Prizmatix

BLCC-2
High Power LED
Desktop
Current Controller
User Manual

Ver. 6

Main Office	European Sales Office	North America Sales Office
Phone: +972-72-2500097	Phone: +44 (0)77-9172-9592	Phone: +1-(248)-436-8085
Fax: +972-72-2500096	Fax: +44 (0)20-7681-2977	Fax: +1-(248)-281-5236
sales@prizmatix.com	sales.europe@prizmatix.com	sales.usa@prizmatix.com

P.O.B. 244 Givat-Shmuel 5410102, Israel

Prizmatix

Safety

Before supplying electricity to the power adaptor of the BLCC-02 system, make sure that the protective conductor of the 3-conductor mains power cord is correctly connected to the protective earth contact of the socket outlet! Improper grounding can cause electric shock with damage to your health or even death!

When wiring the device disconnect it from the power source and turn the main switch to Off.

Not doing so may result in electric shock, injury and/or damage of your equipment.

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

The BLCC-02 must not be operated in explosion endangered environments!

Any maintenance shall be performed ONLY by Prizmatix authorized technician.

Cellular phones or other radio transmitters are not to be used within the range of few meters of this unit.

The LED can emit an UV and other intense light!

In cases where a UV LED is part of the LED system intense UV light can be emitted by the system during operation. Precautions must be taken to prevent looking directly at the UV light with unprotected eyes or illuminating the UV light on skin. Do not look directly into the UV light or look through the optical system during operation of the device. This can be harmful to the eyes even for brief periods due to the high intensity of the UV light.

If viewing of the light is necessary use light protective glasses to avoid damage by the intense light.

Main Office
Phone: +972-72-2500097
Fax: +972-72-2500096
sales@prizmatix.com

European Sales Office
Phone: +44 (0)77-9172-9592
Fax: +44 (0)20-7681-2977
sales.europe@prizmatix.com

North America Sales Office
Phone: +1-(248)-436-8085
Fax: +1-(248)-281-5236
sales.usa@prizmatix.com

P.O.B. 244 Givat-Shmuel 5410102, Israel

Prizmatix

BLCC-2 System Description

The Benchtop LED current controller has been designed to provide precisely controllable, low noise current for driving a variety of High Power LEDs. The current controller can be configured to drive virtually any currently available LED including the high power LEDs in constant current (CW) or chopping mode defined by external TTL input.

Specifications

Output current control range: 0-1000 mA (Factory configured)
Output voltage: 1-15 V
Chopping frequency: DC – 10 KHz
Analog Modulation frequency: DC-10KHz (optional)
Connector for LED: 9-pin D-type
Connector for TTL input: BNC
Input power supply: 24 VDC, 1 A
Power adaptor input: 100-240 VAC, 1 A, 47-63 Hz
Dimensions:
Controller: 75mm x 40mm x 120mm (W x H x L) without key switch and other extrusions
Power adaptor: 60mm x 35mm x 10mm (W x H x L)

BLCC-2 System Connection

To setup the system:

1. Put the Key in the Power Switch and ensure it is turned in OFF position
2. Turn the LED power adjust dial counter clock wise to minimum.
3. Connect the DC Current cord to the Microscope –LED (Binder connector) and to the BLCC-2 LED connector on the back panel (9-Pin D-Type Connector).
4. Connect the Power Adaptor output cord to the 24VDC socket on the back panel of the BLCC-2
5. Connect the Power Adaptor to the wall outlet by the power cord.
6. Switch the Int / Ext toggle switch on the back panel of BLCC-2 to Int position.
7. Turn the Key of the LED power ON and adjust dial control clock wise to desired power level.

Main Office	European Sales Office	North America Sales Office
Phone: +972-72-2500097	Phone: +44 (0)77-9172-9592	Phone: +1-(248)-436-8085
Fax: +972-72-2500096	Fax: +44 (0)20-7681-2977	Fax: +1-(248)-281-5236
sales@prizmatix.com	sales.europe@prizmatix.com	sales.usa@prizmatix.com

