

**MODEL 810 to 853
Stopwatch/Timer**

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TOTALIZING COUNTER STOPWATCH/TIMER



SERIES 800

FEATURES:

- Direct replacement for ERC/ITC Series 2600 and Series 2300
- Four or six big (.56") LED digits of display
- TTL compatible BCD outputs (optional)
- Front panel and remote control inputs for start, stop, and reset
- Crystal or 50/60 hz timebase
- Power interrupt indication
- CMOS circuitry for high noise immunity and low power consumption
- Schmitt trigger input circuitry for all TTL count inputs
- Stopwatch resolutions from 1 microsecond to 100 seconds
- Optional battery backup

Accurate timing of relay closures, switch closures, or TTL logic levels with resolutions down to one microsecond are easily accomplished using the remote inputs for start, stop, and reset. These remote inputs are standard on all Series 800 units as well as the front panel controls. An option for stored display enables the display to be held from one stop command to the next stop command which permits the reading of short time intervals without the annoyance of seeing the display change or having to wait until the end of the time cycle to see the reading. Optional latchable parallel BCD outputs with three state control extend capabilities to control functions when used with a comparator or interfacing with a printer or microprocessor system. When used as a totalizing counter the input count signal can be as low as 200 millivolts or up to 115 volts with option -08. Schmitt trigger inputs are used on all TTL count inputs to prevent false triggering and can be configured for counting from A contact closure simply by adding input filter capacitors.

SPECIFICATIONS

Accuracy:

50/60 hz time base, worst case 3 sec/hr (timer only). Crystal time base, ± 1 count, ± 2 PPM/degree Celsius from -20° to $+60^{\circ}$ Celsius. Counter accuracy ± 1 digit.

Display:

4 or 6 digits. .56" high-efficiency red LED 9.9.9.9.9.9, red LED dot for Overrange.

Controls:

Front panel start, stop, and reset pushbutton switches.

Remote inputs:

Start, stop, and reset signals: Requires closure to logic common or TTL logic zero. Input loading one LPTTL load.

Latch: (option 01 only) Requires TTL logic zero. BCD data is held as long as latch line is held low. Does not affect display time accumulation or totalized count accumulation.

Light test: Requires TTL logic zero display will go to all 8's. Does not affect time or count accumulation.

Outputs:

Parallel BCD: (01 option only) + 8421, TTL compatible. Will drive 4 TTL loads and is a latchable three state output with single line enable.

Overrange: Indicates full scale range of unit has been exceeded. TTL logic level "1" when in overrange condition.

Power interrupt: Normally logic level "1" until power interruption. TTL logic level zero after interruption and until reset is activated.

Reset output: Logic level "O" during reset command, TTL compatible.

Count inputs: (counter only)

Sine wave/pulse count input; (option -08). Minimum signal 150mVRMS, DC to 10Khz, 500mVRMS, DC to 50Khz. Maximum signal 115VAC without damage to circuitry. Input impedance 100Kohm. Threshold adjustable from the front panel with a small screwdriver.

TTL count input: Schmitt trigger type with no limit on rise or fall time of input pulse. Maximum count rate 1Mhz. Input loading 1LPTTL load.

Contact closure count inputs: Accepts form "C" closure input standard but can be modified to accept Form "A" closures by adding filter capacitors on N.O. count input to limit count rate to maximum rate expected. For instance for a count rate of 20hz a 1uf capacitor is required between the N.O. input and logic common with the N.C. input tied to logic common. Can be factory installed.

Power:

115VAC 50-400 hz, 8 watts maximum. Models 831, 832, 834, 840 programmed for 60 hz unless specified otherwise.

Optional 5 VDC power 400 mA maximum.

Optional 10-15 VDC power 400 mA maximum.

Optional 230VAC 50-400 hz, 8 watts maximum.

Optional 10-30VDC power 350 mA maximum.

Operating temperature range:

-20° to $+60^{\circ}$ Celsius.

