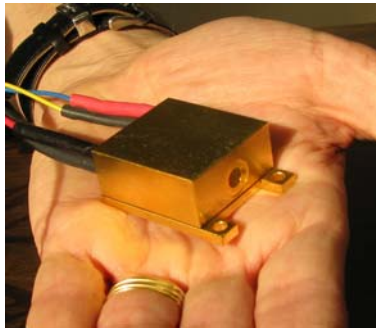




## MK-11

# Diode Pumped Eye-Safe Microlaser

Diode Pumped Solid State (DPSS) High Efficiency Side Pumped (HESP) Laser



**1Hz, ~ 1mJ**  
**~ 6ns, 1534nm**  
**~ 0.6" x 1.2" x 1.8"**

**The MK-11 produces ~ 1mJ over  
temperature -45 to +71 Deg. C**

<b>Laser Wavelength</b>	<b>1534 nm</b>
<b>Pump Voltage &amp; Amps</b>	<b>2V, 100+A</b>
<b>Output Energy</b>	<b>0.8mJ minimum</b>
<b>Laser Output Pulwidth</b>	<b>~ 6ns</b>
<b>Raw Beam Diameter</b>	<b>~0.8mm</b>
<b>Beam Divergence</b>	<b>~ 6mrad</b>
<b>Beam Wander</b>	<b>&lt;0.5mrad</b>
<b>Pulse Rep-rate</b>	<b>1 Hz</b>
<b>Laser Head Size</b>	<b>0.65"x 1.2"x 1.8"</b>
<b>Laser Head Weight</b>	<b>~ 100 grams</b>
<b>Conductive Cooling Requirements</b>	<b>~ 0.5 watts*</b>
<b>Operating Temperature Range</b>	<b>-45 to +71 °C</b>
<b>Storage Temperature</b>	<b>-55 to +90°C</b>
<b>* For Continuous Duty Operation</b>	
<b>Spectral Bandwidth FWHM 4.5nm</b>	<b>10% points 8nm</b>



## MK-830-PS Laboratory Diode Driver

Kigre's MK-830-PS laboratory laser diode driver is for use with the MK-830, MK-88, MK-85, MK-82, MK-81 and MK-11 laser heads. The driver features precision pulsed current operation and supports the HESP family eye-safe laser diode requirements. A USB cable and software are provided so that the customer may use their computer as a laser controller. The driver operates over an extremely wide AC input voltage range and includes ultra-high performance hold-up capacitors for stable pulsed current control up to 140 Amps. Soft-start control, active current limiting, transient filtering, and a mechanical shorting relay provide robust protection for the laser diode even when power is removed. HESP laser customers are provided electrical engineering support to facilitate HESP laser integration. This includes access to Kigre's laboratory diode driver schematics, surface mount board vendors, parts list, and power supply design support.

The HESP lasers contain a built-in photodiode that is used to turn off the pump pulse as soon as the laser pulse is emitted. The laser's photodiode signal may also be used as a "To" (time zero) for a range counter or other event timing. The pump pulse-width is typically between 1.5 and 2.5ms depending upon the laser head's temperature and operating conditions. We time out the pulse at a maximum of 3.4ms for safety to prevent the pump diodes from runaway CW operation. Laser pump pulses greater than 3ms are near the point of diminishing returns with regard to laser output energy and system efficiency.

A useful method for monitoring the laser's internal temperature is to look at the pump current pulse width. Specifically, this pulse width should not exceed 3 milliseconds. You'll notice that the pump pulse width will increase as the laser heats up. This is due to the loss of efficiency. Once the pump pulse width gets beyond 3mS, the efficiency of the laser drops dramatically and the pump pulse width will rise quickly - indicating an overheated condition. Please do not operate the laser if the pump current pulse width exceeds 3mS.

We suggest the use of a Tektronix model # A622 probe. The probe should be located between the driver and the laser. You can clip on a section of the red wire anywhere in the laser cable.

