

SmartLink™

Version 1.0

for Windows 98/2000/XP

OPERATING MANUAL

Computer Communication Software

for

HADECO Dopplers

ES-100V3

Smartdop 20EX

Smartdop 50 / 50EX

DVM-4300

with RS-232C Interface

HADECO®

Excellence in Human Service and Technology

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--- Cautions ---

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Thank you very much for purchasing a HADECO Computer Communication Software, SmartLink™ for Windows.

This manual explains the process for connecting Doppler to computer, installing software and using SmartLink. For the operation of Doppler and PPG/PV probe, please refer to the operating manuals came with your Doppler and PPG/PV probe.

Please read this manual carefully for complete product satisfaction.

PROFILES

The SmartLink allows you to implement easily the vascular studies using the bi-directional Doppler as well as the patient data filing.

- * All operations of Doppler are remote controlled by computer.

- * Real-time vascular waveform display

- * Data storage for future reference

- * Standardized testing modules for easy operation and documentation
 - ABI, TBI and arterial blood flow velocity
 - PPG arterial & venous reflux
 - PV arterial
 - Venous compression
 - Lower & upper extremities

SYSTEM REQUIREMENTS

DOPPLER

HADECO Doppler with RS-232C interface

- Bidop ES-100V3
- Smartdop 20EX
- Smartdop 50 / 50EX
- DVM-4300

COMPUTER

- IBM PC/AT or compatible
- Serial interface: RS-232C
- Mouse
- CPU clock: 400 MHz or more
- Minimum memory requirements:
 - RAM: 64 MBytes
 - HD: 10 MBytes
- Display: 800 x 600 dots, 256 colors or more
- OS: Windows 98 / 2000 / XP

RS-232 CABLE

- Dedicated cable for ES-100V3
- 9 pin standard cable for other Dopplers, straight wired type 9 Pin Female to 9 Pin Female

GETTING STARTED

INSTALLING SmartLink

- (1) Insert the CD-ROM in which SmartLink software is contained.
- (2) Installer dialog box will appear automatically. If it does not appear, open the SMARTLINK icon, and double-click **install.exe** to install SmartLink software. Follow the instructions of installer.

UNINSTALLING SmartLink

- (1) Choose HADECO SmartLink\uninstall on Program menu to uninstall SmartLink.

CONNECTIONS

- (1) Make sure that the Doppler probe is connected to the Doppler
- (2) Connect the RS-232 cable to the Doppler.
- (3) Connect the other side of the cable to the computer.
- (4) Turn the Doppler on.

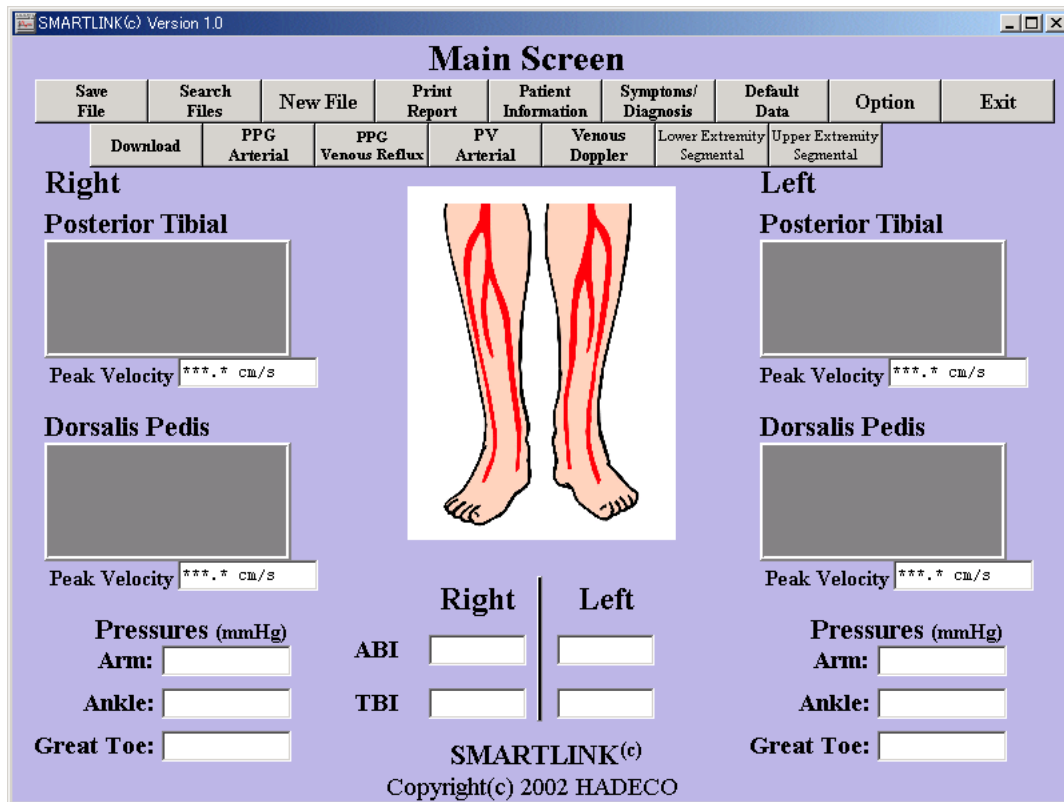
Caution

- **Do not turn off the power both the computer and the Doppler while using the software.**
- **Do not disconnect the cables while using the software.**
- **Do not leave the Doppler probe near the computer.**

STARTING SmartLink

- (1) Choose **HADECO SmartLink\SmartLink Ver1.0** on Program menu to start the SmartLink.
- (2) After a few moments, **Main Screen** appears. You are ready to begin working.

