INNOVATIONS IN OPTICS

# LumiDL™ Modular Illuminator

## Features

- UV Powers of 25-35 Watts (18 die array)
- Designs for Large Format TI DLP™ Chipsets
- Multi-wavelengths in one illuminator
- Non-imaging Etendue Preserving Optics
- Bi-telecentric Lens System
- Recirculating Liquid Heat Exchanger
- Field Replaceable Light Engine – FRU

## Applications

### Industrial

- Direct imaging Lithography
- Laser Markings and Repair Systems
- Computer to Plate Printers
- Rapid Prototype Machines

### Medical

- Ophthalmology
- Photo Therapy
- Hyperspectral Imaging

The LumiDL™ Illuminator allows unprecedented speed and resolution for Ultraviolet DLP applications by providing highly uniform flux density over large areas. The patented, modular device couples a densely packed UV-LED array to a high efficiency, non-imaging collection optic integrated with a telecentric imaging optic optimized to the DLP chipset.

The LumiDL™ is sold as a kit, including the optics module and a driver. The optics module is easily mounted with kinematic registration on a flange mount. The field replaceable unit (FRU) provides fast, easy light engine replacement with no need for re-alignment or adjustment.

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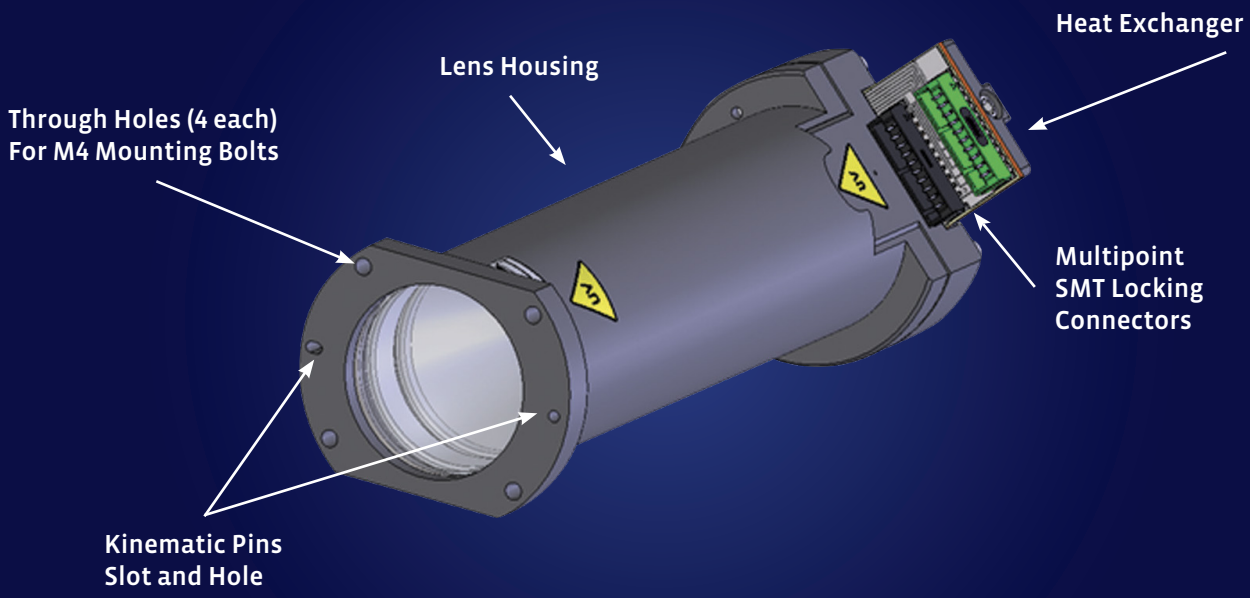
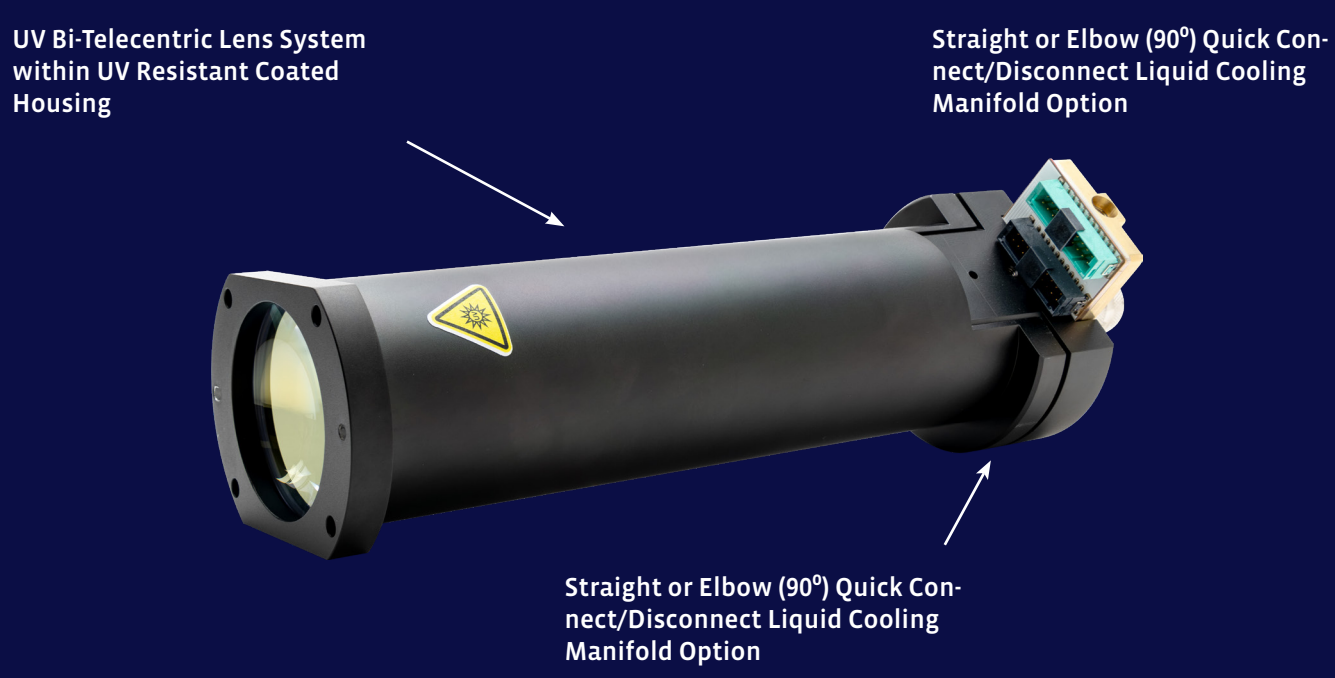
# LumiDL™ – Illuminator Assembly




