Digitimer

NEW

DS4 - Bi-phasic Stimulus Isolator

Voltage In - Current Out • Isolated & Low Noise

Battery Saving Features • Minimal Zero Crossing Distortion

The DS4 has been developed to meet the needs of laboratory scientists who require a stimulus isolator that can output a bi-phasic isolated constant current stimulus in response to an external command voltage signal, provided by a computer DAC via software. Such a requirement is already met by our NeuroLog System in the form of the NL512 Biphasic Buffer and NL800A Stimulus Isolators, but the DS4 provides our first standalone device to meet this need.

The DS4 accepts a variety of voltage input ranges (±1V, ±2.5V, ±5V and ±10V) and produces a constant current stimulus output in 4 overlapping ranges (±10µA, ±100µA, ±1mA and ±10mA) from a compliance voltage of ±48V. In addition, the DS4 has a GATE input which allows multiple DS4's to be connected to a single analogue voltage source, with each DS4 being digitally enabled, separately.

One of the problems with stimulators that make use of an external voltage source to define a stimulus waveform is that small offsets or noisy baseline signals from the DAC's used to drive them can result in unwanted battery drain or perhaps worse, low amplitude stimulation. The DS4 uses a special "inactivity sensor" to monitor the input voltage and disable the DS4 output if this voltage falls within 0±0.2% of the full scale value for a user selectable time period of 100ms, 200ms, 1s or 2s. Unlike other devices which only produce an output when the input voltage exceeds a threshold value, this "inactivity sensor" reduces battery usage and damaging "leak currents" during infrequent stimulation, while at the same time maintaining low levels of zero crossing distortion for repetitive waveforms.

The DS4 uses an external power supply to power the input control circuitry and readily available/inexpensive batteries to provide the opto-isolated stimulus voltage source

DS4 Bi-phasic Stimulus Isolator

Output: Bi-phasic constant current proportional to the input voltage
Output Ranges: ±10µA; ±100µA; ±1mA; ±10mA for a full scale input
Output Duration: >2µs
Compliance: ±48V from 8x GP23A batteries
Linearity: ±3% of full scale output for each output range
Output Impedance: >900Mohms
Output Rise Time: <5µs (1kohm load), <40µs (1Mohm load)
Frequency Response: Expected DS4 output is maintained for frequencies up to 5kHz.

Inputs:

IN: **Ranges:** ±1; ±2.5; ±5; ±10 V full scale (selected by an internal jumper) with a limit of ±12V max. without damage.
Input Impedance: 1Mohm

GATE: **Range:** TTL; Gate OFF if Low; Gate ON if High or open circuit. Limit of ±15V max.
Input Impedance: 10kohm

Inactivity Sensor: The output is disabled if the voltage input remains within 0±0.2% of the full scale value for a user selectable period of 100ms, 200ms, 1s or 2s. This time period can be adjusted with an internal jumper.

Connections:
Output - 2mm shrouded, touch-proof sockets (red and black) spaced at 0.75"
Input - Front panel BNC socket
Gate - Front panel BNC socket
Battery Test - Six 2mm sockets
Power - Socket for external power supply

Controls:
Gate - On/Off toggle (Off overides BNC input)
Output Range - 4 position rotary switch
Power - On/Off toggle switch

Indicators:

Power ON	LED Green (lit when the power supply is connected and DS4 is switched On)
Gate Enabled	LED Amber (lit when Gate is On and the Gate Input is held TTL high)
Phase +ve	LED Amber (lit when input exceeds +0.2% of full scale voltage)
Phase -ve	LED Amber (lit when input exceeds -0.2% of full scale voltage)

Power: Included external power supply (input voltage 100V - 240V) providing ±15V DC output.
10 x 12V GP23A Batteries.
Mounting: One or two stimulators may be mounted in a 19" rack using a specially fabricated frame (model D121-11) available from Digitimer Ltd.
Dimensions: 190 x 110 x 80 (w x h x d)
Weight: 500g (approx.)

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