

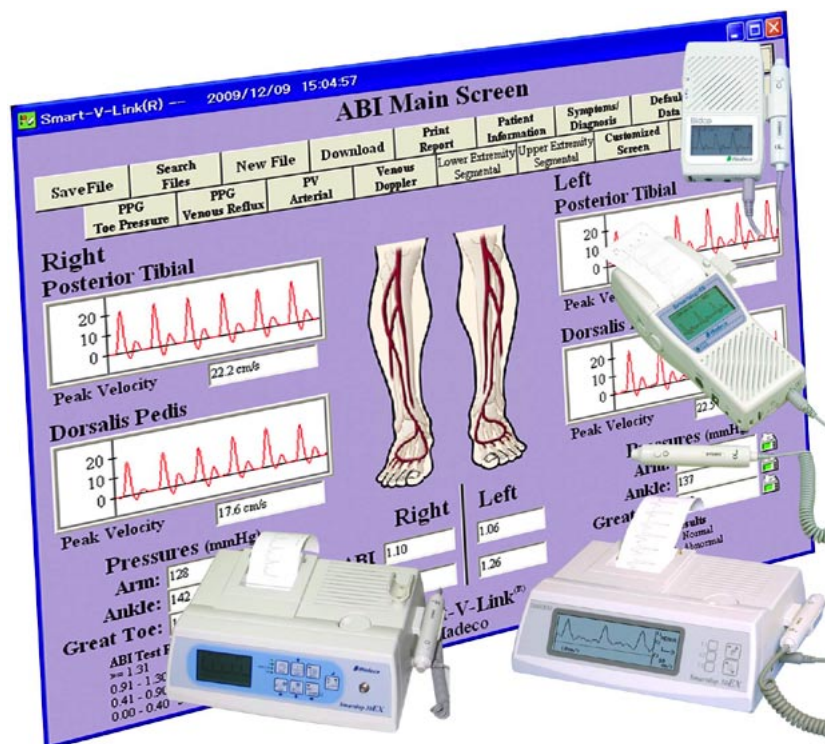
# OPERATING MANUAL

**Smart-V-Link<sup>TM</sup>**

**Version 3.0**

**for Windows 2000 / XP / Vista / 7**

**Computer Communication Software  
for  
Hadeco Dopplers with Serial Interface**



**Hadeco®**

**Excellence in Human Service and Technology**

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### **--- Notes ---**

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# Chapter 1 : INTRODUCTION

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**Thank you very much for purchasing a Computer Communication Software, Smart-V-Link™ for Windows.**

This manual explains the process for connecting Doppler to computer, installing software and using Smart-V-Link. For the operation of Doppler and PPG/PV probe, please refer to the operating manuals that come with your Doppler and PPG/PV probe.

Please read this manual carefully for complete product satisfaction.

To learn how to use Smart-V-Link quickly see "**Chapter 3 : Quick Start**". It introduces a few essential and typical uses of Smart-V-Link.

## PROFILES

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

- \* Operations of Doppler are remote controlled by computer.
- \* Real-time vascular waveform display
- \* Data storage for future reference
  - Data can be stored in the internal hard disk drive as well as any storage devices on network computers.
- \* Standardized testing modules for easy operation and documentation
  - ABI, TBI and arterial blood flow velocity
  - PPG toe pressure & venous reflux
  - PV arterial
  - Venous compression
  - Lower and upper extremities
  - Individual test

# SYSTEM REQUIREMENTS

---

## DOPPLER

Hadeco Doppler with serial interface

- Bidop ES-100V3
- Smartdop 30EX
- Smartdop 45
- Smartdop 50EX (including Smartdop 50EX-F)
- DVM-4300 (including DVM-4300T)

## COMPUTER

- OS: Windows 2000 / XP / Vista / 7
- CPU clock: Celeron 500 MHz or more
- Display: 800 x 600 dots or more  
256 colors or more
- Minimum memory requirements:
  - RAM: 256 MBytes
  - HD: 20 MBytes

## INTERFACE and Communication CABLE

Doppler models	Serial #	Serial I/F	Communication cable
ES-100V3	≤ 05080500	RS-232 (built-in)	Dedicated cable (RS-232) *1
	≥ 06010001	USB (built-in)	Dedicated cable (USB) *1
Smartdop 30EX		USB (built-in)	Dedicated cable (USB) *1
Smartdop 45		USB (built-in)	Dedicated cable (USB) *1
Smartdop 50EX	≤ 07080100	RS-232 module (Option, discontinued)	9 pin standard RS-232 cable *2
	≤ 07080100	USB module (Option)	Dedicated cable (USB) *1
	≥ 08070001	USB (built-in)	Dedicated cable (USB) *1
DVM-4300	*3	RS-232 module (Option, discontinued)	9 pin standard RS-232 cable *2
	*3	USB module (Option)	Dedicated cable (USB) *1
	*3	USB (built-in)	Dedicated cable (USB) *1

- \*1 Predesignate Dedicated cable (USB or RS-232) on the order of Smart-V-Link software.
- \*2 9 pin standard RS-232 cable : straight wired type 9 Pin Female to 9 Pin Female
- \*3 The type of serial interface and communication cable for DVM-4300 cannot be specified according to serial number.

## **CONTENTS OF PACKAGE**

---

- Software CD-ROM
- Dedicated communication cable (Except for Models with RS-232 I/F. See the Interface and Cable table on before page.)

## **TECHNICAL DATA**

---

### **MEASUREMENT RANGE and ACCURACY**

Blood flow velocity : Depends on Doppler connected.

Heart rate : 30 - 300 bpm,  $\pm 5\%$

### **MANUFACTURING DATE**

The first 2 digits and following 2 digits of the serial number represent the year and month of manufacturing, respectively.

The serial number is located on the CD case and it consists of 4 to 8 digits and may start with "Serial number" or "S/N".

Examples:

03020001: Feb/2003

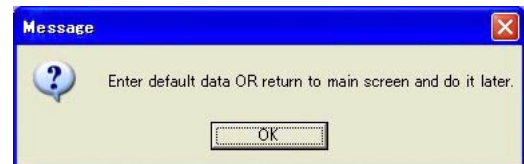
0401: Jan/2004

# Chapter 2 : GETTING STARTED

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## INSTALLING Smart-V-Link

- (1) Insert the Smart-V-Link CD-ROM into the drive of your computer.
- (2) Installer dialog box will appear automatically. If it does not appear, open My Computer and double-click the CD-ROM drive in which Smart-V-Link CD is inserted, and double-click **Setup.exe** to install Smart-V-Link software. Follow the instructions of the installer.
- (3) When installation process is completed, Readme.txt file will be open and Smart-V-Link will start automatically with the dialog box as shown right.
- (4) Click **OK** in the dialog box and input default data on the Default Data screen. See the section "**Default Data**" for details. Click **Return to Main Screen** to proceed. If you wish to do it later, simply click **Return to Main Screen**.



When installing updatet software, this dialog box and Default Data screen do not appear.

- (5) Input patient information data when Patient Information screen appear automatically. Click **Return to Main Screen** to go to ABI Main Screen. See the section "**Patient Information**" for details. If you wish to do it later, simply click **Return to Main Screen**.

*Note : When using with Doppler with USB I/F (ex. ES-100V3, Smartdop 30EX and Smartdop 45 etc.), the USB cable driver should be installed. Please refer to the **README.txt** which you can access via the same program menu for the details.*

## INSTALLING USB Cable Driver

When using with Doppler with USB I/F (ex. ES-100V3, Smartdop 30EX, Smartdop 45), the USB Cable Driver should be installed as follows:

- (1) Set the **Smart-V-Link V3.0 CD-ROM** on your CD-ROM drive.
- (2) If automatic installer **Smart-V-Link Ver3.0 installation** pops up, click on **Cancel**.
- (3) Connect the Doppler to your computer by using the USB cable enclosed.

See the Doppler operating manual of your Doppler for more information.



The following procedures depend on your Windows version:

### **Windows 2000**

- (4) When **Add New Hardware Wizard** is shown, click **Next**.
- (5) On the next dialog, select **Search for a suitable driver for my device (Recommended)** and click **Next**.
- (6) Check **CD-ROM drive** only and click **Next**.
- (7) When the searching is completed, make sure **D:\Drivers\USBS\FTDIPORT.INF**, if your CD-ROM drive is D:, is shown and click **Next**.
- (8) The USB cable driver will be installed.
- (9) When completion dialog is shown, click **Finish**.
- (10) If another "New Hardware Wizard" pops up after completing up to step #9, repeat step #4 to 9.

After the end of work, set the COM port of SV-Link. (Refer to the section "[Option](#)".)

### **Windows XP**

- (4) When **Add New Hardware Wizard** is shown, select **Install from a list or specific location (Advanced)** and click **Next**.
- (5) Select **Search for the best driver in these locations** and check **Search removable media (floppy, CD-ROM)** and click **Next**.
- (6) If caution dialog **Hardware installation (Compatibility with Windows XP)** is shown, make sure the hardware is **USB High Speed Serial Converter** and click **Next**.
- (7) The USB cable driver will be installed.
- (8) When completion dialog is shown, click **Finish**.
- (9) If another "New Hardware Wizard" pops up after completing up to step #8, repeat step #4 to 8.

