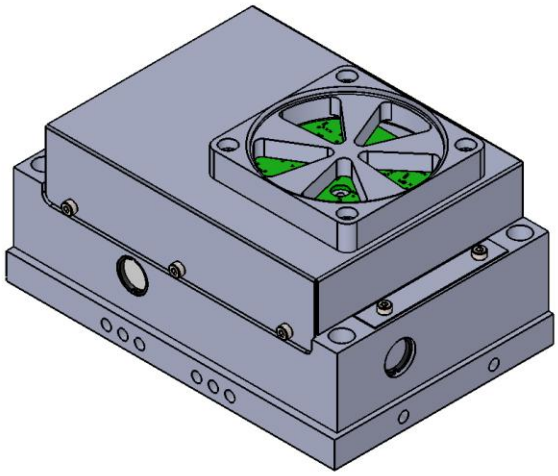
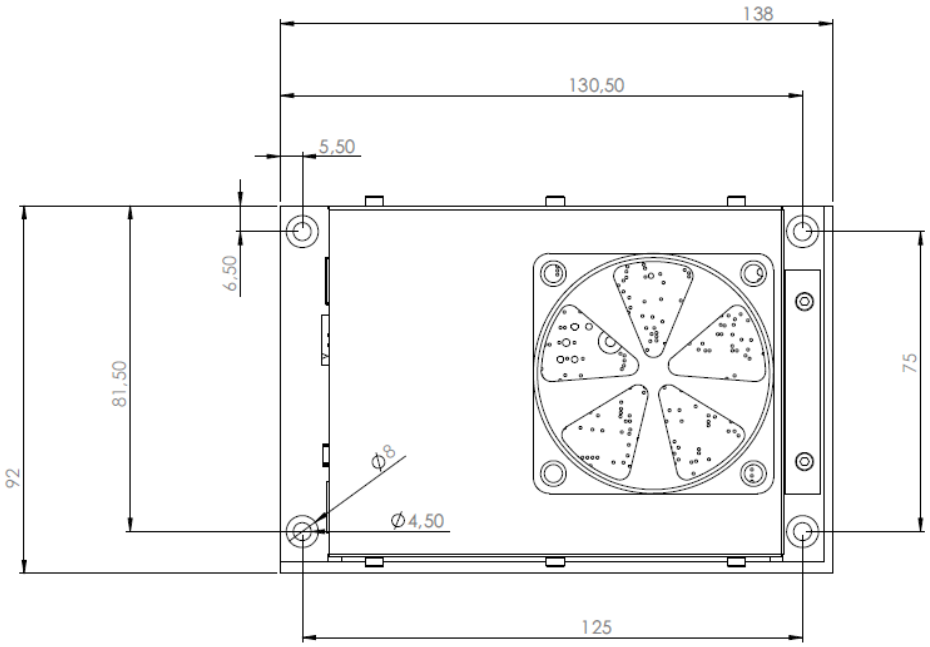


