QUANTUM CALCU-FLASH II

OPERATING INSTRUCTIONS

1. INTRODUCTION



This manual is your guide to operating Calcu-Flash II. Please read it completely to understand the unique capabilities of your instrument.

There are three operating controls:

- ON/RESET, for activating and zeroing the meter
- TRIGGER, for taking measurements and firing electronic flash units through the flash cord and
- 1/SEC (shutter) control for selecting measuring time or for displaying the "memory" of Calcu-Flash II.

Two TURRETS are supplied for incident or reflected light measurements. Additional accessory turrets, that are part of the Calcu-Light/Calcu-Flash system, may be fitted to the instrument.

2. FILM SPEED SETTING

First, rotate the outer dial rim until the reflected \searrow and incident \nwarrow symbols lie on either side of the digital display window.

Next, place your index finger into the slot (on the right hand side of the meter) and your thumb on the dial rim. Squeeze the rim and dial together and turn them. The ASA and DIN numbers will change to new values. If the desired value is not reached, reset the rim to its original position, and again, rotate the rim and dial.

3. MODE OF LIGHT MEASUREMENT

A mark \wedge on the instrument indicates the photo sensor location. For reflected light measurements, set the lens at the position of the mark \wedge . For incident light measurements, set a diffusing dome to that position. You have a choice of high (HI) range, using the dense white dome, or low (LO) range using the translucent white dome, for incident light. To remove or rotate a turret, loosen the thumbscrew.

You must now set the dial windows (with reflected light \(\sigma\) symbol or incident light symbol \(\sigma\) to the corresponding range: (a) for reflected or incident light, (a) for incident light only (dense, white dome).

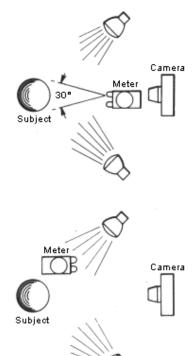
For reflected light aim the lens of the reflected light turret at the subject, from the camera position. The lens measures over a 30° angle.



For incident light measurements, place the meter as close to the subject as possible and aim the center of the diffusing dome towards the camera.







4. SHUTTER TIME CONTROL (1/SEC)

Select shutter time with the 1/SEC control, corresponding to the shutter setting on your camera, from 1/15 to 1/500 second. The meter's "memory" will be displayed when the control is set to "M". The control position "•" de-activates the measuring circuits of the meter.

The instrument measures light (flash plus ambient) for the time set with the 1/SEC control.

5. ON/RESET CONTROL

Only this control (right side of meter) activates the instrument and resets the meter reading to zero (display shows "00"). The instrument will automatically shut off in about one minute unless light readings are recorded. Each light reading re-starts the one minute timer. Therefore, the meter will remain on for accumulated flash readings, but will not accidentally drain the batteries.

6. TRIGGER CONTROL

This control takes single or accumulated flash readings, fires electronic flash units, takes ambient light readings, and takes fill-flash readings.

Flash readings with cord:

Connect the flash cord supplied between either POS. or NEG. receptacles (whichever works) on Calcu-Flash II and your flash unit. Push ON/RESET, the push TRIGGER. The flash will fire and a digital reading will appear for about one second. To take a new, single flash reading push ON/RESET, then push TRIGGER again.

To accumulate several strobe bursts, do not push ON/RESET between TRIGGER pushes. The digital readings will increase with each burst.

To view the reading stored in memory, rotate the 1/SEC control to "M". Rotate the control back to the desired shutter time before taking another reading.

Flash readings without cord:

Do the same as above but without connecting the flash cord. Fire the flash unit with its own trigger switch.

Ambient light readings:

Without connecting the flash cord, push ON/RESET, then push TRIGGER. A digital reading will appear. To take a new ambient reading repeat both steps.

Fill flash readings:

Calcu-Flash II automatically measures ambient plus flash light intensity for the shutter time set on the 1/SEC control. Use the same shutter time on both Calcu-Flash II and the camera.

Note: When operating in the "cordless" mode under strong illumination, Calcu-Flash II may be prevented from sensing the flash. In that case, mount the HI range dome diffuser and reset the dial accordingly.

7. READING THE CALCULATOR DIALS

The dials and shutter time should be set according to sections 2, 3, and 4 of this manual. Then, the digital readings on the inner scale of the dials will correspond to correct lens aperture f-numbers on the outer scale.

Example: set ASA = 100 and incident light pointer to . A digital reading of 23 (one dot to the left of '24') corresponds to a lens aperture of f/8. The dots on the dial scale between whole f-stops are 1/3 stops. The digital readings of Calcu-Flash II are a sequence of 1/3 stops and represent actual light intensity. All scales on the dials are marked with lines for whole stops and dots for 1/3 stop increments.

8. CALIBRATED MEASUREMENTS

Lux-second readings.

Set the incident turret to LO range. Set DIN to "9". Now turn the dial rim until red numbers appear in the \(\sigma\) and windows, next to the digital number scale. The red numbers are lux-second values corresponding to the digital readings of the inner scale.

Footcandle-second readings.

Do the same as above except set ASA to 0.6 which is indicated by a marker \triangle . The red numbers are now footcandle-second values corresponding to digital readings of the inner scale.

High range.

Set the incident turret to HI range. For lux-seconds set DIN to 28 which is indicated by a marker ∇ . For footcandle-seconds set ASA to "50". Read the scales as above.

BCPS (Beam candlepower-seconds)

This measurement gives flash power output independent of distance. Place Calcu-Flash II 3.16 meters from the flash unit and measure incident light. Convert the digital reading to lux-seconds and multiply by 10. The result is BCPS.

