



1.5 μ m DPSS - CW erbium laser



User manual



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Congratulations on your purchase of the 1550 nm Diode Pumped Solid State - CW erbium laser from Optogama.

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The CW erbium laser is intended for industrial and scientific use only. If there are any other electrical devices connected to or used in conjunction with the laser, all legal regulations and technical standards that are applied to those devices must be observed as well.

For any technical assistance and consultation please contact your local dealer or directly <mailto:sales@optogama.com>.



1. Introduction

The package you received contains all the necessary components to run the laser. This manual is intended to provide detailed information on how to operate the laser properly.

Package contents:

- 1550 nm DPSS - CW erbium laser.
- Laser driver
- Power supply.
- Power supply cable.
- USB RS232 cable



1550 nm DPSS laser



Laser driver



Power supply with cables



USB-RS232 adapter



2. Safety information



To ensure safety, please read this manual carefully before operating the device. Complete everything step by step. In case of any uncertainties contact the vendors.



Exposure to the laser radiation may be harmful. Always wear suitable laser goggles to protect your eyes when working with the laser. All apertures which can emit laser light in excess of levels which are considered safe are identified with laser beam warning stickers.



High voltages and currents inside the laser case, do not open it. Perform the connections exactly as described or else you can damage the computer and/or the electronics of the laser.



3. Laser head

Laser head is cooled by a fans, which are always turned ON, if the laser module is powered up. Laser emission apertures are identified with the laser beam warning stickers in the front of the laser head. At the back of the laser head, there is cable with SubD-15 male connector which connects to laser driver. Cable length is approximately 1 meter long.

4. Laser driver

Laser head is controlled by a compact laser driver (110x50x170mm).

Sockets description (see Figure 2):

1. RS232 Connector (SubD-9 female). It's used to control laser parameters using WaveGuard software (Works on Windows OS).
2. Power and Support Connector (SubD-9 male). Laser driver is powered by +24V DC. Also, there is option for interlock.
3. Laser and Peltier Connector (SubD-15 female). Used for laser head control.



Figure 1. Laser driver.

More information about wiring could be found at section 8.



5. The WaveGuard Control software

The WAVEGUARD Control software gives you the ability to control the laser operation via PC, to view specific values on the screen.

Since the remote control feature qualifies to operate the laser without intervisibility, special considerations and precautions must be met. Do not operate the laser in rooms, where no sufficient laser safety is guaranteed.

5.1 Installing the WaveGuard Control software

To install the WAVEGUARD Control software, run the install file from the installation folder. This will install the application itself and some additional runtime components. Follow the instructions of the installer software. Connect the laser driver to the PC via USB RS232 cable **only after** the software installation is completed. Laser driver should be connected to +24V DC power supply. Note that, laser operation is OFF (no laser radiation) until you turn the laser ON manually in the software window.

When you first time connect the laser to the PC, run WAVEGUARD software with Administrator privileges and press "Connect". If green light appears in software, that means you successfully connected.

