MacroLED

Intense Ultra Stable LED Light Source for Macro Imaging

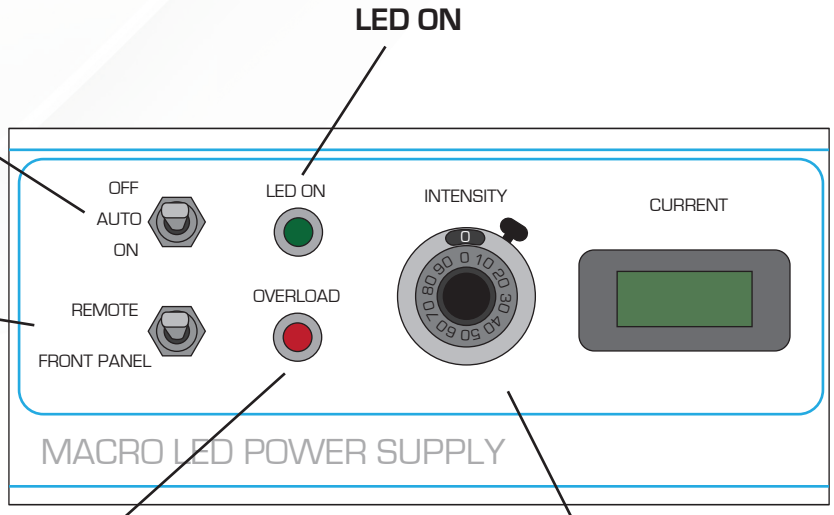
SET UP GUIDE

Thank you for purchasing the Cairn MacroLED. This instrument is designed for stable, intense and rapidly switched illumination of objects from millimetres to tens of millimetres for imaging using macro lenses or low magnification objectives. It is envisaged that the LED heads would either be pointed directly at the sample or introduced episcopically through a macroscope or microscope. It is based on our popular OptoLED platform, but supports much larger and more powerful LED chips and will drive two of these in parallel. This document should contain all the information required to operate the device correctly, but please don't hesitate to contact us. If you have a Skype account or other video conferencing facilities then we are always more than happy to arrange a remote run through of the system and answer any questions.

PANEL CONTROLS:

OFF / AUTO / ON
switches the twin heads on, off or leaves them under TTL (+5V digital) control in the AUTO position.

REMOTE / FRONT PANEL
allows the intensity to be controlled with an optional remote control slider module if preferred.



FRONT PANEL

OVERLOAD
LED chips are current limited to prevent damage. The protection circuitry has a time element, so it is possible to transiently overdrive LEDs for increased intensity in dicontinuous use. The OVERLOAD light will flash if the LED is overdriven, in which case the intensity setting should be reduced.

INTENSITY
this sets the default current applied to the LED(s). The full scale is set internally to 10A so the potentiometer reading will correspond to the current.

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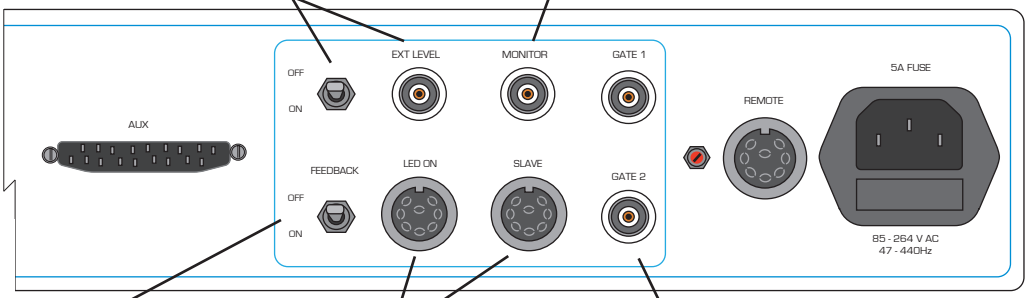
EXT LEVEL
when the adjacent switch is set to ON, the front panel potentiometer will be over-ridden and instead the LEDs will be driven at a current proportional to the voltage applied to the EXT LEVEL BNC connector. The input range is 0 to 10 volts which will correspond directly to current i.e. 2V = 2A.

MONITOR
produces a voltage (0 to +10V) proportional to the actual intensity of the LED. This output comes directly from the built-in photodiode, so gives a more reliable monitor of light dosage than simply monitoring the drive current.

Rear Panel



LED and SLAVE
connectors to twin LED heads.
*(either connector)

FEEDBACK
With FEEDBACK on the intensity of the LED is held constant in a feedback loop with the photodiode built in to the LED head. This is extremely useful as the intensity of LEDs is temperature sensitive (dimmer at higher temperatures), so without it the output will drop over time. Please note that in FEEDBACK mode the drive current on the LED will increase to maintain intensity, so it is necessary to set an initial current a little lower than the maximum to avoid a subsequent OVERLOAD.

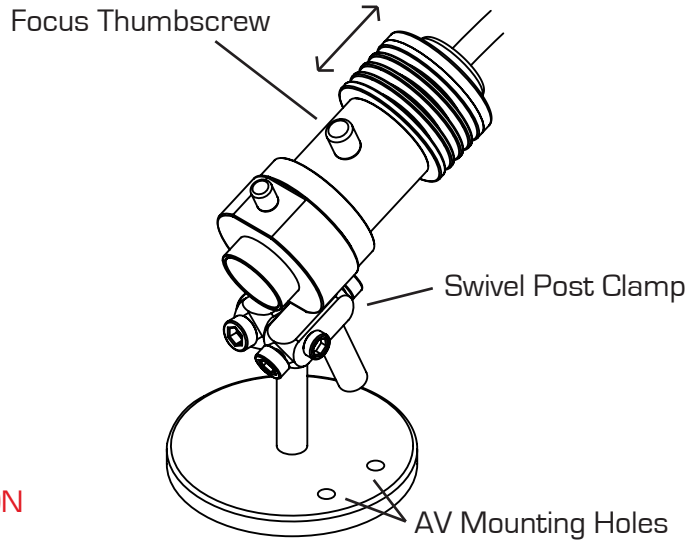
***GATE1 and GATE2**
BNC inputs to rapidly modulate the LED(s) digitally from zero intensity to the intensity set by the front panel potentiometer or the EXT LEVEL input. If both BNCs are connected they act as a logical AND with both needing to be high for the LEDs to switch on. If only one switching source is required then the other BNC should be left disconnected.

Direct illumination mounts:

As default the LEDs with the MacroLED system are supplied with flexible mounting stands for orientating them to the target. A condenser lens is included in the mount and focus is normally set so that the LED is just out of focus at the specimen to avoid seeing the structure of the LED chip. For more diffuse illumination ground glass or anti-Newton glass diffusers can be fitted into the assembly after the condenser.

Alternatively the MacroLED heads can be used with our MultiPort micro and macroscope coupling systems as described in the MultiPort set up guide.

WARNING: ENSURE LED IS ATTACHED TO ILLUMINATION MOUNT BEFORE USE.



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* When using UV LEDs ensure dummy connector is in SLAVE socket.

* The rationale behind having two inputs is that the LED(s) can be simultaneously controlled by a software "shutter" command and also directly linked to the integrate output signal from a camera. This allows the exposure to photons of sensitive samples to be minimised and crucially allows rolling shutter sCMOS cameras to be used in a virtual global shutter mode. http://blog.mshalin.com/2012/08/global-exposure-with-scientific-cmos.html