



MAIMAN
ELECTRONICS

MBL1500A

Laser diode power supply

Datasheet

1. Laser diode driver features

- Low current ripple $\leq 10\mu\text{A}$
- Current stability 0.1%
- No need to adjust voltage
- Soft-start
- Reverse current protection
- Crowbar circuit protection

2. TEC controller features

- Low current ripple $\leq 2\mu\text{A}$
- Integrated PID controller, doesn't require setup
- Adjustable TEC output voltage limit
- Working with sensor NTC 10kOhm

3. Applications

- Supplying laser diodes in butterfly case

4. Description

Laboratory power supply MBL1500 – high stability laser diode (LD) controller, optimized for Butterfly LD. Contains the LD power supply channel, temperature controller (TEC) and integrated LD seat, compatible with pinouts LD Type 1 and Type 2 Butterfly 14-pin.

MBL1500A can be controlled from the front panel using buttons and/or touchscreen or remotely via USB.

The LD power supply channel provides current up to 1.5A with noises no more than 10-15 μA .

The TEC channel provides a temperature change from +12 to +40°C with stability 0,01°C. TEC contains integrated self-adjusted PID controller, providing optimal temperature regulation.

5. Package set

- Laser diode power supply – 1 pcs
- Power cord – 1 pcs
- USB cable – 1 pcs
- Interlock connector – 1 pcs
- Datasheet & User Manual – 1 pcs

6. Overall dimensions and weight

MBL1500 has overall dimensions of 257 x 271 x 117 mm and a weight of 3.4 kg.

7. Electrical characteristics

PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Vin		90		264	V
Consumption power	Operative		45	50	W
Interlock threshold				1	V

8. Electrical characteristics LD power supply channel

PARAMETER	MIN	TYP	MAX	UNIT
Output voltage	0.5		3	V
Output current	0		1500	mA
Current ripple		10	15	μA
Current set step		0.5		mA
Current set accuracy		± 2		%

9. Electrical characteristics TEC

PARAMETER	MIN	TYP	MAX	UNIT
Output voltage	0		±4	V
Output current	0		±4	A
Current ripple		2	4	mA
Temperature set range	+12		+40	°C
Internal measurements accuracy		±2		%

