

## Diode Laser 1 mW with modulation



## OPERATOR'S MANUAL

## Introduction

This manual provides everything about the Diode Laser MLDD 3.0. 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.

## Diode Laser MLDD 3.0

The Diode Laser MLDD 3.0 is delicate optical and electronics equipment. It consists of one laser diode module with **wavelength 635nm**. This product refers to the Class 2 laser product. The Diode Laser MLDD 3.0 contains laser diode module that emits only **red** 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.

This semiconductor Diode Laser MLDD 3.0 is designed mainly for use in commercial, educational and scientific applications in physical laboratories. The main advantages in comparison with standard He-Ne laser are small size, low power consumption and possibility of electronic modulation. Long durability and low voltage operation are the next advantages of a such light source.

## Using of the Diode Laser MLDD 3.0

The Diode Laser MLDD 3.0 is updated version of Diode Laser MLDD 2.2 with adjustable output in the range from 0,02mW to 0,99mW. In contrast with its precursor it displays the emitting output power immediately on a display. The interconnector of the control unit with the laser head by means of a cable avoids any vibration of a laser by setting the experiment.

### **Setting up power optical output:**

Power optical output can be set by the potentiometer OPTICAL POWER in the range from 0,02mW to 0,99mW. Emitted power optical output of the laser diode is monitored through integrated photo diode and electronically stabilized by the MLDD unit to a demand value and can be monitored on a display.

### **Limiting power optical output:**

The power optical output is controlled by the MLDD unit.

### **Modulation:**

The MLDD unit allows modulation of an output signal with an external modulating signal. Low frequency modulation is allowed by 3.5 JACK connector (AUDIO-LF input). Low frequency range is from 100Hz to 10kHz. The Diode Laser MLDD 3.0 could be also used for a demonstration of transmission of audio and video signal.

**The front panel of the transmitter:**

- 1-Display of the power optical output
- 2-Input connector for external LF audio signal
- 3-Green LED light (indicating the power on)
- 4-Power switch with the key
- 5-Input connector for external HF video signal
- 6-Knob for controlling output power of laser beam
- 7-Laser module with the cable



**Following are the steps how to use the Diode Laser MLDD 3.0 with the power supply properly:**

1. Plug the power adapter into a grounded circuit.
2. Connect the power adapter cable to the Diode Laser MLDD 3.0.
3. Turn on the power switch on the MLDD unit. Turning the MLDD unit on is protected by the key. When the MLDD unit is connected to the power supply, turn the key to the right side to start the laser module connected by a cable with the MLDD unit on. When the MLDD unit is switched on, green LED light is on, too.
4. Adjust the power optical output of the laser module to the demanded level by turning the potentiometer on the MLDD unit. The value can be checked on the display at the MLDD unit.

**Technical specifications**

<i>Input voltage:</i>	12V DC
<i>Input current:</i>	500mA
<i>Operating temperature:</i>	0 – 40°C
<i>Power optical output:</i>	$P_{max} < 1mW$
<i>Dimensions (LxWxH):</i>	150x100x60mm
<i>Beam dimensions:</i>	4x2mm
<i>Laser Product:</i>	CLASS 2
<i>Laser type:</i>	Diode
<i>Wavelength:</i>	635nm
<i>LF input (audio):</i>	3.5 JACK
<i>LF frequency range:</i>	100Hz – 10kHz
<i>HF input (video):</i>	BNC
<i>HF frequency range:</i>	<20MHz (PAL,NTSC)

## Electrical safety instructions and warranty

The Diode Laser MLDD 3.0 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:**

- Diode Laser MLDD 3.0 (with laser module on the cable)
- Key
- User's manual
- Power supply 110-240 VAC/12 VDC



## 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.