

# LaserMount™

# 203 & 205

## USER'S MANUAL



**BUTTERFLY MOUNT  
TEC BUTTERFLY MOUNT**

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## Introduction

Thank you for choosing the **203** or **205 Butterfly LaserMount** from Arroyo Instruments. The **Butterfly LaserMount** is designed for high performance and long term use, with innovative features not found in other butterfly mounts.

The **203** and **205 Butterfly LaserMount** supports higher operating currents, up to 5A per pin.

With higher operating currents come higher thermal loads, and an optional fan base is available that significantly increases the thermal performance of **LaserMounts**. Simply remove the standard base and replace with the fan base, and the built-in fan supply provided by most of our temperature controllers, or an external 12V DC power supply.

In addition to the standard **203** and **205** mounts, the **203-1MM**, a variant of the **203**, is specifically designed high power butterfly lasers that use larger 1mm round pins. Except where noted in the specifications or mechanical drawings, the **203-1MM** is otherwise identical to the **203**. Most applications using the **203-1MM** also require the optional fan base for adequate cooling.

The **LaserMounts** support dual port devices (fiber exiting out of the front and rear of the device). In addition, either connector can be removed for 7-pin devices that have a GPO or SMA connector.

The **LaserMounts** include the same benefits of the older mounts, including the field-replaceable butterfly connectors. A common problem in production applications is the wear and tear on the butterfly connectors. Unlike competitive products, the **Butterfly LaserMount** features field-replaceable connectors. Simply unscrew the two retaining screws, pull out the old connector and install a new one. No soldering or disassembly of the mount is required.

For applications requiring case temperature control, the **205** integrates a TEC (Peltier) cooler for precise control of the package temperature. With an operating range of -5°C to 85°C, the **205** should cover most of your case temperature control needs.

The **Butterfly LaserMount** also offers all the features you would expect from a modern butterfly laser diode fixture, including:

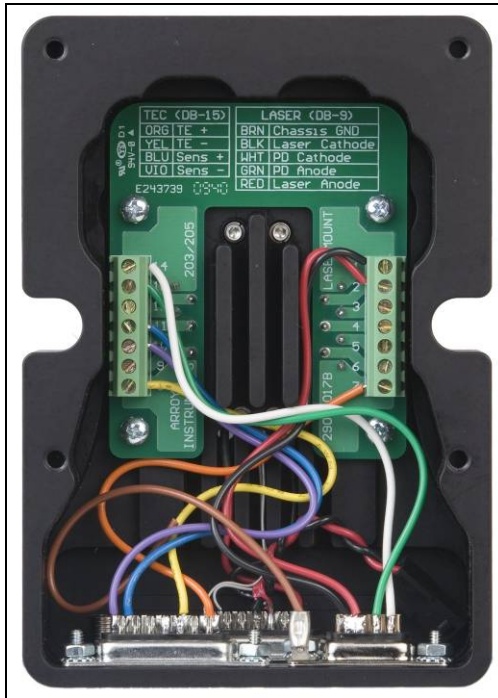
- Designed to be quickly integrated with Arroyo's **LaserSource** and **TECSource** instruments.
- Industry-standard D-sub connectors and pin-outs allow for quick integration into existing laser applications.

- Screw terminals for all 14 pins of the device, allowing for easy, solder-less configuration of the fixture.
- The **205 TEC Butterfly LaserMount** features three standard connectors, eliminating the need for custom cabling to the two TEC interfaces.
- Optional fan base (p/n **200-FAN**) which significantly increases the efficiency of the heat sink.
- Optional fiber management tray (p/n **200-TRAY**) for managing the butterfly's fiber pigtail(s).
- Optional cover (p/n **200-COVER**), which improves the temperature stability of the system.

## Installation and Use

### Wiring the mount to your device

Start by configuring the wiring of the mount to match your butterfly laser. To do this, remove the four screws from the bottom of the fixture and lift off the base plate. This will give you access to the screw terminals inside the fixture.



Internal Wiring Example

Using the wiring guide below, connect the wires to the appropriate pins of the butterfly. The wires are color coded for easy identification.

