

Laser Diode Module HAML-F OPERATING INSTRUCTIONS



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1. FOREWORD

Dear Customer,

Thank you for buying a Frankfurt Laser Company laser diode module. It was developed on the basis of the latest achievements in science and technology and produced using state-of-the-art components.

Since laser modules are designed to be used as components for installation into an OEM product, no provisions were or could be made to provide the laser safety which would normally be required of your application and equipment into which they will be installed. By accepting delivery of this device, you accept responsibility to insure all necessary precautions will be taken with regards to laser safety in your application.

Please, use the laser diode module with the purpose it is designed for and in accordance with the instructions provided. Improper or unauthorized use of this device will void the guarantee.

The vendor will not be liable for the consequences of any incorrect or unsafe use of the laser diode module.

2. INSPECTION

Before using the laser diode module for the first time, please:

- Make sure the packing is undamaged
- Make sure the laser diode module shows no visible signs of damage

In the event of any damage, please, notify the vendor immediately. Retain the original packing material to return damaged goods and use foam packaging for cushioning where appropriate.

3. INSTALLATION

Before installing the laser diode module into the set-up, make sure that:

- The serial number of the product corresponds to the number in the packing list
- The supply voltage and laser diode module control signals correspond to those set by yourself

4. WORKING INSTRUCTIONS

4.1 *Safety Precautions While Operating The Product*

The laser diode mounted in the module is able to create radiation, the appropriate safety precautions applicable in your country to this eye safety laser class must be observed.

4.2 *Installation*

It is strictly prohibited to apply mechanical force to the laser diode module housing while it is used or installed in the set-up. It can lead to instantaneous damage of laser diode and optical system.

4.3 *Heatsinking*

To ensure correct operation of the laser diode module it may be necessary to heat sink the module.

Modules with power output 50mW or less do not require external heat-sinking.

All other modules require external heat-sinking to remove waste heat from the module which will improve stability characteristics and increase the lifetime. For better heat dissipation from the laser diode module use aluminum or copper holders to remove heat energy, do not place excessive force on the modules, this may cause internal damage.

4.3 *Laser Module Operation Requirements*

Electrical signals should comply with the specification of the laser diode module.

It is strictly prohibited to expose the optical surfaces of the module to hard particles of any size, as it can damage optical coatings and integrity of optical parts.



5. ELECTRICAL CONNECTION (Version With Connector)

ATTENTION!
Laser diode module housing has electrical potential

5.1 Module Connection Guide

- 5.1.1 Connect **white** wire to power supply: 5V*
- 5.1.2 Connect **black** wire to power supply: 0V
- 5.1.3 Turn "ON" the power supply
- 5.1.4 Turn "OFF" the power supply

*Please insure that the module is for 5V some versions may operate at different voltages, if not sure, contact Frankfurt Laser Company.

- Pin 1 = Brown Wire
- Pin 2 = White Wire
- Pin 3 = Blue Wire
- Pin 4 = Black Wire

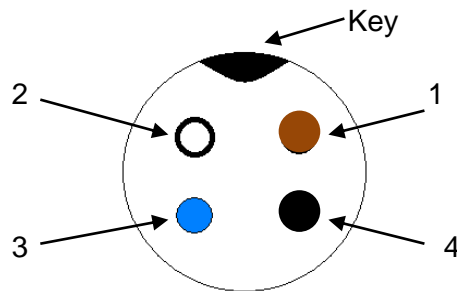


Diagram shows the connector mounted to the module

Cable is enclosed.

Please ensure that the correct signal is applied to the correct pin.
Pins not in use should be isolated.

5.2 Module with TTL Input

5.2.1 Connect **white** wire to power supply: 5V

5.2.2 Connect **black** wire to power supply 0V and “0V” digital generator

5.2.3 Positive TTL Modulation type

Connect **blue** wire to digital generator output.

Low level from digital generator must be 0...0.5V, high level 3.5...5V. Light power will be $P_{\text{output}}=0$ and $P_{\text{output}}=P_{\text{max}}$ respectively.

If modulation is not required, to keep operating the laser diode module in CW mode, connect the **blue** wire with the **white** wire.

5.2.4 Negative TTL Modulation type

Connect **blue** wire to digital generator output.