MAIN SCREEN



FUNCTION BUTTONS

- Save File:** To save measurement data as a new file.
- Search Files:** To search data files to be opened.
- New File:** To erase all measurement data for new measurement. A confirmation dialog box will appear. Click **Yes** to save the data, **No** to erase the data or **Cancel** to cancel erasing and saving the data.
- Print Report:** To go to Print window to print report.
- Patient Information:** To go to Patient Information window to input patient data.
- Symptoms/Diagnosis:** To input patient symptoms and information of attestation.
- Default Data:** To set default and to input, to edit, to erase and to save facility data.
- Option:** Commport setting, gain setting and screen setting.
- Exit:** To quit SmartLink. If the data have not been saved on hard disk, alert dialog box will appear. Click "Yes" to save data or "No" to quit without saving.
- Download:** To download waveform memory data from Bidop ES-100V3.
- PPG Arterial:** To go to PPG Arterial window.

PPG Venous Reflux: To go to PPG Venous Reflux window.

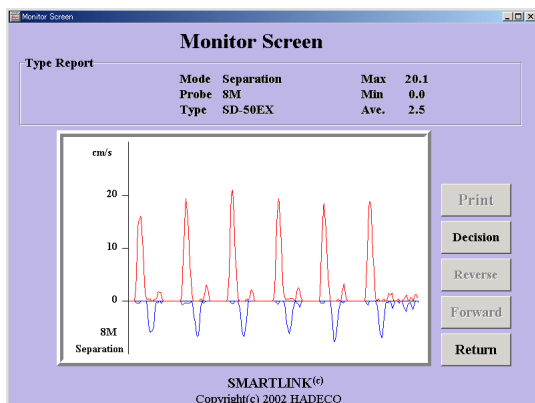
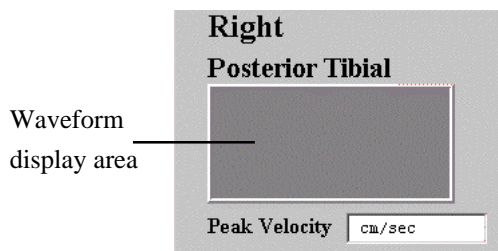
PV Arterial: To go to PPG Arterial window.

Venous Doppler: To go to Venous Doppler window.

Lower Extremity Segmental: To go to Segmental Pressure window.

Upper Extremity Segmental: To go to Upper Extremity window to perform the measurements of blood flow with Doppler and of pressures.

OPERATIONS ON THE MAIN SCREEN



(1) Posterior Tibial

Click the waveform display area to measure the Posterior Tibial artery with the Doppler probe. Monitor Screen appears and SmartLink displays real-time waveform receiving from the Doppler.

Press **Reverse** to change the waveform polarity to Reverse mode. And press **Forward** to go back to Forward mode.

Press the probe button or the space bar on the keyboard to freeze waveform. The numerical data, such as maximum velocity, minimum velocity and average velocity, will be displayed above the waveform on the screen.

If the frozen waveform is satisfactory, click **Decision** to save the data to the memory of the computer and to go back to the Main Screen. If not, press the probe button or the space bar to measure again.

Click **Return** to go back to the Main Screen.

(2) Dorsalis Pedis

Click waveform display area to measure the Dorsalis Pedis artery. Monitor Screen will appear and you can operate as same as the Posterior Tibial.