After the end of work, set the COM port of SV-Link. (Refer to the section "[Option](#)".)

### **Windows Vista**

- (4) When **Found New Hardware** is shown, click **Locate and install driver software (recommended)**.
- (5) If **Found New Hardware - Unknown Device** is shown, click **Don't search online**.
- (6) Windows Security Window alerts you that the publisher of the driver cannot be verified. Click **Install this driver software anyway**.
- (7) The USB cable driver will be installed.
- (8) When completion dialog is shown, click **Close**.

- (9) If another "Found New Hardware" pops up after completing up to step #8, repeat step #4 to 8.

After the end of work, set the COM port of SV-Link. (Refer to the section "**Option**".)

## Windows 7

- (4) A shortcut for "Windows 7 Driver Install" will be created automatically on the desktop when Smart-V-Link installation is completed. Click it and follow the instructions.

### Cautions for CommPort setting

It has been reported in a rare case when using with Doppler with USB I/F that Search Comm cannot search the Doppler for the first time you run after installing USB cable driver.

To solve this problem, restart your computer once.

### Changing property of driver

Connect the Doppler to your computer first before proceeding the following steps.

- (1) Right-click on **My Computer** and select **Property**.
- (2) Click on **Device manager** tab.
- (3) Double-click on **Port (COM / LPT)** and make sure it shows as follows:  
  
USB Serial Port(COM3)                      COM port # depends of computer.)  
  
If it's not shown, reinstall the driver.
- (4) Click on **USB Serial Port(COM3)** and select **Property**.
- (5) When **USB Serial Port(COM3) property** is shown, click **Port Setting** tab.
- (6) Click **Advanced....**
- (7) **Advanced Port Setting** is shown, check **Disable PNP** on **Option** settings and click **OK**.
- (8) When it gets back to device manager, step #5, click **OK**.
- (9) When it gets back to the property, step #2, click **OK**.

## UNINSTALLING Smart-V-Link

- (1) Before uninstalling Smart-V-Link, copy all the waveform data saved on the WaveData folder for future reference.

The original **WaveData** is located in **C:\Program Files\Hadeco\SVLink3.0\**. (Default)

- (2) Select **Hadeco\Smart-V-Link Ver3.0\uninstall** on Program menu to uninstall Smart-V-Link.

## CONNECTIONS

- (1) Make sure that the Doppler probe is connected to the Doppler.
- (2) Connect the communication 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 Smart-V-Link

- (1) Select **Hadeco\Smart-V-Link Ver3.0\Smart-V-Link Ver3.0** on Program menu to start the Smart-V-Link and Patient Information screen will appear automatically..
- (2) Input patient information data and click **Return to Main Screen** to go to ABI Main Screen. If you wish to do it later, simply click **Return to Main Screen**.

If a Smart-V-Link data file is double-clicked directly, Patient Information screen and dialog box will not displayed and Smart-V-Link will start with ABI Main Screen.

- (3) When you start the Smart-V-Link for the first time, click on **Option** button on the ABI Main Screen and do the CommPort setting. (See the section "**Option**" for the details.)

*Note : After clicking on Option, the dialog box below may be shown.  
Click OK and be sure to do the CommPort setting in this case.*



## VIEWING HELP

- (1) Select **Hadeco\Smart-V-Link Ver3.0\Smart-V-Link Help** on Program menu to open Help html, which requires a web browser installed in your computer.
- (2) Opening the help file by pressing F1 is not available on the software.

# Chapter 3 : QUICK START

## 1. Starting Smart-V-Link and Preparation

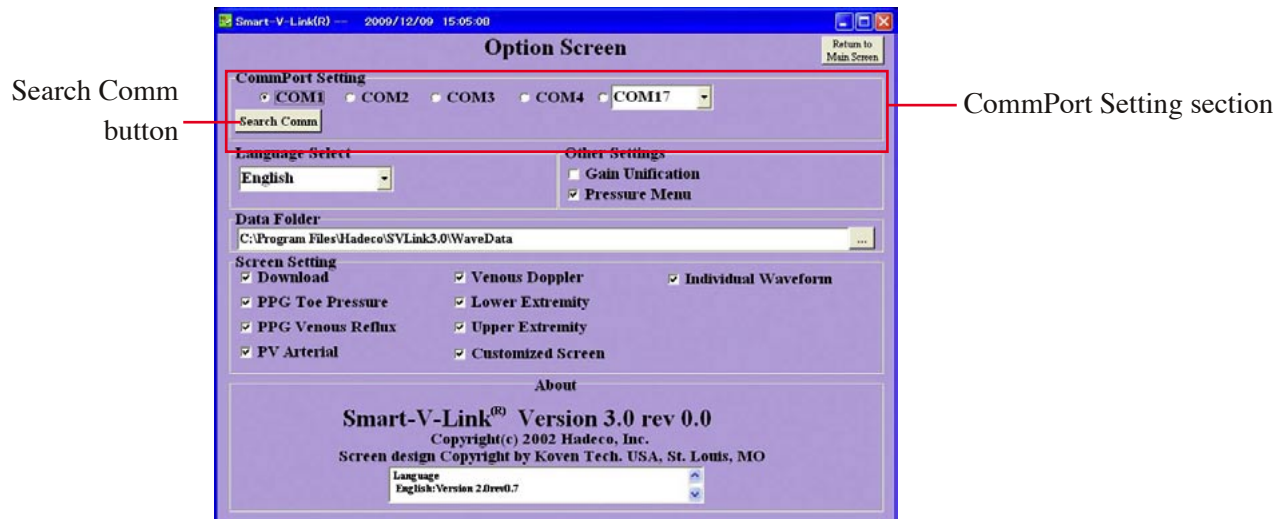
- (1) Connect the communication cable to the Doppler.
- (2) Connect the other side of the cable to USB port of the computer.
- (3) Turn the Doppler on.
- (4) Start the Smart-V-Link and **Patient Information** screen will appear.

The screenshot shows the 'Patient Information' window in the Smart-V-Link software. The window has a title bar with 'Smart-V-Link(R)' and the date/time '2009/12/09 15:05:00'. The main area contains several input fields: 'First Name:', 'Last Name:', 'ID:', 'Sex:', 'Date of Birth:' (with a dropdown for MM/DD/YYYY), 'Age:', 'Height:', 'Weight:', 'Telephone Number:', 'Test Date:' (with a dropdown for MM/DD/YYYY), 'Facility:', 'Performing Studies:', and 'Ordering Physician:'. There are 'Save' and 'Return to Main Screen' buttons in the top right. The bottom of the window displays 'Smart-V-Link®' and 'Hadeco'.

- (5) Type the patient information or you may do it later.
- (6) Click **Save** to save the information and click **Return to Main Screen** to go to ABI Main Screen.

The screenshot shows the 'ABI Main Screen' window. It features a menu bar with options: 'SaveFile', 'Search Files', 'New File', 'Download', 'Print Report', 'Patient Information', 'Symptoms/ Diagnosis', 'Default Data', and 'Option'. Below the menu is a diagram of a human foot with various measurement points labeled: 'Right Posterior Tibial', 'Dorsalis Pedis', 'Peak Velocity', 'Pressures (mmHg)', 'Arm:', 'Ankle:', 'Great Toe:', 'ABI', and 'TBI'. The 'Option' button in the top right corner is highlighted with a red arrow and labeled 'Option button'. The bottom of the window displays 'Smart-V-Link®' and 'Hadeco'.

- (7) Click **Option** in the menu to go to Option Screen.



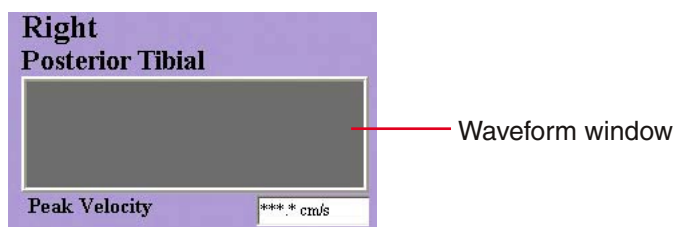
- (8) Click **Search Comm** in the CommPort Setting section to search for COM port Doppler device is connected. Smart-V-Link will show the COM port # and model # of connected Doppler.
- (9) Click **Return to Main Screen** to go to ABI Main Screen.

 We recommend turning off other devices connected to COM port beforehand. The message dialog box below will appear. Click on **OK** to proceed.



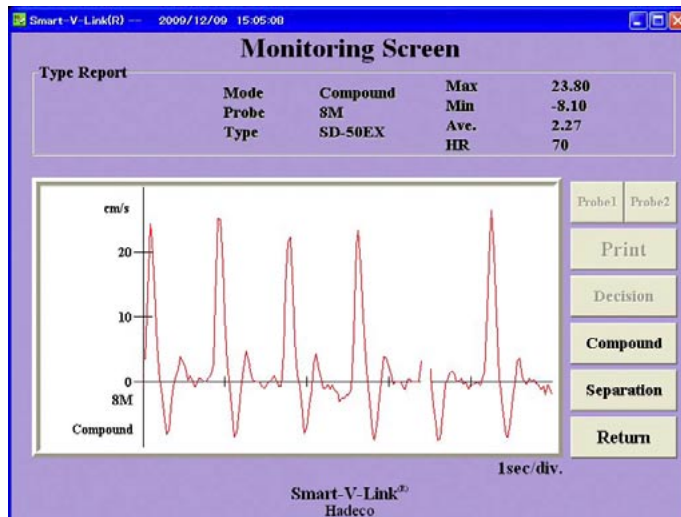
## 2. Measuring Blood Velocity

- (1) Click the waveform window of Posterior Tibial to start monitoring the blood velocity waveform of posterior tibial artery taken with the Doppler.



