Introduction

The HVLab Multi-Channel Plethysmograph has been developed through research at the University of Southampton’s Institute of Sound and Vibration Research, a world-class leader in its field. The Multi-Channel Plethysmograph provides computer-based measurement of blood flow during venous occlusion of the digits using mercury-in-silastic strain gauges. Blood flow measured at sub-diastolic occlusion pressure can be used to detect problems in the vascular response to vibration. The HVLab Multi-Channel Plethysmograph is used in medical, industrial, research and educational establishments.

Applications

The HVLab Multi-Channel Plethysmograph may be used for the assessment of vascular dysfunctions. The equipment is used in research, occupational health, clinical and medical practice. Applications include:

- Fundamental research
- Monitoring programmes

Features

The HVLab Multi-Channel Plethysmograph consists of a single unit containing signal conditioning and pressure control systems. To this are attached pressure cuffs and strain gauge transducers designed for measurement of digital blood flow. The system is controlled using software installed on a computer connected through a USB computer interface box. The system controls venous blood flow by pressuring air flowing through specially designed pressure cuffs.

Software

The HVLab Multi-Channel Plethysmograph software runs under Microsoft Windows, providing the user with a simple menu-driven operating procedure and on-line help.

- User definable test procedure
  The user may select the number of channels to monitor, the number of measurements available for averaging, the duration of a test, the cuff occlusion pressure and cuff inflation rates.

- Automatic recording of finger blood flow
  Volume curves for each channel are recorded and an estimate of the rate of blood flow is calculated by the software. Calculated values can be altered by the user.

- Storage of test results
  Patient test results can be stored and recalled together with patient details. Arterial inflow volume curves and calculated rates of blood flow can be printed. A database stores patient details and test results.
The software runs in desktop or laptop with Microsoft Windows version XP or above. In addition, the software requires 4 MB of free space on the hard drive. The HVLab Multi-Channel Plethysmograph can be supplied with its own desktop or portable PC with the USB computer interface box.

### Technical Details

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
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<tbody>
<tr>
<td>Number of test fingers</td>
<td>1 to 5</td>
</tr>
<tr>
<td>Data sampling rate</td>
<td>18 samples s(^{-1})</td>
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<tr>
<td>Occlusion pressure</td>
<td>30 to 70 mmHg</td>
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<tr>
<td>Measurement time</td>
<td>5 to 60 s</td>
</tr>
<tr>
<td>Cuff inflation rate</td>
<td>&gt; 300 mmHg s(^{-1})</td>
</tr>
<tr>
<td>No. of measurements available for averaging</td>
<td>2 to 20</td>
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### Support Facilities

The HVLab Multi-Channel Plethysmograph and control software is supplied with a comprehensive User Manual and the use of free hotline support for the first 12 months.

### Further Information ...

The HVLab Multi-Channel Plethysmograph measures digital blood flow and finger systolic blood pressure and is just one of a range of HVLab products. The product range includes the multi-channel plethysmograph for measuring finger systolic blood pressure, a thermal aesthesiometer for measuring thermal thresholds, a tactile vibrometer for measuring vibrotactile thresholds, an 8-channel temperature monitor for measuring rewarming times and a database for storing test and patient details. For further information and copies of published studies using the HVLab Multi-Channel Plethysmograph please contact:

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