



ES100V3

Quick-Start T.B.I Guide

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# INSTRUCTIONAL VIDEO

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We have produced a demonstrational video that details the procedure to perform a Toe Pressure Study using the Hadeco Dopplers. The video performs the demonstration using the ES100V3 model however the instructions given are also applicable to both the Smartdop 45 and BiDop7 models.



ES100V3 T.B.I. Kit

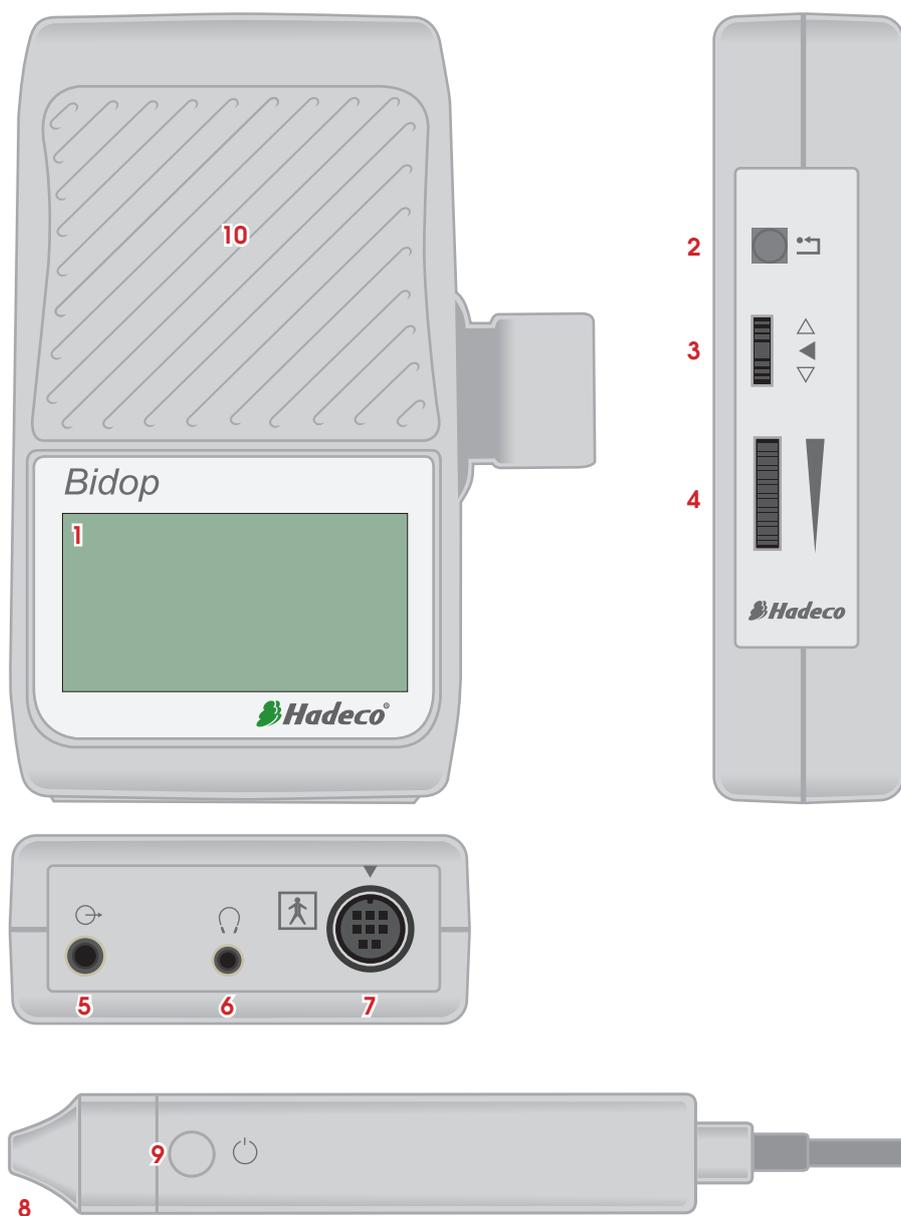


Smartdop 45 T.B.I. Kit



BiDop7 T.B.I. Kit

## MAIN FEATURES & CONTROLS



1. LCD Display
2. Back Button
3. Shuttle Button
4. Speaker Volume Control
5. Doppler/Computer USB Port
6. Headphone Port
7. Probe Connection Port
8. 8MHz Probe
9. Probe Button
10. Speaker

### Other Items Required

- Sphygmomanometer with detachable Arm and Toe Cuffs
- PPG Probe
- PPG Toe Clip or Tape to attach PPG Probe to Toe

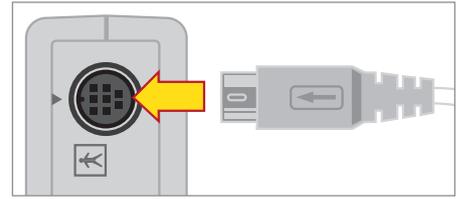
For a more detailed explanation on the Features and Controls for the ES100V3, please refer to the Operating Manual supplied with the unit.

