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Congratulations — you now own the world's most advanced exposure meter!

Your new Luna-PRO — like the Lunasix, its precedent-breaking forerunner — yields reliable measurements under virtually any light condition, all the way from faint moonlight to brightest sunlight.

And — even more important — the Luna-PRO is the first SYSTEM EXPOSURE METER. It measures not only the intensity of incident light, but also the actual exposure technique not only your camera work on location and in the studio, but in enlarging or in photo-micrography and photography through lensless telescopes.

The Luna-PRO represents the most advanced development by P. Gosson & Co., Erlangen, West Germany, Europe's largest manufacturer of precision electronic instruments since 1919, and one of the outstanding pioneers in exposure meter design since 1932.

Your Luna-PRO is so easy to use that, within a short time, its operation will become almost "automatic". These appendixes, printed with this fine instrument for reading the following pages with the Luna-PRO at hand, thus getting off to a good start for consistently good results.

GOSSEN TRI-LUX

Foebande Meter

This exceptionally fine instrument measures light intensity in 13,000 footcandles — with an accuracy of 1% — and with 100 x and 1000 x magnification. Its readings range from 0.1 to 10,000 footcandles, and with 10 x and 100 x magnification. The GosSEN TRI-LUX is an indispensable accessory for the motion picture and TV studio, lighting engineer, and wherever critical measurement of incident light is required.

Available through better camera stores and motion picture supply houses.



Sole U.S. Distributor
KLING PHOTO CORPORATION
 25-20 Broadway-Queens Expressway West
 WOODSIDE, New York City, N.Y. 11377

Basic Operating Instructions

Setting the film speed

Look up the ASA Exposure Index of the film to use; you will find it on the film box or film instruction sheet and turn the plastic film speed selector (11) to the correct number. For ASA (Daguer) or Kodak (Ektachrome) film, use the ASA index number for ASA (Daguer) or Kodak (Ektachrome) film. For ASA (Daguer) or Kodak (Ektachrome) film, use the ASA index number for ASA (Daguer) or Kodak (Ektachrome) film.

You will find a detailed ASA film speed table in the technical appendix on page 23.



Reflected Light Measurement — Move the converter slide (15) all the way to the right; converter slide (15) will rest in the position indicated on the control window. The Luna-PRO is ready when the converter slide has clicked into position. Point the Luna-PRO toward the subject, as indicated by the arrow in the illustration.

Incident Light Measurement — Move the converter slide (15) all the way to the left; converter slide (15) will rest in the position indicated on the control window. The Luna-PRO is ready when the converter slide has clicked into position. Point the Luna-PRO toward the subject, as indicated by the arrow in the illustration.

Light Measurement — (basic steps)

Press the range selector (13) backward and release it when the indicator needle (14) stops moving. This locks the reading for convenient reference.

If the indicator needle is deflected only slightly below 12 on the scale, take a new reading by pressing the range selector forward. If the indicator needle is deflected only slightly above 12 on the scale, take a new reading by pressing the range selector backward.

If the light is so poor that you cannot observe the movement of the needle, simply hold down the selector for several seconds after releasing it; you have locked in the correct reading and can take the Luna-PRO to better light, or use a flashlight to read the scale.

As you press the selector forward, the values 1 to 12 appear in the upper frame, and the upper scale divisions apply; when you press the selector backward, the values 13 to 22 appear in the lower frame to which the adjacent lower scale divisions apply. When you release the selector, only the scale values applicable to the measuring range which you just selected remain visible.

Thus, the Luna-PRO always shows the correct scale!

After taking the measurement, turn the converter ring (16) until the obtained reading is set at the indicator value index (9) of the transfer scale (8). The green and red zero markers apply only for measurements with the Variable Angle "spot meter" attachment. See page 17.

The Luna-PRO now gives you complete exposure information in combinations of f-stops and exposure times (2 and 1), EV settings (18) or frames per second for motion picture cameras (3). You will find additional information about all scale values on pages 24 and 26.

Light Measurement — more specific

Reflected light measurement: The Luna-PRO measures the light reflected by objects within a certain area. The resultant reading, therefore, depends not only on the intensity of the illumination, but on the color and brightness of the object. Thus, for two identical illuminations, the indicator needle will be deflected less by dark objects than by bright ones. In an overall measurement the Luna-PRO will not average brightness of all subjects in a scene.

