USER MANUAL

LASENSE
TECHNOLOGY

Sensing the World Precisely

Ultra-Low Noise Laser Controller-M01

User Manual

LaSense
朗思科技

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01 / Introduction

1.1 Purpose and Features

The M01 is suitable for driving various types of lasers, integrating current driving and temperature control functions. It features extremely low current noise and temperature drift, widely used in various laser spectroscopy measurement systems. It is highly integrated, stable, reliable, and easy to operate.

Integrated current driving and temperature control

Extremely low current noise and ultra-high temperature stability

Plug and play for N/S butterfly, TO-packaged lasers

Compliant voltage supports ICL lasers

Optional RF signal input module

1.2 Product Details

Laser
Laser enable(Off/On)

TEC
Temperature control enable(Off/On)

I–Act
Current

T–Set
Set temperature

T–Act
Actual temperature

I Set
Adjust current

I Limit
Adjust maximum current

T–Act
Monitor actual temperature*

T–Set
Monitor set temperature*

RF In
RF Input*

I–Mod
Current modulation port

Temp Set(knob)
Set temperature value (effective when pressed)

LD EN(button)
Enable current output (long press 1–2 seconds)

N/S(slide switch)
Select laser type

INT I Set/EXT I Set(slide switch)
Select current adjustment method (internal/external)

Fw
Software version

Type
Laser type (Type–S: S–type laser)
(Type–N: N–type laser)

*: Monitoring signal is the voltage value of NTC divider; actual temperature requires converting voltage to NTC resistance value. Contact manufacturer technical support for details.
*: This interface function is an optional upgrade configuration

1.3 Technical Parameters

Name	Parameter
Current range	0~200 mA
Current stability	24hr：50~75 ppm@25℃
Soft start time	3~4 s
Current noise	3 μA（I=100 mA；<100 kHz）
Compliant voltage	7 V
Voltage input impedance	5 kΩ
External modulation voltage range	0~4 V
Modulation bandwidth	2 MHz
Modulation coefficient	50 mA/V
RF modulation bandwidth	10 M~6 GHz
TEC temperature control current	±2 A
Maximum power	12 W
Temperature control range	10~50 ℃
Temperature stability	1hr: 1 mK@25℃ / 24hr: 2 mK@25℃
Temperature sensor type	10 kΩ NTC
Power supply	5.9 V
Operating temperature	0~55℃
Storage temperature	-10~80℃
RF input impedance	50 Ω

