

# LUMEN 100

Single LED illumination system  
Manual Version 1.1



## Worldwide distribution



FM 61600

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# CONTENTS

<b>IMPORTANT SAFETY INFORMATION SECTION 1</b>	<b>3</b>
<b>UNPACKING YOUR SYSTEM SECTION 2</b>	<b>4</b>
<b>INSTALLATION SECTION 3</b>	<b>5</b>
3.1 <i>CONNECTING THE LEDS AND CONTROL BOX</i>	5
3.2 <i>CONNECTING TO THE MICROSCOPE</i>	5
3.3 <i>USING THE COMBINER</i>	5
3.4 <i>ADDING EXCITATION FILTER</i>	5
<b>GETTING STARTED SECTION 4</b>	<b>6</b>
4.1 <i>CONTROL VIA BOX</i>	6
4.2 <i>CONTROL VIA COMPUTER</i>	6
<b>TROUBLESHOOTING SECTION 5</b>	<b>7</b>
<b>SYSTEM SPECIFICATIONS SECTION 6</b>	<b>8</b>
<b>REPLACEMENT PARTS SECTION 7</b>	<b>9</b>
<b>RETURNS AND REPAIRS SECTION 8</b>	<b>10</b>

# IMPORTANT SAFETY INFORMATION

## SECTION I

- **Save this manual as it contains important safety information and operating instructions. Before using the unit please read this manual thoroughly.**
- Use the unit only as specified by these instructions, otherwise injury or damage to the unit or other equipment may result. Follow and adhere to all safety instructions described in this manual. For use in a manner not described in this manual contact Prior before use.
- Do not expose the unit to moisture.
- Do not expose the unit to extremely hot or cold temperatures, or to naked flames.
- Do not allow objects to fall on, or liquids to spill on, the product.
- Only connect the AC supply cord to designated connection points. Do not replace this cord with inadequately rated cords. Ensure the cords are placed in a location where they will not be subject to damage.
- When installing the unit or fitting together components ensure that the unit is disconnected from the main power supply.
- **DANGER – Never alter the AC cord or plug. The power cord set must be an appropriately rated and approved cord set in accordance in the regulations of the country it is used in. If the supplied plug adapter is not the correct fitting for your geographic area or if you are unsure about the relevant regulations, please contact your supplier for advice**
- Only the exterior of this product should be cleaned using a damp lint-free cloth.

- Do not attempt to disassemble the product. Doing so will void the warranty. This product does not contain consumer serviceable components. Service should be performed by Authorised Service Centres.
- **Do not look directly at the LED when lit!**

In accordance with the Waste Electrical and Electronic Equipment Regulations, this symbol indicates that the product must not be disposed of as unsorted municipal waste but should be collected separately. Refer to your local authority in the EU for return and/or collection systems available in your country.



# UNPACKING YOUR SYSTEM

## SECTION 2

Your unit will contain:

A control box

RS232 and USB cables

An AC power cord suitable for your area

An adapter (for the microscope type specified)

