Prizmatix

USER MANUAL

UHP-F

Light Guide Coupled LED for
Microscopy and Various Scientific Applications

Version: 5

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1 Introduction

Prizmatix UHP-F-LED series of Ultra High Power LED Light Guide coupled light sources was designed especially for illumination applications in Microscopy, life science instrumentation, and many others. The UHP-F-LED housing is self-contained light source including all necessary driver electronics and thermal management. The illuminator comprises a single die high power LED coupled to light guide connector where the flexible optical light guide is connected. The LED light is emitted at the distal end of the light guide.

1.1 Features

- High Power
- TTL and Analog Inputs are Optically Isolated
- Remote control by I2C
- Long life (no lamp or laser tube replacement required)
- Rapid warm up time

1.2 Intended Use

The UHP-F illuminator intended to be used as light source in microscopy applications and as illuminator in life science instrumentation and experiments.

2 Safety

Please make yourself familiar with the contents of these operating instructions before using the UHP-F illuminator. 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 result in 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 illuminator without the Light Guide.

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.

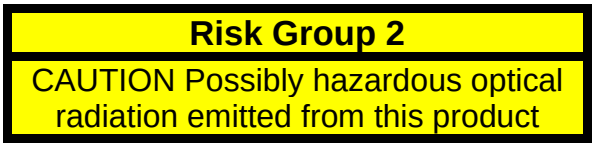
2.1 Eye Safety

The UHP-F illuminator is assigned to following risk groups according to IEC 62471: 2006. The assignment done based on the standard system configurations: (a) UHP-F connected to Liquid Light Guide 3 mm core, (b) UHP-F connected to Liquid Light Guide 3 mm core. The assignment results are summarized in Table 1.

Table 1: UHP-F illuminator assignment to risk groups according to IEC 62471: 2006.

Product Type	Assignment to Risk Group
UHP-F equipped with 3mm core Light Guide	Moderate Risk – Risk Group 2 (RG2)
UHP-F equipped with 5mm core Light Guide	Moderate Risk – Risk Group 2 (RG2)

The products Optogenetics-LED-Violet and Optogenetics-LED-Blue are marked on the product with following label:



2.1.1 Special Safety Notes

Table 2 summarize the safety notes specific to UHP-F product equipped with 3 mm or 5 mm Light Guide (IEC 62471-2/TR (1st edition, 2009)).

Table 2: Safety notes specific to various product configurations

Product	Safety Note
UHP-F equipped with 3mm or 5 mm core Light Guides	⚠**CAUTION!** Do not stare at operating lamp. May be harmful to the eyes

2.1.2 Hazard Distances (HD)

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

Table 3: Distances from distal end of the Light Guide 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]
UHP-F equipped with 3mm core Light Guide	0.9
UHP-F equipped with 5mm core Light Guide	1.25

2.1.3 Permissible Exposure Duration (t_{max})

The Permissible Exposure Durations for UHP-F product are calculated and reported in Table 4 below

Table 4: Permissible Exposure Durations for UHP-F product.

Product	**Permissible Exposure Durations t_{max} [sec]**
UHP-F equipped with 3mm core Light Guide	10
UHP-F equipped with 5mm core Light Guide	14

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 or operate a damaged device.

3.1 Package Contents List

(1)		(2)	
(3)		(4)	
(5)		(6)	
(7)		(8)	

	Item	Description	Quantity
1	UHP-F illuminator	Ultra-High Power Light Guide Coupled Light Source	1
2	Liquid Light Guide	Light Guide to be used with the illuminator	1
3	Power Adaptor	Power adaptor to be used with the illuminator	1
4	Mains Power Cord	Cord to connect the power adaptor to mains power	1
5	CTRL-F	Optional wired Remote controller	1
6	Control Cable	CTRL-F control cable	1
7	UHP-F-USB	Optional USB control interface	1
8	Control Cable	UHP-F-USB control cable (same as of CTRL-F)	1

