The INF7 is the ultimate 6-digit multi-functional process indicator/controller. Each unit can be easily configured via the front-panel pushbuttons or optional serial communication boards, to be used as a ratemeter/totalizer, batch controller, or real-time clock.

Rate may be displayed in engineering units. In addition, average rate, which is a running average that works like a filter, is selectable to help eliminate noise, yet does not introduce a long delay for a step change in the input frequency response. With the optional analog input board, the INF7 can be configured to accept a signal, such as 4-20 mA dc, from any typical differential flow transmitter and extract the square root of this signal, providing a linear display in any engineering units desired. The INF7 can also be programmed as a single input batch controller. It can simultaneously count the batch, number of batches completed, and the grand total of pulses received. In addition, it has an internal timer for process time measurement displayed in HH MM SS format.

**SPECIFICATIONS**

**Accuracy:** ±0.1% @ 15-35°C

**Step Response:** 10 to 90% full-scale, 50 msec

**Turndown Ratio:** max. offset divided by minimum span, 1000 with 0.1% resolution; 100 with 0.01% resolution

**Power:** 115 or 230 Vac, 49-400 Hz; 10 to 32 Vdc

**Power Consumption:** 6 W nominal, 10 W max.

**SIGNAL CONDITIONERS** (Non-isolated TTL-level pulse input standard)

**Threshold:** 0.7 to 2.0 V

**Frequency Ranges:** 0.2 Hz to 20 kHz

**Protection Level:** 24 V

**Trigger Slope:** Positive

**Connection (TTL):** Plug-in screw terminal

**Contact Closure Connection:** plug-in screw terminal

**NPN Open Collector Connection:** plug-in screw terminal

**Sensor Excitation (NPN):** 16-30 V @ 70 mA non-regulated
ISOLATED PULSE INPUT WITH EXCITATION (Voltage input and passive magnetic pickup most popular)
Connection: plug-in screw terminal
Maximum Signal: 60 V rms with protection to 240 V
Sensitivity: 20 mV rms
Input Impedance: 75 KΩ min
Hysteresis: 50 mV

NPN OPEN-COLLECTOR INPUT
Connection: plug-in screw terminal
Sensor Excitation: 12 V regulated

NAMUR INPUT
Connection: plug-in screw terminal
Sensor Excitation: 8.2 V
Internal Load/Source Impedance: 1 kΩ
Activated: <1 mA
Deactivated: >3 mA

CONTACT-CLOSURE INPUT
Connection: plug-in screw terminal
Sensor Excitation: 12 V regulated
Frequency Range: 10 on/off per second

ISOLATED ANALOG INPUT (optional)
Connection: plug-in screw terminal
Signal Range(s): 0-5 Vdc, 1-5 Vdc, 0-10 Vdc, 0-1 mA dc, 4-20 mA dc
Isolation, SIG GND to DIG GND: 354 Vp
Low-Level Shutoff: programmable
Non-Linearity Max.: 0.3% FS
Accuracy at 25°C: 0.05% FS
Temperature Coefficient: 50 ppm/°C

To Order (Specify Model No.) Prices Shown in U.S. Dollars

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Control Output</th>
<th>Analog Output</th>
<th>Serial Output</th>
<th>Input</th>
<th>Price</th>
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</thead>
<tbody>
<tr>
<td>INF7-01000-R</td>
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<td>RS-232</td>
<td>Rate</td>
<td>$765</td>
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</table>
The new INF8 counter is programmable for use as a quadrature counter, up-down counter, or angular counter (absolute code counter models are also available, consult sales for details). This instrument is designed for use with digital encoders, inductive, capacitive or optical pick-ups and ultrasonic sensors. In quadrature counting mode, the INF8 can be used with linear or rotational encoders. Counting direction is automatically selected by the momentary phase angle of the input.

The up-down counting mode is designed for fast bi-directional counting applications, while the angular counting mode uses an incremental encoder and counts quadrature pulses bi-directionally between 0 and 360°. The unit can be configured for either 1° or 0.1° resolution. Absolute code counter models can be used with Grey or Binary code resolvers. Models are available for single or multi-turn serial or parallel inputs. Parallel input models are available with 9 to 14-bit resolution, while serial input models are available with 8 to 19-bit resolution.

