

### Introduction

The CP Series high-voltage power supply (HVPS) has unique capabilities which allow it to provide an extended current range and allow the user to regulate the output power directly. This series, while rated for 10 watts maximum output power, provides a 10:1 range in current capability. This means a 10-kilovolt, 1-milliamp power supply can source 10 milliamps at 1 kilovolt. The power supply is limited to 10 watts of output power by a power regulation circuit that can be programmed with a 0 to +10V signal that is proportional to 0 to 10 watts.

The CP provides three operating modes: the user can regulate output voltage, current, or power. The three regulation modes have automatic crossover. An open drain mode indicator is also available; it can directly drive an LED or, coupled with a pull up resistor, provide a logic level. Monitoring is provided for voltage, current, and power. All monitors are buffered, have low output impedance, and are 0 to +10V full scale.

**Pin 1 and 8 – Power Ground:** Use these pins for the input power return. Do not allow input power return current to flow through the Signal Ground connections.

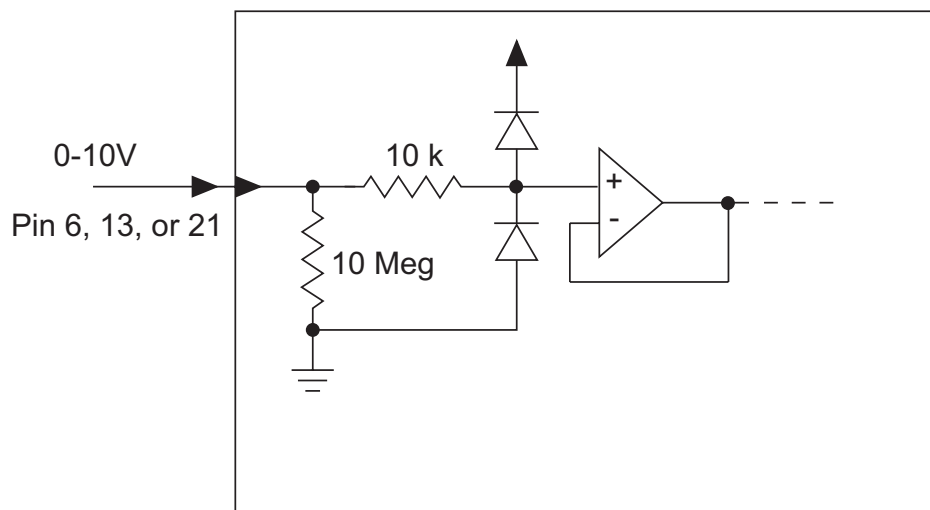
**Pin 2 and 9 – Positive Power Input:** The input power to the CP is +24V nominal with a +/-10% range.

**Pin 3 – Current Monitor:** The current monitor has the same scale factor as the current programming signal. 0 to +10V indicates 0 to 100% of rated current. The current monitor signal is derived internally from the current feedback and is buffered to provide low output impedance.

**Pin 4 – Enable/Disable:** A logic high between 4V and 10V will enable the power supply. A logic low of 4V or less will disable the power supply. The default or open circuit state is enabled.

**Pin 5 – Signal Ground:** The signal ground and power ground are common inside the power supply. This pin should be used as reference for all control and monitoring signals. If input power current is allowed to flow through this pin, offsets can occur which will degrade voltage regulation and monitoring accuracy.

**Pin 6 – Voltage Programming:** A 0V to +10V signal will program the power supply for 0 to 100% rated output voltage. The input impedance for this control pin is 10M $\Omega$ ; a resistor to ground will program the power supply for zero output voltage if this pin is left open. See Figure 1 for a typical programming pin circuit.