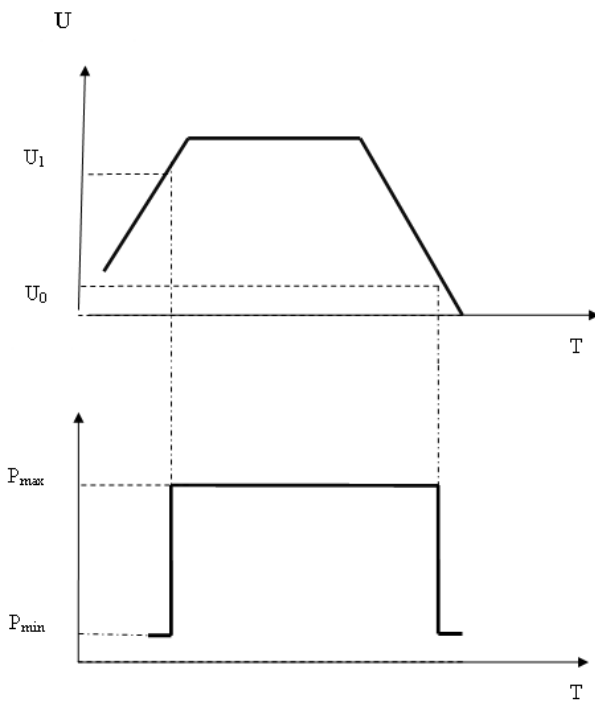
Low level from digital generator must be 0...0.5V, high level 3.5...5V. Light power will be $P_{\text{output}}=P_{\text{max}}$ and $P_{\text{output}}=0$ respectively.

If modulation is not required, to keep operating the laser diode module in CW mode, connect the **blue** wire with the **black** wire.

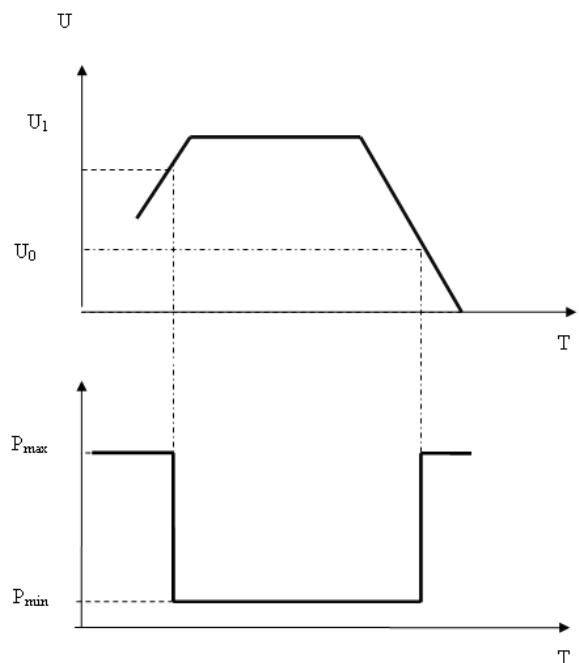
5.2.5 Turn the power supply ON, then turn ON the digital generator, if required.