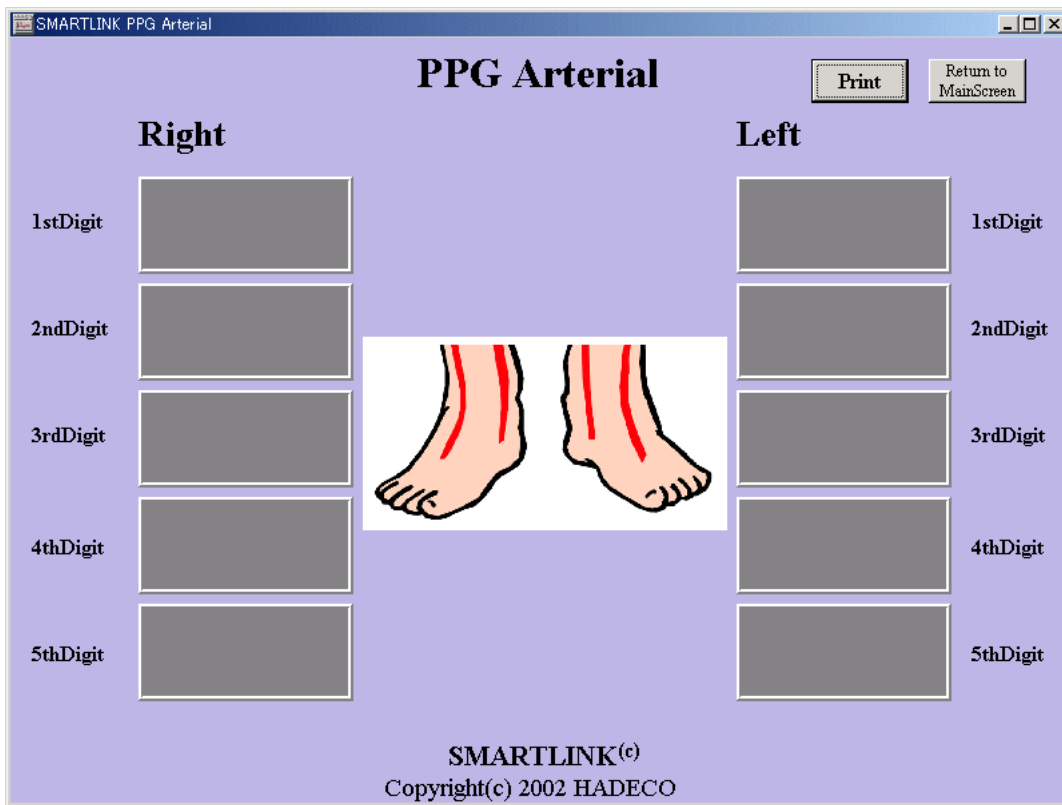
(3) Pressures

Type the pressures of Arm, Ankle and Great Toe, and the ABI (Ankle Brachial Index) and the TBI (Toe Brachial Index) will be calculated automatically.

(4) Side change

Repeat (1) to (3) on the other side.

PPG ARTERIAL



(1) 1st Digit

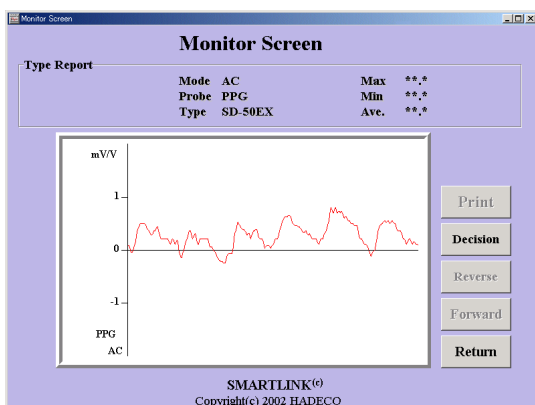


Click the waveform display area to measure the first digit with the PPG probe. Monitor Screen appears and SmartLink displays real-time waveform receiving from the Doppler.

Press the space bar on the keyboard to freeze waveform.

If the frozen waveform is satisfactory, click **Decision** to save the data to the memory of the computer and to go back to the PPG Arterial window. If not, press the space bar to measure again.

Click **Return** to go back to the PPG Arterial window.



(2) 2nd to 5th Digits

Click each waveform display area to measure the 2nd to 5th digits. Operate as same as 1st Digit.

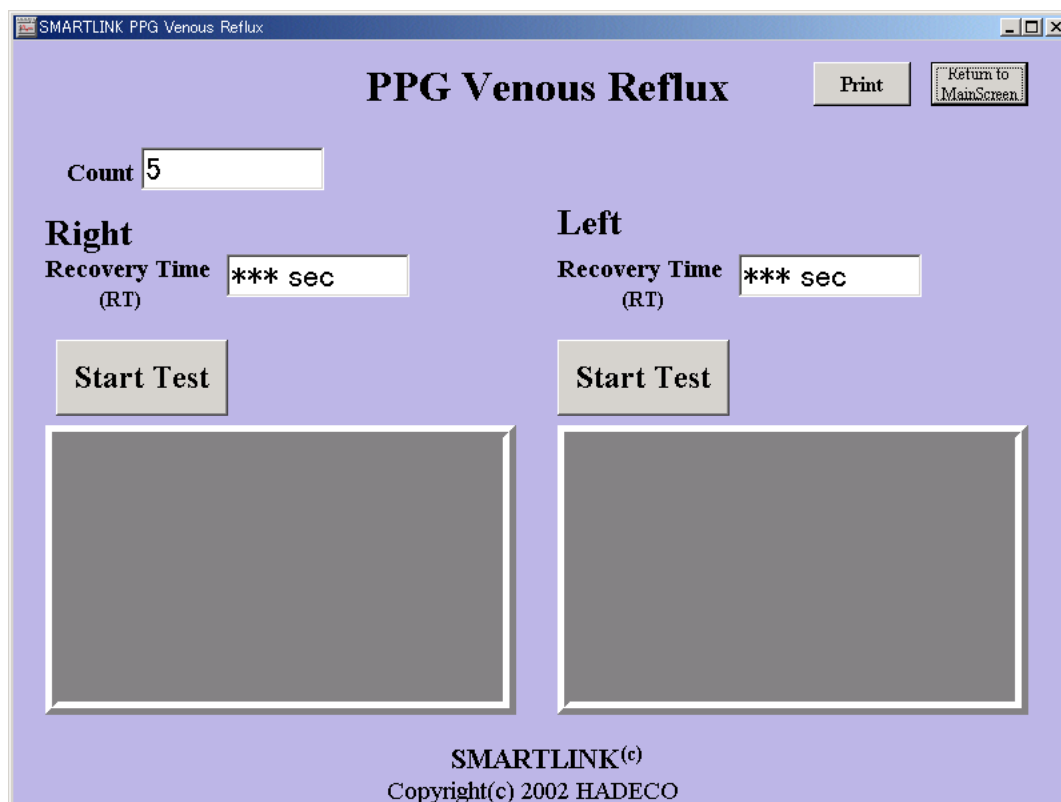
(3) Side change

Repeat (1) to (2) on the other side.

(4) Printing waveform

Click **Print** to print the report if desire. For the print procedure, see the section of Print Report in this manual.