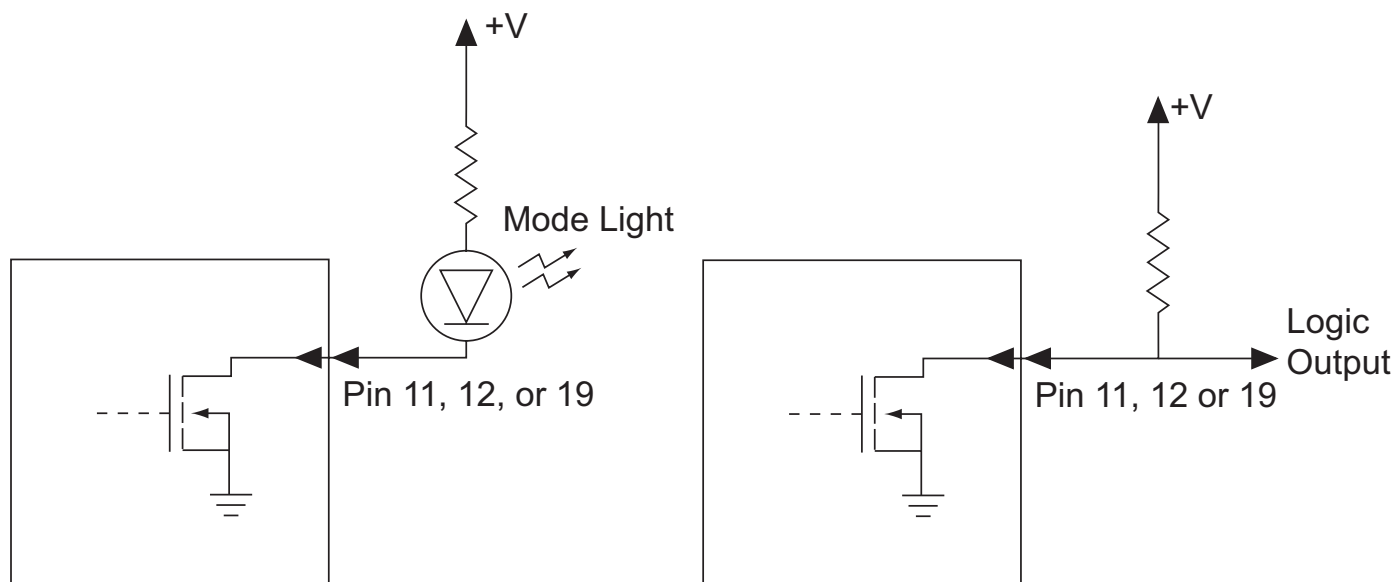


**Figure 1. Typical Programming Input**

**Pin 7 – Reference Voltage:** A precision, low temperature coefficient +10.50V reference voltage is available on this pin. Please see the datasheet for accuracy and temperature characteristics.

**Pin 10 – No Connection**

**Pin 11 – Current Mode Indicator:** An open drain configuration indicates when the power supply is in current regulation. The indicator is an active low and will appear as an open circuit when the power supply is in voltage control, in power control, or in a disabled state. A pull up resistor can be used to create a logic signal, or the pin can be used to ground an LED to provide an illuminated indicator showing the operating control mode. See Figure 2 for usage suggestions.



**Figure 2. Typical Mode Indicator**

**Pin 12 – Voltage Mode Indicator:** An open drain configuration indicates when the power supply is in voltage regulation. The indicator is an active low, and will appear as an open circuit when the power supply is in current control, in power control, or in a disabled state. A pull up resistor can be used to create a logic signal, or the pin can be used to ground an LED to provide an illuminated indicator showing the operating control mode. See Figure 2 for usage suggestions.

**Pin 13 – Current Programming:** A 0V to +10V signal will program the power supply for 0 to 100% rated output current. The input impedance for this control pin is 10MΩ; a resistor to ground will program the power supply for zero output current if this pin is left open. See Figure 1.

**Pin 14 – Voltage Monitor:** The voltage monitor has the same scale factor as the voltage programming signal. 0 to +10V indicates 0 to 100% of rated voltage. The voltage monitor signal is derived internally from the voltage feedback and is buffered to provide low output impedance.

**Pin 15, 16, 17, and 18 – No Connection**

**Pin 19 – Power Mode Indicator:** An open drain configuration indicates when the power supply is in power regulation. The indicator is an active low, and will appear as an open circuit when the power supply is in current control, in voltage control, or in a disabled state. A pull up resistor can be used to create a logic signal, or the pin can be used to ground an LED to provide an illuminated indicator showing the operating control mode. See Figure 2 for usage suggestions.

**Pin 20 – Power Monitor:** The power monitor has the same scale factor as the power programming signal. 0 to +10V indicates 0 to 100% of rated power. The power monitor signal is derived internally from the voltage feedback and the current feedback and is buffered to provide low output impedance.

**Pin 21 – Power Programming:** A 0V to +10V signal will program the power supply for 0 to 100% rated output power. The input impedance for this control pin is 10M $\Omega$ ; a resistor to ground will program the power supply for zero output power if this pin is left open. See Figure 1.