## INITIAL SET-UP

### QUICK START

1. Set the alkaline battery in the unit.
2. Connect the chosen probe to the Bidop so that the polarity mark aligns with the triangle mark (Fig.1).
3. Press the probe button or shuttle button to switch on and hold the button for longer than 2 seconds to switch off (Fig.2).

(Fig.1)

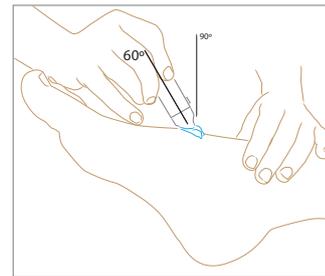


(Fig.2)

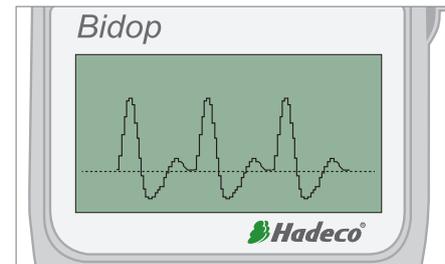
## DOPPLER VELOCITY WAVEFORM

1. Insert the 8 MHz probe into the unit (Fig.1).
2. Palpate relevant pulse and apply ultrasound gel (Fig.3).
3. Position probe on pulse and angle at approximately 60 degrees to the vessel (Fig.3). Adjust the probe angle until clear, crisp sounds are heard and a defined waveform is visible on the LCD display (Fig.4). You can freeze the waveform and save using the Probe Button and menu selection to upload the test to the Smart V Link software (sold separately).

(Fig.3)



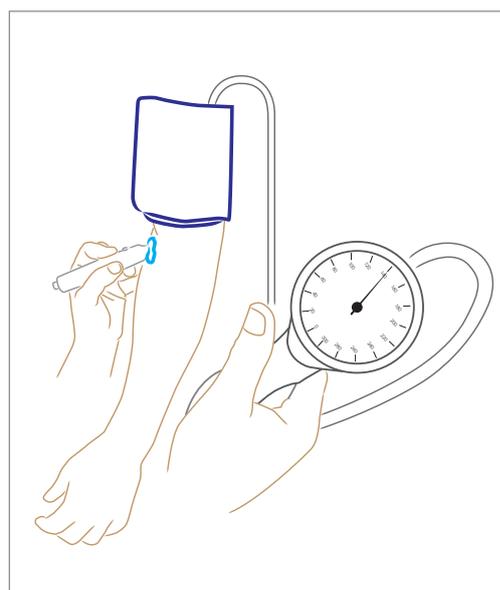
(Fig.4)



## OBTAINING A.B.I & T.B.I READINGS

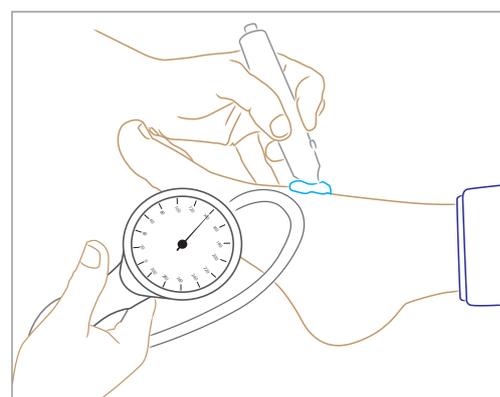
### BRACHIAL PRESSURE

1. Apply the Arm Cuff. Follow the same process as displayed on page 2 to locate the pulse waveform.
2. When the waveform is steady and clear inflate the cuff using the sphygmomanometer 20 mmHg above the point of sound cessation and flat lining of the waveform. Slowly deflate the cuff at a rate of 2-3 mmHg per second.
3. Identify the brachial pressure at the point of the return of the waveform and sound. Repeat both arms and use the highest pressure for the ABI calculation.



