-coded 5-position Male M12 connector.*

M8 Connector Pinout Functions for 24V, IC, I3 and I3S Control Options



PIN	24V FUNCTIONS	IC FUNCTIONS	I3/I3S FUNCTIONS
1	24 V DC	24 V DC	24 V DC
2	N/A	0-10 V ANALOG DIMMING	0-10 V ANALOG DIMMING
3	DC GND	DC GND	DC GND
4	N/A	PNP/ACTIVE LOW GATE	PNP/ACTIVE HIGH TRIGGER

*The functions listed above are only applicable when this product is configured with built-in 24V, IC, I3, or I3S control, **with** an A-coded 4-position Male M8 connector.*

For details on operating configurations without built-in control (C1, C5, Q1, and Q4 control, when available), please refer to Advanced illumination's controller manuals.

Warranty Information

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No Liability for Consequential Damages: In no event shall Ai be liable for any consequential, special, incidental, or indirect damages of any kind arising from the sale or use of the products.

Electromagnetic Compatibility

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Customer Service

For information on existing orders, or to make an order adjustment, contact us Monday through Friday 8:00 am to 5:00 pm ET or send an email to orders@advancedillumination.com.

Company Information

Advanced Illumination

440 State Garage Road, Rochester, VT 05767

Phone: 802.767.3830

Fax: 802.767.2636

Email: info@advancedillumination.com

Web: advancedillumination.com

RL5064

Dual Function Ring Light

Product Highlights

- Characterized as a Dual Function Ring Light, the RL5064 is capable of both bright and dark field illumination with independent control (depending on control option).
- A wide variety of wavelengths may be specified from UV to IR.
- The large inner diameter of the ring light can accommodate lenses up to 55mm in diameter.
- The light can also be ordered with an optional 3 point mounting barrel.

General Specifications

Electrical Specifications	Color	24V Current Bright Field	24V Current Dark Field	All Other Controls Bright Field	All Other Controls Dark Field
	625, 660, 880	0.12 A	0.24 A	0.04 A	0.12 A
	WHI	0.08 A	0.16 A	0.027 A	0.08 A
	470	0.08 A	0.17 A	0.027 A	0.09 A
	520	0.08 A	0.18 A	0.027 A	0.10 A
	395	0.08 A	0.19 A	0.027 A	0.11 A
Normal Operating Temperature	0 - 60°C				
Weight	273.1g (9.6 oz) for standard mounting option				
Standard Cable Information	2 m long -0/+150 mm (80" -0/+6") - 105°C rated PVC jacket, foil shield with drain.				
Photobiological Risk Factor	Exempt Applicable Wavelengths: 880 Group 1 (Low-Risk) Applicable Wavelengths: 470, 520, 625, 660, WHI Group 2 (Moderate-Risk) Applicable Wavelengths: 395				
Compliance	CE, RoHS				
IP Rating	Not Rated				

Lumen Maintenance	L70 = 50,000 hours

Part Number Key

Model	Mounting Options	–	Peak Wavelength	Connector/ Control	–	Alternative Connector
RL5064	X	–	XXX	XX	–	XXX
RL5064	S (Standard) B (Barrel)		395 (UV) 470 (blue) 520 (green) 625 (red orange) 660 (red) 880 (IR) WHI (white)	C1 C5 IC I3 I3S 24		M8[1] M12[1]

EX:
RL5064B-395C1
RL5064-625I3-M12

[1] Available with IC, I3, I3S, and 24 V options only
[2] Not available in IC or 24 V option

See website product page for in-stock product numbers.

Shipping:
Stock Products: within three days
Build-to-Order Products: within one to three weeks

Change Notice

PCN No: 166

Date Issued: May 5, 2023
Notice Type: Product Change
Product Type: 660nm Wavelength on traditional 5mm Lights Discontinuation

Change Notification Summary

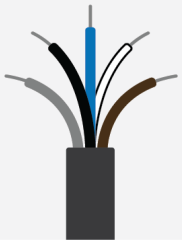
Advanced illumination (Ai) will be ending the manufacture of the 660nm color option on our classic aimed lights due to the LEDs being discontinued from the manufacturer. We expect to have six months of inventory to fulfill orders, after that we suggest purchasing the same light but with the 625nm wavelength.

