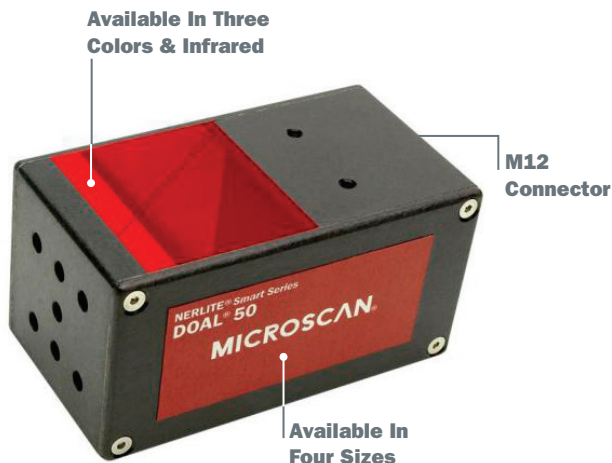


## NERLITE® DOAL®



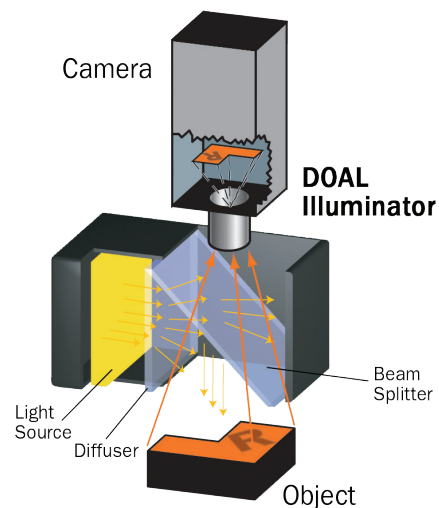
## Diffuse On-Axis Lighting (DOAL)

Microscan's Smart Series NERLITE products feature built-in controllers for a complete and easily integrated solution.

DOAL illuminators provide the best contrast for images of features marked or embossed on a flat specular surface with diffuse and uniform on-axis illumination. With the coaxial lighting approach, specular surfaces perpendicular to the camera appear bright, while surfaces which are marked or embossed absorb light and appear dark.

### DOAL: At a Glance

- Smart Series: Built-in controller with adjustable intensity continuous mode and high output strobe mode
- Integrated Pulse Width Modulation (PWM) feature for dimming and on-off control
- Provides high intensity diffuse illumination with superior uniformity throughout the envelope
- Compact, lightweight package can be used on moving camera modules
- Passively cooled design for efficient and reliable operation



### Illumination Example:

Object



Resulting Image



**Stamped characters on a metal plate:** High contrast image allows inspection or reading.

For more information on this product, visit [www.microscan.com](http://www.microscan.com).

### Application Examples

- Evenly illuminate flat, shiny surfaces
- Enhance scribed, indented, or embossed features
- Create contrast between specular, diffuse, or absorptive surfaces
- Diminish visibility of clear overcoats or coverings
- Electronic component inspection
- Fiducial location

# MICROSCAN®

# NERLITE® DOAL® SPECIFICATIONS AND OPTIONS

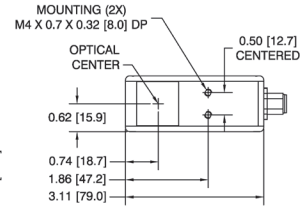
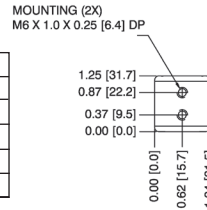
## DOAL 25

DESCRIPTION	nm/K	CONT. CURRENT	STROBE CURRENT	mcd		mw	
				CONT.	STROBE	CONT.	STROBE
DOAL-25, Smart Series, Red	628 nm	110 mA	400 mA	4173	23369		
DOAL-25, Smart Series, Blue	470 nm	83 mA	200 mA	2522	11096		
DOAL-25, Smart Series, White	5500 K	83 mA	200 mA	5443	23406		
DOAL-25, Smart Series, Infrared	880 nm	75 mA	450 mA			15	134

