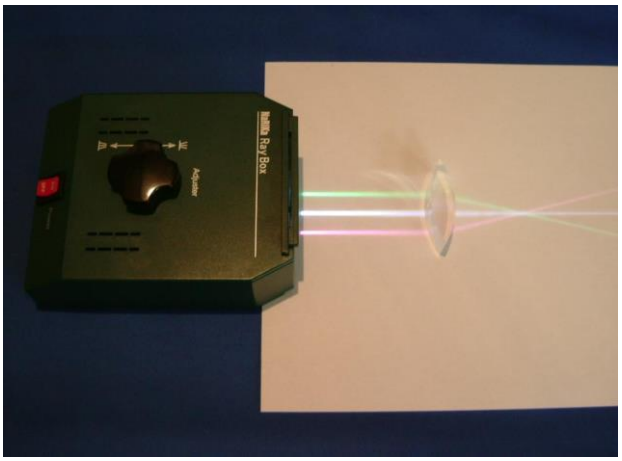
Cat. No. D20-1507-W0

Ray Box L-2

(Light Source Unit)

INSTRUCTION MANUAL



Thank you very much for purchasing the Ray Box (Light Source Unit) L-2.

Be sure to read this manual before using it.

Store this manual in a place that is easily accessible, so that you can refer to it anytime if needed.

2020/08

Cautions and Warnings for Use

(a) This product employs a highly bright high-power white LED light source. Never look at the light emitted by the light source directly. If you look at it directly, you may suffer an eyesight disorder.
(Danger of eyesight disorder WARNING)

(b) Never disassemble or modify the product. **(Danger of electric shocks or fire WARNING)**

(c) The body of this product is made of ABS resin. If it is dropped by mistake from the table onto a hard floor during an experiment, the casing of the unit body may break. Be careful not to drop it.
(Danger of breakage of the unit CAUTION)

Product Introduction

Purpose and Features of this Product

This product is a light source device - ray box that uses a bright white LED called Beam LED. By using a white LED as a light source, you can perform experiments that show the properties of light more safely and easily than with traditional laser light sources - ray boxes. In addition, since the color filters attached to the slit can change the color of the optical paths from white to red and green, the product can very effectively show the properties of refraction and reflection of light.

Overview of the Product

● See the photograph below and check the contents of the package.

Contents of Package

1. Light source unit L-2: 1 unit
   Light source: Highly bright high-power white LED – Beam LED
   Lens: Resin cylindrical convex lens
   Slit: Optical path changing, detachable
   * Red and green sliding filters built in
   Power source:
   - Four size AA alkaline batteries (sold separately)
   - AC adapter – DC 6V, 2A (sold separately)

2. Instruction manual: 1 copy

How to Use the Product

1. Inserting batteries

Pull up the knobs of the two box covers for batteries on the back of the light source product shown in Photo 1. Set two **size AA alkaline batteries (sold separately)** in each battery box. Close the covers.

2. Power switch and optical path adjusting knob

Turn the power on and off with the toggle switch on the top of the unit shown in Photo 2. To adjust the parallelism of the optical path, turn the large black knob counterclockwise slightly and slide it up and down. Three optical path modes (**distribution-parallel-convergence**) are available by moving the knob. * The knob is set in parallel when taken out of the box.

3. Adjusting the number of optical paths and colors

It is possible to change the number of optical paths (1 to 3) and color combinations (red, white, and green) with the slide knob on the front of the unit shown in Photo 3.

