



PCE Americas Inc.  
711 Commerce Way  
Suite 8  
Jupiter  
FL-33458  
USA  
From outside US: +1  
Tel: (561) 320-9162  
Fax: (561) 320-9176  
info@pce-americas.com

PCE Instruments UK Ltd.  
Unit 11  
Southpoint Business Park  
Ensign way  
Hampshire / Southampton  
United Kingdom, SO31 4RF  
From outside UK: +44  
Tel: (0) 2380 98703 0  
Fax: (0) 2380 98703 9  
info@pce-instruments.com

[www.pce-instruments.com/english](http://www.pce-instruments.com/english)  
[www.pce-instruments.com](http://www.pce-instruments.com)

# Manual Lux Meter PCE-174



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## 1 Introduction

Thank you for purchasing the PCE-174 from PCE Instruments.

The PCE-174 light intensity meter is a precision device to measure Lux and Footcandle readings. The light intensity meter can be used to measure light levels in industry, agriculture and research.

## 2 Safety notes

Please read this manual carefully and completely before you use the device for the first time. The device may only be used by qualified personnel and repaired by PCE Instruments personnel. There is no warranty of damages or injuries caused by non-observance of the manual.

- The device may only be used in the approved temperature range.
- The case should only be opened by qualified personnel of PCE Instruments.
- The instrument should never be placed with the user interface facing an object (e. g. keyboard side on a table).
- You should not make any technical changes to the device.
- The appliance should only be cleaned with a damp cloth / use only pH-neutral cleaner.

This user's handbook is published by PCE Instruments without any guarantee.

We expressly point to our general guarantee terms which can be found in our general terms of business.

If you have any questions please contact PCE Instruments.

### 3 Specification

|                          |                                                                                                             |
|--------------------------|-------------------------------------------------------------------------------------------------------------|
| Measurement range        | 400.0 / 4000 / lux<br>40.00 / 400.0 klux<br>40.00 / 400.0 / 4000 / fc<br>40.00 kfc                          |
| Resolution               | 0.1 / 1 / 10 / 100 lux<br>0.01 / 0.1 / 1 / 10 FootCandle                                                    |
| Accuracy                 | ± 5% of measurement value ± 10 digits (<10,000 lux)<br>± 10% of measurement value ± 10 digits (>10,000 lux) |
| Reproducibility          | ± 3 %                                                                                                       |
| Storage                  | 16,000 values                                                                                               |
| Storage Interval         | Between 2 and 99 seconds                                                                                    |
| Over-range display       | OL= overload                                                                                                |
| Display-update           | 1.5 per second                                                                                              |
| Environmental conditions | 0 ... 40°C / 80% RH                                                                                         |
| Display                  | 3¾ digits LCD-display                                                                                       |
| Supply                   | 9 V block battery                                                                                           |
| Dimensions               | Device: 206 x 95 x 45 mm (W x H x D) Light sensor : 115 x 60 x 20mm (W x H x D)<br>Cable length: 95 cm      |
| Weight                   | 265g                                                                                                        |
| Standards                | Safety: IEC- 1010- 1; EN 61010- 1<br>EMV: EN 50081- 1; EN 50082- 1 DIN 5031 ; DIN 5032                      |

#### Delivery contents

1 x Lux-measuring device PCE-174, 1 x light sensor, 1 x software, 1 x USB-cable, 1 x battery, 1 x device case, 1 x operating manual

### 4 System description



1. **On/Off key**
2. **Display:** 3¾ digits display
3. **UNITS key:** Press this key to switch to the measuring mode for footcandle (1 fc= 10.76 lux)
4. **Backlight:** Turn on and off
5. **REC/SET key**
6. **PEAK key:** Press this key to activate the peak value display.
7. **HOLD key:** The current value on the screen is frozen.
8. **Range key:** Press this key to select between different measurement ranges (e. g. 400.0/4000 lux).
9. **MAX/MIN key:** Press this key to select the maximum and minimum value.
10. **REL key:** Press this key to switch to comparative readings (zeroing).

