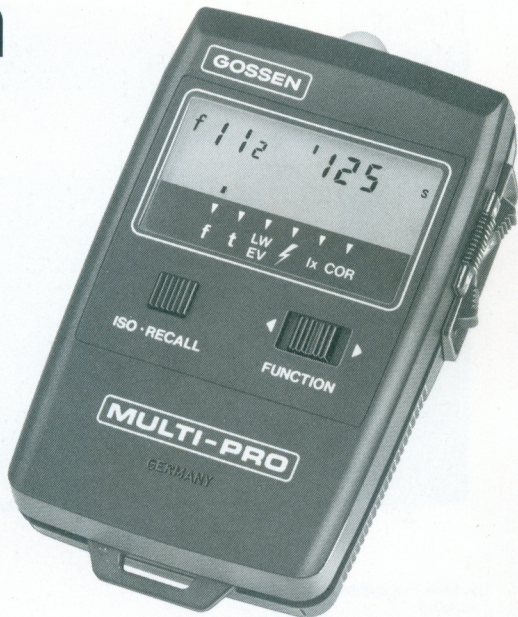



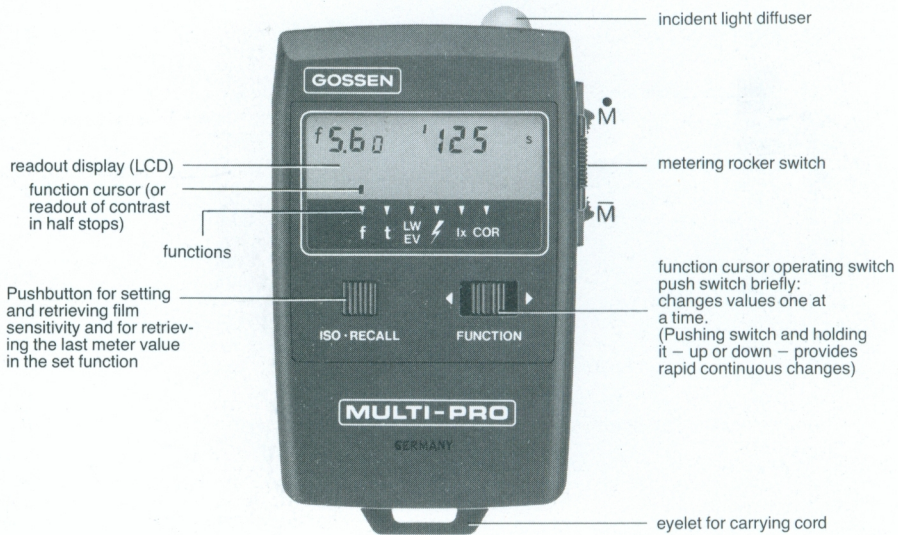
Instruction Manual

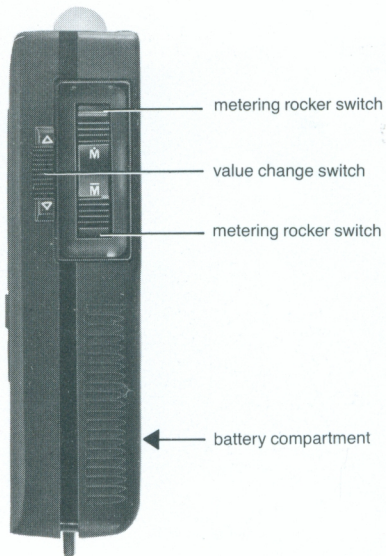
7909-1048Y0

GOSSEN® Multi Pro

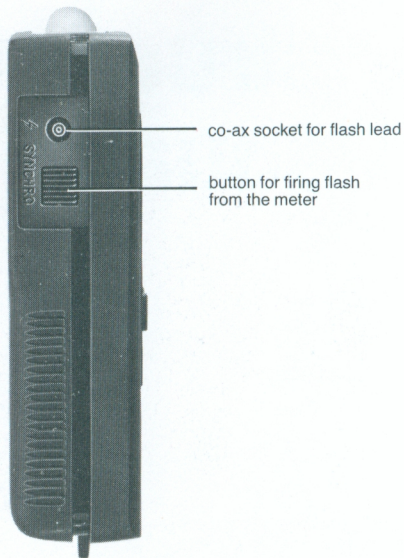


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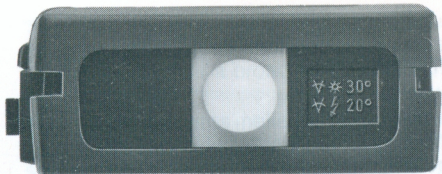




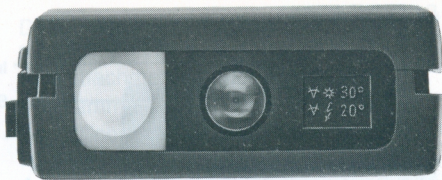
The Multi Pro automatically switches off within 2 minutes.
Therefore there is no "off-switch".



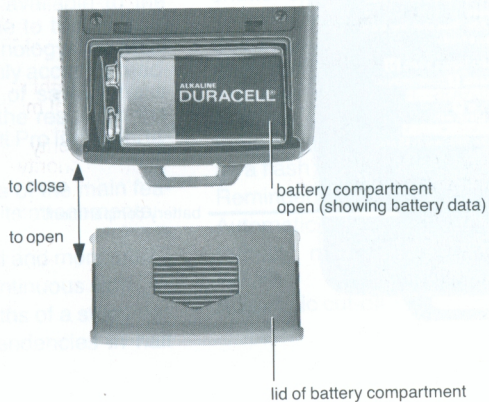
The Multi Pro switched off, when after display of the actual measured value ISO display appears again. This display does not reduce battery life.



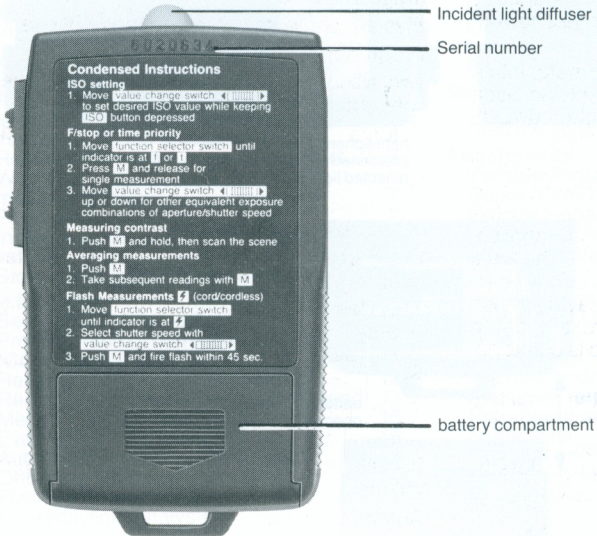
hemisphere diffuser
positioned for
incident light mode



hemisphere diffuser
positioned for
reflected light mode



Rear with instructions



The Multi Pro is a digital exposure meter made by GOSSEN for flash and continuous light readings over a broad range and with high accuracy.

The five attachments make the meter into a system for facilitated use in solving even special light reading tasks in photography as well as when working with flash.

Sophisticated light reading on the basis of decades of experience in manufacturing exposure meters is now available to the user for facilitated use due to the application of microprocessor technology. The Multi Pro not only produces highly accurate readings but is also capable of saving these readings and computing the results at the touch of a button. The Multi Pro is comfortable and easy to use.

Here is an outline of some of the main features of the Multi Pro and its attachments:

Microprocessor-controlled and monitored
Reads flash as well as continuous light
LCD digital readout in tenths of a stop
Analogue indication of tendencies in half stops

Direct analogue readout of the contrast range ± 4 stops

Five attachments extending range of use
Programmable exposure corrections

Two silicon blue cells, one for continuous light and one for flash

Automatic averaging of measurements from separate readings (up to 15)

Converts lux readings into aperture and shutter speed combinations and exposure values and permits

Scanning and selecting all exposure combinations of any value measured

Provides choice of aperture or shutter priority

Extra features and information when used as a flash meter

Reminder for "under" or "over" range

Automatic battery check

In-built memory stores measurement values

Automatic cut-off

The Multi Pro system comprises the basic exposure meter and five optional attachments.

