Operation Procedures for Green SLM PL530 Laser Source

Model: PL530E32

(11-20-2025)

The PL530E32 laser source utilizes the ESP32 TTGO-T-Display board to control the Osram PL530 laser diode and TEC, and supports four operation modes:

1. Standalone Mode
2. Serial Port Mode
3. WiFi Access Point Mode
4. Bluetooth Mode

1. Standalone Operation Mode

A) Turn on the Power and Enable Lase Power Output

- Plug the +5 VDC power supply into the onboard Power Jack (P1) or the optional USB-C connector (P1), and set the sliding switch (S1) to the **ON** position.
- When the TTGO board screen displays **"Temp = Good"** with a blue background, press the Laser Enable Switch (S2) to activate the laser power output.
  Switch S2 toggles the laser power **Enable / Disable**.

B) Laser and Heater Current Adjustment

- The laser and heater current adjustment potentiometers, **POT1** and **POT2**, are preset to optimal positions. However, the Heater current potentiometer may require slight adjustment, and it has a significant impact on laser power quality.
- The laser current can be adjusted from **0 to 480 mA**, and the heater current from **40 to 72 mA**.
  The recommended operating currents are:
  Laser current ≈ 450 mA
  Heater current ≈ 66 mA
- The laser current, heater current, and TEC temperature are displayed on the TTGO screen.

C) Open and Close the Shutter

- Press the pushbutton (S3) to toggle the shutter **Open / Close**.

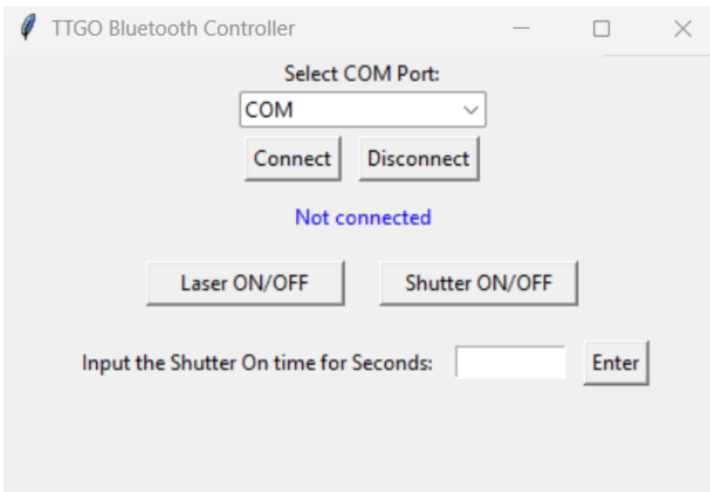
2. Serial Port Operation Mode

A) **Connect the Power Supply and the Serial Port to the Computer**

- Plug the +5 VDC power supply into the onboard Power Jack (P1) and set the sliding switch (S1) to the **ON** position.
- Use a USB-C / USB-A **data** cable to connect the TTGO board to the computer.

B) Set UP the Control Panel

- Download the Serial Port Control Panel from www.pdcontrol.com.
- Locate item **#8** and click **"Download Control Panel."**
- Unzip the downloaded file and open "**Control Panel 51002.exe**".
  A Control Panel window will appear, as shown in the image below.



C) Set the COM Port

- Enter the serial port number in the format **COMx**, where *x* represents the actual port number.
- Click the **"Connect"** button. If the port number and connection are correct, the message **"Connected to COMx"** will appear.
- Click the **"Disconnect"** button to disconnect the serial port.

D) Enable and Disable Laser Power Output

- Click the **"Laser ON/OFF"** button to enable or disable the laser power output.
- Click the **"Shutter ON/OFF"** button to open or close the shutter.
- When the shutter is closed, enter a value in the **"Input the Shutter On Time for Seconds"** field, then click the **Enter** button. The shutter will open immediately and close automatically after the specified number of seconds.

