Designed by Scientists for Scientists

Human Testing

SR-HLAB™

Human startle reflex testing system

SR-HLAB EMG System

SR-HLAB PEC System

Features & Benefits

- Complete solution for a wide variety of startle paradigms
- Lightweight system transports easily from laboratory to offsite test facilities
- EMG electrodes or photoelectric cell (PEC) sensor
- Menu driven software sets up protocols without programming
- USB interface makes laptops available to run the system
- Protection circuits limit excessive sound
- Available with optional Heart Rate Module and/or Galvanic Skin Resistance Module

PRODUCT OVERVIEW

The SR-HLAB™ Startle Response System is designed as a human startle reflex testing system. It supports many startle paradigms and has been used extensively in Schizophrenia and Posttraumatic Stress Disorder(PTSD) studies.

The SR-HLAB™ Startle Response System used in human startle reflex testing is available in two basic models EMG or PEC. The EMG model measures the startle response by recording the eyeblink reflex via electromyography (EMG) using electrodes placed on the Orbicularis Oculi muscle. The PEC model measures the startle response by recording the eyeblink reflex using a Photoelectric Cell (PEC) to monitor the closing and opening of the eyelid.

The basic system includes an integrated impedance meter(checks all electrode pairs at the same time), Integrated Control Circuit with external connector to control 12 V devices, an auditory stimulus module(white noise, 1 KHz or 1.2 KHz) and a Response Module of the appropriate type for the sensor being used; EMG or PEC. Additional modules for Heart Rate, Galvanic Skin Resistance, and Digital I/O can be added to the basic system. In some cases a second EMG or PEC module is added to compare the response between the left and right eye. If multiple response modules are used each response is recorded on a separate channel with all timing aligned.

The included software through a simple menu system allows the user to define a test protocol. A test protocol contains Trials(discrete tests) that are then put into the Session definition, listed in the order the researcher would like the Trials executed. Trials control the delivery of the auditory stimuli and control when and how much response data is to be recorded. After a Session is completed the Data Reduction feature will take the raw data and create a tabular scored data file. Several parameters that affect scoring are set by the user. The scored data can be exported for use in statistical packages. The raw data is available for viewing and exporting. The raw data provides the user a method to verify that the scored data is accurate.

SR-HLAB™ Components

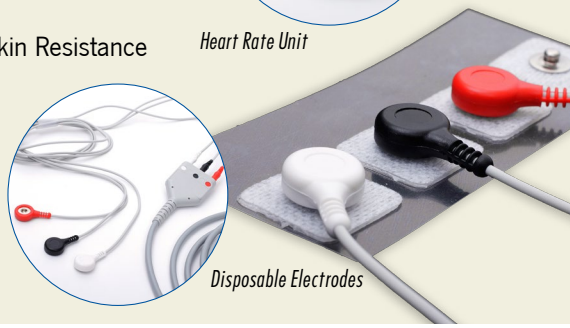
Basic System

- Integrated Impedance Meter
- Stimulus Module
- Response Module – EMG or PEC
- Digital I/O Out
- Integrated circuit to control external 12 V devices
- Software
- EMG electrodes or headband with PEC sensors
- Calibrated headphones
- All cables and connectors

Optional Add-ons

- Response Module – EMG
- Response Module – PEC
- Response Module - Heart Rate
- Response Module - Galvanic Skin Resistance
- Digital I/O Module
- Tactile Kit
- Portable Air Puff Unit

Heart Rate Unit



Disposable Electrodes

SR-HLAB DETAILS

Integrated Impedance Meter

The meter will check the impedance of all pairs of electrodes simultaneously. Connect the yoke cable to the impedance meter and read the results. The display will make it very easy to determine an electrode with poor impedance. Once all electrodes show good impedance re-connect the yoke cable to the EMG Response Module(not used with PEC sensor).

Stimulus Module

The Stimulus Module provides the auditory stimulus. The user can choose between white noise, 1KHz or 1.2KHz of pure tone. The Stimulus Module provides 1 ms resolution for the timing of all stimulus parameters. The hardware protection circuit limits excessive sound amplitude and sound duration to the subject. Calibration settings allow you to calibrate the sound level at the headphones.

Response Modules

These modules sense the voltage changes at the sensors and amplify the signal from the sensor. Data points are recorded at 1 millisecond rate. The only adjustment is a gain control. The PEC response module can be used with the PEC sensor or the Heart Rate sensor. EMG and GSR response modules are limited to these specific functions.

Integrated Control Circuit

The Integrated Control Circuit provides a method to control a device accepting a 12V signal to be turned on and off via SR-HLAB software. San Diego Instruments provides several units that will work off this connector; Tactile Kit for air puff using an air tank for input, Portable Airpuff Unit a self-contained air puff kit with compressor and Slave Mouse(See Digital I/O for alternative control) to trigger picture changes on a separate computer. User supplied units meeting the 12 V signal requirement can also be controlled.

Digital I/O

Three digital output lines using 5V TTL signals are integrated into the system. If the Digital I/O module is included it provides the same three digital output lines and one input line using a switch closure signal. The output lines can control 5V TTL devices such as the SDI Slave Mouse to trigger pictures on a separate computer. The Input line can be used to execute a Trial in the Session list based on an external signal versus timing.

Tactile Kit

The Tactile Kit provides a control box with a regulator for the air out pressure and solenoids to turn the air on/off under software control. Tubing can be connected to direct the air puff to any part of the subject's body. Alternatively the red tube from a PEC headset is connected to the Tactile Kit air output for delivery of the air puff to the eye. The Tactile Kit connects to the external connector of the Integrated Control Circuit which is controlled by the software. The user must provide an input air source.

Portable Air Puff Unit

The Portable Air Puff Unit contains a small compressor eliminating the need for an air tank. The air puff is limited to 15 PSI and the maximum length of an air puff is 0.5 seconds. It is designed for use with a PEC headset including the red air tube mounted below the sensor to deliver low pressure puffs to the eye. The Portable Air Puff Unit connects to the external connector of the Integrated Control Circuit which is controlled by the software. The Portable Air Puff Unit does not have the pressure capacity to provide a stimulus to other parts of the body. The Tactile Unit should be used in this case.

SR-HLAB™ SPECIFICATIONS

Dimensions	9” (W) x 9.5” (D) x 8.75” (H)
Weight	6 lbs.
Maximum # Stations	1
Standard Cable Length	6 ft.
Stimuli Options	White Noise, Tone, Air, Visual
Certifications	CE

SR-HLAB SYSTEM COMPUTER REQUIREMENTS

Windows 10/Windows 7 compatible computer system with available USB connection. Minimum disk and memory sizes specified to support Windows 10/Windows 7 are acceptable.

SDI CONFIGURED COMPUTERS

SDI offers high performance Configured Computers that are pre-installed with the Windows® operating system and applicable SDI software. If required, SDI will pre-install all relevant drivers. Each computer is fully tested with your system prior to shipment. When your SDI system arrives, all you have to do is unpack it, attach the cables and begin testing.

SDI HUMAN TEST SYSTEMS

- SR-LAB™
- Eyeblink Conditioning System
- SR-HLAB™

FOR MORE INFORMATION

To learn more about SDI behavioral testing systems, please visit **www.sandiegoinstruments.com**. If you have any questions or would like to request a quote please call **(858) 530-2600** or email us at **sales@sandiegoinstuments.com**.

San Diego Instruments, Inc.
9155 Brown Deer Rd, Suite 8
San Diego, CA 92121
Ph: 858-530-2600
Fax: 858-530-2646
www.sandiegoinstruments.com