Variable Angle Attachment reduces the measuring angle to 15° or 7.5°.

Repro (Copy) Attachment provides exposure information for copying.

Flexible Fieber Optics Probe Attachment Sensor for macro and micro readings and hard-to-reach areas; for ground glass continuous light readings.

Microscope Attachment assures convenient and precise measurement in micrography.

Enlarging Attachment determines exposure data in darkroom printing and enlarging.



Battery

Your Multi Pro is supplied with a 9 V alkaline battery. A suitable rechargeable 9 V battery may be used. The minimum life duration of such a battery is sufficient for about 2000 measurements. When the warning symbol **BAT** comes on in the display another 50 measurements (approx.) may be made.

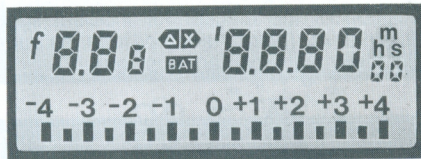
Changing the battery is easy: Slide off the battery compartment lid, remove exhausted battery, contact a fresh one, and insert it into the compartment as indicated. Close the compartment lid.

Automatic circuit check

Immediately after battery insertion the microprocessor carries out a circuit check and all LCD indicators in the meter will go on at once confirming the meter's operational status. After the test this display will be replaced by f stop 5.6 and shutter speed $1/125$ sec the meter's preset film speed setting (for technical data see page 25).

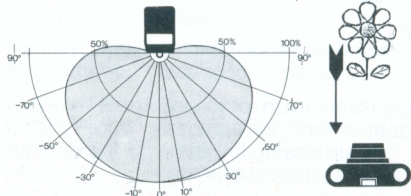
Changing the battery will cancel all values measured or stored in the meter.

BAT

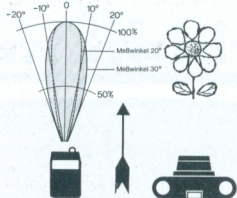


Measuring Methods incident light and reflected light

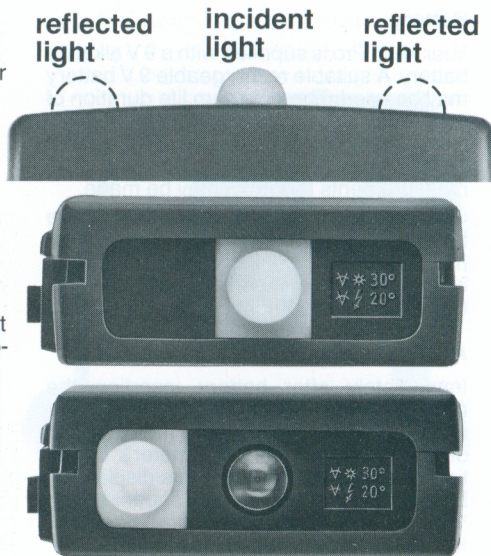
The meter will measure either incident or reflected light for f, t, LW/EV, ⚡ functions.



Position of the diffuser for incident light readings \triangle (point the meter from the subject towards the camera position).



Position for the diffuser when reflected light readings ∇ are being taken (point the meter from the camera position towards the subject.)

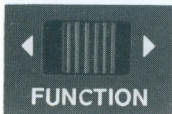


Instantaneous readout of values

When pushing the rocker switch forward \bar{M} you will obtain instantaneous readings of the appropriate values in the display which will stay there for 2 minutes after the last operation of the rocker switch. Rock the switch backward (\bar{M}) for computing automatically the average value of up to 15 readings (page 16).

The Multi Pro then switches off automatically, but the measured values remain stored and can be displayed by pressing the ISO button. Keep ISO button pressed for half a second.

The stored reading can also be retrieved by means of the function selector switch or the value change switch.



function selector switch



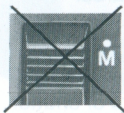
value change switch

Storing readings in the memory

Values measured and stored will be shown in the display for 2 minutes and retained in the memory until a new measurement is taken. Pushing the rocker switch \bar{M} forward for metering will make the newly measured value be displayed immediately. The value is then stored in the meter memory.

In the continuous light mode this will also change all the values in the memory except those which had been preselected or programmed. In the flash mode all values in the memory pertaining to the flash metering which have not been preselected will change.

After the 2 minutes readout time the pre-selected film speed will appear on the display, this is regardless of the position of the function cursor.



Pressing the measuring switch eliminates the stored reading.

Setting the film speed

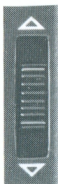
Press ISO button and hold pressed for at least $\frac{1}{2}$ second.

Setting the desired ISO value using the value change switch with the ISO button pressed.

This selected film speed will be retained in the meter memory until you change it to a new setting as described above or until you change the battery.

ISO Recall

By pushing the ISO recall button, you can recall into the display the film speed you had set. After releasing the button the last set of values measured will reappear.



The film speed is indicated in ISO (International Organisation for Standardization) in accordance with international standards. ISO 100/21° corresponds to 100 ASA/21 DIN for example

Programming of correction factors

With the function selector switch set the cursor to COR.

Set desired correction factor with the value change switch.

Example: -0.5 stops, factor 1.4

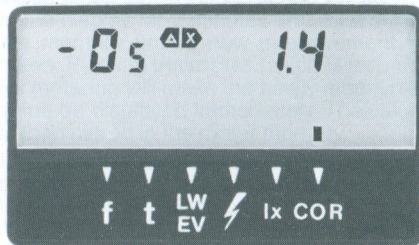
For programming the correction factors necessary when using the attachments see page 29 and following.

The reminder symbol will appear in the display as soon and as long as a factor is in the meter memory.

This will serve as a constant reminder that an exposure correction is in the meter's memory in the functions f, t, LW/EV, ⚡ and that the reading has been adjusted automatically for that correction factor.

Correction expressed
in f/stops

Correction value
as factor



Eliminate the correction value by altering the value change switch or **quickly resetting the correction values:**

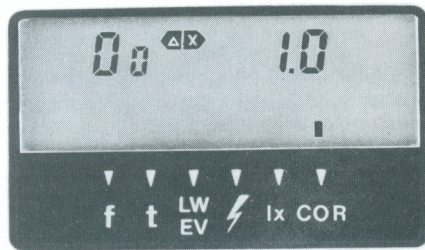
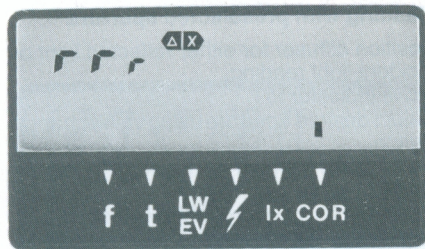
Set COR mode.

Position diffusor to "Light measurement".

Press first rocker switch \bar{M} , then \dot{M} .

The surface should be evenly illuminated.

Display in COR position when correction value has been eliminated



rotive agnato

Reading with preselected aperture

Position diffuser for either reflected light or incident light reading.

Move indicator to f.

Select desired aperture using value change switch.

Push rocker switch \dot{M} forward to obtain reading.

Each reading takes roughly $\frac{1}{2}$ second.

When using **preselection** the small number alongside the aperture reading can be ignored. The indicated exposure time is the stored value of the previous measurement.

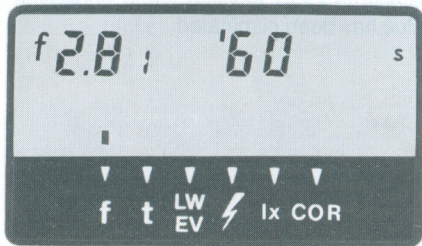
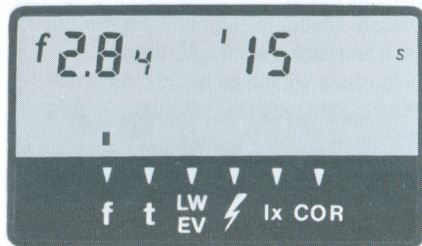
Example: preselected aperture 2.8

The indicated 4 can be ignored in this reading.

