

# Robot Lights Instructions

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# 1. Specifications

The OSE Robot Lights provide spot light illumination on 4x faces of any platform they are mounted to. The primary intended platform for Robot Light integration is the Boston Dynamics Spot robot, and thus the mounting brackets are designed with that platform in mind, the mounting and control of the lights is platform agnostic.

When mounted to Spot, the Robot Lights are designed to use the Boston Dynamics COREIO / EAP2 for power and signalling.

Specifications are as follows:

- 24 V – 0.8 A – 19.2 W
- Operating environmental temp -40 - 85 °C
- Max observed lamp temp (1 hour test) – 30 °C
- 30 ° Spot beam per lamp
- 6000K pure white colour
- 1600 Lumen brightness per lamp
- Ingress protection IP54



*Figure 1: Robot Lights*

## 2. Warnings

1. Do not disassemble device, warranty will be void if device is tampered with.
2. Do not power the device with voltages exceeding 24 V.
3. Ensure correct PPE is worn to prevent pinching and or cutting of skin whilst fitting.

## 3. Mounting Instructions

The Robot Lights will come with the following items:

- 6x M5 12 mm Hex bolts
  - 8x M5 washers
  - 6x M5 T nuts
  - 2x M5 25 mm hex bolts
  - Gorilla double sided tape
  - 1x Front lamp
  - 1x Rear lamp
  - 1x Side lamps assembly with junction box
  - 1x FET controller
1. Using the M5 12mm hex bolts, washers and M5 T nuts, secure the front lamp and side lamps assembly with junction box to Spot's payload rails.
    - Should you have a payload on the front of the robot, which blocks the front lamp, you can secure the front lamp to the top of the nose cowling using the double sided gorilla tape.
  2. Using the M5 25mm hex bolts and washers, secure the rear lamp to the recessed mounting point on the rear of the robot
  3. Open up the rear compartment of the COREIO / EAP2 and connect the FET controller to the following pins, as shown in the below diagram:
    - White – Signal – CN2 Pin 1 (for GPIO control via the COREIO / EAP2 web console)
    - White – Signal – CN4 Pin 5 (for always on when payload power is active)
    - Red – Power – CN4 Pin 2 – 24 V
    - Black – GND – CN4 Pin 10
  4. Route the cabling outside of the COREIO / EAP2 using the silicon gaskets provided with the COREIO / EAP2, and close up the unit.