Please contact your Ai Sales Representative if you have any questions.

PCN 166

Electrical Specs

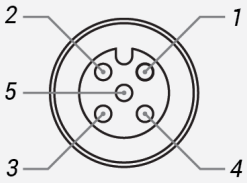
Standard Flying Lead Functions for 24V, IC, I3 and I3S Control Options



COLOR	24V FUNCTIONS	IC FUNCTIONS	I3/I3S FUNCTIONS
BROWN	24 V DC	24 V DC	24 V DC
WHITE	N/A	0-10 V ANALOG DIMMING	RESERVED
BLUE	DC GND	DC GND	DC GND
BLACK	N/A	PNP/ACTIVE LOW GATE	PNP/ACTIVE HIGH TRIGGER
GRAY	N/A	N/A	0-10 V ANALOG DIMMING

*The functions listed above are applicable when this product is configured with built-in 24V, IC, I3, or I3S control, **without** the optional A-coded 5-position Male M12 or A-coded 4-position Male M8 connector.*

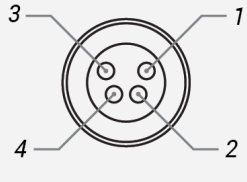
M12 Connector Pinout Functions for 24V, IC, I3 and I3S Control Options



PIN	24V FUNCTIONS	IC FUNCTIONS	I3/I3S FUNCTIONS
1	24 V DC	24 V DC	24 V DC
2	N/A	0-10 V ANALOG DIMMING	RESERVED
3	DC GND	DC GND	DC GND
4	N/A	PNP/ACTIVE LOW GATE	PNP/ACTIVE HIGH TRIGGER
5	N/A	N/A	0-10 V ANALOG DIMMING

*The functions listed above are only applicable when this product is configured with built-in 24V, IC, I3, or I3S control, **with** an A-coded 5-position Male M12 connector.*

M8 Connector Pinout Functions for 24V, IC, I3 and I3S Control Options



PIN	24V FUNCTIONS	IC FUNCTIONS	I3/I3S FUNCTIONS
1	24 V DC	24 V DC	24 V DC
2	N/A	0-10 V ANALOG DIMMING	0-10 V ANALOG DIMMING
3	DC GND	DC GND	DC GND
4	N/A	PNP/ACTIVE LOW GATE	PNP/ACTIVE HIGH TRIGGER

*The functions listed above are only applicable when this product is configured with built-in 24V, IC, I3, or I3S control, **with** an A-coded 4-position Male M8 connector.*

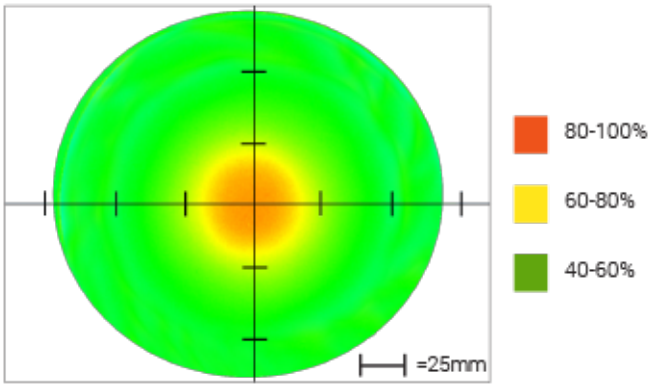
For details on operating configurations without built-in control (C1, C5, Q1, and Q4 control, when available), please refer to Advanced illumination's controller manuals.

