TKlamp Lighting Tester Docs

TKlamp Flashlight Tester is a specialized lighting meter designed to measure lumen, candela and lux values of flashlights.

The TK2303D model offers data logging capabilities, allowing users to transfer measurement data to a PC for further analysis. This repository contains a quickstart guide to exporting data from TK2303D, a detailed user manual and serial data specifications.

If you are instead looking for:

TKlamp Lighting Testers, visit website.

Purchasing TKlamp Tester, visit online store.

Documentations

1. Data Logging Tutorial - Quickstart guide to exporting data to PC
2. User Manual
3. Serial Data Specifications - How to interprent raw serial data from UBS serial port

Contributing

To make contributions, join Discord.

To suggest any changes in the repos, use pull request or Discord.

TK2303D Specifications

Table of Content

- Dimensions

Measurements & Range

- Luminous flux. Range: 0-25,000 lm
- Luminous intensity. Range: 0-6,500,000 cd
- Illuminance. Range: 0-250,000 lux

Resolution

- Live reading and plotting: 1lm/1cd/1lux
- Data logging: 1lm. cd and lux x1/x10/x100

Select cd/lux multiplier in settings based on estimated value:

- cd/lux < 65,535: select x1. (Max value: 65,535. Resolution 1 cd/lux)
- 65,535 <= cd/lux < 655,350: select x10 resolution (Max value: 655,350. Resolution 10 cd/lux)
- cd/lux >= 655,350: select x100 resolution (Max value: 6,553,500. Resolution 100 cd/lux)

> This is because log data is stored and transferred in 2 bytes, which can only represent up to 65,535 in value.

Live Plotting

- Lumen/Candela/Lux each has 600 sampling data points
- Sampling time: adjustable between 0.2s - 60.0s
- Maximum logging time: 600 mins (10 hrs)

Sensor sampling time interval

- Sensor sampling time interval: 150ms
- Sampling rate: ~6.6 times per second.

Lux and Candela Measurement

- Distance to surface range: 1-10m
- External sensor cable length: 2m
- External sensor extension cable length: 10m (Not included. Can be purchased separately)

Wavelength

- Range: 450-650nm (Not for UV/IR light)

Data Logging and Transfer

- Data length: 3620 bytes
- Data transfer time: approx. 5s
- Cmmunication interface: RS485 USB

Timer

- Up timer: up to 24 hours
- Down timer: 1-999 minutes

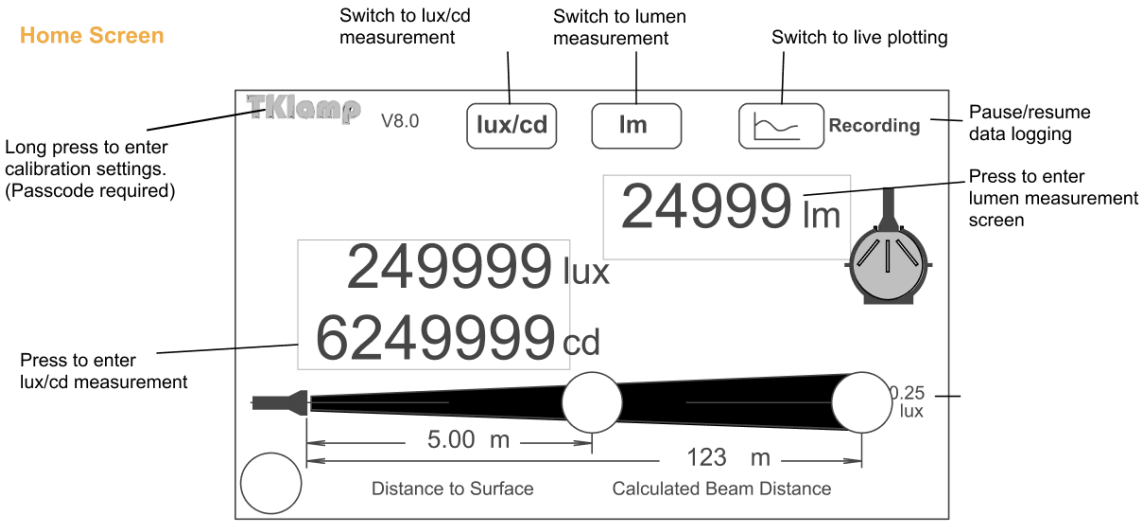
Power Supply

- Power consumption: < 4w
- AC power/DC power
- AC power range: 90~240V
- DC power range: 5~24V

