ANAHEIM SCIENTIFIC®

User Manual

Models H115, H116, H117
Light, UVA, Solar Power Meters

H117
Light, UVA,
Solar Power

Table of Contents

1   Introduction

Thank you for purchasing an H110 Series meter from Anaheim Scientific. With this meter you will have highly accurate results for Illumination (H117), Solar (H115,H117), or UVA (H116,H117) light measurements. Light and durable, the H110 Series meters will provide years of reliable service. The H110 Series applications include : Lighting for warehouses, factories, office buildings, restaurants, schools, library, and hospitals. Also photography, videography, building security, UV curing, suntan lighting, etc. The H100 Series features:

- Convenient easy to read data displayed on the LCD screen
- Real time data
- Data hold function
- Auto ranging
- Back light
- Auto power off and disable auto power off
- USB PC interface
- Data logging capacity up to 45,000 readings
- Low battery indicator
- Over load indicator
- Maximum/Minimum/Average record and elapse time
- Auto zero adjustment

The H110 Series of light meters offers 3
models with different light sensors

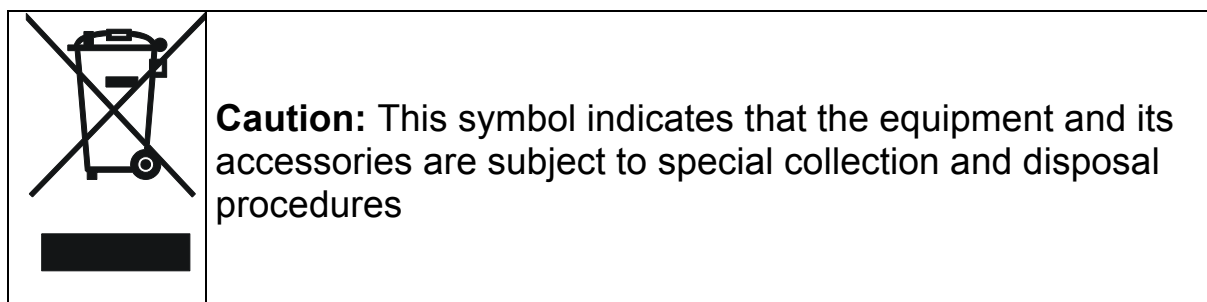| Model #	Sensor
H115	Solar Power
H116	UVA
H117	Solar Power, UVA, and Light

2   Safety Summary

⚠	CAUTION
	Adhere to the following conditions for safe and effective usage of this meter

- Operating altitude: Below 2,000m.
- Do not store this device in direct sunlight or where it is hot and/or damp.

- Remember to turn OFF the power after use. For long storage, remove the battery to prevent the battery from leaking to cause damage to the parts inside.
- Clean the device with a dry soft cloth. Wet cloths, liquid and water are prohibited.

3   Compliance Statements

	Caution: This symbol indicates that the equipment and its accessories are subject to special collection and disposal procedures

- This tester was designed in accordance with EMC Standards in force and its compatibility has been tested in accordance with EN61326-1 (2006)
- Meets JISC1609:1993 and CNS 5119 General Class A Specifications

4   Product Contents and Inspection

This unit is tested prior to shipment. It is therefore ready for immediate use upon receipt. An initial physical inspection should be made to ensure that no damage has been sustained during shipment.

Inspect the packing box on receipt for any external damage. If any external damage is evident, remove the instrument and visually inspect its case and parts for any damage. If damage to the instrument is evident, a description of the damage should be noted on the carrier's receipt and signed by the driver or carrier agent. Save all shipping packaging for inspection. Forward a report of any damage to the agent through which the unit is procured.

Retain the original packing in case subsequent repackaging for return is required. Use of the original packing is essential.

