



Round Module User Manual



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1 Safety Precautions

This instruction manual explains how to use the Round Laser Diode Module.

Before use, please read this manual thoroughly. After reading, keep it together with the product for reference when necessary. Please retain packaging material in the event the unit is stored or shipped in the future.

Caution – use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure. Body of the unit contains labels specifying wavelength and maximum emitted power.

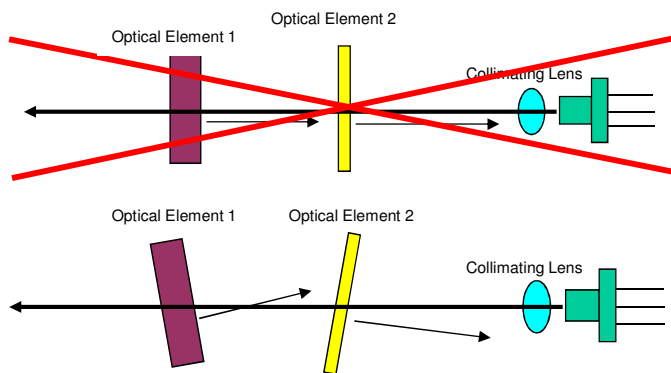
Recommend following user requirements for Class 3B products according to latest ANSI Z136.1 Standard for the Safe Use of Lasers. Use protective eyewear when engineering or other procedural and administrative controls are inadequate to eliminate potential exposure in excess of the MPE.

Laser Diode Optical Feedback Warning

Semi-conductor laser diodes are highly sensitive to optical feedback. They can suffer damage that maybe immediately apparent through loss in power or a reduction in life. Furthermore, wavelength stabilized laser diodes may lose their spectral characteristics such as center wavelength and linewidth if sufficient optical feedback exists.

Your Ondax laser diode does not incorporate an optical isolator, so may be susceptible to extraneous optical feedback. We recommend the following precautions:

- If the output of the laser diode is collimated, all reflective surfaces in the optical path should be angled so that surface reflections would not be reflected back to the laser diode. Furthermore, since optimal alignment for interferometric measurement instruments is often achieved with the instrumentation optics at normal incidence to the laser, we recommend the use of optical isolators or slightly misaligning the instrument to avoid direct feedback into the laser.
- Beware of focusing the light output on a highly reflective/scattering surface. This is another means of generating high optical feedback to the diode.
- If fiber coupling, anti-reflective (AR) coated tips are recommended for multimode (MM) fiber. Angle polished tips and AR coating are recommended for single mode (SM) fiber.
- Beware of wavelength selective filters with narrow wavelength pass bands. Care should be taken not to align at normal incidence to the beam. Furthermore, be careful not to align the reflected light to be normal incidence during the alignment process (e.g. sweeping the beam back across the laser during alignment). If such a possibility is unavoidable, use a sufficient OD filter (or isolator) at the output of the laser diode during the alignment process. Please note that if sufficient additional feedback reaches the laser diode, it would overcome the grating-induced stabilization, unlocking and shifting the wavelength of the laser beyond the pass band of the filter. This will dramatically increase the reflected intensity back into the laser possibly causing damage.



1.1 Explanation of Warning Symbols

The meaning of the symbols used in this manual and attached to the product follows.

Warning messages are intended to prevent accidents to operating personnel such as burns and electrical shocks.

Some caution messages are intended to prevent damage to the module.



Precaution for handling electrostatic sensitive devices.



Visible and/or invisible Class 3B laser radiation. Avoid direct exposure to beam. Wear suitable protective eyewear whenever laser is in operation.

Laser Aperture

Laser output location warning.



Warning

To prevent permanent damage, observe these precautions:

1. Protect against electrostatic discharge.
2. Avoid external damage to the enclosure.
3. Use supplied power supply or power supply meeting specifications.
4. Do not drop the module or operate it at extreme temperatures or humidity.
5. Beware of optical feedback from reflective surfaces. Permanent damage to the laser diode is possible.

2 Application and Features

2.1 Applications

This device is a Round Laser Diode Module with integrated laser diode current driver and temperature control for high precision equipment and instrumentation. It plays a pivotal role in testing or manufacturing, and can be used in various applications such as Raman Spectroscopy, Flow Cytometry, Data Storage, metrology, graphic arts, bio-instrumentation, analytical instrumentation and sensing.