Only after taking the actual measurement by pushing \dot{M} forward, the actual exposure time is indicated precisely with the aperture alongside in tenths of a stop.

Example: for this take, the aperture 2.8 must be **shut down** by 0.1 stop.

Select other suitable combinations of f/stops and shutter speeds with the value change switch.



Reading with preselected shutter speed

Adjust diffuser for either a reflected or incident light reading.

Set indicator to t.

Preselect shutter speed (shutter priority) using value change switch.

Obtain reading by pressing \dot{M}

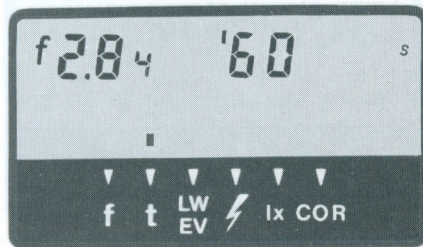
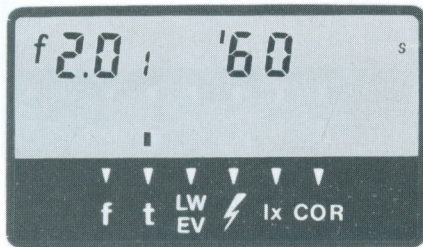
Each reading lasts approx. $\frac{1}{2}$ second.

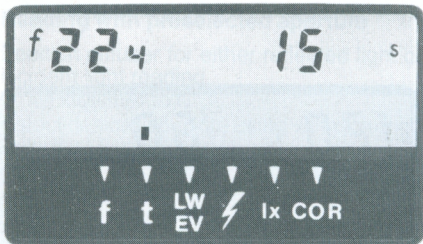
The shutter speeds always appear in the internationally standardized sequence as on most cameras. In addition, $\frac{1}{90}$ second can be indicated. The high reading accuracy of the Multi Pro makes fine incrementation in $\frac{1}{10}$ stops possible. These intermediate values in $\frac{1}{10}$ stops are displayed on the Multi Pro logically the same as they can be set on the camera, i.e. with the f/number.

Example of reading:

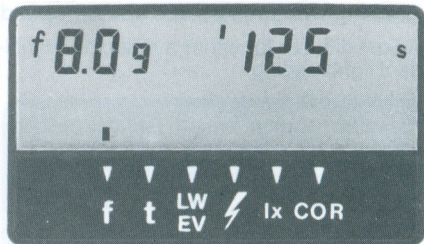
With preselected shutter speed $\frac{1}{60}$ sec. the reading indicates an f/number 2.8; in addition an $\frac{1}{10}$ stop fine display is obtained, i.e. the lens must **be closed** by 0.4 of a stop.

Other f/t values can be selected by means of the value change switch.

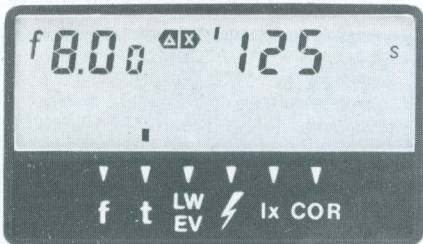




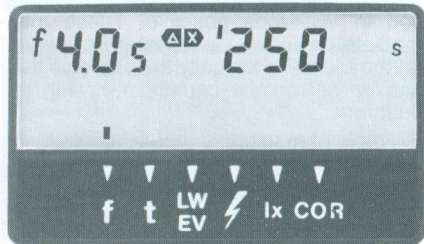
Preselected shutter speed (shutter priority) without preprogrammed correction value



Preselected f/number (aperture priority) without preprogrammed correction value



Preselected shutter speed (shutter priority) with preprogrammed correction value

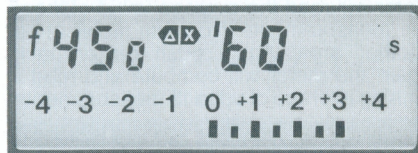
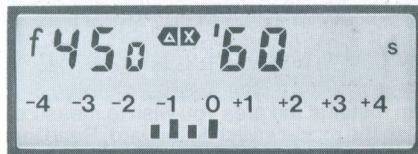
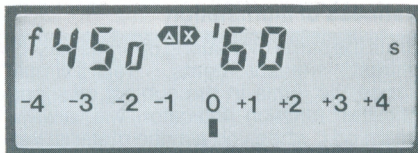


Preselected f/number (aperture priority) with preprogrammed correction value

Measuring of contrast ranges

Aim the meter at the area you wish to measure, push rocker switch forward M and hold it down. As you meter other areas of the scene the graphic display of the EV contrast scale below the exposure reading will indicate the relative brightness of other scene areas in half stop increments.

Our example shows the difference in brightness of that area as compared to the first reading -1.5 to $+3$ stops.



If the high-light or shadow reading is beyond the ± 4 EV range of the contrast scale, the entire display will blink to signal that you are beyond the ± 4 EV scale.

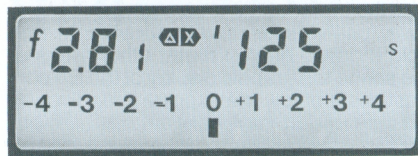
Evenness of illumination

This is the same measuring operation as for contrast measurements. You simply change the lights in the subject or scene until the function indicator will always remain on 0 when you aim the meter at various measuring areas while keeping the measuring switch \bar{M} depressed.

Automatic averaging of readings in f, t and LW/EV modes

Aim meter at the area you wish to measure. Push the rocker switch \bar{M} forward. Read the next area and push rocker back \bar{M} and the meter will read the average value of those two measurements. Now aim meter at yet another area. Again push rocker back. Again the meter will compute and read a running average of up to 15 measurements.

Note: each measuring operation will take approx. $\frac{1}{2}$ second.



Obtaining exposure values (LW/EV)

The exposure values are combinations of shutter time and f/number which are adjustable on some camera models.

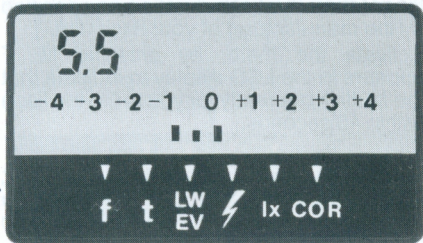
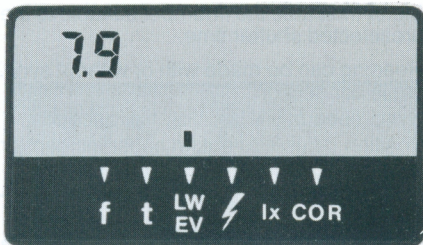
Set diffuser for either a reflected or incident light reading as the case may be.

Position indicator to LW/EV.

Obtain reading by pressing \dot{M}

Obtain a contrast reading or automatic averaging same as for reading with pre-selected f/number (aperture priority) or shutter speed (shutter priority).

Here too, the reading is stored in memory and converted and indicated when changing to the corresponding function setting.



Flash measurement

Meter indicates the f/number suitable to the preselected shutter time.

Reading can be made with or without sync. cable connection.

Sync. speeds $1/60$, $1/90$, $1/125$, $1/250$ seconds.

Position diffuser to obtain either incident or reflected light reading, as the case may be.

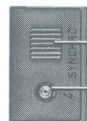
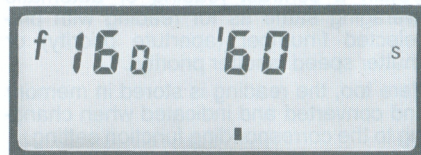
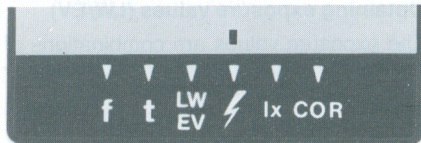
Use the FUNCTION selector to set the cursor to ⚡.

Select sync. time using value change switch. This should be at least equal or longer than the flash duration as specified by the manufacturer of your flash unit.

