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Exposure meters

Why film plane exposure measurement?

Photographic exposure involves making the correct amount of light, controlled by the aperture and shutter speed, act on the sensitive film. Relevant for the latter is only the light it actually receives – not the light that falls on, or is reflected by, the subject. So an exposure meter that can measure the light coming through the lens into the film plane reads where the exposure in fact takes place. The result therefore is more precise than conventional incident or reflected light measurements outside the camera.

Such film plane or image plane measurement automatically allows not only for closeup and filter factors but also for flare and marginal light fall-off, especially with wide angle lenses or when the full shift movements are utilised. Finally such readings also allow for mechanical iris diaphragm tolerances.

The logical modern way

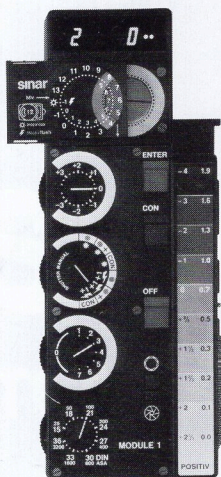
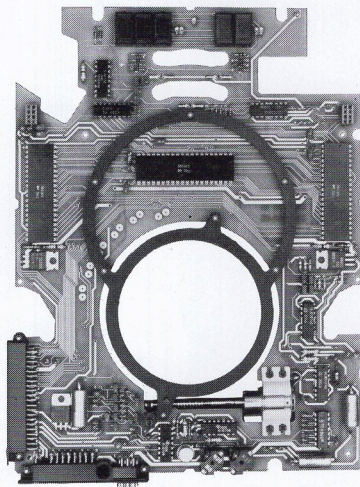
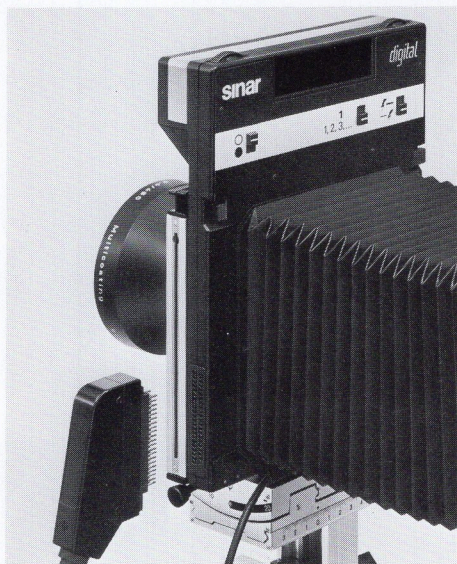
The electronic modular system

To determine correct exposures, SINAR has developed an automation system tailored to practical view camera technique.

This system permits spot readings of any image point that the photographer wants to reproduce in a required density to achieve specific pictorial effects. Based on given standards, the automation system evaluates all the data and presents the correct exposure settings. The electronic control and computing system further looks after all essential co-ordination and transfer operations. It eliminates interpretation and handling errors, relieves the photographer of time-wasting routine and allows him to devote his attention fully to the pictorial side of his work.

The system determines the correct exposure in all conditions and for every type of light. Yet the photographer is not at the mercy of this automatic control. He gets a best exposure recommendation which he can adopt or modify at will by entering further data.

The electronic modular system fits all SINAR cameras. To offer everything every photographer is likely to want, the system consists of different modules that can be combined.



The brain: – The SINAR DIGITAL shutter

This electronic behind-lens shutter automatically controls speeds from 1/500 to 80 seconds and sets the auto-aperture iris of the lenses.

While inserting the film holder into the camera back, the shutter and aperture automatically close – and open again on removing the film holder. The central display indicates exposure settings in large LED numerals.

For further versatility, each SINAR DIGITAL shutter has a terminal socket at the side to connect to external signal input units.

The SINAR «Lenses and shutters» catalogue gives further details of the operation of the DIGITAL shutter which already incorporates all electronic features for system extension.

The signal input units

The SINAR Module 1

The SINAR Module 1 plugs directly into the terminal socket of the SINAR DIGITAL shutter or may be mounted behind on the camera rail by the module carrier and linked to the shutter by a cable. The module has settings for film speed, reciprocity failure characteristics of different films, a measuring and computation mode, for the type of light and further controls for manual correction inputs and contrast information.

