

**HUMAN FACTORS ENGINEERING**  
**IE 442**  
**LABORATORY MANUAL**

LAB - 6

**SKIN RESISTANCE**



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### **Objective:**

The objective of this experiment is learning to measure skin resistance and investigate the change in resistance of the skin R with response to changes in external factors.

### **Experiment description**

Skin resistance is a measure for physical stress and relaxation respectively that is covered by the limbic system. The limbic system represents the phylogenetically earliest part of the mammalian brain governing most congenital behavior and emotions. Skin resistance as electrical parameter may be changed by external influence within less than a second.

Skin resistance decreases upon emotional excitement following stress stimuli. Lowering of excitement by relaxing exercises increases skin resistance. However, changes are as well influenced by transpiration. Increased sweat production lowers skin resistance. This process only contributes partly to changes in skin resistance, because the transpiration effect cannot explain very rapid changes of this parameter.

The resistance of the skin R changes in response to external factors. The measurement always shows the conductance of the skin  $G=1/R$  (greater values mean lower resistance).

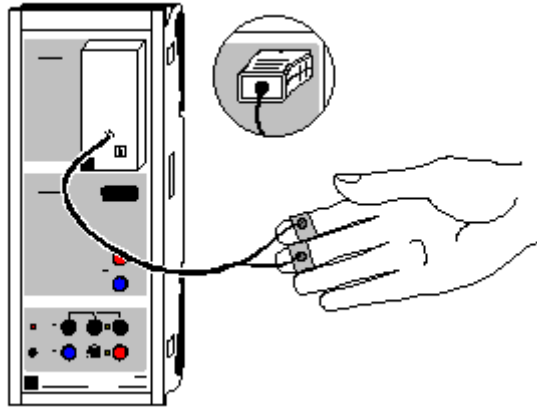
### **Safety notes**

The values and diagrams obtained in this experiment have no medical significance and are not suitable for monitoring human health.

Use the skin resistance box only as described in the Instruction Sheet.

### **Equipment list**

1	Sensor-CASSY	524 010
2	CASSY Lab	524 200
3	Skin resistance box or Skin resistance sensor S	524 048(1)
4	PC with Windows 98/2000/XP/Vista	



**Figure 5.1** Experimental setup for measuring skin resistance

### **Experiment setup (see figure 5.1)**

Plug in the skin resistance box at Sensor-CASSY input A and attach the electrodes securely to the tips of the test subject's index and middle fingers using the Velcro strips. The hand should rest on a support.

### **Carrying out the experiment**

- Start Cassy Lab software and Load settings.
- Adjust the measuring range in Settings Skin Conductance GA1 or drag the y-axis of the diagram so that the displayed skin conductance value  $G_{A1}$  is about in the middle (if necessary, enter the values via the keyboard after clicking on the y-axis).
- Start the measurement with **F9**.
- If desired, investigate the effects of autogenous training or a startling event (e.g. a loud hand clap) followed by conscious relaxation.
- Stop the measurement with **F9**.
- You can repeat the measurement with altered factors or different test subjects. Once again, adjust the y-axis before pressing **F9** to restart the measurement.

## **Evaluation**

The diagram reveals how the skin conductance changes in response to external factors.

You can determine the average skin conductance by finding the mean value from the measuring curve. Simply click the right mouse button over the diagram, select **Draw Mean Value** and mark the desired curve range. The value appears in the status line at the bottom left and can be inserted anywhere in the diagram as text.