(Another method: place Calcu-Flash II 10 feet from the flash unit; read footcandle-seconds and multiply by 100 to get BCPS).

It is recommended that you take these measurements in an area with minimal reflections from walls, ceiling, and floor. A DX-1 accessory attachment (flat diffuser) is also recommended.

9. MISCELLANEOUS

Digital readings will be accurate from 01 to 45. The only exception is if a **single flash** reading **exceeds** 30. In that case, switch to the high range incident dome.

Measuring speed

Calcu-Flash II responds about 10 times faster than even auto-thyristor strobes (1/50,000 sec.). In the cordless mode, the sensor detects a strobe burst in about 2 micro-seconds, opens the measuring "gate" for the shutter time set on the 1/SEC control, then closes the gate and waits for another flash.

When measuring auto-thyristor flash units it is useful to remember that their sensors measure reflected light, and they are sometimes "fooled" by the subject's background. Incident light readings with Calcu-Flash II are more reliable and accurate.

Dial care

Loosen the dial thumbscrew to remove the clear dial cover for cleaning the dials. Accessory dials, when available, will be mounted in place of the clear dial cover.

10. BATTERIES

When the batteries are weak, two dots appear intermittently above the digits in the display. When they appear continuously the batteries should be changed.

Loosen the battery door screw with a coin. Handle the new batteries with tissue paper to avoid corrosion of the contacts.

Cold temperatures will sometimes cause the battery voltage to drop temporarily, thereby lighting the indicators.

When the instrument will not operate, clean all batteries and battery contacts as most problems are caused by poor electrical connections.

11. ACCESSORY ATTACHMENTS

SX-1 spot attachment

This attachment measures a 10° angle for reflected light, compared to 30° for the standard reflected mode. No compensations are necessary. Use the reflected window pointer of the dial.

CFX-1 filter attachment

This accessory provides for filtered light measurements with standard photographic type filters. CFX-1 contains the 80B, 85B, 25A, 8, and 4x (neutral density) filters. All common filter types are additionally available separately.

FOX-1 fiber optic probe

This accessory measures reflected light values of 1/8 inch (3 mm) diameter areas on focusing screens, ground glass, light tables and other luminant objects. It serves as a densitometer for negatives and transparencies with a resolution of 0.1 density units.

DX-1 flat diffuser

The purpose of the flat diffuser attachment is to make calibrated illuminance measurements and contrast measurements with studio lighting.

SDX studio dome attachment

This accessory takes incident light readings with a swivel head mounted 90° from the standard incident domes.

DX-2 flat diffuser

This attachment can be used with your darkroom enlarger or as a lux or footcandle attachment similar to DX-1, except with a swivel head.

FOX-2 flexible fiber optic probe

This attachment can take all the measurements of FOX-1 with the added feature of flexibility for difficult measurements. The length of the probe is 12 inches (30 cm).

MX-1 microscope adapter

This accessory permits you to take light readings through a microscope eyepiece.

12. SPECIFICATIONS

Model: Calcu-Flash II

Capabilities: Strobe and continuous (ambient) light measurements of incident and reflected light. **Digital Display:** Two digit L.E.D. numerals representing light value in 1/3 Ev sequence 01 to 45.

Accuracy: Plus or minus 1/3 Ev.

Sensor: Blue enhanced silicon photodiode.

Light Acceptance Angle: 30° reflected, 180° incident.

Trigger: With or without cord; .000002 second response time.

Measuring Gate (shutter time): 1/15, 1/30, 1/60, 1/125, 1/250 or 1/500 sec. **Output:** 2.5 mm phone jacks for positive or negative polarity flash units.

Flash Measuring Range:

0.1 to 160,000 footcandle-sec.

1.1 to 1,750,000 lux-sec.

.48 to 10,000 candela-sec./m²

.14 to 2,900 footlambert-sec.

Continuous Light Measuring Range:

Incident light, ASA 100, from Ev 3 to Ev 24.

Dial Markings:

ASA 0.8 to 50.000

DIN 0 to 48

F# 1.0 to 181

Units 0.1 to 800M (800,000) fc-sec. or lux-sec.

Batteries: Mallory MS-76, 10L14; Ray-O-Vac RS-76, RW-82,

Eveready 357, A-76; National G-13; or equivalents.

Size: 10 x 7 x 3 cm (4 x 2 3/4 x 1 1/4 inches).

Weight: Approx. 130 gms (4.6 oz).

Supplied With: Flash cord, instruction manual, incident and reflected light turrets, batteries, case, and neckstrap.

Specifications subject to change without notice.

ADDENDUM

Note: Using the Memory and Automatic Shut-off Feature.

Press and release the ON/RESET button to turn the Calcu-Flash meter on or to reset it to zero.

The Calcu-Flash meter (not the display) will stay on for one minute after the ON/RESET button is pressed or for one minute after a reading is recorded.

The display light will go on for one second, then go out as each reading is recorded.

To display the last reading use the memory feature.

CFII - Turn the 1/sec control to "M" memory.

CFS - Press the "Memory" button.

A NOTE ON BATTERIES

To insure daily trouble-free performance of your meter, proper care must be given to the batteries and the battery compartment.

- 1. Clean batteries use clean tissue paper and rub gently. Handle batteries with tissue paper, not fingers, after cleaning. When meter is left unused for extended period, remove batteries (do not stack).
- 2. Clean battery contacts use clean tissue paper with alcohol, or pencil eraser. Clean all four contacts at the bottom of the battery compartment.
- 3. Gently clean all four springs on the battery door.

The above procedures should also be followed before replacing old batteries with new ones and before you return meter to factory for repair, or if batteries appear to be weak.