# Modular Design for Field Serviceability




- Field Replaceable Unit (FRU) is pre-aligned, calibrated, with quick disconnects for coolant
- Provides fast, easy replacement with no need for re-alignment or adjustment

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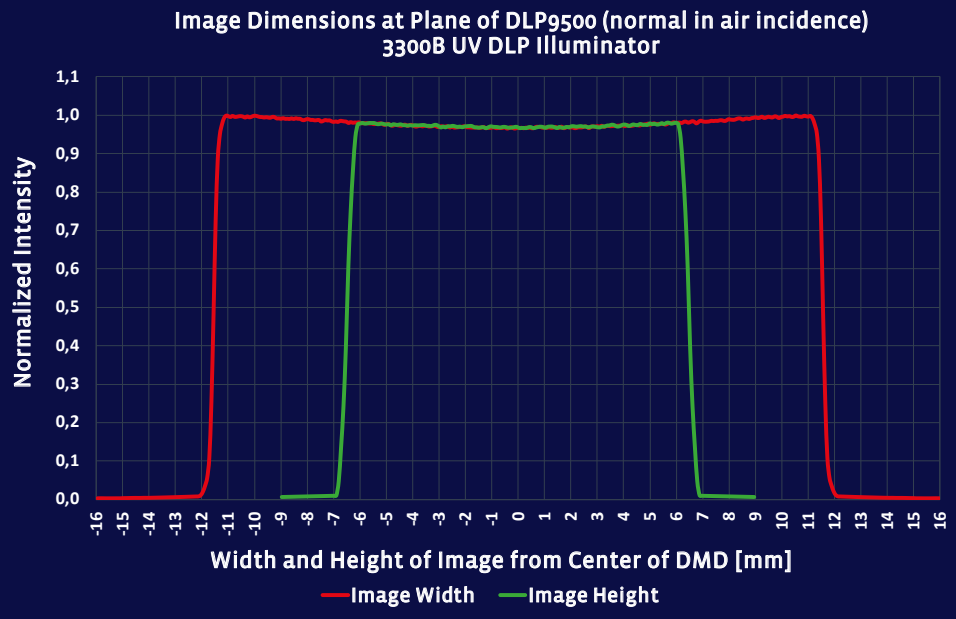
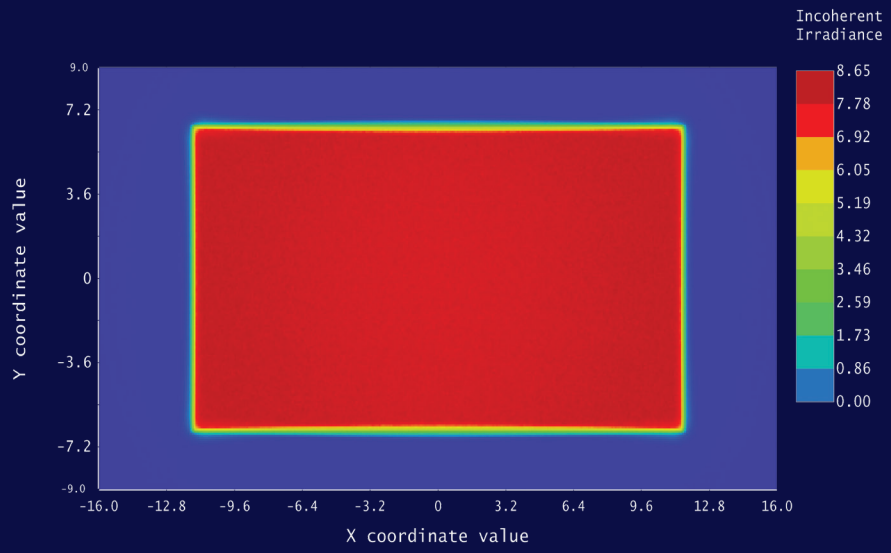
# LumiDL™ – Excellent Spatial Uniformity

LumiDL™ optical design provides highly uniform flux density over large areas

Radiant flux is confined to 12° acceptance half-angle and DLP active area

Illumination overfill of the DLP relaxes positional tolerances along optical axis




Detector Image: Incoherent Irradiance

1/4/2021
Detector 55, NSCG Surface 1: DMD Plane
Size 32.000 W X 18.000 H Millimeters, Pixels 400 W X 200 H, Total Hits = 3628605079
Peak Irradiance : 8.6495E+00 Watts/cm^2
Total Power : 2.5266E+01 Watts