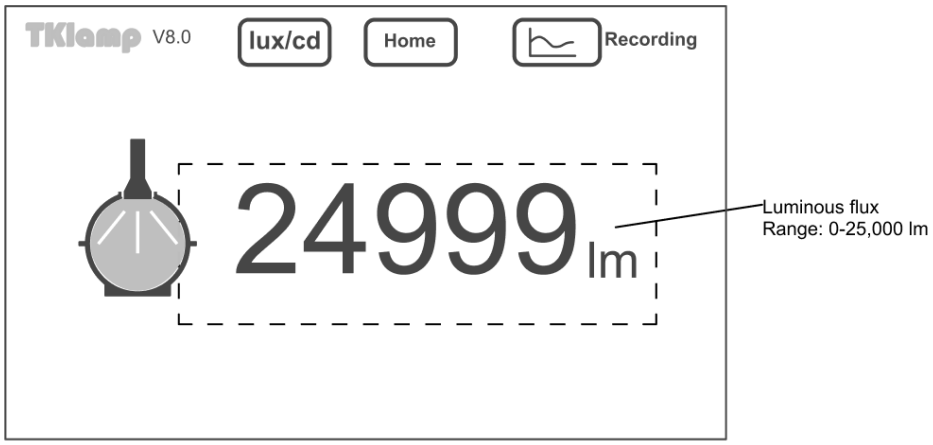
Dimensions

- Sphere openning sizes: 0.7”, 1.5”, 2.9”
- Sphere diameter: 6.29”