10. Typical Performance Characteristics

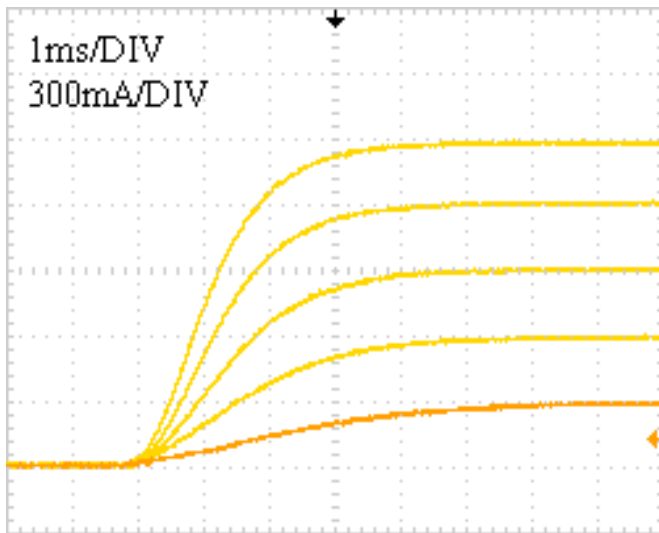


Fig. 1 – Typical start up sequence

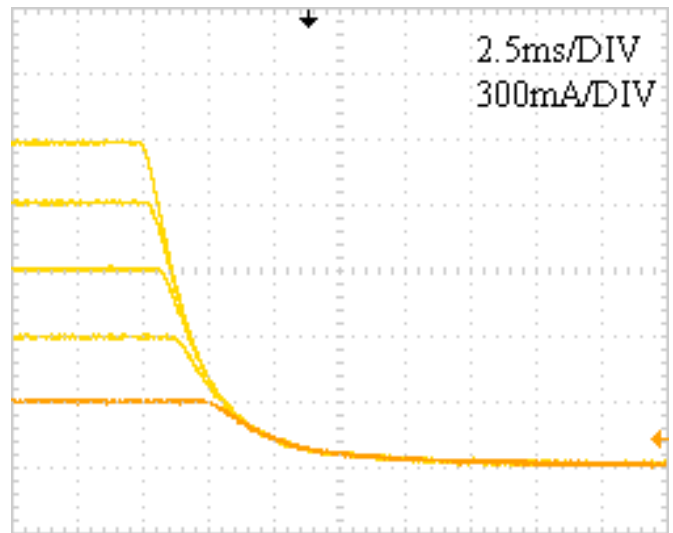


Fig. 2 – Typical stop sequence

11. Protections

The power supply includes various protections that prevent damage to the LD.

External interlock

External interlock function provides multiply protections at the same time:

- Prevents inadvertent use;
- Allows to connect an external emergency switch;
- Allows to connect an external auto protect device (e.g. over-temperature switches).

The laser can only be turned on with shorted Interlock.

Soft-start

The soft-start function protects against unwanted overshoot of the LD in the power up process.

LD max current limiting

LD max current limit (*LD max current*) is described in paragraph 15.7. You cannot set the operating current above LD max current.

Laser diode temperature protection window

This function protects the LD from unwanted temperature in combination with a thermal controller. If you set the temperature window limits close to the set temperature, the laser can be turned off permanently (the measured temperature will be outside the LD temperature window). LD

temperature protection window can be set in 13.7 *Settings* submenu using parameters *TEC max temperature* and *TEC min temperature*.

Over-temperature protection

The MBL1500 has automatic overheating protection. If the set *TEC max temperature* is exceeded, the LD power supply will be automatically turned off. After the temperature returns to normal, the LD power supply can be switched on again.

State after switching on

After turning on the MBL1500 with the *Standby* button the LD power supply and TEC will always be turned off.

Memorization of parameters

In case of an interruption/unplanned shutdown, the MBL1500 remembers the settings that were set at the time of the last On/Off Laser or TEC command.