Signal	Color
Laser Anode	Red
Laser Cathode	Black
Photodiode (PD) Anode	Green
Photodiode (PD) Cathode	White
Chassis Ground (GND)	Brown
TE (+)	Orange
TE (-)	Yellow
Thermistor	Blue
Thermistor	Violet

**Fixture Wiring Guide**

## NOTE

### Earth Grounding Considerations

The DB-9 and DB-15 connectors are electrically connected to the housing and 8mm banana jack. Depending on the wiring of your cables and instruments, this may or may not provide earth grounding of the fixture. Make sure the cable shell is earth grounded on both ends of the cable, and that the instrument makes connection from its connector to earth ground. If in doubt, you can also use a grounding strap from the 8mm banana jack directly to earth ground.

## Using the Optional Fan Base

The optional fan base (p/n **200-FAN**) replaces the existing bottom cover, so start by removing the four screws on the bottom of the fixture and setting the standard bottom cover aside. Before screwing on the fan base, you first need to plug the fan in. You will find a black, two-pin socket inside the fixture that is wired to the TEC (or Mount TEC) connector. The fan base has a matching two-pin plug. It is easiest to place the mount on its back, insert the plug into the socket, and lower the fan base onto the mount. Take care that you do not pinch the fan wires (or any other wires) between the mount and the base.



**205 with Fan Base Installed**

If you will be using the **5300 Series TECSource** temperature controller to power the fan, make sure to use 1262 cable, which has the additional connections for the fan power supply. Otherwise, you can use a 12V DC external power supply with a 2.1mm round DC power jack (center positive). It is possible to operate the fan as low as 6.5V if you would like to reduce the fan noise or vibration, but low fan speeds will reduce the thermal capacity of the mount.

## Using the Optional Fiber Management Tray

The **203** and **205** offers an optional fiber management tray (p/n **200-TRAY**), which makes managing excess fiber much simpler by providing a protected area to coil the fiber. Unlike other solutions that use ties to retain the fiber, our fiber tray has an upper lip that catches the fiber, retaining it gently without needing any ties. To install the tray, simply use the provided screws. Note that if you will be using the cover and screwing it down, you will need to install only the front two screws, as the socket head screws that come with the cover will use the rear two threaded holes.



**Mount with Fiber Management Tray Installed**

### Using the Optional Cover

For applications that demand the best in thermal stability, a cover is available for the **203** and **205** that insulates the device from air currents that can otherwise cause instability in the device and cold plate. Two alignment pins locate the cover on the mount and prevent it from sliding around when the screws are not installed. For more permanent installations, two socket head screws are provided that can bolt the cover to the mount to prevent removal and also add additional protection for the device. The cover can be used in conjunction with the fiber tray.



**Mount with Cover Installed**

## Connecting to the Laser Diode Driver and TEC Controller

Next, connect the **Butterfly LaserMount** to your laser diode driver and temperature controller. For the **205 TEC Butterfly LaserMount**, you will need a second temperature controller for the case temperature control.

### NOTE

Arroyo Instruments offers Laser and TEC cables designed to connect directly between our **LaserSource** and **TECSource** products. If you use your own cables, ensure the connections are properly made between the instrument and the mount, and that proper grounding techniques are used. The pin-out of the connectors can be found later in this document.

### WARNING

Be sure you are properly ESD protected before handling your laser. For additional information, read the section titled "Laser Diode Protection" later in this manual.

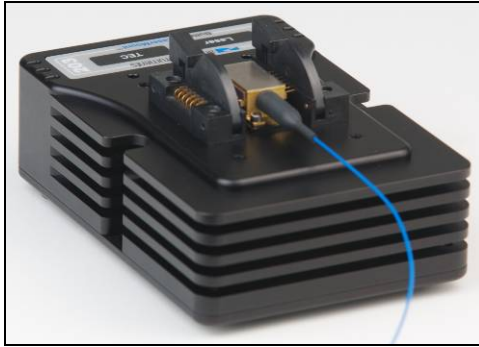
## Mounting your device

If you will be using a butterfly laser with a GPO or SMA port on one side, you can remove the ZIP connector by unscrewing the two socket head screws in the connector and pulling it off. If you wish to reinstall the connector later, take care in aligning the connector pins with the sockets.

Remove the four small butterfly mounting screws from the mounting plate, open the connectors on either side of the mounting plate, and carefully place your butterfly laser onto the mounting plate.

Screw in the mounting screws, ***but do not over tighten, as you can strip the threads in the mounting plate.***





**Device Loaded**

Your mount is now ready for use. Additional technical information can be found below.

