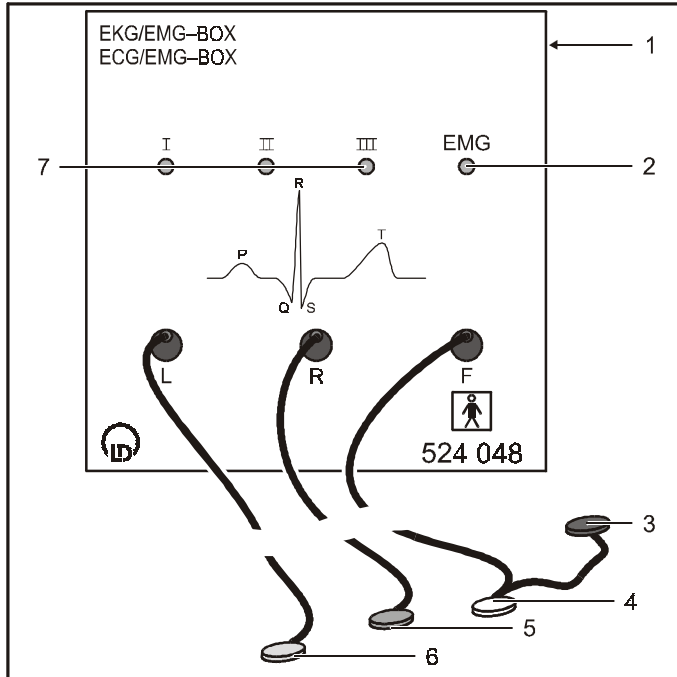


06/05-W97-Ne/Sel



## Instruction sheet 524 049

## ECG/EMG box (524 049)

- 1 Plug
- 2 Indicator lamp (EMG)
- 3 Shield (black)
- 4 Electrode F (green)
- 5 Electrode R (red)
- 6 Electrode L (yellow)
- 7 Indicator lamps (ECG)

### Safety notes

The ECG/EMG box can interfere with the normal operation of pacemakers or other electrical excitation or stimulation devices. It is not protected against defibrillation voltage.

- Do not operate the ECG/EMG box near pacemakers or other electrical excitation or stimulation devices.
- Connect the ECG/EMG box only to a test person without assistance by others.

The ECG/EMG box is intended exclusively for educational purposes. The values and curves derived using this device have no medical significance and do not provide any indication of a person's state of health.

- Do not use the ECG/EMG box for diagnostic purposes.
- Do not use the ECG/EMG box to monitor therapeutic treatment.

The ECG/EMG box conforms fully to current safety regulations (classification BF, protection class II).

- The ECG/EMG box should only be used with a PC which complies with CE regulations.
- Never open the ECG/EMG box (Repairs must only be carried out by the manufacturer, LD Didactic GmbH).

### 1 Description

The ECG/EMG box is used in conjunction with the CASSY® computer-assisted measurement system. It enables an electrocardiogram to be recorded using Einthoven limb leads and measuring the potential changes on the skin surface caused by the cardiac contractions. Moreover, the action potentials of muscles in the resting and excited state can be recorded (electromyogram).

Experiment examples are found on the CD of the CASSY Lab software (524 200) or in the download version of the software under <http://www.ld-didactic.com> or in the manual of the CASSY Lab software (524 201).

### 2 Scope of supply

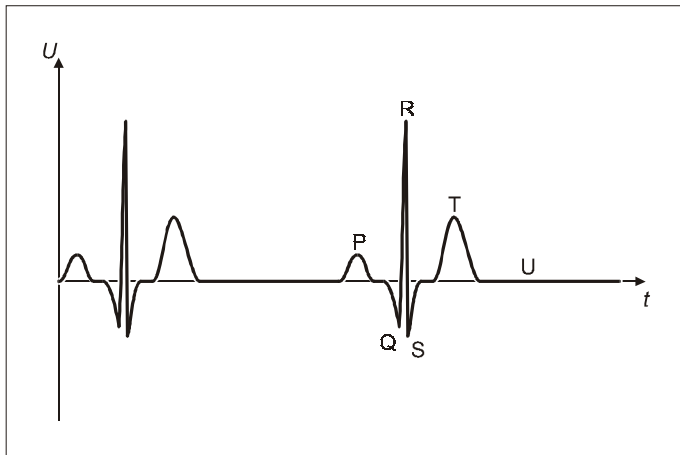
- 1 box
- 4 silver electrodes
- 4 rubber straps

### 3 Measurement quantities

| Measurement quantity | CASSY Lab <sup>/1/</sup><br>(524 200)   | Measuring range     |
|----------------------|---|---------------------|
| ECG leads            | $U_{(A)11}$ , $U_{(A)12}$ , $U_{(A)13}$ | -5.000 ... 1.000 mV |
| EMG                  | $U_{(A)1}$                              | -10.00 ... 10.00 mV |