12. Controls

Front panel

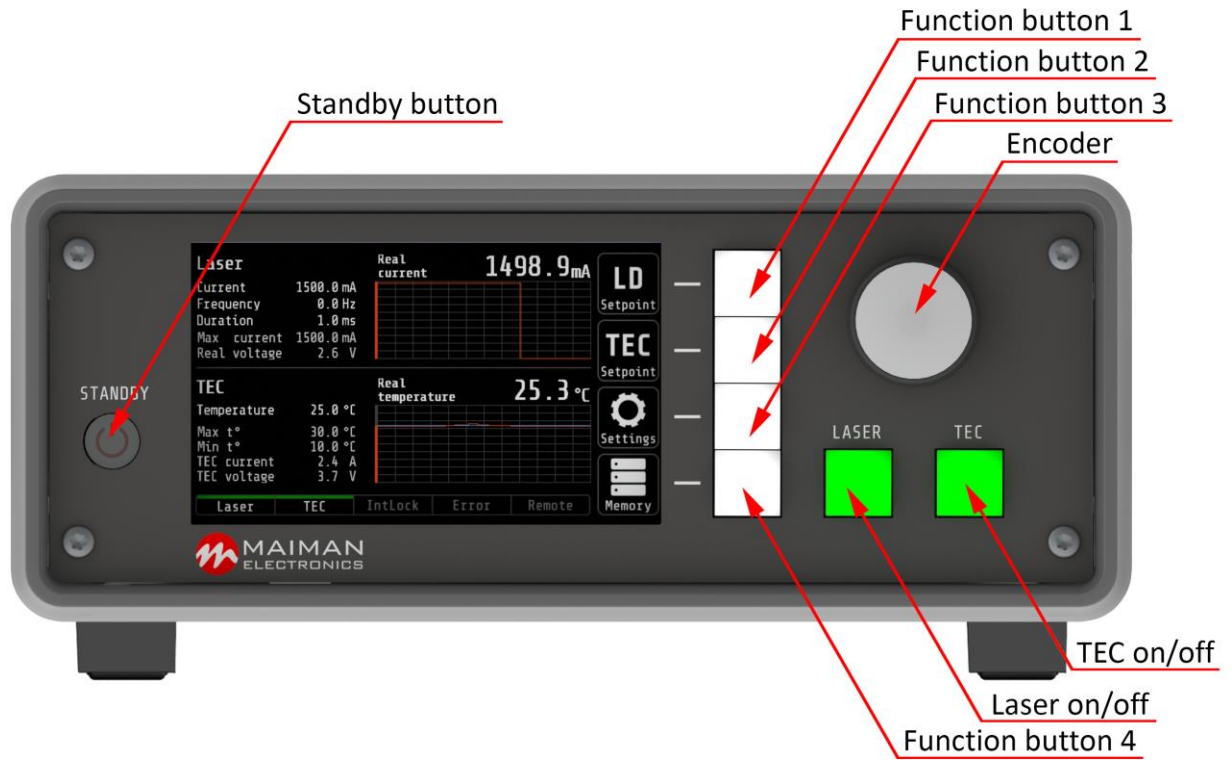


Fig. 3 – Front panel description

Back panel

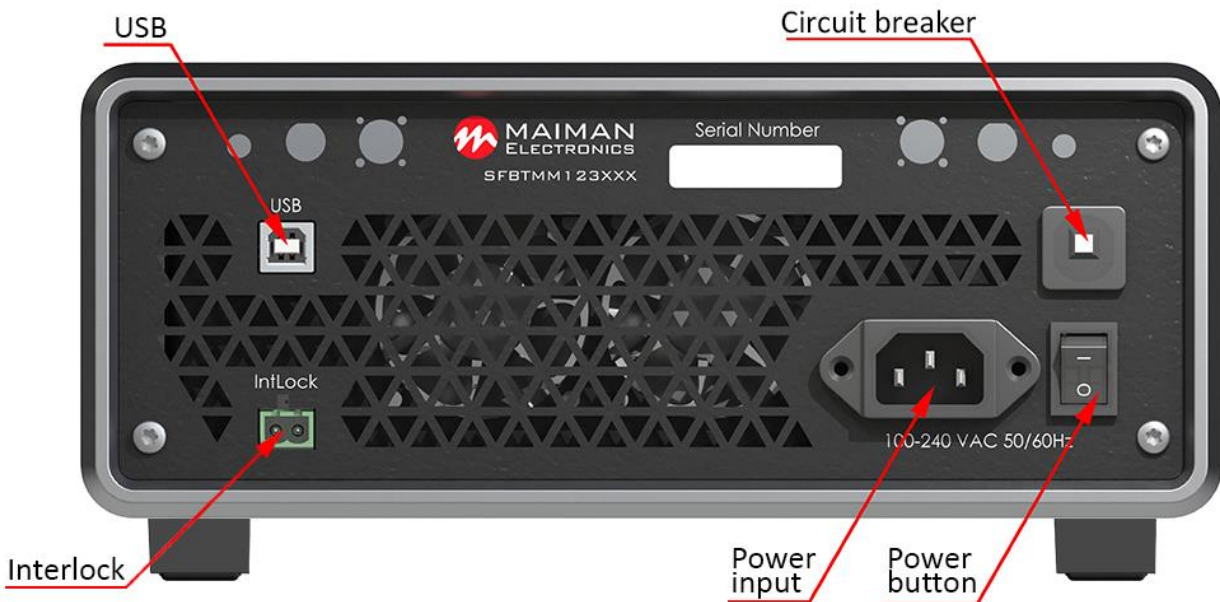


Fig. 4 – Back panel description

13. LD connection

MBL1500A compatible with pinouts LD Type 1 and Type 2 Butterfly 14-pin.

