

4711 MICROPOWER, 10 kHz VOLTAGE-TO-FREQUENCY CONVERTER

The Model 4711 provides a 10 Hz to 10 kHz pulse train output which is a direct linear function of a +1 mV to +10 VDC input signal. With over 3 decades of dynamic range and high linearity the transfer characteristic of the 4711 is:

$$F_{out} = 10 \text{ kHz} \frac{\text{input voltage}}{+10 \text{ V}}$$

Applications for the 4711 include frequency modulation for telemetry or magnetic tape recording using solar or battery power. The 4711 will operate for 1 month on four 9 V transistor radio batteries. Philbrick's Model 4714 can be used for precision demodulation.

Precision long-term, low-drift integrate and hold circuits can be made with a 4711, and CMOS counters. Adding a display and a time base to this circuit will result in a battery powered DVM. The 4711 can be easily adapted to drive CMOS IC's from power supplies over the range of 3 to 15 V. The 4711 can also be used with a photo isolator to transmit data in the presence of high common mode voltages.

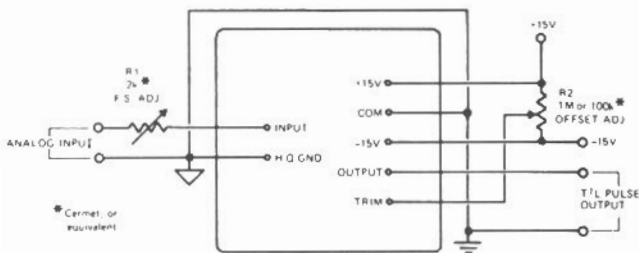
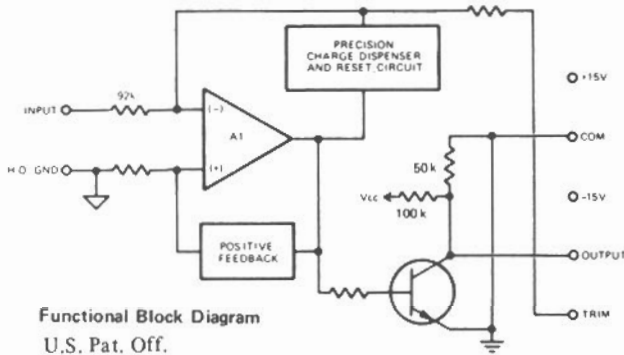


FEATURES

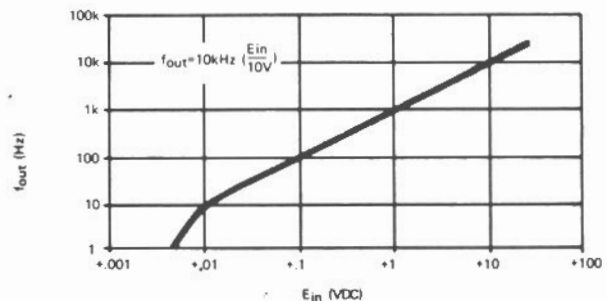
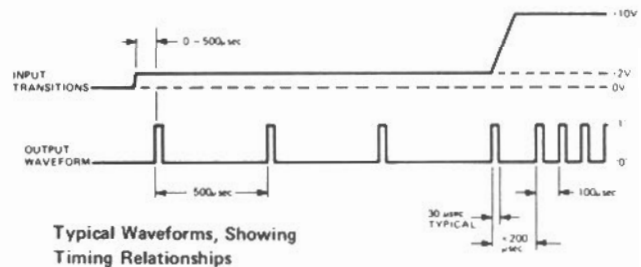
- Very Low Power – 30 mW max.
- Inexpensive
- Good Linearity – 0.008% Typical
- Resolution to 13-Bits

APPLICATIONS

- Battery Powered Data Recording System
- Solar Powered Telemetry Systems
- No Drift-No Droop Integrators
- Signal Isolation
- Digital to Frequency Conversion



Connections Required for Operation, plus optional Input Offset and Full Scale Adjustments



SPECIFICATIONS (Typical at +25°C, $V_{CC} = \pm 15V$, unless otherwise indicated)**MODEL 4711****ANALOG INPUT**

Full Scale	0 VDC to +10 VDC
Overrange	+10% min., +25% typical
Configuration	Single-ended, referred to ground
Offset Voltage (Adjustable to zero)	± 3 mV typical, ± 10 mV max.
Impedance	92 k Ω , nominal
Overvoltage Protection	± 15 V max. input without damage

