Power Supplies in Test Applications

Simple System Control for Signal Sequences

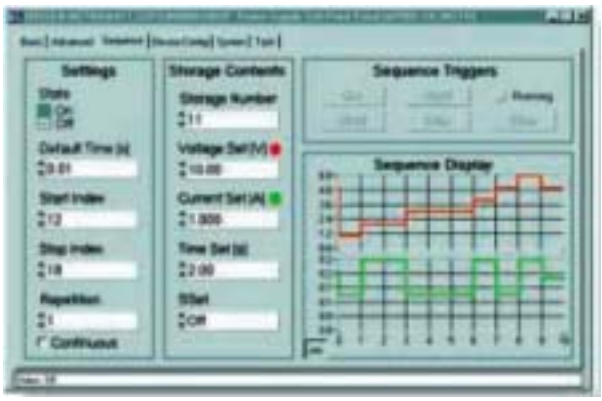
Safety and reliability can only be achieved for electrical and electronic components by means of continuous, detailed testing – from conceptualization and R&D, right on up to production. Power supplies are required to this end which quickly reach the desired signal levels and maintain constant voltage regardless of load, which is no problem for most devices. However, the entry of specific signal sequences is more difficult. Konstanter power supplies from Gossen Metrawatt are equipped with a sequence function which makes this task convenient, as well as quick and precise.

Within a period of just 1 ms, Konstanter power supplies reach the desired signal level and remain unaffected by the connected load.

Electrical and electronic components used in passenger vehicles and trucks are continuously subjected to a multitude of tests in accordance with any and all operating conditions which might occur within the automotive electrical system This assures that function modules used for all vehicle applications are as reliable and safe as possible. As a result of the diverse engineering design aspects incorporated into any given vehicle, vehicle-specific test signals and variations on standard test pulses are frequently required in addition to the standard signals described in the SAE J 1113 regulation. Variations of this type result from, amongst other factors, different impedances within the electrical system as measured from each respective power consumer.

Static and Dynamic Testing

In addition to virtually static tolerance tests, test signals from the mid dynamic range can be easily implemented as well with SSP 32N series Konstanter devices. Tests with static values evaluate the functional reliability of the components and assemblies under test, based upon actual battery voltage tolerances depending upon the age and charging level of the battery. With dynamic test signals, for which edge rises in the millisecond range are required, events are described which may occur as a result of operation of other power consumers, when switching such loads on or off, or when starting or shutting the engine down. Both static and dynamic signals are possible with SSP devices. The user is thus able to incorporate his tests into the production process or continuous testing systems if necessary, in order to implement complete routine testing. Due to the fact that high performance power supplies are used, the power consumers can be tested at full power.



The graphic user interface facilitates the entry of complex sequence functions.

The SAE J 1113 regulation defines a series of signals as they may occur at the 12 or 24 V batteries in the electrical systems of trucks and passenger vehicles. The most important prerequisite for power supplies when implementing signals of this type is a short response time for the specified output quantities – independent of the momentary load to the greatest possible extent. After all, this is the only way to obtain reproducible test results. SSP 32 N power supplies are well suited for this type of measurement: not only as a result of the short response time of approximately 1 ms for the rising as well as the falling edge, but rather because response time is largely independent of the connected load as well. Due to the U-I square wave curve, the rising edge is influenced by the selected current limit value. This must be set high enough to assure minimal response times. These extremely short response times are made possible for Konstanter power supplies through the use of a special circuit concept.

Graphic Entry of Sequences

The integrated sequence function is an additional important feature with which Konstanter devices are furnished. Any desired signal sequences can be saved to device memory with this function, and can be started as needed by selecting from amongst several options. Execution is started by selecting the start and stop addresses, and by initializing the sequence. The use of control computer resources is minimized because the PC doesn't have to specify each individual point within the signal sequence online. The signal sequence is defined by setting three parameters for each point within the sequence: initial voltage (Uset), the current value (Iset) and dwell time for the respective point (Tset). Device-specific response time establishes the point in time at which transition from one point to the next takes place. The D-A converter has a resolution of 12 bits, assuring correspondingly fine graduation for signal display. Operation at a PC is facilitated by means of graphic user interface. Soft Front Panel (SFP) is provided to this end, which assures easy handling of all functions.
Sequence functions can be entered either manually at the front panel, or via the computer interface with a PC. If manual entry is utilized, the desired signal sequence is broken down into corresponding time segments based upon available resolution. Output voltage, output current and dwell time are then set for each individual point. Settings are written to the desired memory location with the preset keys. This method is more than adequate for simple sequences, but it's very time consuming if a 2B curve in accordance with the SAE J1113 regulation needs to be entered, which shows how a DC motor functions as a generator after switching the ignition off.
With SFP, the individual memory locations can be entered directly to the sequence worksheet. At the same time, the sequence is also displayed as a graphic next to the worksheet. For additional convenience, the display can be switched to representation according to memory location, or as a function of time. In addition to direct graphic entry, the curve can also be adapted by means of a data file. For example, the sequence can be processed with Excel using mathematical formulas, or by means of graphic editing. The resulting values table is subsequently converted into a text file including memory location, voltage value, current value and dwell time parameters. The text file can be saved to the Tasks folder included with SFP software, from where it can be opened and executed. In accordance with the specified requirements, sequences can also be executed step by step for testing purposes. The user is also able to easily adapt signal sequences to his own individual needs.

Compact

Simple power supplies are inadequate for testing electrical and electronic components, even if stable output values are quickly available. In order to obtain representative results, the signals must comply with specific sequence functions. These test pulses are often so complex that manual entry is highly time consuming. The SSP Konstanter 32 N and the Soft Front Panel are the ideal pair for applications of this type. Any desired signal sequences can be quickly created with SFP, and the power supply makes the required signals available in 1 ms.

SSP 32 N
Power Supply

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