## Connector Pin-Outs



**203 Butterfly LaserMount Connectors**



**205 TEC Butterfly LaserMount Connectors**

DB-9 Pin	Description
1 – 3	No connection
4 & 5	Laser cathode
6	Photodiode cathode
7	Photodiode anode
8 & 9	Laser anode

**Laser DB-9 Connector Pin-Out**

DB-15 Pin	Description
1, 2	Butterfly TE (+)
3, 4	Butterfly TE (-)
7	Butterfly Thermistor
8	Butterfly Thermistor
11	Fan+ ( <i>203 only, 205 no connection</i> )
12	Fan- ( <i>203 only, 205 no connection</i> )
5, 6, 9, 13 - 15	No connection

**TEC DB-15 Connector Pin-Out**

The **205** adds a second DB-15 connector for the Mount TEC, which pinned identically to the device's TEC except for the addition of two fan power pins:

DB-15 Pin	Description
1, 2	Mount TE (+)
3, 4	Mount TE (-)
7	Mount Thermistor
8	Mount Thermistor
11	Fan+
12	Fan-
5, 6, 9, 13 - 15	No connection

**Mount TEC DB-15 Connector Pin-Out (205 Only)**

### Fan Power Connection

The optional fan base can be powered either through a 2.1mm round DC jack (center positive) located on the rear of the fan base, or via pins 11 & 12 on the Mount TEC DB-15 connector (see above). Using the DC jack will disconnect the Mount TEC DB-15 power connection, preventing simultaneous connection of two power supplies to the fan.

## Technical Specifications

Specification	203	203-1MM	205
<b>LASERS</b>			
<b>Packages Supported</b>	14-pin Butterfly, 7-pin Butterfly w/ GPO or SMA		
<b>Base-to-Pin Height (in [mm])<sup>1</sup></b>	0.220 [5.6]	0.175 [4.5]	0.220 [5.6]
<b>Pin Size</b>			
<b>Width (in [mm])</b>	0.035 [0.9]	0.039 [1.0]	0.035 [0.9]
<b>Height (in [mm])</b>	0.012 [0.3]	0.039 [1.0]	0.012 [0.3]
<b>INPUT CONNECTOR</b>			
<b>Laser Diode</b>	DB-9, male		
<b>Laser TEC</b>	DB-15, male		
<b>Mount TEC</b>	DB-15, male		
<b>TEMPERATURE CONTROL</b>			
<b>Temperature Range (°C)<sup>2</sup></b>	-5 to +85		
<b>Sensor Type</b>	10kΩ Thermistor		
<b>TE Module</b>			
<b>I Max (A)</b>	3.9		
<b>V @ I Max (V)</b>	7.6		
<b>THERMAL PERFORMANCE</b>			
<b>Without Fan Base<sup>3,4</sup></b>	2.8°C/W	3 Watts <sup>5</sup>	
<b>With Fan Base<sup>3</sup></b>	1.0°C/W	8 Watts <sup>5</sup>	
<b>OPTIONAL FAN BASE</b>			
<b>Connector</b>	2.1mm round, center positive		
<b>Power</b>	12V DC, 150mA		
<b>GENERAL</b>			
<b>Size (H x W x D) [in(mm)]</b>	1.72 (44) x 3.50 (89) x 5.00 (127)		
<b>Device Mounting Holes</b>	2-56 x 3/16"		2-56 x 1/8"
<b>Table Mounting Holes</b>	1/4-20 through-hole, 3" on center (x2)		

<sup>1</sup> Pin height measured from laser mounting surface to bottom of pin. As most laser datasheets specify pin centerline, subtract 1/2 of your device's pin height from its centerline to obtain bottom of pin.

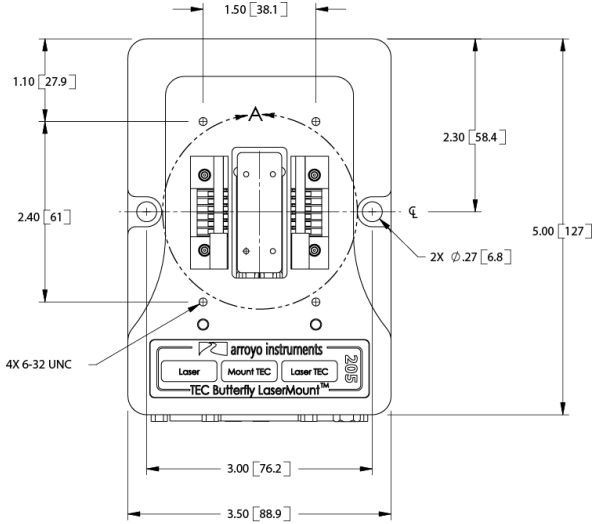
<sup>2</sup> Temperature control range is dependent on the power dissipated into the heat sink.