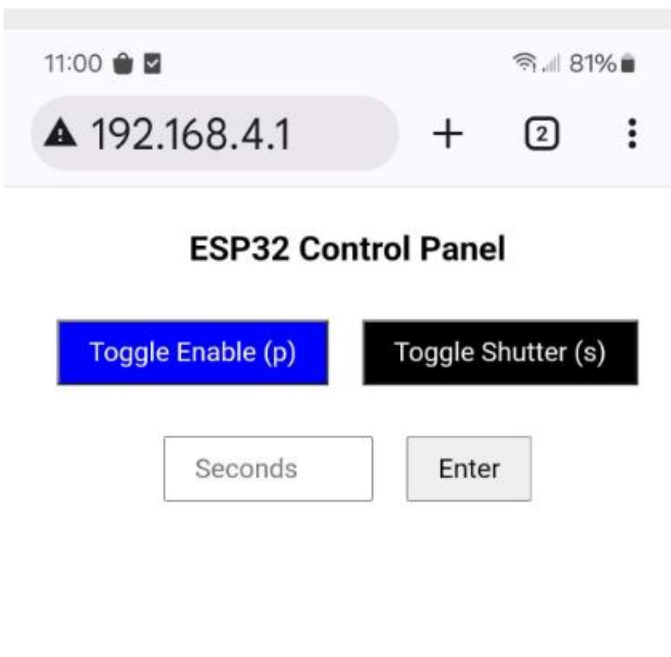
3. WiFi Access Point Mode

A) Connect the Board to the Power Supply

- Plug the +5 VDC power supply into the onboard Power Jack (P1) and set the sliding switch (S1) to the **ON** position.

B) Set Up a WiFi-Enabled Device

- Use a WiFi-enabled device (such as a smartphone or laptop) and search for available networks, through *Settings → Connections → TTGO_AP*.
  Network ID: TTGO_AP
  Password: 12345678
- Once connected, open a web browser and go to **192.168.4.1** to access the control webpage.



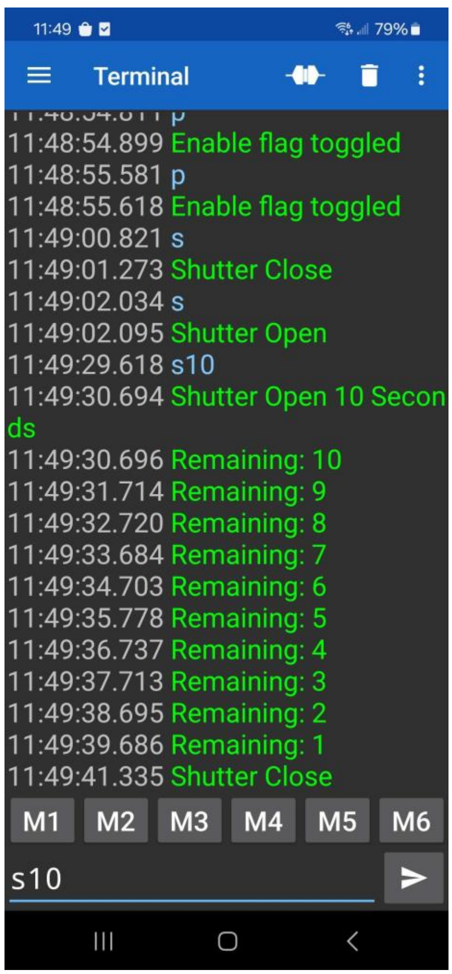
• Press the **"Toggle Enable (p)"** button to enable or disable the laser power output.
• Press the **"Toggle Shutter (s)"** button to open or close the shutter.
• In the **Seconds** field, use the up/down arrows to select the desired shutter-open time in seconds.

• Press the Enter button, the shutter will open for the number of seconds entered then close.

4. Bluetooth Mode

A) Set up the Android Phone for a Bluetooth Connection

• Download and install **“Serial Bluetooth Terminal”** from the Google Play Store. Then pair your phone with **“TTGO_BT”** through *Settings* → *Connections* → *Bluetooth*.
• Open the **Serial Bluetooth Terminal** app and select **TTGO_BT** from the device list.
• When the terminal window appears as shown in the picture below, type **“p”** and press **Enter** to toggle the laser power output on or off.
• Type **“s”** and press **Enter** to open or close the shutter.
• Type **“s”** followed by a number to set the shutter to open for the specified number of seconds.



B) Set up the iPhone for a Bluetooth Connection