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THORLABS

LIU525A - September 2, 2015

Item # LIU525A was discontinued on September 2, 2015. For informational purposes, this is a copy of the website content at that time and is valid only for the stated product.

LED ARRAY LIGHT SOURCES

- **LED Light Sources with Intensities up to 4.0 mW/cm²**
- **Central Wavelengths from 365 to 850 nm**
- **Broadband White Option Available**

LIU470A
470 nm LED Array

PAA630
M8 Power Cord

AD38
Ø2" Mounting Adapter

LIU-PS
24 VDC Power Supply

LIU525A with an AD38 Ø2" Mounting Adapter Secured in a KS2 Kinematic Mount on a Ø1/2" Post

Hide Overview

OVERVIEW

Features

- LED Array Comprised of 20 High Brightness LEDs
- Longer Lifetime than Traditional Light Sources (up to 100,000 hours)
- LED Array Output Intensity can be Adjusted with a Customer-Supplied Variable Voltage Source
- Fits Many Commercially Available Camera Illumination Units
- Compatible with Thorlabs' 30 mm Cage System

Click to Enlarge
The photo above shows an LED array in a 30 mm cage system. When pushed together, the two cage plates clamp the LED array in place.

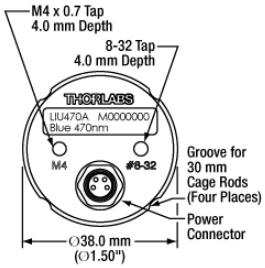
Thorlabs' LED Array Light Sources consist of 20 individual bright LEDs and are available with one of seven central wavelengths between 365 nm and 850 nm or with a broadband, cold-white output (see the graph below for the available emission spectra). The intensities of these LED arrays range from 0.26 mW/cm² to 4.0 mW/cm², as measured from 100 mm away along the emission axis.

Conveniently mounted in a Ø1.5" housing, these light sources can be used for a variety of lighting applications. The housing can be readily secured into most optical mounts used in camera illumination units. Additional mounting options include two threaded holes on the rear of the housing, one M4 and one 8-32 (see drawing below), as well as grooves running the length of the housing that allow the LED unit to be placed in a 30 mm cage system. The LED unit will be suspended by the cage rods but not restrained from moving along the optical axis of the cage system as shown in the photo above and to the right. To fix the position of the LED unit, clamp it between two fixed cage elements (see the *Application Idea* tab for more details). Thorlabs also offers a mounting adapter (Item # AD38) for these LEDs to be mounted in our Ø2" mirror mounts, such as the KS2 shown above.

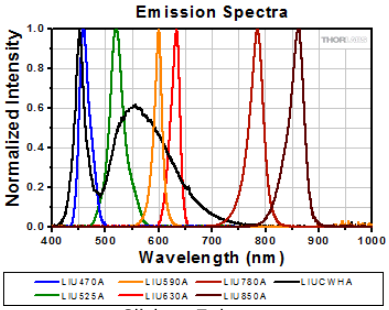
A power supply for the LED arrays must be purchased separately. We offer the LIU-PS below, which is a 24 VDC power supply designed for operating the LED arrays at full intensity. For custom applications, the PAA630 power cord is also available. This 2 m long cord has an M8 connector on one end and bare wires on the other. By combining the PAA630 power cord with a user-supplied variable voltage supply, the intensity of the LEDs can be controlled. At lower

voltages, only a selection of the individual LEDs will be illuminated. Internal circuitry is used to supply a constant current to the LEDs that varies with the applied voltage. The plot below and to the right shows the LED current vs. input voltage.

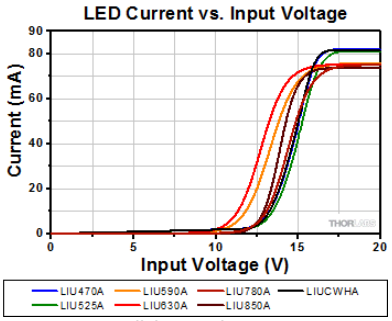
Please Note: During normal operation, the temperature of the LED housing can increase by as much as 25 °C above the ambient temperature. Avoid handling the LED housing while the LED is on or shortly after it has been turned off. These LED arrays are not compatible with Thorlabs' LED current controllers.



Click to Enlarge
The drawing above shows a back view of the LIU470A LED array.



Click to Enlarge
Click Here to Download Raw Data
The plot above shows the spectra for all of the LEDs on this page, measured using our CCS200 compact spectrometer.