<sup>/1/</sup> for Sensor-CASSY (524 010) or Pocket-CASSY (524 006) at a PC

#### 3.1 Normal form of the ECG curve



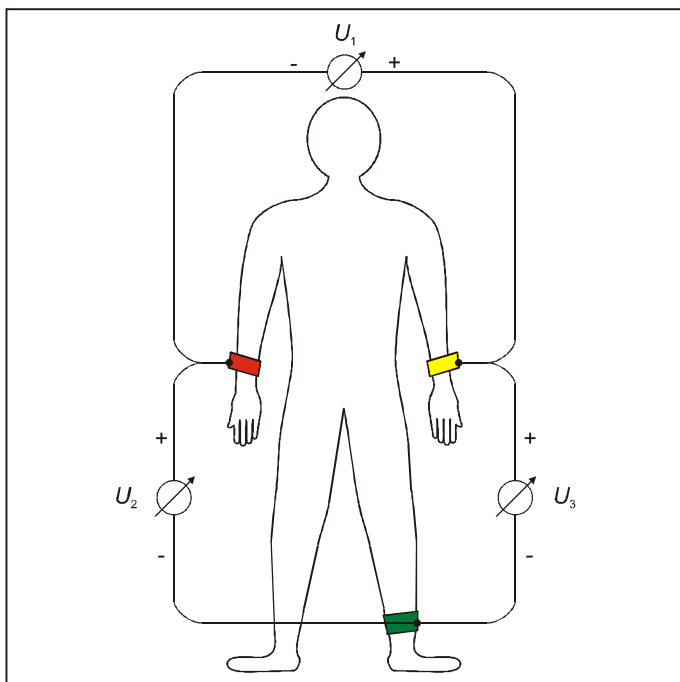
P-Q interval: from the beginning of the atrial excitation to the beginning of the ventricular excitation

QRS group: ventricular excitation

T wave: repolarisation in the ventricles

U wave: repolarisation (not constant)

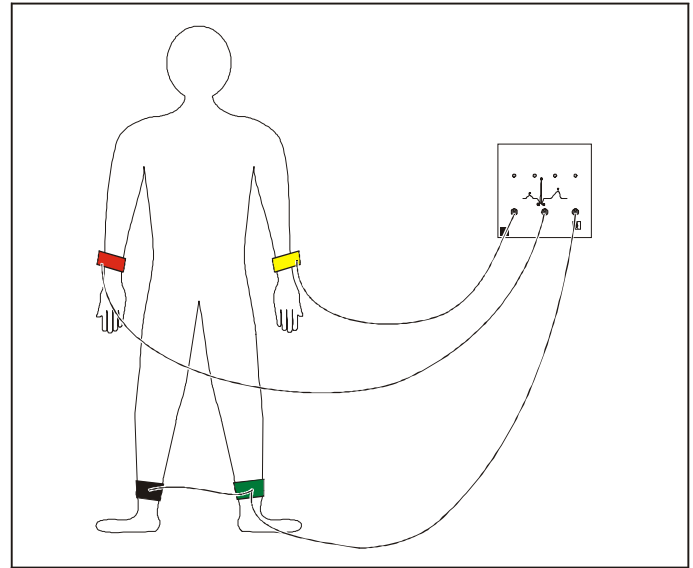
#### 3.2 Leads according to Einthoven




### 4 Operation

- Plug the ECG/EMG box on a CASSY module.

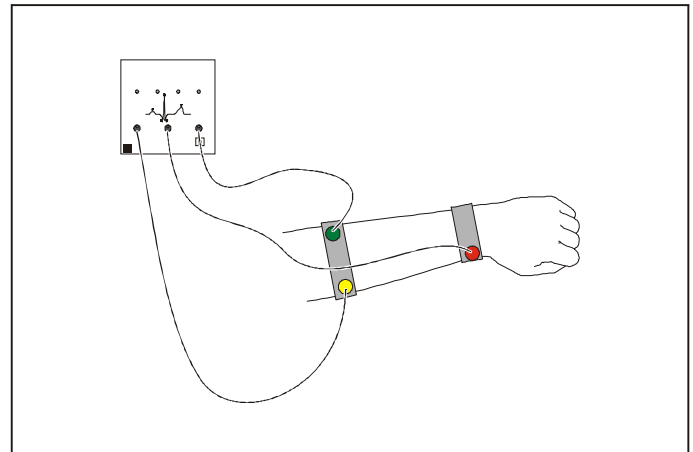
#### 4.1 Recording the electrocardiogram




*Remark: the test person should be relaxed and in a resting posture.*

- Select the measurement quantity ECG leads.
- Spread electrode gel on the electrodes.
- Attach the electrode R (red) to the right and the electrode L (yellow) to the left forearm, the electrode F (green) to the left and the shield (black) to the right calf.
- Start the measurement with the  button or with F9.
- Disinfect the electrodes afterwards.

#### 4.2 Recording the electromyogram:



- Select the measurement quantity EMG.
- Spread electrode gel on the electrodes.
- Attach the electrode R (red) to the start of a muscle, e.g. for the finger muscles on the lower underside of the forearm.
- Attach the electrode L (yellow) to the end of the muscle, e.g. for the finger muscles on the upper underside of the forearm.
- Attach the electrode F (green) and the shield (black) to the opposite side, e.g. to the upper outside of the forearm.
- Start the measurement with the  button or with F9.
- Disinfect the electrodes afterwards.

## 5 Care and maintenance

- When the experiment is over, clean the electrodes with a paper towel to prevent a salt layer from forming when the gel dries.
- Then spray the electrodes with disinfectant.

## 6 Technical data

|                    |                     |
|--------------------|---------------------|
| Input resistance:  | > 10 M $\Omega$     |
| Output voltage:    | max. $\pm 1$ V      |
| Cut-off frequency: | 50 Hz               |
| Cable length:      | 1 m                 |
| Sensor:            | 4 silver electrodes |

## 7 Compatibility

The ECG/EMG box can be used in conjunction with the following CASSY modules:

|         | Sensor-CASSY<br>(524 010)                    | Pocket-CASSY<br>(524 006) |
|---------|--|---------------------------|
| With PC | CASSY Lab software<br>1.00 or higher version |                           |

As a member of the CASSY family this box has the following features:

- The box can be plugged in at any time.
- The connected box is recognized automatically.
- Measurement quantities and measuring ranges are set using the menu-driven software.

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