After the mechanical inspection, verify the contents of the shipment. The items included in this package are:

- H11X Meter
- Carrying case
- User's Manual
- 9V Battery
- Mini USB 4P (Male) to USB A Type Cable
- Installation CD
- AC to DC 9v (300mA) power supply
- Solar sensor (H115); UVA Sensor (H116); Solar, UVA, Illumination Sensors (H117)

5   Device Description

5.1   Diagram

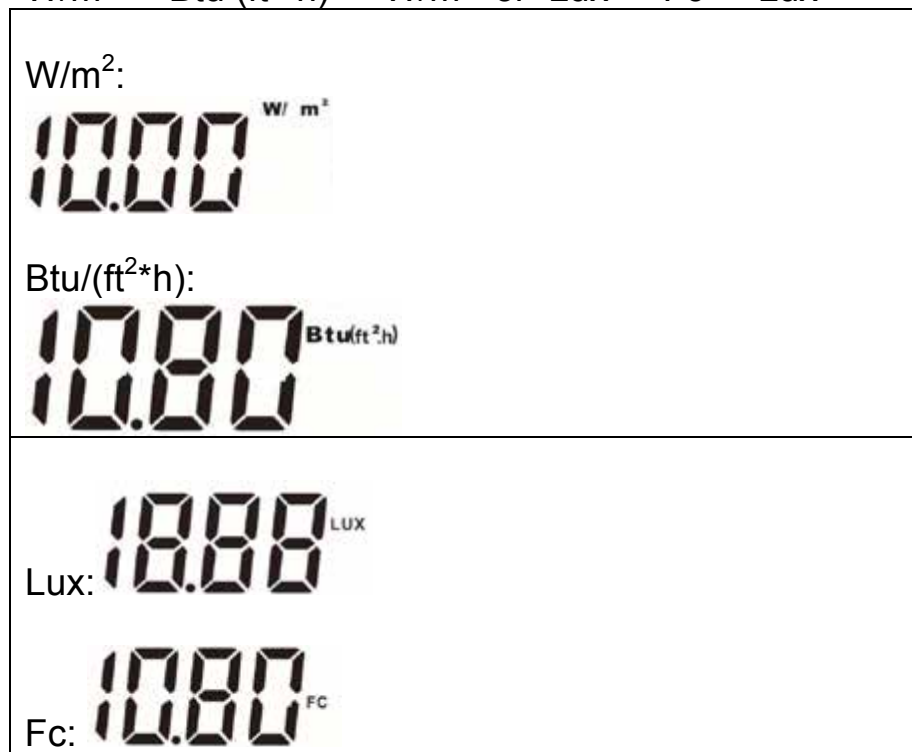| 1. Sensor Input connector	2. LCD
3. Power Button	4. Backlight/Down Button
5. Hold/Up Button	6. ADJ/SET Button
7. MAX/AVG/Min Button	8. Time/MEM button
9. Record/ UNIT switch Button	10. External power DC 9V
11. USB interface	12. Sensor Probe input(+)
13. UVA Sensor	14. Illumination sensor
15. Solar Sensor	

5.2   LCD description
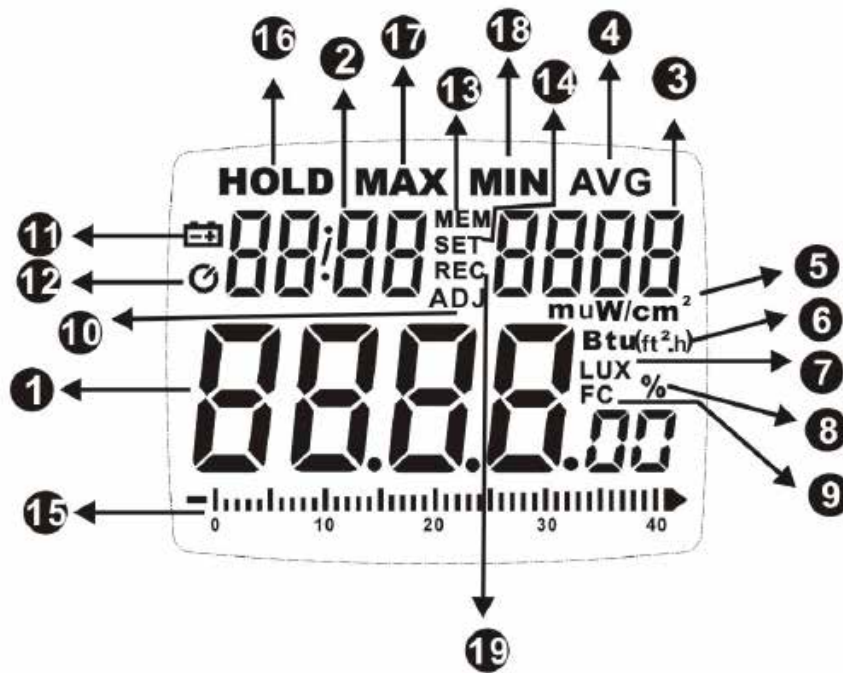
1. Numeral reading value	2. Time unit (hour: minute: month: second)
3. Memory reading symbol	4. AVG symbol
5. W/m^2, mW/cm^2, μW/cm^2 unit	6. [Btu/(h*ft^2)] unit
7. Lux unit	8. % unit
9. FC unit	10. Adjustment symbol
11. Low battery symbol	12. Auto power-off symbol
13. Memory symbol	14. Set symbol