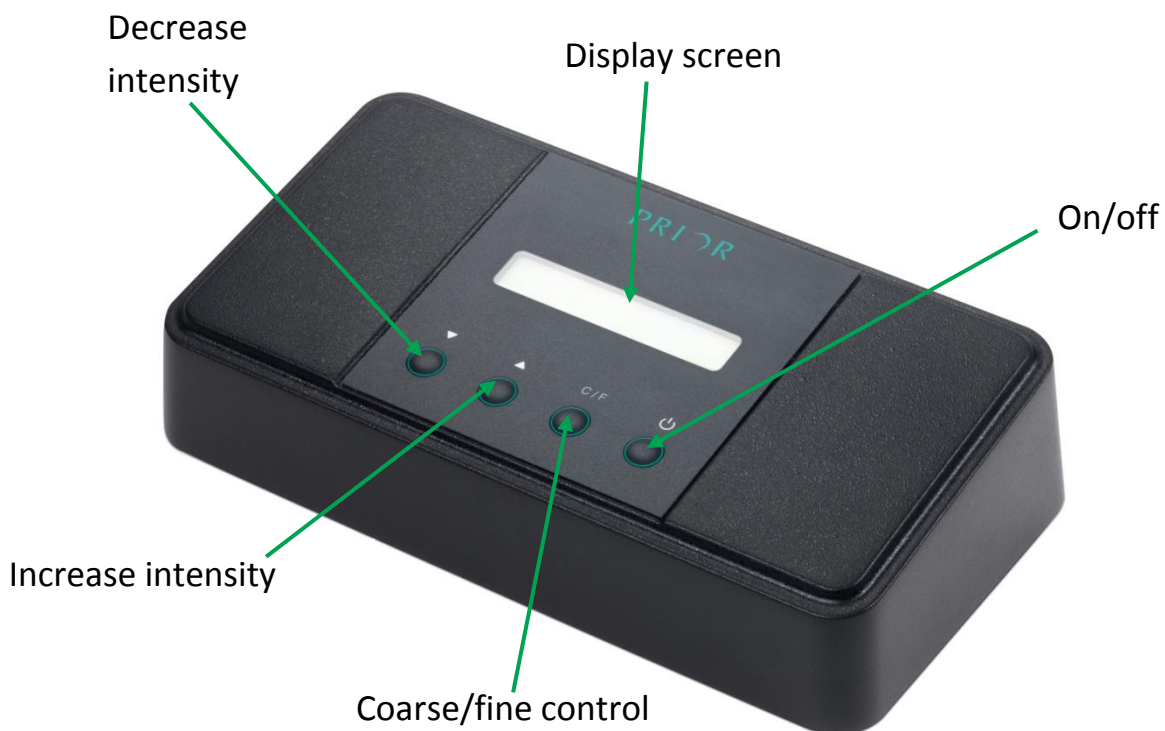
LED unit(s)

LED cable(s)

A combiner (if ordered)

Dichroic mirrors (if ordered)

If any of these components are not present contact your distributor immediately.



# INSTALLATION

## SECTION 3

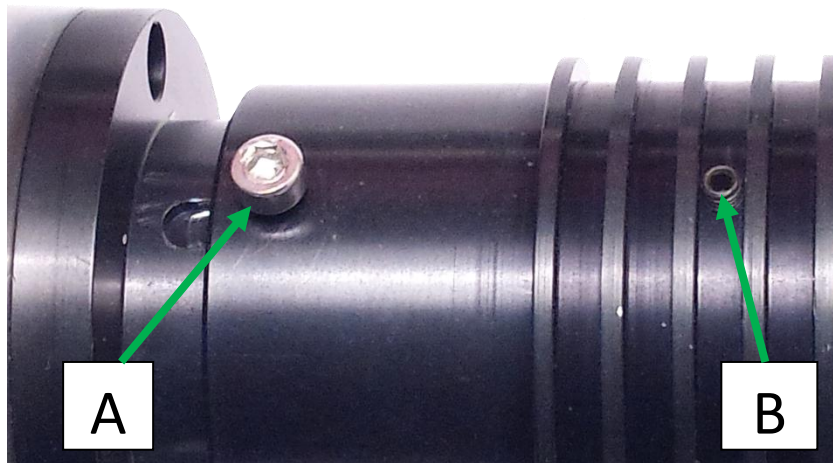
Before fitting any components together or installing the unit onto the microscope ensure the power cord is not connected to a power supply!

### 3.1 Connecting the LED unit and the control box

- Ensure the control box is switched off and not connected to the power supply
- Using the cable, attach the LED unit to the control box via the cable provided.
- Ensure the connection is firm

### 3.2 Connecting the LED unit to the microscope

- Ensure the LED unit and the microscope are switched off and not connected to the power supply.
- The system will have been supplied with the necessary adapter for the microscope specified. If this adapter is not correct, please contact your distributor immediately.
- It may be necessary to focus and centre the LED in order to achieve the best results.
- To focus, first focus the microscope onto a suitable sample, such as an autofluorescent plastic slide (available from Chroma Technology Corp). Use the hex key to undo the focus locking screw (A on the image below), allowing the top half of the LED unit to freely slide back and forth. Moving the top of the unit away from its base will focus the illumination into a smaller area increasing the intensity but reducing the homogeneity in the field of view. Once the optimum position has been achieved lock the focus locking screw.