### 5 Operation

1. Connect the device to the light sensor.
2. Press the on/off key to turn on the Lux-measuring device.
3. Remove the cover of the light sensor and hold it horizontally to the light source.
4. Select the desired unit, lux or fc.
5. The light intensity value is displayed on the screen. If "OL" appears, then the measurement value is outside of the measurement range. Please select a higher measurement range.
6. The measurement range is selected by pressing the **RANGE** key (e.g. 400.0/4000 lux).
7. Switch between the measuring modules Lux and Footcandle (1 fc= 10.76 lux) by pressing the **UNITS** key.
8. To freeze the current value on the screen, press the **HOLD** key. Press the key again to continue with the measurement.
9. To record the peak value, press the **PEAK** key. By briefly pressing the **PEAK** key, the maximum and minimum peak values can now be recorded.
10. Maximum and minimum values can be selected by pressing the **MAX/MIN** key.
11. To set the display to "0", press the **REL** key. The device will now deduct the current measurement value from the final value.
12. To turn the backlight on or off, press the **LOAD** key.
13. To disable power off function, press the REC/SET key and RANGE/APO keys simultaneously.
14. When the measurement procedure has been completed, put the cover back on the light sensor and turn off the device

## 6 Set time and sampling rate

1. Press the **REC** and **UNITS** keys simultaneously. The first digit of the time will begin to flash.
2. By pressing the **PEAK** ◀ or **REL** ▶ key the appropriate selection may be selected (hour, minute, second, sampling rate, month, day, week, year).
3. The value of the range selected can be changed by pressing the **MAX/MIN** ▲ key or the **HOLD** ▼ key.
4. To exit, press the **REC** key and **UNITS** key simultaneously.

## 7 Manual save

1. Press the **REC/Setup** key to save manually.
2. The saved values can be viewed by pressing the **LOAD** key for approx. 3 seconds.
3. The memory locations can be viewed by pressing **MAX/MIN** ▲ and **HOLD** ▼ key.
4. To switch back to the standard mode, press the **LOAD** key for approx. 3 seconds.

## 8 Data log storage

1. Set the sampling rate as described in point 6.
2. Press the **REC/Setup** for approx.3 seconds, until the **MEM** display begins to flash.
3. Press the **REC/Setup** for approx.3 seconds and the saving will be complete.
4. Connect the light intensity meter to a USB port and the data log will be selected using the included software.

## 9 Delete saved data

Delete the manually saved data as follows:

Press the **LOAD** key and the **REC/Setup** key simultaneously until the symbol **MEM CL** appears on the screen to delete the saved data.

Delete the automatically saved data as follows:

Press the **REC/Setup** key whilst the device is turned off and keep it pressed **whilst turning on** the device until **DEL-MEM** appears on the screen.

## 10 Battery replacement

A battery warning indicator will appear on screen when the battery power is low. To replace the battery, remove the battery compartment cover with a screwdriver. Replace the 9V block battery with a new one and screw the battery compartment cover back on.

