Operation Procedures for Green SLM PL530 Laser Source

Model: PL530E32

(3-6-2026)

The PL530E32 laser source utilizes the ESP32 TTGO-T-Display board to control the Osram PL530 laser diode and TEC. The system supports four operation modes. **WiFi Access Point and Bluetooth modes provide wireless remote control from compatible devices.**

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

Note: Timer control is available in **Serial Port, WiFi Access Point, and Bluetooth modes only**.

1. Push Button Operation Mode

A) Turn on the Power and Enable Lase Power Output

- **Turn power on:**
- plug the +5 VDC power supply into the onboard Power Jack (P1) or a +5V USB Type-C adapter cable to the USB-C connector, then 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 laser current can be adjusted from **0** to approximate 460 mA, and the heater current from approximately 50 to 77 mA.
  The factory preset values are approximately:
- Laser current ≈ **450** mA.
  Heater current ≈ **650 mA**:
- **Note:** the heater current has a significant impact on the laser power output, if adjustment is required, finely adjust the heater current potentiometer.
- The laser current, heater current, and TEC temperature values are displayed on the TTGO screen.

C) Open and Close the Shutter

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

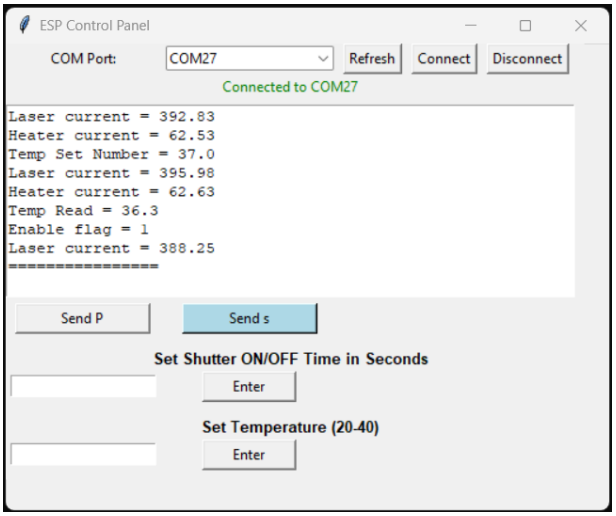
2. Serial Port Operation Mode

A) **Connect the Serial Port to the Computer**

- **Turn power on**
- Use a USB-C / USB-A **data** cable to connect the TTGO board to the computer.
- **Note: If a USB Type-C to USB-A data cable is used alone to power the unit (without the main power supply), the shutter will not be activated**

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 60307.exe"**.
  A Control Panel window will appear, as shown in the image below.



C) Set the COM Port

- Select the serial port number in the COM Port field, and click the Connect button, a green message text will display Connected to COM*x*, *x* represents the actual port number.
- Click the **"Disconnect"** button to disconnect the serial port.

D) Enable/Disable Laser Power and Open/Close the Shutter with Timer Function

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

E) Using PuTTY or HyperTerminal for Serial Port Control

- Set the baud rate to **115200** and select the correct serial port number when using PuTTY or HyperTerminal.
- In the input prompt window:
- Type **"p"** and press **Enter** to toggle the laser power output ON or OFF.
- Type **"s"** and press **Enter** to toggle the shutter Open or Closed.
- Type **"t"** followed by a number (20 to 40), then press **Enter** to set the TEC temperature to the specified value in °C.

F) Set the Shutter to Open for a Specified Number of Seconds

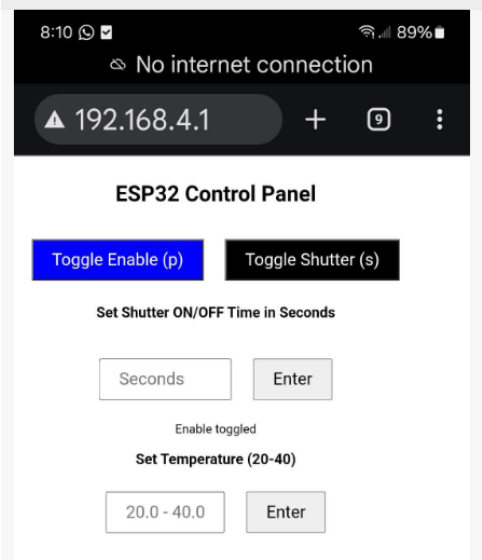
• To set a timed shutter opening, type **"s"** followed by the desired number of seconds, then press **Enter**. The shutter will open for the specified duration.

3. WiFi Access Point Mode

A) Turn power on

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 open the control webpage shown below.



• 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, type in a number for the desired shutter-open time in seconds. Press the Enter button, the shutter will open for the number of seconds entered then close.