1.4 Applicable Laser Types

Applicable Laser Types

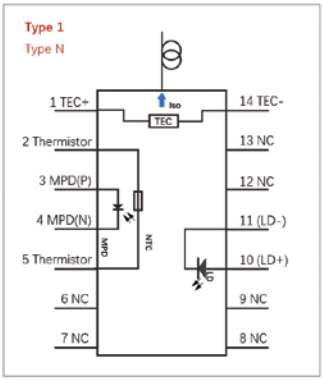


Figure 1: N-type butterfly laser

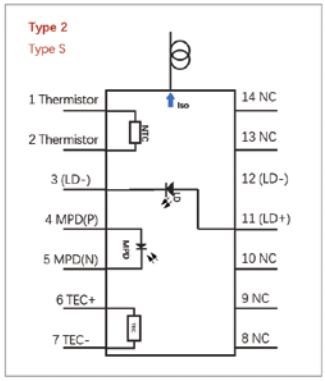


Figure 2: S-type butterfly laser

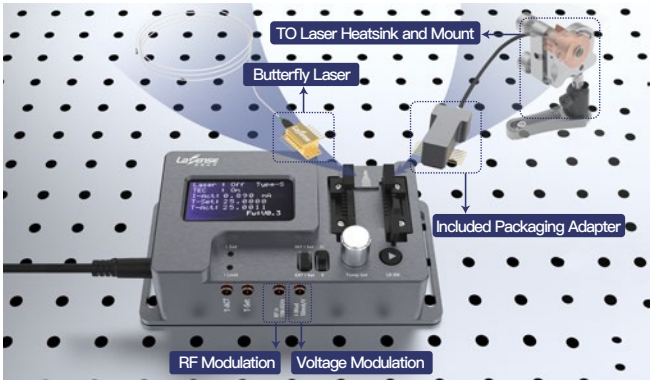
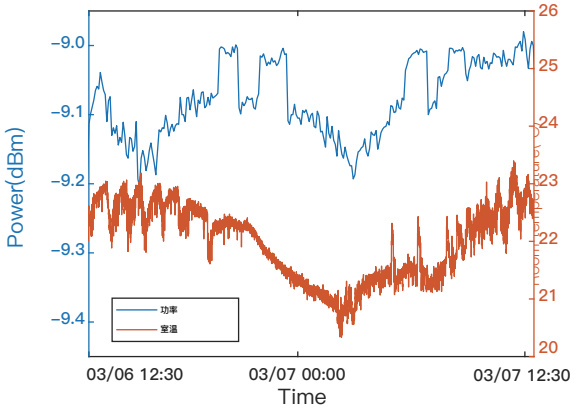


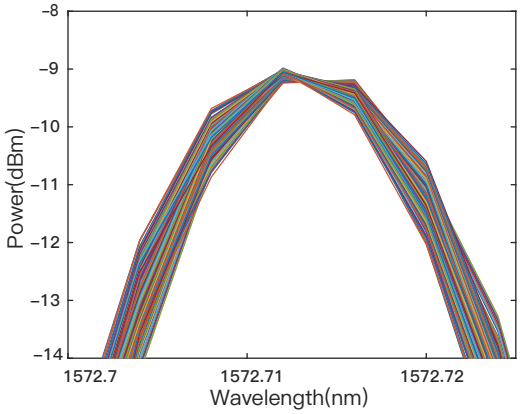
Figure 3: TO-packaged laser and butterfly-packaged laser installation diagram

