

KEPTROL

Counter, Timer or Ratemeter

Features

- Counter, Timer or Ratemeter
- Counts Up To 100 kHz
- 8 Digit Display
- Input Scaling
- Batch Counter
- DC Output to Power Peripherals Sensors
- NEMA 4X / IP65 Sealed Front Panel

Applications:

Metering, Rate Monitoring, Cut to Length, Coil Winding, Batch control, all in one programmable unit.

Description:

Featuring 8 digits of bright .55 inch alpha-numeric display, the KEPTrol can accept up to 100,000 pulses per second of digital count or rate data, and time in keyboard selected ranges of 1/10,000 of a second to hours. The unit can multiply the input from 0.0001 to 99.9999 to easily understood units of measurement and give two control outputs at separate set points.

Selection of counter, timer or rate meter function as well as input scaling, timer frequency, preset levels, output timing and special security number are entered on the sealed front keypad by following instructions written on the display.

The unit operates from either 110 VAC /12 to 27 VDC or optional 220 VAC /12 to 27 VDC. If AC power is used, two built-in regulated 12 VDC ~100 mA power supplies are offered. They can be connected to provide + 12 VDC and - 12 VDC or + 24 VDC to drive external devices. CMOS logic is used to provide high noise immunity and low power consumption with EEPROM to hold data a minimum of 10 years if power is interrupted.

Integrating the KEPTrol with computers or programmable controllers is made easy by optional RS232 or RS422 interface. Up to 15 units can be addressed separately to set control points or access data through the I/O ports.

Specifications:

Display: 8 digit .55" high, 15 segment red orange LED.

Input Power: A: 110 VAC \pm 15% or 12 to 27 VDC. B: 220 VAC \pm 15% or 12 to 27 VDC.

Current: Max. 280 mA DC or 5.3 VA at rated AC voltage.

Output Power: (on AC powered units only): + 12 VDC @100 mA. Separate isolated 12 VDC @100 mA to allow \pm 12VDC or +24 VDC, regulated \pm 5% worst case.

Memory: EEPROM stores all program and count data for minimum of 10 years if power is lost.

Approvals: CE Approved, UL/CSA Pending



Pulse Inputs: Various inputs may be ordered from standard plug-in input cards.

2A: Simultaneous Pulses:

Use for count or rate modes only. Separate pulses on input A count up, pulses on input B count down without loss of count even if pulses come at the same time. Open or 0 to 1VDC (low), 3 to 30VDC (high), 10 kOhm impedance. Max speed 10KHz (min. on/off .05 msec) (Internal switch to select debounce filtering to max. speed of 40, 400, or 10K Hz) (Board #2102)

3A: **Standard.** High Impedance Up/down Control. Use for count, time and rate modes. Input A accepts all pulses for count, rate, time stop. Input B controls direction of count (low: counts down, high: counts up), starts timer. Open or 0 to 1 VDC (low), 3 to 30VDC (high) 10K Ohm impedance. 100 kHz max. speed (min on/off 5 sec., 13 μ sec, if direction is changed). Min 13 μ sec delay required after up/down level change before count pulse. May be used with KEP encoder 715-2.

3B: Same as 3A input but has 4.7K Ohm input pull up resistors to +5VDC on inputs A and B for pulsing with contact to ground or NPN open collector transistor.

3C: High Impedance Separate Up/down: Use for count or rate modes only. Same specs as input 3A but separate pulses on input A count up, pulses on input B count down. Inputs must be normally low. (If input A is high, input B counts up on positive edge. If input B is high input A counts down on positive edge). May be used with KEP encoder 715-1.

3D: Same as 3C input but has 4.7K Ohm input pull-up resistors to 5VDC on inputs A and B.

NOTE: Inputs 3A, 3B, 3C, 3D as well as debounce filtering to max. speed of 40, 400 or 100 kHz are selectable by internal switches on any series 3 input card.

4A: Optically Isolated Up/down Control 5 to 12VDC: Use for count, time and rate modes. Input A accepts all pulses for count, rate, time stop. Input B controls direction of count (low: counts down, high: counts up), starts timer. Open or 0 to 1.5VDC (low), 5 to 12VDC (high), 1.1K Ohm impedance. Max speed 1500 Hz (min. on/off .33 msec. Min. count delay after up/down change.