6 Operating Procedures

6.1 Starting Up

- If changing the sensor, make sure the meter is off while changing.
- Push " ⊙ " button turn on the meter. Push " ⊙ " button again to turn off the meter.
- Hold " ⊙ " button and push " REC/UNIT " button to change the measuring unit.

W/m^2>> Btu (ft^2*h)>> W/m^2 or Lux>> Fc >>Lux

W/m²:

Btu/(ft²*h):

Lux:

Fc:

Push " HOLD " button to lock display data on the LCD. Push " HOLD " button again to unlock.

HOLD:

6.2 Zero Adjustment

- Push "⬤" button and attach the cap on the sensor. "0.00" will appear on the LCD. Make sure that the cap is attached on the sensor.
- If the zero adjustment has not been made correctly, some digits will appear on the LCD instead of "0.00", and the word "CAP" will also appear on the LCD to inform you that the cap is not completely covering the sensor.

ADJ/CAP:

6.3 Viewing and Setting the Clock

- Press ⬤ button to see the Year, Month, Date, hour and Second. Press it again to keep changing through these values.
- This meter's clock uses 24-hour time setting.
- Hold "⬤" button and Push "⬤" button to setup the clock.

- Push "⬤" or "⬤" button to change digit
- Push "⬤" or "⬤" to select the setting to adjust
- And press "⬤" button to skip from hour to day, and day to month, etc.

- Hour: day: Month:

- Year: Sec: Minute:
- Push "TIME MEM" button to store the setting.
- Years allowable: 2000~2099. Display will show: 00 ~ 99

6.1   Auto Recording Time Setup

- Hold "⓪" button and push "ADJ SET" button to go into the setup mode.

Push "ADJ SET" button again to go into Auto Recording Time Setup.

Min:

- Push "HOLD ▲" or "☀▼" button to change digit
- Push "MAX MIN" or "REC UNIT" to select the setting to adjust
- Press "MAX MIN" button to skip from minute to hour and press "MAX MIN" button one more time, it will skip to second, etc. (Min→Hour →Sec).   .
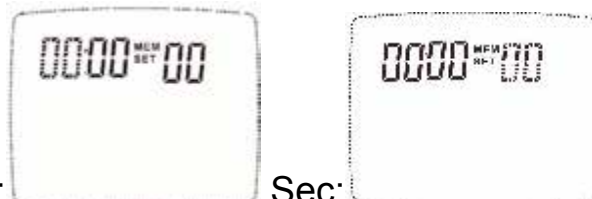
- Hour: Sec:
- Push "TIME MEM" button to store the setting.

- If you do not want to use auto power off, you can set auto power off time to be 00:00 00.

- Maximum auto recording time: 23 hours 59 minutes 59 seconds.
- Minimum auto recording time: 1 second.

6.2   Viewing Records

- Hold " ⊙ " button and Push " TIME MEM " button to view records.

-
- Push" HOLD ▲ " or " ▼ " button to scroll through the records.
- Push" REC UNIT " to change between [Btu (ft^2*h) >> W/m2 >>Btu (ft^2*h)]
Or [FC >> LUX >> FC) units.