<sup>3</sup> At 25°C ambient.

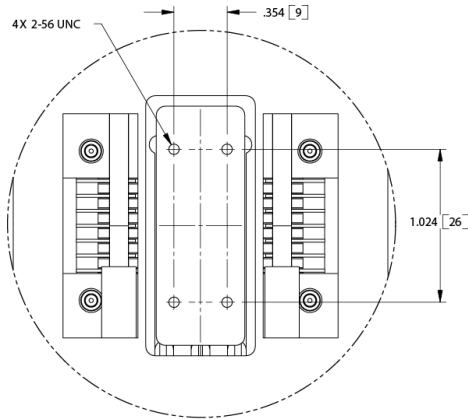
<sup>4</sup> Mounting fixture to an optical table will increase the heat dissipation capability.

<sup>5</sup> At 0°C delta from ambient.

# Mechanical Specifications

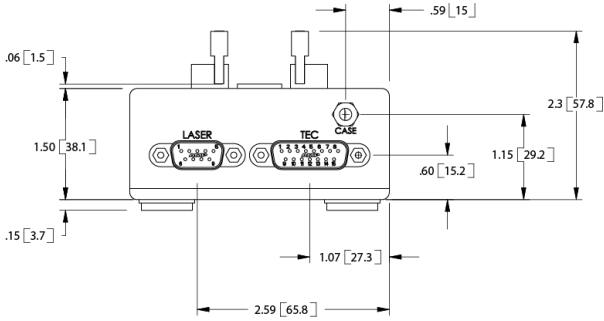


**Top View**

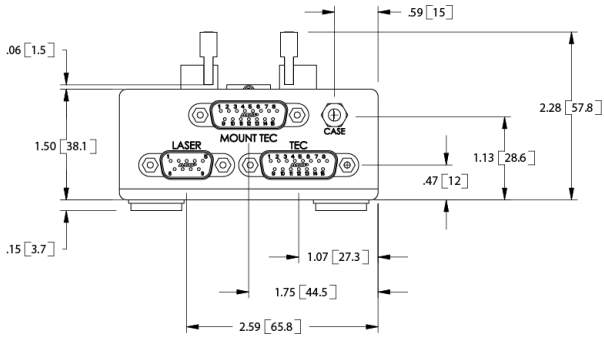


DETAIL A  
SCALE 2 : 1

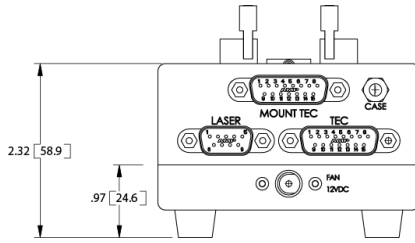
**Detail View of Device Mounting Hole Pattern**



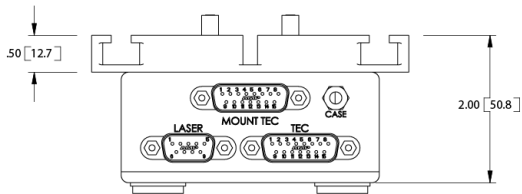
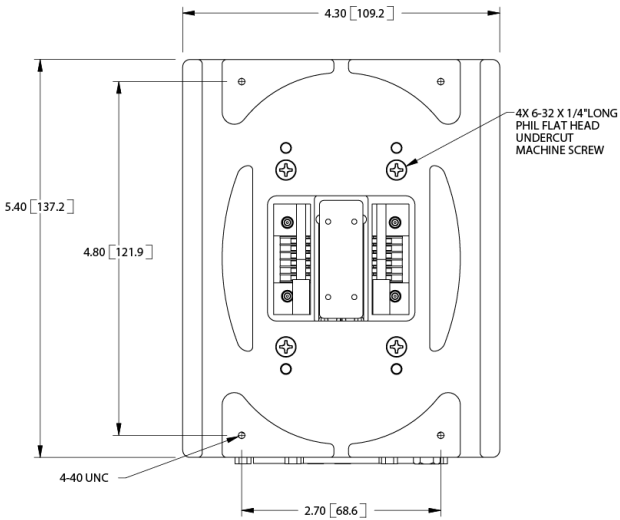
**203 Rear View**