Datasheet for current probe:

<http://www2.tek.com/cmswpt/psdetails.lotr?ct=PS&ci=13510&cs=psu&lc=EN>

To purchase the probe:

<http://www.alliedelec.com/search/productdetail.aspx?SKU=7000622>

Pump Pulsewidth: Approximately 1.5mS (photodiode feedback controlled)

Internal Photodiode: Hamamatsu # G8376-05 (InGaAs, 0.5mm Ø active area)

Link to Photodiode Datasheet:

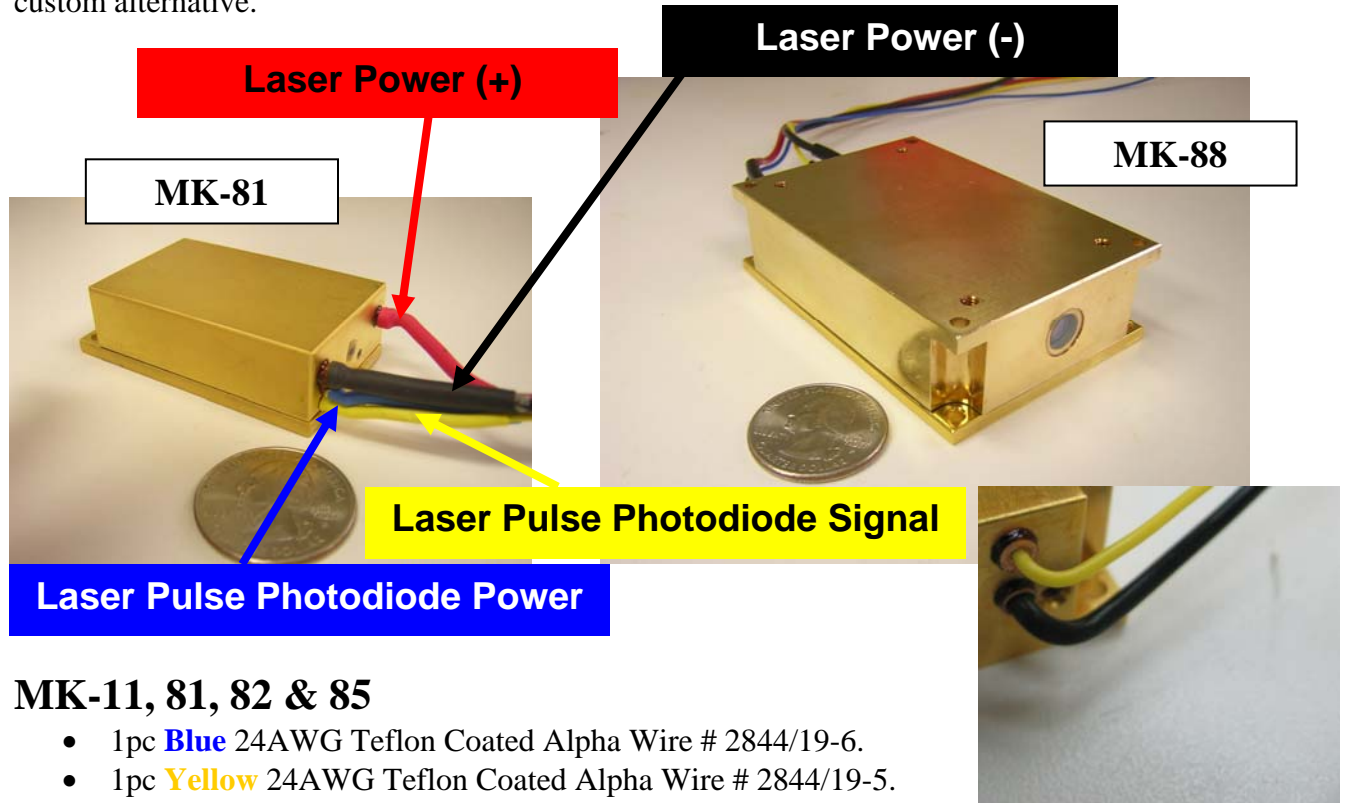
[http://sales.hamamatsu.com/assets/pdf/parts\\_G/g8376\\_series\\_kird1051e05.pdf](http://sales.hamamatsu.com/assets/pdf/parts_G/g8376_series_kird1051e05.pdf)

**KIGRE, INC.**, 100 Marshland Road, Hilton Head, SC 29926  
PH:(843) 681-5800 FAX: (843) 681-4559 Web site: [www.kigre.com](http://www.kigre.com)  
E-mail: [info@kigre.com](mailto:info@kigre.com)



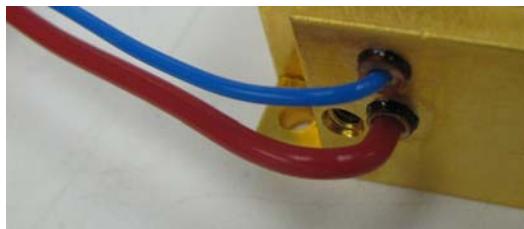
## HESP Laser Flying Lead Electrical Interface

Kigre has developed a highly flexible flying lead electronics interface using Teflon coated wire and a unique high strength strain relief support through the enclosure bulkhead. The standard configuration for Kigre's HESP laser products is rear exit flying leads. Side exit flying leads are a custom alternative.