4B: Same as 4A, but input voltage is open or 0 to 2 VDC (low), 12 to 24 VDC (high), impedance 2.2K Ohm.

4C: Optically Isolated Separate Up/down, 5 to 12VDC: Use for count or rate mode only. Same specs as input 4A, but separate pulses on input A count up, pulses on input B count down. Inputs must be normally low. (If input A is high, input B counts up on negative edge If input B is high, input A counts down on positive edge).

4D: Same as input 4C but input voltage is open or 0 to 2 VDC (low) 12 to 24 VDC (high), impedance 2.2K Ohm.

NOTE Inputs 4A, 4B, 4C, 4D as well as debounce filtering to max. speed of 40 or 1500 Hz are selectable by internal switches on any series 4 input cards. (#2098)

9A: Quadrature Input: Use for count or rate mode only. Accepts pulses 90° out of phase for up/down counting. Open or 0 to 1VDC (low), 3 to 30 VDC (high), 10K Ohm impedance, 20 kHz max speed (min on/off .025 msec) (Internal switch to select debounce filtering to max. speed of 40, 400 or 20 kHz.) (Board #2135) May be used with KEP 716 encoder

1A: Quad (x2) 5-30 VDC

1B: Quad (x4) 5-30 VDC

Reset: Front push-button CLR and remote reset input requirements follow pulse input selected. High level reset overrides other inputs. Min. on time, 5 msec.

Scaling: Any input from an external source or the internal time base can be multiplied by any number from 0.0001 to 99.9999. Press C to see scale factor. To change scale factor, press CLR and key in new factor. Press ENT to load in the displayed factor.

Preset: Two levels (8 digits) or one preset (8 digits) and one batch preset (8 digits). The preset numbers can be displayed or updated at any time by pressing A (preset A) or B (preset B). Enter the flashing preset number or press CLR and key in a new number and ENT to enter it. Output time from 0.1 sec. to 9.9 sec. or latched till reset is selected by RELAY mode set up.

NOTE The RATE METER mode has a floating decimal point. If a preset with a decimal is needed in the RATE METER mode only, use D to key in a decimal when setting up preset numbers. Outputs are active at or above preset rate and "off" below preset rate.

Control Outputs: (each of 2 outputs).

1. NPN transistor version: (Standard) Open collector sinks max. 250 mA from max. 30 VDC when active. (when relay is used, 10 VDC is provided at transistor outputs through relay coil. If greater than 2 mA is used, relay will remain energized. Applying greater than 10 VDC may destroy unit. Transistor will sink 100 mA in "on" state.)

2. SPDT Relay version: 10A 120/240 VAC or 28 VDC

Temperature: Operating +32°F (0°C) to +130 °F (+54°C).

Storage: -40°F (-40°C) to + 200°F (+ 93°C)

Mode Selection: All following functions are selected by front keypad. Following prompts written on the display, choose the basic device type, relay output operation, outcard data interface and panel lockout security code.

Ratemeter: Accurate to 5 1/2 digits ± 1 display digit. It can be programmed to accept almost any number of pulses per unit of measurement, sample from 2 to 24 seconds maximum, perform weighted averaging from 0.0 to 9.9. [(old data x wt + new data ÷ wt. + 1)] and auto-range up to 6 digits of significant information. Two levels of preset are standard. Outputs are active at or above the preset rate and return to the rest state when reading drops below the preset rate.

Counter: 8 digits of count with 2 levels of preset or 1 level of count preset and 1 level of batch preset Counter is designed to advance on negative edge of pulse. Choose between reset to zero or set to preset. Other choices include; manual reset, auto recycle at preset A, alternate action (counts to preset A, activates output A, counts to preset B, drops out output A.) or batcher. In the batch mode, the unit counts to preset A, activates output A, recycles and advances separate batch counter one count. At a preset number of batches output B is activated until batch counter is reset. At any time the display can be made to flash the batch total by pressing ENT while the unit is running. Activating CLR while the batch total is flashing resets the batch counter and the B preset output.