- To centre, first focus the microscope onto a suitable sample, such as an autofluorescent plastic slide (available from Chroma Technology Corp). Use the hex key to undo the centre locking screws (B on the image above), allowing the top half of the LED unit to move freely in a circular motion. Look at the image and check the flatness of illumination. Adjust the position of the LED unit until you achieve a homogenous illumination across the field of view.

### 3.3 Using the combiner

The combiner allows two LEDs to be used at once; for example if one is doing multi fluorophore work. The combiner fits onto the microscope using the adapter; just like the Lumen 100-LED does.



A dichroic mirror will have to be fitted inside the combiner to ensure that both desired wavelengths enter the light path. A dichroic mirror allows wavelengths below a certain value to pass through, whilst reflecting those at a higher wavelength. Therefore, the two Lumen 100 LEDs must be placed correctly, with the higher wavelength LED in such a position that its light will be reflected into the light path. See the diagram below.





# GETTING STARTED

## SECTION 4

After installation, your unit is ready for use. The bulb will last approximately 20,000 hours. Light levels and intensity will not greatly fluctuate during this time. After installing the bulb, and making sure it is focused and centred, there is no need to further move or align the bulb.

The system is partially modular. Therefore, it is possible to alter the LED unit (if a different wavelength is required) or the adapter (if a different microscope is to be used). If needed, excitation filters can also be added. For guidance on altering the system, see the 'Installation' part of this manual.

The unit is very simple to use. The system can be controlled via the control box, or via computer.

### 4.1 Control via the control box

The on/off switch turns the unit on or off.

The C/F (Coarse/Fine) button toggles the resolution of the intensity control buttons between 5% and 1%.

The intensity control buttons (▲ and ▼) provide brightness control for the LED.

### 4.2 Control via the computer.

It is possible to control the system via the computer, using either the Prior Terminal program or via third party software such as NIS Elements or cellSens. For third party software control please refer to the appropriate documentation. The Lumen 100 is TTL enabled.

Control via Prior Terminal is simple. The software must first be installed, which can be done by visiting [www.prior-scientific.co.uk](http://www.prior-scientific.co.uk), navigating to the 'Downloads' page and selecting either the 32 Bit or the 64 Bit version of 'Software download for Windows XP, Vista and Windows 7'. Follow the onscreen instructions to install the program, ignoring any warning messages. To run the program, go to the start menu: Start>Prior Scientific>Prior Terminal

Once the program is open, the following commands can be entered.

All commands should be terminated with a carriage return (<Cr>) e.g. the ENTER key.

? = Returns information about what is connected. This is useful for showing whether the device is connected. (If no text is returned then it is not connected or the driver isn't working.)

VER = shows version currently in use.

LEDTYPE = displays wavelength of current LED.

LEDCONTROL 1 – turns unit ON.

LEDCONTROL 0 – turns unit OFF

LEDCONTROL – returns status of unit; 0= OFF, 1 = ON.

LEDLIGHT [VALUE] – sets intensity of light to [VALUE] (between 1-100)

LEDLIGHT – returns intensity of light (value between 1- 100)

By right clicking on the blank buttons on Prior Terminal commands can be entered for rapid use. If the above commands appear not to be working, first check that the spacing between characters is correct.

## TROUBLESHOOTING

### SECTION 5

Be aware that the Lumen 100 contains no user serviceable parts. Attempting to repair the Lumen 100 may damage the unit further and void the warranty. The unit can be cleaned using a lint-free cloth. Other than this no other maintenance should be required. Prior is always happy to assist if you experience problems with your product. If you wish to return a unit for service, please contact your nearest Prior office in order to obtain an RMA number prior to sending.

*Problem – The LED does not turn on/ no light is visible in the field of view*

Suggested solution -

Ensure the control box is switched on

Ensure that the bulb is working (**CAUTION – DO NOT LOOK DIRECTLY AT THE LED WHEN LIT**)

Ensure that the LED unit is connected to the control box

Ensure that the LED unit is firmly connected to the microscope via the adapter

If possible, install another LED unit to see if the fault lies with the controller or bulb

*Problem – The light quality is low*

Suggested solution - Ensure the intensity is set correctly

Ensure that all the connections between the adapter, LED unit and the microscope are firm and tight.

