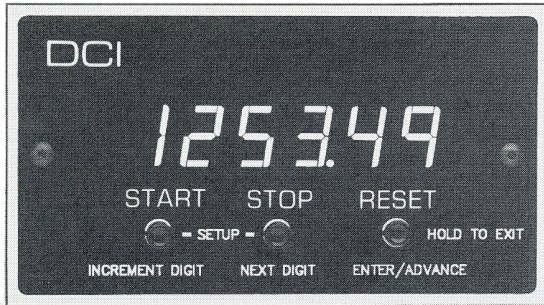# COUNTER/TIMER
WITH QUADRATURE OPTION

SERIES 8000

FEATURES

- IBM PC™ compatible RS232 or RS422 output (optional)
- Front panel and remote inputs for start, stop, reset, and setup
- Up to 5 Khz count rate
- Timer resolutions down to 1 millisecond
- Microprocessor based unit programmable for different modes of operation
- 6 1/2 digits of display
- Quadrature input counting logic (optional)
- Differential receivers available on count inputs for high noise immunity
- 5VDC @ 150mA output for external circuitry or encoder (optional)
- Programmable multiplier (.001 to 199.999) for special scaling and English/Metric conversion
- Programmable divider 1 to 250 (can be used with multiplier to increase resolution of multiplier to 1.99999)
- Four limit set points
- Count stored indefinitely after loss of power without battery

The Series 8000 is a new microprocessor based Counter/Timer with Optional RS232 or RS422 outputs which facilitate easy interfacing to computers or programmable controllers. The microprocessor based unit is easily programmed for special scaling with six digit multiplier programmable from .001 to 199.999 and programmable divider (1 to 250) which can be used to increase resolution of multiplier to 1.99999. In the event of a power loss the accumulated count, multiplier, and limits are stored in solid state memory until power is reapplied. The big (.56") high-efficiency LED display is easily read at 20 to 30 ft. and the attractive black and silver bezel with non-glare lens will enhance the appearance of any control panel. The 8010 can be programmed for all modes of operation, except quadrature input counting, from the front panel switches. Timer ranges are 1999.999 sec, 19999.99 sec, 199999.9 sec, 199.59 hr/min/sec, 19999.99 min, and 1999.999 min which are programmable via the front panel switches or the remote inputs.

SPECIFICATIONS

Accuracy: (Timer) Crystal time base, $\pm$ 2 PPM/degrees Celsius from zero to fifty degrees Celsius. Totalizer accuracy $\pm$1 digit. Tachometer accuracy $\pm$ digit, $\pm$ 1 x $10^{.5}$ time base accuracy.

Display: 6 1/2 digits. .56" highefficiency red LED $\pm$ 1999999. Decimal points are user programmable.

Controls: Front panel start, stop and reset pushbutton switches which are also used to set limits and multiplier.

Remote Inputs: Start/stop and reset signals: require closure to logic common or TTL logic zero. Input loading one LPTTL load. Can also be used to set limits and multiplier.

Z Reference Input: Normally low requires pull up to +5 VDC. Resets on "A" channel transition when Z input is high. (8033 only)

Outputs: ASCII RS232 compatible: (optional) ASCII RS422 compatible: (optional) Programmable baud rates. Baud Rates: 300, 1200, 9600.
Excitation Output: 5VDC @ 150mA maximum (optional)

Limit Outputs: TTL compatible output can be programmed to go high or low at limit and hold until reset. Will drive 4TTL loads. Limits are set by putting unit in setup mode and then toggling through numbers

Sine Wave/Pulse Count Input: (option-8). Minimum signal 150 mVRMS DC to 10 Khz. Maximum signal 115VAC without damage to circuitry. Input impedance 100 Kohm.

Differential Count Input: (optional) differential receivers on up and down count inputs. DS8820 type receivers.

TTL Count Input: Schmitt trigger type with no limit on rise or fall time of input pulse. Maximum count rate 5 Khz, input loading one LPTTL load.