Activate the meter by pressing \bar{M} . F appears in the LCD display to indicate that the Multi Pro is ready for you to fire the flash within 45 seconds.

Fire the flash.

If you want to fire the flash from the meter, attach a sync cord to the connector at the meter and fire the flash by pressing the sync button.



Button
for firing flash

Co-ax socket
for flash lead

End of meter activation is signalled by the ISO display. Reactivate meter by again pressing M.

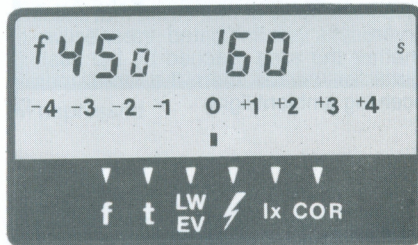
Flash/daylight analysis

The contrast scale (the scale below the digital exposure information) will show how many stops the flash differs from ambient light.

Example: the flash has increased the ambient light by 3 stops.

If the difference between ambient light and flash is greater than 4 stops the meter display will be as shown here. The contrast scale will no longer appear, but the function indicator only.

Should the battery need changing, display will show the BAT alarm and a flash reading is no longer possible. The F indication appears only briefly before disappearing.

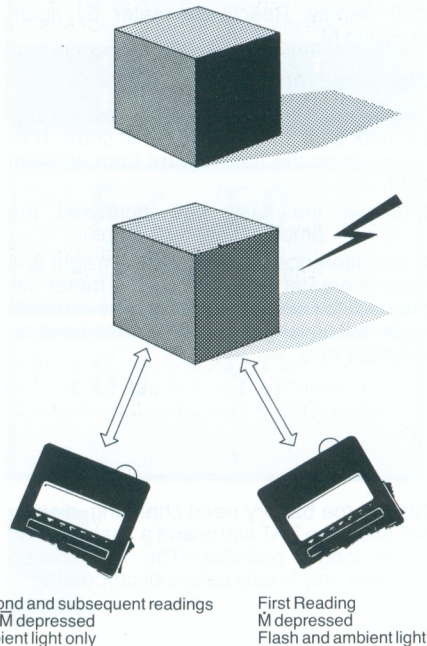


BAT

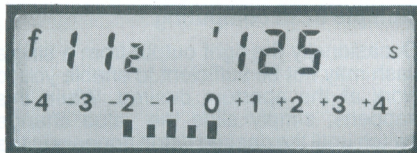
After this first flash reading you can measure the contrast between the area where the flash is being used and those areas which were not reached, i. e. the light distribution as reproduced later in the picture.

Press \bar{M} and the original contrast reading will disappear. The Multi Pro holds the first measurement in the memory. The contrast display is now continuously showing the difference in the illumination of the areas of the subject reached by the flash and those by ambient light alone.

These examples demonstrate that satisfactory results are indicated irrespective of whether the area reached by the flash is lighter or darker than the area merely receiving ambient light.



Example: the area not brightened by the flash measured in the second reading is 2 stops under the area first measured.



\bar{M} depressed

Example: the area now measured is by $1\frac{1}{2}$ stops brighter than the area where the flash was used.



\bar{M} depressed

The contrast scale will blink on and off if the lighting contrast ratio is greater than + or - 4 stops. Therefore the reading cannot be used.

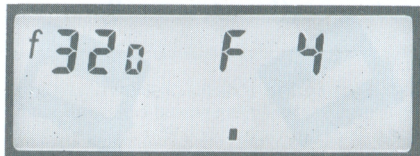
Multiple flash computing

Occasionally the light output from a single flash may not be sufficient to enable you to work at the aperture desired. When this happens, simply slide the value change switch until the desired f/stop appears in the display (to the left). The Multi Pro instantly computes the number of flashes needed for the desired aperture and indicates that number in the display to the right.

Example: first aperture reading f/16,
preselected shutter speed
 $\frac{1}{60}$ second,
desired f/stop 32

The indication F4 means that based on the light from the first flash you will need 4 flashes to shoot at f/32.

Using this method, the flash energy for multiple flash is therefore required only when taking the picture and not when measuring. Your batteries will last longer and the energy saved will be used for more flash pictures.



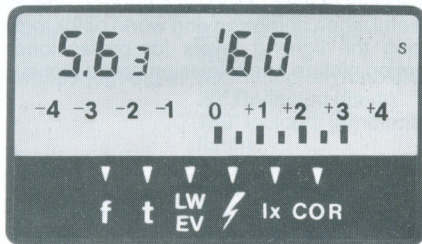
Obtaining readings under extremely bright ambient light conditions

When extremely bright ambient light conditions require a shutter speed exceeding $1/60$ seconds, establish the necessary values by making the following measurement:

Flash reading when setting to $1/60$ s, reading the contrast display and changing the indicated f/stop according to the following tables:

Contrast reading in stops	Correction of flash reading in stops for camera shutter speed	
	1/25 / 1/30 sec.	1/10 / 1/15 sec.
1	1/2	1
2	1/3	2/3
3	1/6	1/3
4	1/10	1/4

Example: In the example shown the indicated f/stop must be **shut down** by $1/3$ stop, i.e. to $5.6 \frac{2}{3}$ for the shutter speed $1/10/1/15$ sec.



Function lx (reading light intensity)

Move diffuser to center position.

Set function lx.

Press \bar{M} and obtain reading.

Lux is the international standard for measuring light intensities and adapted to the characteristics of the human eye.

In English speaking countries this value is expressed in footcandles.

1 footcandle = 1 fc = 10.764 lx

The Multi Pro gives direct readings in lux.

The Multi Pro permits you to take lux readings for exposure purposes. It gives direct readouts of light falling on a surface (this is useful when doing copying work) or for metering the lighting levels for professional motion picture and television productions.



Technical Specifications

Measuring Ranges

Ambient	EV - 2 to EV + 18 at ISO 100/21°
Flash	f/2.8 to 45 at ISO 100/21°
Light Intensity	0.680 to 710 000 lx

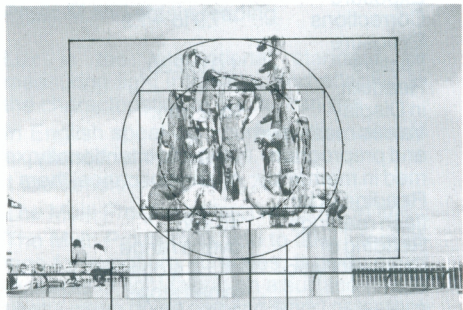
Indicating Ranges

ISO	1/1° to 800 000/60°
△ DIN	1 to 60 DIN
△ ASA	1 to 800 000 ASA
f/values	f/0.7 to f/90 ^{9/10}
Shutter Speeds	1/8000 sec. to 8 hours
Exposure values	- 9.9 to + 9.9

Other Data

Flash measuring times	1/60, 1/90, 1/125, 1/250 sec.
Exposure Corrections	- 7.9 to + 7.9
Exposure Factors	1.0 to 239
Readout in Display	for 2 min.
Values measured and preprogrammed in memory	until you intentionally change or cancel them
Readiness for flash readings	45 sec.
Reading of Contrast Ratio	over a range of ± 4 stops in half stops
Sensors	2 silicon blue cells (sbc)
Measuring Angle	30° Reflected (ambient) 20° Reflected (flash) 180° Incident (ambient/flash)
Battery	9 Volt alkaline or rechargeable ni-cad
Dimensions	2 ^{5/8} " × 4 ^{3/8} " × 1"
Weight (with battery)	approx. 7 oz.

Measuring Circle of the Multi Pro with ambient light



f/35

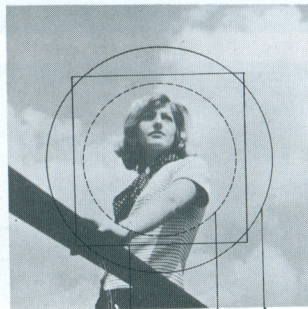
f/50

f/90

Measuring circle 30°
(Measuring circle 20°)

Size 24×36 mm

You can evaluate the size of the measuring areas by comparing them with the view finder image.



f/80

f/135

Measuring circle 30°
(Measuring circle 20°)

Size 6×6 mm

Measuring Circle of the Multi Pro with flash



f/35

F:50

f/90

(Measuring circle 30°)
Measuring circle 20°

Size 24×36 mm

You can evaluate the size of the measuring areas by comparing them with the view finder image.