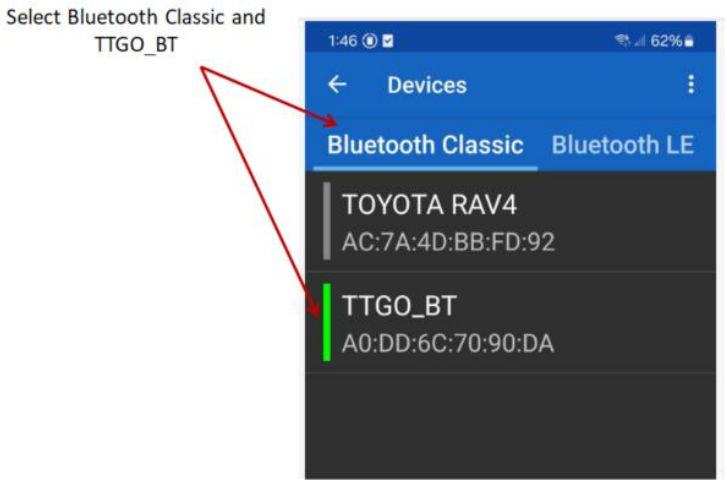
• Enter a value between 20 °C and 40 °C for the desired TEC temperature, then press **Enter** to apply the setting.

4. Bluetooth Mode

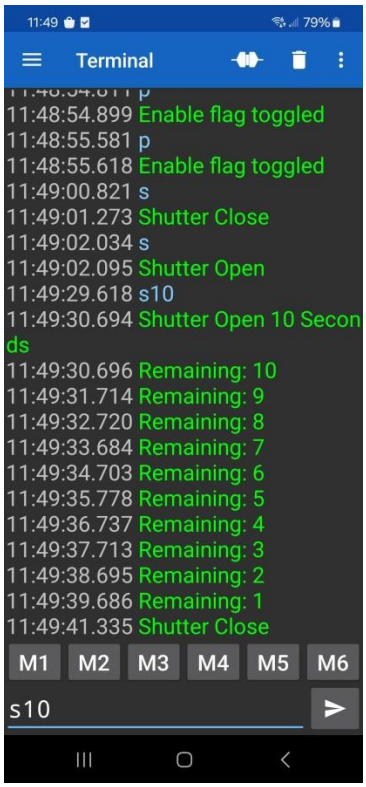
A) Set up the Android Phone for a Bluetooth Connection

Turn power on

• 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 ***Bluetooth Classic*** *and* ***TTGO_BT*** from the **Device** list, as shown in the picture below



• 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 toggle the shutter Open or Close.
• Type **"s"** followed by a number to set the shutter to open for the specified number of seconds.•
• Type **"t"** followed by a number to open the shutter for the specified number of seconds.



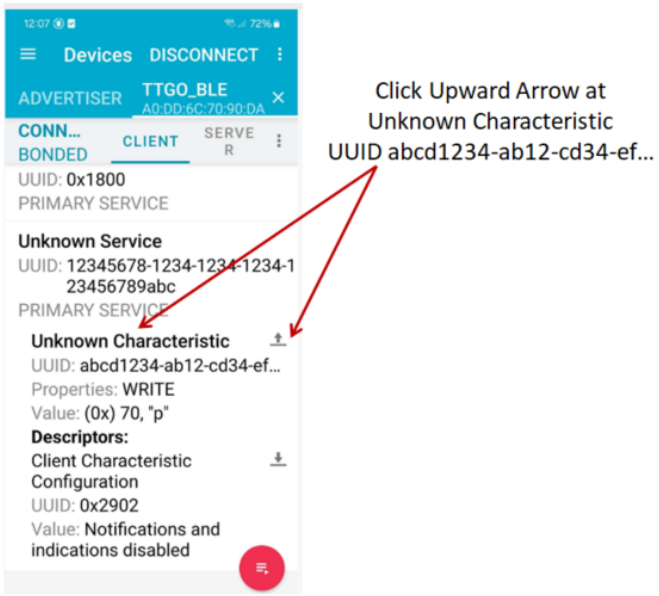
B) Set up the iPhone for a Bluetooth Connection

Turn power on

• Download and install an iPhone app for Bluetooth, for example, **nRF Connect for Mobile.**

• Pair with TTGO_BT, open the app, select TTGO_BLE and CONNECT:

• Click the Upward Arrow shown on the picture below



• In the **New Value** field, click the dropdown arrow and select **TEXT (UTF-8)**. Then enter the previously described control commands (see the Operating Procedure for Android phone) to toggle the laser Enable/Disable, toggle the shutter Open/Close, set the shutter time, and set the TEC temperature.

• Follow the steps shown in the picture below to send commands to the unit.