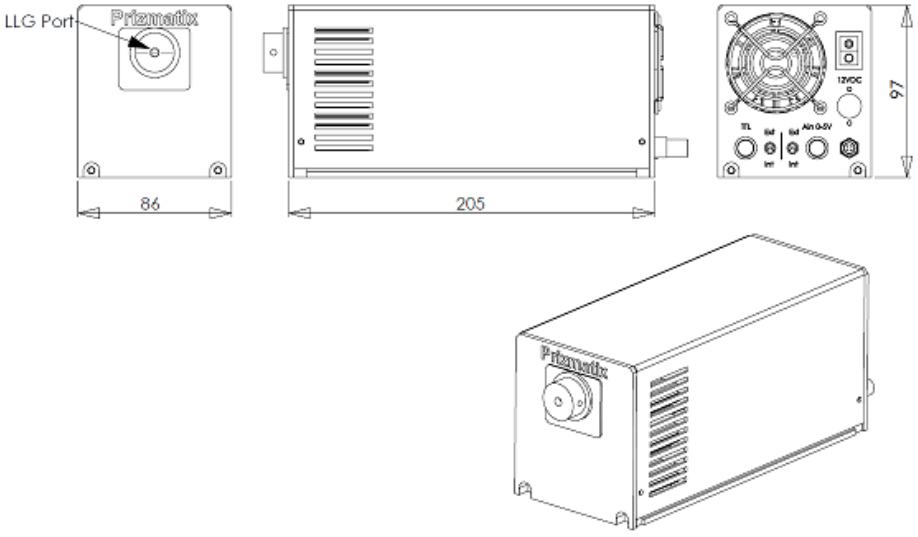
3.2 Specifications

3.2.1 Electrical Specifications

TTL Input, Analog Input		Optically isolated BNC connectors
Analog power control	%	0-100
ON/OFF		Power switch or by TTL signal
Input Voltage (Float)	V	12
Max Input current	A	6.5
Power Adaptor Input		85-264 VAC, 47-63 Hz, 1.5 A

3.2.2 General Specifications

Operation temperature range	°C	10 - 35
Storage temperature range	°C	-10 - 55
Operating relative humidity (Non-condensing)	%	<90
Dimensions		See drawing below
Head weight	g	1250
Power adaptor dimensions (L x W x H)	mm	167 x 240 x 35
Power adaptor weight	g	620
Power Adaptor Safety		



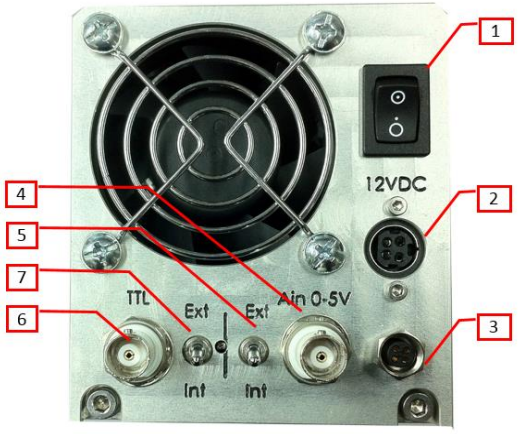
3.3 System Overview

3.3.1 UHP-F Illuminator Controls

The front panel of the illuminator unit features: (1) Connector for Light Guide, (2, 3) Plastic set-screws for the light guide.

Illuminator front panel

The back panel of the illuminator unit features: (1) Main power switch, (2) Power adaptor input socket (3) Connector for I2C control, (4) Connector for Analog input (0-5V) for control of LED power, (5) Toggle switch Analog Input Int/Ext to enable/disable control of LED power by external analog input, (6) Connector for TTL input, (7) Toggle switch TTL Input Int/Ext to enable/disable control of LED ON/OFF by external TTL signal



Illuminator back panel

⚠ **CAUTION!**: Do not use the illuminator without the Light Guide connected to Light Guide port at the illuminator!

3.3.2 Typical System Setup

Typical UHP-F illuminator setup for microscope will include following components:

(1) UHP-F illuminator - Light Guide coupled LED light source

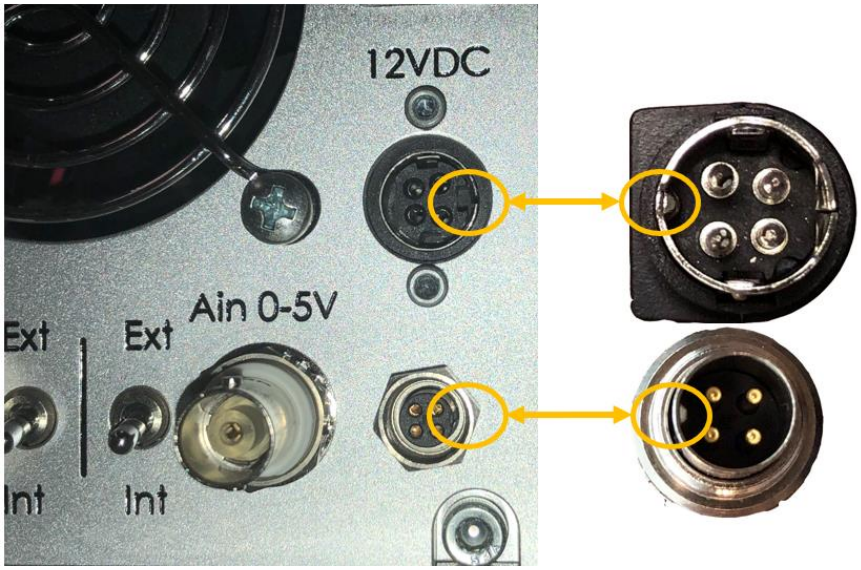
(2) Liquid Light Guide - Light guide to deliver the light to microscope

(3) Microscope adaptor - Enable connection of the light guide to the light port of the microscope (the specific type of this part is dependent upon the microscope type and it is sold separately)

3.4 Initial Set-up of UHP-F illuminator

1. Set Power Switch on back panel of the unit to OFF position and connect power adaptor to the back of the unit and into wall mains socket.

CAUTION!: The power adaptor cable connector and control cable connector have a key for correct connection. Please pay attention to the correct orientation of the connectors.