F:80

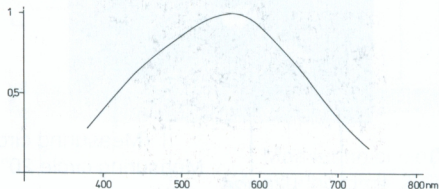
f/135

(Measuring circle 30°)
Measuring circle 20°

Size 6×6 mm

Spectral Sensitivity of the Multi Pro

The Multi Pro utilizes special filters in front of the light sensor to provide a relative spectral sensitivity that closely matches the spectral sensitivity distribution of films, for optimum compatibility.



Average relative spectral sensitivity of silicon blue cells according to manufacturers' indications

The all-purpose Multi Pro system

The attachments available for the Multi Pro expand its use in various special photography applications.

All Multi Pro attachments are elements of a light measuring system which are also compatible with other GOSSEN hand-held exposure meters, this being the reason why these attachments are furnished with Instructions for Use describing how to use them together with other exposure meters.

How to use these attachments together with the Multi Pro is described in the present Instructions for Use. General explanations given in both Instructions for Use apply correspondingly to other GOSSEN system exposure meters.

Obtaining a flash reading with the Multi Pro requires no attachment.

Attachments

The attachments Variable Angle Attachment, Repro (Copy) Attachment, Flexible Fiber Optics Probe Attachment, Microscope Attachment and Enlarging Attachment are mechanically connected to the Multi Pro. The diffuser is slid to the right and a lug on the side of the attachment engages in a recess on the Multi Pro. With the knob pressed, the two are joined together; when the knob is released, the Multi Pro and the attachment are rigidly connected.

With the instrument set in the COR mode, the appropriate correction factors must be fed in.

Variable Angle Attachment	
Setting at 15° measuring angle	+1
Setting at 7.5° measuring angle	
for ambient light readings	+3
for flash readings	+2
Repro (Copy) Attachment	+3
Flexible Fiber Optics Probe Attachment	+3



Variable Angle Attachment

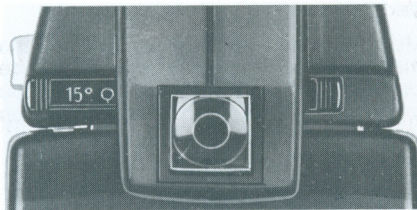
Using the Variable Angle Attachment, the measuring angle of your Multi Pro can be reduced to 15° or 7.5°.

Attaching the Variable Angle Attachment is quite easy. You simply slide the diffuser to the right and locate the lug on the Variable Angle Attachment in the recess provided on the Multi Pro. Then, with the knob pressed, join the two together; when the knob is released, the Multi Pro and Variable Angle Attachment are rigidly connected.



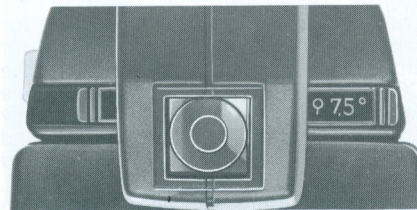
Before taking a reading

The measuring angle is adjusted with a switch, which slides fully to one side or the other. If “ $\odot 15^\circ$ ” appears at the end of the slide, as shown in the diagram, the measuring angle is set at 15° .



If the slide is moved all the way in the opposite direction, the inscription “ $\odot 7.5^\circ$ ” appears at the end of the slide, indicating that the measuring angle is set at 7.5° .

To avoid measuring errors, always ensure that the slide reaches a stop which you can actually feel and engages.

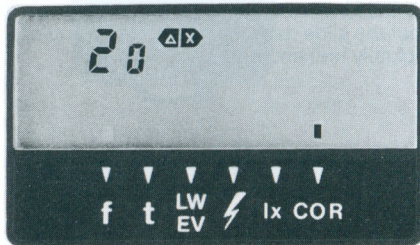
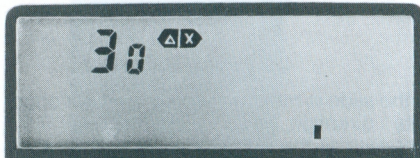
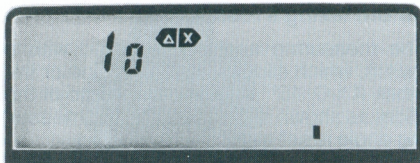


Taking a reading

Measurements are made as described in these operating instructions. **Exposure corrections** have to be made before the measurements. The following correction factors have to be fed in (see page 10):

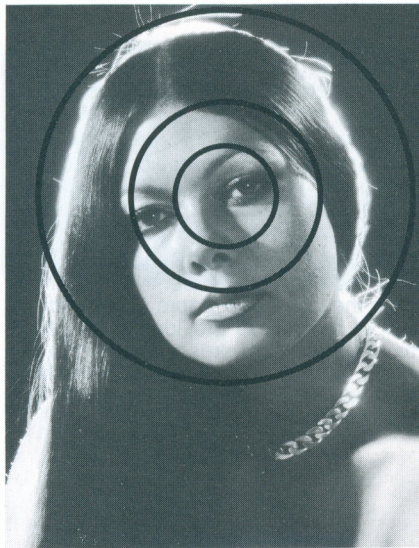
with a 15° measuring angle:	+1 for ambient and flash readings
with a 7.5° measuring angle:	+3 for ambient readings +2 for flash readings

The following method is also suitable **for rapid setting of correction factors** for ambient light readings: with the meter in the COR mode and with the Variable Angle Attachment in place, aim at a uniformly illuminated surface, e.g., a house wall, and press \bar{M} . Then remove the attachment and measure at the same place by pressing \bar{M} . This will program the individual correction factor of your Variable Angle Attachment into the Multi Pro. This, of course, assumes constant illumination.



To take a reading, aim at your subject through the attachment's reflex viewfinder. The distance from your eye to the viewfinder should be about 25 cm. What you can see inside the (larger) red circle will be measured at a setting of 15°; the (smaller) green circle belongs to the 7.5° measuring angle.

The illustration shows the three measuring fields (30°, 15°, 7.5°) of the combination of Multi Pro and Variable Angle Attachment for a constant distance from the subject being photographed.



Repro (Copy) Attachment

The Repro (Copy) Attachment converts your Multi Pro into an instrument with which you can determine the requisite exposure values for copying.

The exposure values for the copying of a black-and-white or coloured original can be determined with the Multi Pro + Repro (Copy) Attachment combination, as can the uniform distribution of the illumination.

The Repro (Copy) Attachment is simple to fit. You slide the diffuser to the right and locate the lug on the Repro (Copy) Attachment in the recess provided on the Multi Pro. With the knob pressed, unite the two units; when the knob is released, the Multi Pro and Repro (Copy) Attachment are rigidly connected.



Before taking a reading

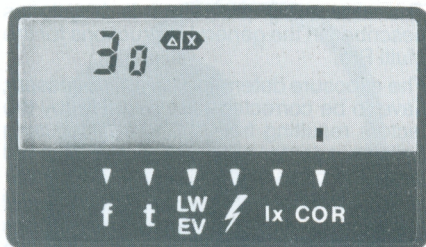
Before a reading is taken, a correction factor of "+3" should be set on the Multi Pro (see page 10). This correction factor, which is unique to the Repro (Copy) Attachment, is automatically taken into account in the readout.

The film sensitivity is set in the usual way (see page 9) and \bar{M} is pressed to take a reading.

Mode of operation

The Multi Pro + Repro (Copy) Attachment combination is placed on the original with the measuring window pointing towards the camera. It is therefore the incident light that is being measured.

Take care that the reading is not affected by shadow from your hand, your arm or your body. Reflection and glossy light must be avoided. If necessary, you should alter the lamp arrangement.