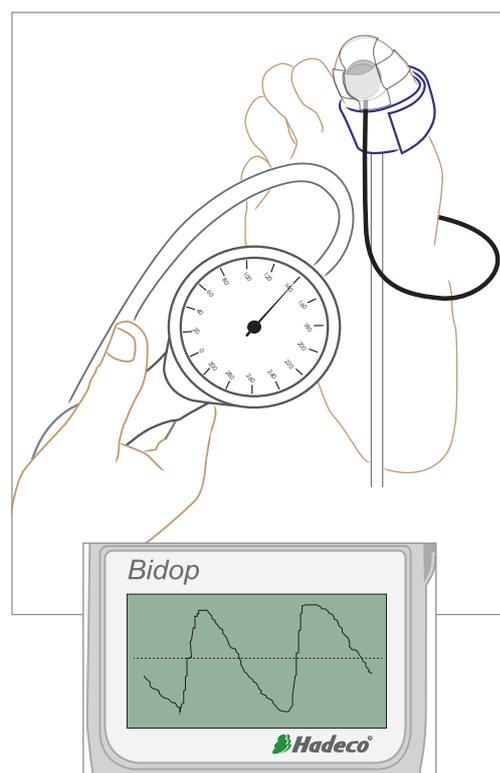
### ANKLE PRESSURE

1. Apply the cuff to the ankle. Follow the same process as above to locate the various pulse waveforms of the feet i.e. dorsalis pedis and posterior tibial.
2. Repeat the same process of cuff inflation and deflation as the brachial pressure and note the two pressures to be used in the ABI calculation.



### TOE PRESSURE

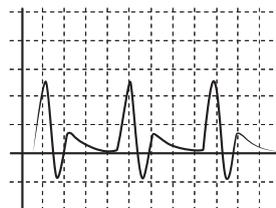
1. Apply the digital cuff as low as possible on the toe to expose as much of the apex.
2. Position the PPG Probe, ensuring complete contact between the sensor and the skin. Hold in place with either tape or the PPG Clip. The orientation of the sensor is not relevant. Keep the PPG Probe cable clear of interference by taping it to the dorsum of the foot.  
**PLEASE NOTE: DO NOT APPLY ULTRASOUND GEL**
3. When a clear and steady waveform is obtained inflate the cuff. Aim to inflate with one squeeze ONLY on the sphygmomanometer. This prevents over inflation and potential destruction of the cuff. Loosen the sphygmomanometer so that it automatically deflates at a controlled and steady rate of approximately 2-3 mmHg per second.
4. Note the return of blood flow when the sound changes and the waveform returns. This can then be used in the TBI calculation.
5. Repeat on the contralateral limb.



## DOPPLER WAVEFORMS - INTERPRETATION

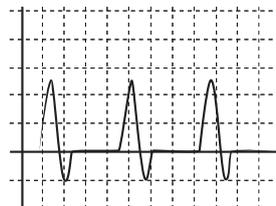
### TRIPHASIC (Normal)

- Triphasic sounds indicate bi-directionality and a compliant artery at the point of probe contact.
- The first long sound is the systolic forward component.
- The second short sound is the reversal component and is seen below the baseline of the waveform print out. It is thought to occur upon closure of the aortic valve.
- The third sound indicates wall motion characteristic of a compliant artery.



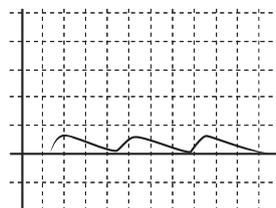
### BIPHASIC (Normal to Mild PAD)

- Biphasic sounds indicate bidirectional flow velocity having both forward systolic and reverse diastolic component but no third component.
- While they are considered normal, the lack of the third component may indicate minor to moderate blood flow impairment or simply improper probe angle this is why it is important to carefully adjust the probe to obtain the best sounds.



### MONOPHASIC (Severe PAD)

- Monophasic sounds are low frequency sounds having a single cycle. They are low in intensity and indicate severe disease.



### ABI

Ankle Brachial Indexes provide quantitative measurements of peripheral circulation. However, elevated readings >1.3 are common with patients with diabetes due to calcification of the vessels which results in an invalid reading.

$$\text{ABI} = \frac{\text{ankle systolic blood pressure}}{\text{brachial systolic blood pressure}}$$

Peripheral arterial disease (PAD)	<0.9
Mild PAD	0.7-0.9
Moderate PAD	0.4-0.69
Severe PAD	<0.4

### TBI

Toe Brachial Indexes are now commonly used as the chance of an invalid reading due to calcification of the vessels is less likely when compared with ankle pressures.

$$\text{TBI} = \frac{\text{toe systolic blood pressure}}{\text{brachial systolic blood pressure}}$$

Normal	0.65-1
Severe/Critical PAD	<0.2

### Absolute Toe Pressures

Absolute toe pressures are also used to indicate wound healing potential.

