# 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

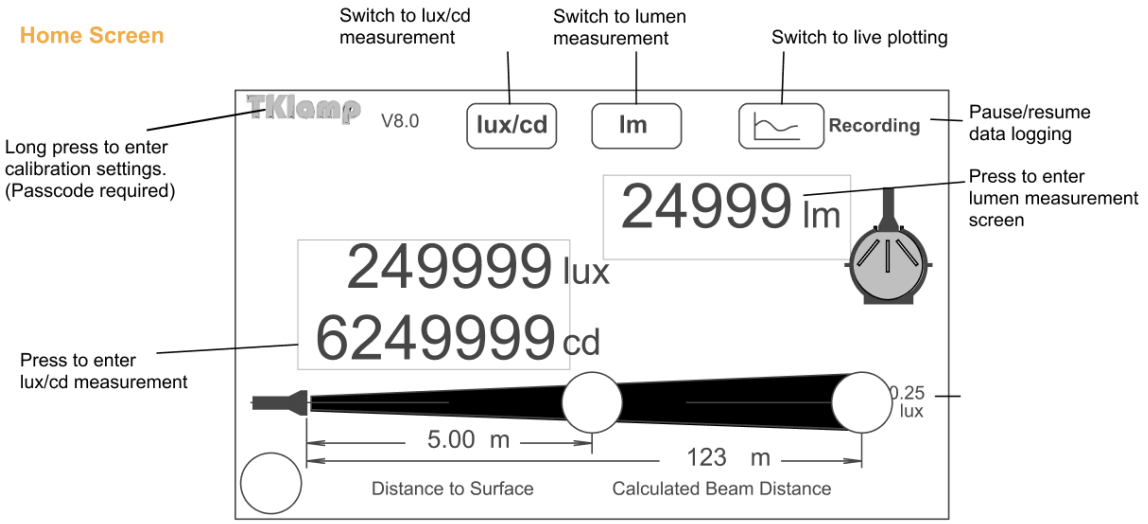
### Power Supply

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

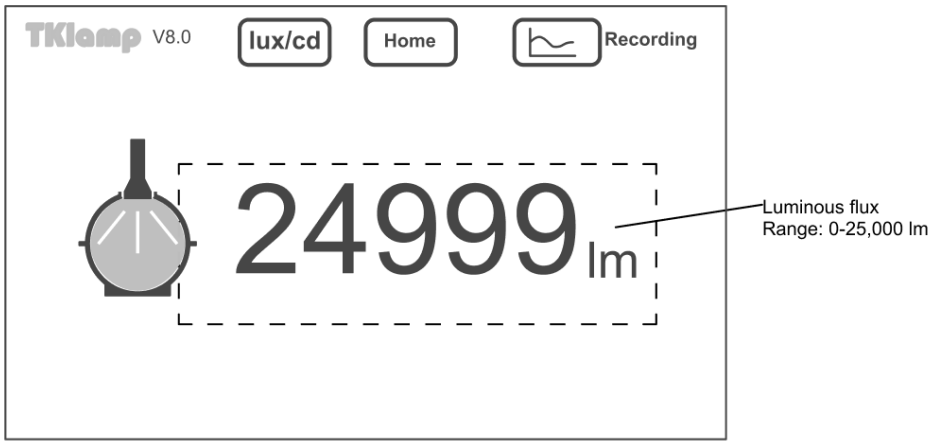
### Dimensions

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

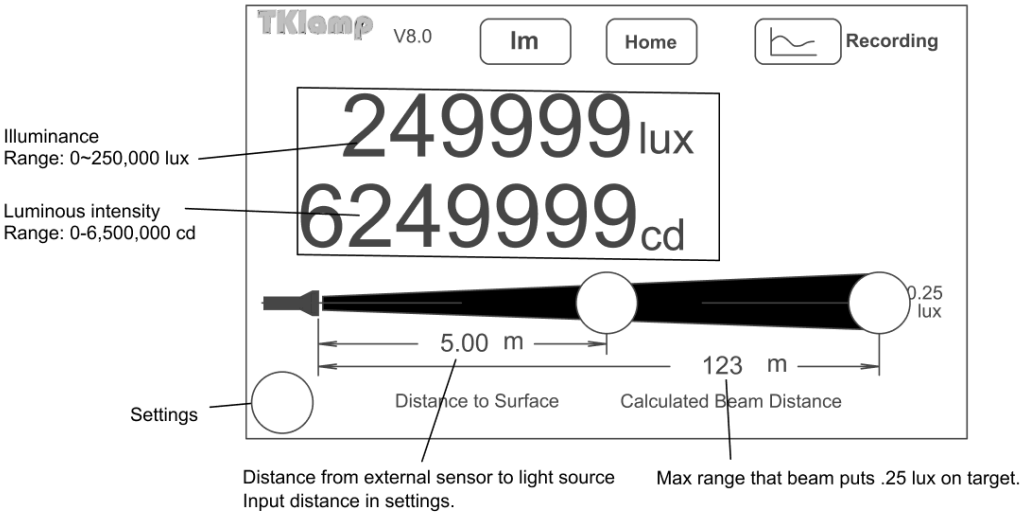