PPG VENOUS REFLUX



- (1) Type the number of times for patient dorsiflexes in the **Count**.
- (2) Click **Start Test** to start measurement of Venous Reflux. Smart Link will display the waveform receiving from the Doppler unit. It will stop the measurement automatically when getting an appropriate waveform and the waveform returns to the base-line amplitude.

Press the space bar on the keyboard to stop the measurement still in progress.

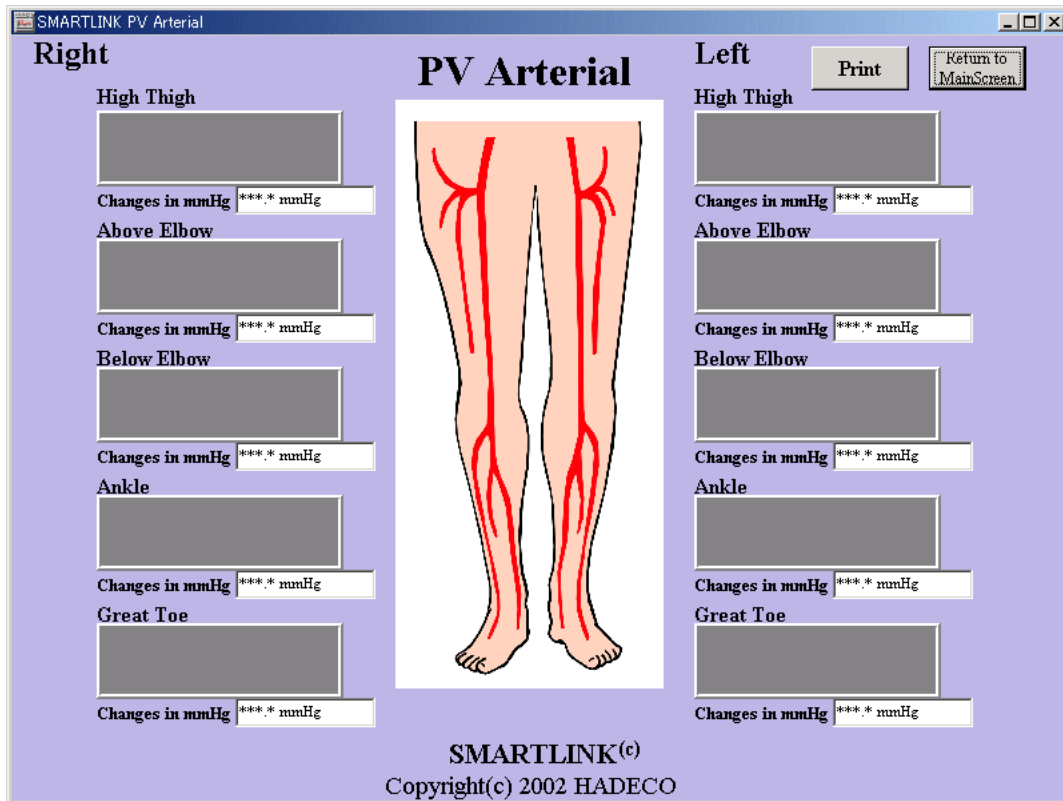
If the measured waveform is not satisfactory, press the space bar to measure again.

- (3) Repeat (1) to (2) on the other side.

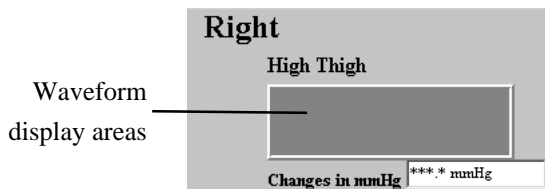
- (4) Click **Print** to print the report if desire.

PV ARTERIAL

This function cannot be available to the use with Bidop ES-100V3.



(1) High Thigh:



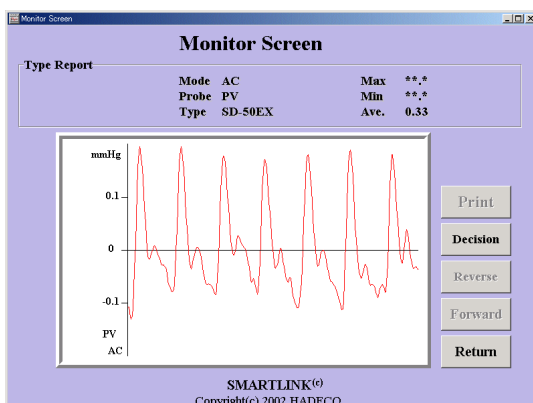
Click the waveform display area to measure the High Thigh with PV Probe. Monitor Screen will appear and Smart Link will display real time waveform receiving from Doppler unit.

Press the space bar on the keyboard to freeze waveform.

If the frozen waveform is satisfactory, click **Decision** to save the data to the memory of the computer and go back to the PV Arterial window.

If the frozen waveform is not satisfactory, press the space bar on the keyboard to measure again.

Click **Return** to go back to the PV Arterial window.