Measured values are entered manually by a scale dial which is interchangeable to match different exposure meters.

The SINARSIX-digital meter directly enters measured values from the film plane into the module; manual entry is then automatically disengaged.

In continuous-light mode the module calculates the appropriate exposure time, allowing for all prevailing factors. The correct time is automatically set as a function of the preset aperture and shown in the display. The photographer can immediately insert the film holder and release the shutter without adjustments.

For multi-point readings the module automatically establishes a mean value. With two-point readings the contrast or brightness range appears in the shutter display on pressing a button.

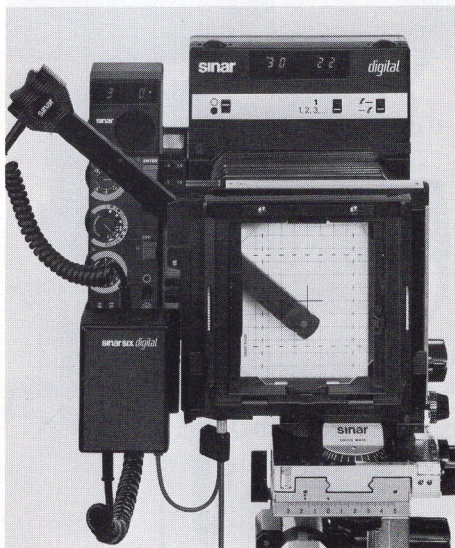
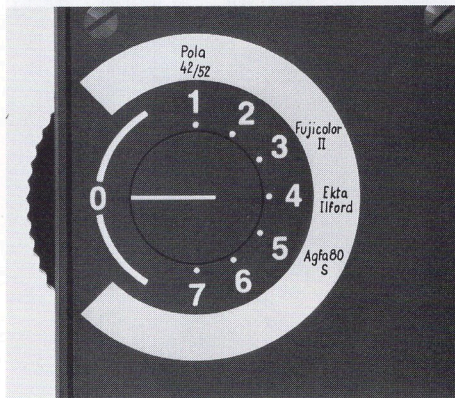
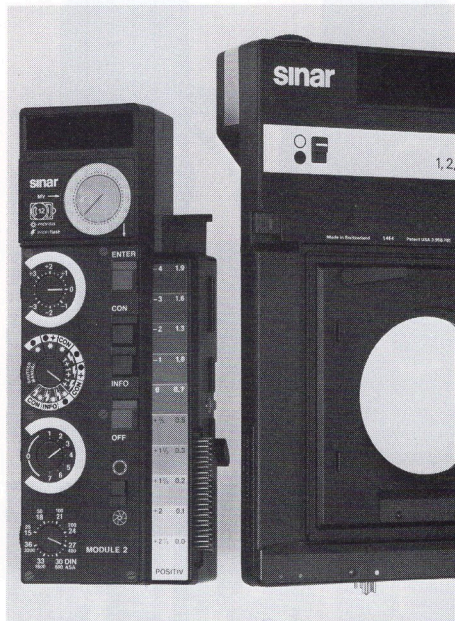
The module equally allows for all other factors controlling the exposure, such as reciprocity failure, film speed, working aperture and overriding correction for deliberate over- and under-exposure.

The logical modern way

The reciprocity correction program comprises seven curves covering all actual film characteristics. The scale on the module may be hand-lettered: The photographer can thus enter his film type designations next to the reciprocity group codes.

Alternative values may be set on the module for bracketing sequences (exposure ranges): The automatic control immediately calculates the new exposure combination, sets it and shows it on the display.

In **flash mode** the shutter display indicates the preselected aperture and shutter speed. The module display shows the number of flashes and any fractional aperture correction required if the flash output is insufficient. If the flash is too powerful, the module indicates the resulting overexposure in f-stops. To correct the exposure you only have to reduce the flash output or close the aperture via the **DIGITAL** shutter control until the module display indicates zero correction. In flash mode the module also calculates a mean value with multi-point readings and shows the prevailing brightness range if contrast readings are required.



For direct metering input - the SINARSIX-digital

The full scope of the SINAR Module is utilised by direct reading input from the film plane with the SINARSIX-digital.