2.2 Standard Features

- Plug & Play Operation
- ESD Protection
- Remote Key Switch with Remote Interlock (Optional for OEM customers)
- Constant Current Driver
- Temperature Stabilized

3 Specifications

OPTICAL (beam properties and polarization valid for only free space units)

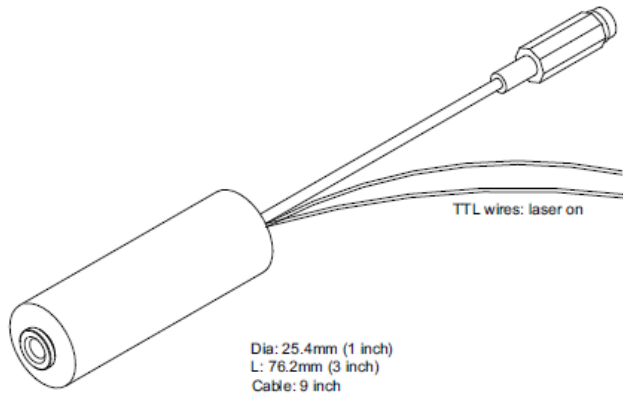
Power Stability (over 1 hr)	< 0.5%
Laser Noise (10 to 1Mhz) RMS	< 0.5%
Laser Class	Class 3B (Maximum power and wavelength labeled on safety labels of the unit)
Laser Operation	CW
Spatial Mode	TEM ₀₀
Beam Divergence (full)	< 1 mrad Typical
Beam Size at Aperture (FWHM)	< 1 mm
Beam Pointing Stability	< ± 10 μrad
Polarization (typical)	> 100:1, vertical or horizontal
Warm-up Time	< 5 min

ELECTRICAL

Operating Voltage	3.3 V DC (5V DC for 405nm Modules)
Operating Current	1.5 A max / 3.0 A for MM >300mW Modules

MECHANICAL

Laser Dimension	25.4 mm x 76.2 mm
Power Connector	2.1mm Power Jack
Weight	< 1 lb
Operating Temperature	+10°C to +40°C
Storage Temperature	-40°C to +80°C



Supplied with connector with flying leads for TTL laser On/Off:

Default Open: Laser On

To Turn Laser Off: Connect TTL, white wire, to ground, black wire.

Figure 1: Mechanical Dimensions

Pins	Definition	Description
1		No Connection
2		No Connection
3	GND	Ground
4	TEMP	Temperature Reading (UNSUPPORTED)
5	TTL	TTL Modulation (Laser On/Off)

Note: Connector with flying leads is included.

2.1 x 5.5mm Center Positive Standard Jack for supplying operating voltage and current

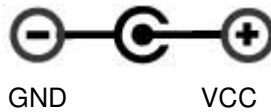
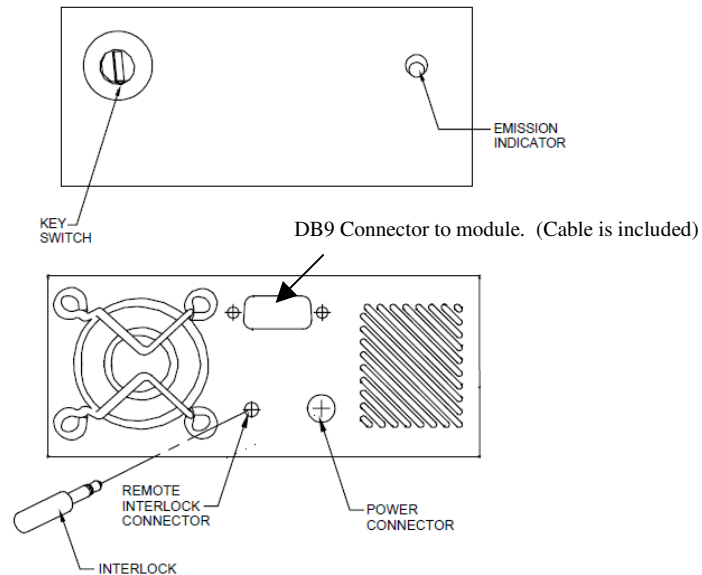