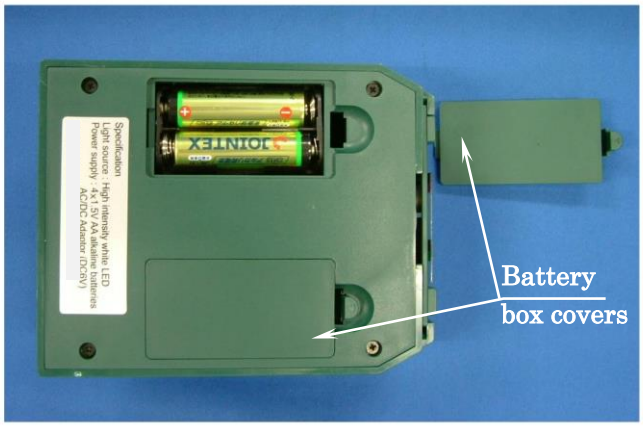


Photo 1 Back of Light Source Unit

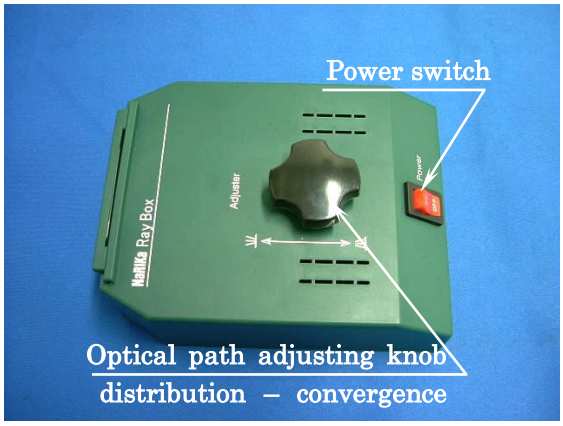


Photo 2 Top of Light Source Unit

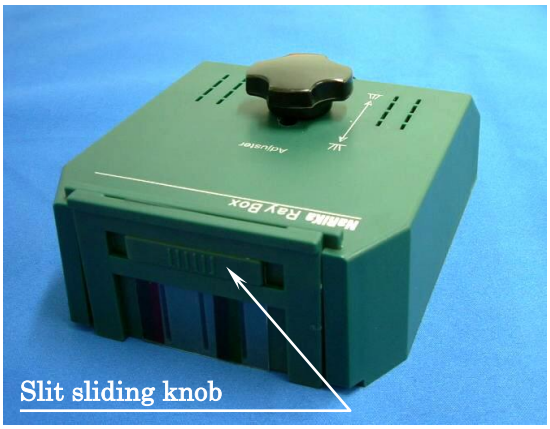


Photo 3 Front Panel of Light Source Unit

Photo 4 Three Optical Path Outputs through Slit Plate

Example of Experiments

● Light refraction or reflection with lens or mirror

1. Place (A4 size) white paper in front of the light source unit to observe the optical paths emitted by the light source unit clearly.
2. Turn down the lighting of the classroom slightly so that the optical paths from the light source unit can be observed clearly.
3. Turn on the power switch of the light source unit and with the slide knob slit adjust the number of optical paths to 3 and colors to red, white, and green. **(Toggle switch**

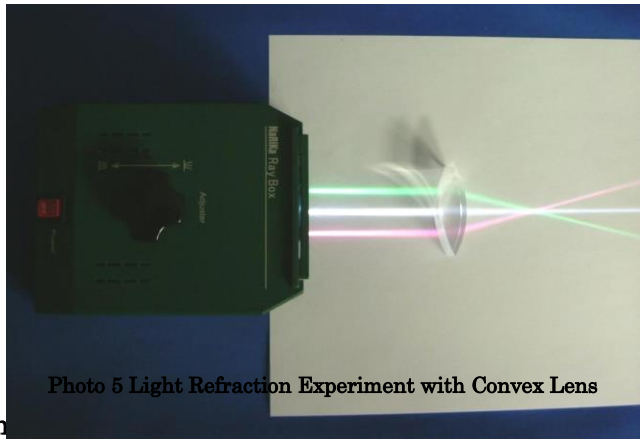


Photo 5 Light Refraction Experiment with Convex Lens

4. Set lens in front of the optical paths and observe how the light travels before and after it passes through the lens as well as how the light travels after crossing of the light paths.

* By setting dispersive prism (for experiments with spectrum) in front of one optical path we can confirm the spectrum contained in white light by breaking up the light into its spectral colors.

● Other experiments examples

- Light reflection experiments with protractors and flat mirrors
- Light refraction experiments with trapezoidal lenses
- Light refraction and spectrum experiments with prisms

* Lens sets and product sets of the light source unit and lenses designed for various experiments are available. Please consider purchasing them.

Storage Instructions

Put the product in the original package or another box and store it in a dry place away from exposure to direct sunlight.

Troubleshooting

Problem	Cause	Solution
Light paths will not become parallel, always change to distribution or convergence.	Misalignment of optical path adjustment screw.	Loosen the optical path adjustment screw and move it back and forth to adjust the light path until it is parallel.

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