**SPECIFICATIONS**

**INF8Q—Quadrature Counter:** counting direction selected automatically by phase position of input signals A and B

**INF8U—Up-Down Counter:** input A represents input pulses, input B represents direction

**INF8A—Angular Counter:** counting direction automatically by phase position of input signals A and B; zero pulse from the external encoder sets the display to zero

**Display:** 6-digit, 0 to ±999,999, 7-segment, 14.7 mm

**Inputs:** 5 V CMOS, protected to 24 V max.

**Absolute Code Counter, Parallel:** grey or binary code, direct connection from absolute code resolvers; compatible with 9 to 14-bit resolvers with parallel outputs; single turn or multi-turn counter mode

**Absolute Code Counter, Serial:** grey or binary synchronized serial absolute counter mode, direct connection from absolute code resolvers; compatible with 8 to 19-bit resolvers with serial outputs; single turn or multi-turn counter mode

**Keypad:** five front panel keys to adjust all operating parameters

**Scaling:** 6-digit multiplication with sign and decimal point.

**Optional Digital Communications:** Either RS-232 or RS-485 is selectable from the front panel; baud rates from 1200 to 9600

**Analog Output:** -10 to 10 V and 0/4 to 20 mA; assignable to any display value from 0 to ±999,999

**Setpoints:** adjustable from 0 to ±999,999 with decimal point and sign; 4 open collector outputs rated 60 V at 100 mA Standard or 4 mechanical relays with contacts rated 5 A at 230 Vac optional

**User Lockout:** three levels of security; prohibit setpoint adjustments, entering into setup menu, or use of preset/reset function; optional for absolute counters

**Excitation:** 20-25 Vdc, 40 mA, unregulated

**Connections:** screw terminals and flat cable connector

**Power:** 115/230 Vac ±10%, 50-60 Hz; 10 W power consumption
### Dimensions
- 1/8 DIN, 48 H x 96 W x 159 mm D
- Panel Cutout: 1.8” x 3.7” (45 x 93 mm)
- Depth Behind Bezel: 100 mm (3.94”)

### To Order
( * Complete Model No.) Prices Shown in U.S. Dollars

<table>
<thead>
<tr>
<th>INF8-</th>
<th>( \text{(*)} )</th>
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</tr>
</tbody>
</table>

*Courtesy of Steven Engineering, Inc.*

230 Ryan Way, South San Francisco, CA 94080-6370
Main Office: (650) 588-9200
Outside Local Area: (800) 258-9200
www.stevenengineering.com
The **INFCTRA Series** ratemeter/totalizer offers user programming via the 5 front-panel keys. Scale factor may be programmed from -99,999 to 999,999 (any decimal point, multiply or divide), while offset may be programmed from -99,999 to 999,999 (any decimal point). Programs are stored in non-volatile memory, with three levels of program lockout for security. Optional features include Hi or Lo setpoints for control or alarm, plus RS-232 communication. Fixed decimal point or autoranging is standard.

**FUNCTIONS**

- Rate and totalize selected by menu

**SPECIFICATIONS**

- Rate and totalize selected by menu
**Display:** 6-digit, 7-segment red LED display

**INPUTS**
- **Type:** Single input. TTL, CMOS, NPN open collector, contact closure and magnetic pickup compatible; selected by dip switch. Non-isolated.
- **Level:** Max. 60 V; min. 25 mV rms
- **Frequency:** 30 kHz max.
- **Excitation:** Regulated, 5.0, 8.2, or 12.5 V selected by DIP switch, 100 mA max.
- **Accuracy:** ±1/2 LSD of total; 0.01% of the rate ±1/2 LSD
- **Setpoints:** Two, optional
- **Alarm Outputs:** Optional
- **Communication:** RS-232, analog output, optional
- **Rate Measurement Technique:** 1/x
- **Gate Time:** 0.30 sec
- **Decimal Point:** Programmable or autoranging
- **Trigger Slope:** Selectable by DIP switch
- **Leading Zeros:** Blank
- **Power:** 230 ±15% Vac
- **Dimensions:** 1.9" H x 3.8" W x 6" D (48 x 96 x 152 mm)
- **Panel Cutout:** 1.8" H x 3.6" W (45 x 92 mm)
- **Weight:** 16 oz (454 g)