I/O Method: Card edge connectors with solder tabs. (Supplied)

Case size: "A"

OPTIONS

- 01 Buffered, latched, three (4 digits)
state BCD outputs, with (6 digits)
single line enable.
- 02 Add two digits to left of display to make a
six digit display
- 03 Add two digits to left of display on either 814 or
832 to make a six digit unit with a display of
9.59.59.9 hr/min/sec/.1 sec
- 05 5VDC input power
- 06 Stored display. Stop command will update
display and this reading will be displayed until
next stop command. NA with 07 & 09 option
- 07 Alternate action start/stop. NA with 09 option
- 08 Input amplifier for sine wave/pulse input signals
Threshold is adjustable from front panel. (804 only)
- 09 Stop override start (like ERC/ITC) NA with 06 & 09 option
- 10 Remove front panel switches.
- 12 10-15VDC input power
- 18 Reset switch only
- 22 230VAC \pm 10%, 50-400 hz, input power
- 23 Green LED display
- 24 10-30VDC input power
- 25 Special legends and/or logo One time charge
(Special artwork to be Plus per lens
supplied by customer)
- 26 No logo
- 27 Screw terminal I/O connector with option 01
without option 01
- 28 Blank lens
- 31 "SECONDS" legend
- 32 "MIN/SECONDS" legend
- 33 "MINUTES" legend
- 34 "HR/MINUTES/SECONDS" legend
- 35 "MILLISECONDS" legend
- 36 "COUNTER" legend
- 50 Sunlight readable .6" LED display

MODELS

Model No.	Time base		Display
	Crystal	50/60 hz	
804			totalizing counter 9.9.9.9
810	X		9999 seconds
811	X		999.9 seconds
812	X		99.99 seconds
813	X		9.999 seconds
814	X		9.59.9 min/sec/.1 sec
815	X		99.9 minutes
816	X		99.99 minutes
817	X		9.999 minutes
831	X		999.9 seconds
832	X		9.59.9 min/sec/.1 sec
834	X		999.9 minutes
840	X		9999 seconds
851	X		999.9 milliseconds
852	X		99.99 milliseconds
853	X		9.999 milliseconds

J1 — (BCD output-all units) Option 01 only

LSD	-----4	A	1	4-----
1st digit	2	B	2	3rd digit
BCD	8	C	3	8 BCD
	-----1	D	4	1-----
	-----4	E	5	4-----
2nd digit	2	F	6	2 4th digit
BCD	8	H	7	8 BCD
	-----1	J	8	1-----
	-----4	K	9	4-----
5th digit	2	L	10	2 6th digit
BCD	8	M	11	8 BCD
	-----1	N	12	1-----
** (Normally high, low enables) latch		P	13	** three state control (normally high, low enables)
common		R	14	common
5V		S	15	5VDC

J2 — Timer Hook Up

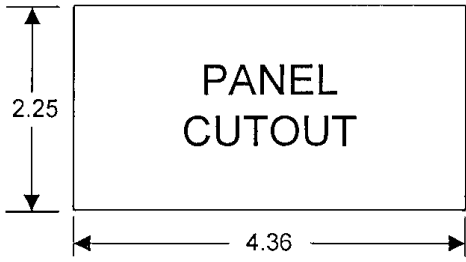
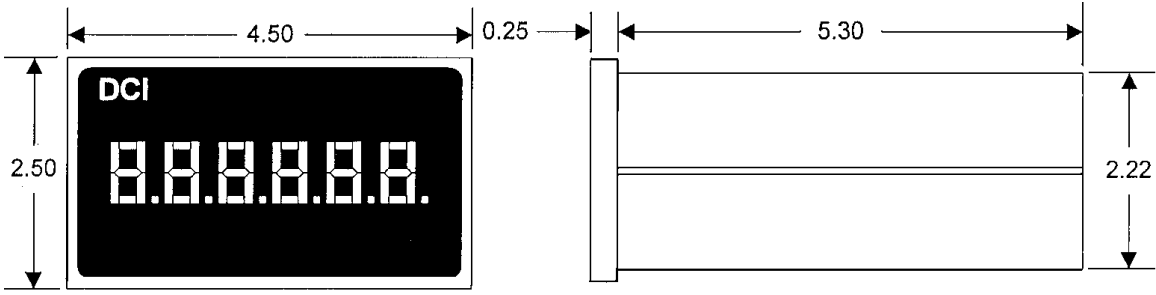
1	pwr interrupt/light test
2	NC
3	ext start (normally high, low enables)
4	ext stop (normally high, low enables)
5	ext reset (normally high, low enables)
6	reset out
7	115VAC *
8	NC
9	115VAC *
10	count out
11	out of range
12	one megahertz (crystal unit only)
13	unreg 5VDC
14	common
15	5VDC

