

Laser-785

Installation and Operation Manual

Document Number 000-30000-010-02-0605

Offices: **Ocean Optics, Inc.**
830 Douglas Ave., Dunedin, FL, USA 34698
Phone 727.733.2447
Fax 727.733.3962
8 a.m.– 8 p.m. (Mon-Thu), 8 a.m.– 6 p.m. (Fri) EST

Ocean Optics B.V. (Europe)
Geograaf 24, 6921 EW DUIVEN, The Netherlands
Phone 31-(0)26-3190500
Fax 31-(0)26-3190505

E-mail: **Info@OceanOptics.com** (General sales inquiries)
Info@OceanOpticsBV.com (European sales inquiries)
Orders@OceanOptics.com (Questions about orders)
TechSupport@OceanOptics.com (Technical support)



WARNING

Protective Eye Wear Should Be Worn
When Using This Instrument - Intense
Radiation Present

See Important Safety Notices inside.

Copyright © 2001-2005 Ocean Optics, Inc.

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, by any means, electronic, mechanical, photocopying, recording, or otherwise, without written permission from Ocean Optics, Inc.

This manual is sold as part of an order and subject to the condition that it shall not, by way of trade or otherwise, be lent, re-sold, hired out or otherwise circulated without the prior consent of Ocean Optics, Inc. in any form of binding or cover other than that in which it is published.

Trademarks

Microsoft, Windows, Windows 95, Windows 98, Windows Me, Windows NT, Windows 2000, Windows XP and Excel are either registered trademarks or trademarks of Microsoft Corporation.

Limit of Liability

Every effort has been made to make this manual as complete and as accurate as possible, but no warranty or fitness is implied. The information provided is on an “as is” basis. Ocean Optics, Inc. shall have neither liability nor responsibility to any person or entity with respect to any loss or damages arising from the information contained in this manual.

Important Safety Notices

The laser described here is safe to operate, provided the user pays attention to all safety warnings:

1. Post warnings in the area of the laser beam to alert those present.
2. Keep all unauthorized personnel out of the area where the laser is operated.
3. Whenever the laser is running and the beam is not in use, it is good operating practice to mechanically block the path.
4. Never look directly into the laser source or scattering laser light from any reflective surface. Never sight down the beam into the source.
5. Maintain experimental setup at low heights to prevent inadvertent beam-eye contact.
6. As a precaution against accidental exposures to the output beam or its reflection, operators should wear laser safety glasses attenuated to the wavelength being generated.

Sources for additional information and assistance on laser safety are the following:

Center for Device and Radiological Health
Office of Compliance
2098 Gaither Rd.
Rockville, MD 20850
Tel: 301 594 4654
Fax: 301 594 4672

Laser Institute of America
12424 Research Parkway, Suite 125
Orlando, FL 32826
Tel: 407 380 1553
Fax: 407 380 5588

Compliance

The Ocean Optics Laser-785 is certified to be in compliance with Class IIIb. It is equipped with a keylock switch, remote control connector, laser radiation emission indicator, emission time delay (in the laser driver), and appropriate warning labels. The following labels were designed to warn the user of potential hazard:



Table of Contents

About This Manual	iii
Document Purpose and Intended Audience	iii
Document Summary	iii
Product-Related Documentation.....	iii
Upgrades	iii
Chapter 1: Introduction	1
Overview.....	1
Features	1
Package Contents	2
Additional Equipment Required	2
Chapter 2: Set-up and Operation	3
Overview.....	3
Set-up	4
Operation.....	5
Appendix A: Specifications.....	7
Index.....	9

About This Manual

Document Purpose and Intended Audience

This document provides you with information to get your laser set up and operating.

Document Summary

Chapter	Description
Chapter 1: Introduction	Contains a list of product features and package contents.
Chapter 2: Set-up and Operation	Provides instructions for setting up and operating the laser.
Appendix A: Specifications	Provides a list of product specifications.

Product-Related Documentation

You can access documentation for Ocean Optics products by visiting our website at <http://www.oceanoptics.com>. Select *Technical* → *Operating Instructions*, then choose the appropriate document from the available drop-down lists. Or, use the **Search by Model Number** field at the bottom of the web page.

You can also access operating instructions for Ocean Optics products on the *Software and Technical Resources* CD included with the system.

Engineering-level documentation is located on our website at *Technical* → *Engineering Docs*.