Absolute toe pressures >30mmHg indicate there is an increased chance of healing.

These quantitative measurements can assist in establishing a baseline to track a patient's progress over time, as well as being an excellent screening tool to identify potential foot health risk.

Reference: International Working Group on the diabetic foot, 2011

ALSO AVAILABLE:



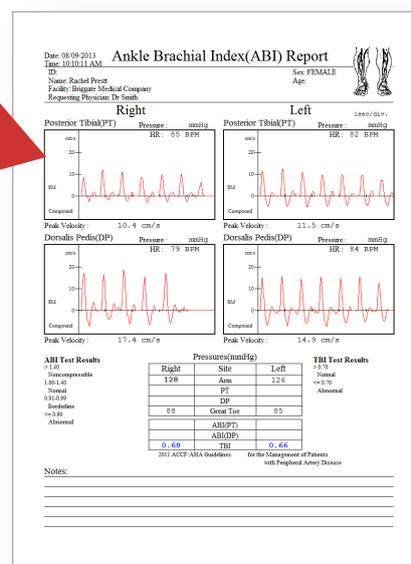
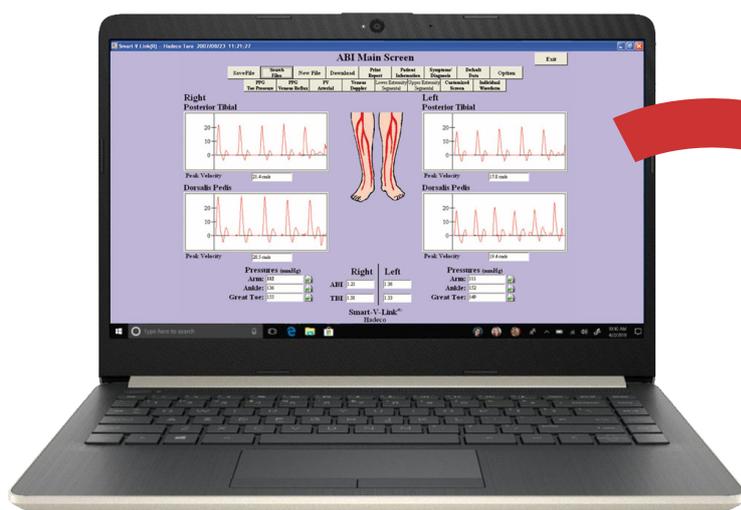
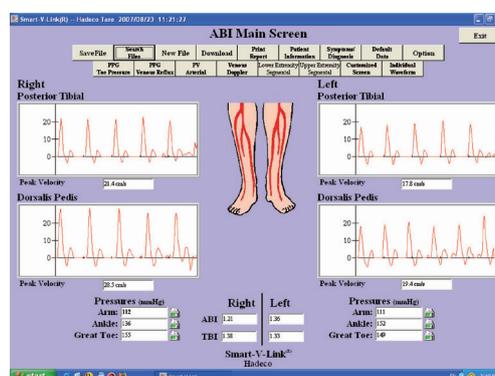
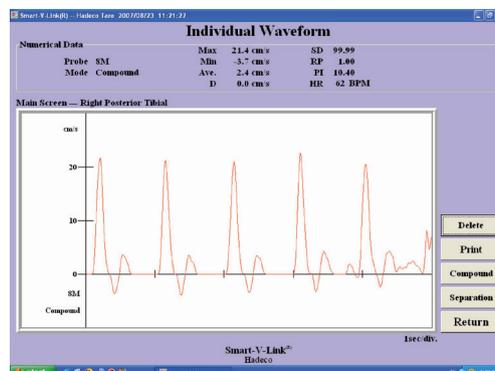
## Smart-V-Link Software

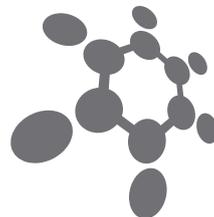
for use with Smartdop 30EX/Smartdop45/ES100V3

- Allows for creation of detailed patient reports in pdf format - ideal for referrals
- Fully auto-gain controlled waveform by computer
- ABI, TBI and arterial blood flow velocity
- Real-time vascular waveform display
- Data storage for future reference
- Standardised testing modules for easy operation and documentation
- Includes specially designed USB interface cable to link Doppler to PC
- Requires Windows 7/8.1/10

CODE: DOP/SMLINK

Contact Briggate Medical for pricing





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