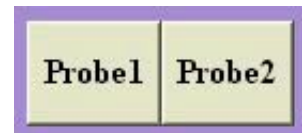
Monitor Screen will appear and the real-time waveform and numerical data received from the Doppler will be shown.

## Monitoring Screen in measurement mode

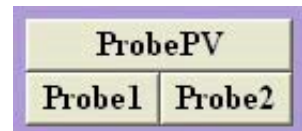


Probe selection buttons for 2-probe type Doppler

Click either Probe1 or Probe2 to select the probe used for the measurement when 2 probe connection is available for the Doppler connected.



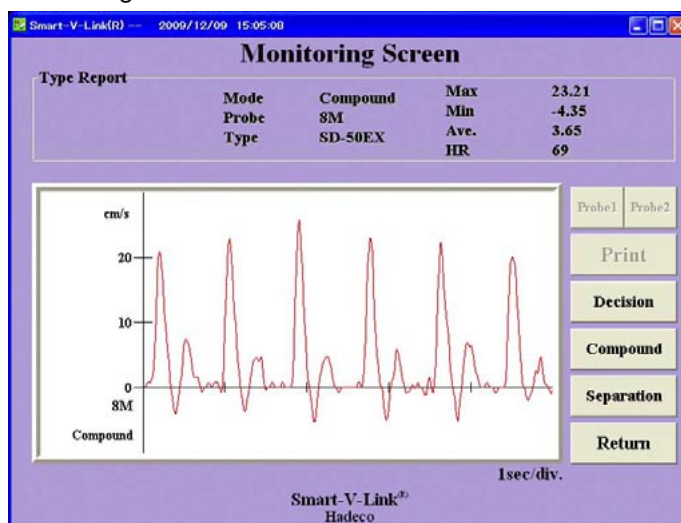
Click either ProbePV, Probe1 or Probe2 to select the probe used for the measurement when Smartdop 30EX with built-in PV is connected.



- (2) Press **Compound** or **Separation** to set the waveform mode for combined bidirectional waveform or directionally separated dual-trace waveform, respectively.
- (3) Wait at least 5 seconds after the waveform becomes stable and press the probe button or the space bar on the keyboard to freeze the waveform of latest 5 seconds.

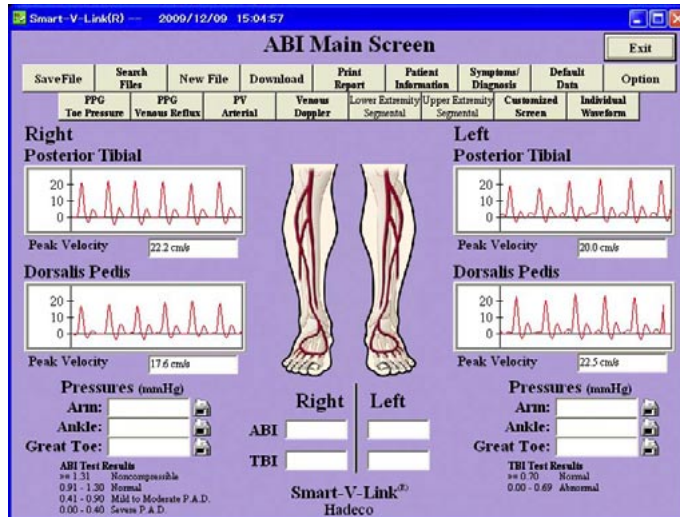
Probe selection buttons for Smartdop 30EX with built-in PV

## Monitoring Screen in freeze mode





- (4) If the frozen waveform is satisfactory, click **Decision** to save the data to the memory of the computer and it'll go back to ABI Main Screen. If it's not satisfied, press the probe button or the space bar to go back to monitoring mode again.
- (5) To go back to the Main Screen without saving the data, click **Return**.



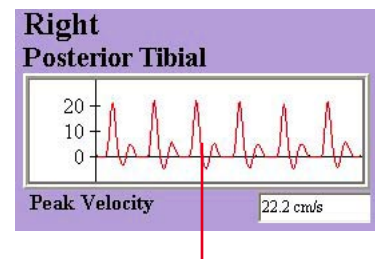
- (6) Repeat steps #1 to #5 for other sites.
- (7) Enlarging waveform

Right-click one of the waveform windows to enlarge the waveform and the **Individual Waveform** screen will appear with enlarged waveform and numerical parameters.

Click Compound or Separation to change the waveform mode.

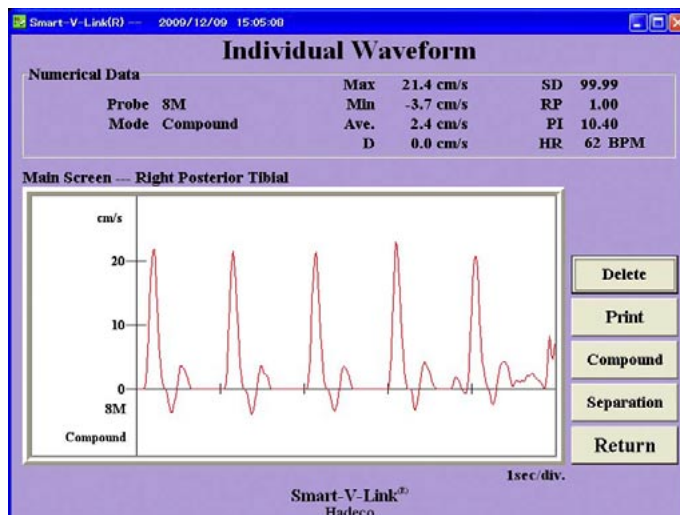
Click Print and follow the instructions to print out this screen.

Click Return to go back to the previous screen.



Right click in waveform window.

Enlarged waveform



### 3. Measuring Blood Pressure

Blood pressures can be measured by using with Doppler and pressure value can be typed on each of pressure box on **ABI Main Screen**.

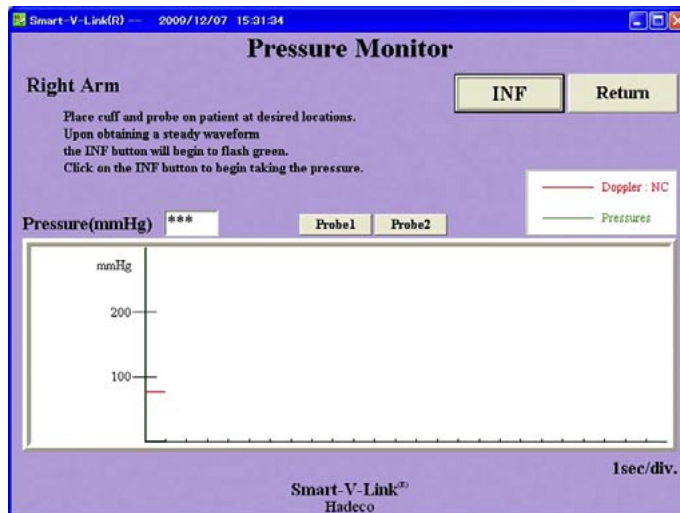
If you're using Smartdop 30EX with Smart-V-Link, it allows you to set pressure value taken with the Doppler on each box automatically. Follow the instructions as follows:

The screenshot shows the 'ABI Main Screen' with a purple background. It features two columns for 'Right' and 'Left' sides. Each column has three input fields for 'Arm', 'Ankle', and 'Great Toe' pressures in mmHg, each with a small icon to its right. In the center, there are two more input fields for 'ABI' and 'TBI'. At the bottom center, it says 'Smart-V-Link<sup>®</sup> Hadeco'.

- (1) Click on Arm Pressure icon , and Pressure Menu (pull-down menu below) will appear.



- (2) Select **Take Pressure** to start arm pressure measurement with Doppler, and **Pressure Monitor** screen will appear.



- (3) Set the cuff on the patient and connect the tubing to Doppler, and place the probe on the radial or brachial artery.
- (4) Click Probe1 or Probe2 to select the probe used with Smartdop 30EX if necessary.