*Problem: Cannot control via Prior Terminal*

Suggested solution –

Ensure the USB cable is attached!

You might be able to swiftly resolve the problem by clicking 'Com' and altering the port. If there are a large number of ports, go to Start Menu > Control Panel > System. Click the 'Device Manager'. Expand the 'Ports' selection to identify the virtual COM Ports. The virtual COM port Number is the one under "USB serial port".

Ensure that this is the port selected by Prior Terminal by clicking the 'Com' button. If this fails to resolve the problem then it is probably the case that the driver is not installed properly. Go to Control Panel > Systems >> Device Manager. Scan for hardware changes, select 'Prior Virtual COM port'. Right click 'Update driver' and select the correct driver. The driver will be located in the 'Prior Scientific' program files as it is automatically included in the Prior Terminal download (C:\Program Files\Prior Scientific\Prior Software (assuming the program is in the C Drive)).

*Problem: I have a connection but not all the commands work!*

Suggested solution:

If typing '?' shows there is a connection, but other instructions do not work, ensure you are typing them in correctly. There is no space between LED and the command (e.g. LIGHT or CONTROL) so it is 'LEDLIGHT' and 'LEDCONTROL' rather than 'LED LIGHT' or 'LED CONTROL'. However, there is a space between the command and any numeric values (e.g. to turn on the unit (0 or 1) or intensity).

## **SYSTEM SPECIFICATIONS**

### **SECTION 6**

#### **CONTROLLER:**

199 mm long x 107 mm wide x 50 mm deep

#### **CABLE:**

2000 mm long

#### **LED UNIT:**

68.5 mm long x 50 mm diameter

#### **POWER:**

Universal external power supply Input: 110 – 240V, 50/60Hz 60W

Output: 24VDC 2.5A

#### **WAVELENGTHS AVAILABLE**

- 365nm
- 385nm
- 405nm
- 447nm
- 460nm
- 505nm
- 525 nm
- 550 nm
- 590 nm
- 625nm
- 660nm
  
- “White light”

## REPLACEMENT PARTS

### SECTION 7

LI00	Control Unit
LEDS 365	LED Unit emitting at 365nm
LEDS 385	LED Unit emitting at 385nm
LEDS 405	LED Unit emitting at 405nm
LEDS 447	LED Unit emitting at 447nm
LEDS 460	LED Unit emitting at 460nm
LEDS 505	LED Unit emitting at 505nm
LEDS 525	LED Unit emitting at 525 nm
LEDS550	LED Unit emitting at 550 nm
LEDS 590	LED Unit emitting at 590 nm
LEDS 625	LED Unit emitting at 625nm
LEDS 660	LED Unit emitting at 660nm
LEDS WT01	LED Unit emitting white light
OL	Adapter for Olympus Microscopes
ZS	Adapter for Zeiss Microscopes
LC	Adapter for Leica Microscopes
NI	Adapter for Nikon Microscope
LDS 200	Combiner allowing 2 LEDs to be used simultaneously
LDD 410	Long bandpass dichroic filter at 410nm
LDD 495	Long bandpass dichroic filter at 495nm
LDD 552	Long bandpass dichroic filter at 552nm
LDD 593	Long bandpass dichroic filter at 593nm

## RETURNS AND REPAIRS

### SECTION 8

Should you experience problems with your OptiScan II System and want to send it back for service, warranty or otherwise, a **Return Material Authorisation (RMA) number must be obtained from the appropriate Prior Scientific office before returning any equipment.**

For North and South America contact Prior Scientific Inc. and for the rest of the world call Prior Scientific Instruments Limited on the telephone numbers shown below.

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**All specifications in this manual are subject to change without notification. Please feel free to contact us regarding any questions, comments or suggestions. Prior Scientific manufactures a wide range of products designed for a huge range of microscopy applications, from automated systems to illuminators, sample holders, filter wheels, and robotic slide loaders. Contact us or visit [www.prior.com](http://www.prior.com) to find out more.**