Measured Case

LaSense M01 Driving NEL 1572nm Laser

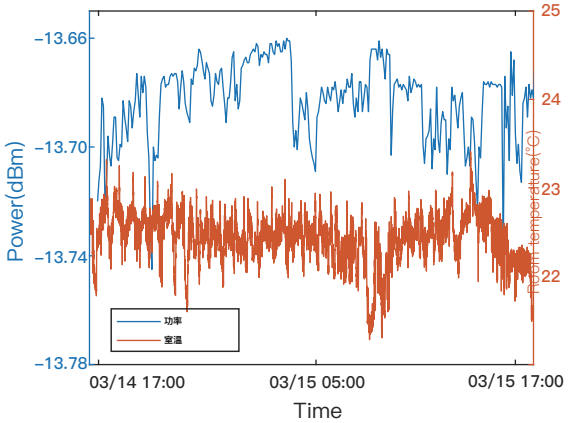


▲ 24-Hour Power Stability

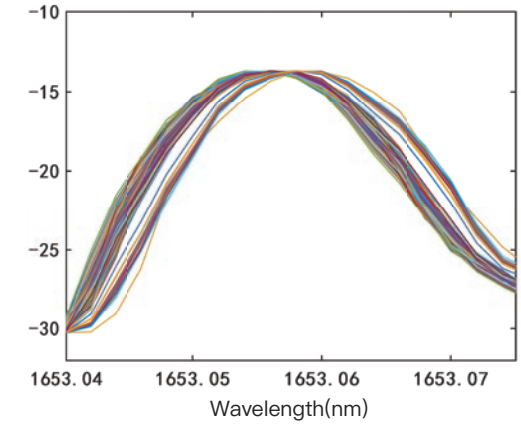


▲ 24-Hour Wavelength Stability

LaSense M01 Driving Eblana 1653nm Laser



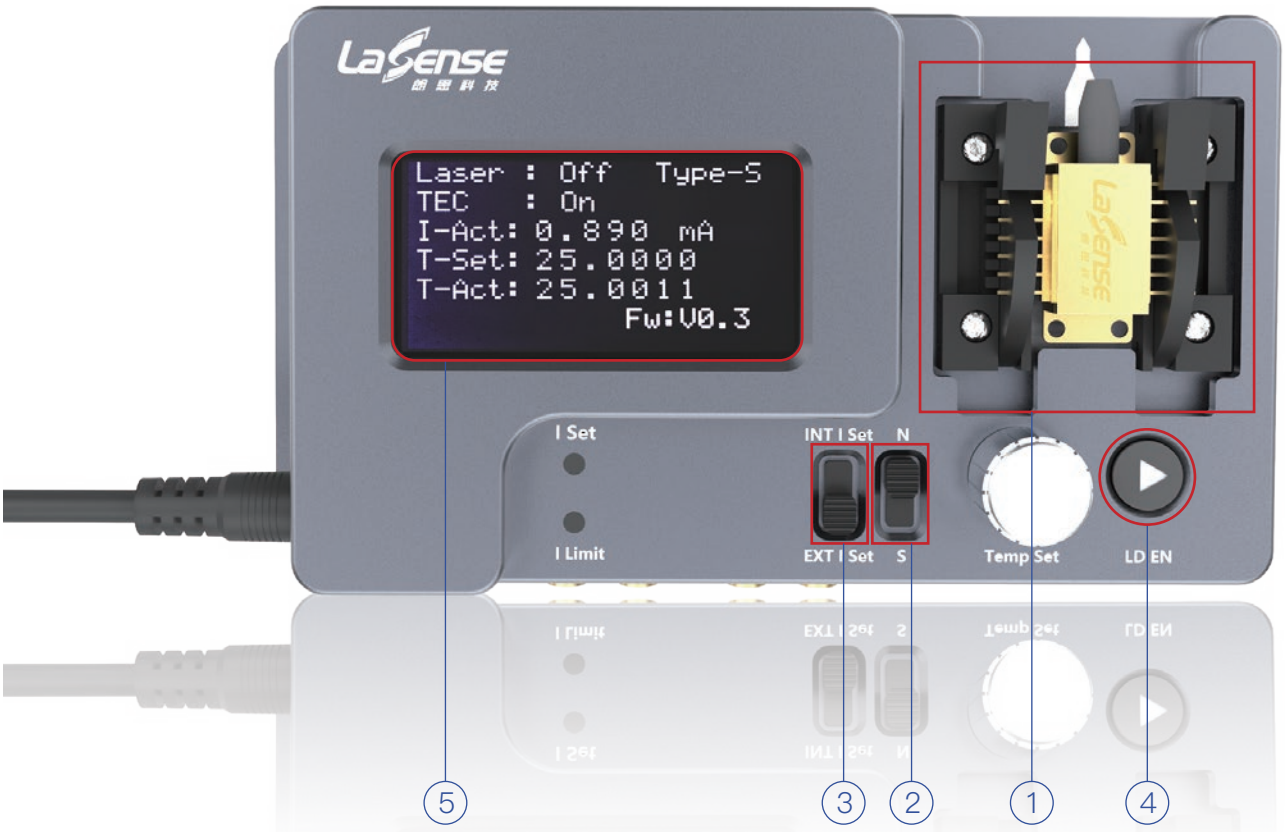
▲ 24-Hour Power Stability



▲ 24-Hour Wavelength Stability

02 / Usage

2.1 Power On



Step1
Install the laser
(N/A)

