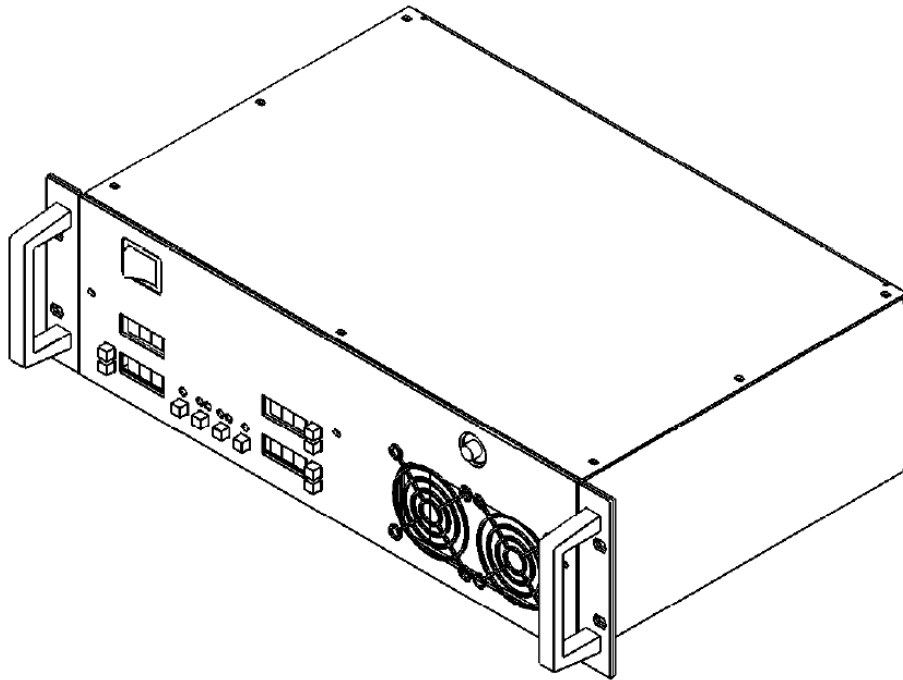


DL-series diode lasers

Applications notes



Overview

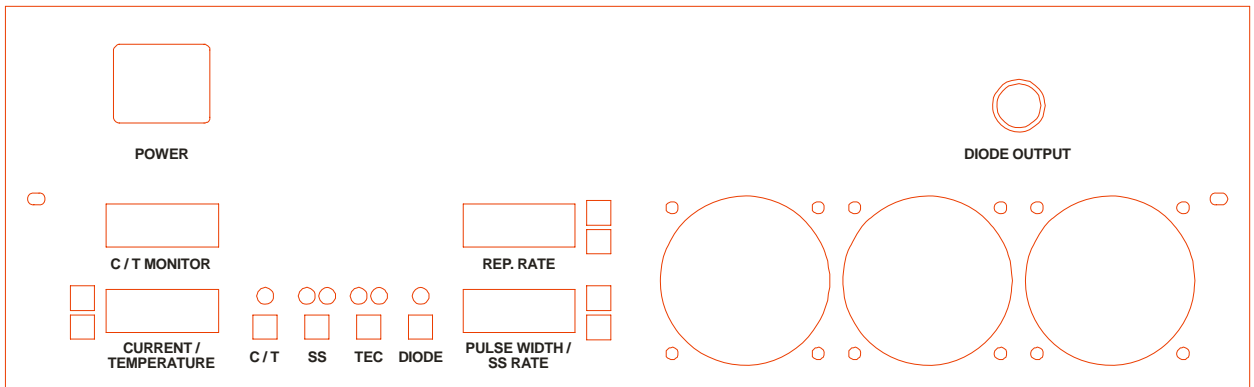
DL is a series of turn-key diode laser systems. Each module consists of fiber-coupled diode module, feeding circuit (laser diode driver), cooling circuit (Peltier module, temperature controller, heatsink and fan), user interface and coverage case.

Module's input is 230VAC mains, module's output is optical SMA-905 connector. User interface is dual (front panel interface and RS-232 interface).

All modules are based on high quality fiber-coupled diode modules from the world-best manufacturers like Dilas, JenOptik, LIMO etc. All electronics and mechanics are produced by OEM Tech.