The SINARSIX-digital fits either the SINAR metering back or a lightmeter cassette and measures the luminance of any point in the image plane. The readings are transferred digitally directly into the module with a coiled cord.

The movable meter probe of the SINARSIX-digital has a colour-corrected silicon blue diode (sbc cell). A circular 4.5 mm window on the probe marks the measuring point.

The best way to use the SINARSIX-digital is to take working-aperture spot readings. This eliminates mechanical iris tolerances and light fall-off towards the image margins.

With working aperture readings, pressing the probe switch automatically closes the aperture to the preselected value.

As soon as the aperture is closed, the SINARSIX-digital enters the actual reading into the module. The module's computer processes this reading, and in the continuous-light mode immediately sets the shutter to the correct exposure and shows this on the display.

In **flash mode**, the aperture also closes to its preselected value before the reading. Once the aperture has closed down, the flash setup (connected to the synchronising contact) is automatically triggered. The SINARSIX-digital reads the flash intensity and simultaneously the ambient light during the set flash synchronisation time.

The module processes these readings. Its display now shows the required flash intensity or aperture correction values - faster, more exactly and more reliably than was ever possible before.

For mixed-light setups: The Module 2

The more elaborate Module 2 has all the features of the Module 1, plus an additional mixed-light metering mode.

This for the first time provides absolute mastery of complex mixed-light conditions without test exposures.

The exposure values are determined by single-point or two-point readings (with contrast check).

Mixed-light mode readings with the Module 2 are made exclusively via the SINARSIX-digital.

Each spot reading automatically measures separate flash and continuous-light values, both being stored in the computer.

With single-point readings the complex computation program starts immediately after the reading. With two-point readings the electronic system waits for the second reading values and then computes the correct exposure time at the preset aperture.

Exposure time can range from 1/60 to 80 seconds and is exact within a 1/3 EV step. The computation automatically and exactly allows for any prevailing light reaching the subject during the exposure time determined by the module. By altering entered values you can also assess the effect of different alternative exposures.

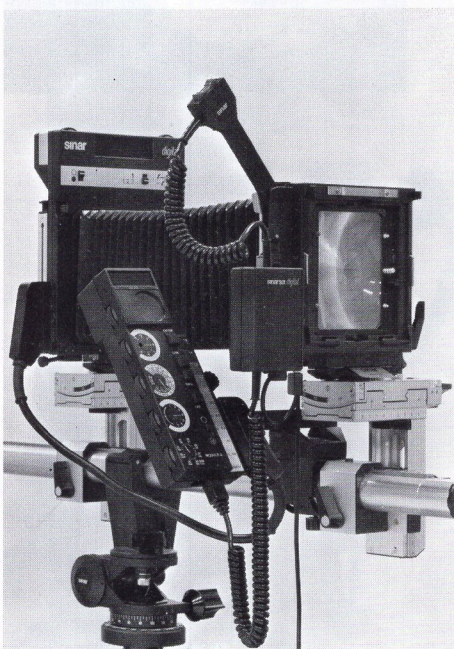
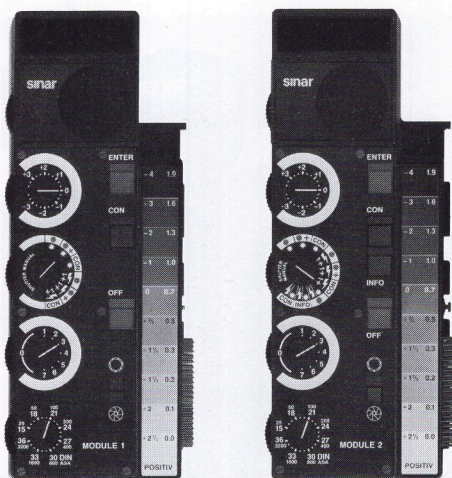
A further mode in mixed light also provides so-called information readings. These do not modify the calculated exposure but provide additional local readings of specific object points (views out of a window, scale illumination, partial fill-in areas, catchlights, very deep shadows, etc.) present in most mixed-light shots. The information is displayed in + or - EV steps relative to the mean luminance.