W/m2:

Btu/(ft^2*h):

Lux:

Fc:
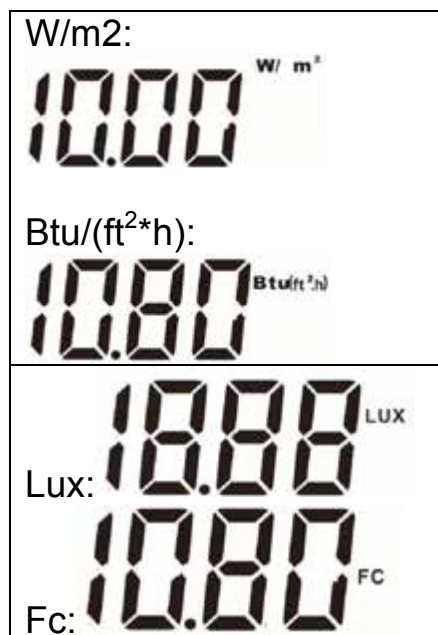
- Push " TIME MEM " button to view the time data (H:M, M:D, year, sec).

- H:M **18:00** MEM   M:D **10:02** MEM   year **2000** MEM   sec **·28** MEM

- Hold " ⏻ " button and push " TIME MEM " button again to exit viewing records mode.

6.3   Max/Min/Avg Record:

- Press " MAX MIN " key to show the current MAX, MIN, and AVG values.

- Press " MAX MIN " key to switch to the next display. The display switches from MAX to MIN, MIN to AVG, and AVG to MIN. Follow the figure circles.

MAX **00:01**   **522** LUX   MIN **00:08**   **484** LUX   AVG **00:08**   **484** LUX

- Press and hold " MAX MIN " key to disable this function.
- The maximum storage is up to 99 minutes and 99 seconds.

- Press and hold " MAX MIN " button for more than 2 seconds to exit this mode.

6.4   Single Data Record

- Push " REC UNIT " button. The meter will save the current measured result, and REC will also appear on the LCD.

⏱ **0** REC **0001**

16:59
508 LUX
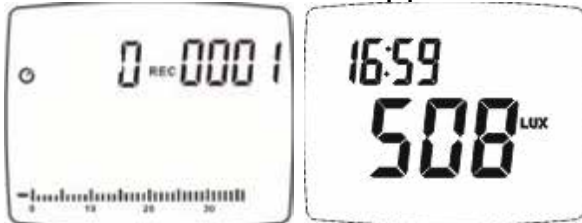
6.5   Auto Power Off

- If you want disable auto power off, please hold " ⬭ " button and push " ⬭ " button, the auto power off symbol will not display on the LCD.
- If you want enable auto power off please hold " ⬭ " button and push " ⬭ " button again. The auto power off symbol will display on the LCD.
- Auto power off time is 30 minutes.

6.6   Relative Deduction Value(%)

- Hold " ⬭ " button and push " ⬭ " button to save the current measured result. "100" will show at first. Then future measured results will be divided by the saved result and given as a percentage on the LCD.

%:

- The transmission percent = (second measured value/first measured value)x100
- Hold " ⬭ " button and push " ⬭ " button again to exit REL mode.

6.7   Battery Replacement

⚠	**WARNING**
	If the symbol " 🔋 " appears on the LCD, please replace the battery immediately

- Turn off the instrument.
- Open the battery cover and remove the battery
- Replace with a 9V battery
- Install the battery cover.

7 Technical Specifications

7.1 General Specifications

General Specifications (H115, H116, H117)	
Battery Life	Approximately 100 hours
Display	3 ¾ LCD
Sampling	4 times/second
Power Off	Manual by push button or auto shut off after approx. 30 minutes
Data Output	USB PC serial interface
Datalogging Capacity	Up to 45,000 reading
Power	9v battery or AC to DC Adaptor (9v/300mA)
Dimensions	130(L) x 56(W) x 38(H) mm
Weight	250g
Current Consumption	≤10mA
Sensor Length	1 meter