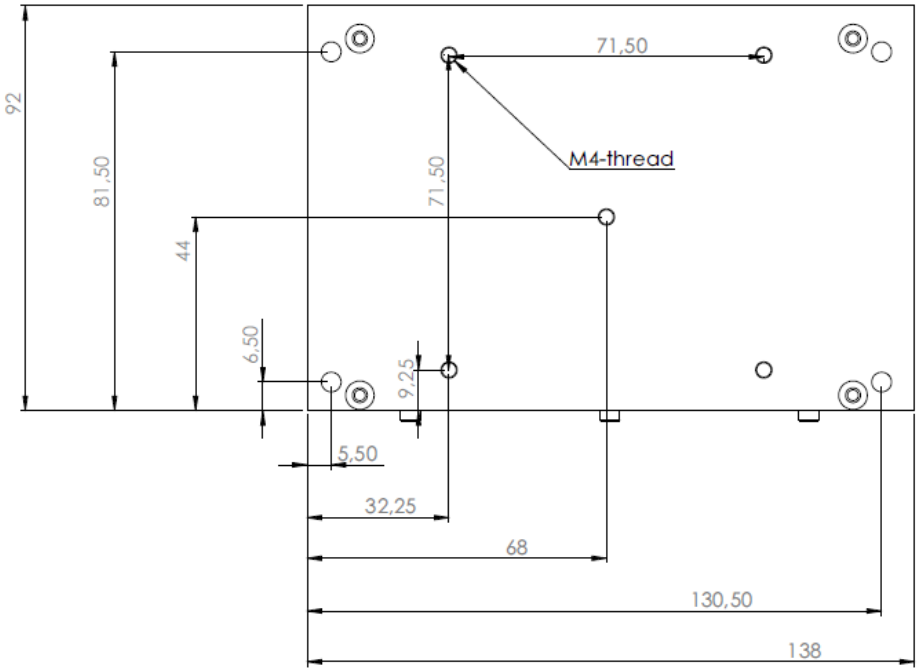
# CP Laser Dimensions and Interfaces

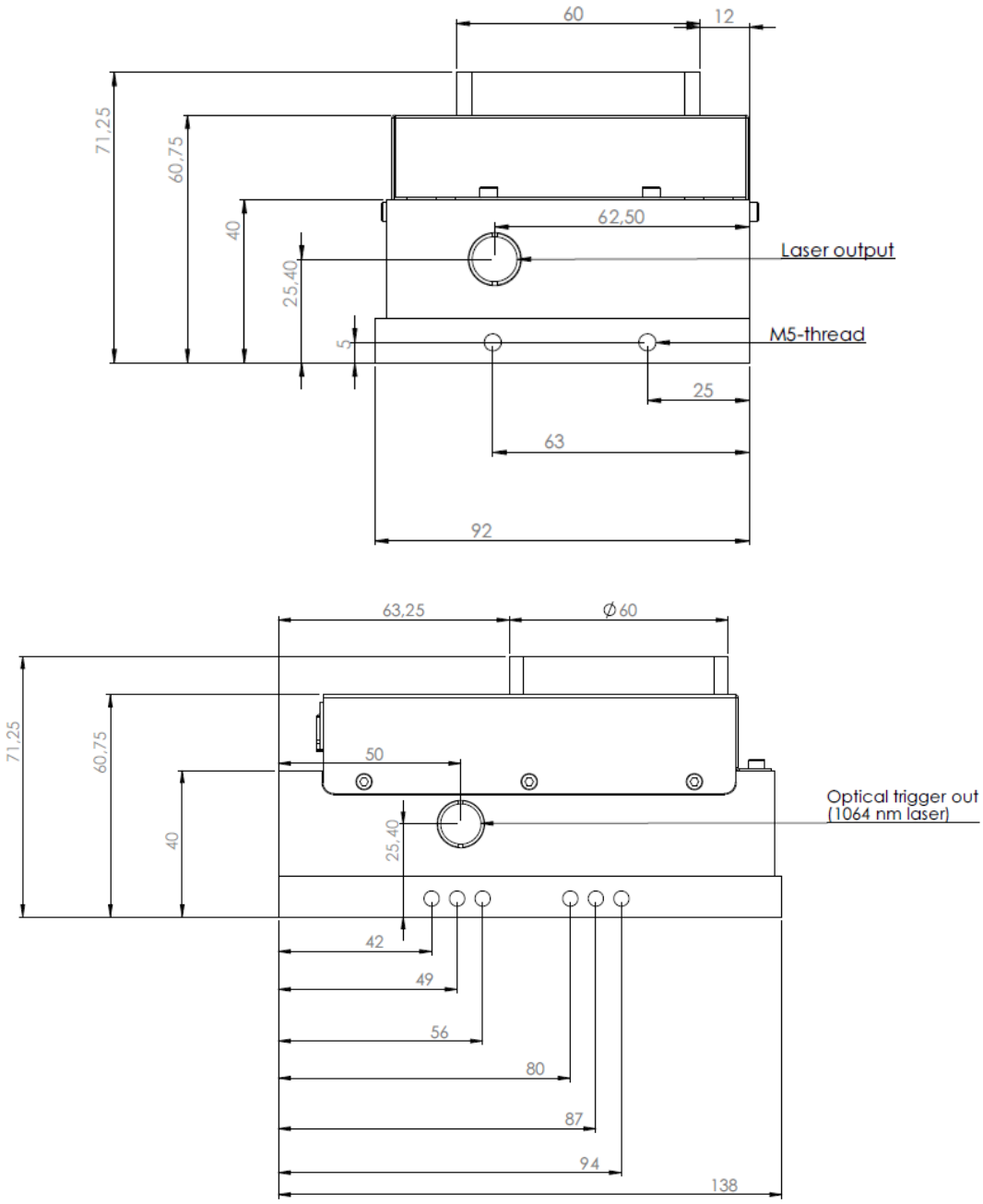
## Content

# 1. Mechanical Dimensions

Mechanical dimensions of the laser are presented below. All dimensions are in millimeters.






## Laser mounting

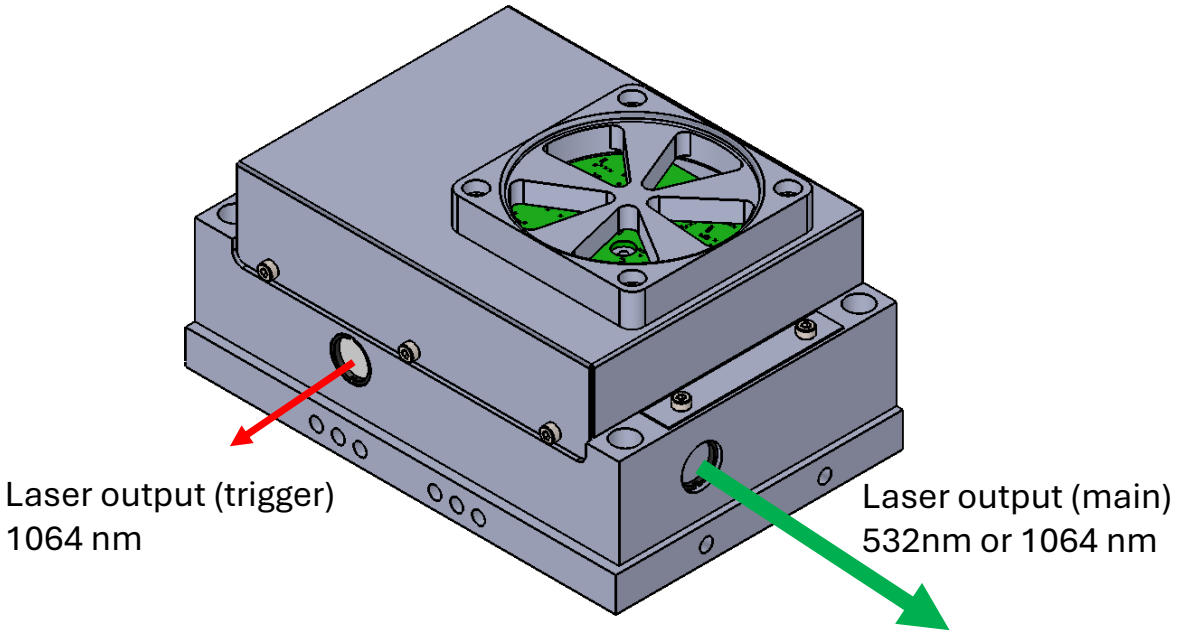
- The laser should be fixed to a temperature stabilized heatsink from all four corners using M4×20 mm hex socket screws (8-32, length 3/4" or longer). The pitch of the fixing holes is 75×125 mm. The surface of the screw fixing point is located 16 mm above the bottom surface of the laser.
- The heatsink must have flat and smooth surface and its cooling capacity should exceed 40 W.
- Use thermal interface material (for example 30–60 µm thick graphite sheets, such as Wurth 4051210297017) or thermal paste between the laser and the heatsink to ensure good thermal contact.
- The heatsink temperature should be stabilized to a temperature between T=25–30 °C. Drifting heatsink temperature may reduce laser power stability.
- An air-cooled mounting bracket with Peltier elements can be provided by Picophotonics and it will fit directly onto standard optical table with M6 or ¼” threads and 25 mm or 1-inch pitch (see part 4.)

