

DLR 400 UB

Red diode laser module

Technical manual



Here, at MediaLas, we truly believe that Laser is the world's most beautiful lighting entertainment technology today. We do not mean to disrespect or degrade any other lighting effect, but the homogenous coherent light beam of a laser is the most unique lighting entertainment effect ever created.

“Everything we do is dedicated to the laser light”, founder and president of MediaLas, Dirk Baur, says. "We envision a world where those who work with lasers in live shows and presentations can bring out the very best from any performance, and where the possibilities of laser light performances are endless."

Our mission is lead by a simple rule:

Bring the best performance at highest possible level for a humanized and affordable cost.

So this is how we create our show laser tools. This is how we created legends like CATWEAZLE scanner, Mystiqe showlasers, or the new thrilling and freshly awarded Infinity showlaser system. It also means, that there is a group of engineers and technicians, research specialists and laserists sitting in Balingen/Germany, who spend most of their living time on the dedicated love to laser lights. This passion creates legends!

Our products focus on removing barriers and bringing the best possible laser technology with inspiring creativity in performance. Check out our range and features on our website, or visit us during a demo day or trade show worldwide!

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Global Features

- High brightness
- Modulation up to 100 kHz
- Air Cooling
- Very good beam properties
- Integrated driver and TEC control
- Very compact and rugged housing



Main Applications

Ultra stable and powerful red laser modules for marking, pointing, show and light applications. Solid aluminum housing with integrated driver and active cooling for diodes. Very good beam properties with low divergence, useful in RGB mixed laser systems.

Specification

Wavelength	637nm +/-3nm
Optical power	CW, 380 - 400mW
Beam mode	Multimode
Beam diameter (1/e ²)	< 3.5 mm
Beam divergence (1/e ²)	< 0.8 mrad
Modulation	< 100 KHz, 0-5VDC analog input, single ended against GND
Polarization	Random, no polarization
Operating power	12VDC / 4A peak, 2A nom.
Optimal operation temperature	5 °C to + 35 °C
Warm up time	ca. 5 min
Cooling type	Active TEC
Size Laser-head (l x w x h)	142 mm x 60 mm x 47 mm
Beam height from base	ca. 30mm
Operating hours (at 10 h / day)	Typ. > 5.000 h

General description

The DLR 400 UB module was mainly designed for laser show and light show applications, where a powerful red laser beam is needed. The analog modulation input improves speed of the display system, by offering a modulation frequency of up to 100kHz. Internal stabilization, adaption to the diode's characteristic, and the integrated TEC cooling, increased the module's lifetime, and offers a very bright red beam. The sealed aluminum housing, milled of raw aluminum bricks, offers a thitherto unknown stability and ruggeness of the module. Internal limiters ensure a safe operation, and switches of diode current at unsafe temperatures.

Important!

Pls read this manual carefully before installing and operating the laser module. Wrong operation or installment can decrease lifetime of the laser diodes! Do not remove warranty stickers from the laser unit, to avoid loss of warranty.

Mounting

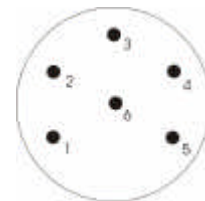
It is essential to mount the laser unit on a proper heat sink to remove the heat coming from the TEC elements inside the unit. The bottom of the laser unit must be in good thermal contact to the heatsink. Use only special heat pads, supplied by MediaLas. If no heatsink is available, the module will work for a few minutes only. Wrong use of the laser module can result in a internal structure failure, and could destroy the TEC elements. This is not a warranty failure.

Be **EXTREMELY** careful, not to bend the laser housing during mounting procedure! **Tight screws only very light**, to make sure, the unit is not moving on the heat sink pad. The DLR will stick on the heat pad very tight, the screws are just used for fixing the unit and secure against movement

Connection

There are four cables at 6 pins coming from the 6-pin connector. View is from end of laser unit onto female connector.

- Pin 3+6: Source + 12VDC, red cable
- Pin 4+5: Source GND, blue cable
- Pin 2: Modulation +5V, yellow cable
- Pin 1: Modulation GND, black cable



Use minimum 0.75 mm² wires for the source, to avoid voltage drop from source to laser. We recommend to use 1 mm² wires. Check for a proper connection to the supply.

Signal description

Source: A source of 12VDC +/-1V has to be applied to run the diode laser unit. The source must be stabilized and ready to offer 4A continuous current. Use minimum 1mm² cabling. Operating voltage must be stabilized and peak free. Make sure to apply correct polarization.

Modulation: Digital or analog signal to trigger the laser output. If Low (0V) laser output is off, at approx. 0.7V, the laser output starts. The 0.7V trigger is done on purpose, to avoid any external signal influences on the modulation cable.

The laser can be adjusted in brightness by applying a signal between 0 and 5V to the modulation input. Avoid any influences on the input cabling. Signal has to be peak free. Do not run signal wires near switching power supplies or transformers.

Operation

The DLR 400 UB laser units can be operated continuously, if heat is removed adequate. Continuous operation does not reduce lifetime.

After applying voltage to the laser unit, the internal heat control will bring the diodes to optimal temperature. Give the unit time to warm up. After 5-10 minutes the optimum internal temperature is reached and beam divergence will reduce to minimum. As long as unit is connected to the source, and the module is properly mounted on a heatsink, temperature will be stable, even if laser is not triggered and there is no laser output. If diode temperature exceeds healthy parameters, the laser will shut down. This means, there was no good thermal contact to the extra heatsink or mounting plate. Let it cool down for minimum 60 minutes, attach the laser to an appropriate heatsink or large metal base plate and shut it on again. Continuous use on improper heatsink could destroy internal structure.

The laser is emitting slight straylight and some interference artefacts around the main laser beam. This is normal, due to the fact of high power optical mixing procedure. Under normal circumstances, this straylight is not visible during normal operation. If, for any reason, the artefacts are parasitic, use a small optical aperture in front of the galvo mirrors. The larger the distance of the aperture to the beam exit, the better the extinction of the artefacts.