Zemax
Zemax OpticStudio 16.5 SP1

3300B DMD Illuminator Production Design-18 Die-NSC-1 uniformity plot.zmx

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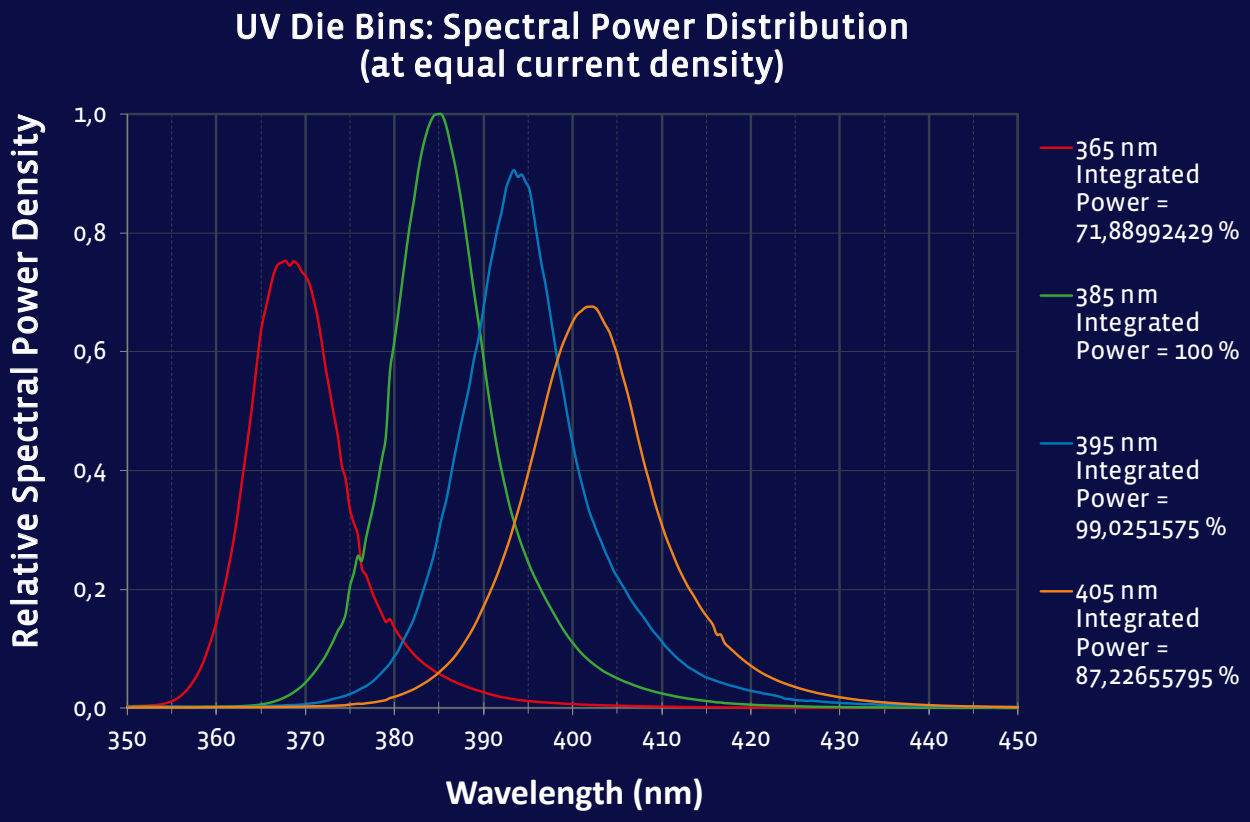
# LumiDL™ – Excellent Spatial Uniformity

- LED die are available in a range of UV and Violet wavelengths
- For example - Mercury - Xenon Lamp
  - 365nm – i-line
  - 405nm – h-line
- Mix of die is ideal for thicker UV resists
- Array can be populated to fit your needs