If the scene contains strong contrasts in brightness or color, it is preferable to measure that part of the scene which requires the most accurate exposure. For black-and-white or color negative films, this is usually a detail area which is to show sharp detail. For reversal color (slide or movie) films, however, the lighter areas are usually favored.

To measure the important areas, get closer to the subject but not so close that your own shadow or that of the Luna-PRO falls on the subject. This method is called **close-up reading**.

Incident light measurement: From the subject towards the camera, the Luna-PRO measures all the light falling on that part of the subject which faces the camera. Naturally, neither the color nor the brightness of the subject itself is considered by this measurement.

Testing the Batteries

1) First check the condition of the batteries from time to time, as follows: Push the rigid slide (22) in the direction of the arrow **without** pressing the range selector (13). During the battery test, the indicator needle (14) should point to the red check mark (23). Otherwise, high batteries must be used.

2) To replace the batteries, uncover the cover of the battery chamber (21) — a cover will be useful for this. Make sure you use only **Mallory PX 13** batteries in your Luna-PRO. Also replace both batteries, immediately after the battery test is completed.

Mallory PX 13 mercury batteries are available at camera shops, or send 1.50 for 2 batteries (postage) to Kling Photo Corporation, P.O. Box 1980, Woodside, N.Y. 11377.



Testing Zero Position

To test the zero position of the indicator needle, first remove both batteries from the Luna-PRO. Then press the range selector (13) forward or backward. The indicator needle should now rest on the check line to the left of the scale divisions (15).

To adjust the indicator needle to the zero check line, turn the zero adjustment screw (24) on the underside of the Luna-PRO, **while holding down the range selector (13)**.

Thinking and Measuring

One thing the Luna-PRO can not do: It cannot think for you! Even the most advanced electronic brain is helpless without the scientist who guides his problems so that they can be processed by the computer. The Luna-PRO, too, answers exposure questions all the more precisely, if you ask more carefully! You will find this quite easy once you become familiar with your Luna-PRO.

Above all, you must know how your Luna-PRO sees the world that you want to get on your film. This world is made up of many parts, which differ considerably in size, color and brightness. In the case of **reflected light measurement**, the Luna-PRO senses the light which is reflected from these many individual parts of the scene, adds up all the light and indicates a suitable exposure time. And, normally, the exposure indicated in this manner is perfectly correct. (Reflected Light Measurements, see also pages 3 and 5.)

Anything unusual which you — as attendee (1 observer) — really notice, may not be "seen" by the Luna-PRO. It will only "see" what it is pointed at. If you have a large very bright area — far from the "average" that the Luna-PRO would normally calculate with — it will indicate a shorter exposure time than it would for a large very dark area. But you want to see the very light, or very dark area in the finished picture space as "very light" or "very dark" — not as "grey" what do? Your judgment has to guide the Luna-PRO. If there are extensive very light or very dark areas in the scene, steer the Luna-PRO away from them and take the measurement from the "average" parts of the scene. Keep in mind the

Measuring Area of the Luna-PRO

You can see in the viewfinder, or on the groundglass of your camera exactly what will be measured by your Luna-PRO. The Luna-PRO cannot exceed half of course, you'll want to know what parts of a scene are included in a **reflected light measurement**.

The camera, with your help, selects its "rectangle" or "square"; the Luna-PRO covers a measuring "circle". Movement has control of these specially shaped areas remains constant. But you can easily position the field of the Luna-PRO measuring area by comparison with the ruler or groundglass image. The illustrations on page 10 show the relation for 35 mm cameras (28 mm with reduced focal length lenses) and for 35° and 21° cameras, when reflected light measurements are made from the camera position.

The normal measuring area of the Luna-PRO corresponds to a light acceptance angle of 30°.

For 35 mm camera (28 mm lens)

For 35° or 21° camera

The normal measuring area of the Luna-PRO corresponds to a light acceptance angle of 30°. Small measuring angles (15° or 7.5°) can be measured when the Luna-PRO is used with the Variable Angle "spot meter" Attachment. (See page 17).

The normal measuring areas permit very accurate, carefully aimed measurements for exposures with longer lenses, and selective readings of various parts of a scene or subject (see normal lenses in text). The tiny indicator heads of your Luna-PRO tell you very clearly whether a scene has uniform distribution of brightness or not. That's especially important for close-up measurements.