Control Specs

C1 Connector	C5 Connector	ICS 2 (IC)	ICS 3 (I3)	ICS 3S (I3S)	24
For use with: **DCS Series Controllers**	*For use with:* **Pulsar 320 Strobe Controller.**	Continous in-line controller *Powered with:* **24V power supply**	Combination strobe/continous in-line controller *Powered with:* **24V power supply**	Default-OFF strobe/continous in-line controller *Powered with:* **24V power supply**	Flying/tinned leads *Powered with:* **24V power supply**

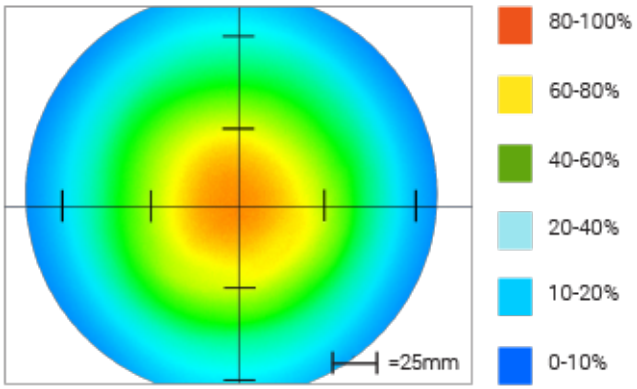
Optical Specs

Dark Field Intensity Distribution



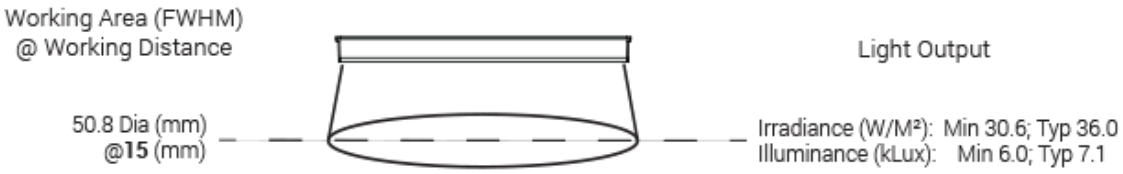
Optical measurement taken using
RL5064-625I3 @ 15 mm Dark Field

