

# HAMEG Power Supplies

## HM8143 – The decathlete among the power supplies

The power supply market is very fragmented today. You can choose between an almost unlimited number of models: general purpose, high voltage, and high current. There are also power supplies with arbitrary waveform function, some with electronic load, analogue programming, and many more. But what about space on your R&D workbench or the 19" rack in production? To meet most of your needs you might purchase several power supplies. The HAMEG Arbitrary Power Supply HM8143 incorporates all these and many more functions in one instrument, and takes the lead in the decathlon of power supplies.



### 1st Discipline: Standard Operation

The HM8143 provides 130 W output power on three isolated channels with 2x 0...30 V, 2 A and 1x 5 V, 2 A. With the ability to series connect or parallel these channels, the user may choose between higher voltage (up to 65 V) or higher current (up to 6 A). The operation of the power supply with its rotary knob and buttons is quick and easy. The front panel controls can be locked via remote control to protect against accidental parameter changes. The output voltages and currents are displayed simultaneously with a resolution of 10 mV and 1 mA. The HM8143 automatically switches from CV (constant voltage) to CC (constant current) mode in case the output current exceeds the programmed current limit, and returns to CV when the current is back within the limit. LED indicators show the actual CV/CC mode of each channel. It takes only 45  $\mu$ s for the output to recover to within 1 mV following load variation from 10 % to 90 %.

### 2nd Discipline: Protection of the DUT

To safeguard your DUT (Device Under Test) from damage, the HM8143 not only provides current limiting but also an electronic fuse. In case of an inadvertent short during standard operation, the current will be limited to the set value. In order to provide better protection than current limiting, the HM8143 features an electronic

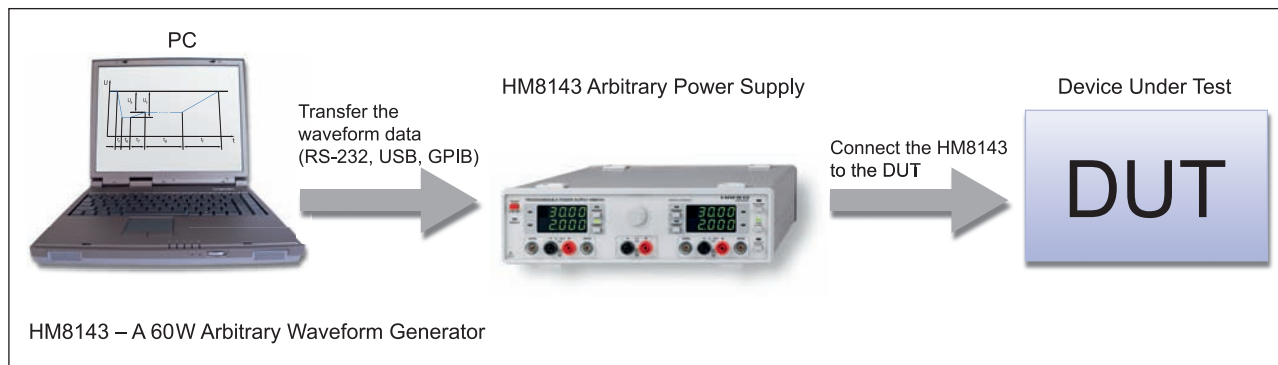
fuse. As soon as the current limit is exceeded all outputs will immediately be disabled. They are turned on again manually by button or via remote control.

### 3rd Discipline: Measurement of voltage and current

The HM8143 simultaneously displays the four parameters: voltage and current of channels I and III. With the outputs turned off or during variation, the nominal values of the voltage and the current limits are displayed. If the outputs are activated, the HM8143 monitors the actual values of voltage and current of each variable channel. The accuracy of the built-in voltage and current measurement is typically 2 digits. The accuracy of up to 0.07 % competes with a standard multimeter. If you want to perform a test series, the PowerARB software offers a recording function. The measurement values and the instrument's status are saved in csv (comma-separated values) format.