5.2.6 Work with the module.

5.2.7 Turn OFF the digital generator and then turn OFF the power supply



Positive TTL Modulation

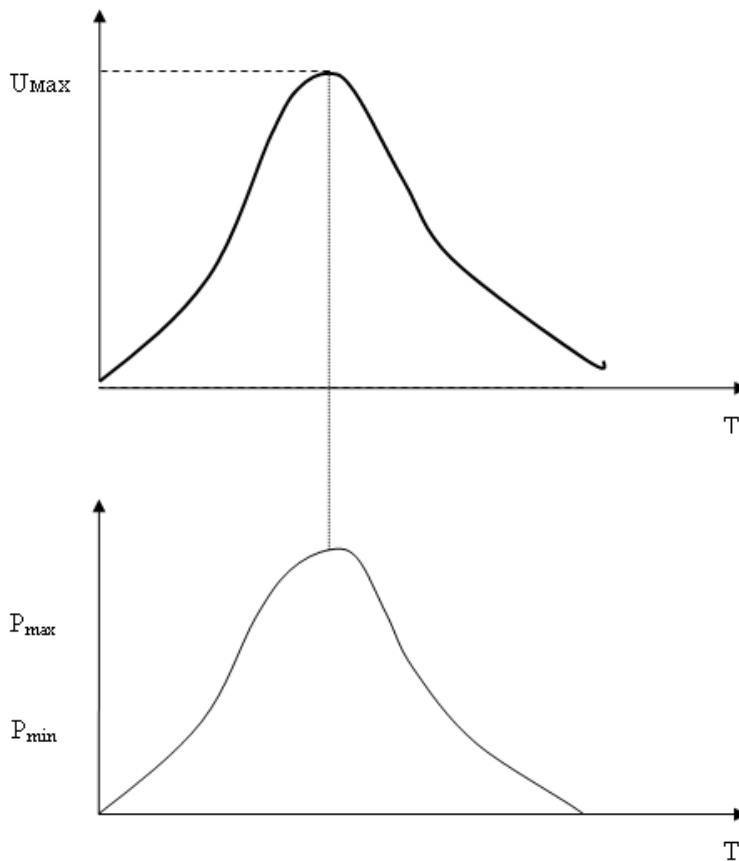


Negative TTL Modulation

5.3 *Module with Analogue Modulation*

The output power of the laser diode module in this mode will depend on the input voltage from the secondary supply voltage unit

- 5.3.1 Connect **white** wire to power supply: 5V
- 5.3.2 Connect **black** wire to power supply: 0V and "0V" analogue generator
- 5.3.3 Connect **brown** wire to analogue generator output.
- 5.3.4 If modulation is not required, to keep operating the laser diode module in CW mode, connect the **brown** wire with the **white** wire.
- 5.3.5 Turn the power supply ON, then turn ON the analogue generator, if required.
- 5.3.6 Work with the module.
- 5.3.7 Turn OFF analogue generator and then turn OFF the power supply



Analogue Modulation

5.4 *Module with a Potentiometer*

To change the power output, change the position of the potentiometer at the back of the module.

6. ELECTRICAL CONNECTION (Version With Cable)

ATTENTION!
Laser diode module housing has electrical potential

6.1 *Module Connection Guide*

- 6.1.1 Connect **white** wire to power supply: 5V*
- 6.1.2 Connect **brown** wire to power supply: 0V
- 6.1.3 Turn "ON" the power supply
- 6.1.4 Turn "OFF" the power supply

*Please insure that the module is for 5V some versions may operate at different voltages, if you are unsure please contact Frankfurt Laser Company.

Cable is fixed to the laser module.

Please ensure that the correct signal is applied to the correct wire.
Any wires that are not in use should be isolated.



6.2 Module with TTL Input

6.2.1 Connect **white** wire to power supply: 5V

6.2.2 Connect **brown** wire to power supply 0V and "0V" digital generator

6.2.3 Positive TTL Modulation type

Connect **green** wire to digital generator output.

Low level from digital generator must be 0...0.5V, high level 3.5...5V. Light power will be $P_{\text{output}}=0$ and $P_{\text{output}}=P_{\text{max}}$ respectively.

If modulation is not required, to keep operating the laser diode module in CW mode, connect the **green** wire with the **white** wire.

6.2.4 Negative TTL Modulation type

Connect **green** wire to digital generator output.

