

APPLICATION NOTES
REFLEX[®] MODEL 258 FREQUENCY TO VOLTAGE
CONVERTER (DIGITAL TACH)
PART NUMBER 12M03-00145-01

1. A speed signal can be economically obtained by putting a magnetic pickup on a gear anywhere on the machine. A standard 60 tooth gear on the motor shaft at 1800 RPM produces a frequency of 1.8KHz. This circuit can produce 10 volts output on the 2.5K Hz range at speeds below 1000 RPM depending on setting of the "Output Trim Adjust".
2. For smooth operation at low speeds there should be a minimum of 10 pulses per second at the lowest operating speed.
3. If a directional sense is required a quadrature type zero speed pulse generator with square wave output must be used. It is connected to terminals 2 and 4 and must be terminated for active output of 1's and 0's in both directions with a pull-up or pull-down resistor if required. If the directional sense is reversed, reverse the leads to terminals 2 and 4.
4. This circuit may be used in conjunction with the REFLEX[®] Model 202 Voltage Sensitive Relay for overspeed detection independent of the tachometer generator used for speed control.
5. This circuit may be used to detect loss of tachometer signal by comparing its output to the tachometer generator used for feedback. An absolute value amplifier can be used to detect an error of either polarity.
6. This circuit may be used for speed indication by putting an analog or digital meter on the appropriate output terminal (terminal 5 analog, terminal 3 digital).
7. Output at terminal 5 with a single-ended pickup is normally negative. If a positive output is desired, connect the Quadrature Input, terminal 2, to positive 6 volts, terminal 6.
8. If terminal 2 is not used, it should be connected to negative 15 volts, terminal 7 or to circuit common, terminal 8 to avoid possible noise pickup.
9. The "Output Trim Adjust" has a nominal range of 2.5 to 1 based on the frequency range selected. This means that the circuit will produce a full ten volts output with a 60 tooth gear at speeds below 1000 RPM.

10. To avoid erratic operation due to undesired electrical signals, connect the pickup to the circuit card with a shielded cable. The shield should be connected at the pickup (source) end only to the pickup lead that is connected to system common.

11. If an oscilloscope is available, observe the conditioned Frequency Output at terminal 3. It should be a clean, uniform duration rectangular wave. If it is not, with the unit running at minimum speed, turn the "Input Attenuator" Counter-clockwise (CCW) until the wave form is obviously no longer representative of the input frequency. Turn the adjustment CW a few degrees past the point where the wave-form becomes stable and clean. Then observe the wave form over the full speed range.

If extra pulses are observed this indicates input noise and linearity and accuracy will suffer unless the problem is corrected (see Paragraph 10 above).