### MK-11, 81, 82 & 85

- 1pc **Blue** 24AWG Teflon Coated Alpha Wire # 2844/19-6.
- 1pc **Yellow** 24AWG Teflon Coated Alpha Wire # 2844/19-5.
- 1pc **Red** 20AWG Teflon Coated Alpha Wire #5856-3.
- 1pc **Black** 20AWG Teflon Coated Alpha wire #5856-2.

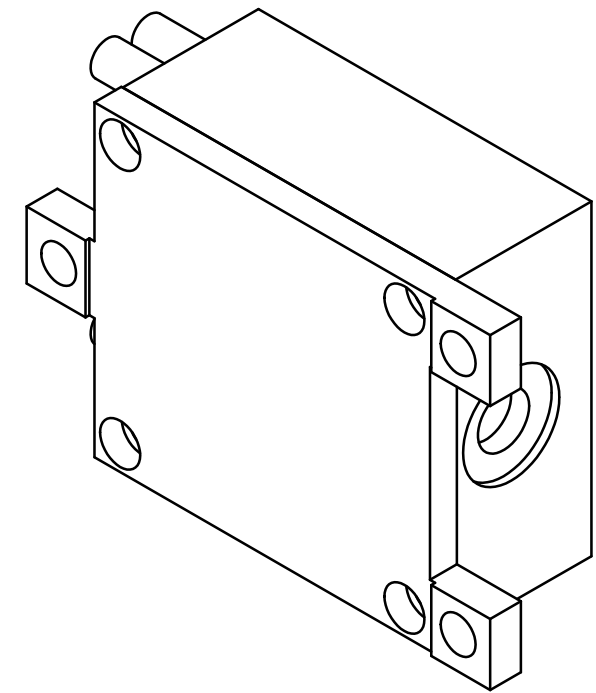
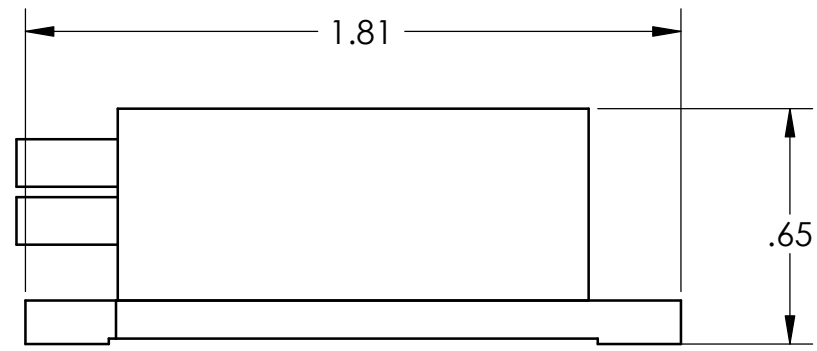


### MK-84, 88 & 830

- 1pc **Blue** 24AWG Teflon Coated Alpha Wire # 2844/19-6.
- 1pc **Yellow** 24AWG Teflon Coated Alpha Wire # 2844/19-5.
- 1pc **Red** 16AWG Teflon Coated Alpha Wire #5858-3.
- 1pc **Black** 16AWG Teflon Coated Alpha wire #5858-2.