Taking a reading

The measuring procedure is largely as described in the general instructions for the Multi Pro.

The exposure determined will, if necessary, have to be corrected (see page 10) by the factors resulting from the use of focusing bellows, adapter rings, filters, etc. This will be on the basis of the manufacturer's data.

In order to **check the even illumination** of the original, slide the combination of units about on the original and, with rocker switch M pressed, observe the analogue readout. Ideally, a value of 0 will be indicated on the scale at every part of the original. If not, the lighting should be changed until optimum illumination is obtained.

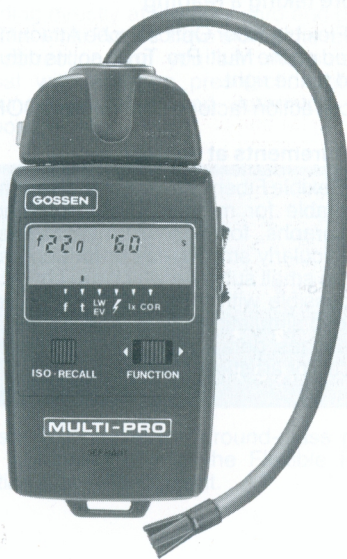


Flexible Fiber Optics Probe Attachment

The Flexible Fiber Optics Probe Attachment converts your Multi Pro into a special instrument for tasks which cannot be performed with an exposure meter on its own. Optimum utilization of the very high measuring sensitivity of the Multi Pro is achieved.

Wherever one is faced with small objects or locations which are difficult to get at for exposure readings, we can recommend this attachment with its flexible measuring probe and its small measuring aperture. It is particularly suitable for exposure measurements for macrophotography, density measurements on films and for measuring the light density. Contrast measurements (density contrast, subject contrast, etc.) are equally easy.

A further special task are groundglass measurements for small-format, medium-format, and large-format cameras at ambient light.



Before taking a reading

The Flexible Fiber Optics Probe Attachment is fitted on the Multi Pro. To do so, its diffuser is slid to the right.

Set correction factor +3 in function COR.

Measurements at subject

The Flexible Fiber Optics Probe Attachment is suitable for measurements for macro-photographs, for close-up measurements in particularly small areas or for spot readings on small subjects which are physically inaccessible with an exposure meter, e.g. reduced simulations of indoor scenes and landscapes, details of architectural models, circuitry or artistic exhibitions.

Aim the measuring aperture of the Flexible Fiber Optics Probe Attachment at your subject, taking care that your field of measurement is not in shadow. You will get the best results by measuring with a grey card. To do this, place a small grey card in front of the important part of your subject and direct the measuring aperture towards the card, without putting it in shadow. Ensure that only the area of the grey card is covered by the measurement. The distance between the card and the measuring aperture must not be greater than the diameter of a circle which can just be inscribed inside the card. Otherwise the surrounding area will invalidate the reading.

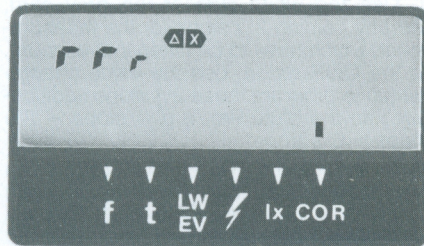
Ground-glass readings

Ground-glass measurements of ambient light are particularly simple using the Flexible Fiber Optics Probe Attachment. Extension factors for open bellows or any aperture errors, filter factors and light-scatter components are automatically taken into account in the reading.

The measuring aperture of the Flexible Fiber Optics Probe Attachment is placed on the point of the ground-glass plate being measured. Any undesired stray light must be excluded with a black cloth. It is recommended that readings should not be taken at the corners of the ground-glass plate, because of the light drop there, caused essentially by the objective lens, particularly with wide-angle objectives. A Fresnel screen should always be used in order to achieve a more-or-less uniform light-distribution over the ground-glass plate.

To determine the exposure time, it is best to use a grey card, arranged so that it receives the same illumination as the important part of the subject. Switch in the COR mode. Then take a reading at the ground-glass plate of the image area of the grey card. Press M. The readout shown here will appear in the display.

Then use the measuring probe to take a reading directly at the grey card and press M. The Multi Pro will have stored the requisite correction and you can measure as usual with aperture preselection at the ground-glass plate and determine your exposure data.



Flash readings at the ground-glass plate are not possible with the Flexible Fiber Optics Probe Attachment.

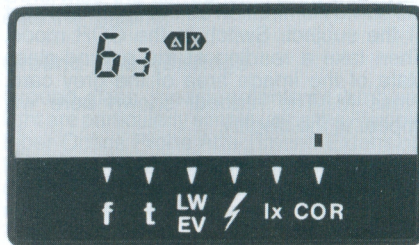
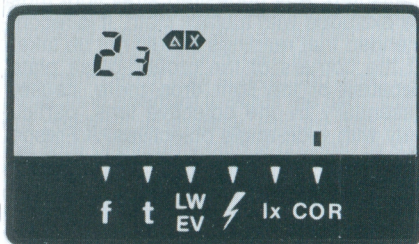
When ground-glass readings are not possible with the working aperture

This can occur with small apertures or when filters in front of the camera objective have to be taken into consideration.

The following advice may help:

1. Use the white side of the grey card, thereby gaining $2\frac{1}{3}$ stops for the measurement, which have to be taken into account. In the COR mode, use the value change switch to program these $2\frac{1}{3}$ stops additionally into the Multi Pro, e.g. 4 stops + $2\frac{1}{3}$ stops = $6\frac{1}{3}$ stops.

2. Take a reading with the aperture open and observe the difference compared with the working aperture. The Multi Pro will yield the correct result if you have fed in the difference, using the value change switch in the COR mode.

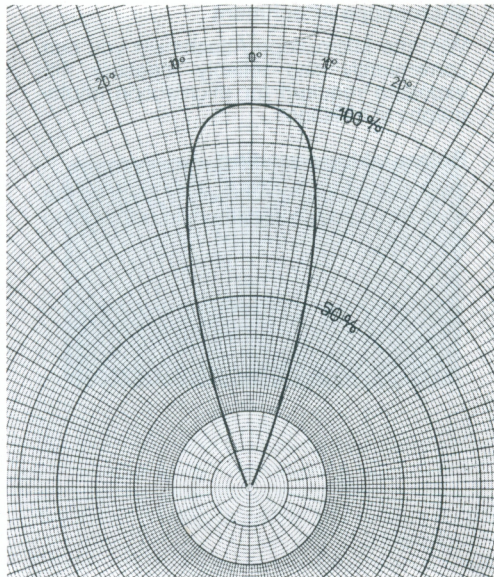


Technical data

The fibre-optics cable of the Flexible Fiber Optics Probe Attachment consists of roughly 4000 glass fibres each having a diameter of about $70\ \mu\text{m}$ ($= 0.07\ \text{mm}$). It must not be kinked, since breakage of fibres causes loss of light.

Set correction factor + 3 in function COR.

Length	400 mm
Measuring aperture	5 mm diam. $\triangleq 19.6\ \text{mm}^2$
Start of measuring range for flash readings	$f/5.6^{2/3}$ at ISO 100/21°
Measuring angle	approx. 30°



Angular sensitivity of Flexible Fiber Optics Probe Attachment

Microscope Attachment

With the Microscope Attachment you can conveniently and reliably measure the exposure required for microscope photographs of all kinds.

Before taking a reading

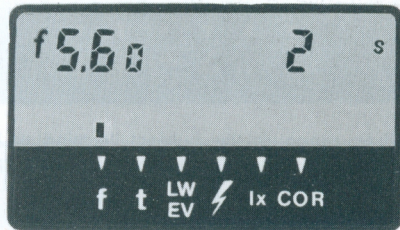
The Microscope Attachment is fitted on the Multi Pro. To do so its diffuser must be slid to the right.



Taking a reading

The Multi Pro in conjunction with the Microscope Attachment can be used at various points of microphotographic equipment. Such measuring points include, for example, the focusing telescope or eyepiece tube.