Click to Enlarge
Click Here to Download Raw Data
This plot shows the LED current vs. input voltage. Internal circuitry is used to supply a constant current to the LEDs that varies with the applied voltage. The LED current remains constant up to the recommended 24 V.

Hide Pin Diagram

PIN DIAGRAM

Pin Diagram for LED Arrays

Pin	Specification	Wire Color on PAA630 Cable
1	24 VDC	Brown
2	Ground	White
3	Not Connected	Blue
4	Not Connected	Black

Please Note: The pin diagram above is viewed looking into the male plug. The above color scheme is standard for M8 connectors and can be used for external wiring applications. When the PAA630 cable is plugged into an LIU series unit, the table above relates cable wire color to unit pin number.

Hide Application Idea

APPLICATION IDEA

Dichroic Filters and Filter Wheel for Multi-Color Light Source

The image below and to the left shows the LIUCWHA white LED array being inserted between the 30 mm cage rods. The LED is sandwiched between a CFW6 30 mm Cage Filter Wheel and a CP03 30 mm Cage Plate so that it cannot slide along the cage rods. The Ø35 mm aperture of the CP03 cage plate allows for easy access to the power terminal located on the rear of the unit. The photo below and to the right shows the completed assembly.

In this application, the CFW6 was loaded with Ø1" dichroic filters (FD1R Red Filter, FD1G Green Filter, FD1B Blue Filter, FD1M Magenta Filter, FD1Y Yellow Filter, and FD1C Cyan Filter). When combined with the white LED array, the user can illuminate the sample, object, or subject with any of the primary or secondary colors by simply rotating the filter wheel.

For automated applications, the CFW6 can be replaced with either a FW102C or FW103H motorized filter wheel. In addition, these LED arrays can be mounted to any SM1-threaded (1.035"-40) motorized filter wheel that is not cage compatible by using 30 mm cage rods, an SM1T2 coupler, and a CP02 cage plate.

Click to Enlarge
To secure the LIUCWHA LED array within a 30 mm cage system, it can be sandwiched between two 30 mm cage components. Here, the LED array is being secured by the CFW6 filter wheel and the CP03 cage plate.

Click to Enlarge
The white LED array combined with our dichroic filters can be used to selectively illuminate a sample with a particular color.

Hide LED Selection Guide

LED SELECTION GUIDE

Light Emitting Diode (LED) Selection Guide									
(Click Representative Photo to Enlarge; Not to Scale)									
Type	**Unmounted LEDs**	**PCB-Mounted LEDs**	**Heatsink-Mounted LEDs**	**Collimated LEDs for Microscopy (Item # Prefix[a])**	**Fiber-Coupled LEDs[b]**	**High-Power LEDs for Microscopy**	**4-Wavelength LED Source Options[c]**	**Modulated LEDs for FLIM Microscopy**	**LED Arrays**
Wavelength									
245 nm	LED245W (0.07 mW)	-	-	-	-	-	-	-	-
255 nm	LED255J (1 mW Min)	-	-	-	-	-	-	-	-
260 nm	LED260W (0.3 mW) LED260J (1 mW Min)	-	-	-	-	-	-	-	-
265 nm	LED265W (0.3 mW)	-	-	-	-	-	-	-	-
275 nm	LED275W (0.8 mW) LED275J (1 mW Min)	-	-	-	-	-	-	-	-
280 nm	LED280J (1 mW Min)	M280D2 (25 mW Min)	M280L3 (25 mW Min)	-	M280F2 (323 µW)	-	-	-	-
285 nm	LED285W (0.8 mW)	-	-	-	-	-	-	-	-
290 nm	LED290W (0.8 mW)	-	-	-	-	-	-	-	-
300 nm	LED300W (0.5 mW)	-	-	-	-	-	-	-	-
310 nm	-	M310D2 (25 mW Min)	M310L3 (25 mW)	-	-	-	-	-	-
315 nm	LED315W (0.6 mW)	-	-	-	-	-	-	-	-
	LED341W	M340D2	M340L3						