*Note : The guidances for procedures are displayed above the waveform window.*

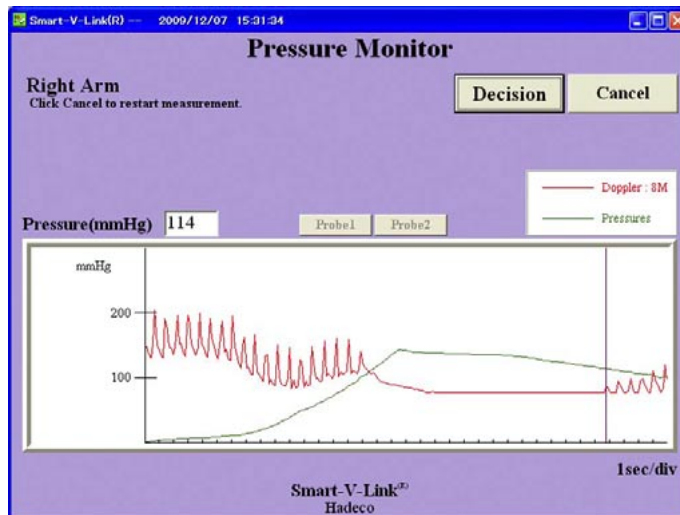


- (5) When velocity waveform becomes stable, **INF** will turn green and flash to let you know it's ready for the measurement. Click INF to proceed and built-in cuff inflator will start inflating the cuff.

If INF does not turn green and flash due to arrhythmia, straight click INF to proceed the measurement on manual.

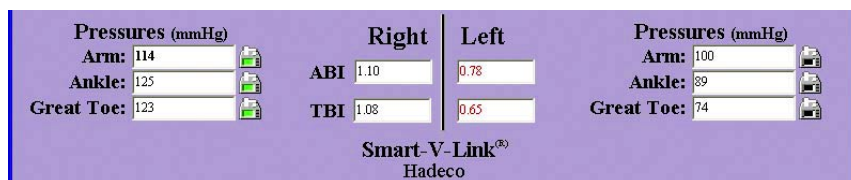
Click **DUMP** to cancel the measurement and dump the cuff.

- (6) When the measurement is completed, blood pressure and pressure waveform will be displayed.



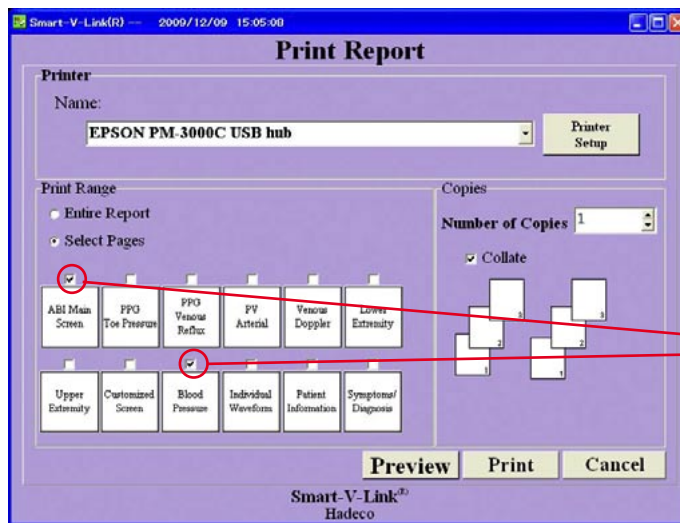
If the result is satisfactory, click **Decision** to save the data to the memory of the computer and it'll go back to previous screen. If it's not satisfied, press the probe button or the space bar, or click **Cancel** to go back to monitoring mode again.

- (7) Repeat steps #1 to #6 for ankle and great toe pressures.
- (8) ABI and TBI are automatically calculated and displayed.



## 4. Printing Report

- (1) Click Print Report on ABI Main Screen to show the **Print Report** screen.

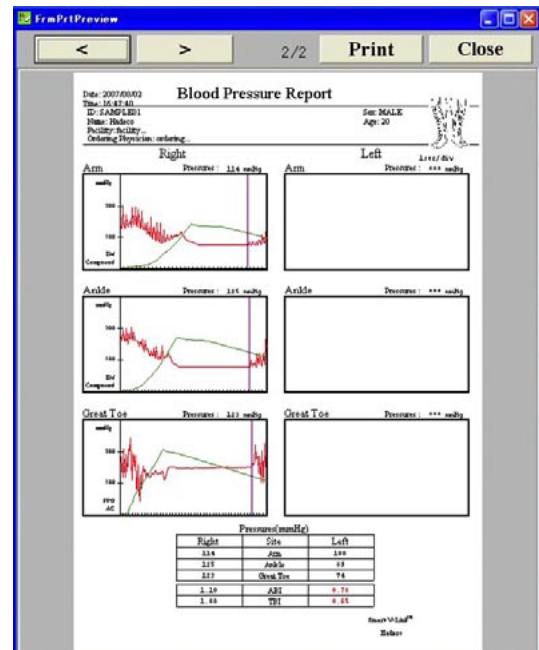
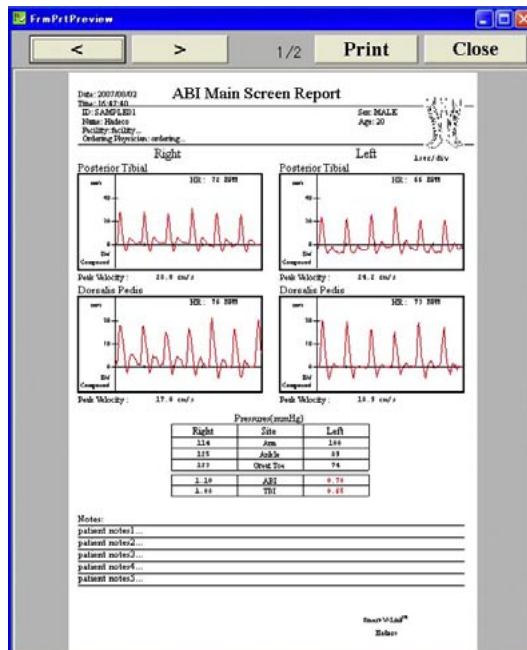


Check the check boxes for printing report.

- (2) Choose the printer you wish to use for printing from the pull-down menu. Click **Printer Setup** to display Printer Setup dialog box of Windows for printing options.
- (3) Check all the check boxes for testing modules you wish to print out.
- (4) Click **Preview** to display the print preview if desired.



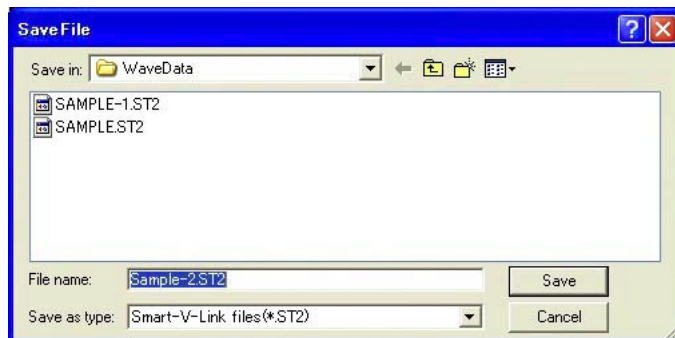
Check Blood Pressure check box to print pressure waveform & parameters related to each testing chosen to print.



- (5) Click **OK** to print out or click **Cancel** to go back to ABI Main Screen without printing.

## 5. Saving Data

- (1) Click **Save File** on ABI Main Screen to save data to local or network hard disk, and **SaveFile** window will appear.

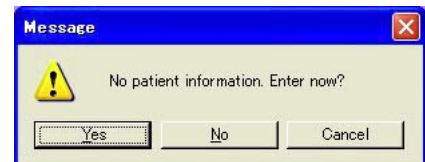


*Note : Patient ID, or name if ID is not typed, will be automatically used for the file name. If neither patient ID nor name have been typed for Patient Information, the dialog box shown right will appear.*

*Click **Yes** to enter patient information.*

*Click **No** to type file name in Save-File window.*

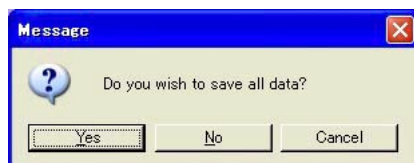
*Click **Cancel** to cancel the saving process.*



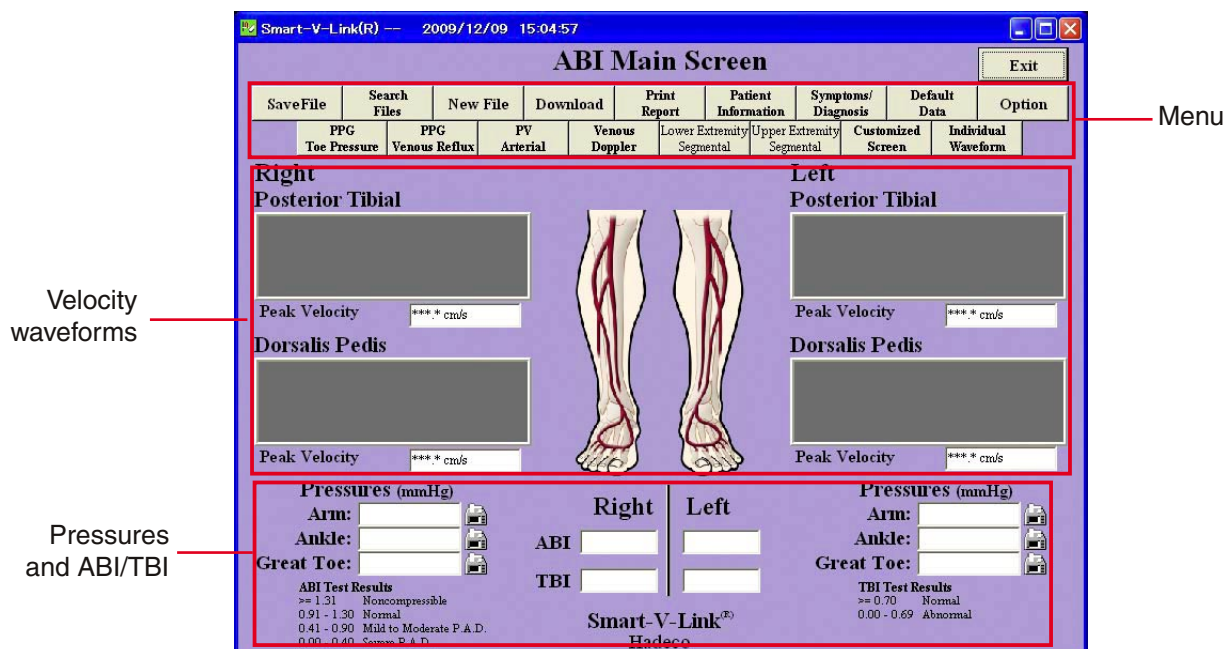
- (2) Click **Save** to save the data.