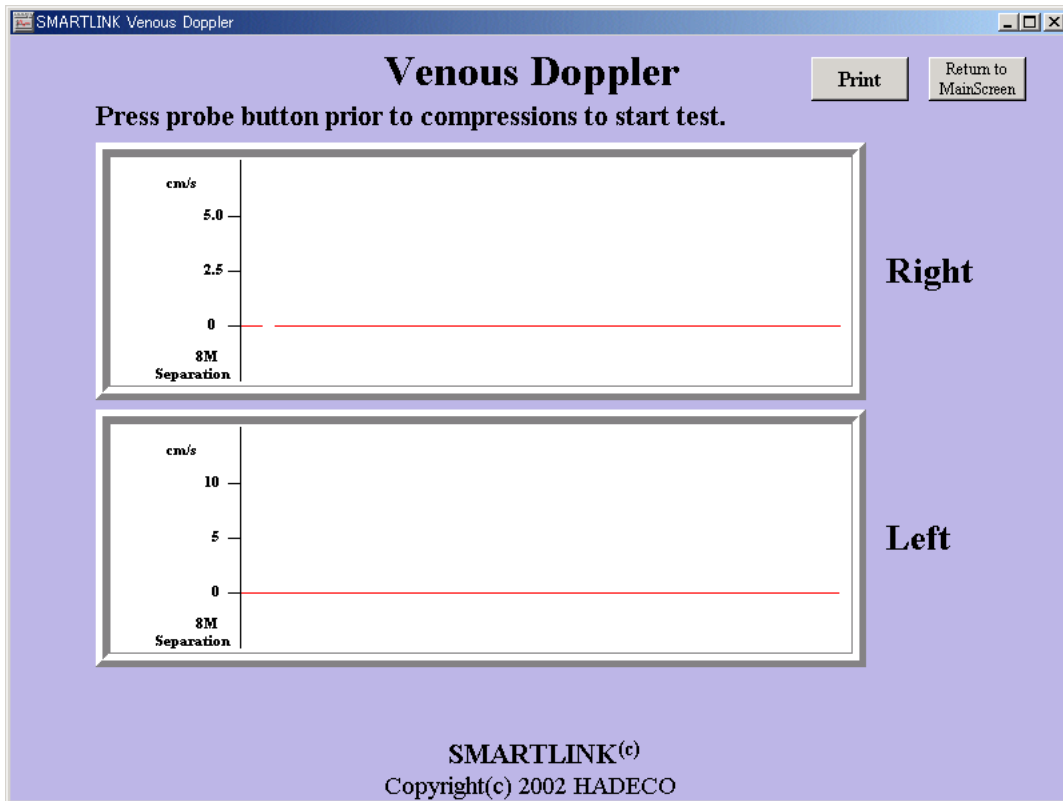
(2) Above Knee, Below Knee, Ankle, Great Toe:

Click each waveform display area to measure the site. Operate as same as High Thigh.

(3) Side change:

Repeat (1) to (2) on the other side.

VENOUS DOPPLER



(1) **Right:**

Click the waveform display area to start measurement. Smart Link displays real time waveform receiving from Doppler unit.

After compressing, press the space bar to freeze waveform.

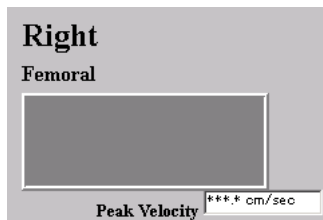
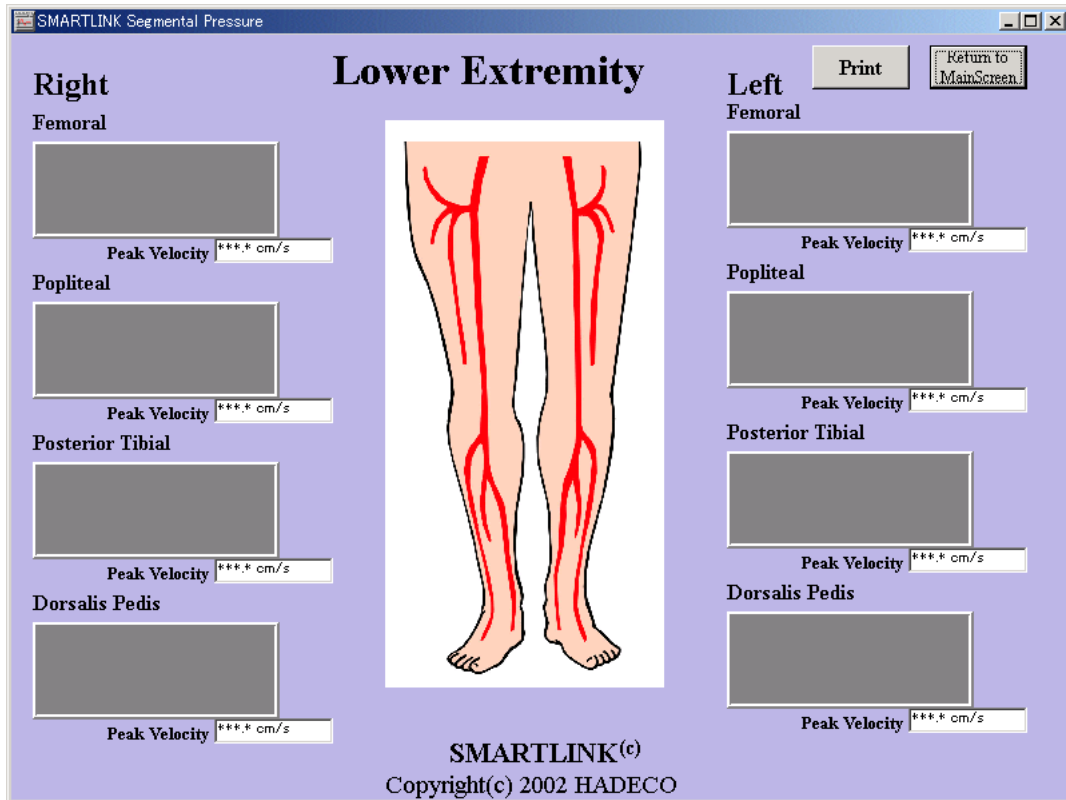
If the waveform is not satisfactory, press the space bar to repeat the measurement.