## 11 Maintenance

1. The outer casing can be cleaned with a damp cloth.
2. Do not store the device in areas of high humidity.

## 12 Classification of the measurement results

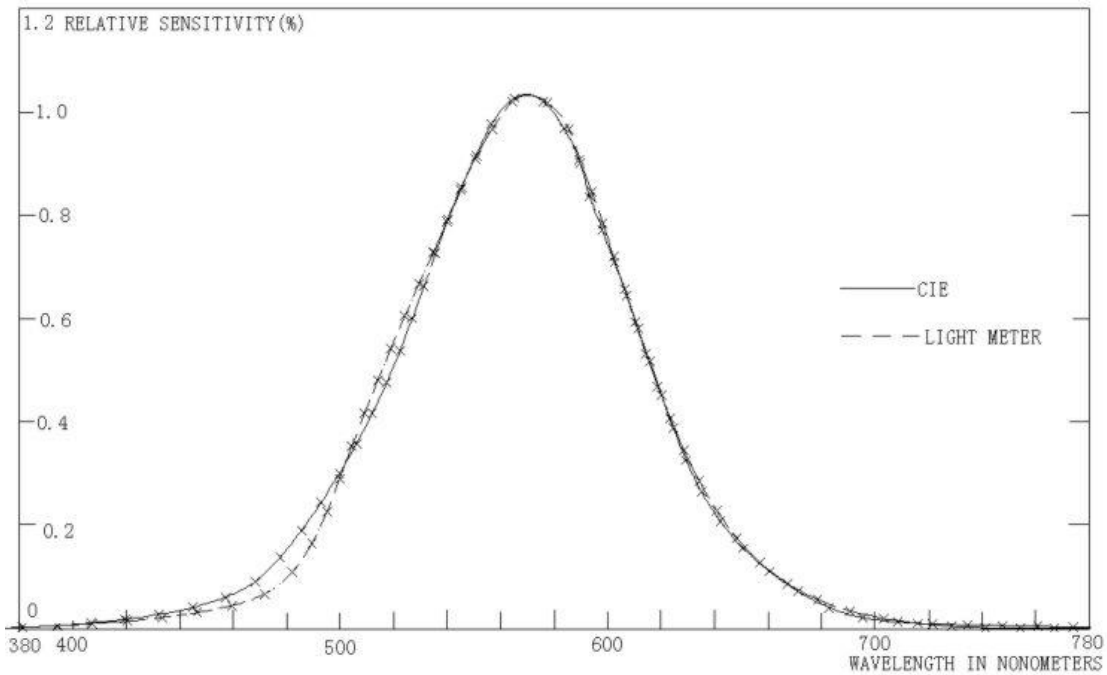
PCE have provided the following table to be used as a guide when using the light intensity meter in different environments. The table shows the standard settings to be used when using the light intensity meter indoors. When using outdoors, considerably higher readings are to be expected (e.g. 30.000 lux or 100.000 lux in sunlight). These values are only approximate values and PCE cannot accept any liability for their accuracy.

| Lighting area | Type of work/ work room      | luminous intensity range |
|---------------|------------------------------|--------------------------|
| School area   | Carrying out experiments     | 700 - 1500 lux           |
|               | Writing on the board         | 700 - 1500 lux           |
|               | Graphical designs            | 700 - 1500 lux           |
|               | Hallways                     | 150 - 300 lux            |
|               | General classrooms           | 150 - 300 lux            |
|               | Reading room                 | 700 - 1500 lux           |
| Office area   | Canteen                      | 300 - 700 lux            |
|               | Computer room, Computer work | 1500 - 3000 lux          |
|               | Technical drawings           | 1500 - 3000 lux          |
|               | Holding of meetings          | 300 - 700 lux            |
|               | Canteen                      | 150 - 300 lux            |
| Factory area  | Reception                    | 300 - 700 lux            |
|               | Production hall              | 1500 - 3000 lux          |
|               | Development office           | 700 - 1500 lux           |
|               | Planning office              | 700 - 1500 lux           |
|               | Laboratory studies           | 1500 - 3000 lux          |
|               | Packing products             | 700 - 1500 lux           |
|               | Warehouse                    | 300 - 700 lux            |
| Hospital area | Electrical rooms             | 150 - 300 lux            |
|               | Visitors room                | 300 - 700 lux            |
|               | Training                     | 300 - 700 lux            |
|               | Anatomical training          | 300 - 700 lux            |
|               | First aid / Treatment room   | 700 - 1500 lux           |
|               | Pharmacy sector              | 700 - 1500 lux           |
|               | Reading in hospital bed      | 150 - 300 lux            |
|               | Radiotherapy room            | 70 - 150 lux             |
|               | Washroom                     | 150 - 300 lux            |
|               | Hotel area                   | reception                |
| Entrance area |                              | 300 - 700 lux            |
| Banquet       |                              | 300 - 700 lux            |
| Offices       |                              | 150 - 300 lux            |
| Restaurant    |                              | 150 - 300 lux            |
| Toilet        |                              | 150 - 300 lux            |
| Washrooms     |                              | 150 - 300 lux            |
| Bar           |                              | 70 - 150 lux             |
| Hallways      |                              | 70 - 150 lux             |