2. Set both the TTL and Ain (Analog Input) switches on back panel to 'Int' position.
3. Connect the Light Guide to the front panel connector and secure it by the two set-screws.

4. Connect the other end of the Light Guide to the microscope port by appropriate adaptor (sold separately).
5. Switch the back-panel power switch to the "ON" position. The LED light should be seen at the microscope slide.

⚠**CAUTION!**: Do not stare at operating lamp. May be harmful to the eyes

6. In case you are using digital camera to inspect the sample adjust the camera exposure to get best image.
7. At end of use switch the unit off by switching the Power Switch on back panel to OFF position.

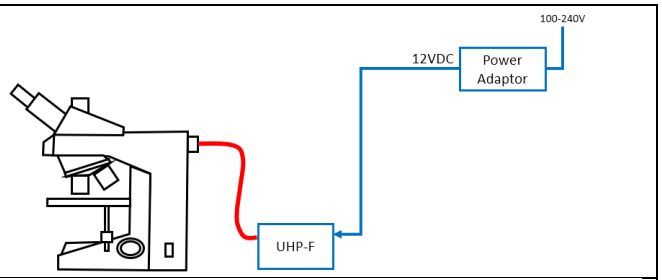
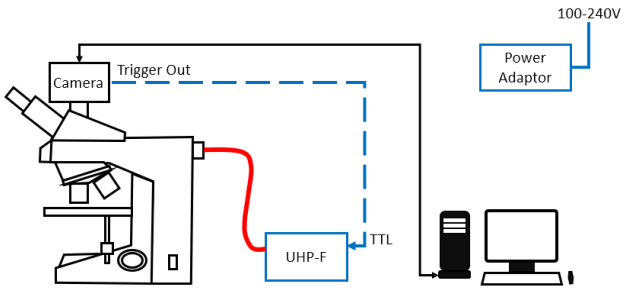
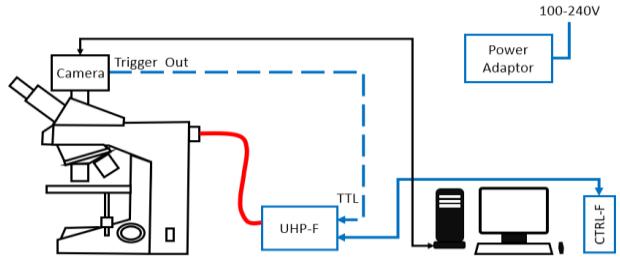
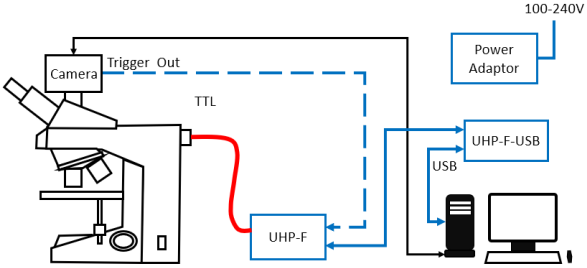
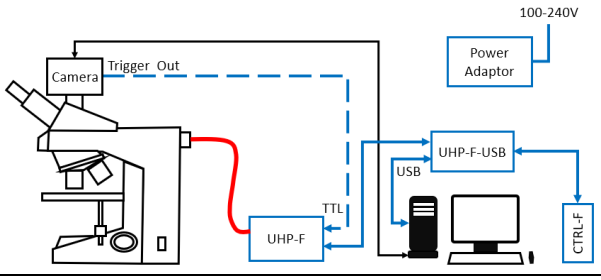
CAUTION!: Never disconnect the power cord form the product before switching the ON/OFF switch on back panel to OFF position

8. For TTL input connect BNC cable to **TTL** input connector on back of unit. To enable TTL control change the position of the **TTL Int/Ext** switch to **Ext** position.
9. For Analog Input connect BNC cable to **Ain** input connector on back of unit. To enable Analog Input control change the position of the **Ain Int/Ext** switch to **Ext** position

CAUTION!: Do not cover back panel of unit - ensure that air can circulate freely.

3.5 Set-up of UHP-F illuminator with CTRL-F or UHP-F-USB (-RS232)

The UHP-F illuminator and its optional control units (CTRL-F, UHP-F-USB or UHP-F-RS232) can be assembled on microscope or at other illumination setup in several various configurations as described in following figures.

Configuration A: Basic On/Off - mimics the standard Mercury or Metal-Halide lamp.	
Configuration B: Additionally, to configuration A: optional camera synchronization by connecting the camera's Trigger out signal to UHP-F TTL input.	
Configuration C: Additionally, to configuration B: UHP-F power is manually controllable by wired CTRL-F control.	
Configuration D: Additionally, to configuration B: UHP-F power can be controlled by a Windows software via USB or RS232	
Configuration E: UHP-F power can be controller either by software or manually. The latest change will take over the LED control. Both USB and RS232 interface units available	

3.6 Cleaning

Keep the Light Guide connector port clear from dirt and do not leave it open. Make sure to close the Light Guide port with a cap when the Light Guide 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