P.O.B. 244 Givat-Shmuel 5410102, Israel

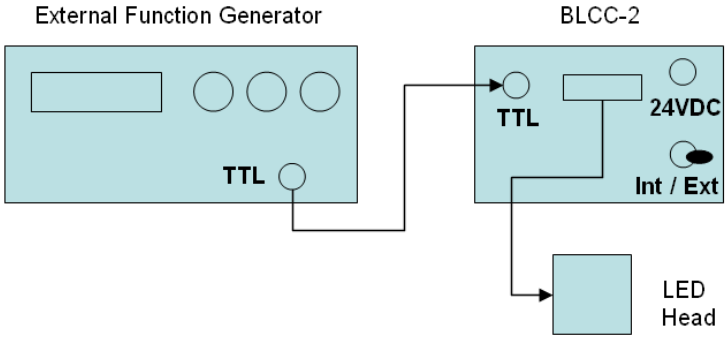
Prizmatix

Fig. 1: BLCC-2 Current Controller Front Panel

Fig 2: BLCC-2 Current Controller Back Panel

External TTL Modulation

The external TTL input on the back panel of BLCC-2 enables external control of LED ON/OFF state. The TTL Low state will switch the LED OFF and the TTL High state will switch the LED ON according the power that have been set at the Power Adjust Dial on the front panel of the BLCC-2. See Fig. 3 for the setup. In order to enable this operation mode switch Int / Ext toggle switch to Ext position.



Main Office	European Sales Office	North America Sales Office
Phone: +972-72-2500097	Phone: +44 (0)77-9172-9592	Phone: +1-(248)-436-8085
Fax: +972-72-2500096	Fax: +44 (0)20-7681-2977	Fax: +1-(248)-281-5236
sales@prizmatix.com	sales.europe@prizmatix.com	sales.usa@prizmatix.com

P.O.B. 244 Givat-Shmuel 5410102, Israel

Fig 3: BLCC-2 External TTL modulation setup.

LED Power Control by Analog Input
(Optional Feature)

If the LED output power needs to be controlled over the whole power range from minimum to maximum power the Analog input is a preferable choice.

General Information regarding Analog modulation

In order to implement the Analog input control a few basic issues shall be clarified:
Transfer Function – describes the output LED power as function of Analog input voltage. The transfer function will be slightly different for each LED type but in general it will be similar to the following figure:

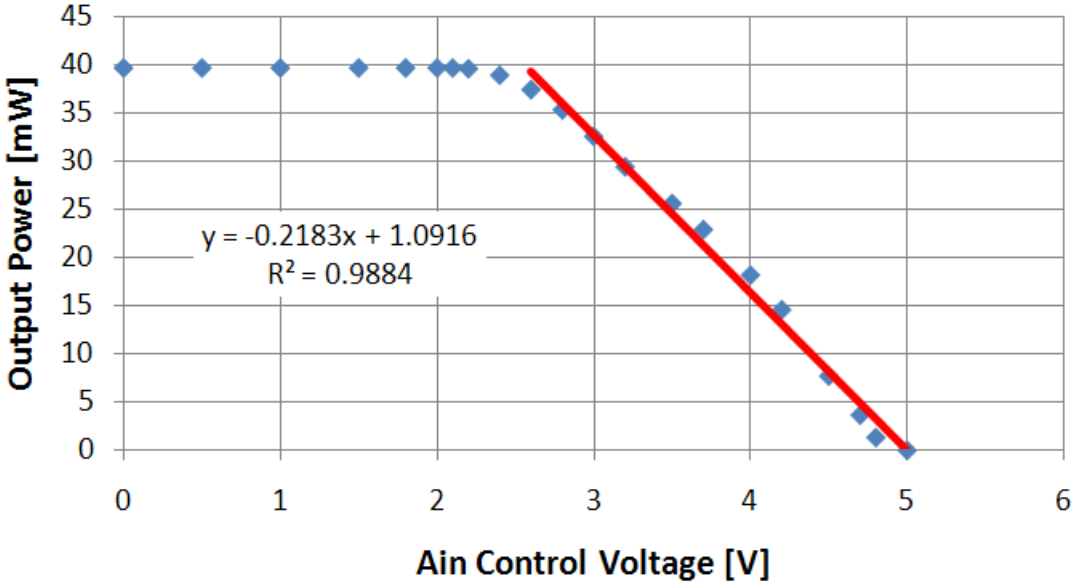


Fig. 3: Example of Transfer Function. LED Output Power vs. current control Voltage input at Vin BNC connector on back panel.

We can see from the graph that the input values 0V to 2.5V do not contribute any changes to the output power. The Output power is an inverse function of the input voltage between about 2.5V to 5V.
Amplitude Modulation (AM) – AM is the varying of strength of the transmitted signal in relation to the information being sent. In this case it is a varying of the LED light power amplitude according to the input voltage values. In order to get good AM modulation it is very important to supply the

correct input modulation voltage (Pk-Pk) and the correct offset voltage, as described in following figure.