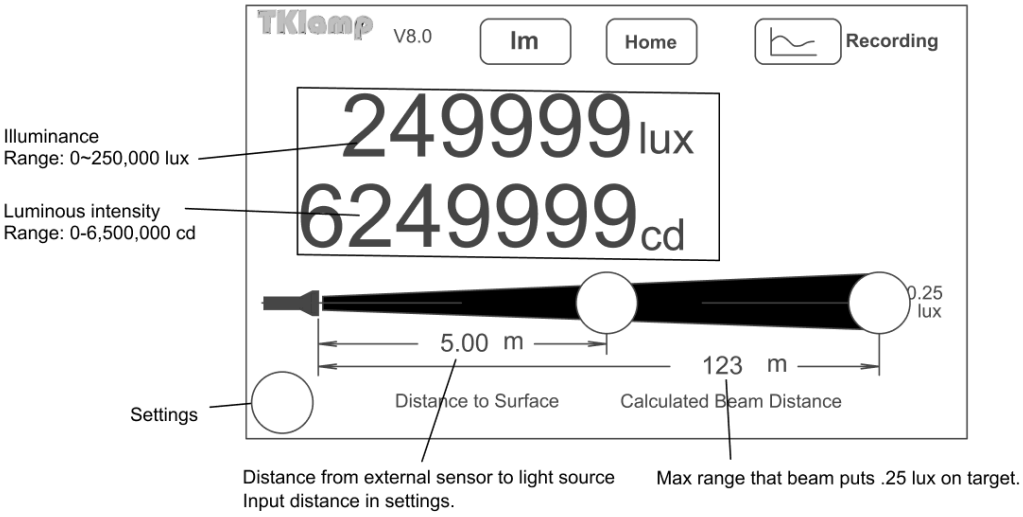
Home Screen



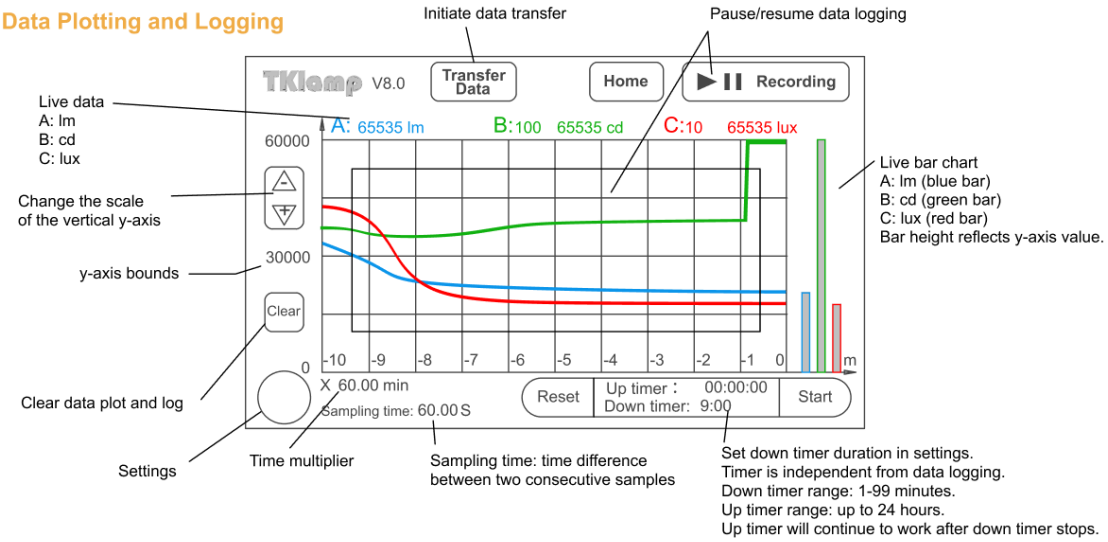
Lumen Measurement



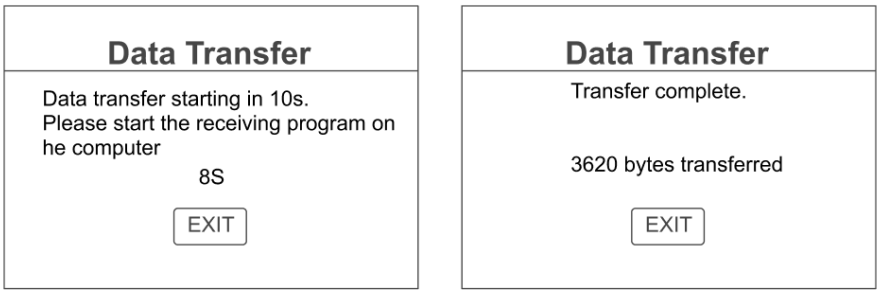
Lux/Candela Measurement



Data Plotting and Logging

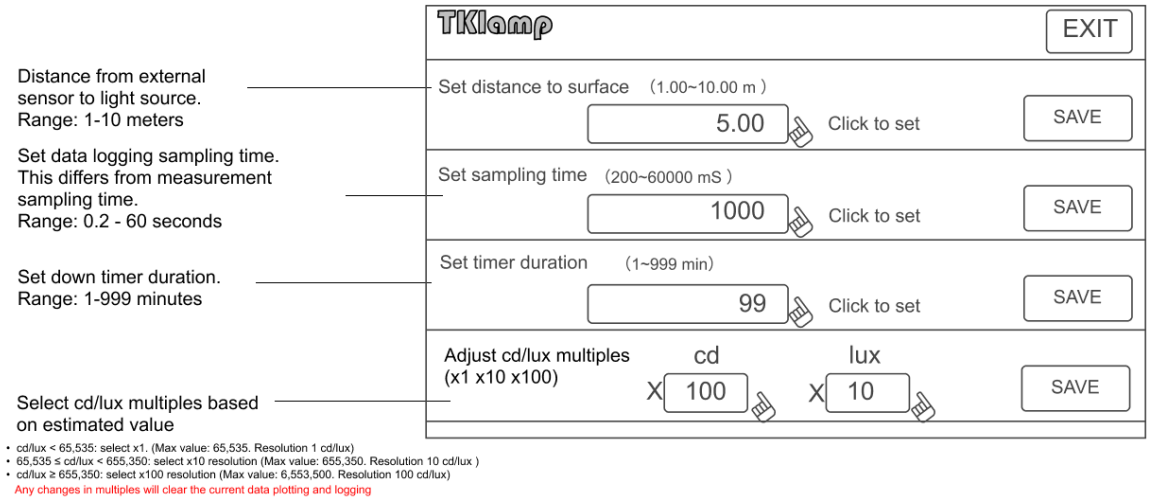


Data Transfer



Settings

Always remember to save any changes before exiting settings



- cd/lux < 65,535: select x1. (Max value: 65,535. Resolution 1 cd/lux)
- 65,535 ≤ cd/lux < 655,350: select x10 resolution (Max value: 655,350. Resolution 10 cd/lux)
- cd/lux ≥ 655,350: select x100 resolution (Max value: 6,553,500. Resolution 100 cd/lux)

Any changes in multiples will clear the current data plotting and logging

Serial Data Reference

> This reference is created for decoding raw serial data read directly from USB serial port or 3rd party application such as CoolTerm.

To see a sample serial data output, click here. The same data is used in the examples below.

Total length: **3620 bytes**

- Header: 1-16 bytes

- Body: 17-3616 bytes
- Ending: 3616-3620 bytes

Table of Content

Header

```
<table>
  <tr>
    <th>Byte position</th>
    <td>1-2</td>
    <td>3-4</td>
    <td>5-6</td>
    <td>7-8</td>
    <td>9-10</td>
    <td>11-12</td>
     <td>13-14</td>
     <td>15-16</td>
  </tr>
  <tr>
    <th>Example data</th>
    <td>aa aa</td>
    <td>0e 10</td>
    <td>01 f4</td>