Incident Light Measurement (see also pages 3 and 5)

To test the zero position of the indicator needle, first remove both batteries from the Luna-PRO. Then press the range selector (13) forward or backward. The indicator needle should now rest on the check line to the left of the scale divisions (15).

To adjust the indicator needle to the zero check line, turn the zero adjustment screw (24) on the underside of the Luna-PRO, **while holding down the range selector (13)**.

Perfect Exposure

The correct exposure for any scene that can be photographed, can be determined with the Luna-PRO. But, when is a scene "perfectly" exposed? — That's not always so easy to answer! For the amateur, especially the beginner, the overall impression is usually decisive. But the demands become more stringent, especially when results are compared. "Perfect Exposure" normally means: The brightest portions of a color transparency, the lightest portions of a black-and-white print, should still show some detail!

For color slide or movie film — which, as you know, requires more critical exposure — the lighter portions of a scene usually determine the exposure. Therefore, keep an eye on such lighter areas and preferably expose a little shorter rather than longer, to get more brilliant colors.

For black-and-white or color negative film, however, the darker portions which are to have some detail in the finished print must be given consideration. Therefore, watch the darker areas and expose a little longer rather than shorter.

Most important: Be critical of your results! Analyze your prints and color transparencies for possible mistakes or errors in judgment. Learn from your experience! Future prints obtained will soon lead to consistent successes!

Remember that, when there are extreme contrasts in a scene, the film may not be able to cope with them! Don't blame your Luna-PRO! You will have to compromise with the limitations of the film by exposing a stop more or less than indicated by the Luna-PRO. About "exposure stops" see page 26. However, it is easy to give your Luna-PRO your **Personal Touch** by remembering it with the memories of your camera, your favorite film, your developing methods (or those of your neighbor), there is a hint.

Personal Touch

You may really have to expose very critically every time! There are two answers to this problem:

(1) On black-and-white or color negative film you will get good negative amount without development without loss.

(2) Reversal color film is more critical. Deviations from correct exposure will produce transparencies that are either too light or too dark; you may not even be fully utilized because all sorts of "transparencies" must be developed with you. The actual speed of your camera may differ from the values engraved on the shutter.

(3) The actual exposure may differ from those engraved on your camera (stop scale).

(4) The film development may not always be identical.

In addition, purely subjective considerations and matters of taste enter into the evaluation of the finished print or slide. If you make several exposures of the same scene or subject with various exposure times, you will almost never get complete agreement among different judges as to which negative or which slide received "perfect" exposure! However, you can adjust your Luna-PRO exposure readings to the characteristics of your camera, your favorite film, your type of processing, your projector — in other words to your **personal touch**.

Use a reversal color film, select several "normal" scenes, take careful reflected and incident light measurements and record the scale time made in each of 4 exposures in addition to the one at the indicated exposure time, make one each at a full stop and one-half stop more and less indicated by your Luna-PRO. Make comparative notes of the readings and of any special conditions. When you have your finished transparencies, select the one which, in your judgment, are "perfect" and compare them with your notes concerning exposure measurements, etc.

If they are C-41 and most cases they will be - everything is fine. Otherwise, determine by how much you need to increase or decrease future exposure readings to get the best results with this adjustment you have just gained your "Personal Touch".

Sharpness for Motion and Depth of Field

After you have taken a light measurement, the computer scales of your Luna-PRO may be too soft for the subject.

Time	1/2	1/4	1/8	1/16	1/32	1/64	1/128	1/256	1/512	1/1024
f	2.8	3.5	4.5	5.6	7.1	8.8	11	14	18	22

Eight combinations of which you may really see only one! Now, which combination might be "the best"? The Luna-PRO has done its best giving you so many equivalent pairs so that you can choose the most suitable one. After all, a properly exposed picture must also be in sharp focus - which means that you have to ignore aperture (f-stop) settings and some shutter speeds.

The Luna-PRO System

Thanks to its unique design as a SYSTEM EXPOSURE METER, your Luna-PRO provides you with an adaptability and universality previously unknown in exposure meters.

Used alone, the Luna-PRO continues the age-old tradition of the Gossen Lunas as the world's most sensitive, widest range (1:200000) exposure meter. It converts incident and reflected light measurements, from reflected to incident light measurement - and you find its one-hand operation (even with a glove on) a great boon when momentary count or location is so important.

