

HSM-300 Heart Sounds Monitor

Technical Note



HSM-300

Overview

The HSM-300 is a simple device which converts the sound waves, created by the heart valves opening and closing, into voltages which can be recorded and displayed. A piezo-electric sensor, mounted on the side of the HSM-300 picks up the vibrations that are created by the heart sounds. The piezo crystals on the sensor convert the changes in pressure created by the vibrations into voltages. These voltages are usually recorded along with the ECG of the subject to identify the specific heart sounds that occur during ventricular contraction and relaxation.

How It Works

The sensing element of the HSM-300 is placed on the chest of the subject at one of the four prescribed auscultation areas. These areas are located over the sections of the heart and large vessels containing the valves that create the heart sounds that can be heard with a stethoscope. The sensor of the HSM-300 picks up the low frequency sound waves of the heart sounds and converts these waves into voltages that can be seen on a computer screen. The output of the HSM-300 is amplified so that the recorded waves are about 1V in amplitude.

How to Use the HSM-300

Equipment Setup

Insert the DIN8 connector of the HSM-300 into a DIN8 transducer input and the ECG cable into a bioamplifier input of an iWorx data acquisition unit or amplifier.



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Start the Software

Open LabScribe by double-clicking on the LabScribe icon.

- 1) When the program opens, select **Preferences** from the **Edit** menu (or from the **LabScribe** menu on a Macintosh computer).
- 2) Select the **Channel** preferences dialog window. Name the channel to which the HSM-300 is connected. Set the **Mode/Function** for this channel to **DIN8**. Also, set the sampling rate and display time. Click **OK**.

Recording Heart Sounds

- 1) Place the ECG electrodes on the subject as he or she sits quietly. Connect the lead wires to the electrodes. Place the HSM-300 firmly over one of the auscultation areas.
- 2) Begin recording the subject's ECG and the heart sounds. The subject should hold his or her breath for a short period while recording. Once a good segment of ECG and heart sound data have been recorded, stop recording.

Experiments

LabScribe experiments using the HSM-300 include:

- **Experiment HH-2: The Electrocardiogram and Heart Sounds** (found in the **Human Heart** category of the LabScribe **Settings** menu as **ECG-HeartSounds**)
- **Experiment HH-8: Heart Sounds** (found in the **Human Heart** category of the LabScribe **Settings** menu as **Auscultation**)

Technical Data and Specifications

SPECIFICATIONS	
Excitation Voltage	+4 VDC
Output Connector	DIN8
Power	From DIN8 transducer input



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