## 6. Quitting Smart-V-Link

- (1) Click **Exit** on ABI Main Screen to quit Smart-V-Link. If the data have not been saved, alert dialog box shown below will appear. Click **Yes** to save data, **No** to quit Smart-V-Link without saving or **Cancel** to go back to ABI Main Screen.



# Chapter 4 : ABI MAIN SCREEN



Menu

Velocity waveforms

Pressures and ABI/TBI

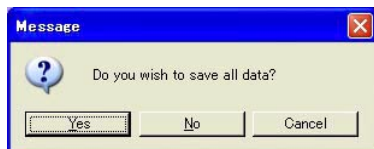
## 1. Menu

- Save File:** To save measurement data. See the section "**Save File**" for details.
- Search Files:** To search data files to be opened. See the section "**Search Files**" for details.
- New File:** To erase all measurement data in the memory for next measurement. See the section "**New File**" for details.
- Download:** To download waveform memory data from Doppler to Smart-V-Link. See the section "**Download**" for details and model #s Download is available.
- Print Report:** To print report. See the section "**Print Report**" for details.
- Patient Information:** To input patient data. See the section "**Patient Information**" for details.
- Symptoms/Diagnosis:** To input symptoms and diagnosis for patient. See the section "**Symptoms / Diagnosis**" for details.
- Default Data:** To input and/or revise Default Data: Facility data, Performing Studies and Ordering Physician. See the section "**Default Data**" for details.
- Option:** CommPort setting, gain setting, default data folder setting and screen setting. See the section "**Option**" for details.

<b>PPG Toe Pressure:</b>	To go to PPG Toe Pressure screen. See the section " <b>PPG Toe Pressure</b> " for details.
<b>PPG Venous Reflux:</b>	To go to PPG Venous Reflux screen. See the section " <b>PPG Venous Reflux</b> " for details.
<b>PV Arterial:</b>	To go to PV Arterial screen. See the section " <b>PV Arterial</b> " for details.
<b>Venous Doppler:</b>	To go to Venous Doppler screen. See the section " <b>Venous Doppler</b> " for details.
<b>Lower Extremity Segmental:</b>	To go to Lower Extremity screen to perform the measurements of blood flow with Doppler and of pressures. See the section " <b>Lower Extremity Segmental</b> " for details.
<b>Upper Extremity Segmental:</b>	To go to Upper Extremity screen to perform the measurements of blood flow with Doppler and of pressures. See the section " <b>Upper Extremity Segmental</b> " for details.
<b>Customized Screen:</b>	To go to Customized Screen to customize your own test module. See the section " <b>Customized Screen</b> " for details.
<b>Individual Waveform:</b>	To go to Individual Waveform screen to perform measurement of individual site with Doppler, PPG or Pneumo. See the section " <b>Individual Waveform</b> " for details.

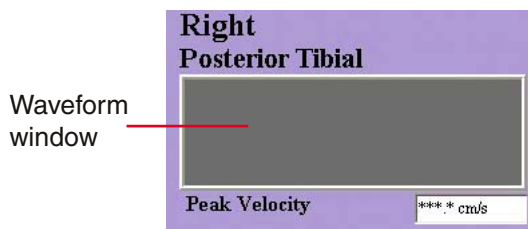
**Exit:**

To quit Smart-V-Link. If the data have not been saved, alert dialog box shown left will appear. Click **Yes** to save data, **No** to quit Smart-V-Link without saving or **Cancel** to go back to ABI Main Screen.



*Note : Any of the testing modules you don't use can get unavailable by going to Option for changing the Screen setting.*

## 2. Measuring Blood Velocities



### (1) Posterior Tibial

Click the waveform window to measure blood velocity of posterior tibial artery taken with the Doppler. Monitor Screen will appear and the real-time waveform and numerical data received from the Doppler will be shown.

The peak velocity is calculated based on the first 3 beat average and will be displayed on the Main Screen.

See the section "[Monitoring Screen](#)" for details.

### (2) Dorsalis Pedis

Click waveform window to measure blood velocity of dorsalis pedis artery. Monitor Screen will appear and you can operate the same way for posterior tibial.

### (3) Side change

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

### (4) Enlarging waveform

After freezing waveform, right-click the waveform window to observe it in large size. See "[Enlarging Waveform](#)" for details.

*Note : Gain unification*

*To unify all the amplitude scales of waveforms in waveform window, go to Option and check the check box of **Gain Unification** in Other Settings.*

## 3. Blood Pressures and ABI/TBI

**For all the Doppler models to type in pressures:**

### (1) Pressures

Pressures (mmHg)		Right	
Arm:	120	ABI	1.02
Ankle:	122	TBI	0.98
Great Toe:	118		

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.

Note : Once you input or change these pressure data, they are reflected in those on PPG Toe Pressure, PV Arterial and Lower Extremity screens.

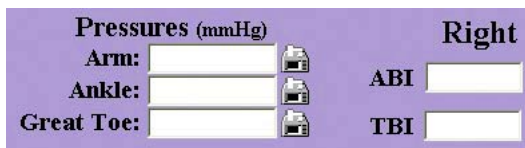
#### Parameter definitions

$ABI = (\text{Ankle systolic pressure}) / (\text{Brachial systolic pressure})$


$TBI = (\text{Toe systolic pressure}) / (\text{Brachial systolic pressure})$

#### For Smartdop 30EX only to download pressure data from the Doppler connected:

Go to Option and make sure check box for Pressure Menu is active.



The screenshot shows a software interface with a purple background. On the left, under the heading "Pressures (mmHg)", there are three rows: "Arm:" with a text input field and a printer icon, "Ankle:" with a text input field and a printer icon, and "Great Toe:" with a text input field and a printer icon. On the right, under the heading "Right", there are two rows: "ABI" with a text input field and "TBI" with a text input field.

- (1) Click on Arm Pressure icon  and select "Take Pressure", "Show Waveform", or "Delete" on Pressure Menu to take, show, or delete the pressure data taken with Smartdop 30EX, respectively. See the section "[Pressure Monitor](#)" for details.
- (2) Click on Ankle Pressure icon to get ankle pressure in the same manner above. ABI will be calculated automatically and displayed.
- (3) Click on Great Toe Pressure icon to get great toe pressure in the same manner above. TBI will be calculated automatically and displayed.
- (4) Repeat the steps #1 to #3 on the other side.

*Note : The greater arm pressure of right or left than other side is used for calculation of ABI/TBI.*