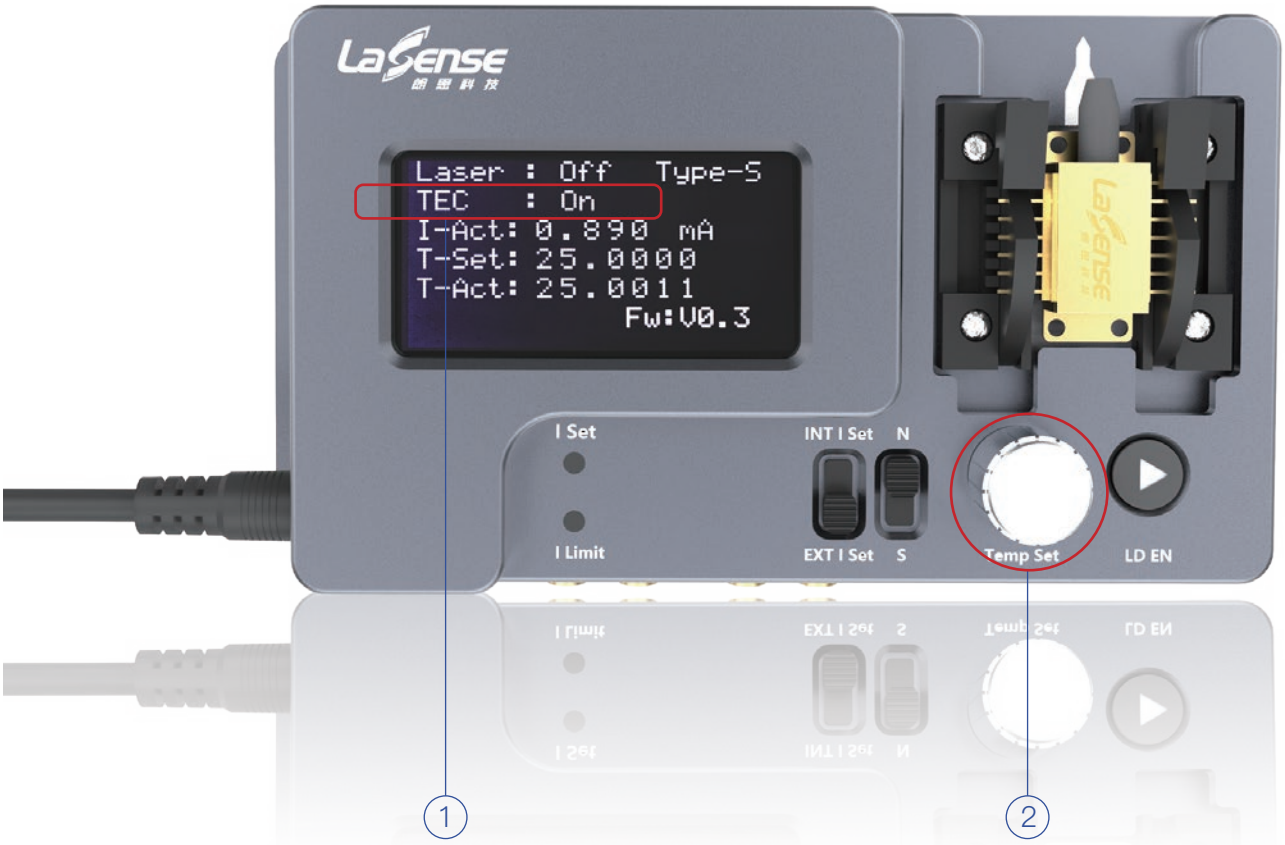
Step2
Select the N/S switch (slide switch)
according to the laser type
N for N–type laser, S for S–type laser

Step3
Select the INT I Set/EXT I Set switch (slide switch)
for current adjustment
INT I Set for internal, EXT I Set for external

Step4
Press the power switch
Power On
(Use original power supply)