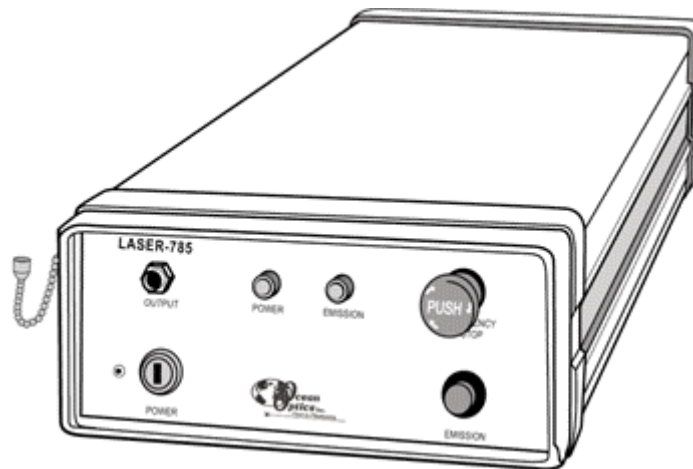
Upgrades

Occasionally, you may find that you need Ocean Optics to make a change or an upgrade to your system. To facilitate these changes, you must first contact Customer Support and obtain a Return Merchandise Authorization (RMA) number. Please contact Ocean Optics for specific instructions when returning a product.

Introduction

Overview

The Ocean Optics LASER-785 is a narrow spectral line-width, high-power laser, specifically developed for the application of Raman spectroscopy. It is compact and rugged for various industrial applications with an integrated laser driver, thermoelectric cooler, TEC controller and efficient fiber coupling. The module is powered by a 5V DC input with low-power consumption. The laser module also provides a TTL modulation port, which can accept a modulation control input of up to 100 kHz.



Laser-785

Features

The Ocean Optics Laser-785 offers the following features:

- Fiber coupling: 100 μm at 0.22NA
- Narrow spectral line-width
- Compact package integrated with laser and driver

1: Introduction

- Rugged design with laser welded key component
- Hermetically sealed laser component
- Low power consumption with 5VDC input
- Operating between -10°C to 40°C
- Long life time $> 10,000$ hours
- Best performance-to-cost ratio
- Ideal for medical and sensor instruments

Package Contents

Your Laser-785 package contains the following:

- ❑ One (1) Ocean Optics Laser-785
- ❑ One (1) power cord
- ❑ Two (2) keys
- ❑ One (1) remote plug
- ❑ One (1) Test Results sheet

Additional Equipment Required

The following equipment, available from Ocean Optics, is also required to use your Laser-785:

- ❑ A $100\ \mu\text{m}$ output fiber or a Raman Probe (such as the RIP-RPS)

Caution

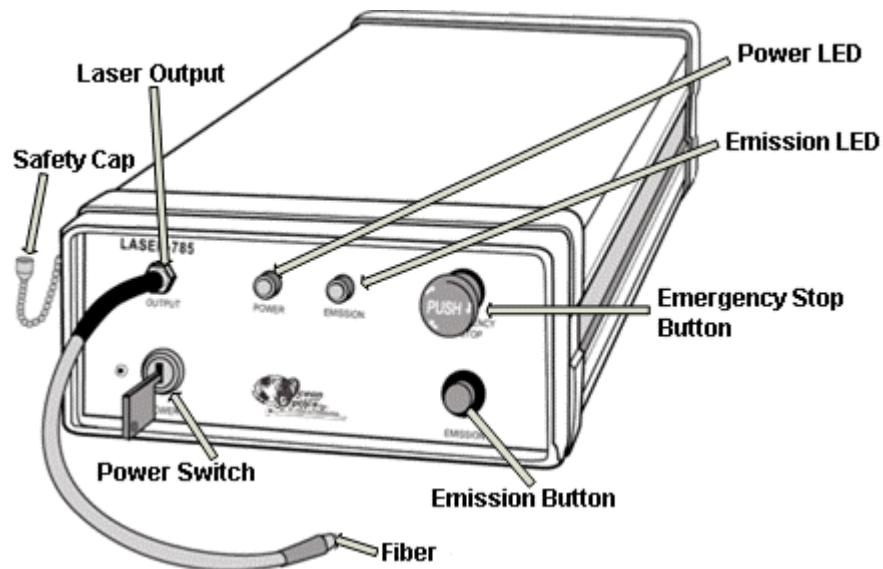
Never use an output fiber that is smaller than $100\ \mu\text{m}$. In addition, you must use epoxy-free fiber, otherwise it can damage the internal fiber optics.