# Chapter 5 : FILE OPERATIONS

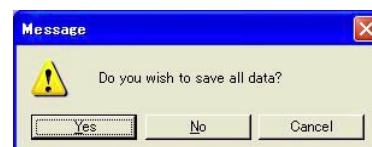
---

## NEW FILE

---

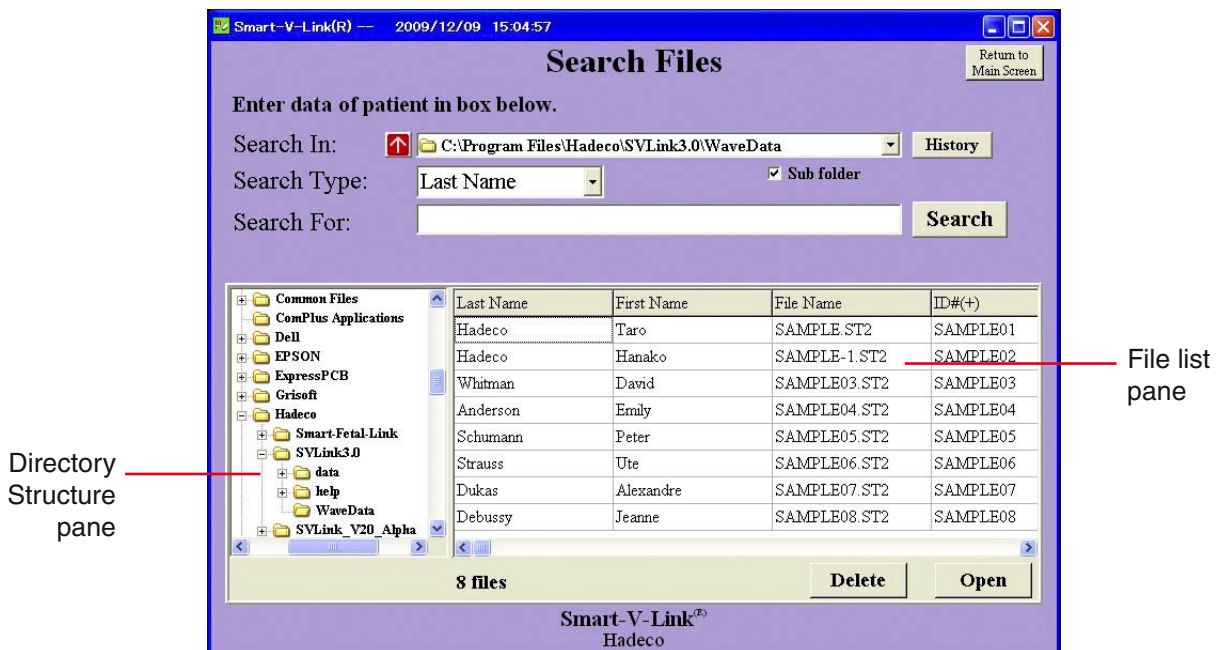
Click on **New File** to create a new patient file and **Patient Information** screen will be shown. Type all the patient data and click **SAVE** to save the data.

If previous data has not been saved when **New File** is clicked, a confirmation dialog box shown left will appear. Click **Yes** to save the data, **No** to erase the data or **Cancel** to cancel New File process.





# SEARCH FILES



- (1) Click on the folder in which Smart-V-Link data are stored in Directory Structure represented with "tree" type of appearance in the pane left of file list pane. The path to the folder will be displayed next to the label "Search In".

(Default : C:\Program Files\Hadeco\SVLink3.0\WaveData)

If you wish to search also in sub folder, put a tick in the box left of **Sub folder** by clicking on.

*Note : 1. **Search In** default data folder can be specified in Option Screen, and it will be changed after search-file operation if other folder was specified at that time.*

*2. Click the button to go to upper directory (folder).*

*3. Clicking **History** shows the list of paths to the folders which you have used.*

- (2) The files can be searched by patient name, ID, file name, ordering physician, and test date. (Case -insensitive)

Select **Search Type** from pull-down menu, and type a search word in the **Search For** text box. (Partial match retrieval)

(3) Click on the **Search** button, and search result will be listed.

(4) Click on the target file and click **Open** to open the file.

(5) Clicking on **Delete File** deletes designated file.

*Tips: 1. Directory Structure pane and file list pane can be resized by dragging the splitter bar between the 2 panes. Columns in file list pane can also be resized.*

*2. Click the column name to sort files alphabetically and click it the second time to sort anti-alphabetically.*

Click here

Last Name(+)	First Name	File Name	ID#
Anderson	Emily	SAMPLE04.ST2	SAMPLE04
Debussy	Jeanne	SAMPLE08.ST2	SAMPLE08
Dukas	Alexandre	SAMPLE07.ST2	SAMPLE07
Hadeco	Hanako	SAMPLE-1.ST2	SAMPLE02
Hadeco	Taro	SAMPLE.ST2	SAMPLE01
Schumann	Peter	SAMPLE05.ST2	SAMPLE05
Strauss	Ute	SAMPLE06.ST2	SAMPLE06
Whitman	David	SAMPLE03.ST2	SAMPLE03

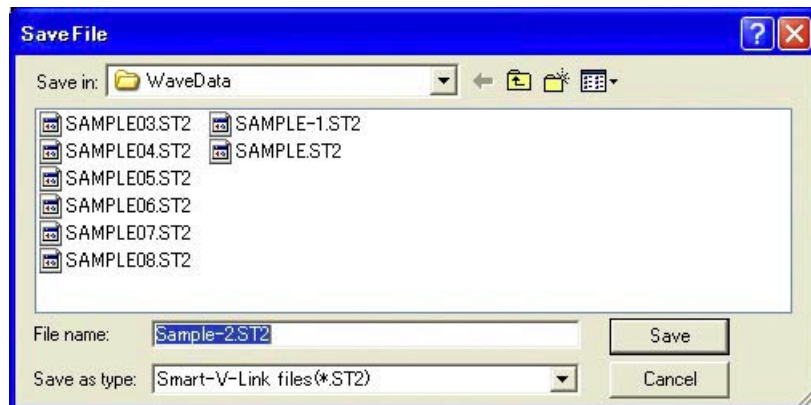
*3. Right clicking on folder in Directory Structure shows a context menu for renaming and deleting the folder and making a new folder.*

*Note : Data files with extension "ST1" created by previous Ver. 1.0/1.1/1.2/1.3 of Smart-V-Link can be opened.*



# SAVE FILE

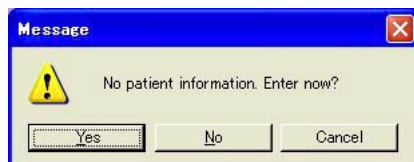
---



## In the case of saving new measurement data

Patient ID, or name if ID is not typed, is automatically used for file name, which will be shown in **Save File** box, and each file name consists of extension of "ST2", e.g. ID0001.ST2

If both data have not been typed, you will be asked to enter the data.




- (1) If neither patient ID nor patient name have been typed in, the dialog box shown left will appear.

Click **Yes** to enter patient information.

Click **No** to enter your own file name without typing in patient name and ID.

Click **Cancel** to cancel Save File process and go back to ABI Main Screen.

- (2) On Save File window, data folder in which the measurement data will be saved is shown next to the label "Save in". At the beginning the folder is set for the default data folder specified in Option Screen. It can be changed temporarily by clicking the button  and next Save File operation will revert to it until **New File** is selected or Smart-V-Link is restarted.

*Note : Default data folder can be specified in **Option Screen**.*

- (3) Confirm the file name shown next to the label "File Name" or type a file name in, and click **Save**.

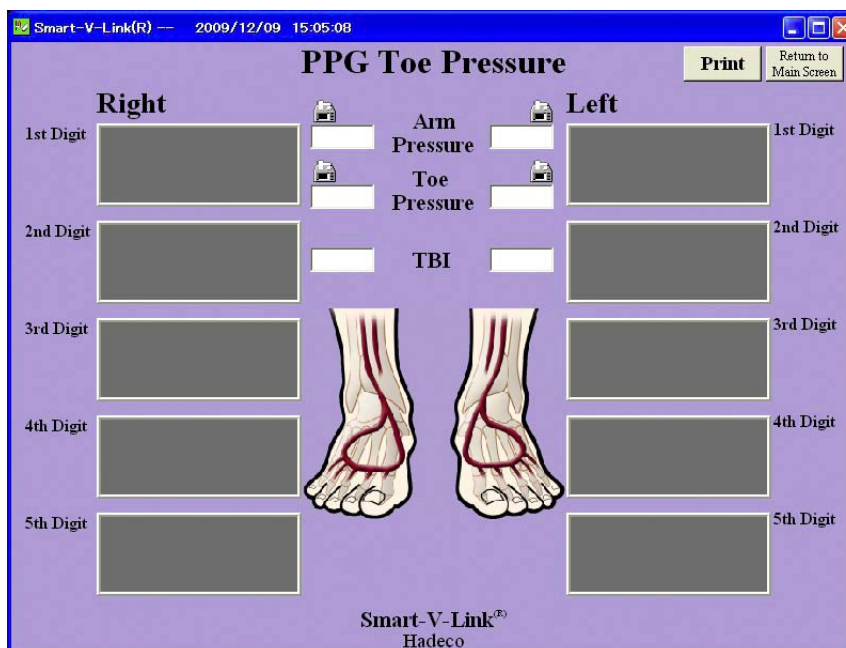
### In the case the same file name already exists



If the saving file name already exists, the dialog box shown left will appear. Click **Yes** to overwrite, **No** to save the data as a new file, or **Cancel** to cancel Save File process.

# Chapter 6 : TEST MODULES

## PPG TOE PRESSURE



### (1) 1st Digit



Click the waveform window to measure the first digit with the PPG probe. Monitor Screen appears and Smart-V-Link displays real-time waveform received from the Doppler. See the section "**Monitoring Screen**" for details.


### (2) 2nd to 5th Digits

Click each waveform window to measure the site. Operate the same way as 1st Digit.

### (3) Pressures

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



If Pressure Menu on Option Screen is active, arm and toe pressures can be measured with Doppler with pressure capability by clicking on each Pressure icon . See the section "[Pressure Monitor](#)" for details.

*Note 1 : Once you input or change these pressure data, they are reflected in those on ABI Main Screen, PV Arterial and Lower Extremity screens.*

*Note 2 : The greater arm pressure of right or left than other side is used for calculation of TBI.*

#### **(4) Side change**

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

#### **(5) Enlarging waveform**

Right-click the waveform window to observe it in large size. See "[Enlarging Waveform](#)" for details.