*Note: Option 12 & 24, Pin 7 of J2 = +VDC input power
Pin 9 of J2 = DC Power return
Option 22, Pin 7 & 9 of J2 = DC Power return

**Note: Latch & three state control are used with option 01 only

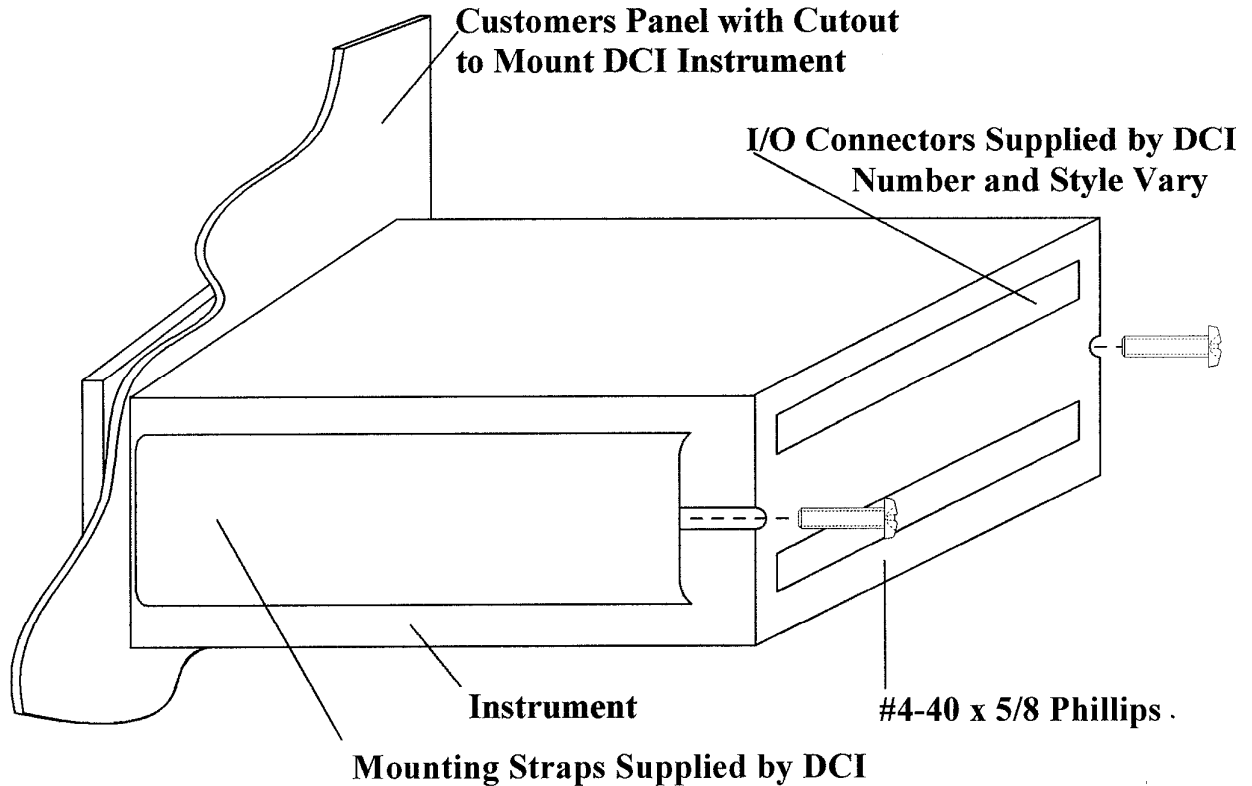
Note: Single line start stop can be accomplished by tying pin 4 & 14 together. Then anytime start is pulled low the counter/timer will run, unless option 09 is installed.

Note: Option 06, start command starts counter/timer but display will not change until the stop command is received.



CASE SIZE A

MOUNTING



Note: Ground Case per FIGURE 1.0, page 16

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