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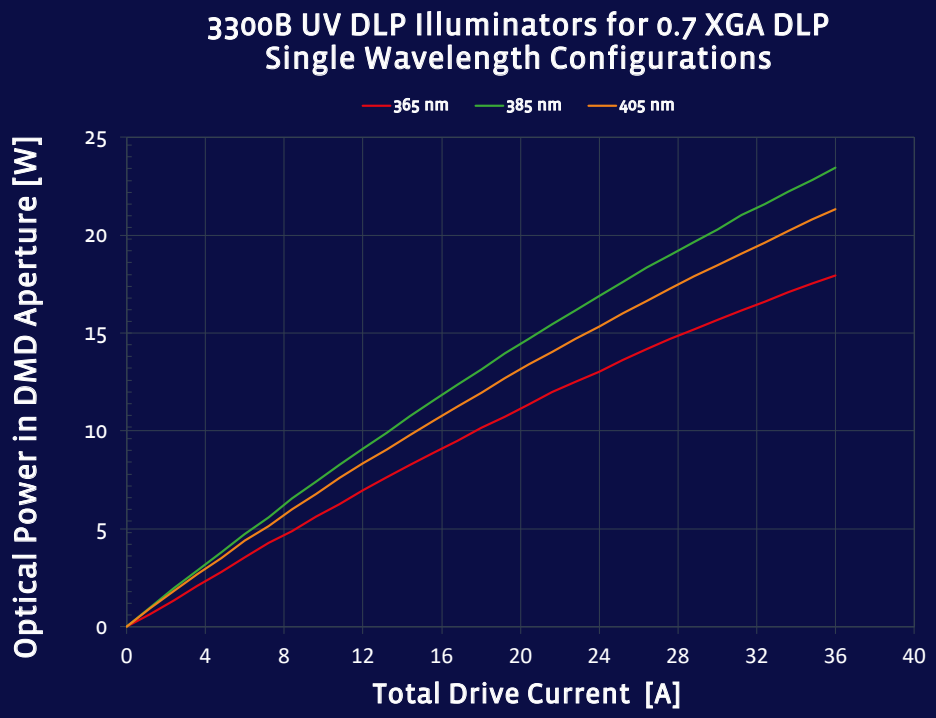
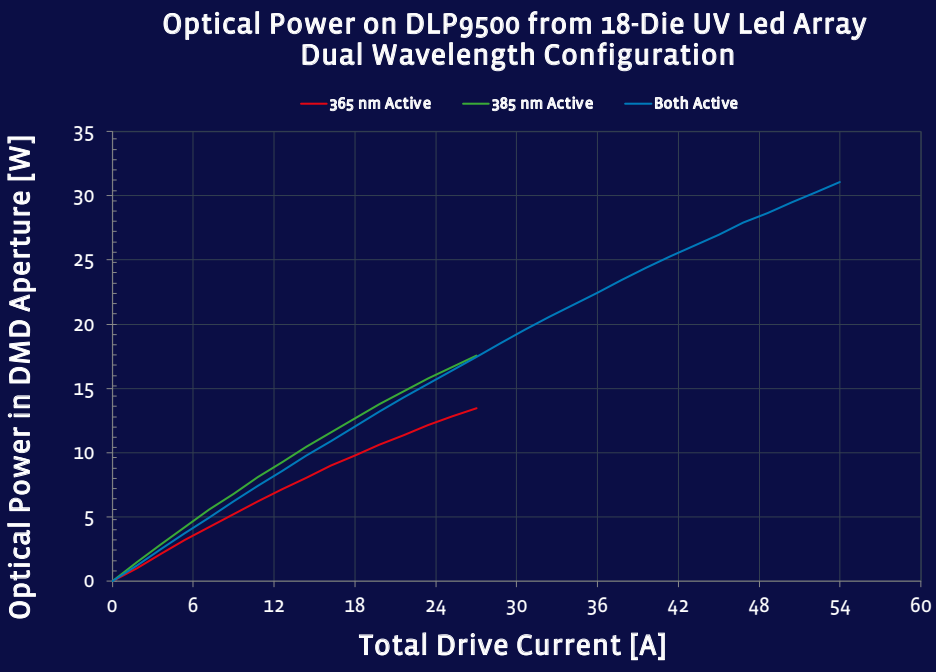
# LumiDL™ Total Flux – Single Wavelength