(2) **Left:**

Operate as same as "Right".

(3) Click **Print** to print the report if desire.

LOWER EXTREMITY SEGMENTAL



(1) Femoral

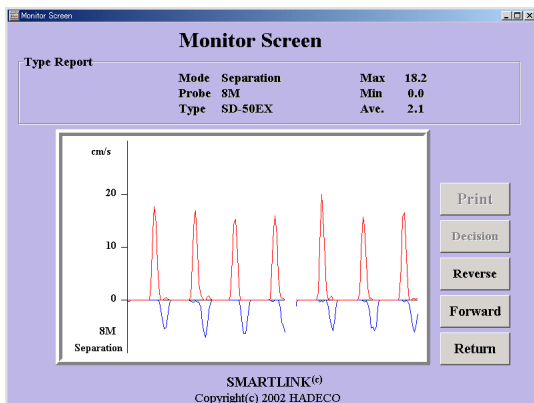
Click the waveform display area to measure of Femoral artery with Doppler probe. Monitor Screen appears and SmartLink displays real time waveform receiving from Doppler.

Press **Reverse** to change the waveform polarity to Reverse Mode. And press **Forward** to go back to Forward Mode.

Press the probe button or the space bar on the keyboard to freeze waveform. The numerical data, such as maximum velocity, minimum velocity and average velocity, will be displayed above the waveform on the screen.

If the frozen waveform is satisfactory, click **Decision** to save the data to the memory of the computer and go back to the Lower Extremity window. If not, press the probe button or the space bar to repeat the measurement.

Click **Return** to go back to the Lower Extremity window.



(2) **Popliteal, Posterior Tibial, Dorsalis Pedis**

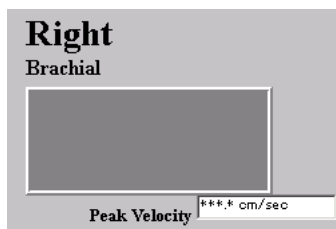
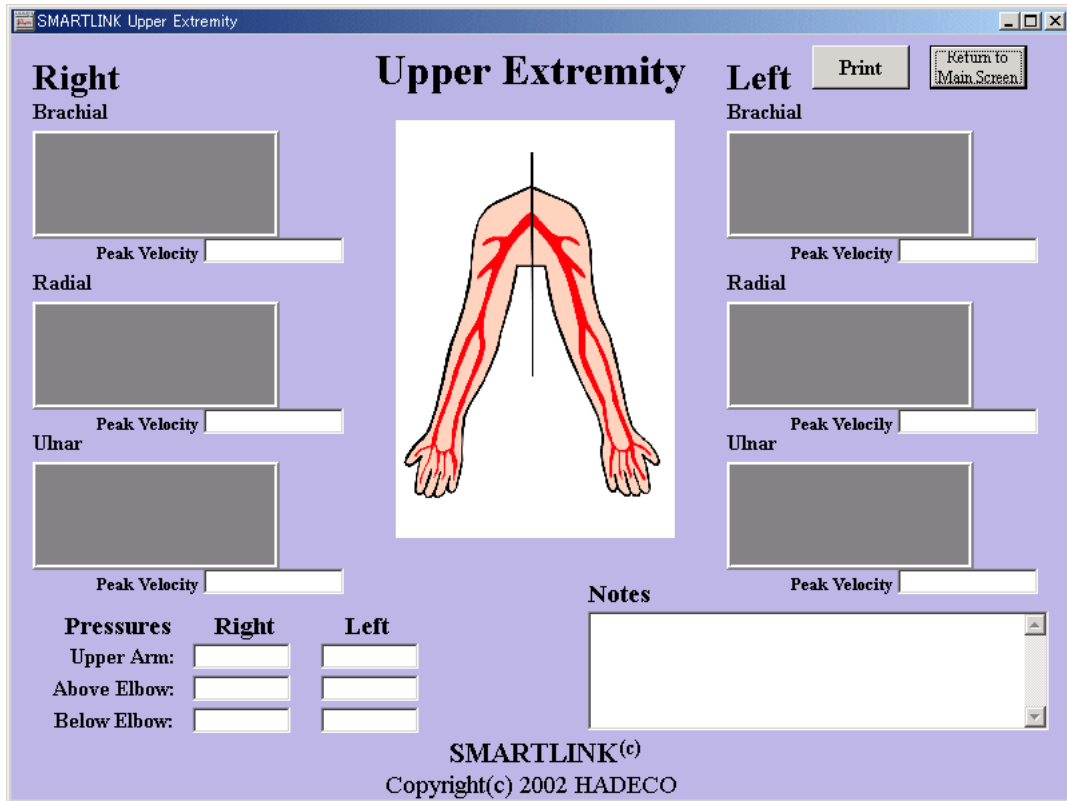
Click each waveform display area to measure the site. Operate as same as the Femoral.

(3) **Side change**

Repeat (1) to (2) on the other side.

(4) Click **Print** to print the waveform if desire.