**To Order** (* Complete Model No.) Prices Shown in U.S. Dollars

<table>
<thead>
<tr>
<th>Model</th>
<th>Power</th>
<th>Relay</th>
<th>Analog</th>
<th>Serial</th>
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<td>*</td>
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<td></td>
<td></td>
<td>N/C</td>
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</tr>
</tbody>
</table>

**Ordering Example:** INFCTRA-0011-R is a ratemeter/totalizer version ($260) with 115 Vac power, analog output ($100), and RS-232 output ($60), $260 + 100 + 60 = $420.
The **INFLDTA** provides a five-key front panel, which can be used to select mode of operation, scale factor, zero offset and two setpoints for ON/OFF control or alarm. Setup parameters can be saved in non-volatile memory with four levels of front-panel lockout for program security. In addition, the P6000 can be programmed via RS-232. It can also report its own setup data and transmit ongoing readings and alarm status via RS-232 or 20 mA ASCII current loop. Modem support is built in for remote operation.

The **INFLDTA** is a high accuracy indicator/controller for use with Newport’s line of linear displacement transducers. A bright, readable display gives you quick and accurate measurement information. Three open collector outputs let you preset high, low and go setpoints so that you get the right measurement time after time. This highly accurate product is easily scaled in virtually any units of measure right from the front-panel. Hardware lockouts allow you to prevent unauthorized adjustment of the meter. A standard NEMA 4 (IP65) front bezel will stand up to tough industrial environments. The full 6-digit display lets you measure accurately down to 1/1000th of an inch!

**Leading Technology**

The linear displacement display (INFLDTA) launches a current pulse along a wire inside the **LDT** probe. When the magnetic field of the current pulse interacts with the magnetic field of the rare-earth magnet a torsional strain pulse is sent back to the INFLDTA. The lapsed time between the current pulse and the returning strain pulse is measured and scaled to read in engineering units (i.e., inches, millimeters, etc.).

**SPECIFICATIONS**

**Accuracy at:** 25°C  
**Maximum Error:** ±0.001 inches  
**Warmup to Rated Accuracy:** 115 min.

**ENVIRONMENTAL**

**Operating Temperature:** 0 to 60°C (32 to 140°F)  
**Storage Temperature:** -40°C to 85°C (-40 to 184°F)  
**Relative Humidity:** 90% to 40°C (104°F) (non-condensing)

**POWER**
AC Voltage: 115 V or 230 V ±10%, 48 to 440 Hz
Consumption: 10 watts max.

MECHANICAL
Dimensions: 1.89" H x 3.78" W x 6.02" D (48 x 96 x 153 mm)
Panel Cutout: 1.78 H x 3.62" W
Weight: 1.27 lb. (574 g)

APPLICATIONS
- Hydraulic cylinders
- Material handling
- Forest product processing
- Blow molding
- Robotics
- Process control
- Metal and plastics pressing
- Metal extrusion
- Metal stamping
- Printing machinery
- Packaging machinery
- Wind power generation
- Biomedical use

To Order (* Complete Model No.) Prices Shown in U.S. Dollars

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Price</th>
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<tbody>
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<tr>
<td>0</td>
<td>No output options</td>
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<tr>
<td>1</td>
<td>BCD 5 V logic</td>
<td>$110</td>
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<tr>
<td>2</td>
<td>Dual 8 A form 'C' relays</td>
<td>$80</td>
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<tr>
<td>3</td>
<td>Analog Output</td>
<td>$155</td>
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</tbody>
</table>

Ordering Example: INFLDTAO3 position indicator with analog output, $475 + 155 = $630.

Linear Displacement Transducer Probes

Available from NEWPORT
The INFPT multifunctional panel meter is designed to be set up as a clock/timer controller or stopwatch. The unit contains eight different time bases and has a built-in date function. The meter employs five controller output modes, which enable the user to set up the unit to virtually any timer control application.

The INFPT is perfectly suited for life cycle testing, turning four loads on and off based on timing cycle. The clock time base is derived from the 50 or 60 Hz power line and from the internal crystal oscillator. Front-panel pushbuttons provide a convenient means of configuration and access to the meter’s many features. These features can also be accessed through RS-232 or RS-485 serial communications. The front-panel displays values and messages with six, 14-segment LEDs.

**SPECIFICATIONS**

**Accuracy:** max. error ±50 ppm over full temp range; Warmup to rated accuracy: 55 min  
**Display:** 6-digit, 14 segment LED; 14.2 mm (0.56” H): 4 LED outputs to indicate ON or ACTIVE mode  
**Display Modes:** 12-hour clock, 24-hour clock, 99-day, 99-hour, 99-minute, 999999-hour, 9999.99-hour, 9999.99-minute, 9999.99-sec  
**TTL Outputs:** 4, standard; rated 150 mA at 1 V sink: 30 V open  
**Relay Outputs (optional):** Dual relays, form C, 5 A at 30 Vdc or 230 Vac  
**Four-Relay Board:** Dual 7 amp plus Dual 1 amp form C relays  
**Power:** 115 or 230 Vac ± 10%, 49-440 Hz (to 440 Hz with 110 or 220 V min)  
**Power Consumption:** 3 to 10 Watts max.

**GENERAL**

**Input Threshold:** 1 V to 3.5 V  
**Protection Level:** 24 Vdc  
**Connection:** Two 3-Socket input plugs  
**Input Resistance:** 30 kohm pull-up resistor to +5 V  
**Operating Ambient Range:** 0 to 50°C (32 to 122°F)  
**Relative Humidity:** 90% at 40°C (non-condensing)  
**Dimensions:** 48 H x 96 W x 156 D mm (1.89” x 3.78” x 6.13”)

http://www.newportus.com/Products/FreqRate/INFPT.htm (1 of 2) [9/1/2000 2:16:58 PM]
**Panel Cutout:** 45 H x 96 W mm (1.772" x 3.622"); 1/8 DIN  
**Weight:** 574 g (1.27 lb)

**To Order** (* Complete Model No.) **Prices Shown in U.S. Dollars**

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<th>MODEL INFPT</th>
<th>INFINITY™ Process Timer/Controller</th>
<th>Price</th>
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<tbody>
<tr>
<td>Power &amp; LED Color</td>
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<tr>
<td>0</td>
<td>115 Vac power and red LED</td>
<td>$395</td>
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<td>1</td>
<td>230 Vac power and red LED</td>
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<td>230 Vac power and green LED</td>
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<th>BCD &amp; Control Output(s)</th>
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<td>0</td>
<td>4 Optically isolated open collector outputs</td>
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<td>1</td>
<td>Isolated parallel BCD outputs</td>
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<td>Dual 7 amp relays</td>
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<td>2</td>
<td>Isolated RS-485 serial output 110 (includes 6' cable and connectors).</td>
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</table>

**Ordering Example:** **INFPT-0-0-1** programmable timer with RS-232C communications, $395 + 110 = $505.
The P5000 microprocessor-based, 6-digit, 1/8 DIN panel instrument can be configured by front-panel keys or by a personal computer as a frequency meter/ tachometer, frequency-ratio meter, period/ period-average meter, time-interval/time-interval-average meter, reset stopwatch, and cumulative timer or totalizer/1-stage batch controller. However, the P5000 display cannot toggle between rate and total. Two signal inputs can be used to provide frequency ratio or time-interval measurements.

### Five Operating Modes
In the frequency meter, the minimum display update rate is equal to 1 period of the frequency input. Thus, very low frequency measurements are displayed and updated faster than most conventional frequency meters. Only two sensors are required to measure the rate of a moving object. The P5000 can be set up as frequency-ratio meter, ideal for monitoring flow ratios.