Suppose you have an exposure in which a room interior is lit by flash while an outdoor view is visible through a window. Here is how you immediately get the correct exposure:

Take a first reading on a typical midtone of the interior and a second reading on a similar value outside. Thanks to the small measuring area of the movable probe you can precisely and freely cover almost any image point from behind the camera.

In mixed-light mode the module immediately computes the flash and the continuous-light proportion from the two readings.

The exposure is equally easy and reliable for mood shots where the flash only acts



as fill-in light – or for interiors with decorative effect illumination switched on.

The scope of this metering system is virtually unlimited. However complex the lighting setup, the SINARSIX-digital with the Module 2 or Module 1 provides rapid, precise and straight-forward exposure settings.

At the SINAR factory any time a Module 1 can be converted into a Module 2.

You never depend completely on the automatism – the 'shutter manual' mode permits any time manual positioning.

Power supplies

The shutter, module and SINARSIX-digital are powered either by the external accumulator of the DIGITAL shutter or by a module accumulator that fits directly into the module without a cord.

The picture shows the SINAR p with full electronic system. The module is mounted at rear by means of the module holder which clips the auto rail. Data transfer to DIGITAL shutter with special module cable. This combination is specially indicated in case of long bellows extension, reproduction and the like.

Updating the manual method

Spot exposure readings have also been made available to owners of the hand-held PROFISIX exposure meter: SINAR has in collaboration with GOSSEN developed the PROFI-select TTL.

This is an attachment with a movable probe. With a lightmeter cassette it can be used in the film plane of all view cameras fitted with an international back – or without a lightmeter cassette directly in the 4×5"/9×12 cm SINAR metering back.

The PROFI-select TTL probe attachment

The meter cell, a colour-corrected silicon photo diode, is located in the probe. A circular 4.5 mm window marks the measuring area. This probe window can be located precisely at any point of the glass screen image.

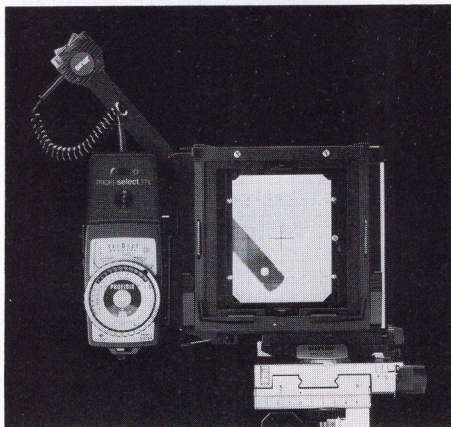
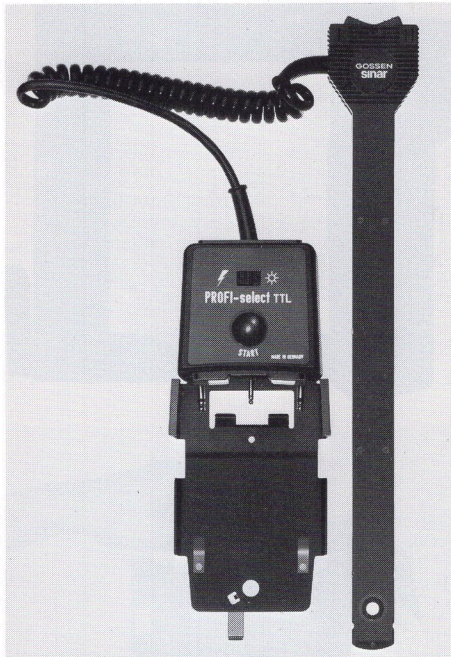
Pressing the meter switch pushes the cell into the reading position. A coiled cord connects the probe to the adapter attachment which in turn carries a mode selector switch (continuous light or flash) and a start button that clears the memory for flash reading.

The basic PROFISIX

The adapter fits on the standard PROFISIX meter in the same way as other GOSSEN accessory attachments (PROFI-flash, PROFI-color, etc.). Without the probe, the basic PROFISIX continues to function as a normal hand-held exposure meter for incident or reflected light readings.

The power supply

The probe is powered from the basic PROFISIX meter. The reasonable-priced 9 volt alkaline battery is obtainable anywhere and one battery lasts for up to 500 readings.