### 4th Discipline: Electronic Load

The HM8143 comes along with a sliding 2 quadrant sink/source capability on both 30 V channels which simplifies testing and characterising of DC power sources, battery cells (charge/discharge/cycling), generator/motor applications etc. Automotive, mobile phone and power cir-



cuit designers will relish the unique value of the 2 x 60 W in/out ability in their daily work.

### 5th Discipline: Power Amplifier / Modulation

Both 30V channels are equipped with a rear BNC analogue input, which allows the HM8143 to be used as a wide range modulation power amplifier with 3 dB frequency range DC...50 kHz. As

$$V_{\text{out}} = (V_{\text{modin}} \times 3) + V_{\text{set}}$$

full scale (30 V) is achieved with a control voltage of 10 V. Connecting a function generator to the modulation inputs allows you to create complex arbitrary load waveforms without being connected to a PC.

### 6th Discipline: Remote Sensing

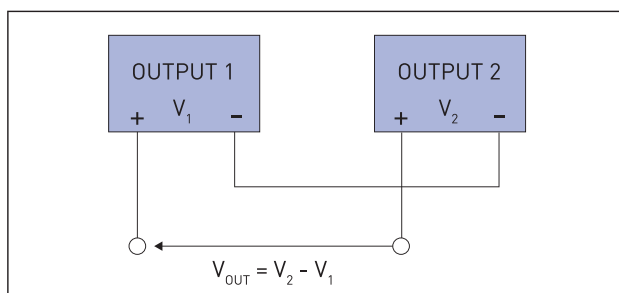
Remote Sensing is available for both 30 V channels to eliminate voltage drops on the load leads (4-wire). This feature is in particularly important in case of 19" rack applications in order to compensate long leads to the DUT.

### 7th Discipline: Remote Control

The HM8143 is shipped with a RS-232 interface; GPIB (IEEE-488) or USB interface options are also available. Easy to use commands keep programming fast and simple. For ATE (Automatic test equipment) applications a 19" rackmount kit is available. With the free software PowerARB you can change and read settings, import and draw waveforms with the graphical Arbitrary Editor.

### 8th Discipline: Tracking

With the aid of the tracking function, it is possible to simultaneously vary 2 setting parameters of the two 30 V channels. In other words, either both output voltage settings or both current limits can be varied at the same time by using the tracking function.



Generation of bipolar voltages (-30 V...+30 V) with HM8143

### 9th Discipline: Bipolar Voltages

Bipolar voltages are realised by using two channels as shown in the picture. The two positive poles realise differential voltages in asymmetric applications (e.g. -5 V...+12 V) in the range -30 V...+30 V. In virtual ground mode, the high channel will source and the low channel will sink current. Combined with arbitrary function or the modulation inputs it is even possible to supply AC voltages.

### 10th Discipline: Arbitrary Function

The HM8143 can also be used as a 60 W arbitrary generator. With a resolution of up to 100  $\mu$ s and 4096 points the arbitrary function opens various possibilities to create complex DC transient waveforms. The waveform is started by a trigger signal at the trigger input at the rear panel of the HM8143 or by command via remote control. By virtue of the burst mode capability, the user can choose between 1-255 steps or continuous repetition of the waveform. Since the waveform is stored in a non volatile memory, the arbitrary function can be operated irrespective of a PC. The software PowerARB allows you to program pulse waveforms and other arbitrary waveforms without writing a single line of code. The waveform can be created with the easy to operate arbitrary editor or by import of csv files. The user can draw the waveform in the arbitrary editor or enter the data points manually.

A well known waveform in the automotive industry is the motor start up curve. Simulation of the start up curve according to DIN40839/ISO/TR7637 is very useful in car hifi design testing, e.g. to spot problems due to unexpected data loss of theft proof car radios with security code. The arbitrary function allows devices to be tested under even bipolar conditions like voltage drops, spikes, load dump etc. Further applications include DC/DC Converters and Inverters, audio applications, electronic product life cycle test etc.

### And the winner is...

In contrast to a human decathlete (who will not be able to perform all disciplines at a time) each of the HM8143 disciplines are combinable. All these features, the intuitive user interface and the compact design paired with the excellent price/performance ratio, put the HM8143 in the lead of the decathlon of power supplies. Even your financial controller will love this instrument, as HM8143 is ready for countless future applications.