340 nm	(0.33 mW)	(10 mW Min)	(10 mW Min)	-	-	-	-	-	-
365 nm	-	M365D1 (190 mW Min)	M365L2 (190 mW Min)	M365L2 (60 mW)[d]	M365F1 (4.1 mW)	-	Available (85 mW)	DC3100-365	LIU365A (31 mW)
		M365D2 (1150 mW Min)	M365LP1 (1150 mW Min)	M365LP1 (350 mW)[d]	M365FP1 (15.5 mW)				
370 nm	LED370E (2.5 mW)	-	-	-	-	-	-	-	-
375 nm	-	M375D2 (387 mW Min)	M375L3 (387 mW Min)	-	M375F2 (4.23 mW)	-	-	-	-
385 nm	-	M385D1 (270 mW Min)	M385L2 (270 mW Min)	M385L2 (90 mW)[d]	M385F1 (10.7 mW)	-	Available (95 mW)	-	-
		M385D2 (1650 mW Min)	M385LP1 (1650 mW Min)	M385LP1 (520 mW)[d]	M385FP1 (23.2 mW)				
395 nm	-	M395D3 (400 mW Min)	M395L4 (400 mW Min)	-	M395F3 (6.8 mW)	-	-	-	-
405 nm	LED405E (10 mW)	M405D1 (410 mW Min)	M405L2 (410 mW Min)	M405L2 (260 mW)[d]	M405F1 (3.7 mW)	-	Available (95 mW)	DC3100-405	-
		M405D2 (1500 mW Min)	M405LP1 (1500 mW Min)	M405LP1 (450 mW)[d]	M405FP1 (24.3 mW)				
420 nm	-	M420D2 (750 mW Min)	M420L3 (750 mW Min)	-	M420F2 (16.2 mW)	-	Available (290 mW)	-	-
455 nm	-	M455D2 (900 mW Min)	M455L3 (900 mW Min)	M455L3 (360 mW)[d]	M455F1 (11.0 mW)	-	Available (310 mW)	-	-
460 nm	-	-	-	-	-	SOLIS-460A(/M) (4175 mW)			
465 nm	LED465E (20 mW)	-	-	-	-	-	-	-	-
470 nm	LED470L (170 mW)	M470D2 (650 mW Min)	M470L3 (650 mW Min)	M470L3 (250 mW)[d]	M470F1 (10.1 mW)		Available (250 mW)	DC3100-470	LIU470A (253 mW)
490 nm	-	M490D2 (200 mW Min)	M490L3 (200 mW Min)	-	M490F2 (2.0 mW)		Available (50 mW)	-	-
505 nm	-	M505D2 (400 mW Min)	M505L3 (400 mW Min)	M505L3 (150 mW)[d]	M505F1 (8.0 mW)		Available (170 mW)	-	-
525 nm	LED525E (2.6 mW Max) LED528EHP (7 mW)	-	-	-	-	SOLIS-525A(/M) (1650 mW)	-	-	LIU525A (111 mW)
530 nm	-	M530D2 (350 mW Min)	M530L3 (350 mW Min)	M530L3 (130 mW)[d]	M530F1 (5.1 mW)	-	Available (100 mW)	-	-
565 nm	-	M565D2 (880 mW Min)	M565L3 (880 mW Min)		M565F1 (2.0 mW)	-	Available (106 mW)	-	-

590 nm	LED591E (2 mW)	M590D2 (160 mW Min)	M590L3 (160 mW Min)	M590L3 (60 mW)[d]	M590F1 (3.2 mW)	-	Available (65 mW)	-	LIU590A (109 mW)
595 nm	-	M595D2 (445 mW Min)	M595L3 (445 mW Min)	-	-	-	-	-	-
617 nm	-	M617D2 (600 mW Min)	M617L3 (600 mW Min)	M617L3 (230 mW)[d]	M617F1 (10.8 mW)	-	Available (210 mW)	-	-
623 nm	-	-	-	-	-	SOLIS-623A(/M) (2530 mW)	-	-	-
625 nm	-	M625D2 (700 mW Min)	M625L3 (700 mW Min)	M625L3 (270 mW)[d]	M625F1 (10.1 mW)	-	Available (240 mW)	-	-
630 nm	-	-	-	-	-	-	-	DC3100-630	LIU630A (208 mW)
635 nm	LED631E (4 mW) LED635L (170 mW)	-	-	-	-	-	-	-	-
639 nm	LED630E (7.2 mW)	-	-	-	-	-	-	-	-
660 nm	-	M660D1 (270 mW Min)	M660L3 (270 mW Min)	M660L3 (370 mW)[d]	M660F1 (14.5 mW)	-	Available (210 mW)	-	-
730 nm	-	M730D2 (515 mW Min)	M730L4 (515 mW Min)	M730L4 (165 mW)[d]	-	-	-	-	-
740 nm	-	-	-	-	M740F2 (6.0 mW)	-	-	-	-
780 nm	LED780E (18 mW)	M780D2 (200 mW Min)	M780L3 (200 mW Min)	M780L3 (130 mW)[d]	M780F2 (7.5 mW)	-	-	-	LIU780A (315 mW)
810 nm	-	M810D2 (325 mW Min)	M810L3 (325 mW Min)	M810L3 (210 mW)[d]	M810F2 (6.5 mW)	-	-	-	-
850 nm	LED851W (8 mW) LED851L (13 mW)	M850D2 (900 mW Min)	M850L3 (900 mW Min)	M850L3 (330 mW)[d]	M850F2 (13.4 mW)	-	-	-	LIU850A (322 mW)
870 nm	LED870E (22 mW)	-	-	-	-	-	-	-	-
880 nm	-	M880D2 (300 mW Min)	M880L3 (300 mW Min)	-	M880F2 (3.4 mW)	-	-	-	-
910 nm	LED910E (12 mW)	-	-	-	-	-	-	-	-
940 nm	LED940E (18 mW)	M940D2 (800 mW Min)	M940L3 (800 mW Min)	M940L3 (320 mW)[d]	M940F1 (6.5 mW)	-	-	-	-
970 nm	-	M970D2 (35 mW Min)	M970L3 (35 mW Min)	-	M970F2 (0.3 mW)	-	-	-	-
1050 nm	LED1050E (2.5 mW)	M1050D1 (50 mW Min)	M1050L2 (50 mW Min)	-	M1050F1 (1.4 mW)	-	-	-	-
1070 nm	LED1070E (7.5 mW)	-	-	-	-	-	-	-	-