Bright Field Intensity Distribution

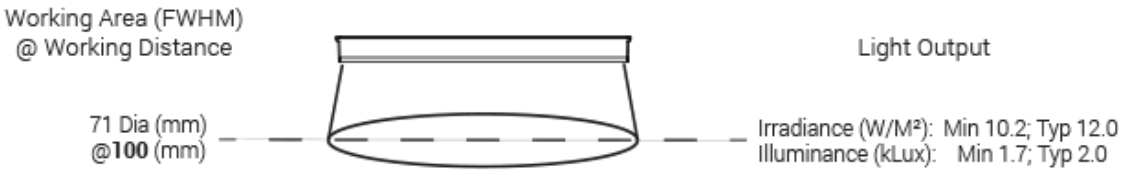


Optical measurement taken using
RL5064-625I3 @ 15 mm Bright Field

Dark Field Area of Illuminance & Intensity

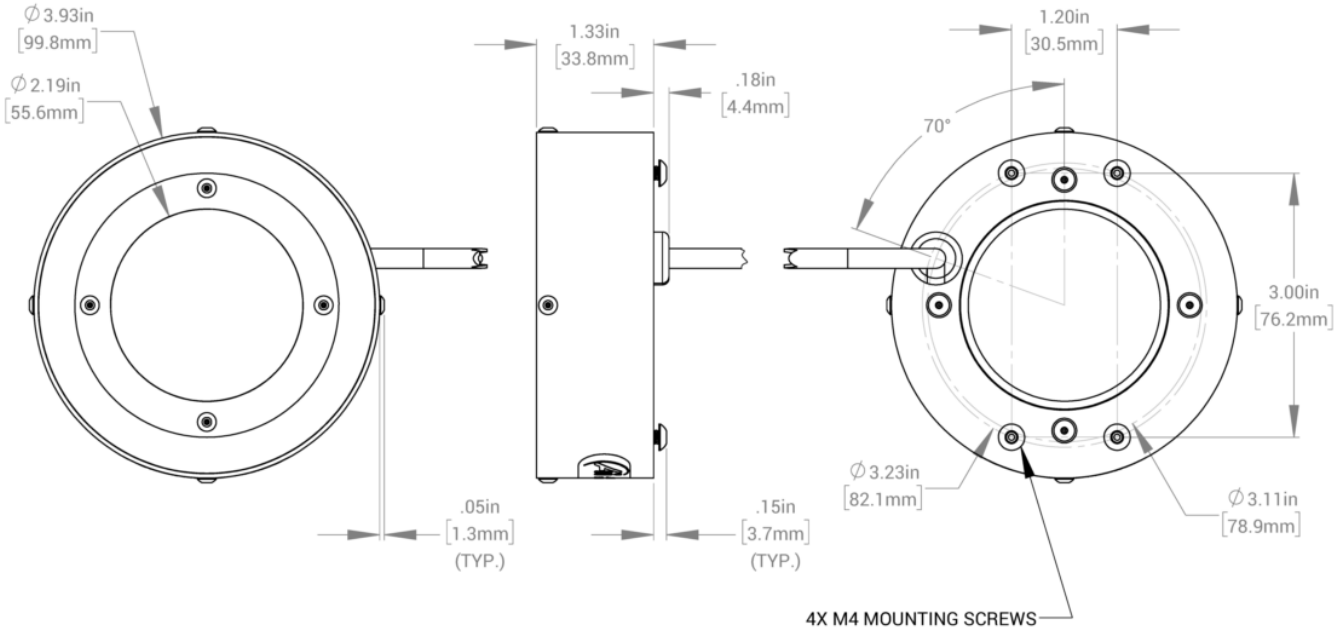


Bright Field Area of Illuminance & Intensity

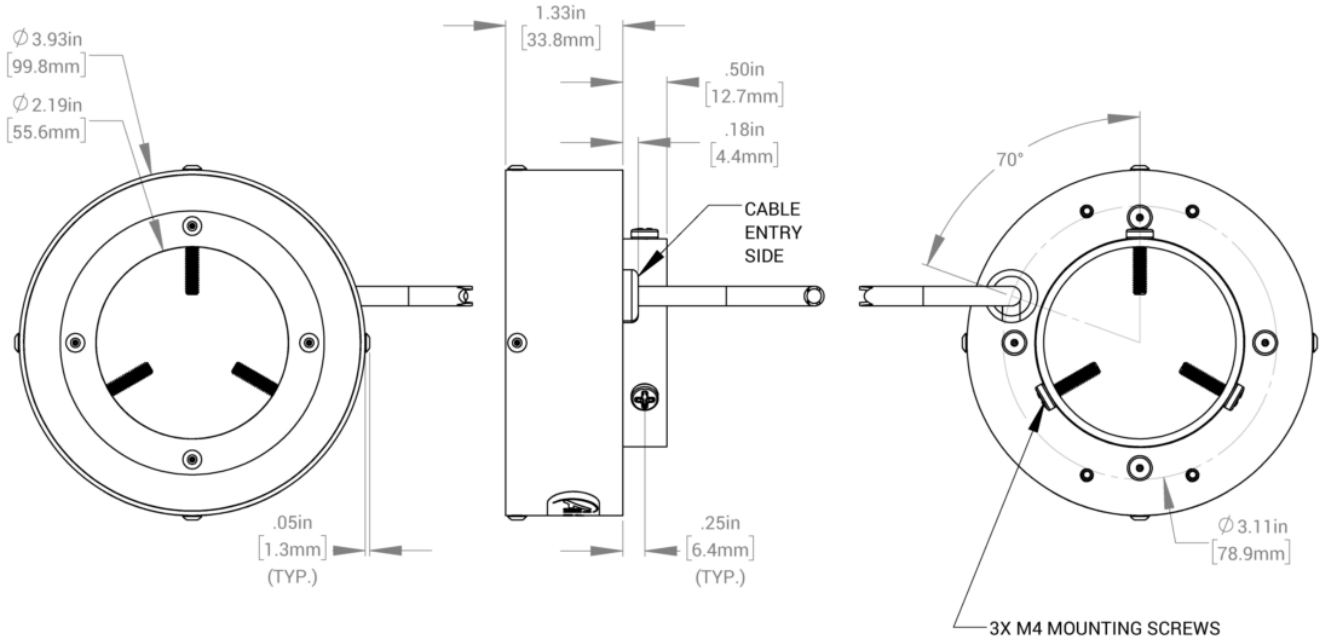


Mechanical Specs

[RL5064 - STANDARD MOUNTING OPTION]



[RL5064 - MOUNTING OPTION B]



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