Figure 2 – Electrical Connections

Remote Key Switch (Optional Only for OEM customers)



1. **Power on/off key switch**—Located on the front panel of the Remote Key Switch, this switch enables users to power the unit on with the turn of a key. The unit is inoperable when key is removed.
2. **Emission indicator**—This red LED, located to the upper right of the front panel, lights up when the unit is on to warn of eminent laser emission.
3. **5-second activation delay**—The unit does not apply power to the laser module until five seconds after a user has turned the key switch to the “on” position.
4. **Remote interlock & connector**— This feature is located on the rear panel of the Key Switch. The unit will not operate without the interlock intact. Interlock needs to be shorted for power to be available for laser diode module.

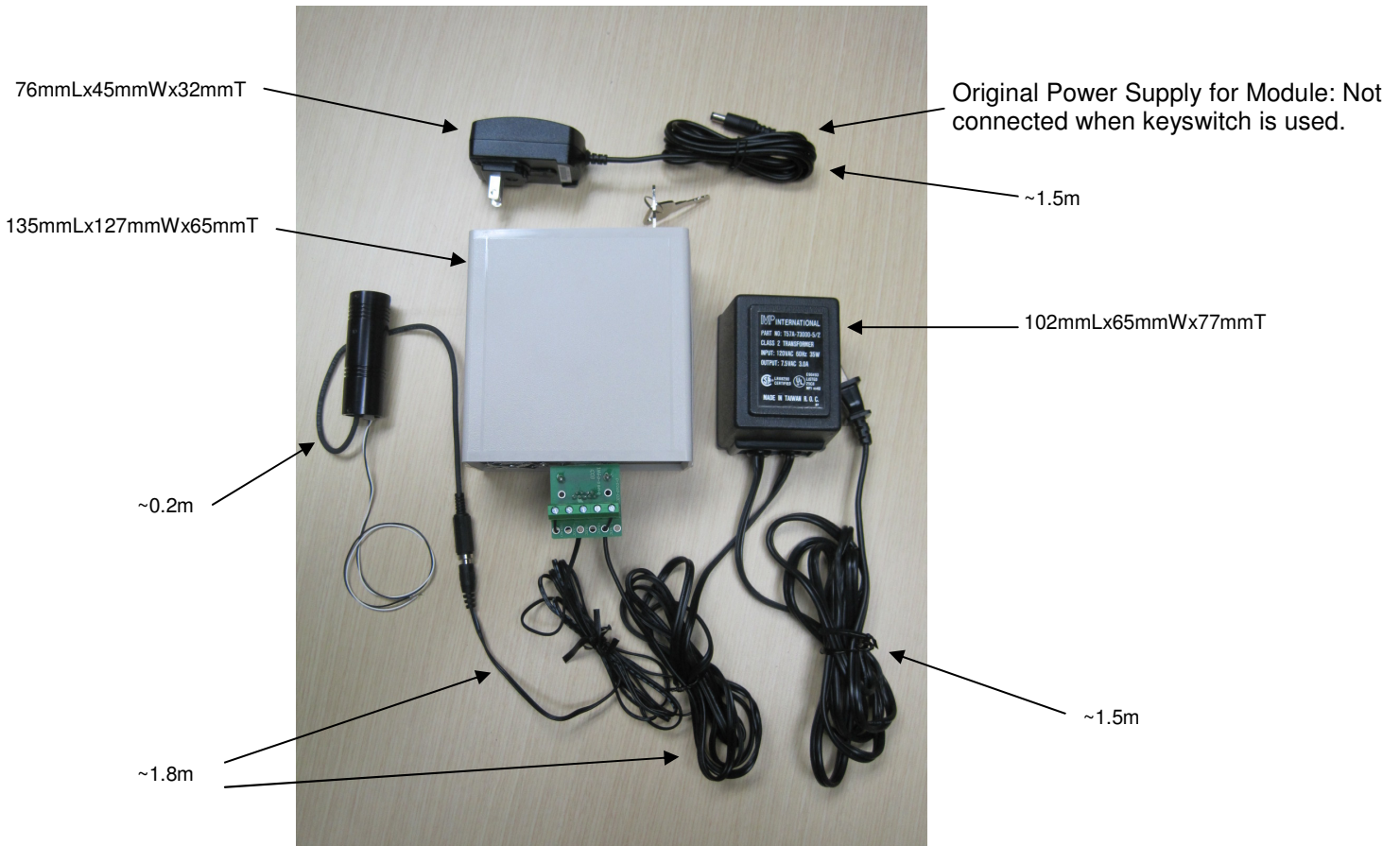


Illustration of Module with Keyswitch

4 Operating Procedures

4.1 Standard CW Operation

.User Startup Procedure:

- Properly mount laser module on a heat sink
- Connect power connector to power adapter or Remote Key Switch power cable
- Plug power adapter or Remote Key Switch to wall plug

Remote Key Switch Procedure:

- Use key to activate and deactivate power to the laser module. A 5 second delay will begin after key switch is turned to "on" position.
- Emission warning light will light up
- Laser system is "off" when key is in vertical position.
- Interlock must be "shorted" for power to be applied to laser module

Laser Module Startup Process:

- . Upon receiving power from either power supply or remote key switch:
 - LED will turn on which signal possible laser emission.

- Laser module will begin to temperature stabilize.
- Laser diode will not emit light for 20 seconds after power has been applied.
- Use of TTL line does not affect temperature control

5 Maintenance

5.1 Maintenance and Inspection

Routine maintenance is not required. If the unit appears to be operating incorrectly or with low output power, check the following:

- Inspect the enclosure for scratches, dings, dents, or other signs of damage due to handling.
- Verify that the module enclosure has not been opened and the factory seal is intact.
- Verify power source connections to the laser module.
- Ensure that the operating environment is within specifications.

6 Service

6.1 Repair

There are no user-serviceable parts inside and do not attempt to open housing. Warranty would not be valid if housing has been opened. If the module fails during use, check the items in section 5.1 before requesting an RMA.

Defective modules that are beyond the warranty period will be repaired at cost, if possible. An RMA must be requested before sending it to Ondax. When shipping, please use a box at least five times as large as the module with enough packaging material to prevent any movement of the module within the box.

6.2 For Information or Enquiries

If you need information regarding purchase or repair, or for any other Sales related questions, please contact the distributor or selling agent from whom the module was purchased.

6.3 Ondax Limited Warranty

Ondax warrants that all **SureLock™** integrated laser modules (RO, FCLM, LM) will be free from defects in material and workmanship for 12 months from the date of shipment. This limited warranty covers only those defects that arise as a result of normal use of the product, and does not cover any other problems, including those that arise as a result of: (i) improper handling, maintenance or modification, (ii) operation outside the product's specifications; or (iii) unauthorized modification or misuse.

If Ondax receives, during the applicable warranty period, notice of a defect in any product which is covered by this warranty, Ondax shall either repair or replace the product, at Ondax's option. Ondax shall have no obligation to repair, replace or refund until the customer returns the defective product to Ondax. Any replacement product may be either new or like-new, provided that it has functionality at least equal to that of the product being replaced. Ondax products may contain remanufactured parts, components, or materials equivalent to new in performance.

Limitations of Liability

1. TO THE EXTENT ALLOWED BY LOCAL LAW, NEITHER ONDAX NOR ITS THIRD PARTY SUPPLIERS MAKES ANY OTHER WARRANTY OR CONDITION OF ANY KIND, WHETHER EXPRESS OR IMPLIED WARRANTIES OR CONDITIONS OF MERCHANTABILITY, SATISFACTORY QUALITY, AND FITNESS FOR A PARTICULAR PURPOSE.

2. TO THE EXTENT ALLOWED BY LOCAL LAW, EXCEPT FOR THE OBLIGATIONS SPECIFICALLY SET FORTH IN THIS WARRANTY STATEMENT, IN NO EVENT SHALL ONDAX OR ITS THIRD PARTY SUPPLIERS BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES, WHETHER BASED ON CONTRACT, TORT, OR ANY OTHER LEGAL THEORY AND WHETHER ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

3. To the extent allowed by local law, the remedies provided in this Limited Warranty Statement are the customer's sole and exclusive remedies.

6.4 Contacting Ondax

Ondax, Inc.
850 E. Duarte Rd.
Monrovia, CA 91016
Tel: 626-357-9600
Fax: 626-357-9321
Web: <http://www.ondax.com>
Email: sales@ondax.com