|                       |                 |                 |
|-----------------------|-----------------|-----------------|
|                       | Stairs          | 70 - 150 lux    |
| Business area / shops | Shop window     | 1500 - 3000 lux |
|                       | Exhibition room | 1500 - 3000 lux |
|                       | Packing area    | 700 - 1500 lux  |
|                       | Common room     | 300 - 700 lux   |
|                       | Meeting room    | 300 - 700 lux   |
|                       | Toilet          | 150 - 300 lux   |
|                       | Stairs          | 70 - 150 lux    |

### 13 Spectral sensitivity characteristics

The devices light sensor fulfils the C.I.E (International Commission on Illumination) spectral curve as displayed below:

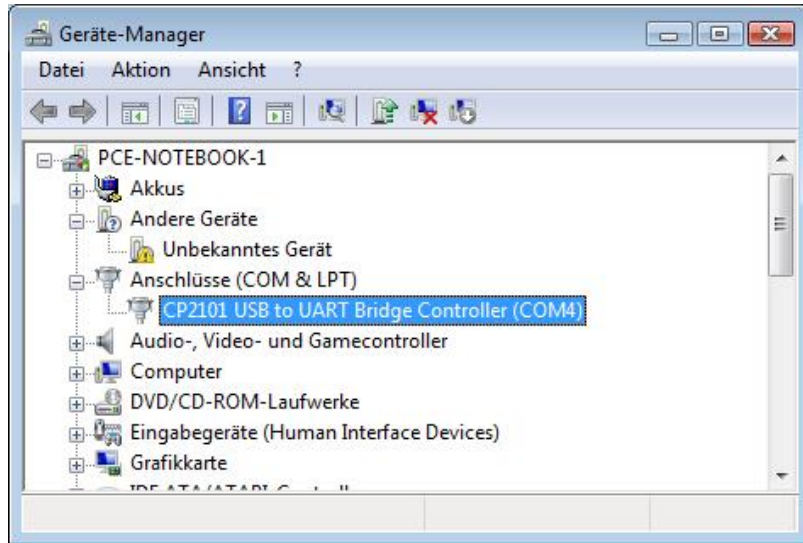


#### Software installation

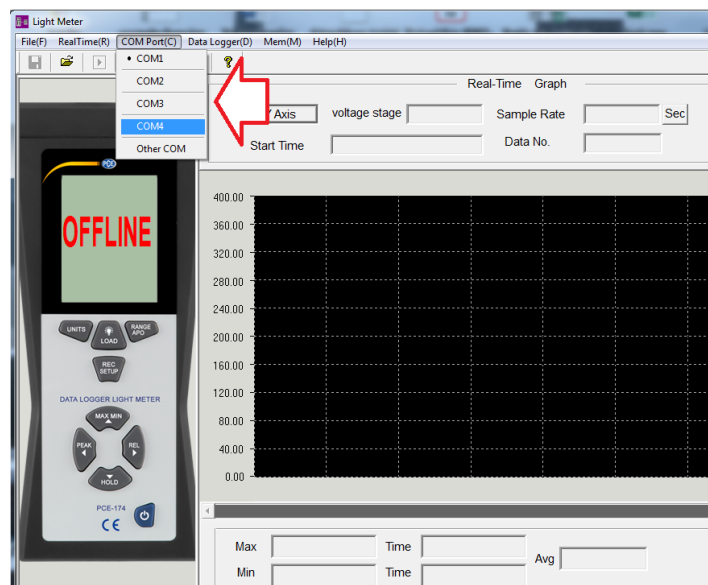
Place the software CD into the drive and double click "Setup". The installation window appears. Click "Next". To install the software, click on the install button. After the software has been successfully installed, click "Finish" to complete the installation.