1200 nm	LED1200E (2.5 mW)	M1200D2 (30 mW Min)	M1200L3 (30 mW Min)	-	-	-	-	-	-
1300 nm	LED1300E (2 mW)	M1300D2 (25 mW Min)	M1300L3 (25 mW Min)	-	-	-	-	-	-
1450 nm	LED1450E (2 mW)	M1450D2 (31 mW Min)	M1450L3 (31 mW Min)	-	-	-	-	-	-
1550 nm	LED1550E (2 mW)	M1550D2 (31 mW Min)	M1550L3 (31 mW Min)	-	-	-	-	-	-
1650 nm	LED1600P (1.2 mW)	-	-	-	-	-	-	-	-
1750 nm	LED1700P (1.2 mW Quasi-CW, 30 mW Pulsed)	-	-	-	-	-	-	-	-
1850 nm	LED1800P (0.9 mW Quasi-CW, 20 mW Pulsed)	-	-	-	-	-	-	-	-
1950 nm	LED1900P (1.0 mW Quasi-CW, 25 mW Pulsed)	-	-	-	-	-	-	-	-
2050 nm	LED2050P (1.1 mW Quasi-CW, 28 mW Pulsed)	-	-	-	-	-	-	-	-
2350 nm	LED2350P (0.8 mW Quasi-CW, 16 mW Pulsed)	-	-	-	-	-	-	-	-
4200 nm	LED4300P (0.01 mW Quasi-CW, 0.2 mW Pulsed)	-	-	-	-	-	-	-	-
4500 nm	LED4600P (0.006 mW Quasi-CW, 0.12 mW Pulsed)	-	-	-	-	-	-	-	-
467.5 nm, 525 nm, and 627.5 nm	LEDRGBE (5.8 mW, 6.2 mW, and 3.1 mW)	-	-	-	-	-	-	-	-
470 - 850 nm	-	MBB1D1 (70 mW Min)	MBB1L3 (70 mW Min)	-	MBB1F1 (1.2 mW)	-	-	-	-
6500 K (Cold White)	LEDWE-15 (13 mW)	MCWHD2 (800 mW Min)	MCWHL5 (800 mW Min)	MCWHL5 (320 mW)[d]	-	SOLIS-1A(/M) (3070 mW)	-	-	LIUCWHA (250 mW)
5600 K (Cold White)		-	-	-	MCWHF1 (7.0 mW)		-	-	
3000 K (Warm White)	-	MWWHD1 (500 mW Min)	MWWHL3 (500 mW Min)	-	MWWHF1 (7.0 mW)		-	-	-

- These Collimated LEDs are compatible with the standard and epi-illumination ports on the following microscopes: Olympus BX/IX (Item # Suffix: -C1), Leica DMI (Item # Suffix: -C2), Zeiss Axioskop (Item # Suffix: -C4), and Nikon Eclipse (Bayonet Mount, Item # Suffix: -C5).
- Typical power when used with MM Fiber with Ø400 µm core, 0.39 NA.
- Our LED4D 4-Wavelength LED Source is available with select combinations of the LEDs at these wavelengths.
- Typical power for LEDs with the Leica DMI collimation package (Item # Suffix: -C2).