Power:115VAC 50-400 hz, 8 watts maximum
(Optional) 5VDC power 500mA maximum.
(Optional) 10-15VDC power 400mA maximum.
(Optional) 230VAC 50-400 hz, 8 watts maximum
(Optional) 10-30VDC power 400mA maximum

Operating temperature range: Zero to fifty degrees Celsius.

1/0 Method: Card edge connector with solder tabs. (supplied) 25 pin sub-miniature "D" connector for RS232/RS422 output. (optional)

Case size: "A" See page 39.

OPTIONS:

- 01   ASCII RS232 compatible output
- 02   ASCII RS422 compatible output
- 05   5VDC input power
- 08   Input amplifier for sine wave/pulse input signals. Adjustable threshold
- 10   Remove front panel start/stop/reset switches
- 11   Differential line receiver input for count inputs
- 12   10-15VDC input power
- 18   Reset switch only
- 19   Excitation output 5VDC at 150 mA. Nonvolatile memory for displayed count not operable when this option is installed
- 22   230VAC $\pm$ 10%, 50-400hz, input power
- 23   Green LED display
- 24   10-30VDC input power
- 25   Special legends and/or logo. (Special artwork to be supplied by customer)   One time charge / Plus per lens
- 26   No logo
- 27   Screw terminal I/0 connector
- 28   Blank lens
- 29   25 pin "D" connector for RS232 interface
- 31   "SECONDS" legend
- 33   "MINUTES" legend
- 34   "HR/MINUTES/SECONDS" legend
- 35   "MILLISECONDS" legend
- 36   "COUNTER"legend
- 37   "RPM" legend
- 38   "DEG/MIN/SEC" legend
- 39   "DEG/MIN" legend
- 50   Sunlight readable .6" LED display. No polarity available

Functions	Maximum Count Rate
8010 Timer/counter Bi-directional counter frequency meter/tachometer. Programmable via the front panel switches or remote inputs.	5Khz
8033 Bi-directional counter with quadrature interface and Z reference input. Edge detection and multiplication of X2 and X4 must be specified when ordering unit. Count rate is reduced to 2.5Khz for X2 and 1.25Khz for X4 multiplication.	5Khz
8034 Bi-directional counter with quadrature counting logic to interface to encoder with 10800 PPR and read out to 359.59 degrees/minutes.	5Khz
8035 Bi-directional counter with quadrature counting logic to interface to encoder with either 900, 1800 or 3600 PPR (specify one) and read out to 359.9 degrees.	5Khz

CCW Rotation Viewing Shaft →

Hook Up

J2

High Speed Start	A	1	Remote Reset
High Sped Reset	B	2	High Speed Stop
High, zero crossing input (option -08)	C	3	Model Select Input
	D	4	High, non-zero crossing input (option -08)
*Quadrature Input "B"	E	5	Remote Start
Limit 2	F	6	Remote Stop
	H	7	115VAC**
	J	8	NC
	K	9	115VAC**
*Quadrature Input "A"	L	10	Limit 4
	M	11	Spare Output
Limit 3	N	12	Z Input (Model 8033)
COM	P	13	COM
COM	R	14	COM
Limit 1	S	15	+5V

TYPICAL CONNECTIONS OF A QUADRATURE ENCODER WITH DIFFERENTIAL OUTPUTS TO THE MODEL 8033

THE MODEL 8033-11-19 WILL COUNT IN QUADRATURE UP AND DOWN AND DISPLAY A NEGATIVE SIGN WHEN THE COUNT GOES THROUGH ZERO. EXCITATION VOLTAGE OF 5VDC AT 150 mA IS ALSO PROVIDED TO POWER THE ENCODER.

TYPICAL CONNECTIONS OF A QUADRATURE ENCODER WITH QUADRATURE AND Z-REF TTL OUTPUTS TO THE MODEL 8033