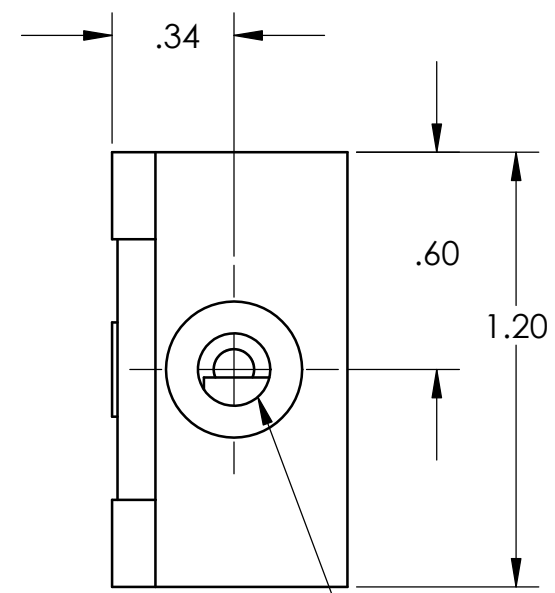
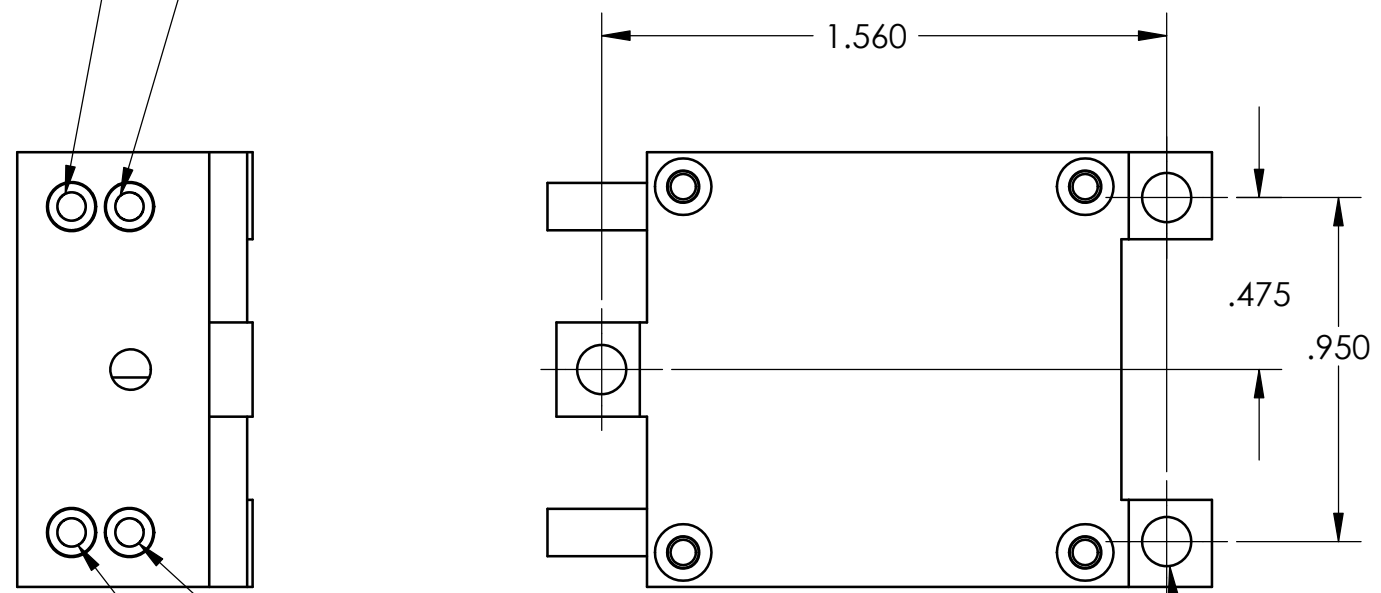
8 7 6 5 4 3 2 1

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED



DIODE POER (+) 18 AWG RED WIRE

DIODE POER (-) 18 AWG BLACK WIRE



PHOTODIODE SIGNAL RETURN  
(22 AWG YELLOW WIRE)

PHOTODIODE POWER  
(22 AWG BLUE WIRE)

3X  $\phi$ .136THRU  
MOUNTING HOLE

LASER BEAM OUTPUT

**PROPRIETARY AND CONFIDENTIAL**  
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF KIGRE INC. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF KIGRE INC. IS PROHIBITED.

UNLESS OTHERWISE SPECIFIED:	
DIMENSIONS ARE IN INCHES	
TOLERANCES:	
FRACTIONAL $\pm$	
ANGULAR: MACH $\pm$ BEND $\pm$	
TWO PLACE DECIMAL $\pm$ .01	
THREE PLACE DECIMAL $\pm$ .003	
INTERPRET GEOMETRIC TOLERANCING PER:	
MATERIAL	
FINISH --	
NEXT ASSY	USED ON
APPLICATION	

NAME	DATE
DRAWN BP	3/10/09
CHECKED	
ENG APPR.	
MFG APPR.	
Q.A.	
COMMENTS:	



LASER HEAD OUTLINE,  
MK11

SIZE	DWG. NO.	REV
<b>B</b>	B1538	<b>A</b>

SCALE: 2:1 WEIGHT: SHEET 1 OF 1

8 7 6 5 4 3 2 1