Hide LED Array Light Sources (Power Supply Not Included)

LED Array Light Sources (Power Supply Not Included)

Item #	LIU365A	LIU470A	LIU525A	LIU590A	LIU630A	LIU780A	LIU850A	LIUCWHA
Image (Click to Enlarge)								
Color	UV[a]	Blue	Green	Orange	Red	Infrared (IR)	Infrared (IR)	Cold White
Central Wavelength	365 nm	470 nm	525 nm	590 nm	630 nm	780 nm	850 nm	N/A
Intensity[b]	0.26 mW/cm^2	4.0 mW/cm^2	1.8 mW/cm^2	1.4 mW/cm^2	2.4 mW/cm^2	3.7 mW/cm^2	3.5 mW/cm^2	3.0 mW/cm^2
Total Output Power	31 mW	253 mW	111 mW	109 mW	208 mW	315 mW	322 mW	250 mW
Typical Max Current	80 mA							
Supply Voltage[c]	24 V							
Operating (Ambient) Temperature	0 to 40 °C (Non-Condensing)							
Storage Temperature	-40 to 70 °C							
Emission Spectrum[d]								

- The visible appearance of this UV LED can vary from violet to cold white. This does not represent a significant change in the spectrum.
- When measured at a distance of 100 mm from the LED along the emission axis.
- Internal circuitry is used to supply a constant current to the LEDs that varies with the applied voltage. The supply voltage of 24 V is generally required for full intensity.
- Click the graph icon to view the emission spectrum of each LED unit. Click here to download raw data.

Part Number	Description	Price	Availability
LIU365A	**365 nm UV LED Array Light Source (Power Supply Not Included)**	**$656.00**	**Lead Time**
LIU470A	**470 nm Blue LED Array Light Source (Power Supply Not Included)**	**$227.00**	**Today**
LIU525A	**525 nm Green LED Array Light Source (Power Supply Not Included)**	**$227.00**	**Today**
LIU590A	**590 nm Orange LED Array Light Source (Power Supply Not Included)**	**$318.00**	**Today**
LIU630A	**630 nm Red LED Array Light Source (Power Supply Not Included)**	**$227.00**	**Today**
LIU780A	**780 nm Infrared (IR) LED Array Light Source (Power Supply Not Included)**	**$277.00**	**Today**
LIU850A	**850 nm Infrared (IR) LED Array Light Source (Power Supply Not Included)**	**$277.00**	**Today**
LIUCWHA	**Cold White LED Array Light Source (Power Supply Not Included)**	**$227.00**	**Today**

Hide LED Array Power Supply and M8-Connectorized Power Cord

LED Array Power Supply and M8-Connectorized Power Cord

To power the LED arrays sold above, two options are available. The LIU-PS is a 24 VDC power supply designed to power the LIU LED Arrays at full intensity. It is shipped with four plug adapters: plug type A (North America and Japan), plug type C (Europe), plug type G (UK and Ireland), and plug type I (Australia and New Zealand).

We also offer the PAA630, a 2 m long power cord with an M8 connector on one end and four bare wires on the other end. Click to Enlarge
The M8 connector is compatible with the receptacle on the LIU LED Arrays, allowing them to be easily connected to an existing power supply.

Note: This power supply is only intended for use with the LED arrays sold above. It is not compatible with our High-Power Mounted LEDs, Collimated LEDs, or Fiber-Coupled LEDs.

Part Number	Description	Price	Availability
LIU-PS	DC Power Supply for LIU Series LED Array, 24 V	$59.70	Today
PAA630	2 m LED Light Source Power Cord, M8 Straight Socket	$18.50	Today

Hide LED Mounting Adapter

LED Mounting Adapter

The AD38 double-bored mounting adapter holds an LIU LED Array in place with a single 8-32 nylon-tipped setscrew. The adapter ring has a 2" outer diameter for compatibility with our Ø2" optic mounts, such as the KC2 kinematic mount shown to the right. To mount the LED array, simply secure it within the adapter with the top-located setscrew, slide the LED array and adapter into desired mount, and secure the adapter with either a setscrew or an SM2RR retaining ring, depending on the mount.

Click to Enlarge
The AD38 mounting adapter is used to secure an LED array inside a KC2 kinematic mount.

Part Number	Description	Price	Availability
AD38	Ø2" to Ø38 mm Mount Adapter for LIU Series LED Array	$17.30	Today

Visit the *LED Array Light Sources* page for pricing and availability information:
https://www.thorlabs.com/newgrouppage9.cfm?objectgroup_id=2853