Now, whenever the need arises, you can greatly expand the capabilities of the Luna-PRO by using one of the following exclusive accessory attachments:

- Luna-PRO Variable Angle "spot meter" Attachment (see page 17)
- Luna-PRO Enlarging Attachment (see page 18)
- Luna-PRO Microscope/Telescope Attachment (see page 19)
- Luna-PRO Flexible Fibre-Optic Attachment (see page 20)

An instant-lock-on device holds each attachment firmly on the Luna-PRO.

Variable Angle "spot meter" Attachment for the Luna-PRO

Although the normal 20° acceptance angle of the Luna-PRO is ideally suited for all-around use, you may want to measure smaller areas when using long telephoto lenses, or "spot" areas within the field covered by shorter lenses.


With the Variable Angle Attachment, the Luna-PRO takes readings at 30° and 7.5° measuring angles. The built-in reflex finder with delineated "target" areas lets you pick out the exact portion to be measured.

Thus, the Luna-PRO System gives you a practical choice of 30°, 20°, 7.5° angles for maximum versatility.



Enlarging Attachment for the Luna-PRO

Converts the Luna-PRO to an efficient enlarging exposure meter for black-and-white or color enlargements. It permits you to measure very small areas of the projected paper contact and color film. Built-in light conductor (instead of a sensor) for greater accuracy and efficiency.




Microscope/Telescope Attachment for Luna-PRO

A great aid in photomicrography. Fits the circular lens of all microscopes for exact exposure determination. Also ideal for light measurement of the aerial image in photomicrography through terminal telescopes.



Flexible Fibre-Optic Attachment for Luna-PRO

Whether you use a reflex hand camera or a view camera - if it has a groundglass you can spot-read any small (and 3 mm) portion of the image for critical exposure measurement and determination of contrast range. The unique flexible probe lets you take readings even in the extreme corners and along the sides of the groundglass.



Your Gossen Luna-PRO

is a valuable precision instrument, made with great care and accuracy calibrated. It delivers your good work! The electronic measuring range - down to half microamps - which you get in your Luna-PRO, is due to its unique photo resistor element. Like the highly sensitive nerves of your own eyes, the photo resistor should not be exposed unnecessarily to bright light for extended periods. While the element does not change its permanent properties under long exposure to light, it tends to retain the impression of light for a while. If the previous impression was "dark", you can be sure of utmost measuring accuracy. Therefore, always keep your Luna-PRO in its case when you are not actively using it.

The battery and zero position tests described on page 7 enable you to check the proper functioning of your Luna-PRO.

Measuring comparisons of your Luna-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 Luna-PRO. See Service information on following page.

Service

The Gossen Luna-PRO Electronic Exposure Meter is guaranteed to the original registered owner as shown on the guarantee certificate supplied with each new meter.

If repair or adjustment should become necessary, send the Luna-PRO (directly or through an authorized dealer) carefully packed and accompanied by the original guarantee card to:

Gossen Service Department
Photo Tech. Inc.
78 East 58th Street
New York, N.Y. 10003

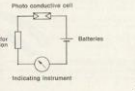
A brief description of the reason for sending the Luna-PRO should accompany the package.

Technical Appendix

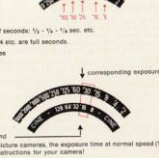
The Luna-PRO Principle

Unlike conventional exposure meters whose photoelectric cell consists of a selenium element, the Luna-PRO has a photo-conductive cell and is powered by dry mercury batteries. While a selenium element converts light into electric energy, the photo-conductive cell merely changes its conductivity in the presence of light. The electrical energy which powers the precision mechanism of the Luna-PRO is derived from the batteries.

Diagram of the Luna-PRO



Reading the Scales



2 1/8 etc. are fractions of seconds; 1/2, 1/4, 1/8 etc. are full seconds.
1m 2m etc. are minutes
1h 2h etc. are hours

Corresponding exposure times (sec.)

Circle frames per second and
Note: On camera meter picture (lenses), the exposure time at normal speed (1/50 f.s.) is not 1/50 second. Check the instructions for your camera!

Speed Values

ASA Exposure Scale	ASA Exposure Scale
25	400
50	800
100	1600
200	3200
400	6400
800	12800
1600	25600

The ASA scales (4 and 16) show only the values listed here in bold type; the intermediate values are indicated by dots on the scales.

Doubling or halving an ASA Exposure Index value is equivalent to one stop; increasing or decreasing the ASA Diaphragm by 1 is equivalent to one stop.

Increasing or decreasing the EV number by 1 is equivalent to one stop.