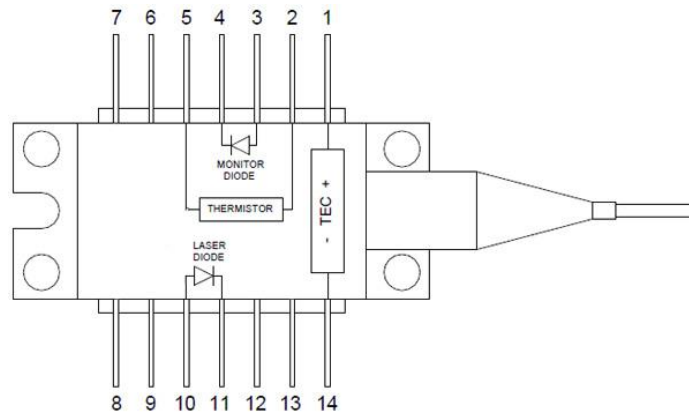


Fig. 5 – Pin functions type 1 Butterfly 14-pin

Table 1. Pin functions type 1 Butterfly 14-pin

No	Description	No	Description
1	TEC anode (+)	8	n/c
2	Thermistor	9	n/c
3	PD anode (+)	10	LD anode (+)
4	PD cathode (-)	11	LD cathode (-)
5	Thermistor	12	n/c
6	n/c	13	n/c
7	n/c	14	TEC cathode (-)

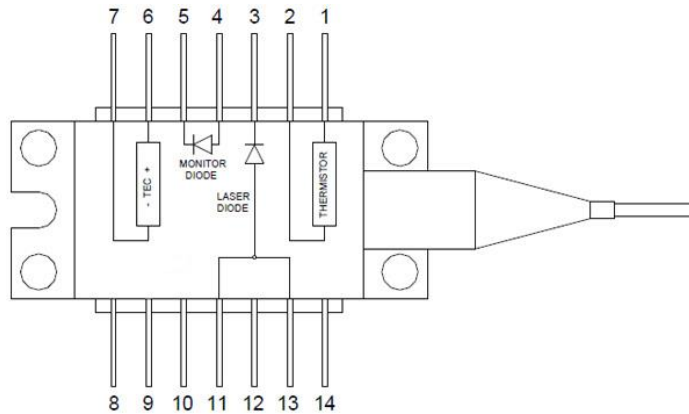


Fig. 6 – Pin functions type 2 Butterfly 14-pin

Table 2. Pin functions type 2 Butterfly 14-pin

No	Description	No	Description
1	Thermistor	8	n/c
2	Thermistor	9	n/c
3	LD cathode (-)	10	n/c
4	PD anode (+)	11	LD anode (+)
5	PD cathode (-)	12	n/c
6	TEC anode (+)	13	LD anode (+)
7	TEC cathode (-)	14	n/c

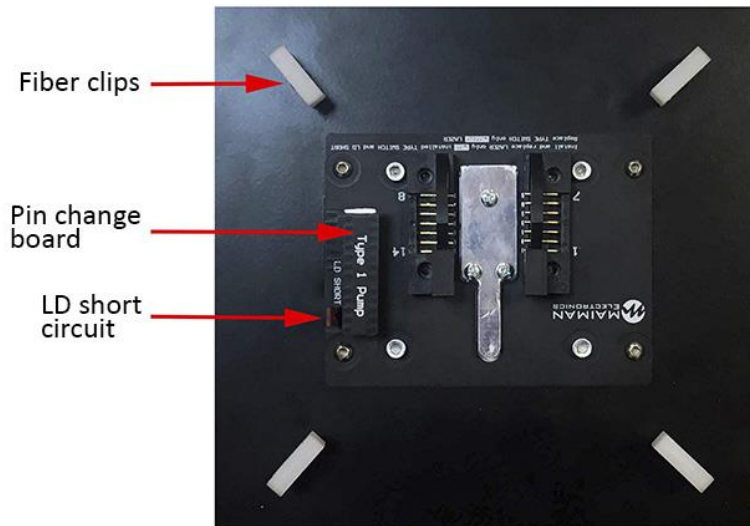


Fig. 7 – LD seat for type 1 Butterfly 14-pin

All works on the installation of the laser diode are performed with the MBL1500A power off!

Replacement of the pin change board is allowed only without the installed laser diode!

Laser diode installation is made only when the short circuit and the pin change board are installed!

Laser diode installation

Remove the 4 screws on the top cover, 2 each left and right, and remove the cover;

1. Determine the required pinout type in accordance with the description on the LD. Install the pin change board in the LD seat (Figure 7). Please note that the position of the pin change board key (white stripe) must correspond to the position of the LD seat key;
2. Open fiber clips;
3. Apply thermal grease to the aluminum plate of the LD seat and install the LD;
4. Place the fiber and close the clips;
5. After installing LD remove the short circuit

14. Mechanical dimensions

All dimensions are in millimeters.

