The VICO produces an output current proportional to an input voltage. The VICO will typically finds application in circuits meant to transmit analog data from one location to another over relatively long runs of wire or cable, up to hundreds of feet. Attempting to transmit voltages directly over that length of wire can lead to problems with voltage drops and noise pickup along the cable.

The signal-dependent current, \( I_o \), is proportional to input voltage \( V_i \). Usually, a resistor \( R \) at the end of the cable or inside the main CPU or controller will convert the current back to a voltage, \( V_o \). The accuracy is not affected by the ground loop voltage \( V_g \).

Please let us know what your requirements are for scaling. A typical value would be 0–20 milliamps output for 0–1 volt input. Component values in the circuit can be customized to provide your desired scale factor in milliamps per volt.

Circuit board size, 0.75" by 1.875", and mounting holes for #50 hardware on 0.6" x 1.7" centers. Phoenix screw-down terminals are provided for signal connections.

Connections: Connect the power supply to the terminals as shown. The voltage supply input must be at least 1.5 volts higher than the highest expected voltage compliance on the current output. For example, suppose that at the far end of the cable, the current source is loaded with 250 ohms, and the maximum current is 20 milliamps, then the voltage compliance must be at least \( 250 \times 0.020 = 5 \) volts. So the minimum power supply is 6.5 volts. The absolute minimum power supply is 4.7 volts. There is an auxiliary power supply terminal that can be used to power an external sensor input or potentiometer if necessary.

Schematic: The VICO has an option to accept either a constant DC voltage, or a PWM input from a microcontroller, which the circuit will average via \( R1/C2 \). The operational amplifiers in conjunction with the transistors implement a precision current mirror. Component values can be customized in the circuit to provide different scale factors, adjustable with trimmer \( RT1 \). The circuit uses a high accuracy CAZ (commutating auto-zero) amplifier and superbeta transistors, in order to achieve low offset of the zero point and high accuracy in the conversion of voltage to current.