5.2 Overview of the software

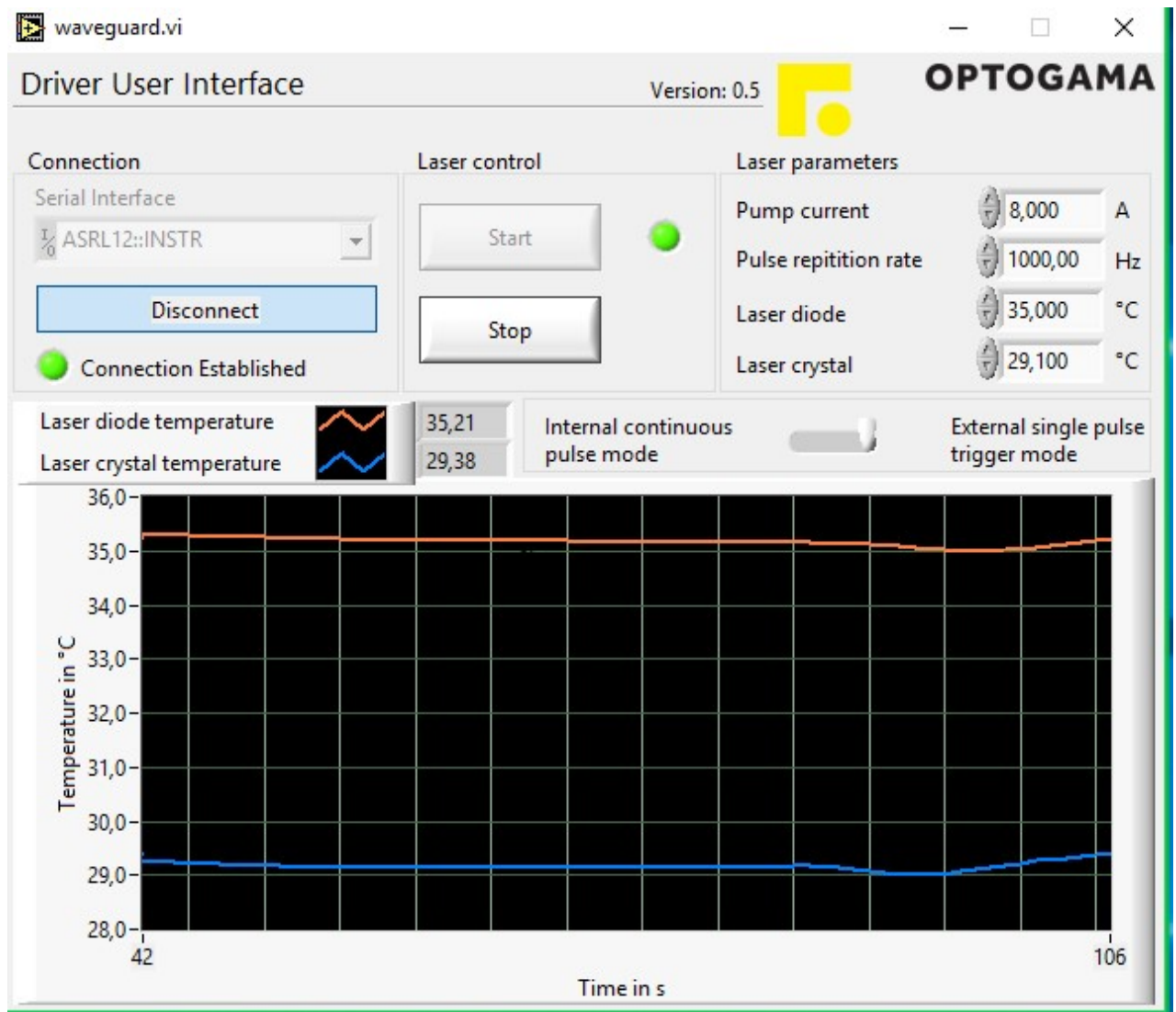


Figure 2. WaveGuard software interface.

After the software installation double click the **WAVEGUARD** shortcut on the desktop and it will start up. The software window is divided into four main parts:

- 1) In Connection section there is Serial interface field, where COM port should be selected. If software is launched with administrator privileges, com port is selected automatically. After that Connect button has to be pressed to connect to laser driver. Green indicator under Connect button should light in green if everything is working correctly.
- 2) In Laser control section there are two buttons: Start and Stop. By pressing Start button laser radiation begins. Stop button turns off laser radiation. Pulses are modulated by laser driver itself.
- 3) Laser parameters section. It contains fields, such as Pump current, Pulse repetition rate, Laser diode and Laser crystal temperature. Pulse repetition rate value can be changed depending on a



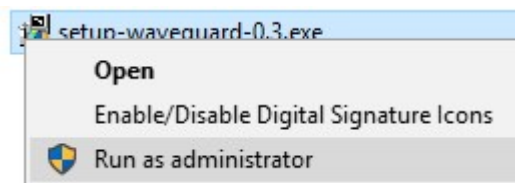
model. Please note, that it is forbidden to readjust pump current, diode and crystal temperature pre-set value without permission.

- 4) Temperature graph section. In this section laser diode and laser crystal temperatures could be tracked during laser operation.

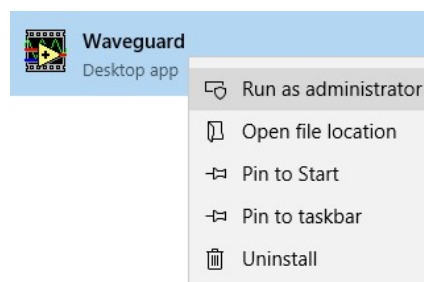
6. Quick start guide

This is a quick start guide but it is strongly recommended to read whole manual.

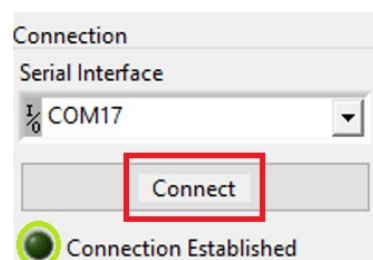
1. Fix the laser head at it's destination place.
2. Remove green protective tape from front part of the laser.
3. Install WAVEGUARD control software as administrator.



4. Connect laser head to laser driver.
5. Connect laser driver to PC via USB-RS232 adapter cable.
6. Connect laser driver to power supply
7. Turn ON laser driver power supply.
8. Run WAVEGUARD laser control software as administrator.



9. Select appropriate COM port for Laser Driver from drop-down menu and press Connect button. Green light indicates successful connection.





10. Wait several minutes till laser diode and crystal temperatures reach pre-set values.
11. Press Start button to begin laser radiation.



7. TTL modulation (on request)

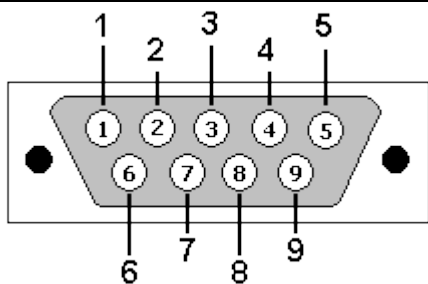
CW erbium laser could be modulated by output source. If this mode is active and the laser is run then the laser is activated by a TTL high-level ($>2V$) at the modulation input and vice versa. TTL low-level is below $<1V$. However, software interface could be different. For more information contact your local distributor. Pins for TTL modulation could be found at 8 section.

To achieve stable laser operation, "Pulse repetition rate" value **should be higher** than external trigger modulation rate.



8. Connectors

Power and Support Connector



SubD- 9 male

Pin. No	Abbr.	Function
4;5	SUP+	Power Supply typ. +24V DC
8;9	SUP0	Power Supply typ. 0V DC
3	ILOCK+	ca. 5mA over 2V
2	ILOCK-	Laser runs only on closed Interlock
6	MOD+	Digital and Analog Modulation Input; positive Pin
1	MOD-	Digital and Analog Modulation Input; negative Pin