Step5
Power on
LCD displays relevant information

2.2 Set Temperature



Step1

Enable temperature control

–Press the Temp Set knob

–LCD TEC status changes from off to on

Step2

Set the temperature

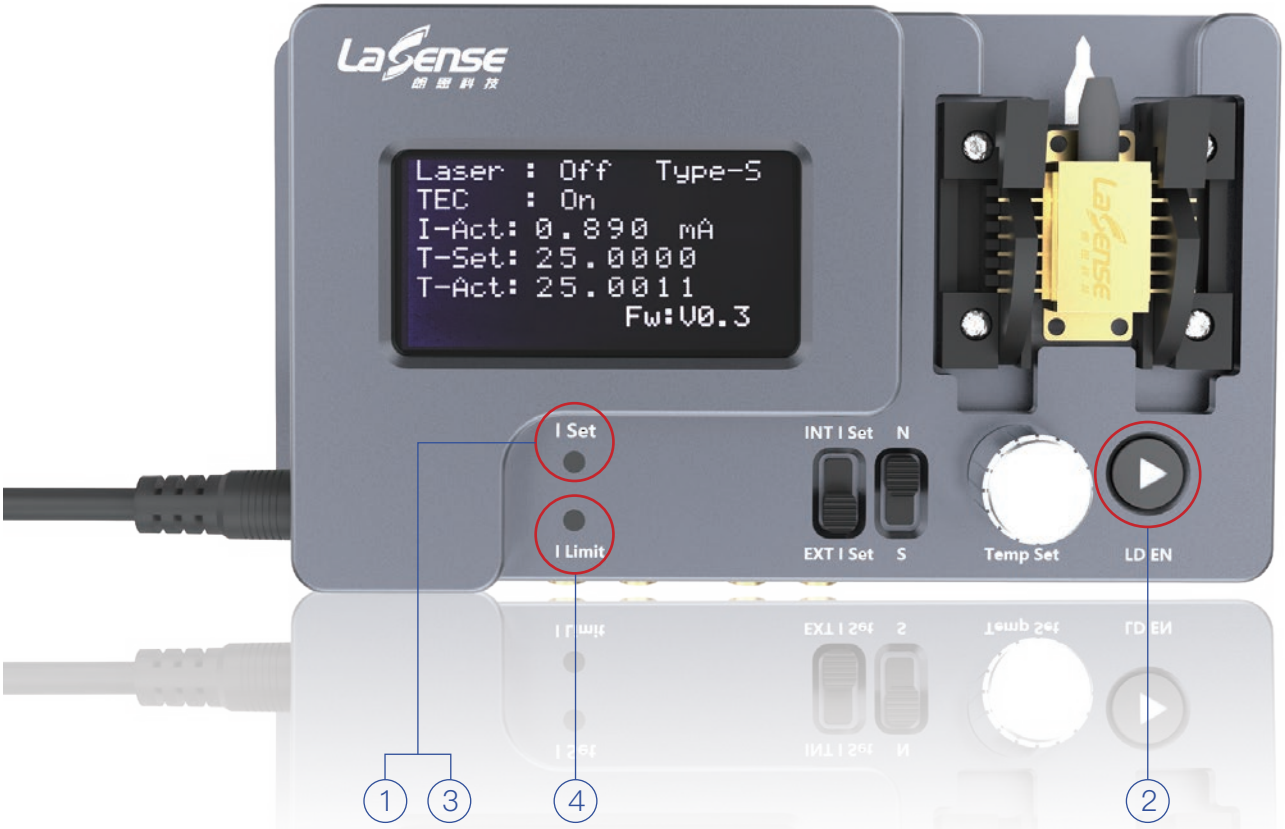
–Press the Temp Set knob while rotating

–T–Set value changes on LCD

(Clockwise to increase, counterclockwise to decrease)

2.3 Set Current Output

2.3.1 INT I set



Step1

I Set knob

Rotate the I Set knob counterclockwise to the minimum

(12 turns or until a click)

步骤2

LD EN button

–Long press the LD EN button for 1 second until the light is on

–Laser status changes from off to on on the LCD

步骤3

I Set knob

Rotate the I Set knob clockwise to increase the output current I–Act

(lockwise increases I–Act, counterclockwise decreases)