Description

FRONT PANEL DESCRIPTION



POWER switch – switches module on and off

C/T button – switches module between CURRENT regime and TEMPERATURE regime;
LED located nearby indicates regime is chosen (LED is off in CURRENT regime and on in TEMPERATURE regime)

CURRENT/TEMPERATURE – group of 4-digits indicator and two buttons;

- in CURRENT regime is used to set diode current (from I_{min} to I_{max} ; minimal and maximal current values depend on certain diode assembly installed inside the module);
- in TEMPERATURE regime is used to set diode temperature (by default from 10°C to 30°C)

C/T MONITOR indicator:

- in CURRENT regime measures and indicates current through diode;
- in TEMPERATURE regime measures and indicates diode temperature

SS button – turns SS regime on and off;

if SS button is pressed (i.e. in SS regime), you can turn SLOW START mode on and off using REP.RATE group;

if SLOW START mode is chosen, you can set slow start rise time using PULSE WIDTH/SS RATE group. Slow start rise time can be chosen in range from 1s to 60s (by default). Current rises linearly with the time.

There are two LEDs nearby SS button:

- the left one just indicates if SS button is pressed or released
- the right one indicates if SLOW START is turned on or off

TEC button – turns temperature controller on and off;

Once this button is pressed module is trying to stabilize diode temperature.

There are two LEDs nearby TEC button.

- the left one indicates if temperature controller is turned on
- the right one indicates if diode was overheated; once diode's temperature rises over 35°C, it's considered as overheating; the same moment module turns off diode current, stops operations and lights this LED;

DIODE button – turns the current through diode on and off;

LED located nearby indicates if current is on

REP.RATE – group of 4-digits indicator and two buttons;

allows to switch between CW and PULSED modes of operation;

CW mode is set by default; it's designated with "Cnt" label;

to switch to PULSED mode you need to press both REP. RATE buttons at the same time; to switch back to CW mode you need to press both REP. RATE buttons again;

in PULSED mode REP. RATE group allows to set desired pulse repetition rate; maximal repetition rate depends on chosen pulse width, by default basing on duty cycle 2, i.e. 1 ms pulse width limits repetition rate at 500 Hz level, 100 ms – at 5 Hz level;

PULSE WIDTH/SS RATE – group of 4-digits indicator and two buttons;

in SS regime allows to set slow start rise time;

in PULSED mode allows to set pulse width (from 1ms to 100 ms by default)

DIODE OUTPUT (type SMA-905 optical connector) – optical output of the module

Warning! It's dangerous for personal and equipment to turn the module on without fiber attached. **Install fiber before the tuning module on!**

BACK PANEL DESCRIPTION

MAINS socket (cable is supplied with the driver) – to connect module to the mains
FUSES – 2 x 5 A fuses
GROUND stud
RS-232 connector – to connect module to the computer

RS-232 INTERFACE DESCRIPTION

RS-232 connection parameters: 38400 bps, 8 data bits, 1 stop bit, no parity.

Command format is: {command} {data (optionally)} {end-of-line}

- command is 1 character long (see list below)
- data is ASCII-string of adjusting value
- end-of-line symbols are \r\n or \n

List of available commands:

- set/get diode current - c/C (in ampere)
- set/get repetition rate - f/F (in Hz, in dependence on pulse width some values can be ignored)
- set/get pulse width - p/P (in milliseconds)
- set/get temperature - t/T (in degrees)
- set/get slowstart time - s/S (in seconds)
- set/get **C/T** button state - a/A
- set/get **SS** button state - j/J
- set/get **TEC** button state - u/U
- set/get **DIODE** button state - r/R
- get current monitor value - Y
- get temperature monitor value - W
- get fault state - Z
- echo on/off - e

Safety

Warning! This equipment produces high voltages that can be very dangerous. Don't be careless around this equipment

- During operations all protective covers of the equipment must be securely in place and all electrical connections must be properly attached

- **Don't remove protective covers!** There are no user serviceable parts inside this equipment. Do not self-repair the driver
- Module is designed to be properly grounded
- Do not turn the module on if it was already damaged with water, chemicals, mechanical or electrical shock
- Do not operate without fiber attached

Operations

- connect module to the mains
- connect fiber to the module (!)
- switch the module on (POWER swich)
- set desired current and diode temperature using CURRENT/TEMPERATURE group and C/T button
- turn on or turn off slow start, set its parameters using SS button, REP.RATE group and PULSE WIDTH/SS RATE group
- select cw or pulsed operation mode, set parameters of pulsed mode using REP.RATE group and PULSE WIDTH/SS RATE group
- turn temperature controller on (TEC button)
- it's recommended to wait while desired diode temperature will become established
- turn on current through diode (DIODE button)
- enjoy
- turn on current through diode (DIODE button)
- turn temperature controller off (TEC button)
- switch the module off (POWER swich)