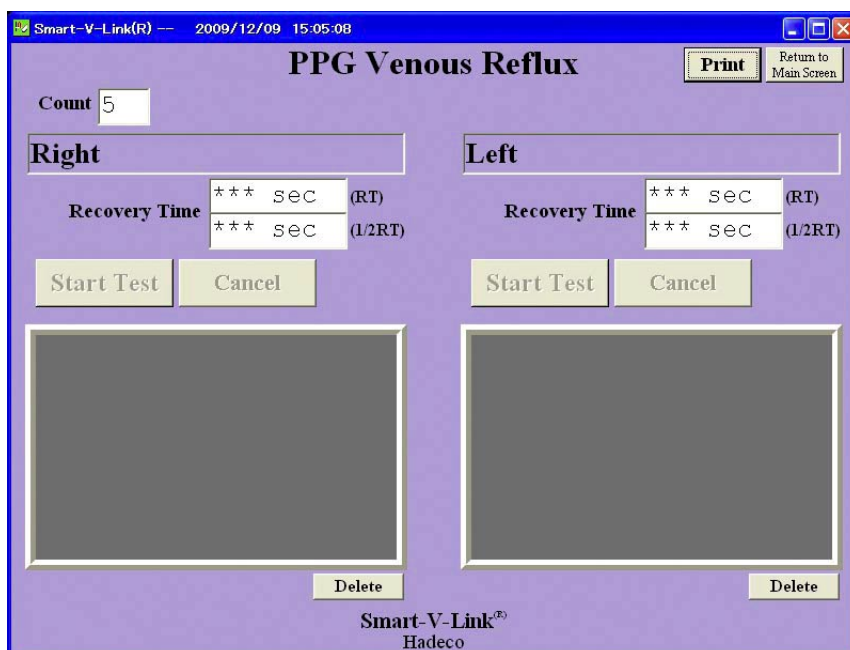
#### **(5) Printing waveform**

Click **Print** to print the report if desired. For the print procedure, see the section of "[Print Report](#)" in this manual.

*Note : Gain unification*

*To unify all the amplitude scales of waveforms in waveform window, go to Option and check the check box of **Gain Unification** in Other Settings.*

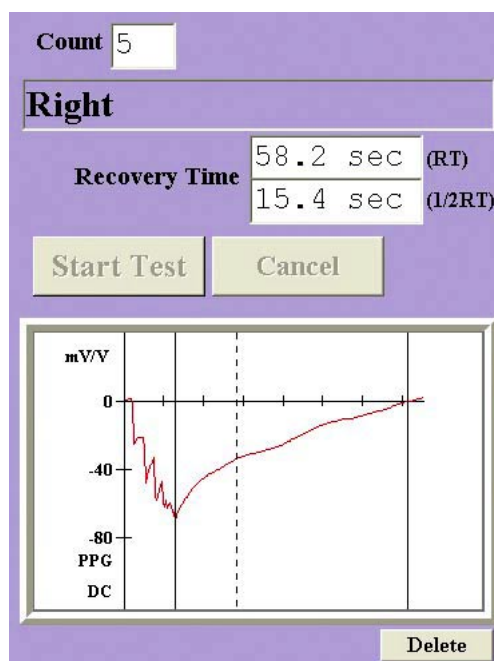
# PPG VENOUS REFLUX



- (1) Type the number of times for patient dorsiflexes in the **Count** box.
- (2) Click one of waveform windows and it will start showing PPG-DC signals received from Doppler.
- (3) When patient is ready, click **Start Test** or press space bar on keyboard or the probe button (PG-21) to start the measurement of venous reflux study.
- (4) Ask the patient to flex her/his foot synchronizing with the beep sounds of the computer. (First long beep sound is a cue to start flexing, and then you will hear the short beep sounds the set number of times.)
- (5) Smart-V-Link freezes the waveform automatically when an appropriate waveform returns to the base-line amplitude. Complete waveform and Recovery Times will be displayed.

*Note : 1/2 RT is the half recovery time to return to 50% of refilling amplitude where vertical dotted line is shown.*

To stop the measurement still in progress, click **Cancel** or press the space bar or the probe button.



- (6) Click **Decision** to save the waveform to the memory of the computer.  
If the measured waveform is not satisfactory, press **Cancel** to measure again.
- (7) Repeat steps #2 to #6 on the other side.

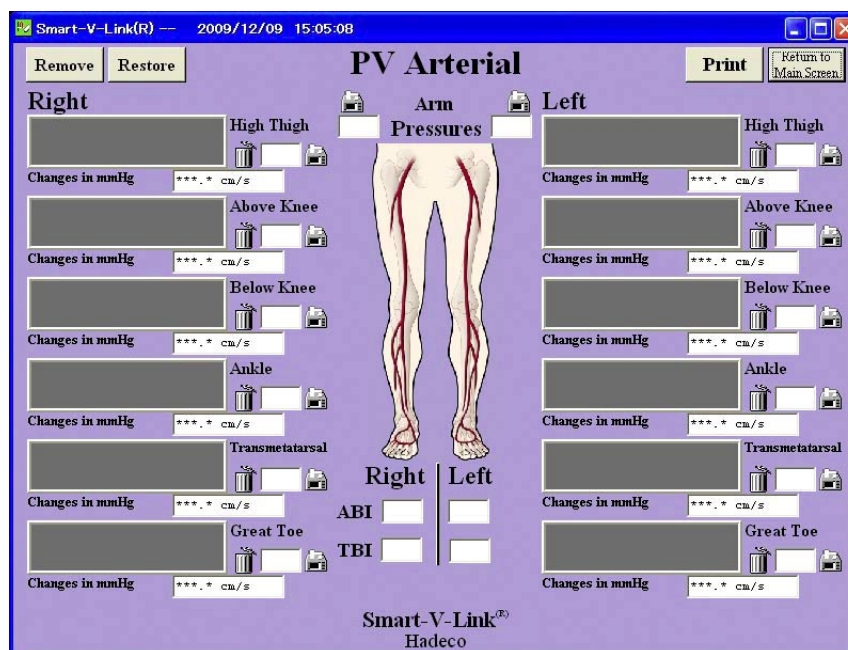
*Note : Type any other site name than Right/Left in each box if desired.*

- (8) Click **Print** to print the report if desired.
- (9) Clicking **Delete** after saving waveform makes deletion of the waveform.



# PV ARTERIAL

This function is not available to the use with Bidop ES-100V3.




## (1) High Thigh:

Click the waveform window to start monitoring the arterial pulse waveform of High Thigh with pneumoplethysmograph. Monitor Screen will appear and real time waveform received from Doppler will be shown. See the section "[Monitoring Screen](#)" for details.

The amplitude of pressure changes is calculated based on the first 3 beat average and will be displayed just below the window.

Type the blood pressure of High Thigh in the pressure box next to the trash.

If Pressure Menu on Option Screen is active, High Thigh pressure can be measured with Doppler with pressure capability by clicking on High Thigh Pressure icon . See the section "[Pressure Monitor](#)" for details.



Waveform window

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

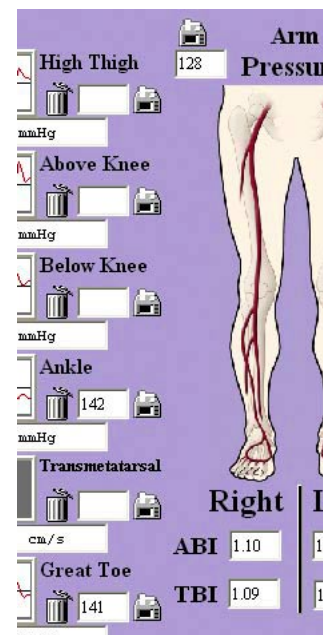
Click each waveform window to measure the site. Operate the same way as High Thigh.

### (3) ABI/TBI

Type the pressures of Arm or set pressure value taken with the Doppler. If the pressure value of Ankle/Great Toe exist(s) in the box(es), the ABI (Ankle Brachial Index) / TBI (Toe Brachial Index) will be calculated automatically. See the picture right.