    <td>00 64</td>
    <td>00 01</td>
    <td>00 01</td>
    <td>00 01</td>
    <td>56 44</td>
  </tr>
  <tr>
    <th>Explanation</th>
    <td>Start indicator</td>
    <td>Data body length (3600 bytes fixed) </td>
    <td>Sampling time</td>
    <td>Distance to surface</td>
    <td>Lumen multiples</td>
    <td>Candela multiples</td>
    <td>Lux multiples</td>
    <td>Version</td>
  </tr>
</table>
```

Body

```
<table>
  <tr>
    <th>Byte position</th>
    <td>17-1216</td>
    <td>1217-2416</td>
    <td>2417-3616</td>
  </tr>
  <tr>
    <th>Example data</th>
    <td>44 00 .. .. 00 00 </td>
    <td>00 00 .. .. 00 00 </td>
    <td>75 00 .. .. 00 00</td>
  </tr>
  <tr>
    <th>Explanation</th>
    <td>Lumen (each data point is 2 bytes) </td>
    <td>Candela (each data point is 2 bytes) </td>
    <td>Lux (each data point is 2 bytes) </td>
  </tr>
</table>
```

- TK2303D tester can take 600 sample points. Each sample point consists of 2 bytes.
- Lumen, Lux and Candela each has 600 * 2 = 1200 bytes data total.
- Data persists time ascending order.

Ending

```
<table>
  <tr>
    <th>Byte position</th>
    <td>3617-3618</td>
    <td>3619-3620</td>
  </tr>
  <tr>
    <th>Example data</th>
    <td>ee ee</td>
    <td>1a b0</td>
  </tr>
  <tr>
    <th>Explanation</th>
    <td>Ending indicator </td>
    <td>No meaning</td>
  </tr>
</table>
```