Working with the PROFI-select TTL

The PROFI-select TTL has a highly sensitive meter cell designed for spot readings in the film plane. Pressing the meter button activates the whole combination for about 30 seconds.

As long as the meter cell is engaged in the working position, the meter indicates the prevailing lighting level all the time in continuous-light mode. For more protracted readings (for example extensive contrast measurement) the auto-off switch can be disengaged. Readings are made at the preselected working aperture. The unit then directly shows the required exposure time.

In flash mode the measuring gate is 1/8 second and during that period the meter also allows for prevailing continuous light.

The unit has a metering memory and can determine apertures also with multiple cumulative flashes.

At the preset aperture the PROFI-select TTL shows the required correction of the flash output or of the aperture.

Locating the meter probe in the image plane

The SINAR metering back

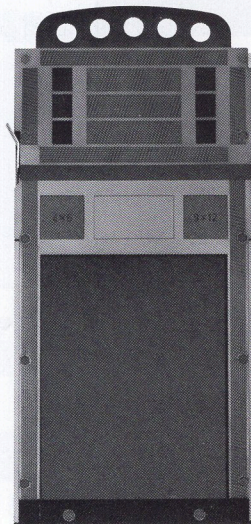
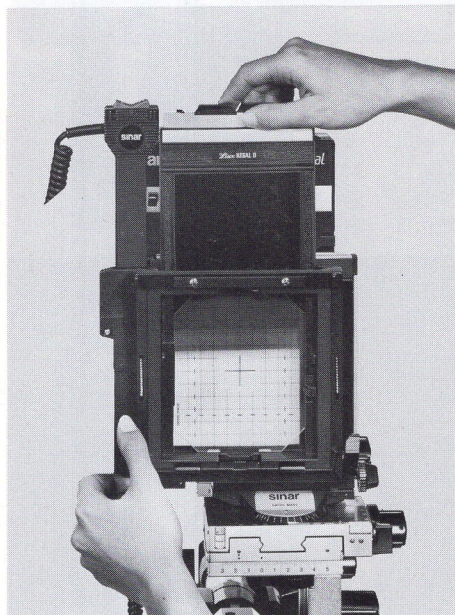
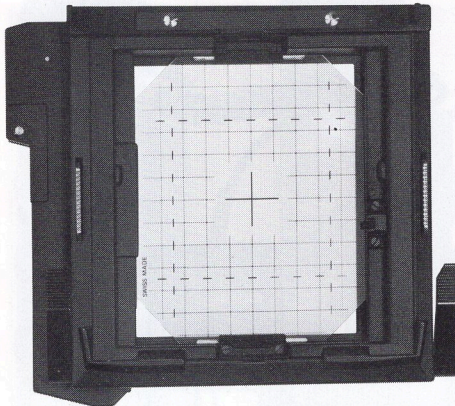
In addition to the ground glass screen, the SINAR 4×5"/9×12 cm metering back has a probe housing for the measuring probe of the SINAR exposure meters. That way the probe is instantly ready for use.

A lightmeter carrier mounts the exposure meter, connected to the probe, directly on the metering back.

For an exposure reading the probe is moved to the required point and locked in position.

With the metering back the ground glass screen image remains sharp all the time – unlike the image with the lightmeter cassette. This of course makes selection of the correct reading point much easier. At the bottom of the cameraback, to the right and the left, there are two levers to lift the screen holder carrier. This mechanism guarantees an easy insertion of the film holder without vibrations.

Since mid-1981 the 4×5"/9×12 cm metering back is a standard component of the 4×5"/9×12 cm SINAR p and SINAR c. All existing cameras SINAR 4×5"/9×12 cm can be equipped subsequently with this metering back.



The lightmeter cassette

Lightmeter cassettes, available in international 4×5"/9×12 cm and 5×7"/13×18 cm sizes, bring spot readings in the film plane to any view camera with international back. An additional adapter for 8×10"/18×24 cm backs takes the 5×7"/13×18 cm lightmeter cassette.

