

Introduction

The -I5 and -I10 control interface options provide significant additional controls and additional monitoring functions over the standard interface found on most UltraVolt high-voltage power supplies. These additional functions include current regulation, indicators showing when voltage regulation or current regulation is active, and 0 to 5V or 0 to 10V control regardless of the polarity of the output voltage.

This Technical Note explains how to implement the various controls, programming, and monitoring functions of the -I5 and -I10 interface options. The -I5 and -I10 options are available on many new UltraVolt HV power supplies. Please refer to the UltraVolt website to see which models the options are currently offered on. Please [download the I5/I10 Option datasheet](#) for actual specifications; complete product datasheets can be found by visiting www.ultravolt.com/products.

NOTE: The -I5 and -I10 options are identical in functionality with the exception of scaling. This Technical Note is written for the -I10 option; it describes the -I5 option as well by substituting 5.00V for 10.00V, full scale on the programming inputs and monitor outputs.

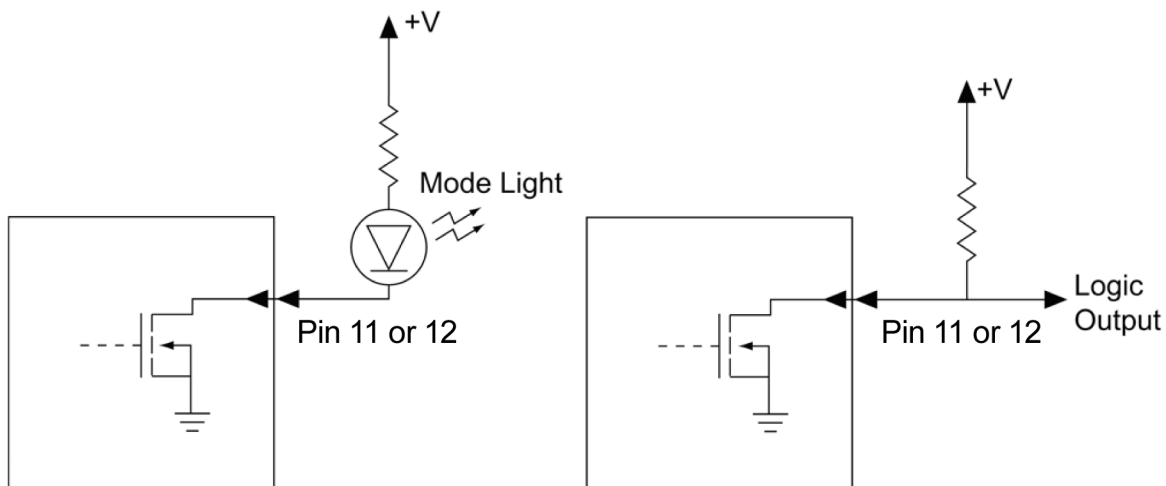


Figure 1: Typical Mode Indicator

Connections Overview

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 – Input Power: Use these pins to supply the input power. Most UltraVolt high-voltage power supplies use either 12VDC or 24VDC nominal.

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. The internal currents in the feedback divider are compensated for, providing a true output current monitor without any offsets.

Pin 4 – Enable: Logic high between 2.5V and 15V will enable the power supply a logic low between 0V and 1V or an open circuit will disable the power supply. The input impedance is 1k Ω ; a resistor to ground will disable the power supply when the pin is left open.

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 that will degrade voltage regulation and monitoring accuracy can occur.

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 Ω ; a resistor to ground will program the power supply for zero output current if this pin is left open.

Pin 7 – Reference Voltage: A precision, low temperature coefficient +10.00V 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 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 1 for usage suggestions.

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 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 1 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 10M Ω ; a resistor to ground will program the power supply for zero output current if this pin is left open.

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.