### Launching the software

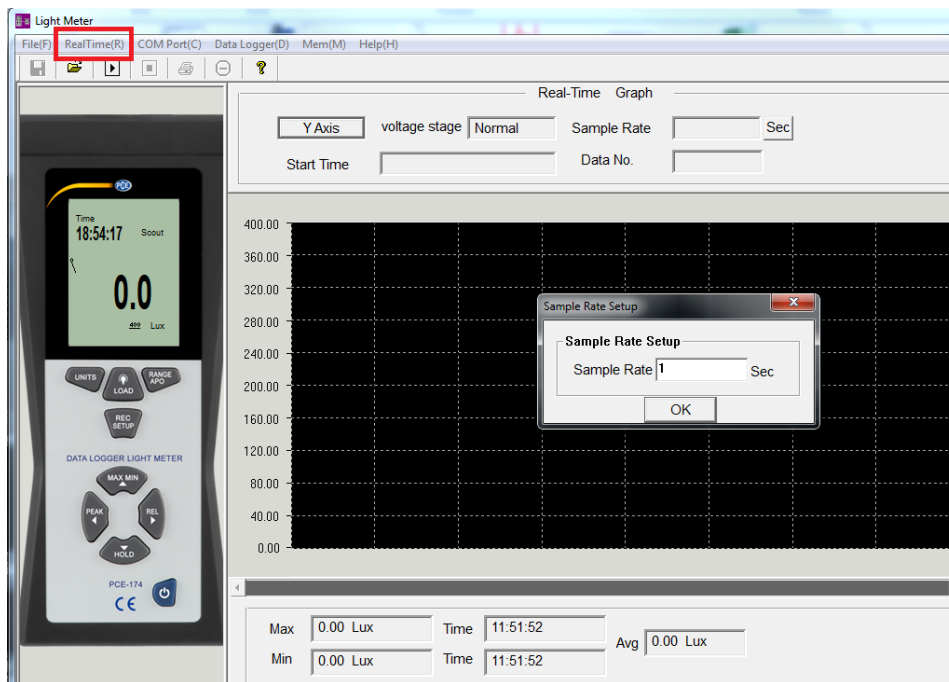
Open the software and connect the device with the provided USB cable to the computer. The software shows that the device is offline. The current connection can be selected by clicking COM Port, to establish a connection.



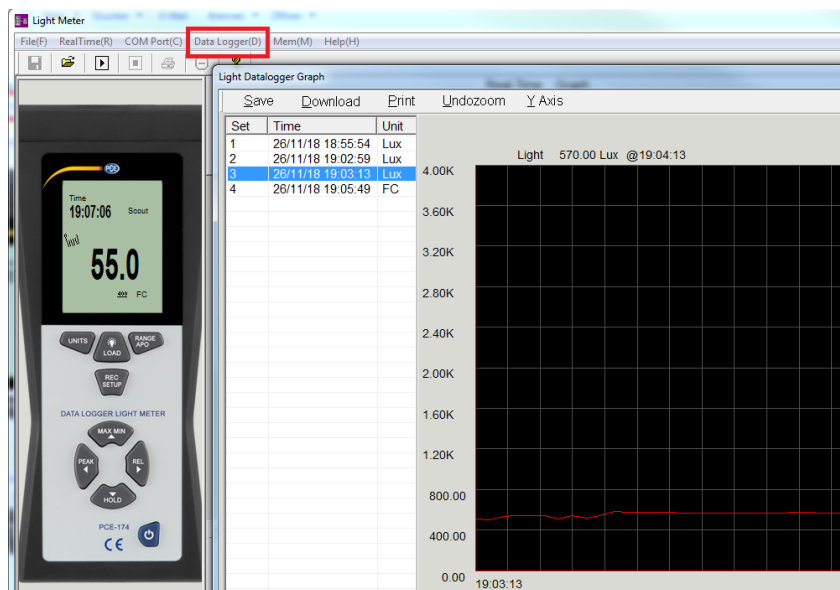
Select an appropriate COM Port on the PC for the measuring device. Then select the same COM Port using the software on the measuring device.