## 2. Optical Interfaces

Laser has two optical outputs: the primary beam output for 532 nm or 1064 nm, depending on laser model and a secondary optical trigger output at 1064 nm.

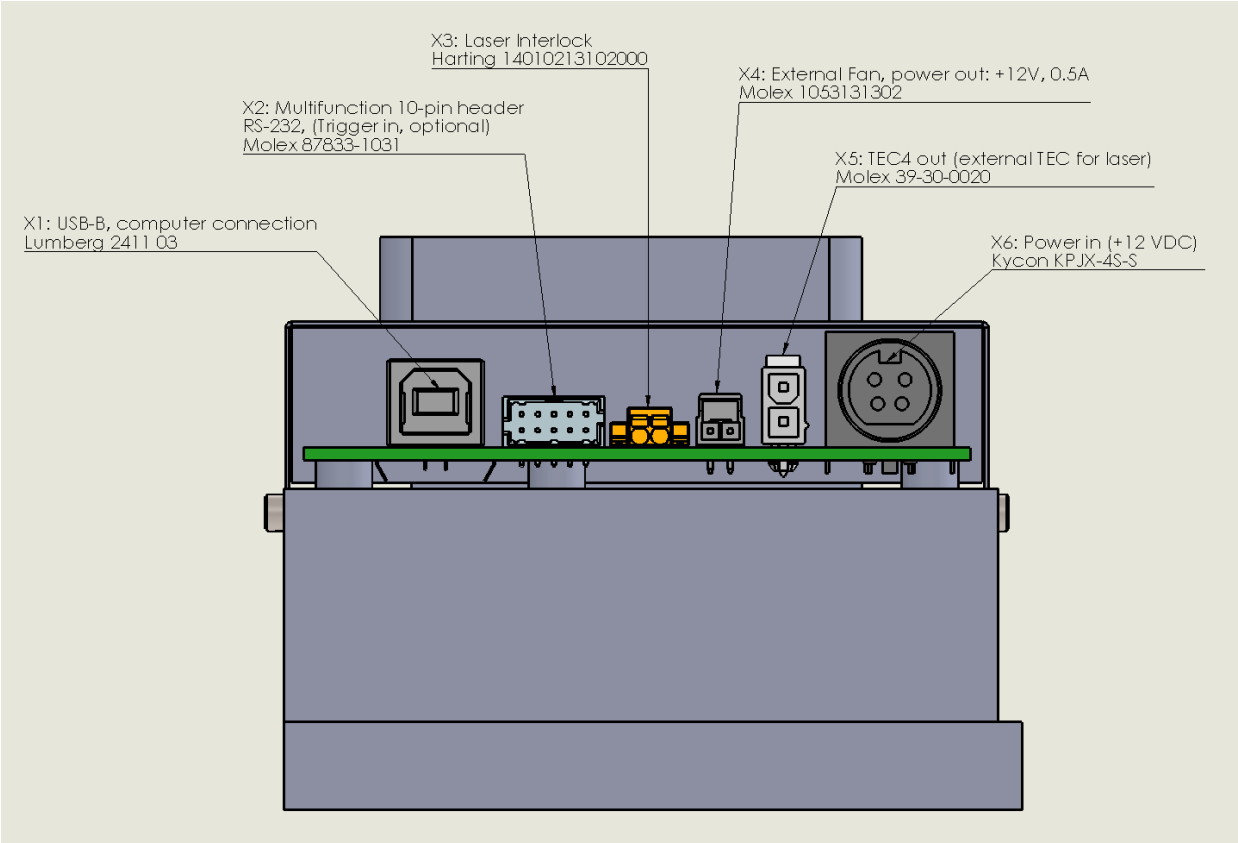
With free-space output, beam diameter at primary output is ~300 µm with half-angle divergence of approx. 10 mrad (collimated) or 40 mrad (freely diverging), based on customer preference.

Both output ports can host external multi-mode fiber coupling adapters, connected with M5 bolts to the laser side. Multimode fiber coupling is optional and should be requested separately.