The P5000 can be set up as an up or down totalizer/1-stage batch controller at rates up to 7 MHz. The display capacity is −99,999 to 999,999 counts with exponential format up to 9.99 E9. Upon ac power loss, the latest reading is automatically saved in non-volatile RAM and is restored upon return of power.

### SPECIFICATIONS

#### TTL INPUT

**Speed and Protection Levels (jumper selectable):** 7 MHz, 0-5 V; 100 kHz, -20 to +25 V; 3 kHz, -20 to +25 V

**Isolated Input Sensitivity (square-wave input):** ±10 mV, 0 to 1 kHz; ±25 mV, 0 to 1 kHz; ±50 mV at 100 kHz Requires PGA1

**NPN or PNP Open-Collector Sensor Excitation Output:** 12.4 V at 20 mA

#### COMMON SPECIFICATIONS (All Input Types)

**Number of Inputs:** 1 or 2 (2 inputs for frequency ratio and time interval only)

**Update Rate:** 60 msec to 99.99 sec, field programmable
OPERATION MODES
Frequency/Tachometer Mode– Frequency Range: 10-6 Hz to 7 MHz
Accuracy at 25°C (square wave): ±0.0002% (+2 ppm)
Totalizer Display–Offset (preset): –99,999 to 999,999

ISOLATED ANALOG INPUT
Accuracy: better than 99.9%
Non-Linearity: 0.05% FS
Isolation: 350 Vdc between output and input
Power: 230 Vac, 10-32 Vdc
AC Frequency: 49-440 Hz
Power Consumption, Typical: 3 W
Battery Backup: user-supplied 6-12 Vdc, 60 mA to maintain operation, 400 mA with display
Dimensions: 1.9” H x 3.8” W x 5.9” D (48 x 96 x 150 mm); 1.8” x 3.6” (45 x 92 mm ) cutout

ON/OFF CONTROL & ALARM OUTPUTS
Standard: three open-collector transistors, rated 150 mA sink, 30V
Optional: two form C relays rated 8 A, 30 Vdc, or 240 Vac for rate alarm or batch control
Analog Output Optional: isolated, scalable, internally powered and field selectable for 0-10 V, 4-20 mA, or 0-20 mA.
Rangeable over 4 left most or right most digits, suitable for rate or total display.
Min. Impedance for 10 V: 500ohm
Max. External Impedance for 20 mA: 600ohm

Input Options
‘0’ = Standard input, dual-channel input board, non-isolated TTL/5 V CMOS-level, frequency range of 10-6 to 7 MHz.
Default calibration: 0 to 10 kHz = 0 to 10000.0.

‘1’ = Isolated single-channel input board with sensor excitation, protected for signals up to 260 Vac. (P6A1). Default calibration: 0 to 10 kHz = 0 to 10000.0.

‘2’ = Non-isolated dual-channel input board with sensor excitation. Protected for input signals up to 260 Vac RMS. (P6A2). Default calibration: 0 to 10 kHz = 0 to 10000.0

‘3’ = Non-isolated single-channel input board with sensor excitation. Protected for input signals up to 60 Vac RMS. (P6A3). Default calibration: 0 to 10 kHz = 0 to 10000.0

‘4’ = Isolated analog-to-frequency single-channel input with 24 Vdc, 0-1 mA, 4-20 mA dc, 1-5 Vdc, and 0-10 Vdc (P6A5).