FREQUENCY OUTPUT

Full Scale Frequency (f_{out})	0 Hz to 10 kHz plus 10% overrange, min.
Linearity ($V_{in} = +10$ mV to +11 V)	$\pm 0.008\%$ typical; $\pm 0.05\%$ max.
Transfer Characteristic	$f_{out} = 10$ kHz \times ($E_{in}/10$ V)
Full Scale Factor	9.900 V ± 0.05 V (trimmable to 10.000 V for 10.000 kHz)
Waveform (See illustration)	Train of DTL/T ² L — compatible pulses @ f_{out}
Pulse Characteristics '1' (HIGH)	+5 V ± 0.5 V (no load); +2.4 V min. (0.04 mA load) (See Note 2)
'0' (LOW)	+0.10 ± 0.10 V @ -3.2 mA sink current
WIDTH	30 μ sec typical; output is normally low with pos. going pulses
Output Impedance (in High State)	30 k Ω
Fan-out (min.)	2 standard T ² L, or 20 LT ² L, or 20 CMOS (See Note 2)
Short Circuit Protection (to ground)	(see note 1)

RESPONSE

Settling Time to 0.01% for Step Input	1 or 2 cycles plus 20 μ sec
Overload Recovery Time	10 msec
Allowable Capacitive Load	100 pF for rated performance

STABILITY

Full Scale (Span)	
T.C. (ppm/ $^{\circ}$ C of F.S.)	± 24 typical, ± 100 max.
Drift Per Day	± 100 ppm of F.S.
Per Month	± 200 ppm of F.S.
Power Supply Sensitivity	± 500 ppm/ $\% \Delta V_{CC}$ max.
Input Offset	
T.C. (μ V/ $^{\circ}$ C Referred to Input)	± 30 typical, ± 100 max.
Drift Per Day	± 100 μ V
Per Month	± 200 μ V
Power Supply Sensitivity	± 100 μ V/ $\% \Delta V_{CC}$ max.
Warm-Up Time	< 2 seconds to 0.01%

POWER

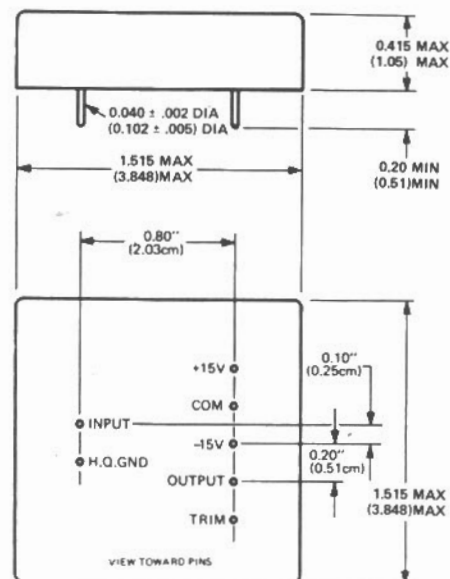
Voltage (V_{CC})	$\pm 12V$ to $\pm 18V$
Current (I_{CC})	± 0.7 mA typical; +1.5 mA max., -1 mA max.
Power	30 mW total power supply drain, max.

ENVIRONMENTAL

Temperature	
Operating	0°C to +70°C
Storage	-55°C to +85°C
Humidity (Operating or Storage)	98% non-condensing

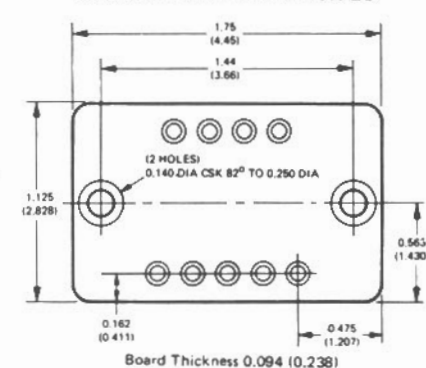
NOTES:

- Short circuit proof to ground or to +15 VDC. Do not short OUTPUT to -Vcc or the 4711 will definitely FAIL.
- To increase the output's High level to +12 VDC for driving CMOS, connect a 12 k Ω pull up resistor from the Output to +15 VDC.



± 0.01 Non-cumulative tolerance between pins
 ± 0.02 Tolerance from case edge to center of pins

DIMENSIONS IN PARENTHESES ARE EXPRESSED IN CENTIMETERS

Optional Socket: Model NSK-20

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