步骤4

I Limit knob

–If the I–Act decreases while rotating the I Set knob clockwise, it indicates the I Limit knob is set to the maximum current

–Rotate the I Limit knob clockwise to increase the maximum output current, then rotate the I Set knob clockwise

(Function of the I Limit button: Set the maximum output current I–ACT

* Note the maximum current of the laser)

2.3.2 EXIT I set

Step1

External voltage modulation interface I–Mod (N/A)

Step2

Voltage modulation relation

(Note: Adjust the I Set and I Limit knobs clockwise to the maximum)

50mA/V:

(1V corresponds to 50mA; 0~4V corresponds to 0~200mA)

2.4 Set Maximum Current Output

Step1

Rotate the I Set knob clockwise to increase the output current I–Act to the target value (maximum value)

Clockwise increases, counterclockwise decreases

Step2

Rotate the I Limit knob counterclockwise

N/A

Step3

When the I–Act displayed on the LCD starts to decrease, stop

N/A

Step4

Rotate the I Set knob clockwise:

–No change in current I–Act, counterclockwise decreases

N/A

03 / Precautions

- The maximum output current of the module is 200mA.
- Before using the butterfly laser, refer to Figures 1 and 2 to set the N/S switch to the matching position and then power on.

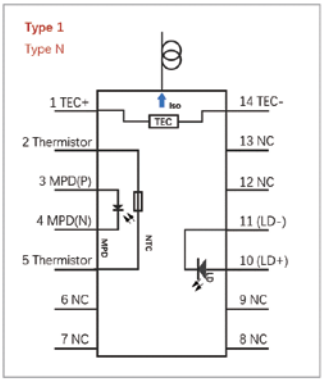


Figure 1: N-type butterfly laser

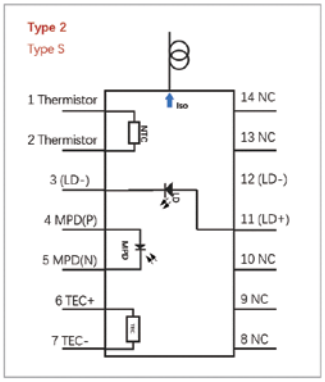


Figure 2: S-type butterfly laser

- For driving Nanoplus standard package TO5 Cube and TO66 Cube ICL lasers, set the N/S switch to S.
- To ensure laser temperature control accuracy, apply thermal grease evenly on the laser mounting base before installing the laser. After installation, secure with four set screws (M2*6).

04 / General Troubleshooting

Phenomenon	Possible Cause	Solution
LCD displays "Laser Error !!!"	Laser not installed	Install the laser
	Poor laser contact	Reinstall the laser, ensure good
	Poor laser contact N/S switch does not match the installed laser type	Reinstall the laser, ensure good connection Select N for N-type laser, S for S-type laser
	If none of the above, contact the manufacturer	N/A

05 / Warranty and Service

5.1 Product Warranty and Maintenance

1. Products manufactured by the company are guaranteed for one year. If users follow the instructions and the product has not suffered physical damage, pollution, modification, or refurbishment, we guarantee the quality of materials, processing, and performance, and will repair free of charge if there are issues.

2. Users are responsible for inspecting and checking the goods upon receipt and must notify the company's sales department via phone or email regarding the receipt condition promptly.

3. During the warranty period, the product must be repaired by the company or authorized service centers; otherwise, the warranty will be void.

4. Within the one-year warranty period, repairs are free. After the warranty period, users will be notified of any part replacement and repair costs before the repair. Repaired parts are warranted for 90 days, including consumables.

5. Users have used toxic, polluting or corrosive gases of the product, such as the absence of pollution removal and purification treatment certificate, the company will not be responsible for maintenance or warranty.

Wechat

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