UPPER EXTREMITY SEGMENTAL



(1) Brachial

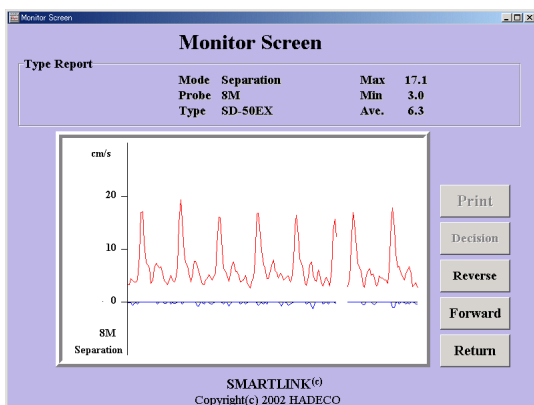
Click the waveform display area to measure the Brachial artery with Doppler probe. Monitor Screen appears and Smart Link displays real time waveform receiving from Doppler unit.

Press **Reverse** to change the waveform polarity to Reverse mode. And press **Forward** to go back to Forward mode.

Press the probe button or the space bar to freeze waveform. The numerical data, such as maximum velocity, minimum velocity and average velocity, will be displayed above the waveform on the screen.

If the frozen waveform is satisfactory, click **Decision** to save the data to the memory of the computer and go back to the Upper Extremity window. If not, press the probe button or the space bar to measure again.

Click **Return** to go back to the Upper Extremity window.



(2) **Radial, Ulnar**

Click each waveform display area to measure the site. Operate as same as the Brachial

(3) **Side change**

Repeat (1) to (2) on the other side.

Pressures	Right	Left
Upper Arm:	<input type="text"/>	<input type="text"/>
Above Elbow:	<input type="text"/>	<input type="text"/>
Below Elbow:	<input type="text"/>	<input type="text"/>

(4) **Pressures**

Input the pressures of the Upper Arm, the Below Elbow and the Above Elbow of both sides.

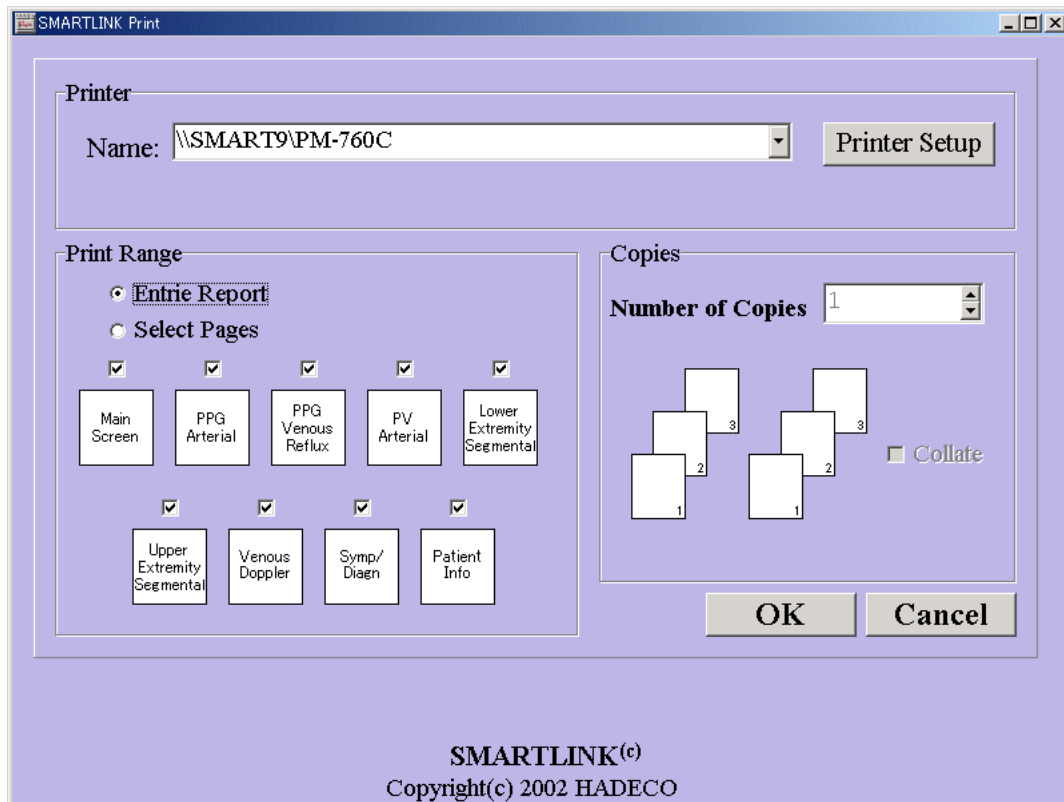
(5) **Notes**

Notes can be typed freely.

(6) **Printing waveforms**

Click **Print** to print the report if desire.

PRINT REPORT



(1) **Printer**

Select a printer which you use for printing from the pulldown menu.

(2) **Print Range**

Click **Entire Report** for the printing all pages, or click **Select Pages** and check the pages you want to print.

(3) **Copies**

Set the number of copies.

(4) Click **OK** to printout or click **Cancel** to go back to Main Screen without printing.

PATIENT INFORMATION

SMARTLINK Patient Information

Patient Information Save Return to MainScreen

Name:

ID:

Telephone Number:

SEX:

AGE:

Facility:

Performing Studies:

Ordering Physician:

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(1) Name, ID, Phone Number and Age

Click the each text area and type the information.

(2) Sex

Select MALE or FEMALE from pulldown menu.

(3) Facility, Performing Studies and Ordering Physician

Select the data from pulldown menu.

<NOTE>

Data cannot be inputted directly on this window. If you want to add a new data in the pulldown menu, set the data on Default Data window.

