

This series of application notes explains the key features and benefits of GENESYS+™ programmable power supplies.

What is power supply slew rate and can it be programmed?

Slew rate is defined as rate of change of voltage or current in a period of time. It is a frequently used term in operational amplifier specifications, but it also applicable when discussing programmable power supplies.

When performing repetitive production testing on say a vehicle engine management system, many manufacturers will perform full function testing at multiple input voltages to simulate varying battery conditions. For an automobile that battery range is typically 9 V to 16 V, but may drop down to 3 V when the engine is first started in cold ambient conditions (cold-crank). Figure 1 shows a typical battery voltage profile under that condition.

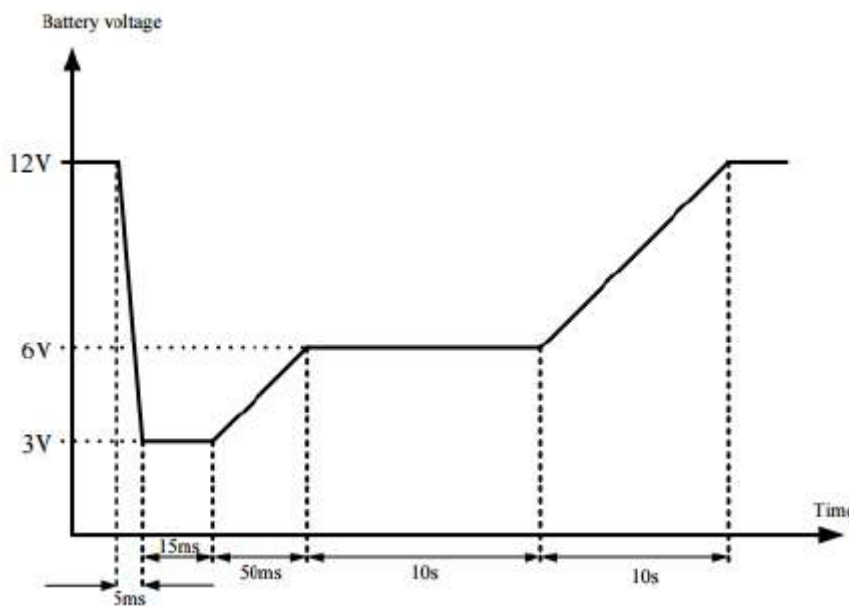


Figure 1: Typical battery voltage profile for "cold crank"

To exactly reproduce the cold crank characteristic in Figure 1, prior generations of programmable power supplies would have to be modified at the factory, as the response time of the supply is primarily determined by the value of the output capacitors. This can then involve making a trade-off between a faster slew rate at the expense of higher ripple voltages and currents.

TDK-Lambda's new GENESYS+ series of programmable power supplies, however, utilises DSP (Digital Signal Processing) allowing the user to individually set both the voltage and current slew rates. Separate values for both the up and down control can also be programmed. For maximum flexibility, a programming range of 0.001 to 999.9 volts or amps/ms can be set, in steps of 0.0001 volts or amps/ms.

For example; Figures 2 and Figure 3 show the results of the same GENESYS+ model programmed for different up control slew rate times.

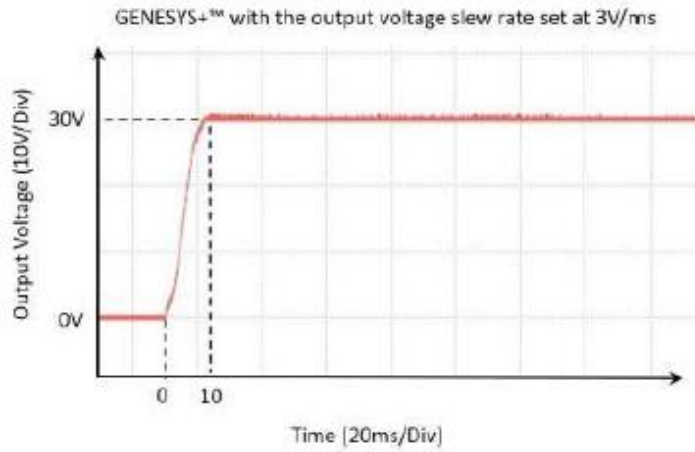


Figure 2

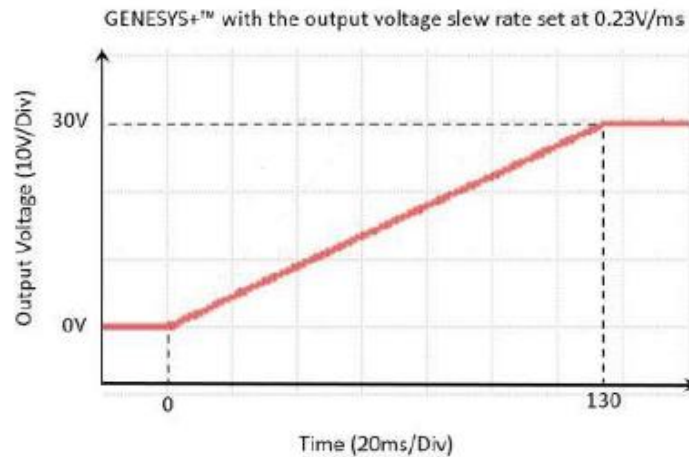


Figure 3

When testing high volume parts where a defined slew rate is not required, using a programmable power supply with a slow fixed up / down program response time can significantly extend device test time. This results in less parts per hour being tested, or additional test stations having to be installed; both of which can impact manufacturing costs. The ability to program the GENESYS+ slew rates provides cost savings, as the same programmable power supply can be used to test multiple products requiring both fast and slow response times.

Slew rate programming for the GENESYS+ can be programmed by using the front panel controls or through one of the communication interfaces. USB, RS232/485 and LAN are fitted as standard, with the option of GPIB or Anybus® interfaces.

As a note, slew rate is not to be confused with the power supply's transient response characteristics.

GENESYS™



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