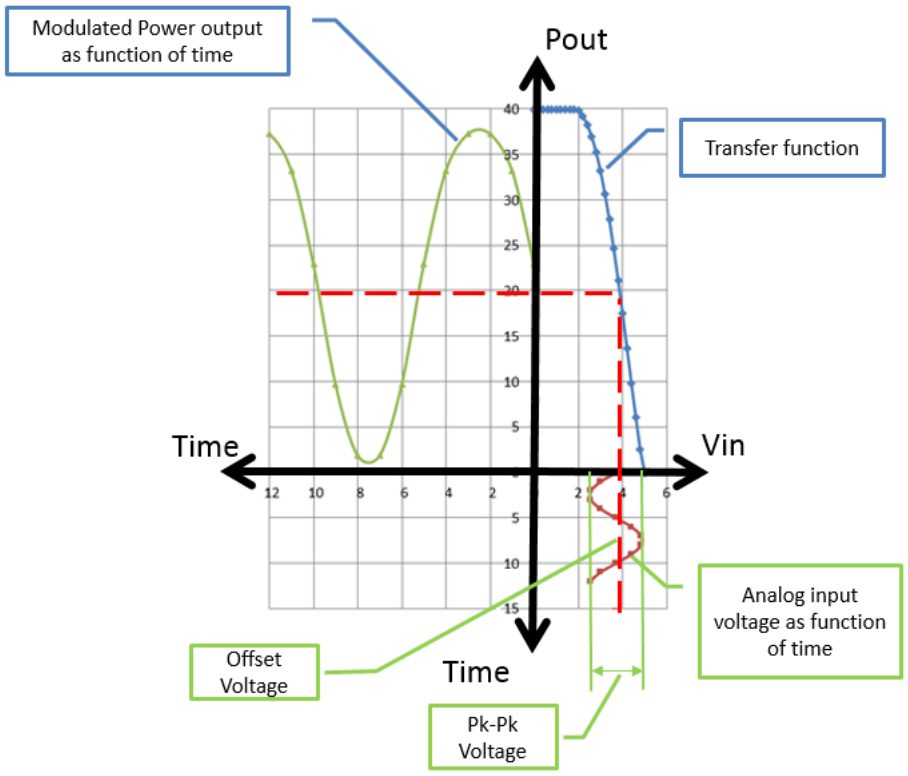
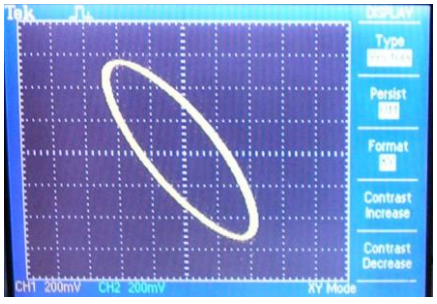


Fig. 4: Analog modulation basics: green labels refer to the Ain signal, blue labels refer to the output light power.

If the input signal and the offset are of appropriate magnitude, and the modulation frequency is within allowed range the quality of the LED, modulation can be checked by a **Lissajous curve** such as the figure below. More information on Lissajous curves can be found at: http://en.wikipedia.org/wiki/Lissajous_curve



Main Office
Phone: +972-72-2500097
Fax: +972-72-2500096
sales@prizmatix.com

European Sales Office
Phone: +44 (0)77-9172-9592
Fax: +44 (0)20-7681-2977
sales.europe@prizmatix.com

North America Sales Office
Phone: +1-(248)-436-8085
Fax: +1-(248)-281-5236
sales.usa@prizmatix.com

P.O.B. 244 Givat-Shmuel 5410102, Israel

Fig. 5: Lissajous of Analog modulated LED

Analog Modulation setup

Preparation of the Analog Source

Connect the Analog voltage source (oscillator, function generator, D/A card) to Channel #1 of the oscilloscope.
Adjust the Peak-Peak amplitude of the Analog voltage source to about 1.0V.
Adjust the Offset Voltage of the Analog voltage source to about 2.5-4.5V.
These values shall be refined as described in next paragraph.

