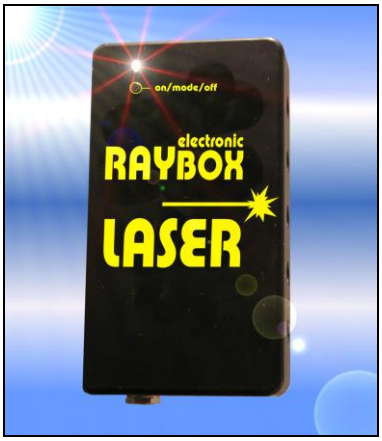
Laser Ray Box (230 V, 50/60 Hz) 1003052
Laser Ray Box (115 V, 50/60 Hz) 1003051

INSTRUCTION MANUAL

06/18 Kvant/ALF



1. Safety instructions

Lasers produce a very intense beam of light. Treat them with respect. Most of educational lasers have an output of less than 1 milliwatts, 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.
- Remove all shiny objects from the area in which you will be working. This includes rings, watches, metal bands, tools, and glass. Reflections from the beam can be nearly as intense as the beam itself.
- Never disassemble or try to adjust the laser's internal components. Electric shock could result.

Electrical safety instructions

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:

- Always plug the adapter into a grounded circuit.
- Do not open the housing of the power adapter under any circumstances, as this will expose you to unshielded electrical connections.

2. Introduction

Lasers are devices that produce intense beams of light, or more strictly, of optical radiation (since laser emission can be in the form of visible light or of invisible infrared or ultraviolet radiation). The word LASER stands for Light Amplification by the Stimulated Emission of Radiation, and describes the process by which a laser beam is generated. Lasers are used extensively in measurement and sensing applications, for industrial processing tasks (such as cutting, drilling, welding and surface treatment), in medical diagnosis and surgery,

for communication using optical fibres, and in laser displays and light shows. Laser beams may damage eyes severely or may cause blindness if they radiate into the eyes directly or indirectly. EN 60825-1 categorizes lasers as follows:

Laser devices of class 2, class 3R, class 3B and class 4

Precautionary measures are only necessary to avoid a permanent direct looking into the laser beam; for classes 2 and 3R is a momentary (0.25 sec.) irradiation in a wave length range between 400 nm and 700 nm, as it may occur when you accidentally look into the beam, not considered to be dangerous. However, you should not level the laser beam intentionally at people. The use of optical aids (e.g. binoculars) together with laser devices of the classes 2, class 3R and class 3B may increase the danger for the eyes.

This product refers to the Class II laser product. The lasing elements used in the Laser Ray Box addressed by this manual emit visible beams of red light. No infrared, ultra-violet, x-ray or other non-visible radiation is emitted. Common sense dictates that one should avoid direct skin and eye exposure to direct laser energy, and that from surface reflections. This low-power laser cannot be used to burn, cut or drill. Even so, you should use caution, because the beams are concentrated. One of them could become focused to a pinpoint within the human eye. Never look directly into a laser beam or stare at its bright reflections — just as you should avoid staring at the sun or other very bright light sources.

3. Description

The Laser Ray Box generates five individual light beams that bend or reflect as they interact with various optical materials. The number of emerging light beams can be selected electronically via a switch. Four modes are available:

First laser mode:	beams 1,2,3,4,5 on
Second laser mode:	beams 2,3,4 on
Third laser mode:	beams 1,3,5 on
Fourth laser mode:	beam 3 on

Power is supplied via a plug-in unit or batteries that are automatically disconnected after 60 minutes.

4. Technical Data

Diode laser:	5 beams, each max. 1mW Laser safety class II
Wavelength:	635 nm
Distance between beams:	18 mm
Input voltage:	3 V DC
Input current:	300 mA
Batteries:	2 x 1,5 V AA batteries (batteries not included)
Operating temp.:	0 – 40° C
Dimensions:	110 x 60 x 20 mm³

5. Operation

- Plug the power adapter into a grounded circuit.

The red indicator should illuminate on the power adapter, indicating that the adapter is under power.

- Attach the Laser Ray Box to a magnetic table, or put it down on a desk.
- Connect the power adapter cable to the Laser Ray Box.

The indicator on the Laser Ray Box should illuminate orange which means the device is in stand by mode.

- If the indicator on the Laser Ray Box illuminates green or red, disconnect the power adaptor, than connect it again.
- Press the *on/mode/off* button.

The indicator should illuminate green and you should see 5 parallel laser beams being emitted from the Laser Ray Box.

- Press the *on/mode/off* mode button so you can switch betwen the four laser modes shown on the pictures 1 – 4.

Between mode changing the indicator should flash up red.

- By holding the *on/mode/off* button for 1,5 sec you can switch back to stand by mode.

The indicator should indicate orange. In stand by mode you can disconnect the power adapter.

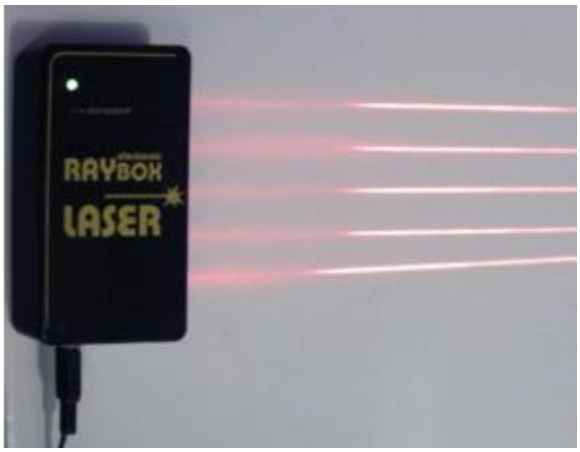


Fig. 1: First laser mode

Fig. 2: Second laser mode

Fig. 3: Third laser mode

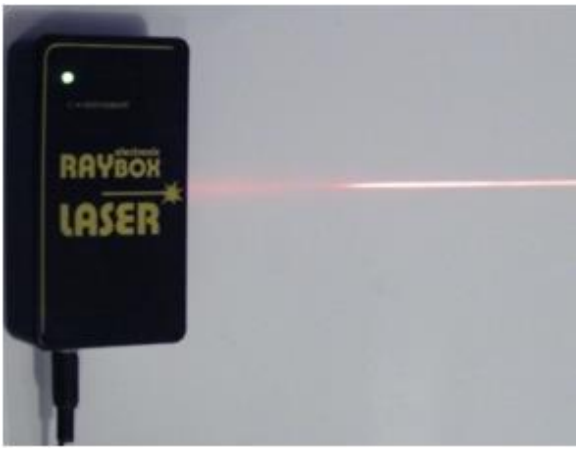


Fig. 4: Fourth laser mode

!!! WARNING !!!

BE SURE TO PLUG FIRST THE POWER ADAPTER TO A GROUNDED CIRCUIT AND JUST THAN PLUG IT TO THE ELECTRONIC RAY BOX. 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 IMEDIATLEY DISCONNECT THE POWER ADAPTER FROM THE LASER RAY BOX AND REPEAT THE STEPS IN CORRECT ORDER.