# LumiDL™ Total Flux – Dual Wavelength Configuration

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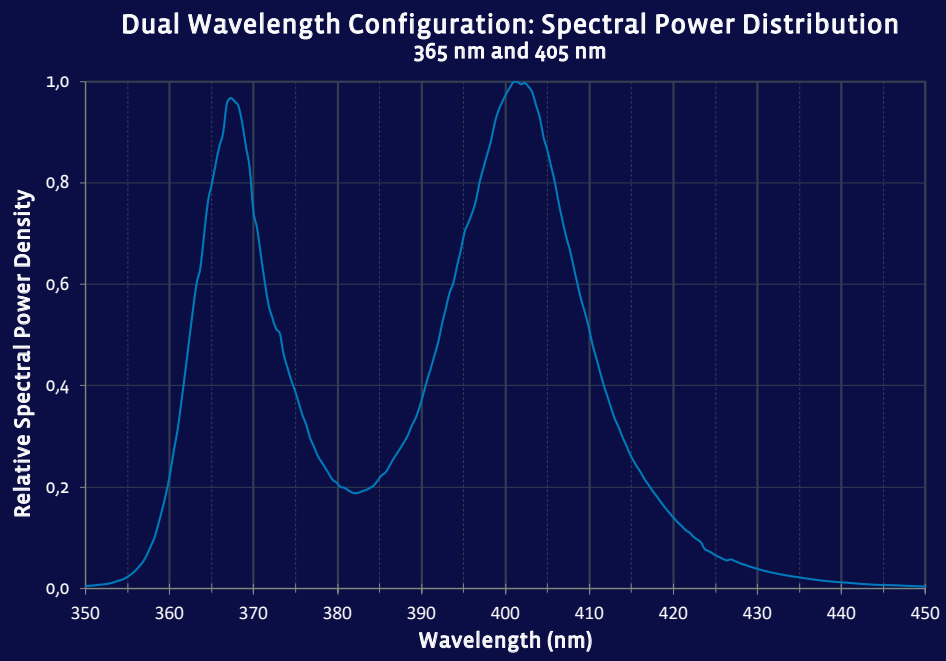
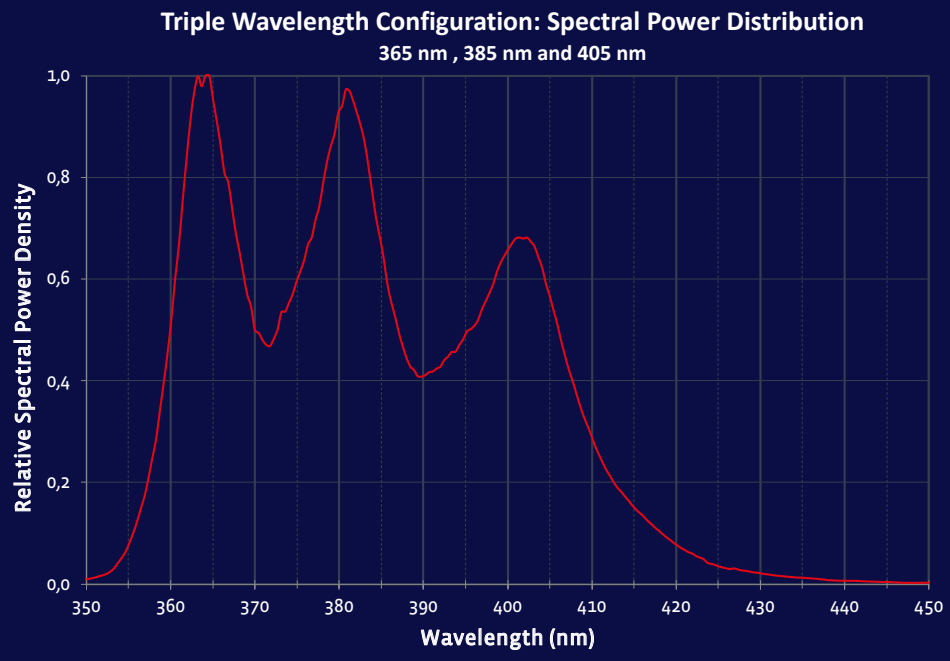
# LumiDL™ Wavelength Combination Options