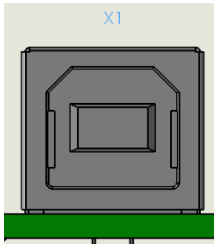


# 3. Electrical Interface

CP lasers have an integrated laser driver controlling laser and TEC operations. Driver connections can be found from the back panel of the laser.

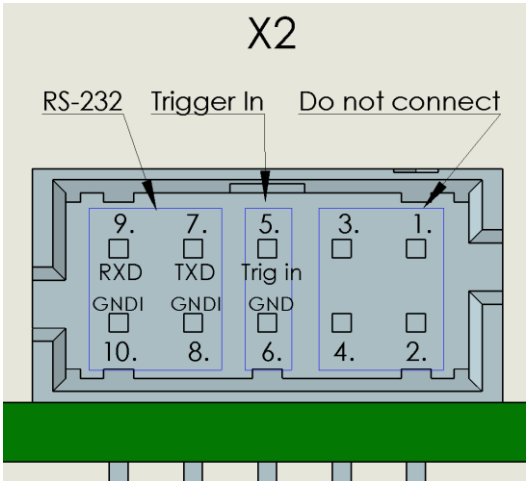



**X1: USB-connection** (Lumberg 2411 03). Laser operation is typically controlled via USB-B connection and a computer interface.

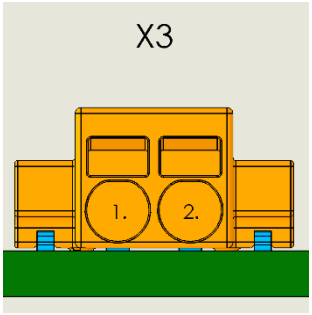



**X2: Multifunction** (Molex 87833-1031). Alternatively, the laser can be controlled using a 10-pin multi-function connector, which includes four pins for RS-232 communication. This connector also includes two pins for an optional trigger-in signal.

| | |
|---|---|
| Pins 1–4 | Do not connect! |
| Pin 5 | Trigger in (TTL, 3-5V) |
| Pin 6 | Trigger in GND (isolated) |
| Pin 7 | TXD (RS-232) |
| Pin 8 | GND RS-232 (isolated) |
| Pin 9 | RXD (RS-232) |
| Pin 10 | GND RS-232 (isolated) |



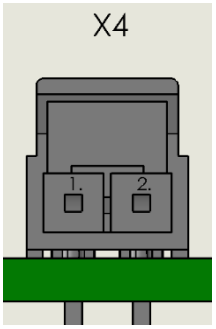
**X3: Laser interlock** (Harting 14010213102000, push-in). The interlock contacts (1 and 2) must be short circuited to enable laser emission. An open interlock circuit will prevent laser from lasing. After opening and re-closing the interlock circuit, user must re-start the laser separately from the user interface.




**X4: Fan power out** (Molex 1053131302).

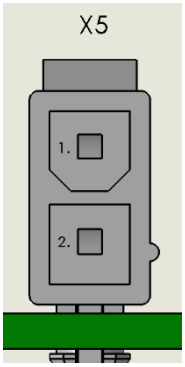
Power is provided to an external 12VDC fan by this connector.

| | |
|---|---|
| Pin 1 | Power out, +12 VDC, max 0.5 A |
| Pin 2 | GND |



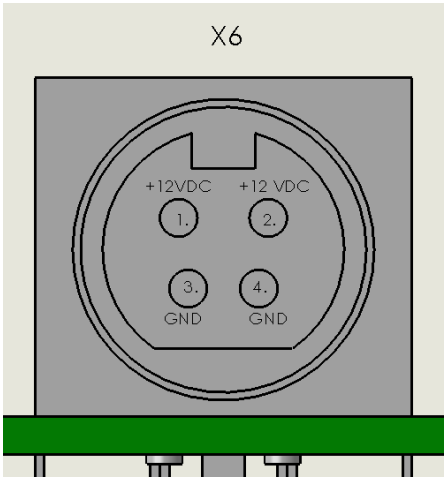

**X5: TEC4 out** (Molex 39-30-0020). The laser case temperature can be stabilized using an external thermo-electric cooler (TEC, Peltier-element). The laser frame has a built-in thermistor, which is linked to the TEC4 output and thus allows stabilization of the laser case temperature. TEC4 driver output is limited to 4 A and 8 V.

| | |
|---|---|
| Pin 1 | TEC4+ |
| Pin 2 | TEC4- |




**X6: Power in** (Kycon KPJX-4S-S). Power is supplied to the laser through connector X6. Standard power supply used by Picophotonics is XP Power, VES120PS12 (https://www.xppower.com/product/VES120-Series), which has +12 VDC and 10A output.

