Counter Buying Tips

Frequency counters are bought based on specifications and features. Here are some tips on what the important specs are, and how to interpret them.

Frequency Range. This spec would seem to speak for itself, i.e., how high does the instrument count? Be sure that the advertised frequency range is no higher than that which is guaranteed by the logic manufacturer. All Heath counters are specified in this manner.

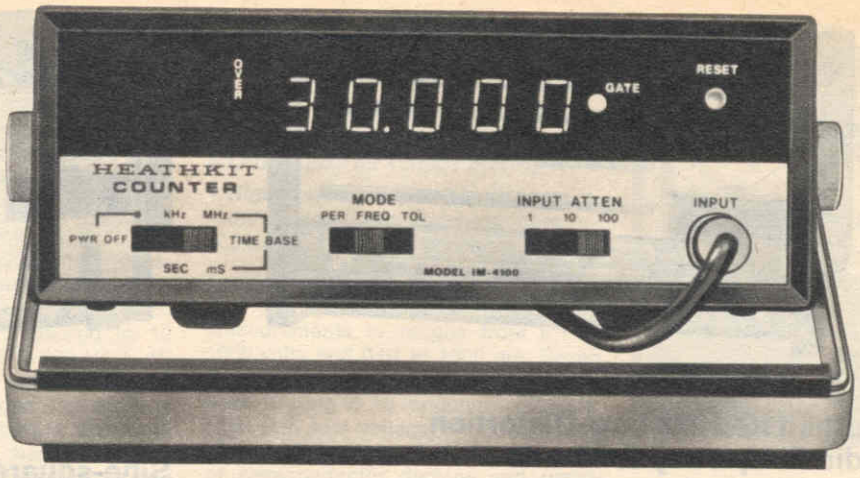
Sensitivity. Heath experience has determined that an input sensitivity of 15-25 mV is the best for most applications. Very low sensitivities (100 mV or higher) are often useless and high sensitivities (1 mV) can give false readings on noisy signals.

Input Impedance. Since the input impedance is both resistive and capacitive, you need to know both values. At high frequencies (above 110 MHz), the capacitive loading becomes the most important factor. At 500 MHz, 1 megohm shunted by 25 pF is actually a 12 ohm load. This is a VSWR of greater than 4, with a 50-ohm cable. At these frequencies, well-designed counters use as a close to a resistive 50 ohm input as practical to maintain a good VSWR. Heath counters GUARANTEE a VSWR of 1.5 to 1 up to 250 MHz, and less than 2.0 at 1 GHz.

Accuracy. This spec is given as time base accuracy ±1 digit. Time base accuracy must include both aging rate and temperature stability to be meaningful. Some manufacturers hide errors of 25 ppm or more by omitting one or both of these factors. All Heath counters are specified with both aging rate and temperature stability to insure a true accuracy specification.

Resolution is determined by the number of digits and gate time. It is easy to be misled by simply considering the number of digits. Well-designed counters, like Heath's, always provide the proper number of digits and the proper gate times for resolution consistent with accuracy as defined above.

These considerations plus numerous other features, service and parts availability make Heath counters one of your best instruments buys!



Our Lowest-Priced Counter

Heathkit IM-4100 — Counts frequency to 30 MHz, period to 99.999 seconds, events to 99,999

$129.95 ***Gives you the performance you NEED for precision measurements with outstanding resolution and sensitivity***

The Heathkit IM-4100 is an almost unbelievable counter value. It's a full five-digit frequency counter which also functions in period and totalize modes. It provides built-in input attenuation and 12-volt operation all in one compact package. The latest digital design and a stable 10 MHz crystal oscillator assure accuracy and precision on all measurements. Its excellent resolution makes it ideal for a variety of signal alignment applications.

As a frequency counter, the IM-4100 is guaranteed to 30 MHz with 1 Hz resolution. Sensitivity is 15 mV from 50 Hz to 30 MHz, 50 mV below 50 Hz.

In the period mode, it measures intervals up to 99.999 seconds. Using the millisecond time base, it resolves to 1 μsec! This mode can be used for low frequency measurements with high accuracy. Just position the TIME BASE switch to mS and the MODE switch to PER. Then solve the equation f = 1/period, using the displayed value.

The totalize mode will add up (totalize) event pulses up to a count of 99,999. Pushing the RESET button starts the count at zero. An inhibit signal can stop the totalize mode at any time, without loss of the displayed count.

The front panel attenuator switch allows the amplitude of input signals to be divided by 1, 10 or 100. The pushbutton RESET switch quickly resets the display to zero in *any* mode. Front panel display includes overrange indicator and a gate lamp.

A rear panel switch easily selects internal or external time base. The rear panel connector can be used as an input for an external time base signal, frequency ratio measurements, or as an output to check the internal 10 MHz time base, or to provide a convenient frequency standard of 1 MHz for bench use. The IM-4100 operates on 120/240 VAC, or 12-volt DC. DC power is applied through a rear panel connector (mating connector supplied).

The IM-4100 is an easy kit to build, with an open chassis layout, with circuit board construction to simplify assembly. Or you can order it factory assembled and tested.

Kit IM-4100, Shpg. wt. 6 lbs. **129.95**
Factory assembled and tested version of above.

SM-4100, Shpg. wt. 6 lbs. **190.00**

IM-4100 SPECIFICATIONS

FUNCTIONS — Frequency: 5 Hz to 30 MHz minimum. Period: 1 μsec resolution to 99.999 sec. Totalize: 1-99,999 events. Sensitivity: 15 mV rms (50 mV, 5 Hz to 50 Hz). Period Pulse Width: 25 nsec minimum. Low Frequency Signal Risetime: 1 msec for signals less than 10 Hz. Input Impedance: 1 meghom shunted by less than 35 pF. Protection: 240 volts rms at 60 Hz. Attenuator: X1, X10, X100 fixed compensation. TIME BASE — Frequency: 10 MHz. Setability: ±1 ppm. Temperature stability: ±10 ppm, maximum 0° to 40° C ambient. Aging rate, 10 ppm per year. OSCILLATOR CONNECTION — External Input Frequency: DC to 20 MHz. External Input Sensitivity: TTL or 2.5 V rms from 50-ohm source. Internal Output: TTL signal at 1 MHz. GENERAL — Gate Interval: kHz-1 sec, MHz-1 msec. Manual Gate: DC control in events mode using external OSC input connector. Display Time: 200 msec plus gate interval. Power Requirement: 105-130 or 210-260 VAC (switch-selected). 60/50 Hz, (at 25 watts); or 9-14 VDC at 1.25 amperes. Dimensions: 2¾" H x 7¼" W x 10½" D (less handle).