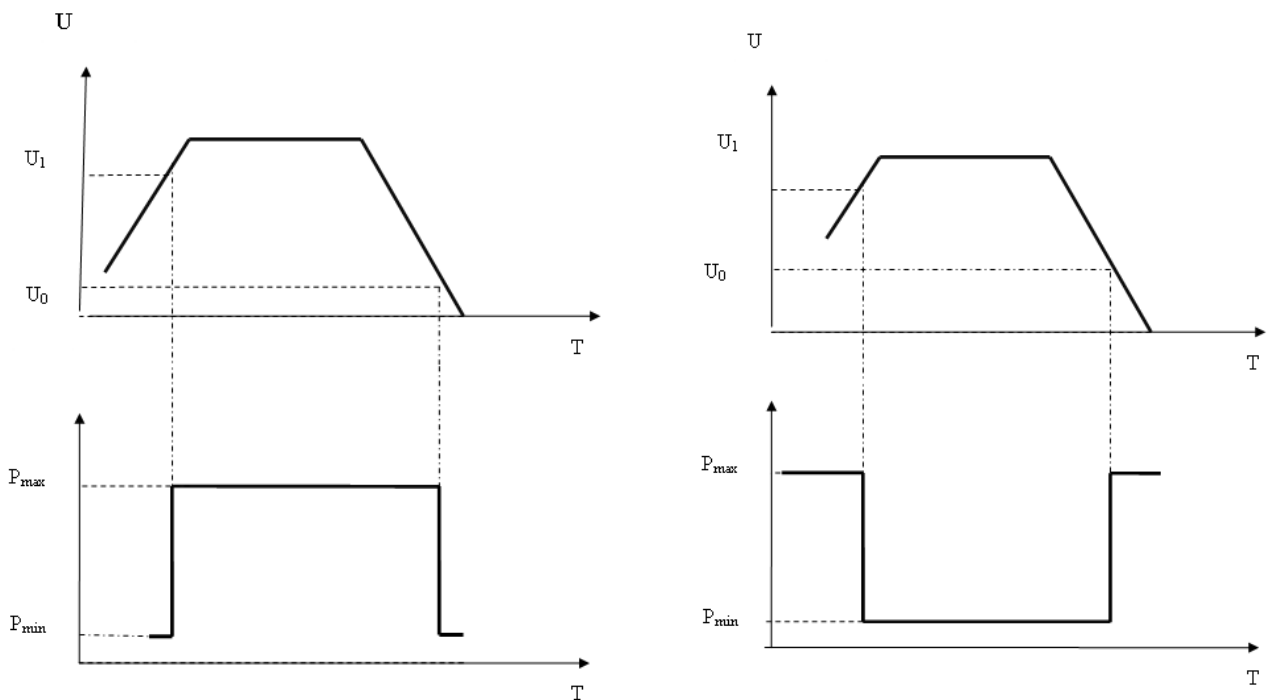
Low level from digital generator must be 0...0.5V, high level 3.5...5V. Light power will be $P_{\text{output}}=P_{\text{max}}$ and $P_{\text{output}}=0$ respectively.

If modulation is not required, to keep operating the laser diode module in CW mode, connect the **green** wire with the **brown** wire.

6.2.5 Turn the power supply ON, then turn ON the digital generator, if required.

6.2.6 Work with the module.

6.2.7 Turn OFF the digital generator and then turn OFF the power supply



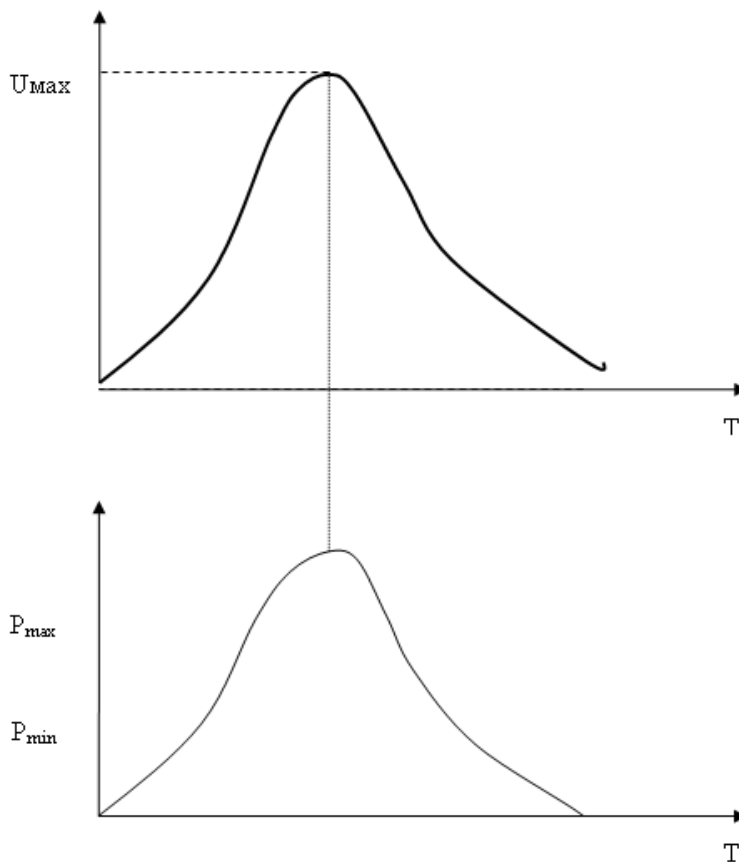
Positive TTL Modulation

Negative TTL Modulation

6.3 Module with Analogue Modulation

The output power of the laser diode module in this mode will depend on the input voltage from the secondary supply voltage unit

- 6.3.1 Connect **white** wire to power supply: 5V
- 6.3.2 Connect **yellow** wire to power supply: 0V and "0V" analogue generator
- 6.3.3 Connect **yellow** wire to analogue generator output.
- 6.3.4 If modulation is not required, to keep operating the laser diode module in CW mode, connect the **yellow** wire with the **white** wire.
- 6.3.5 Turn the power supply ON, then turn ON the analogue generator, if required.
- 6.3.6 Work with the module.
- 6.3.7 Turn OFF analogue generator and then turn OFF the power supply



6.4 Module with Potentiometer

To change the power output, change the position of the potentiometer at the back of the module.

