DUO Didactic Laser R-G DL1

OPERATOR'S MANUAL

Introduction

This manual provides everything about the DUO Didactic Laser. It contains all relevant information which is necessary for set up and handling with device. A manual is supplied with every product and is valid throughout its lifetime. Please read it carefully before using the device.
Thank you for buying this product.

Laser safety instructions

Light amplification by stimulated emission of radiation (LASER or laser) is a mechanism for emitting electromagnetic radiation, typically visible light, infrared or ultraviolet radiation. This mechanism produces intense beams of light. LASER is used mainly in measurement, industrial processing, medical diagnostics and surgery, for communication via optical fibers and many others. It is strictly forbidden to stare directly into the LASER. It may cause eye damage or blindness.

The norm EN 60825-1 categorizes lasers as follows:

Laser devices of classes 1, 1M, 2, 2M, 3R, 3B and 4
Short-time irradiation (0,25sec.) in a wavelength range between 400nm and 700nm is not considered to be dangerous (except of the classes 3B and 4). However, you should not point the beam at people for a long time.

Rules for laser safety

- Lasers produce a very intense beam of light. Treat them carefully. Majority of the lasers produced by the company Kvant have an output less than 1mW and will not harm the skin.
- Never look into the laser aperture while the laser is turned on! PERMANENT EYE DAMAGE COULD RESULT.
- Never stare into the oncoming beam. Never use magnifiers (such as binoculars or telescopes) to look at the beam as it travels or when it strikes a surface.
- Never point a laser at anyone's eyes or face, no matter how far away they are.
- When using a laser in the classroom or laboratory, always use a beam stop, or project the beam to areas which people won't enter or pass through.
- Never leave a laser unattended while it is turned on and always unplug it when it's not actually being used.
- Never disassemble or try to adjust the laser's internal components. Electric shock could result.
- Do not drop the product or expose it to moisture or dust – it can be easily damaged.

DUO Didactic Laser

The DUO Didactic Laser is delicate optical and electronics equipment. It consists of two independent laser diode modules with **wavelength 635nm (red)** and **wavelength 532nm (green)**. This product refers to the Class 2 laser product. The DUO Didactic Laser contains laser diode modules that emits only red or green visible light. Ultra-violet, infrared, x-ray or other non-visible radiation is not emitted. Try to avoid direct contact of laser beam with eyes and skin, do not stare directly into a laser beam or at its reflections. Laser diode modules are not suitable to be used for cutting, drilling or burning. Use only for intentions that are suitable for this device.

Using of the DUO Didactic Laser

The output of the DUO Didactic Laser consists of two light beams that can be used for demonstration effects at optical elements. The DUO Didactic Laser is ideal for teaching the basics of optics. It is a modern light source like Didactic Laser DL1 and Green Didactic Laser GDL1, but includes both laser modules.
At the bottom part of the DUO Didactic Laser there is a gap for holder with diameter M6. (A possibility to order: steel stand - holder with M6).
At the front part of the DUO Didactic Laser there are six adjustable screws for taking up a position of the laser beams radiating from the apertures between them.

Following are the steps how to use the DUO Didactic Laser with the power supply properly:

1. Plug the power adapter into a grounded circuit.
2. Connect the power adapter cable to the DUO Didactic Laser.
3. Select the laser mode between red and green.
4. Push the button up to switch the red laser on (R-ON).
5. The LED indicator should illuminate red light and the red laser is on.
6. Push the button down to switch the green laser on (G-ON).
7. The LED indicator should illuminate green light and the green laser is on.
8. To turn the lasers off push the button to the OFF mode.

Technical specifications

Input voltage:	3V DC
Input current:	300mA
Operating temperature:	0 – 40^{0}C
Power optical output (red/green):	P_{max} < 1mW
Distance between rays:	25mm
Beam dimensions (red):	4 x 2mm
Beam diameter (green):	2mm
Dimensions (LxWxH):	158 x 30 x 60mm
Laser product:	CLASS 2
Laser type (red/green):	Diode/YV04
Wavelength (red/green):	635nm/532nm
Warm up time (for green LM):	<10min
Stability (for green LM):	< +-20%, 15°C-30°C

Electrical safety instructions and warranty

The DUO Didactic Laser is particularly safe because it operates at low wattage and current levels. However, as when using any electrical device, you must take certain safety precautions:

- Do not open the housing of the power adapter under any circumstances, as this will expose you to unshielded electrical connections.
- Do not open the device, otherwise the warranty is void.
- The warranty is invalid if damage is caused by incorrect use or inappropriate handling.

The set consists of:

- DUO Didactic Laser
- User's manual
- Power supply 110-240V AC/3V DC (optional)

Important and warning labels

Warning label for laser Class 2

This symbol on the product or on its packaging indicates that this product must not be disposed of with your other household waste. Instead, it is your responsibility to dispose of your waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment (WEEE). For more information about where you can drop off your waste equipment for recycling, please contact your local city office, our household waste disposal service or the shop where you purchased the product.