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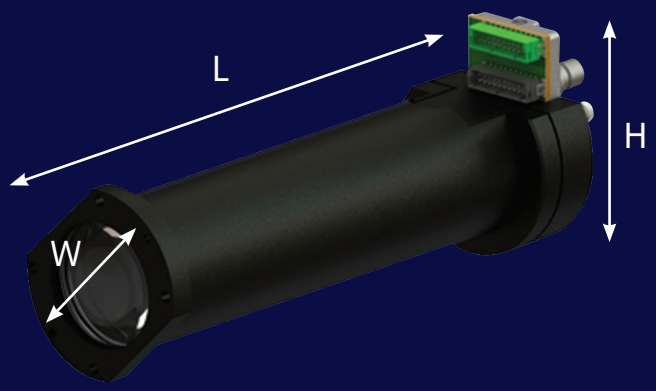
# LumiDL™ Specifications

| Parameter | Specification | Comment |
|---|---|---|
| Optical power output at 3 amps drive current | › 35 Watts | 18 array die |
| Drive current per channel / die | Min 0.30 Amps<br>Max 3.0 Amps | Continuous operation. Die can be driven individually. |
| Typical UV wavelength bins | 365 to 405 nm | Contact Sales Engineer for additional bins |
| Output numerical aperture | NA = 0.208 | Matches DLP +/- 12º micromirror tilt angle |
| Numerical aperature overfill | 5% | |
| Electrical power input | 300W | Typical Maximum |
| Operating environment | 15ºc to 35ºc | 5% to 85%, relative humidity, non-condensing |
| Thermal impedance | 10 kΩ | At 25ºc |
| Thermistor B25/85 | 3574-3646 | For 10 kΩ |
| Cooler fittings | Quick disconnect/No spill | Righ angle (artculating) or in-line |
| Liquid cooling supply | Use in-line filter on inlet | Must be 20 m rating |
| Mounting flange | Four through holes on 68mm diameter | 10mm depth for M4 bolts |
| | Kinematic hole/slot | Locks position/rotation |

# Dimensions

| L:ength | Height | Width |
|---|---|---|
| 272 mm | 76 mm | 85.5 mm |

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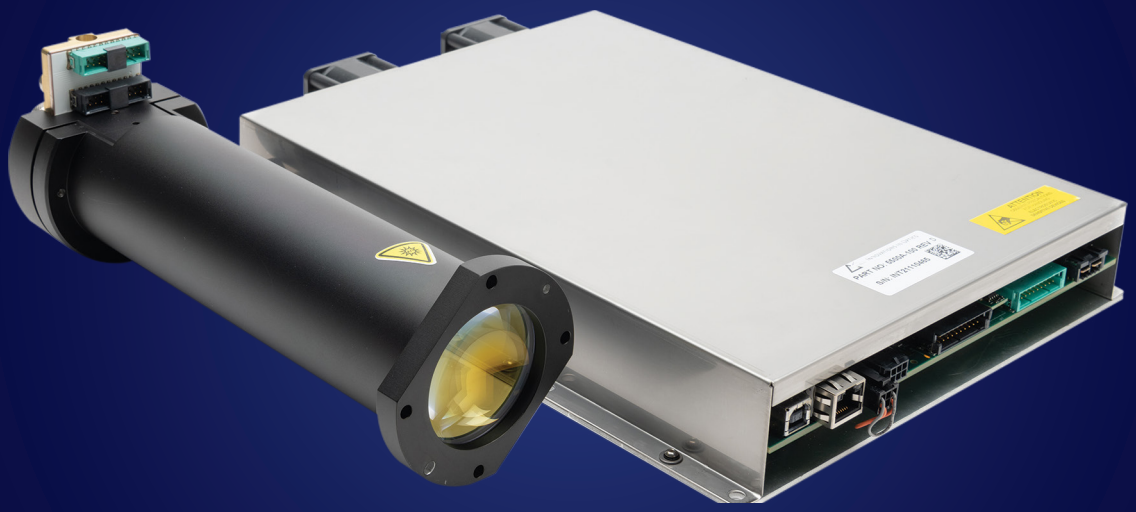
# Multi-Channel Driver/Controller 5500A Series



## Features

- Single constant current source
- Uniform drive current across array for precise exposure control
- Up to 5A each for up to 18 UV-LED die (maximum recommended for LumiDLTM is 3.0A per die)

## Connectivity

- Command set for Ethernet and Modbus serial communication
- External trigger



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