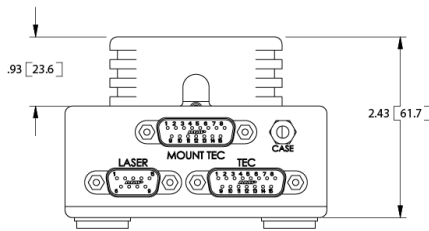
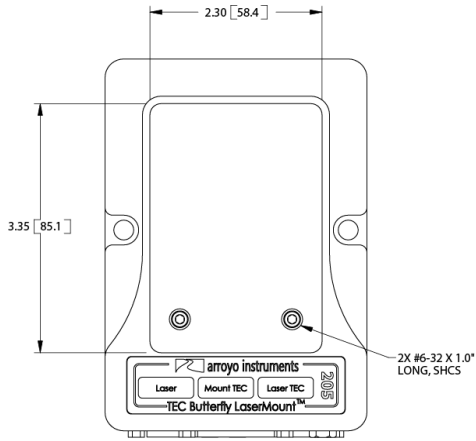
**205 Rear View**



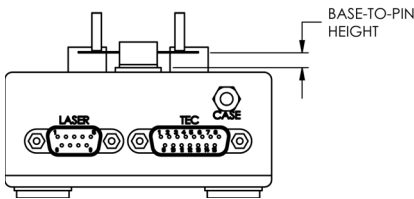
**205 with Fan Base**



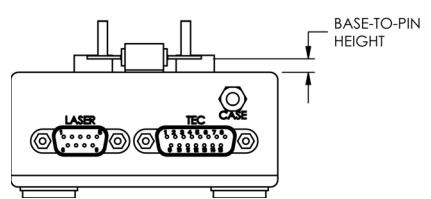
**205 with Fiber Tray**



**205 with Cover**



**203/205 Base-To-Pin Height**



**203-1MM Base-To-Pin Height**

## Laser Diode Protection

Electrostatic discharge and current spikes can be a significant cause of damage to laser diodes, but when proper precautions are taken, these risks can be greatly reduced or eliminated. Arroyo Instruments' controllers offer state-of-art laser diode protection, but no instrument can fully shield the laser from damage. Please take these considerations into account when operating your laser:

1. Always set the current limit at or below the maximum current your laser can handle. This prevents the device from accidentally driving the current too high, either via the set point or from the modulation port. This also provides additional current limiting protection from ESD.
2. Always work in an ESD safe operating environment, including the use of wrist straps, ESD grounded work surfaces and floors, and ESD-safe tools.
3. Where the AC power to the laser driver to temperature controller may be noisy, use isolation transformers or uninterruptible power supplies that provide isolation.
4. Make sure all cables are securely connected and fastening screws are screwed in tight.
5. Do not route power cords or other cables in parallel with the laser or temperature controller cables, as coupling may occur between the cables and inject noise into the laser diode.
6. While it is not possible to create a ground loop through the LaserSource because of it's isolation of all inputs, it is possible when using other equipment. Ensure that any other equipment is properly isolated to avoid any ground loop problems.

For additional ESD protection, adding 3.5 $\mu$ H (Mouser P/N 542-FB73-287) ferrite beads as close to the laser diode as possible is recommended. One ferrite bead should be used on each laser diode and photodiode diode anode and cathode, with the wire going through the bead at least twice (two turns).



## Warranty

Arroyo Instruments warrants this product to be free from defects in material and workmanship under normal use and service for a period of one (1) year from date of shipment. It does not apply when the product has been misused, altered or damaged by accident or abnormal conditions of operation. If found to be defective during the warranty period, the product will either be repaired or replaced at Arroyo Instruments's option.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE. ARROYO INSTRUMENTS SHALL NOT BE LIABLE FOR ANY INDIRECT, SPECIAL, OR CONSEQUENTIAL DAMAGES RESULTING FROM THE PURCHASE OR USE OF ITS PRODUCTS.

## Service and Support

For service and support, contact your local distributor or Arroyo Instruments.

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**NOTES:**

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