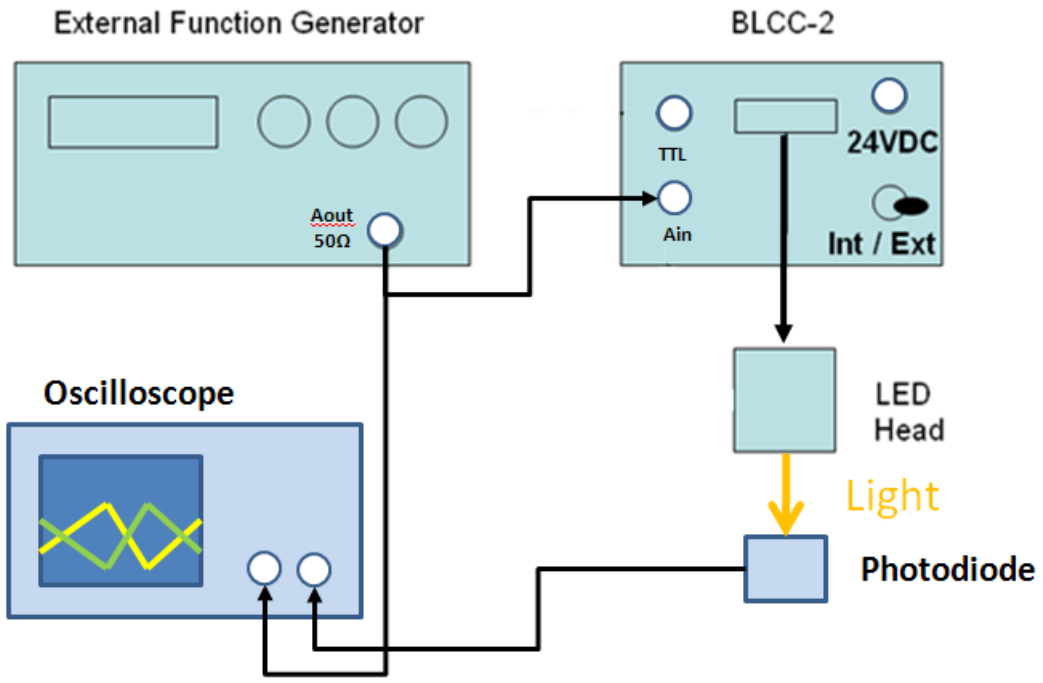


Fig. 6: Setup for analog modulation.

Prizmatix

Preparation of the BLCC-02

Turn dial potentiometer counter-clockwise to the minimum power position.
Connect the Photodiode Receiver output to Channel #2 of the oscilloscope.
Connect the Analog signal cable to the **Ain** input connector on the back panel of the BLCC-02.
Switch ON the ON/OFF switch of the
Change the position of the toggle switch **Int/Ext** to the **Ext** position.
Observe the Analog input signal and the photodiode signal on the oscilloscope. Adjust the Time Base and the Volt/Div of the oscilloscope for optimal observation of signals.
Adjust the Offset Voltage and the Peak-Peak voltage of the input analog signal to obtain the best analog modulation working conditions.
If the photodiode signal appears truncated or highly deformed reduce the Peak-Peak voltage of the analog source, readjust the Offset Voltage and then try to increase the Peak-Peak amplitude of the source once again.

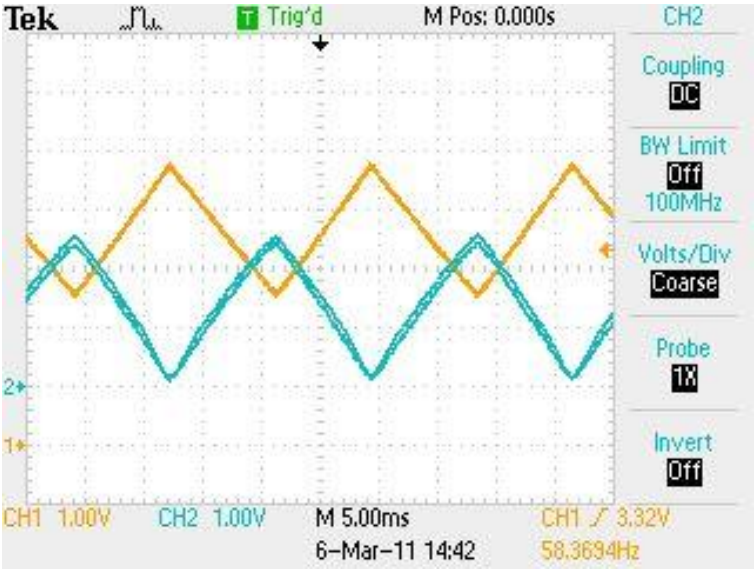


Fig. 7: Typical waveforms with saw tooth analog modulation. Orange is the Analog input signal; Green is the light power as measured by a photodiode

Remark: In models with the Analog Input option the Int/Ext switch controls only the Ain.
In models without the Ain option the Int/Ext toggle switch controls the TTL input.

Main Office	**European Sales Office**	**North America Sales Office**
Phone: +972-72-2500097	Phone: +44 (0)77-9172-9592	Phone: +1-(248)-436-8085
Fax: +972-72-2500096	Fax: +44 (0)20-7681-2977	Fax: +1-(248)-281-5236
sales@prizmatix.com	sales.europe@prizmatix.com	sales.usa@prizmatix.com

P.O.B. 244 Givat-Shmuel 5410102, Israel