To Order (* Complete Model No.)  Prices Shown in U.S. Dollars

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**Ordering Example:** P5021 = 115 Vac power, two relays, and isolated single channel input, $380 + 80 + 95 = $555.
OPERATING MODES
1. Frequency/tachometer from $10^{-6}$ Hz to 7 MHz
2. Frequency ratio FB/FA from 0.02 Hz to 7 MHz
3. Totalizer up or down from -99,999 to 999,999 or accumulating stopwatch
4. Period/period average from 140 ns to 36 days
5. Time interval/time interval average/stopwatch
6. Process meter for 4-20 mA, 0-2 or 0-10 V input
7. Integrating totalizer for 4-20 mA, 0-2 V or 0-10 V input

FAST LOW-FREQUENCY MEASUREMENT
✓ Every 50 ms + 1 signal period
✓ Slower read rates for frequency averaging

PROGRAMMING FEATURES
✓ Scale factor from -99,999 to 999,999 (any decimal point, multiply or divide)
✓ Offset from -99,999 to 999,999 (any decimal point)
✓ HI and LO setpoints for control or alarm
✓ Programming via front-panel or RS-232
✓ Program stored in non-volatile memory
✓ Four levels of program lockout for security
✓ Fixed decimal point or autoranging

SIGNAL CONDITIONER CHOICES
✓ Dual-channel TTL with protection to 25 V
✓ Single-channel, isolated, with excitation
In its base configuration, the P6000 is a microprocessor-based, 6-digit, 1/8 DIN counter which can be configured by front-panel keys or by a personal computer as a frequency meter/tachometer, frequency-ratio meter, period/period-average meter, time-interval/time-interval-average meter or totalizer. It combines these five operating modes with ease of setup, wide dynamic range, six-figure crystal-based accuracy, and software scaling.

With the addition of an optional analog-to-frequency signal conditioner, the P6000 can become a software-scalable process meter with two setpoints and exceptionally wide zero offset capability. It can also become a 6-digit analog integrating totalizer.

The P6000 provides a five-key front panel, which can be used to select mode of operation, scale factor, zero offset and two setpoints for ON/OFF control or alarm. Setup parameters can be saved in non-volatile memory with four levels of front-panel lockout for program security. In addition, the P6000 can be programmed via RS-232. It can also report its own setup data and transmit ongoing readings and alarm status via RS-232 or 20 mA ASCII current loop. Modem support is built in for remote operation.

FLEXIBLE SIGNAL CONDITIONING

0. TTL-LEVEL PULSE INPUTS
Dual non-isolated TTL/5 V CMOS-level input channels with protection to 25 V dc are standard and can accommodate frequencies up to 7 MHz. The inputs can be tied to contact closures by using a spare flip-flop available at the connector for debounce. They can also be tied to sensors with an open-collector NPN or PNP output if these are powered externally. Contact closures require an external 20 kOhm pull-up resistor. PNP sensors require an external 1 kOhm pull-down resistor.

1 & 2. ISOLATED SIGNAL CONDITIONER WITH EXCITATION OUTPUT
This almost universal signal conditioner is available in single- or dual-channel versions. It provides sensor excitation output plus AC or DC coupling, signal isolation to 350 Vp, and jumper-selectable low-pass filtering, debounce time and hysteresis. It allows the P6000 to be tied directly to passive magnetic pickups with output down to ±10 mV, to AC line voltages up to 240 V rms, and to NPN, PNP, NAMUR or contact-closure sensors all with a high degree of input protection.

3. NON-ISOLATED SIGNAL CONDITIONER WITH EXCITATION OUTPUT
This is an economical single-channel non-isolated signal conditioner which supplies power up to 16 V at 25 mA for direct 3-wire connection to NPN sensors, or 2-wire connection to NAMUR sensors (<1 mA ON, >3 mA OFF) and contact closures. It can also be used with magnetic pickups and other active voltage sources from 0 to 200 mV up to 60 V rms.
The P6000 measures frequency or period by counting the number of 11.059 MHz clock pulses during an actual gate time t, which corresponds to an integer number of signal periods N. This technique allows high-accuracy low-frequency measurements. Frequency is calculated from N/t, period from t/N.

4. ISOLATED ANALOG-TO-FREQUENCY SIGNAL CONDITIONER
This signal conditioner accepts 4-20 mA, 0-5 V or 0-10 V analog signals and turns the P6000 into a process meter with isolated input, 6-digit scale and offset capability, two setpoints and RS-232. It also allows the P6000 to serve as an analog integrating totalizer, for instance to display volume based on the 4-20 mA signal from a flowmeter.