When **exposure modification** is in order (see page 13), you simply choose one (and only one) of the following adjustments:

For Example:	One Stop Exposure	Two Stop Exposure
If actual Luna-PRO reading is:	15	17
Indicator Scale	16	17
EV Scale	10	11
Shutter Speed	1/16	1/8
Lens Aperture	f/8	f/11

Note: The ASA setting remains unchanged.

Calibration Data

The table on the back of the Luna-PRO shows the calibration data according to American Standard ASA 9 (3:1981). These are the footcandle and lux values (1 lux = 0.093 footcandle) corresponding to the Luna-PRO scale readings obtained by the incident light measurement method. The Luna-PRO should not be considered a footcandle meter because, strictly speaking, footcandle of illumination can be measured only by means of a flat illumination sensor. The Luna-PRO is equipped with a spherical diffusing sensor and thus

achieves superior collection of the photographically effective illumination. Photographic subjects are usually three-dimensional and they are illuminated from many different directions (left, right, reflections from buildings, trees, ground, etc.). However, the footcandle table can be of practical value for measuring direct light beams (see light spots).

For reflected light measurement, footcandle values cannot be given at all, since this method measures not the illumination but the brightness of the surface. Direct illumination which can be measured in footcandles. The measured results for reflected light measurement are presented in footcandles are approx. 7.5 times smaller than the footcandle values with incident light measurement. Example:

Indicator scale reading	Incident light (footcandle)	Reflected light (footcandle)
1	0.016	0.001
2	0.02	0.002
3	0.03	0.003
4	0.04	0.004

As a result of this calibration, a medium grey tone will be reproduced by black-and-white as well as color film with a density of color values, respectively, that lies approximately in the middle of the straight line of gradation. Thus, sufficient latitude exists in correct exposure for those parts of a scene which are lighter or darker than the "medium grey".

Reciprocity Effect

Film manufacturers base the "speed ratings" of photographic emulsions on average conditions of exposure times and illumination under which such emulsions are normally intended to be used. However, photography under poor light conditions may call for "abnormally" long exposure times.

Black-and-white films, generally, tolerate moderate deviations from normal conditions. On the other hand, reversal color films - because of their limited latitude - not only lose "speed" but their color balance is also affected.

The reason for this divergence lies in the fact that the effective sensitivity of every photographic emulsion is at a maximum at some specific level of illumination. With variations in illumination and exposure time, the effective sensitivity also varies, a phenomenon which is called the "reciprocity effect".

Films of various types and makes react differently to extended exposure times, and it is impractical to incorporate the many possible variations in the Luna-PRO scales.

It is advisable to write to the film manufacturer for information concerning the necessary exposure correction and filtering for color correction of the specific film which you are using with extended exposure times.

GOSSEN SIXTICOLOR

Color Temperature Meter and Filter Indicator

Eliminates costly trial exposures and "off-color" results. At a glance, this compact meter of the light source (2800 to 5000° K) and, respectively, indicates the correction filter required for color or color balance with any type of color film. The GOSSEN SIXTICOLOR is an indispensable aid for every user of color film in still or motion picture photography.

Ask your dealer for a demonstration!





Luna-PRO
Operating Parts and Scales

Keep this page folded out when reading instructions. At the end of the study identify parts and scales.

- 1 Exposure Time Scale (Shutter speeds)
- 2 Aperture Scale (mm)
- 3 Film Scale (frames per second)
- 4 ASA Speeds
- 5 Computer Ring for setting the indicator against the yellow transfer scale
- 6 Transfer Scale
- 7 Green Ring Index for 7 ft measurement (feet)
- 8 Meter adjustment only
- 9 Red Ring Index for 10' measurement (feet)
- 10 Meter adjustment, and for incident light measurement
- 11 Converter Slide with horizontal reference for incident light measurement
- 12 Indicator Scale
- 13 Red Check Mark for battery testing only
- 14 Scale divisions
- 15 Indicator Needle
- 16 Range Selector (forward - low range; backward - bright range)
- 17 ASA Exposure Index Values
- 18 Film Speed Setting Disk
- 19 Scale for shutters (reference to EV (Exposure Values))
- 20 Eyepiece for neckstrap
- 21 Diagram showing correct position of the 2 batteries
- 22 Battery Chamber
- 23 Rugged Slide for battery testing
- 24 Table of Footcandle (Lux) equivalents
- 25 Zero Adjustment Screw