Prizmatix

USER MANUAL

Silver-LED

Fiber Coupled UV, Violet, Blue, Green and Red
LED Light Sources

Ver. 3.1

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1 Introduction

The Silver-LED is designed to provide single wavelength excitation fiber-coupled light sources for various photonics applications. The current controller provides low noise current for driving the high power LEDs in continuous (CW) or chopped operation mode via external TTL input. Analog modulation mode provides means for LED output power control from computer by Digital to Analog Converter (DAC).

1.1 Features

- High Power
- Reciprocal SMA fiber connection
- Precisely adjustable power by 10 turns potentiometer
- Low optical noise <0.05% RMS
- TTL external modulation input (up to 50KHz)
- Analog input (0-5V) for power control
- TTL and Analog Inputs are Optically Isolated

Specifications are subject to change without notice.

2 Safety

2.1 General safety

Please make yourself familiar with the contents of these operating instructions before using the Silver-LED illuminator system. Use the illuminator only as specified in this manual. Otherwise, the protection provided by the illuminator may be impaired.

The following symbols are used for the warnings:

⚠ **CAUTION!** Failure to comply with the safety instructions can be hazardous to the user.

! CAUTION! Failure to comply with the safety instructions can cause damage to the instrument.

Do not use the illuminator if it is damaged. Before you use the illuminator, inspect the case. Look for cracks or missing parts.

Do not use the device around explosive gas.

Never operate the illuminator with the cover removed or the case open.

Any maintenance should ONLY be performed by a Prizmatix authorized technician.

Prizmatix products are NOT authorized for use as components in life support devices or systems.

2.2 Eye safety

The Silver-LED illuminator is assigned to the following risk groups according to IEC 62471: 2006. The assignment was based on worst case assumptions and maximal power setting as well as maximal power that can delivered by best transmitting fiber. The assignment results are summarized in Table 1.

Table 1: Silver-LED illuminator risk group assignment according to IEC 62471: 2006.

Product Type	**Assignment to Risk Group**		
	Exempt RG0	Low Risk RG1	Mod Risk RG2
Silver-LED-365B		√	
Silver-LED-390B Silver-LED-405B Silver-LED-415S Silver-LED-445CA Silver-LED-455L Silver-LED-465CA All other in wavelengths range 380 – 510 nm			√
Silver-LED-525L Silver-LED-550A Silver-LED-590A Silver-LED-630L Silver-LED-655A All other in wavelength range 510 – 700 nm	√		

The Silver-LED illuminators are marked on the product with following labels:

Product	Safety Label
Silver-LED-365B	**RISK GROUP 1** NOTICE UV emitted from this product.
Silver-LED-390B Silver-LED-405B Silver-LED-415S Silver-LED-445CA Silver-LED-455L Silver-LED-465CA	**RISK GROUP 2** CAUTION Possibly hazardous optical radiation emitted from this product.
Silver-LED-525L Silver-LED-550A Silver-LED-590A Silver-LED-630L Silver-LED-655A	Not required

2.2.1 Special safety notes

Table 2 summarizes the safety notes specific to various product types (IEC 62471-2/TR (1st edition, 2009)).

Table 2: safety notes specific to various product types

Product	Safety Note
Silver-LED-365B	**RISK GROUP 1** NOTICE UV emitted from this product. Minimize exposure to eyes or skin. Use appropriate shielding.
Silver-LED-390B Silver-LED-405B Silver-LED-415S Silver-LED-445CA Silver-LED-455L Silver-LED-465CA	**RISK GROUP 2** CAUTION Possibly hazardous optical radiation emitted from this product. Do not stare at operating lamp. May be harmful to the eyes.
Silver-LED-525L Silver-LED-550A Silver-LED-590A Silver-LED-630L Silver-LED-655A	Not Required

2.2.2 Hazard distances (HD)

Table 3 provides the distance from distal end of the fiber at which the threshold illuminance EL returns the product to RG 1.

Table 3: Distances from distal end of the fiber at which the photochemical hazard reduces to Risk group 1, for relevant products.