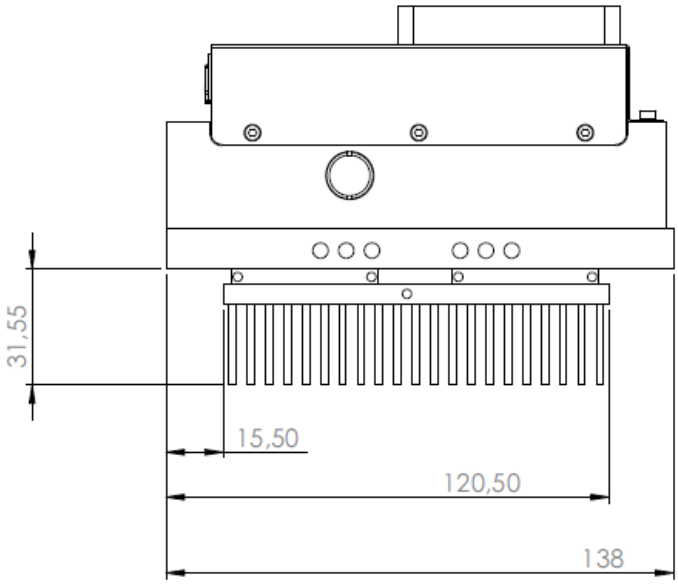
| | |
|---|---|
| Pin 1–2 | Power in: +12 VDC, 10A |
| Pins 3–4 | GND to power in |

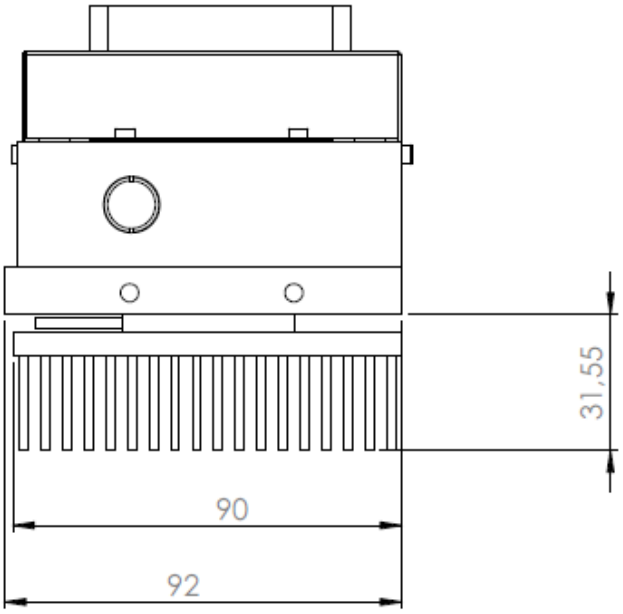


# 4. Integrated Cooling Options

Picophotonics offers two versions for stabilizing the laser base and cooling the system. Integrated heatsink (Option 1) is complimentary to all CP lasers or alternatively customers can request Integrated fan cooling (Option 2) with additional air-cooling frame to option 1, which will be quoted separately.

**Option 1** – Integrated heatsink, includes integrated peltier stabilization for the base and an integrated heatsink according to schematics below. Laser can be mounted on metric table with 50 mm or higher posts, and customer will implement sufficient air cooling for the heatsink. By using 50 mm posts, the optical height of the laser will fit to 75 mm.



Option 2 – Integrated fan cooling, includes the peltier elements and heatsink on option 1 and an additional air-cooling frame with fans and mounting options. Fans are powered by the laser fan output (X4) and laser is mounted on top of the cooling frame according to schematics below. The frame can be mounted to metric optical table by 25 mm pitch.