**Light Aperture:** 1.00" x 0.95" (25.4 mm x 24.1 mm) **Field of View:** 0.50" (13 mm)

**Stand Off:** 0.50" (13 mm) **Weight:** 4 oz. (113 g)

**Dimensions:** H 1.24" (31.5 mm) x W 1.25" (31.8 mm) x D 3.11" (79 mm)



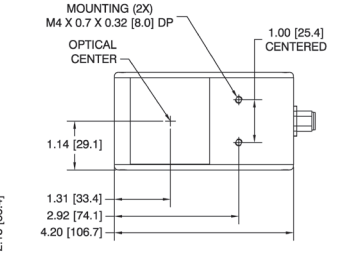
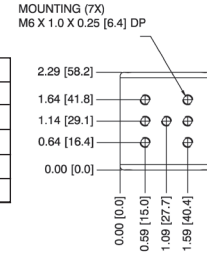
## DOAL 50

DESCRIPTION	nm/K	CONT. CURRENT	STROBE CURRENT	mcd		mw	
				CONT.	STROBE	CONT.	STROBE
DOAL-50, Smart Series, Red	628 nm	345 mA	1.3 A	15967	76640		
DOAL-50, Smart Series, Blue	470 nm	260 mA	1.0 A	9684	41156		
DOAL-50, Smart Series, White	5500 K	260 mA	1.0 A	20902	89878		
DOAL-50, Smart Series, Infrared	880 nm	250 mA	1.7 A			62	444

**Light Aperture:** 2.04" x 1.88" (51.8 mm x 47.8 mm) **Field of View:** 1.00" (25.4 mm)

**Stand Off:** 1.00" (25.4 mm) **Weight:** 11.2 oz. (318 g)

**Dimensions:** H 2.18" (55.4 mm) x W 2.29" (58.2 mm) x D 4.20" (106.7 mm)



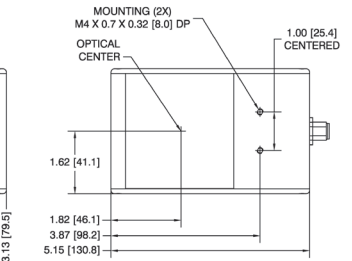
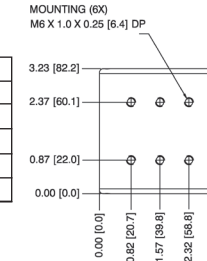
## DOAL 75

DESCRIPTION	nm/K	CONT. CURRENT	STROBE CURRENT	mcd		mw	
				CONT.	STROBE	CONT.	STROBE
DOAL-75, Smart Series, Red	628 nm	650 mA	2.4 A	31026	148926		
DOAL-75, Smart Series, Blue	470 nm	570 mA	1.5 A	22696	97594		
DOAL-75, Smart Series, White	5500 K	570 mA	1.5 A	48989	210652		
DOAL-75, Smart Series, Infrared	880 nm	580 mA	2.0 A			131	810

**Light Aperture:** 2.99" x 2.83" (75.8 mm x 71.9 mm) **Field of View:** 1.50" (38.1 mm)

**Stand Off:** 1.00" (25.4 mm) **Weight:** 22.4 oz. (635 g)

**Dimensions:** H 3.13" (79.5 mm) x W 3.23" (82.2 mm) x D 5.15" (130.8 mm)



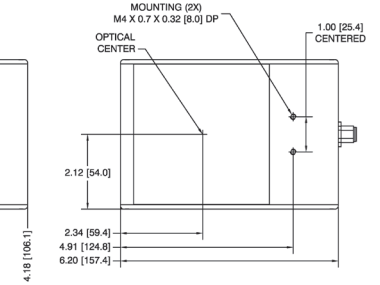
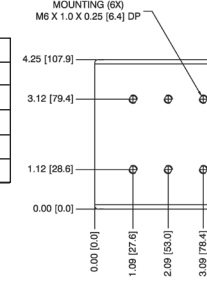
## DOAL 100