7. ADJUSTING THE OPTICAL OUTPUT

7.1. The focal point of the optic can easily be adjusted by rotating the upper part of the laser module manually.

7.2. Do not apply excessive force when adjusting the focus point in extreme positions; it can lead to adjustment mechanism failure.

7.3. Do not attempt to rotate fixation screws. It can lead to focus adjustment mechanism failure.

8. MAINTENANCE AND REPAIR

The laser diode module does not require any special maintenance. The optical window can be cleaned occasionally with a soft cloth or using air flow.

In case of failure, do not attempt to repair the product yourself! Please, return the product to the vendor immediately.

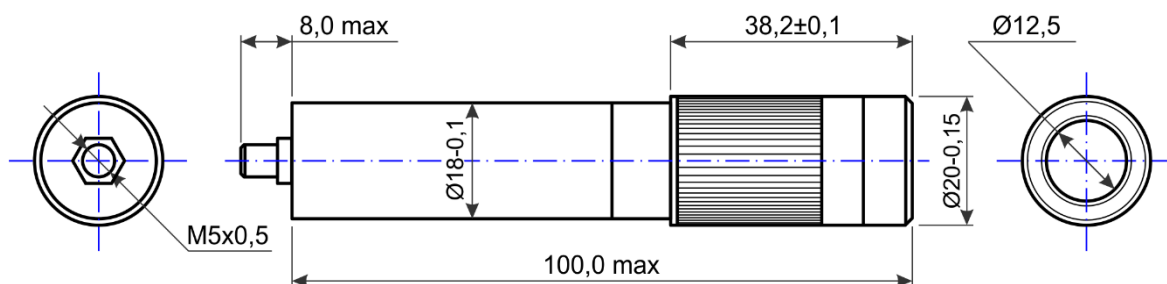
9. GUARANTEE

Guarantee period is 12 months from the day the module is delivered.

The guarantee is void, if the laser module:

- was used not in accordance with manufacturer's instruction manual
- disassembled, regulated without manufacturer's written consent
- was exposed to aggressive environment (liquids, rough dust)
- does not have the serial number

10. MODULE DRAWING



11. ACCESSORIES

The following accessories are available for these laser diode modules.

11.1 Wall Plug Power Supply

We offer the appropriate wall plug power supply for each laser module. Please contact Frankfurt Laser Company for further details.



Wall Plug Power Supply for 5V Laser Diode Modules

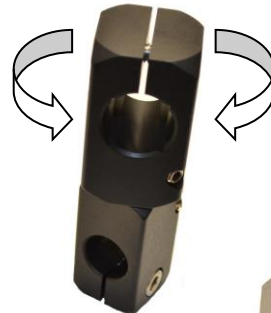
11.2 Laser Diode Module Mountings and Mounting Rods

The following mountings and mounting rods are available to hold these laser diode modules in position and allow easy adjustment.

Mountings

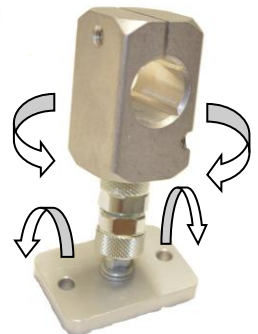
FLM-T15-20-BA

Turnable black anodized aluminium mounting with a Ø15mm and a Ø20mm bracket. Mountable on a Ø15mm rod and suitable for laser modules with 14-20mm outer diameter.



FLM-BJ20-AL

Ball-joint aluminium mounting with a Ø20mm bracket. Fixed on a 50x35x6mm support plate and suitable for laser modules with 14-20mm outer diameter.



Adapter Piece

FLAP-20-18: Adapter to mount a laser module with Ø18mm into a Ø20mm bracket.



Mounting Rods

FLR-15-400-ST

Mounting steal rod with Ø15mm and 400mm length. Incl. 2 pieces
50x35x6mm support plates with Ø15mm bracket.



FLR-15-70-BA

Black anodized mounting rod with Ø15mm and 70mm length, fixed on
a 50x35x6mm support plate.

