

### Models 451, 453

#### FEATURES

##### Low Cost

**Versatility:** Adjustable Threshold, Gain & Output Offset  
**Guaranteed Low Nonlinearity:** 80ppm Max, 451L and 453L  
**Accepts** TTL, CMOS, HNIL, Sinewave, Pulse, Squarewave  
and Triangle Wave Input Signals

**No External Components to Meet Rated Performance**

**+20mA Output to Operate Relays and Meters**

**Low Profile Package, 0.4" Case Height**

**Meet MIL-STD-202E Environmental Testing**

#### APPLICATIONS

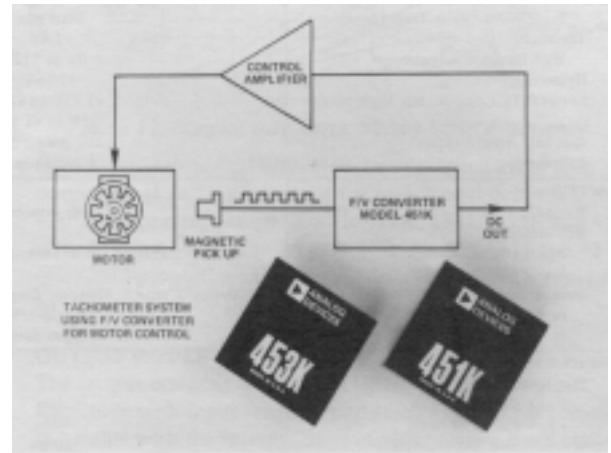
**Motor Control and Speed Monitor**

**Line Frequency Monitor and Alarm Indicator**

**Fluid Flow Measurements and Control**

**FM Demodulation and VCO Stabilization**

**Frequency vs. Amplitude Response Measurements**



#### GENERAL DESCRIPTION

Models 451 and 453 are low cost 10kHz and 100kHz frequency to voltage converters that feature excellent low nonlinearity to less than 80ppm, output current of +20mA and the capability of interfacing with TTL, HNIL, CMOS, sinewave, squarewave, pulse and triangular input signals. External components are not required to achieve rated performance, however, extreme versatility is maintained by allowing access to all critical points of the design. This versatility allows programmable input threshold, gain, and output offset voltage.

Both models 451 and 453 are available in three selections, each offering guaranteed maximum nonlinearity error as well as maximum gain drift error. Models 451J and 453J offer 0.03% max nonlinearity and 100ppm/°C max gain drift. Models 451K and 453K offer 0.015% max nonlinearity and 50ppm/°C max gain drift. Models 451L and 453L offer 0.008% max nonlinearity and 50ppm/°C max gain drift.

#### WHERE TO USE FREQUENCY TO VOLTAGE CONVERTERS

Pin compatible with existing popular models, these versatile new designs offer economical solutions to a wide variety of applications where it is required to convert frequency to an analog voltage.

**Process Control Systems:** For motor speed controllers, power line frequency monitoring and fluid flow measurements where flow transducers, such as variable reluctance magnetic pickups, provide pulse train outputs as a linear function of flow rate.

**Audio and Acoustic Systems:** For wow and flutter measurements with tape recorders and turntables, FM demodulation and speaker response measurements.

**Test Instrumentation:** For VCO stabilization, analog readout frequency meter, vibrational analysis and frequency versus amplitude X-Y plots where the vertical axis presents the normal amplitude signal and

the horizontal axis presents the output signal from the F/V converter.

**Data Acquisition Systems:** For converting serially transmitted data back to analog voltages.

#### DESIGN FEATURES AND USER BENEFITS

The combination of low cost and high performance provided by models 451 and 453 offers exceptional quality and value to the OEM designer. These compact modules have been designed to provide maximum versatility, thereby increasing their utility in a broad scope of applications.

**Adjustable Input Threshold:** Threshold level is externally resistor programmable from 0 to  $\pm 12V$ , permitting simple, direct interface with low level signals, e.g. 10mV p-p, as well as with high level inputs such as CMOS and HNIL logic levels, e.g. 0 to +12V.

**Adjustable Gain:** Model 451 can be adjusted to provide full scale output voltage for any input frequency from 100Hz to 20kHz. Model 453 can be adjusted to provide full scale output voltage for any input frequency from 1kHz to 200kHz. This adjustable gain feature enables the user to easily match the maximum frequency output from a wide class of frequency transducers to the +10V full scale output from models 451 and 453. Increased signal conversion sensitivity with higher resolution results.

**Adjustable Output Offset Voltage:** The output offset is adjustable from -10V to +10V, enabling bipolar outputs or expanded scale measurements or setting the input frequency where zero output voltage occurs.