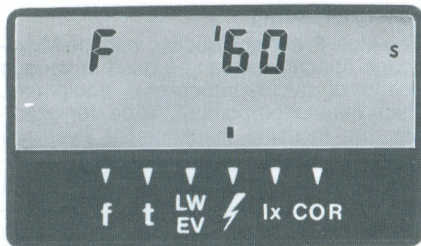
First of all, you take trial photographs of a not-too-extreme subject – without measuring the exposure – with different exposure times e.g. $\frac{1}{15}$, $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, 1, 2, 4 sec.), and select the best. This could be, say, that taken at 2 sec. Then, on the same subject, with the film sensitivity set and under otherwise identical conditions, measure the exposure and use the Multi Pro with aperture preselection. Choose the aperture as in the example, so that a time reading of 2 sec. is obtained. Always preselect the aperture number thus determined for your measurements with the microphotographic equipment. If you use a different microscope and measuring equipment, you must of course, redetermine the preselected aperture, as you must also do when the nature of the illumination is fundamentally altered.



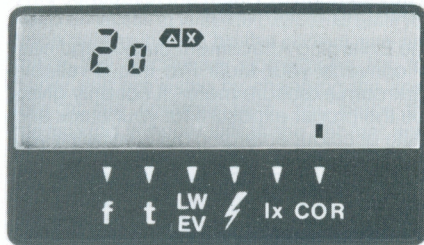
For **flash readings** with the Microscope Attachment, after you have set the film sensitivity, preselect a time of, say $1/60$ sec. This time should also be set on the camera.

Then measure the subject illuminated by the flash. Your reading could be, say, $f/5.6$, $1/60$ sec.

The display should then be amended in the COR mode, so that it indicates the aperture determined by trial photographs for correct exposure.

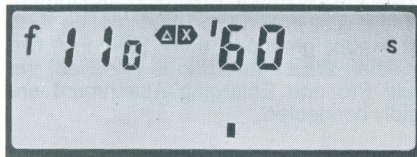


Say the correct value for the aperture is f/11. Compared with the reading f/5.6, there is therefore a difference of +2 stops. This correction factor should be fed in the COR mode.



Then change over to the ⚡ mode and obtain the correct readout of aperture f/11.

The correction factor determined (+2 in the example) and the time used ($1/60$ sec. in the example) must be stored in the Multi Pro before you begin your measurements. They retain their validity for the measuring arrangement on which they were determined and should therefore be noted in a suitable place.



Enlarging Attachment

The Enlarging Attachment quickly and easily converts your Multi Pro into a reliable darkroom exposure meter. It not only gives you the proper exposure for your black and white or colour enlarging but also helps you to determine negative contrast for the proper selection of paper grade for black and white printing.

Fitting the Enlarging Attachment is quite simple: slide the diffuser to the right and locate the lug on the Enlarging Attachment in the recess provided on the Multi Pro. With the knob pressed, then join the two together. When the knob is released, the Multi Pro and Enlarging Attachment are rigidly connected.



Measuring method

Whether you want to determine negative contrast or the proper exposure, the basic form of the operating steps remain the same:

Set up the enlarger, size and focus the negative on the easel.

Adjust the lens to the working aperture normally used. Switch off the darkroom light, as it may affect the results. Place the Multi Pro + Enlarging Attachment attachment on the easel and move the measuring aperture to the area of the projected negative you want to measure.

Next take a reading in the usual way:

Set the film speed while pressing the ISO button to ISO 3200/36° with the value change switch. The indicated exposure value will be the calibration value for further correct exposures.

This concept of the Multi Pro enables you to keep on working with the exposure time you once determined to be the correct one and make the necessary corrections for the paper you are using by changing the aperture of the enlarger lens. You place the measuring window within the lightest area of the projected image (shadow portion of the finished print) which contains still sufficient detail. Next change the aperture of the enlarger lens until the Multi Pro indicates that calibration exposure value.

You need not be concerned with the filter factor of any filter used in the enlarger, since the light absorption of a filter is automatically adjusted for during the measurement.

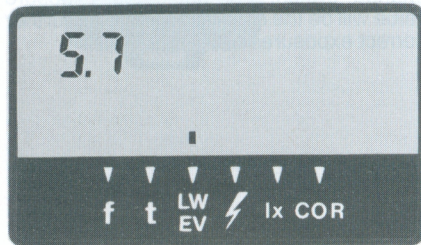
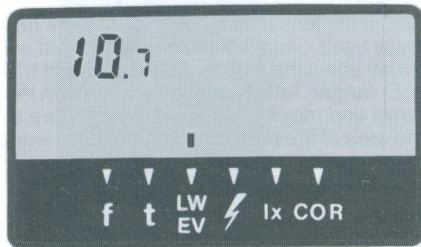
Contrast measurement

The contrast is the difference in brightness between the brightest and the densest portions of a negative. The Enlarging Attachment measures this contrast as a difference in exposure values between the highest and lowest obtainable measuring values.

First place the measuring aperture of the Enlarging Attachment within the lightest area of the projected negative on the easel and record the highest reading. Second find the darkest portion of the negative and record the lowest reading. The difference between the highest and the lowest readings is the contrast ratio expressed as difference of exposure values. The proper grade shown in the table on page 49.

Example:

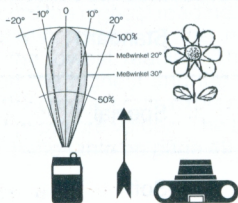
Exposure value measured in the lightest portion $10^{2/3}$, exposure value measured in the darkest area $5^{2/3}$. The difference in exposure values of 5 corresponds to a brightness ratio of 1:32. The proper paper grade for that ratio would be "extra soft", as can be seen from the table on page 49.



Contrast		Grade of paper to use
as exposure-value difference	as brightness ratio	
$\frac{1}{3}$ $\frac{2}{3}$ 1	1:1.25 1:1.6 1:2	Extra hard
$1\frac{1}{3}$ $1\frac{2}{3}$	1:2.5 1:3.2	Hard
2 $2\frac{1}{3}$ $2\frac{2}{3}$	1:4 1:5 1:6.3	Standard
3 $3\frac{1}{3}$ $3\frac{2}{3}$	1:8 1:10 1:12.5	Special
4 $4\frac{1}{3}$ $4\frac{2}{3}$	1:16 1:20 1:25	Soft
5 $5\frac{1}{3}$ $5\frac{2}{3}$ 6 $6\frac{1}{3}$ $6\frac{2}{3}$ 7	1:32 1:40 1:50 1:64 1:80 1:100 1:125	Extra soft

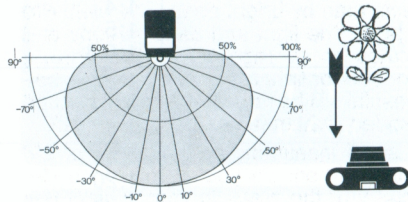
Reflected Light Measurement

Move the spherical diffuser completely to the right or the left until it clicks into place. Point the Multi Pro towards the subject as indicated by the arrow in the illustration. The measuring angle is 30° (ambient light) and 20° (flash).



Incident Light Measurement

Move the spherical diffuser so that it clicks into place centered over the round window. Point the Multi Pro from the subject toward the camera, as indicated by the arrow in the illustration. The measuring angle limitation is eliminated. The angle of coverage is 180° for both ambient light and flash.



When reading **reflected light**, the meter is pointed towards the subject and light reflected from the subject passes through a collecting lens onto the measuring cell within an angle of 30° (ambient light) or 20° (flash) – for further details see page 36 “Measuring fields of the Multi Pro”. The resultant reading depends on the intensity of the light and the reflecting properties of the scene. Thus, under identical illumination, the indication will be less by dark objects than by bright ones. The Multi Pro computes the light and dark portions and indicates an average value. Therefore, if either dark or light areas predominate, better results will be obtained with the method of incident light measurement (page 32).

The small measuring angles of 30° or 20° respectively enable you to aim the meter precisely at the areas in your subject you wish to measure.

