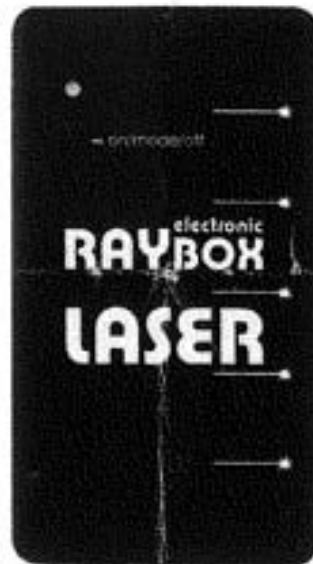


Laser Ray Box Electronic

zu beziehen bei

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OPERATOR'S MANUAL

Introduction

This manual provides everything about the Laser Ray Box Electronic. 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 (0,25 sec.) in a wavelength range between 400 nm and 700 nm 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 1 mW 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.

Laser Ray Box Electronic

The Laser Ray Box Electronic is delicate optical and electronics equipment. It consists of five independent laser diode modules with **wavelength 635 nm** which are optically adjusted to give pattern required. This product refers to the Class 2 laser product.

The Laser Ray Box Electronic contains laser diode modules that emit 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.

Using of the Laser Ray Box Electronic

The output of the Laser Ray Box Electronic consists of five light beams that can be used for demonstration effects at optical elements. This method shows the light interaction that is known as light ray tracing. Cylindrical lens act like parallel linear light source.

The bottom of the Laser Ray Box Electronic is magnetic which enables to use it together with magnet board, worksheets and optical modules from the Ray Optics Demonstration Set and Ray Optics Demonstration Set PLUS.

Following are the steps how to use the Laser Ray Box Electronic with the power supply properly:

1. Plug the power adapter into a grounded circuit.
2. Connect the power adapter cable to the Laser Ray Box Electronic.
3. The indicator on the Laser Ray Box Electronic should illuminate orange which means the device is in stand by mode.
4. If the indicator on the Laser Ray Box Electronic illuminates green or red, disconnect the power adapter, then connect it again.
5. Press the *on/mode/off* button and now you should see 5 parallel laser beams being emitted from the apertures on the side of the Laser Ray Box Electronic. The indicator should illuminate green.
6. Press the *on/mode/off* mode button so you can switch between the four laser modes shown on the pictures.
7. By holding the *on/mode/off* button for 1.5 seconds you can switch back to stand by mode. The indicator should indicate orange. In stand by mode you can disconnect the power adapter.

!!! WARNING !!!

BE SURE TO PLUG FIRST THE POWER ADAPTER TO A GROUNDED CIRCUIT AND JUST THEN PLUG IT TO THE LASER RAY BOX ELECTRONIC. NEVER INTERCHANGE THESE STEPS. IN SUCH CASE THE LASER RAY BOX ELECTRONIC WOULD NOT GET TO THE STAND BY MODE, BUT IMMEDIATELY TO LIGHTNING MODE. IF IT HAPPENS IMMEDIATELY DISCONNECT THE POWER ADAPTER FROM THE LASER RAY BOX ELECTRONIC AND REPEAT THE STEPS IN CORRECT ORDER.

The 1 st laser mode:	beams 1,2,3,4,5 on
The 2 nd laser mode:	beams 2,3,4 on
The 3 rd laser mode:	beams 1,3,5 on
The 4 th laser mode:	beam 3 on



Technical specifications

<i>Input voltage:</i>	3V DC
<i>Input current:</i>	300 mA
<i>Operating temperature:</i>	0 – 40 °C
<i>Power optical output (per beam):</i>	$P_{max} < 1 \text{ mW}$
<i>Distances between beams:</i>	18 mm
<i>Dimensions (LxWxH):</i>	112x62x32 mm
<i>Laser Product:</i>	CLASS 2
<i>Laser type:</i>	Diode
<i>Wavelength:</i>	635 nm

Electrical safety instructions and warranty

The Laser Ray Box Electronic 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:

- Laser Ray Box Electronic
- external battery box with interconnect cable (2x1,5V AA battery type)
- 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.