# TelmTech

TT500 Laser Diode Driver

Description

The TT500 is a general purpose linear (non-switching) constant current or constant power laser diode driver PCB. It has a current capability up to 500mA and will operate diode lasers with forward voltages up to 6.5V enabling it to work with lasers emitting at wavelengths from NIR to violet regions of the spectrum. It will work with a various laser package types where the cathode is at 0V. Communication is with a USB compatible connection and is supplied with the 'TT Driver Control' Graphical User Interface (GUI) for set up and control.

Features

- Laser current to 500mA.
- Will drive laser with wavelengths from NIR to violet.
- Constant current or constant power mode.
- Simmer current capability.
- Over current and over voltage shut down.
- Supplied with the 'Driver Control' interface for set up, display and control.
- Pulsed at frequencies up to 40kHz.
- Compatible with many diode laser package styles.
- Following initial set up the TT500 can be controlled via the remote connector without the compatible USB connection.

TT 'Driver Control' Graphical User Interface
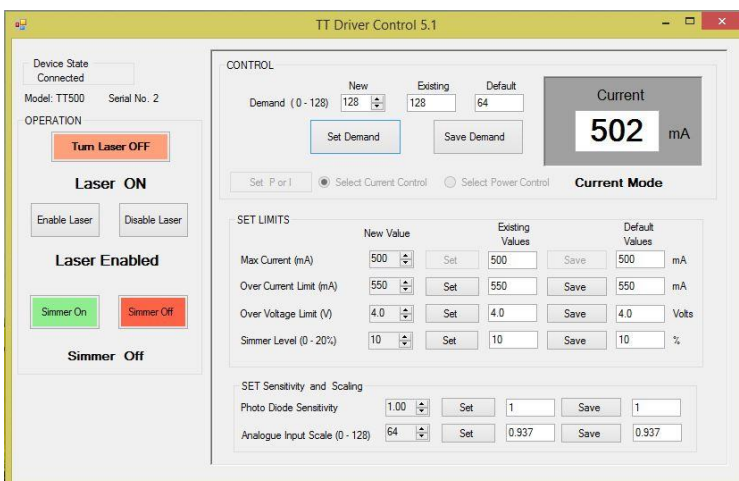
The 'Driver Control' graphical user interface is used to set up and control the TT500. The interface allows the upper current level to be set together with the over current and over voltage trip points which can be saved to the TT500. In addition, the interface may also set the demand level, enable the TT500 and switch on the laser. In current mode the simmer level may be set, and the simmer activated. Monitoring photodiode and analogue remote demand scaling factor are also set and saved. Constant current or constant power mode may be selected which may also be saved as the default mode to be used on power up. TT 'Driver Control' has a current meter that displays the current supplied by the TT500 to the laser (this is not rms). Once set up the interface may be disconnected and the TT500 controlled with standard logic levels via the remote connector.

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TT500 Specification

Input power supply voltage range	9 – 12V[1]
Input power supply current	<750mA[1]
Maximum Laser Current	500mA
Set upper current range (Upper I)	30 – 500mA
Resolution (number of levels in the selected current range)	128 (Driver Control only)
Over current range	Set Upper I + 20%
Maximum diode laser forward voltage	6.5V
Over voltage trip set range	0 to 9V
Monitor Photo-diode Scale range	0.1 to 1
Remote analogue input scale setting	0 to 128
Simmer current setting (related to maximum current setting)	0 - 20
Current mode current rise time typical to 95%	3us to 13us[2]
Current mode fall time	~8us to 15us[3]
Minimum current mode pulse width (fwhm)	~15us
Maximum current mode frequency	40kHz[3]
Power mode time to settle to constant power	7us to 80us[4]
Maximum Enable repetition rate (square wave)	25Hz[5]
Laser package types	A[6], B, C, D[6],E[6], F, G and H
Photo-diode current range style A	0.05 -0.75mA
Photo-diode current range style B	0.05 -4.0mA
Photo-diode current range style C	0.05 -0.75mA
Remote control input logic level (Enable, Gate and Simmer)	5V
Remote analogue demand	0 to 5V
Remote control output logic levels (Ready and On)	5V
Remote Control logic levels High	>=3V
Low	<1.5V
Heatsink over temperature trip	~60C
Heatsink reset temperature	~57C
Dimensions (mm)	150 x 95 x 50
Weight	148g
Ambient temperature range	10 – 30C

Connectors

CONN3	USB Style 'A' female
CONN2	Input Power, 2-way screw terminal
V+	Positive
0V	0V
CONN5	Diode laser, 4-way screw terminal
LDA	Laser Anode
LDK	Laser Cathode
PDA	Photo-diode Anode
PDK	Photo-diode Cathode
CONN7	Remote Control, 7-way screw terminal
0V	0V
D	Demand (Input, 0-5V)
En	Enable (Input, 5V = On)
G	Laser Drive On/Off or Gate (Input, 5V = laser drive on)
Rdy	Ready (Output, 5V = Ready)
On	Laser Drive On (Output, 5V = Laser Drive (LD) on, or LD & simmer on)[7]
Sim	Simmer (Input, 5V = On)
CONN8	DO NOT connect to any pins, for TT use only.