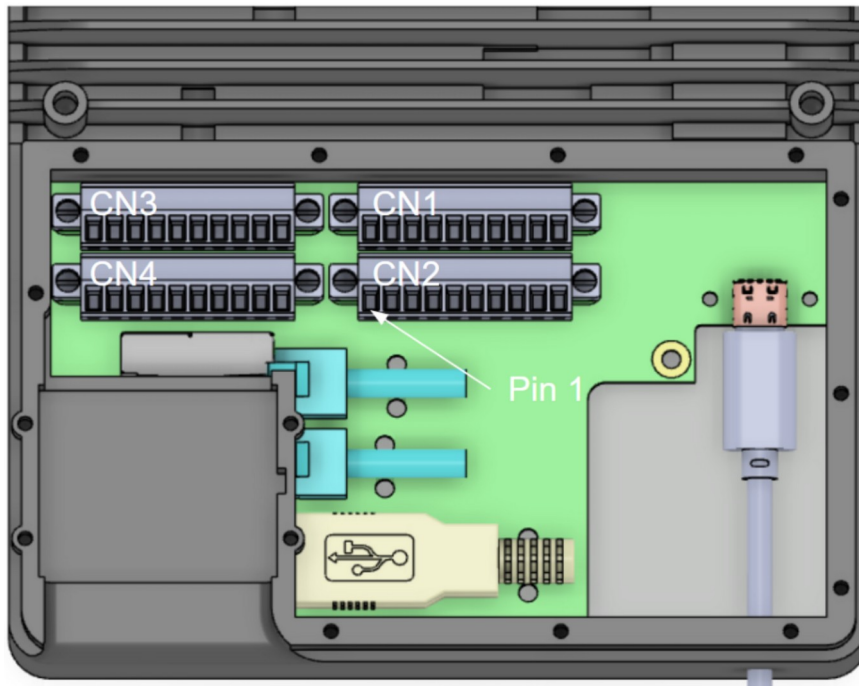


Figure 2: COREIO / EAP2 connection names

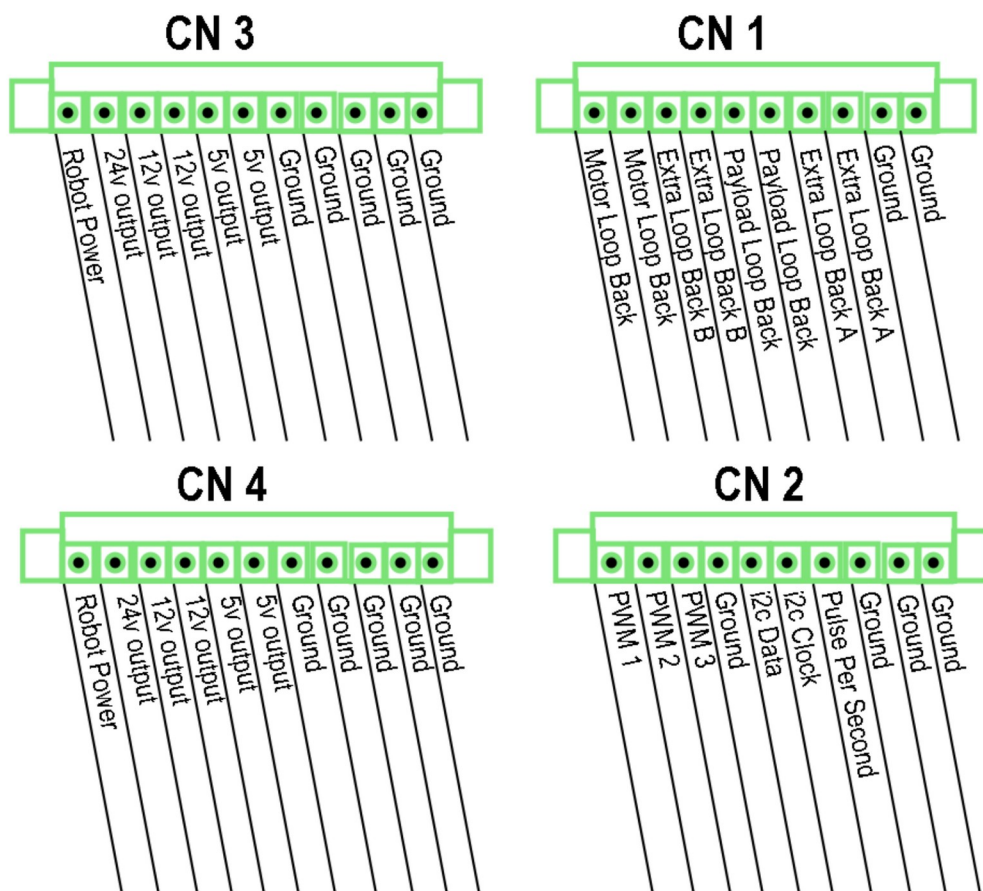


Figure 3: CN pin out

## 4. Operation

In order to switch the lights on and off, 3.3 – 5 V must be applied to the signal line of the FET controller.

If you have mounted the robot lights to a Boston Dynamics Spot with COREIO / EAP2, and you have connected the signal line to the 5V output of the COREIO / EAP2, the lights will switch on whenever payload power is active, this is typically after the robot has fully booted up.

If you have connected the signal line to the GPIO on the COREIO / EAP2, the GPIO can be toggled on and off, which will in turn switch the lights on and off. This can be done from within custom dockerised software, or via the COREIO / EAP2 web console.

To access the webconsole, navigate to the following URL in a web browser:

`https://*ROBOT-IP*:21443`

Where \*ROBOT-IP\* is the IP address of spot on your network. GPIO can be accessed on the GPIO tab on the left hand side of the web page. If you have followed the above instructions, the lights can be switched on and off by toggling GPIO 1.

Please note, that at the time of writing the COREIO / EAP2 web console is not available via a rjant connection, and must be accessed via Spot's wifi. An issue has been raised via Boston Dynamics to fix this.

For further information regarding developing custom software to control the GPIO and lights, please see the following documentation:

[https://dev.bostondynamics.com/docs/payload/coreio\\_documentation#gpio-and-pwm](https://dev.bostondynamics.com/docs/payload/coreio_documentation#gpio-and-pwm)

[https://dev.bostondynamics.com/python/examples/core\\_io\\_gpio/readme](https://dev.bostondynamics.com/python/examples/core_io_gpio/readme)

<https://support.bostondynamics.com/s/article/Spot-Core-IO-Setup-and-Usage-73140>

## 5. Disposal

The Robot Lights are classed as electronic waste, and must be disposed off according to local regulations.