7.2 Solar Power Sensor

Solar Power Sensor (H115, H117)	
Measuring Range	40.00 W/m^2, 400.0 W/m^2, 2000 W/m^2 [13 Btu/(h*ft^2), 127 Btu/(h*ft^2), 634 Btu/(h*ft^2)]
Resolution	0.01 W/m^2, 0.1 W/m^2, 1W/m^2 [0.01 Btu/(h*ft^2), 0.1 Btu(h*ft^2), 1 Btu(h*ft^2)]
Accuracy	Typically within ± 10 W/m^2 [±3 Btu/(h*ft^2)] or ±5%, whichever is greater in sunlight. Additional temperature induced error ±0.38 W/m^2 / °C [±0.12 Btu/(h*ft^2)/ °C] from 25°C
Spectral Response	400 – 1100 nm
Auto Measurement & Ranges	0.01 W/m^2 ~ 2000 W/m^2 [0.01 Btu/(h*ft^2) ~ 634 Btu/(h*ft^2)]

7.3   UVA Sensor

UVA Sensor (H116, H117)	
Range	40.0 μW/cm^2, 400 μW/cm^2, 20 mW/cm^2
Resolution	0.1 μW/cm^2, 1 μW/cm^2, 0.01 mW/cm^2
Accuracy	± (4%.F.S + 2dgt)
Spectral Response	320 – 400 nm
Peak Sensitivity Wavelength	365 nm
Sensor	Photo diode & UVA color correction filter

7.4   Light Sensor

Light Sensor (H117)	
Sensor	Silicon photodiode and filter
Measuring Range	40.00, 400.0, 4000, 40000, 400000 Lux 40, 400, 4000, 40000 Foot-candles
Resolution	0.01, 0.1, 1, 10, 100 Lux
Accuracy	±3% (Calibrated to standard incandescent lamp 2856° K) 6% other visible light source
Angle Deviation from Cosine Characteristics	30° ±2% 60° ±6% 80° ±25%
Spectral Response	400 – 1100 nm
Peak Sensitivity Wavelength	550 nm
Auto Measurement & Ranges	0.01 W/m^2 ~ 2000 W/m^2 [0.01 Btu/(h*ft^2) ~ 634 Btu/(h*ft^2)]

7.5   Relative Spectral (Sensitivity)

The deviation from the comparative standards for luminosity is determined by JIS standard C 1609-1993. Peak sensitivity wavelength: 550 nm .

Typ. T_a=23°C
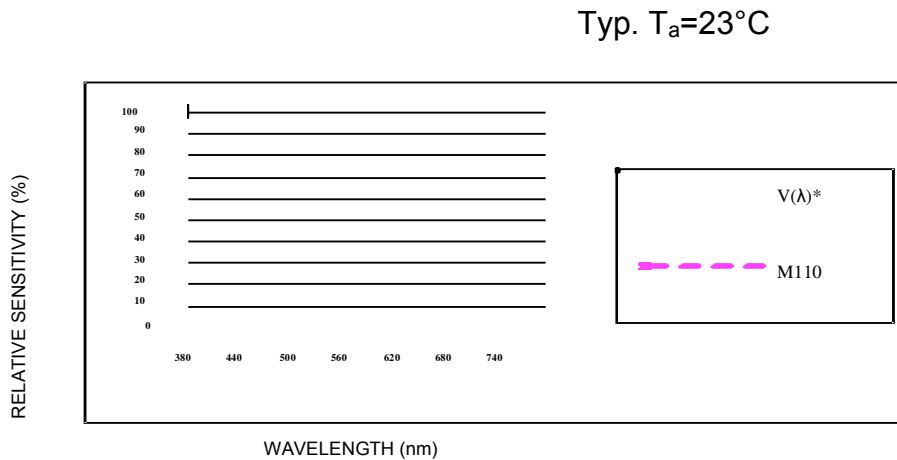
*CIE Luminosity Function

7.6   External DC Power

- External AC to DC adapter: Voltage 9VDC (8~14 VDC Max)
- Socket pin Positive, Ground Casing
- External Diameter 5.5mm, internal Diameter 2.1 mm.
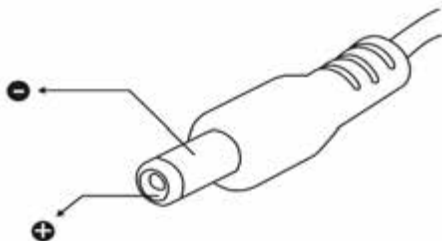
7.7 System Requirements

- CPU Pentium 1000MHZ.
- RAM SDRAM 256MB.
- Hard Disk 200MB.
- OS: Windows 2000, Windows XP.
- Display: 800×600, 256 colors.

