

**Model 99539C**  
**Voltage-to-Frequency Converter**

The Model 99539C VFC is an 8-channel wide dynamic range voltage-to-frequency converter of modular design and occupies the ninth slot of the Model 99539 multi-channel current preamplifier system. The VFC accepts voltage inputs via the Model 99539 system backplane from each of the modular preamplifier outputs or may be configured to accept external inputs from other remote instrumentation. The VFC outputs are made available at the rear panel of the Model 99539B rack chassis.

The Model 99539C VFC is designed to operate with any microprocessor-based counter/timing system (external) for wide dynamic range analog-to-digital conversion. Attainable resolution (repeatability), for counter gate times as low as 5 msec and up to 1 second, is better than 18 bits (minimum dynamic range of 108 dB).

The VFC inputs are isolated from the Model 99539 system ground to provide for ground (input low) noise rejection. The outputs are isolated from the system ground for rejection of conducted noise (ground loop protection). VFC inputs are overload-protected to  $\pm 50$  volts and outputs are short-circuit protected. The VFC outputs are designed to drive cable lengths up to 30 feet.

- Input:** DC-coupled, single-ended inputs (8) with isolated signal low. Inputs may be configured to accept signals from instrumentation external to the Model 99539 system.
- Input Impedance:** 1 M $\Omega$ //50 pF
- Input Range:**  $\pm 10$  volts for full scale; input polarity is selectable internally for each channel
- Input Range Expand:** Internally-selectable, each channel, to  $\pm 1$  volt for full-scale; permits amplifier output expansion (full scale sensitivity) without degradation of VFC specifications.
- DC Stability:** 35  $\mu$ V/ $^{\circ}$ C, maximum
- Maximum Input:** Maximum safe input is  $\pm 50$  volts, DC or peak AC.
- Transfer Function:**  $\pm 10$  volts or  $\pm 1$  volt for 1 MHz full scale. Full scale frequency may be internally changed from 20 kHz to 2MHz.

**Model 99539C VFC (continued)**

<b>Linearity Error:</b>	Less than 0.01% over the full scale range (transfer function endpoints) for full scale = 1 MHz.
<b>Gain Error:</b>	Internally trimmed at factory to less than 0.05%.
<b>Gain Stability:</b>	25 ppM/°C
<b>Frequency Jitter:</b>	200 ppM pk-pk maximum over the operating frequency range.
<b>Reference:</b>	Internal reference provision allows for transfer function offset if required. Reference stability is 50 ppM/°C maximum.
<b>Time Constant:</b>	Internally-selectable (each channel) from minimum (less than 1 msec), and 10 msec to 10 seconds in decade steps.
<b>Outputs:</b>	BNC outputs (8) on Model 99539 system rear panel. Outputs are isolated from system power ground.
<b>Output Waveform:</b>	Pulse waveform; may be changed to provide square-wave output via internal jumper
<b>Output Level:</b>	TTL/HCMOS
<b>Output Drive:</b>	55 mA minimum with no rate-limit distortion. Output will drive up to 30 feet of coaxial cable.
<b>Gate Function:</b>	Gating of all 8 channels may be accomplished via BNC input on the rear panel of the Model 99539 system. If left unconnected, or with a logic high applied, the VFC channels are enabled. If a logic low is applied, the VFC channels are disabled. Gate input levels are TTL/HCMOS compatible.  Alternately, as an option, each VFC channel may be gated individually.  Enable settling time is one cycle of frequency plus 5 microseconds.
<b>Temperature, operating:</b>	0°C to 45°C; specifications apply, 25°C ±5°C.