TT500 Dimensions
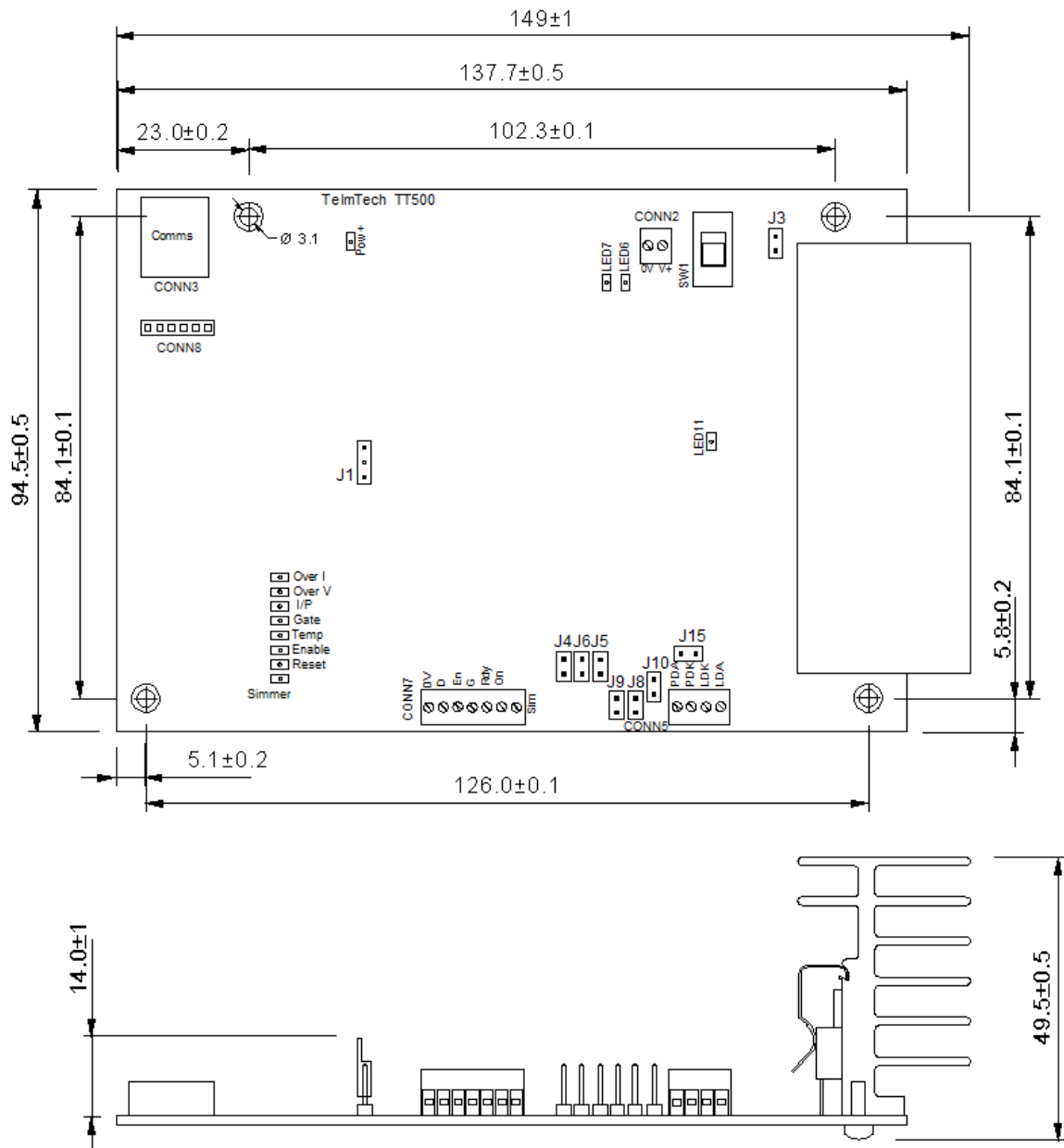
1. It is strongly recommended that regulated 9 to 12V, 1A power supplies are used.
2. Higher forward voltage lasers result in slower rise times.
3. Depends on laser type.
4. Depends on laser type and PDS setting.
5. The Enable is not intended for fast pulsed operation and is limited by the onboard delay.
6. Provided the anode case of the diode laser is floating and not connected at 0V or ground potential.
7. Output does not go high when enabled and simmer only selected.

Important Notice: The TT500 is NOT to be used in high reliability and risk applications, such as medical, aerospace & transport, where failure might present a risk to life or serious injuring. In addition, the information presented in this data sheet is provided in good faith and is considered to be accurate at the time but may be subject to change without notice.