DESCRIPTION	nm/K	CONT. CURRENT	STROBE CURRENT	mcd		mw	
				CONT.	STROBE	CONT.	STROBE
DOAL-100, Smart Series, Red	628 nm	1.05 A	3.6 A	50803	219470		
DOAL-100, Smart Series, Blue	470 nm	740 mA	1.6 A	30665	113461		
DOAL-100, Smart Series, White	5500 K	740 mA	1.6 A	66189	244900		
DOAL-100, Smart Series, Infrared	880 nm	785 mA	2.3 A			189	1076

**Light Aperture:** 4.00" x 3.88" (101.6 mm x 98.5 mm) **Field of View:** 2.00" (50.8 mm)

**Stand Off:** 1.00" (25.4 mm) **Weight:** 38.4 oz. (1089g)

**Dimensions:** H 4.18" (106.1 mm) x W 4.25" (107.9 mm) x D 6.20" (157.4 mm)



## ENVIRONMENTAL

**Enclosure:** Black anodized aluminum, IP40 rated; **Operating Temperature:** 0° to 50° C (32° to 122° F)

**Storage Temperature:** 0° to 50° C (32° to 122° F); **Humidity:** up to 95% (non-condensing)

## LIGHTING PARAMETERS

**Light Aperture Defined:** Area of light output from the coaxial illuminator.

**Field of View Defined:** Largest recommended evenly illuminated area as seen from the camera (also known as Area of Interest [AOI]).

**Stand Off Defined:** Recommended distance between the bottom of the light and the surface of the object being illuminated.

## LIGHT SOURCE

**Type:** High output LEDs

**Light Output:** Millicandelas

**Radiant Output:** Milliwatts

**Expected Life:** 50,000 hours (Red, Infrared LEDs)

**Expected Life:** 10,000 hours (Blue, White LEDs)

**Eye Safety:** EN 60825-1: Class 1 (Red, White, Infrared LEDs); Class 2 (Blue LEDs)

## CONNECTOR

**Type:** M12 5-pin plug, A-code

## ELECTRICAL

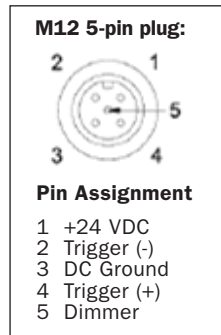
**Power:** 20.2–28.8 VDC

**Continuous Operation:** No additional signals required

**Continuous Operation with Dimming:** 0 VDC (LEDs off) to 3.1–3.5 VDC (LEDs on) PWM signal. < 1 mA, modulation frequency 2 KHz +/- 100 Hz. Note: LED duty cycle will equal duty cycle of dimming signal when using this mode.

**Continuous Operation with On/Off Control:** 0 VDC (LEDs off) to 3.1–3.5 VDC (LEDs on), < 1 mA

**High Output Strobe Operation:** Optoisolated. 0 VDC (LEDs off) to 3.1–28.8 VDC (LEDs on). 10 mA max, 5 µs min to 10 ms max pulse width. Note: High Output Strobe internally limits LED frequency and pulse width to maximum of 90 Hz and 1 ms respectively.



## QMS CERTIFICATION

[www.microscan.com/quality](http://www.microscan.com/quality)

©2017 Microscan Systems, Inc. SP052G-EN-0217

Read Range and other performance data is determined using high quality Grade A symbols per ISO/IEC 15415 and ISO/IEC 15416 in a 25° C environment. For application-specific Read Range results, testing should be performed with symbols used in the actual application. Microscan Applications Engineering is available to assist with evaluations. Results may vary depending on symbol quality. **Warranty:** For current warranty information on this product, please visit [www.microscan.com/warranty](http://www.microscan.com/warranty).

**MICROSCAN**  
[www.microscan.com](http://www.microscan.com)