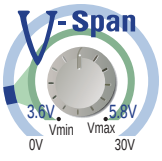
Power Protection of Electrical Devices During Test with Digital Controls on a Programmable Power Supply

Technical Note

Engineers and technicians in electrical laboratories use programmable power supplies as a basic instrument for either base power or variable power in margin testing. These supplies are typically low cost instruments with very basic controls of an on/off switch and two knobs, one for voltage control and one for current limiting. Knob control continues to be the preferred interface as it allows for each varying of the voltage or current level while viewing other measurement instruments or the device under test for performance.

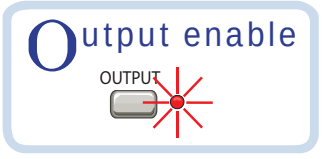
With the majority of power supplies in this low cost application, there are no limits on the power supply to protect the device under test. Further, most bench top power supplies are required to be used in many different applications at different voltage levels, but are typically needed only over a very narrow range (±10% or ±20%) for an individual application. With the basic controls and wide ranging requirements, it is left to the user to ensure that the voltage is not increased or decreased outside range of safe operation for the device. This makes it easy to damage devices.

The Sorensen XEL series solves the safety dilemma while maintaining the ease-of-use that knob controls provide.



V-span allows the user to set the minimum and maximum voltage for the knob. The limits can be set at any level up to the rating of the supply. Setup is as easy as 1-2-3. 1a. Use the knob to set the minimum voltage desired, 1b. press and hold the Vmin button until "Set" appears on the display, 2a. Use the knob to set the maximum voltage desired, 2b. press and hold the Vmax button until "Set" appears on the display, 3. Press the "ENABLE" button to activate the limits. The voltage knobs now will go down to Vmin when turned fully counterclockwise and up to Vmax when turned fully clockwise. For example, if working with a device designed for 5V power, the Vmin might be set at 4 volts and Vmax at 6 volts (±20%). The user can now feel safe in turning the voltage control knob without fear of accidently under- or over- voltage of the device as the knob is turned while watching an output signal. If a broader test is quickly needed without the "safe" limits, the V-span can quickly be turned off with a press of the "ENABLE" button.

Further device protection is provided for fixed output applications. In these uses, the programmable power supply is used as a voltage rail, e.g. 3.3V, 5V or 12V or 24V. The S-lock provides an easy fixed voltage output from the supply. This effectively provides a front panel lockout of the knob control so that the voltage and current levels are not accidentally changed.



Most low cost power supplies turn on their output as soon as the on/off switch is turned on. This prevents the user from verifying the set voltage and current limit. The XEL Output Enable feature allows preview of the voltage and current settings before turning on the output. While a simple feature, it allows the user to verify the settings before applying them and further avoid damage to the device being tested.