## Home Screen



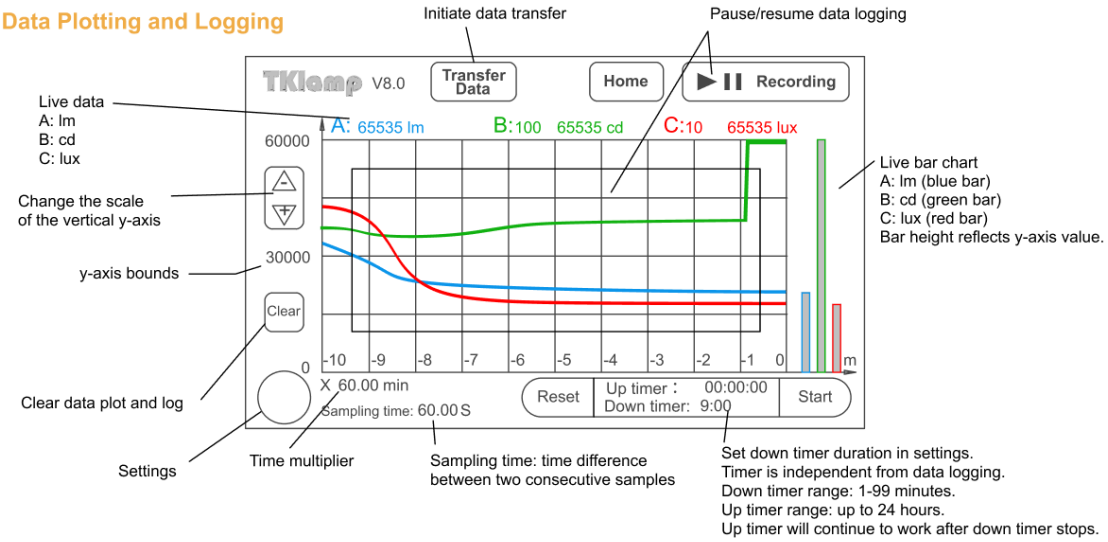

## Lumen Measurement



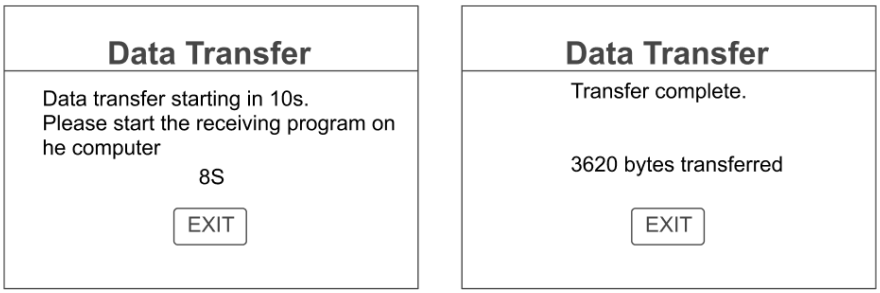
### Lux/Candela Measurement




### Data Plotting and Logging

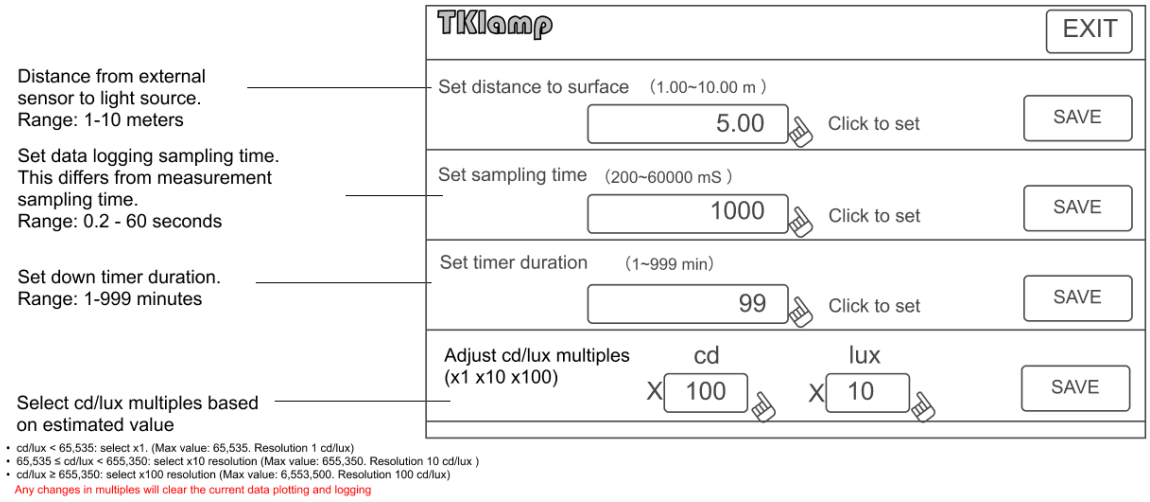


Data Transfer




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>
```