- ❑ Safety goggles (R-2001-GL goggles from Ocean Optics are recommended)

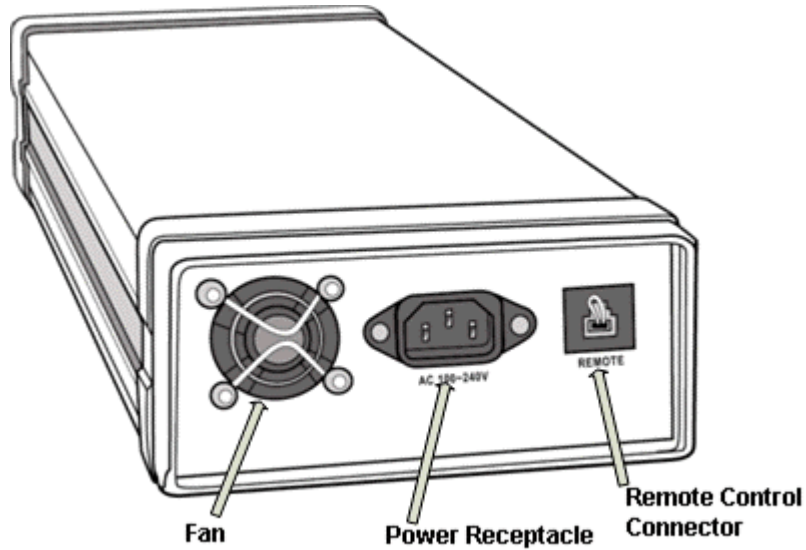
Set-up and Operation

Overview

This section provides instructions for setting up and operating the Laser-785. Read all instructions and warnings carefully before attempting to install and operate your laser.



Laser-785 Front View



Rear Panel View

Set-up

► **Procedure**

1. Carefully clean the tip of the output fiber.
2. Unscrew the safety cap from laser's SMA receptacle (OUTPUT).
3. Connect the fiber to the laser's SMA receptacle (OUTPUT).
4. Connect the power cord to the receptacle on the rear panel of the laser and the other end to a 100-240 VAC power wall outlet. The power cord is a 3-wire cable; ensure that a suitable ground wall outlet is used.
5. Ensure that the remote control connector on the laser's rear panel is plugged in and the remote control circuit has been completed. The laser will be disabled if the center two pins are disconnected.

Operation

Read the following warnings before attempting to use the laser:

WARNINGS

DO NOT LOOK DIRECTLY INTO THE LASER. LASER RADIATION IS HAZARDOUS TO THE EYES. When the laser is in operation but the beam is not in use, block radiation by closing the shutter output aperture. AVOID DIRECT EXPOSURE TO THE BEAM.

Never try to connect or disconnect the output fiber to or from the SMA connector during laser operation. This could destroy the internal fiber optics.

► *Procedure*

1. Turn the power on by rotating the key until it is horizontal (lined up with the dark circle on the left). The green Power LED lights.
2. Push the **Emission** button on the front panel to turn on the laser. The yellow **Emission** LED lights.
3. Push the **Emission** button again to turn off the laser. The **Emission** LED turns off. Then turn off the power with the key (key should rest in a vertical position).

IN CASE OF EMERGENCY

To shut down the laser for an emergency, press the large, red emergency button (labeled PUSH) on the front panel. To release the switch, turn the knob clockwise.

4. When the laser is not in use, remove the fiber from the OUTPUT connector and replace the safety cap.

Appendix A

Specifications

Specifications	Criteria
Optical	
Power Output (CW)	> 500mW
Peak Wavelengths	785 +/- 0.3nm
Spectral Line Width	0.2nm (typical)
Optical Power Stability	<3% p-p over 8 hours
Noise	<0.5% rms
Output Fiber	100 μ m@ 0.22NA (or Free Space output)
Connector	SMA 905 (ST, FC/PC optional)
Expected Lifetimes	> 10,000 hours
Electrical	
Input Power	Max. 3.0 A @ 5VDC
Rise Time	< 500 μ sec
Control	TTL modulation 0-100 kHz
Warm-up Time	10 – 15 min.
Mechanical	
Physical Dimensions	110 x 89 x 53 mm
Cooling	Internal Thermoelectric cooler
Weight	600 grams
Environmental	
Ambient Temperature	-10 to 40°C
Humidity	5 – 95%, non-condensing

A: Specifications

Index

D

document
 audience, iii
 purpose, iii
 summary, iii

E

emergency instructions, 5
equipment
 required, 2

F

features, 1
front panel, 3

I

introduction, 1

O

operation, 5

P

package contents, 2
product-related documentation, iii

R

rear panel, 4
required equipment, 2

S

set-up, 4
specifications, 7
 electrical, 7
 environmental, 7
 mechanical, 7
 optical, 7

U

upgrades, iii