Product	**Distance at which Blue-Light hazard reduced to Risk group 1** [m]
Silver-LED-405B	0.9
Silver-LED-415S	0.6
Silver-LED-445CA	0.9
Silver-LED-455L	1.1
Silver-LED-465CA	1.0

3 Set-up of the device

Remove the device from the packaging and inspect the device for loose components or any signs of damage. Notify Prizmatix if the device appears damaged in any way: do not install a damaged device.

3.1 Package contents list

Silver-LED	Power Adaptor / Mains Power Cord
	

	Item	Description	Quantity
1	Silver-LED	High Power Fiber Coupled LED light source	1
2	Power Adaptor / Mains Power Cord	Universal power adaptor, Cord to connect the power adaptor to mains voltage	1

4 Operating the illuminator

1. Turn the LED power adjust dial counter-clockwise to minimum.
2. Connect the fiber to the SMA connector on the front panel
3. Connect the Power Adaptor output cord to the 12VDC socket on the back panel of the Silver-LED
4. Connect the Power Adaptor to the wall outlet by the power cord.
5. Switch both Int / Ext toggle switches on the back panel of Silver-LED to Int position.
6. Press the green ON key on the front panel and adjust dial control clockwise to desired power level.

Fig. 1: Silver-LED Front Panel

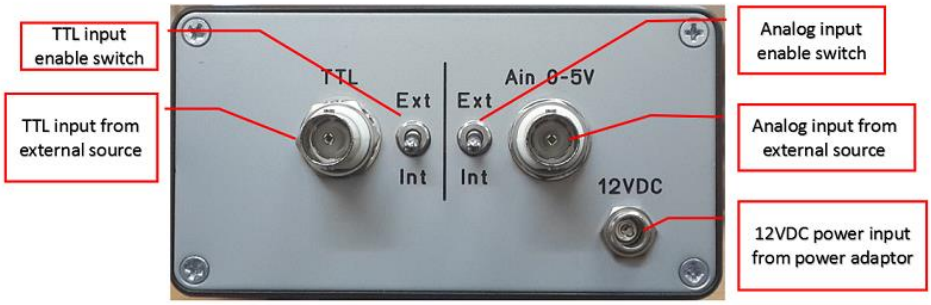

Fig 2: Silver-LED Back Panel

⚠ **CAUTION**: **Do not use the illuminator without the Optical Fiber connected to the SMA output port!**

4.1 External TTL triggering

The external TTL input on the back panel enables external control of LED ON/OFF state – via Triggering. This can be useful, for example, to synchronize the LED with a camera. The TTL Low state will switch the LED OFF and the TTL High state will switch the LED ON with the power controlled by the dial on the front panel of the Silver-LED. In order to enable this operation mode switch Int / Ext toggle switch to Ext position.

4.2 Power control by analog input

The LED output power can be controlled from a computer by Digital to Analog Converter (DAC). The DAC needs to be configured to provide 0-5Vdc to be compatible with the Analog Input (Ain) of the Silver-LED. The 0V at Ain will switch the LED OFF, the 5Vdc at Ain will drive the LED at highest output power. In order to enable this operation mode switch Int / Ext toggle switch to Ext position. While at Ext position the Dial on the front panel will not function.

5 Cleaning

Keep the connector port clear from dirt and do not leave it open. Make sure to close the SMA port with the chained cap when the fiber is not connected.

CAUTION*:* Do not try to clean inside the port – you may damage the illuminator!

The box can be wiped with mild wet-wipes.

CAUTION*:* Do not attempt to use chemicals, e.g. Alcohol or Acetone – you may damage plastic components

6 Specifications

6.1 Electrical specifications

Typical Optical RMS Noise (DC-1MHz)	%	<0.05
TTL and Analog inputs		Optically isolated BNC connectors
Rise / Fall time (10% - 90%)	µs	<5 / <2.5
Analog input voltage range	V	0-5
Analog modulation frequency	Hz	DC-100
Input Voltage	V	12
Power Adaptor Input		100-240 VAC, 50/60Hz, 0.6A

6.2 General specifications

Operation temperature range	°C	10 - 35
Storage temperature range	°C	-10 - 55
Operating relative humidity (Non-condensing)	%	<90
Dimensions (L x W x H)	mm	166 x 106 x 56
Weight	g	470
Power adaptor dimensions (L x W x H)	mm	90 x 53 x 35
Power adaptor weight	g	190
Power Adaptor Safety		