8 Software installation

Please insert the CD into your PC to install the software.
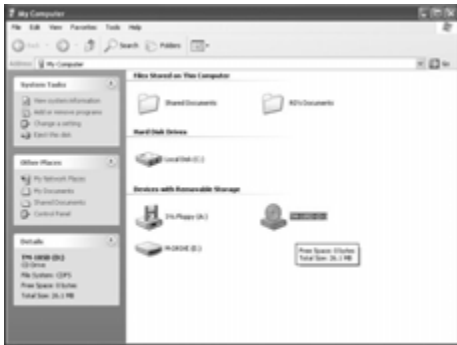
Please select **PL-2032 Driver** folder. Click twice on the **PL-2303 Driver Installer** to install the USB driver.

Now select the **H117 Windows software** folder to install the **Light Meter** program on your computer. Double-click on the **Setup** file. If you see the "unknown publisher" window, select yes.

Take out the CD from PC after completing the installation of the desktop icon.

Use the USB cable to connect the meter and computer according to the drawing.
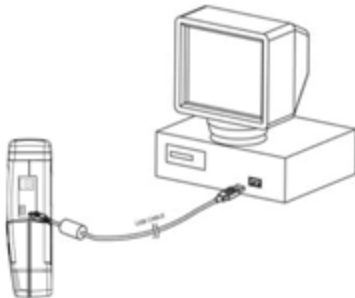
Select the desktop icon (Light Meter) and click twice on left key of the mouse to run the program. You should now see the LCD from your light

meter showing on the computer screen. If no digits appear on the light meter LCD (the one showing on the computer) then right click to **Tools/Connect**. You may also want to try manually turning on the light meter and/or reconnecting the USB.

Once the LCD on the computer screen reflects what is showing on the actual meter, your program is running properly. Right click on the mouse to see your options. Select **Tools/Download** to access the data recorded on your meter.

9 Maintenance

This is a precision instrument. To guarantee its performances be sure to use it or keep it stored within the suitable environmental conditions given in the Safety Summary and Technical Specifications. Be sure to turn it off after use. To store the instrument for an extended period of time, remove the batteries to avoid any damage to its inner components.

10 Service Information

10.1 Service, Repair, or Calibrations

- The following are instructions regarding policies for servicing, repairing or calibrating Anaheim Scientific products. Turnaround time is usually less than ten (10) working days unless expedited service is requested and pre-arranged.

- Send an email to   requesting an RMA number specifying your request for either service/repair and/or calibration with your product's model number.
- Once you receive a reply from   , you will be asked to ship prepaid to the address below. Package the unit carefully using filler or bubble wrap, and if possible, ship in the original box. Ship each unit separately. (Anaheim Scientific is not responsible for any shipping damage that may occur.)
- Include a packing list with each unit shipped stating what type of service is required and include the return shipping information: name, address and telephone number.
- If the unit is in warranty, please provide the following: proof of purchase or copy of the original invoice.
- If the unit is out of warranty, prepayment is required by Check, Money Order or Credit Card.
- Return all merchandise to Anaheim Scientific with pre-paid shipping. The flat-rate repair charge for Non-Warranty Service does not include return shipping. Return shipping to locations in North American is included for Warranty Service.
- For overnight shipments and non-North American shipping fees please contact Anaheim Scientific

10.2   Limited Two-Year Warranty

- Scientific warrants to the original purchaser that its products and the component parts thereof, will be free from defects in workmanship and materials for a period of two years from date of purchase.
- Anaheim Scientific will, without charge, repair or replace, at its option, defective product or component parts. Returned product must be accompanied by proof of the purchase date in the form of a sales receipt.
- To help us better serve you, please complete the warranty registration for your new instrument via our website _____
- Exclusions: This warranty does not apply in the event of misuse or abuse of the product or as a result of unauthorized alterations or repairs. The warranty is void if the serial number is altered, defaced or removed.
- Anaheim Scientific shall not be liable for any consequential damages, including without limitation damages resulting from loss of use. Some states do not allow limitations of incidental or consequential damages. So the above limitation or exclusion may not apply to you.
- This warranty gives you specific rights and you may have other rights, which vary from state-to-state.