Timer: Choose from 1 to 10,000 pulses per second or minute basic time base with accuracy to +.015% and scale base from 0.0001 to 99.9999 to time in seconds, minutes, hours or days. Timing is controlled by positive edge of signal by one of three ways selected on the keypad:

Level: Times while input B signal is high

Pulsed: One positive pulse on input B starts timer, second positive pulse on input B stops timer

Start-Stop: Positive pulse on Input B starts timer, positive pulse on input A stops timer.

Once the time base is selected and the timing started, the unit operates much as a counter. All the features listed under "Counter" are available with the timer. (See section under "Counter" operating modes)

Relay: Control output timing is selected by pressing D until the RELAY mode is selected and entered. Time duration from .1 to 9.9 seconds (or 00 for latch output) may be entered for A and B outputs. Once the output has been activated, unit must be reset before another output will occur. The control output timing is independent of the counter/timer reset which is selected under its setup modes. In the RATE MODE of operation the outputs are active at or above the preset rate and return to the rest state when the reading drops below the preset rate.

Lockout: Unauthorized front panel changes can be prevented by entering a user selected 4 digit code in the LOCK-OUT mode. The status of the unit can be observed but "LOCKOUT" appears if changes are attempted. Entering the code returns the unit to "LOCK OFF" status.

Outcard: RS232 or RS422 serial 2 way communication options are available. Up to 15 units can be linked together and addressed separately to transmit unit status or accept new set points in the standard ASCII format. Baud rates of 300, 600,1200, 2400, 4800 or 9600 as well as choice of odd, even, space or mark parity can be selected by keypad control.

Opt 1: RS 232 serial interface.

Opt 2: RS 422 serial interface.

How To Order:

EXAMPLE KP8 A 3A 2 A 2

Series

KP8

Operating Voltage

- A: 110 VAC ± 15% or 12 to 27 VDC
- B: 220 VAC ± 15% or 12 to 27 VDC

Control Inputs

- 2A: Simultaneous, 3 to 30 VDC
10KHz max., Count and rate models only
- 3A: **Standard**, High impedance, Up/down control:
3 to 30 VDC, 100KHz max. Use for all models.
- 3B: As 3A, with 4.7KΩ pull up resistors.
- 3C: As 3A, with separate Up and Down inputs
- 3D: As 3C, with 4.7KΩ pull up resistors.
- 4A: Standard, Opto-isolated up/down control
5 to 12 VDC: 1500Hz max. Use for all models.
- 4B: As 4A, but to 12 to 24 VDC
- 9A: Quadrature, 3 to 30 VDC, 20KHz max.
Count and rate models only.
- 1A: Quad (x2) 5-30 VDC
- 1B: Quad (x4) 5-30 VDC

Control Outputs

- 1: Open collector (NPN)
- 2: SPDT relay 10A

Input Speed

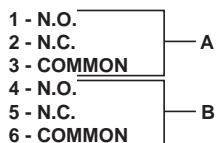
- A: 0-40 Hz (relay or snap action switch), inputs 2,3, 4, 9
- C: 0-400 Hz (reed switch), inputs 2, 3, 9
- D: 0-1500 Hz (opto-solid state), input 4
- E: 0-10 KHz (solid state), inputs 2, 3, 9
- F: 0-20 KHz (quad-solid state), input 9
- G: 0-100 KHz (hi-speed solid state) input 3

Options

- 1: RS232 serial interface
- 2: RS422 serial interface

Terminations:

- 1 - OPTO INPUT COMMON
- 2 - NOT USED
- 3 - INPUT B (CNT DN, UP/DN CTRL, START)
- 4 - INPUT A (CNT UP, RATE, TIME STOP)
- 5 - RESET INPUT
- 6 - NOT USED
- 7 - NOT USED
- 8 - NOT USED
- 9 - NOT USED
- 10 - NOT USED
- 11 - GROUND (-DC)
- 12 - GROUND (-DC)
- 13 - 12 VOLTS OUT
- 14 - DC POWER IN
- 15 - ISOLATED -12 VOLTS OUT
- 16 - ISOLATED +12 VOLTS OUT
- 17 - AC INPUT
- 18 - AC INPUT
- 19 - PRESET B TRANSISTOR
- 20 - PRESET A TRANSISTOR



Mounting:

