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A. W. VINCENT ASSOCIATES, INC.

ADVANCED ELECTRO-MECHANICAL ENGINEERING • 1255 UNIVERSITY AVENUE • ROCHESTER, NEW YORK 14607 • (716) 473-2232

SHUTTER DRIVER & TIMING UNIT MODEL SD 1000

FEATURES

Precision Crystal controlled exposure time.
Large 4-Digit LED display.
High speed repeat exposures (continuously variable from DC-100/sec.)
High Resolution of exposure time.
3 separate display modes.
External pulse, or push button triggering/resetting.
External pulse width determined exposure time.
Built-in electronic synchronization circuit.
Selectable pulse energy.
Normally open, or normally closed shutter operation.

The Uniblitz® SD-1000 shutter driver timer is a highly accurate instrument providing all of the functions necessary for operating Uniblitz® Electro-programmable shutters. The unit features crystal controlled exposure timing accurate to 0.01%. A bright 4-digit LED display conveniently indicates the units status of the exposure time setting, elapsed time of a series of exposures, or the total number of elapsed exposures.

Advanced circuitry allows for high resolution of exposure time adjustment from .0001-99.99 sec in three ranges. Repeat exposure interval is continuously variable in one range from .01-1 sec. In addition a front panel control allows selection of the number of exposure cycles desired from 1-9 or continuous. (An exposure cycle being the total of the exposure time, and recycle interval.)



Triggering, or resetting the unit is accomplished either manually via front panel controls, or with external pulse inputs. In addition, external pulse width determined exposure timing, bypassing the internal timer, is featured in this unit (minimum 4ms. delay between exposures required).

When using shutters equipped with either a mechanical or electronic synchronization the SD-1000 provides outputs conveniently located on the rear panel. The electronic synchronization output will provide a +5V upon 90% aperture of the shutter (see specifications). The mechanical synchronization will put its output ground at 90% aperture.

Shutter connection is made easily via 5-way binding posts, 4-pin Female, or 7-pin Female connector located on the rear panel.

OPTIONAL ACCESSORIES:

6-0020

Cable to connect shutters equipped with 4-pin connectors — 6′.

6-0011

Same as 6-0020, 25′ long.

6-0040

Cable to connect shutters equipped with a 7-pin connector — 6″.

6-0041

Same as 6-0040, 25″ long.

Rack Mount Handles

SPECIFICATIONS

GENERAL

Exposure Time

.1 ms.-99.99 sec. in 3 decade ranges. Variable within one decade, in .1 ms. steps, with 4-digit thumbwheel switch.

Recycle Interval

10 ms.-1 sec. in single range. Continuously variable with logrithmic vernier.

Repeat Exposures

-9 or C (continuous) exposures in single range. Selectable with 10-position rotary switch.

Shutter Drive

Continuously variable frequency of exposures from DC-100 cps. Max. peak pulse power 300W. Max. peak pulse voltage 60 VDC. [1] Min. hold voltage 5VDC. [1] Max. peak pulse current 5A. [1] Min. time between exposures 4 ms.

Accuracy

Exposures ± .01% on all ranges (crystal time base).
Recycle ± 5% on all ranges (RC time base).

[1] These ratings measure into standard 5V coil (12 ohm impedance) with 20 ms. exposure pulse at recycle rate of 5 cps.

OPERATING MODES

Normally Closed (N.C.) Shutter [4]
After exposure controls have been set as desired, ACTUATE switch or EXT. TRIG. input will enable timer to open shutter for selected time period. [2] After initial exposure is complete, unit will automatically shut down (NO. EXP. set to 1), or will continue to run until number of exposures selected is reached. If NO. EXP. are set to C Unit will then run continuously until either RESET switch [6] is depressed or proper signal is placed into the EXT. RESET [3] input. For exposure settings greater than 1 to C movement of the RECYCLE INTERVAL control will continuously select time interval between exposures from 10 ms.-1 sec.

Normally Open (N.O. Shutter)
Operation is the same as normally closed mode except shutter will be closed for exposure interval and open for recycle interval. Synchronization systems will also operate inverted.

Timer Bypass
Allows external pulse width (into PULSE IN/OUT) to drive internal shutter drive system without activation of internal timer. Shutter will remain open for duration of input pulse. See input specifications for proper drive pulse and polarity.

Ext. Reset.
It may be desired to allow unit to cycle through more than 9 exposures and shut down as in normally closed mode. This may be achieved by setting the NO. EXP. to C and Resetting the unit by use of the EXT. RESET [3] input. This will allow user to select a greater number of exposures before unit is reset. Achieving this mode may be done by using an external counter to count pulses from the PULSE IN/OUT [5] jack and providing a reset pulse when the desired exposure count is reached.

[2] If shutter is equipped with either mechanical or electronic synchronization options, see output specifications.
[3] See input specifications. (Display is not Reset.)
[4] Standard SD-1000 operating mode.
[5] See output specifications.
[6] Reset switch will reset display to zero.

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INPUTS

External Trigger [7]

Input impedance 10K ohm MAX. input voltage 12VDC (at 100% duty cycle). MIN. input voltage required for triggering 3.5VDC, MIN. pulse width required for triggering 1u sec. (can be used for remote triggering by switching 5V into EXT. TRIGGER).

External Reset [7]

Input impedance 10K ohm MAX. input voltage 12VDC (at 100% duty cycle). MIN. input voltage required for resetting 3.5VDC. MIN. pulse width required for resetting 100u sec. (can be used for remote resetting by switching 5V into EXT. RESET).

Pulse In/Out [8]

Input impedance 1.5K (with N.O./N.C. switch in N.C. position).
Input impedance 5.5K (with N.O./N.C. switch in N.O. position).
MAX. imput voltage 20VDC (at 100% duty cycle). (Can operate drive remotely by switching 5V into PULSE IN/OUT.)

[7] These inputs internally protected by CMOS protection networks do not exceed rated voltage.

[8] Drives internal shutter driver and by-passes internal timing. Min. pulse width determined by shutter used. Max. pulse width determined by exposure time desired.

OUTPUTS

Pulse Out

Source impedance 2.5K ohms, MAX. voltage output 3.5 (with N.O./N.C. in N.O. position). MAX. voltage output 2.0 (with N.O./N.C. in N.C. position). Rise time 5u sec. Fall time 10u sec.

Shutter Drive Out

60V discharge from stored capacitor into shutter coil (12 ohm) dropping to 5V MIN. to hold shutter in open position for remainder of exposure cycle.

See shutter drive specifications for output parameters.

Driver connections to the shutter may be made by:

1. YEL/BLU 5-way binding posts.
2. 4-Pin connector.
   a. A and B pin to shutter coil.
   b. C and D use for shutters equipped with Mechanical synchronization contacts.
3. 7-Pin connector.
   a. A and B pins to shutter coil.
   b. C-F used for shutters equipped with Electronic synchronization contacts.
   c. H used for shutter ground.

Mechanical
Synchronization Out

Provide convenient output for shutters equipped with mechanical synchronization contact. When shutter is activated to the open position mechanical synchronization output is shorted to ground.

Electronic
Synchronization Out

Provide convenient output for shutters equipped with electronic synchronization contact. When shutter is activated to the open position synchronization output will be 5VDC.

Shutter open +5VDC MAX. 4.75V Min.
Shutter closed +1.5VDC MAX. .5V Min.
Rise time (determined by shutter speed).
Fall Time (determined by shutter speed)
Source impedance 1K ohm.

CONVENIENCE FEATURES

Display

Large 4-digit 7-segment LED display can be operated in 3 modes with 3-position rotary switch.

Mode 1

ELAPSE EXPOSURE TIME.
Elapsed exposure time will accumulate with each exposure, the total amount of time shutter was in the open position (or closed position, depending if N.O. mode was used).

Mode 2

TIME/EXPOSURE
Timed exposure mode will read out the exposure time of each operation that was set with the thumbwheel switch.

Mode 3

NO EXPOSURES
Number of exposures mode will count the total of elapsed exposures.

Timer operation will be the same regardless of what display mode is used.

Shutter Open
Indicator

LED will light each time shutter coil is energized.

Power Indicator

LED will light when power switch is activated.

Pulse Energy Switch*

Selectable pulse energy for standard shutter units and for 62 mm shutter which require additional pulse energy for their operation.

Power Supply

+5V at 750 ma power supply available for use in remote switching and/or providing bias to external circuits requiring +5VDC for operation.

MISCELLANEOUS

Power Line
Requirements

110-130 VAC 60 Hz
210-230 VAC 50 Hz

Selectable internally by 2-position slide switch.

Fuses

3AG 1/2 A slow-blow fuse 120 VAC 60 Hz
3AG 1/2 A slow-blow fuse shutter coil protection.

Size

11.5 x 7 x 5.25

Net Weight

Approximately 7 lbs.

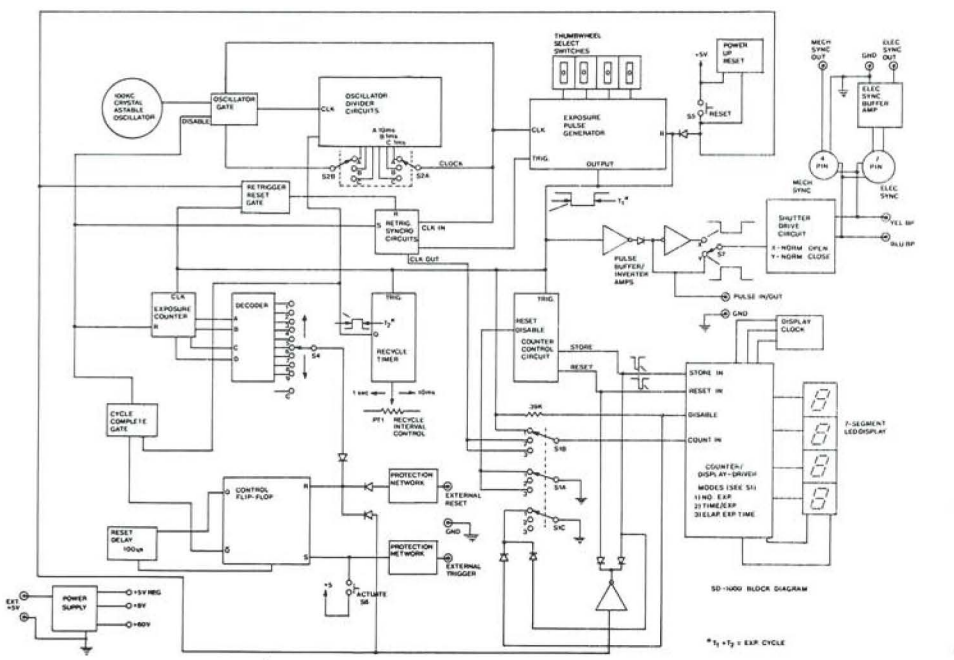
Shipping Weight

Approximately 10 lbs.

Accessories Included

8" Tilt Stand.

*WARNING:
Use of unit with switch in wrong position can cause premature failure of shutter.



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