(4) Click Save to save the data to the memory of the computer.

SYMPTOMS / DIAGNOSIS

The screenshot shows a software window titled "SMARTLINK Symptoms/Diagnosis". The window has a purple background. In the top right corner, there are two buttons: "Print" and "Return to MainScreen". Below the title bar, there are two large text input areas. The first is labeled "Symptoms" and the second is labeled "Diagnosis". Both input areas are currently empty. At the bottom of the window, the text "SMARTLINK(c) Copyright(c) 2002 HADECO" is displayed.

(1) You can simply type information of both Symptoms and Diagnosis in the text area.

(2) Click Print to print the report if desire.

DEFAULT DATA

The screenshot shows a software window titled "SMARTLINK Default Data". The window has a light purple background and a title bar with standard window controls. The main content area is titled "Default Data" and contains several input fields and a button panel. The fields are: "Facility" (a dropdown menu), "Address" (a large text area), "Telephone Number" (a text field), "Performing Studies" (a dropdown menu), and "Ordering Physician" (a dropdown menu). To the right of these fields is a vertical stack of five buttons: "Add", "Edit", "Erase", "Save", and "Cancel". At the bottom of the window, it says "SMARTLINK(c) Copyright(c) 2002 HADECO".

1. Setting Default

The default data can be used in pulldown menu at Patient Information window.

- (1) **Facility:** Select the facility from the pulldown menu.
(When new facility is selected, Address and Telephone number are changed corresponding to the facility.)
- (2) **Performing Studies:** Select from pulldown menu.
- (3) **Ordering Physician:** Select form pulldown menu.

2. Adding new data

2-1. Facility, Address and Telephone number

- (1) Click **Add**, and cursor will locate in text area of Facility.
- (2) Input new facility and press Enter key on the keyboard.
- (3) Cursor automatically moves to the text area of Address.

SMARTLINK Default Data

Facility
Hayashi Denki

Address
Miyamae-ku
Kawasaki
216-0003

Telephone Number

Performing Studies

- (4) Input the address in 4 lines as shown left and press Enter key.
- (5) Cursor moves to text area of Telephone Number.
- (6) Input the telephone number and press Enter key.
- (7) Click **Save** to save the data to the memory of the computer.

2-2. Performing Studies

- (1) Click **Add**, and cursor will locate in text area of Facility.
- (2) Double-click in the text area of Performing Studies.
- (3) Input performing studies and press Enter key.
- (4) Click **Save** to save the data to the memory of the computer.

2-3. Ordering Physician

Operate as same as Performing Studies.

3. Revising data

3-1. Facility, Address and Telephone Number

- (1) Select the facility that you want to revise from the pulldown menu.
- (2) Click the text area which you want to revise and click **Edit**.
- (3) Revise the data and press Enter key.
- (4) Click **Save** to save the data to the memory of the computer.

3-2. Performing Studies

- (1) Select the performing study that you want to revise from pulldown menu.
- (2) Click the text area and click **Edit**.
- (3) Revise the data and press Enter key.
- (4) Click **Save** to save the data to the memory of the computer.

3-3. Ordering Physician

Operate as same as Performing Studies.

4. Erasing Data

- (1) Select the disused data from pulldown menu.
- (2) Click **Erase** to erase the data.

When facility data is erased, the address and the telephone number corresponding to the facility are erased automatically.

FUNCTION BUTTONS

Add: To add new data of facility.

Edit: Editing the data.

Erase: To erase editing data in text area.

To erase the data of pulldown menu.

Cancel: To go back to the Main Screen.

OPTION



(1) Commport Setting

Select the commport to which you will connect the RS cable.

(2) Gain Setting

Check Gain Unification to unify all the amplitude scale of waveform of each testing module.

(3) Language Select

Select language from the pulldown menu. (On this version of the SmartLink, only English is available.)

(4) Screen Setting

Check the testing modules you use.

DOWNLOAD

Click memory No.

Memory No.	Data Stored	Test Module	Site
1	Yes	Main Screen	Right Posterior Tibial
2	Yes	Main Screen	Right Dorsalis Pedis
3	Yes	Main Screen	Left Posterior Tibial
4	Yes	Main Screen	Left Dorsalis Pedis
5	Yes	PPG Arterial	Right 1stDigit
6	Yes	PPG Arterial	Right 2ndDigit
7	Yes	PPG Arterial	Right 3rdDigit
8	Yes	Not Selected.	Not Selected.
9	Yes	Not Selected.	Not Selected.
10	Yes	Not Selected.	Not Selected.
11	Yes	Not Selected.	Not Selected.

Select test module and site if you want to change.

Memory No.: 1 Clear

Data Stored: Yes

Test Module: Main Screen

Site: Right Posterior Tibial

Preview

cm/s
5.0
2.5
0
NC
compound

Save As Default
All Clear
Download
Return to MainScreen

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Waveform Memory data of the Bidop ES-100V3 can be downloaded in this module and are stored to each data memory of the testing module designated in this module.

This function works only when ES-100V3 is connected.

Designating waveform memory data

- (1) Click memory number to designate.
- (2) The test module and the site are set as default. If you want to change the setting, select the test module and the site from pulldown menu.
- (3) If you want to clear the designation, click Clear for one memory or click All Clear for all memories.
- (4) If you need to preview the waveform, click **Preview**. The waveform will appear in the waveform area under the Preview button.

Downloading

- (1) When the designation is completed, click **Download** to download all the designated data to the computer memories.

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