DS7R

Digitimer

NEUROSPEC

Research Neurosciences

DS7R Constant Current Research Stimulator

Introduction

The DS7R Constant Current Research Stimulator delivers brief duration (50-2000µs) isolated current pulses for transcutaneous electrical stimulation and activation of nerves and muscles via surface electrodes. The current output of the DS7R is adjustable over the range 0mA to 999mA, with a compliance voltage variable from less than 100V to 400V. The pulse duration range can be varied from 50 microseconds to 2 milliseconds in six steps. The DS7R incorporates a stimulus polarity control, which allows the operator to select between normal, reverse and alternating polarity modes. A specially designed isolated output stage maintains a square (current) pulse shape while minimising stimulus artefacts.

Flexible Stimulus Parameters for Demanding Applications

The DS7R is virtually identical to our medically certified DS7AH stimulator, but has some important differences, which make it more suitable for demanding research applications, such as sensory threshold testing, studies of nociception (pain), behavioural psychology, sports medicine or rehabilitation research. Unlike the DS7AH which is limited to a maximum pulse duration of 200µs, the DS7R is able to deliver stimuli of up to 2ms. This means that the DS7R can deliver pulses of >50mJ, which means it cannot be medically certified to the same standard as the DS7A and DS7AH. Instead it is offered for research applicaitons involving human subjects or larger animals.

Safe for Human Research Use

Although the DS7R is not a medical device, it has been designed for safe use in human research applications and meets the following standards:-

60601-1 General requirements for basic safety and essential performance.

60601-1-2 General requirements for basic safety and essential performance - Collateral Standard: Electromagnetic disturbances – Requirements and Tests.

60601-1-6 General requirements for basic safety and essential performance - Collateral standard: Usability.

60601-2-10 Particular requirements for the basic safety and essential performance.

DS7R

Stimulus Output
CURRENT selected by 10 turn dial and x1/x10 switch.
Dial reading 00.0 to 99.9 giving 0 to 100 mA (99.9 mA) for x1 setting and 0 to 1000 mA (999 mA) for x10 setting.
PULSE DURATION 50, 100, 200, 500, 1000, 2000 microseconds (µs)
PULSE POLARITY Three position toggle switch selects Normal/Reverse/Alternating.
COMPLIANCE Continuously variable from 100V to 400V.
ON/OFF On is up. Off disables output and open circuits terminals.
CONNECTIONS 4 mm shrouded sockets (red and black) on 3/4" centres. Red socket goes positive with reference to black socket.

Trigger
The Maximum trigger rate is 1,000 pps (1 kHz).
INPUT Electrical via Rear Panel BNC socket:
Triggers: Logic signal (+3 to 15V) +ve edge, TTL compatible (-ve edge by factory change). Minimum Pulse Duration is 5 microseconds.
Front panel: Push button.
Rear panel: 3.5mm mono jack socket for contact closure foot switch (contact closure).
OUTPUT Rear panel BNC, positive TTL pulse, 1 ms (950 ±50µs) wide (can be factory set for a negative pulse).

Indicators
TRIGGER LED - Amber, flashes for each trigger received.
POLARITY LED – Green, two LEDs indicate the polarity of the next output pulse.
TOO-FAST LED – Amber, Lit when trigger frequency exceeds 100Hz in Alternating Polarity Mode. Results in stimulus output being disabled and FAULT condition (see below).
OUT OF COMPLIANCE LED - Amber, lit when selected current not delivered.
FAULT LED - Amber, illuminated on (i) sensed over-current internally (ii) over-current to the subject or (iii) Trigger frequency “Too-fast” in alternating polarity mode. The unit is latched in this condition until reset by the Output On/Off switch being placed in the OFF position.
POWER ON LED - Green, illuminated for power on

Dimensions
Size: 255 x 100 x 225 mm (d x h x w).
270 x 110 x 225 mm (d x h x w) - over controls and feet.
Weight: 2.1 kg (approx.).

Other
Power: 100 - 120V or 200 - 240V @ 47-63 Hz. Rating: <30 VA
Case Material UL94 V-0 Flame Retardant. Case Screw: 2.5mm Hex/Allen key compatible.

The Digitimer DS7R is NOT a medical device and use is limited to human/animal research applications

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