You can scan various parts of the scene to determine the degree of contrast in the subject. For grey card measurements the small measuring angle is an advantage. Care should be taken that only the grey card itself is being measured. To make such a mea-

surement, place the grey card in the area of greatest importance in the scene.

When **reading incident** light the spherical diffuser is placed in front of the measuring cell window and pointed towards the camera i.e. opposite direction to the subject being photographed. The diffuser should receive the same light intensity and distribution as that falling on the subject. The resulting measurement is primarily determined by the illumination while the reflecting properties of the scene will have only a minor influence on the measuring result. The method of incident light measurement is generally preferable, and you can prove with your Multi Pro that this method generally leads to the best exposures under difficult conditions.

Incident light readings are most valuable when determining exposures where the subject is inaccessible or difficult to reach. You just take the **incident light reading at a substituted spot** which receives the same illumination as your subject. Instead of pointing the Multi Pro toward the camera, point it parallel to an imaginary line from subject to camera.

Useful Hints

Cine Use

To use the Multi Pro for motion picture work please refer to the chart below. First set the meter to the "t" mode and programme it for the shutter speed indicated in your camera's instruction manual. For many cine settings and exposure correction will have to be programmed as indicated in the chart below.

Cine speeds	t set shutter speed to	Use correction COR
4.5	1/8 S	-0.4/1.3
6	1/8 S	-0.8/1.7
8	1/15 S	-
9	1/15 S	-0.4/1.3
16	1/30 S	-
18	1/30 S	-0.4/1.3
24	1/30 S	-0.8/1.7
32	1/60 S	-
54	1/60 S	-0.9/1.9
64	1/125 S	-
96	1/125 S	-0.8/1.7
128	1/250 S	-
144	1/250 S	-0.4/1.3

Preselecting the shutter speed

When shooting action, you generally need a faster shutter speed to obtain sharp images. To create a more realistic feeling of motion you can, from the very start, pre-select an appropriate short shutter speed in your Multi Pro.

Preselecting the aperture

For maximum depth of field you should pre-select a suitable aperture in your Multi Pro for perfect results.

Average Readings

In order to assure proper exposure for scenes having a wide range of highlight and shadows the contrast range of the scene must be determined. If necessary corrective action must be taken to make sure that the contrast range will not exceed the limits of the film. The Multi Pro can easily measure the highlight and shadow areas of the scene and then average the readings. Normally it will be sufficient to take about 5 readings and then average them.

Preprogrammable exposure corrections

The Multi Pro gives you exact exposure information. However, if your results are not perfectly satisfying, remember that all sorts of tolerances may influence the outcome of your photographs. For example

the "true" sensitivity of your film may differ somewhat from the one indicated on the package;

the "true" shutter speeds of your camera may differ somewhat from the values shown on the shutter speed dial;

the "true" apertures of the lens may differ somewhat from those engraved on the aperture scale of the lens;

the film processing may not always be identical.

We have already mentioned the purely subjective considerations and matters of taste which enter into any assessment of picture quality.

But, you can adapt your Multi Pro to the characteristics of your camera, your favourite film, your type of processing, your projector!

Use a reversal colour (slide) film; select several "normal" scenes; take careful reflected and incident light measurements. Then make two series of 5 exposures of each of the selected scenes – one series based on the reflected light, the other on the incident light reading. In addition to an exposure made at the exposure indicated by your Multi Pro, make one exposure each at a full stop and one-half stop more and less exposure than indicated. Light conditions during the test series should remain constant. Make complete notes of the readings and any special conditions. Finally, when you have your finishes transparencies, select the ones which, in your judgement, are "perfect" and check them against your notes on exposure. Should you find that you prefer transparencies made with altered exposures, you can easily preprogramme that correction value into your Multi Pro and all subsequent readings will be automatically adjusted (page 10).

Contrast and optimum exposure

Films and photographic papers are more limited in tonal range than the human eye. Therefore it is important to determine the emulsions range capability to find out, if the subject matter is in acceptable limits. The Multi Pro is ideally suited for this purpose. In the incident light mode you can easily measure the contrast of lighting; in the reflected mode you can determine the scene brightness range. The contrast scale gives readings in the range of ± 4 stops; contrast beyond that range are also beyond the acceptance of normal films and papers.

You will not usually get the right exposure for your subject if you only take readings of the brightest and darkest parts. You should either seek out an overage grey on the subject as your measuring point or take an average value of the readings at the brightest and darkest points. The Multi Pro will calculate the mean value for you automatically (page 16).

Should you establish that the contrast on your subject is greater than your film can cope with, you can lighten the shadow, for example, with a brightening screen or with a flash, thereby reducing the contrast.

When taking the contrast of your subject into account by averaging, the following rules-of-thumb generally apply.

Negative film

Provided the contrast between important bright parts and dark parts does not exceed two aperture stops, each intermediate value could be used as a setting; in more demanding situations the mean value is more appropriate. An acceptable picture will be obtained in this way in most cases.

Dense negatives produce poor sharpness of outline. With a reading difference of, say, $f/4$ to $f/11$, the best reproduction of detail can usually be expected with $f/8$.

If the important light and dark parts are within two stops of each other, a better result will usually be obtained with the less-generous exposure.

Example: reading-difference $f/4$ to $f/8$; aperture setting $f/8$.

Colour reversal film

Compared with negative film, a colour reversal film can cope with a greater contrast, but its practical exposure-tolerance is considerably lower.

Measurement of the subject contrast is the basis for the decision as to whether, under given lighting conditions, the subject can or cannot be faithfully reproduced. If the subject does not call for special treatment, it is recommended that the exposure be based on the highlights.

For **photographs with a long-focal-length objective lens**, you can generally match your measuring field to the field of the photograph, if you use the Variable Angle Attachment in conjunction with your Multi Pro.

Reciprocity failure

Photographs in poor light require particularly long exposure times. With all makes of film a so-called "reciprocity failure" occurs. The measured times have to be extended for the photograph in order to avoid underexposure. Different types of film exhibit the effect in differing degrees. It is unlikely to occur at exposures under 0.1 sec. This is the reason for it not being taken into consideration with the Multi Pro.

For some types of colour film, there are special data-sheets or codes of practice with directions for photographs with long exposure times. Up-to-date information should in any case be obtained directly from the film manufacturer.

Reciprocity failure can also cause colour displacement. This should be compensated with correction filters.

Night Pictures

To preserve the night effect of darkness with little detail, you should actually use less exposure than the Multi Pro indicates so that the result does not look like a daylight scene. However, "reciprocity failure" often produces the same results as shorter exposures, but there are no definite rules about it. To gain experience, start out with night exposures indicated by your Multi Pro.

Snow

In a snow-covered landscape, a reflected light measurement will almost always indicate too short an exposure; because of the snow's high reflectance, important parts of the scene (people, houses, or trees in the foreground) would be underexposed. Therefore, exposure modification of 1 to $1\frac{1}{2}$ stops longer exposure is advisable.

It would be simpler to use the incident light measurement method because it indicates correct exposure directly. If you want special effects — for instance an emphasis on the subtle shadows in the snow — modify the reading to $\frac{1}{2}$ — 1 stop shorter exposure.

Your Multi Pro makes such modifications easy for you.

Your Multi Pro enables you to measure any subject or scene accurately. Remember, however, that extreme contrasts may exceed the contrast range of your film.

Care and Service

Your Gossen Multi Pro is a valuable precision instrument made with great care and accurately calibrated. It deserves your good care!

Measuring comparisons of your Multi Pro with similar or other types of exposure meters cannot be made properly without special laboratory equipment (optical bench). Do not attempt to open or repair your Multi Pro.

Should your Multi Pro require service, send the meter (directly or through an authorized dealer), in the original packing, if possible, prepaid and insured to:

Bogen Photo Corp.
17-20 Willow St., P.O.Box 712,
Fair Lawn, N.J. 07410-0712
Telephone (201) 794-6500

A brief description of the reason for sending the meter should accompany the package.

GOSSEN®

Specifications Subject to Change Without Notice

bogen

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