The real-time recording can be set by entering the measurement rate (e. g. measurement every second).

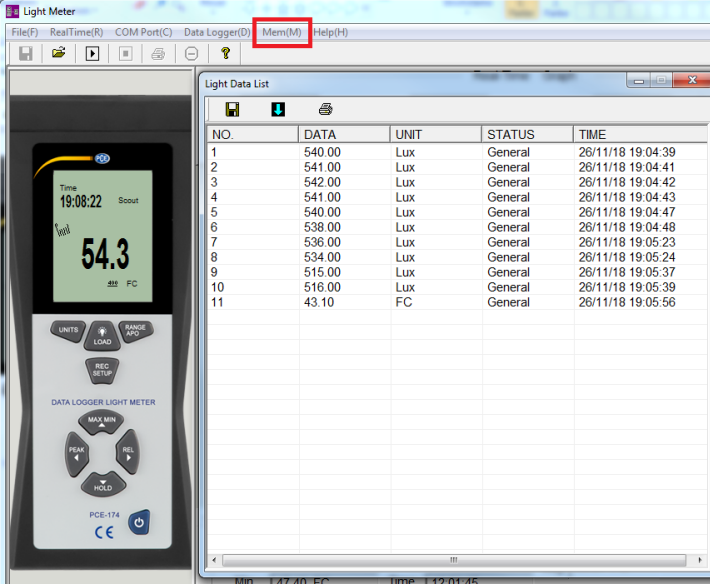


Data log read out:





Read out of measurement data:



The screenshot shows the 'Light Meter' software interface. On the left is a handheld device displaying 'Time 19:08:22 Scout' and a large '54.3' reading. The device has buttons for 'UNITS', 'RANGE', 'LOAD', 'REC. SETUP', 'MAX MIN', 'PEAK', 'REL', 'HOLD', and a power button. The model is 'PCE-174'. On the right is a 'Light Data List' window with a table of measurement data.

| NO. | DATA   | UNIT | STATUS  | TIME              |
|-----|--------|------|---------|-------------------|
| 1   | 540.00 | Lux  | General | 26/11/18 19:04:39 |
| 2   | 541.00 | Lux  | General | 26/11/18 19:04:41 |
| 3   | 542.00 | Lux  | General | 26/11/18 19:04:42 |
| 4   | 541.00 | Lux  | General | 26/11/18 19:04:43 |
| 5   | 540.00 | Lux  | General | 26/11/18 19:04:47 |
| 6   | 538.00 | Lux  | General | 26/11/18 19:04:48 |
| 7   | 536.00 | Lux  | General | 26/11/18 19:05:23 |
| 8   | 534.00 | Lux  | General | 26/11/18 19:05:24 |
| 9   | 515.00 | Lux  | General | 26/11/18 19:05:37 |
| 10  | 516.00 | Lux  | General | 26/11/18 19:05:39 |
| 11  | 43.10  | FC   | General | 26/11/18 19:05:56 |

## 14 Disposal

For the disposal of batteries, the 2006/66/EC directive of the European Parliament applies. Due to the contained pollutants, batteries must not be disposed of as household waste. They must be given to collection points designed for that purpose.

In order to comply with the EU directive 2012/19/EU we take our devices back. We either re-use them or give them to a recycling company which disposes of the devices in line with law.

If you have any questions, please contact PCE Instruments.



## 15 Contact

If you have any questions about our range of products or measuring instruments please contact PCE Instruments.

### 15.1 PCE Instruments UK

**By post:**

PCE Instruments UK Ltd.  
Unit 11 Southpoint Business Park  
Ensign Way, Southampton  
Hampshire

United Kingdom, SO31 4RF

**By phone:**

02380 987 035

### 15.2 PCE Americas

**By post:**

PCE Americas Inc.  
711 Commerce Way  
Suite 8  
Jupiter  
33458 FL  
USA

**By phone:**

561 320 9162