The lightmeter cassette takes the probe in a lockable guide. It also includes a holder for the SINAR exposure meters (PROFISIX with the PROFI-select TTL or SINARSIX-digital). The complete assembly is inserted in the camera back like a normal film holder. This does not actuate the automatic coupling with the SINAR shutter and aperture control. On withdrawing the darkslide, the ground glass screen image may be observed and at the same time the probe located at any required reading point.

Working with the SINAR exposure meters

I Continuous-light readings

With Module 2 and SINARSIX-digital

- 1 Metering mode *
- 2 Select reading point
- 3 Lock probe
- 4 Preset working aperture on shutter
- 5 Operate probe switch
- 6 Module calculates correct time and sets it on shutter

With Module 1 and SINARSIX-digital

- 1 Metering mode *
- 2 Select reading point
- 3 Lock probe
- 4 Preset working aperture on shutter
- 5 Operate probe switch
- 6 Module calculates correct time and sets it on shutter

With PROFISIX and PROFI-select TTL

- 1 Selector to *
- 2 Select reading point
- 3 Lock probe
- 4 Set working aperture on lens
- 5 Press red meter button
- 6 Operate probe switch
- 7 Turn computer ring to zero meter needle
- 8 Read off exposure time opposite f/1
- 9 Switch off probe switch
- 10 Set on shutter exposure time read off meter

III Mixed-light readings

With Module 2 and SINARSIX-digital

- 1 Metering mode * ⚡
- 2 Select reading point
- 3 Lock probe
- 4 Select working aperture on shutter
- 5 Operate probe switch (a single reading measures continuous light and flash)
- 6 Module calculates correct exposure time for continuous light and sets it on shutter.

With Module 1 and SINARSIX-digital

With Module 1 it is not possible to calculate mixed light exposures with a single reading. Separate continuous-light and flash readings are required in succession. Once both readings are available, the module is switched off and the aperture/shutter speed combination calculated from the two readings set on the shutter.

With PROFISIX and PROFI-select TTL

Mixed-light readings with the PROFI-select TTL need two separate flash and continuous-light readings, as with Module 1.

With real mixed-light situations where different significant image reading points involve different relative proportions of flash and continuous light, these conventional metering methods are inaccurate and – depending on the relative mixed-light intensities – may yield wrong exposures.

II Flash readings

With Module 2 and SINARSIX-digital

- 1 Metering mode ⚡
- 2 Select reading point
- 3 Lock probe
- 4 Preset working aperture on shutter
- 5 Operate probe switch (automatically triggers flash)
- 6 Module display shows deviation from correct exposure

With Module 1 and SINARSIX-digital

- 1 Metering mode ⚡
- 2 Select reading point
- 3 Lock probe
- 4 Preset working aperture on shutter
- 5 Operate probe switch (automatically triggers flash)
- 6 Module display shows deviation from correct exposure

With PROFISIX and PROFI-select TTL

- 1 Selector to ⚡
- 2 Select reading point
- 3 Lock probe
- 4 Set working aperture on lens
- 5 Close shutter
- 6 Press red meter button
- 7 Clear memory by pressing start key
- 8 Operate probe switch
- 9 Trigger flash by releasing camera shutter
- 10 Turn computer ring to zero meter needle
- 11 Read off deviation from correct exposure on EV scale
- 12 Switch off probe switch

Alternative reading methods in mixed-light mode

Single-point readings

- Measurement of subject midtone (e.g. grey card)

Two-point or contrast readings

- Two-point and contrast readings are made in same way as in continuous-light and flash modes.

Information readings

- Selected image points may be read separately for information. Readings indicate luminance difference (in EV) between the reading point and the midtone. Information readings do not change a previously calculated exposure time.

Both modules offer three metering ways in continuous-light and in flash mode:

Single-point readings

- Read a midtone (for instance a grey card) in the subject

Two-point or contrast readings

- Read a light and dark subject area
- Pressing the contrast key (CON) indicates the contrast in EV steps
- Module calculates mean exposure for both readings and sets it on shutter

Multi-point readings

- Any number of readings may be made. The module constantly calculates and updates the mean value and sets the correct values on the shutter.

Single and multiple flash

- Depending on the selected mode, single-flash readings calculate exposure for one flash, multi-flash mode indicates the number of flashes required. Advanced electronic control in this case prevents wrong exposures.

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