*Note 1 : Once you input or change these pressures, they are reflected in those on ABI Main Screen, PPG Toe Pressure and Lower Extremity screens.*

*Note 2 : The greater arm pressure of right or left than other side is used for calculation of ABI.*



### (4) Side change

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

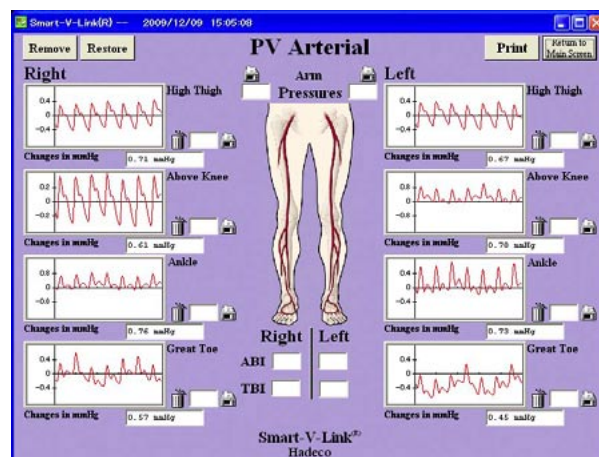
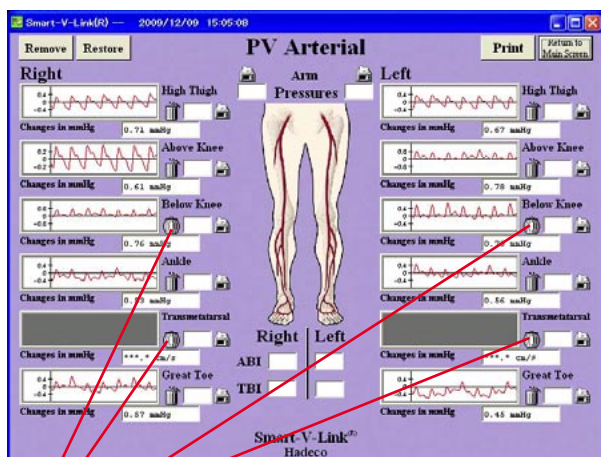
### (5) Enlarging waveform

Right-click the waveform window to observe it in large size. See "[Enlarging Waveform](#)" for details.

### (6) Printing report

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

- (7) Any of the PV waveform windows you don't use can be removed from PV Arterial screen. To do it, click each trash can next to the window you wish to remove and click **Remove**. Click **Restore** to get them back.



After clicking Remove.

After clicking on trash can, it bulges.

*Note : Gain unification*

*To unify all the amplitude scales of waveforms in waveform window, go to Option and check the check box of **Gain Unification** in Other Settings.*

# VENOUS DOPPLER

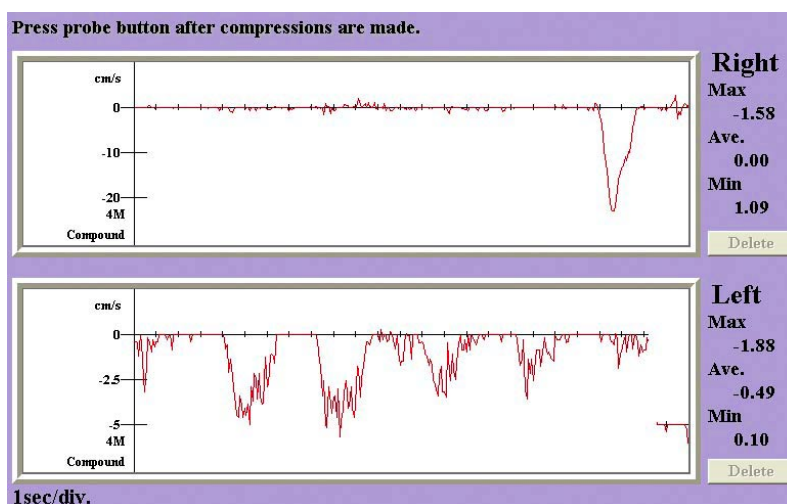


## (1) Right

Click the waveform window to start monitoring venous blood flow and real time blood flow waveform and parameters (Max, Ave. and Min) received from Doppler will be shown.

After performing venous compression study, press the probe button or the space bar to freeze the waveform of latest 25 seconds. The frozen waveform and numerical parameters will be shown.

*Note : Parameters are calculated based on every second when on measurement mode and first 10 seconds of waveform when on freeze mode.*



If the waveform is not satisfactory, press the space bar or click the waveform window to go back to monitoring again.

**(2) Left**

Operate the same way same as "Right".

**(3) Printing report**

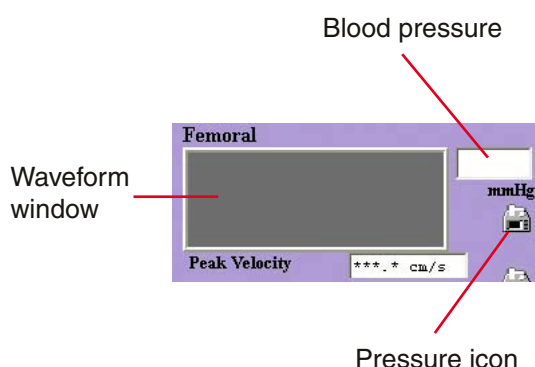
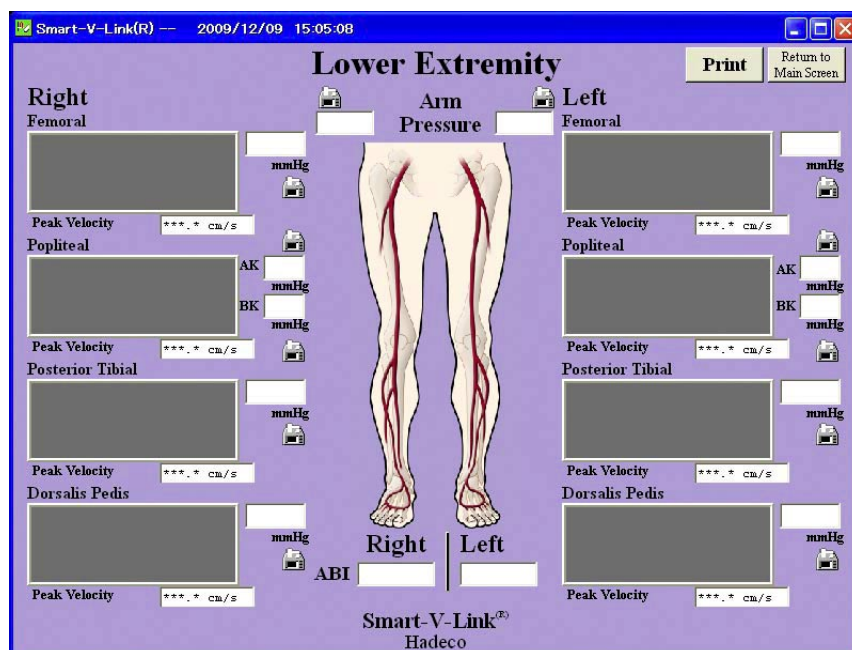
Click **Print** to print the report if desired.

**(4) Clicking **Delete** makes deletion of the waveform.**

*Note : Gain unification*

*To unify the amplitude scales of waveforms in waveform window, go to Option and check the check box of **Gain Unification** in Other Settings.*

# LOWER EXTREMITY SEGMENTAL




## (1) Femoral

Click the waveform window to measure blood velocity of femoral artery. Monitor Screen will appear and real time waveform and numerical data received from Doppler will be shown.

The peak velocity is calculated based on the first 3 beat average and will be displayed on the Lower Extremity screen.

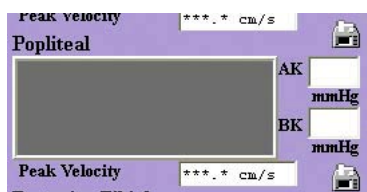
See the section "[Monitoring Screen](#)" for details.

Type the blood pressure of femoral in the pressure box next to the window.

If Pressure Menu on Option Screen is active, femoral pressure can be measured with Doppler with pressure capability by clicking on femoral Pressure icon . See the section "[Pressure Monitor](#)" for details.

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

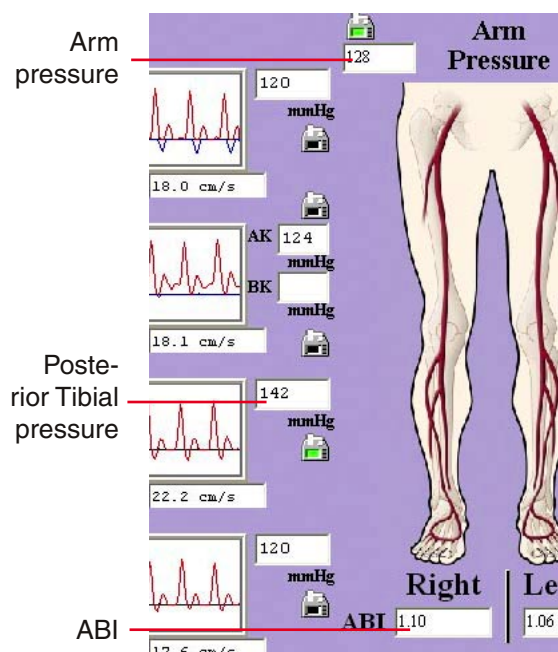
Click each waveform window to measure the site and operate the same way as femoral.



With regard to popliteal, pressures of Above Knee (AK) and Below Knee (BK) can be typed in or set pressure value taken with the Doppler automatically.

### (3) ABI

Type the pressures of Arm or set pressure value taken with the Doppler. If the pressure value of Posterior Tibial exists in the box, the ABI (Ankle Brachial Index) will be calculated automatically. See the picture left.



*Note 1 : Once you input or change these pressures, they are reflected in those on ABI Main Screen, PV Arterial and PPG Toe Pressure screens.*

*Note 2 : The greater arm pressure of right or left than other side is used for calculation of ABI.*

### (4) Side change

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

### (5) Enlarging waveform

Right-click the waveform window to observe it in large size. See "[Enlarging Waveform](#)" for details.

### (6) Printing report

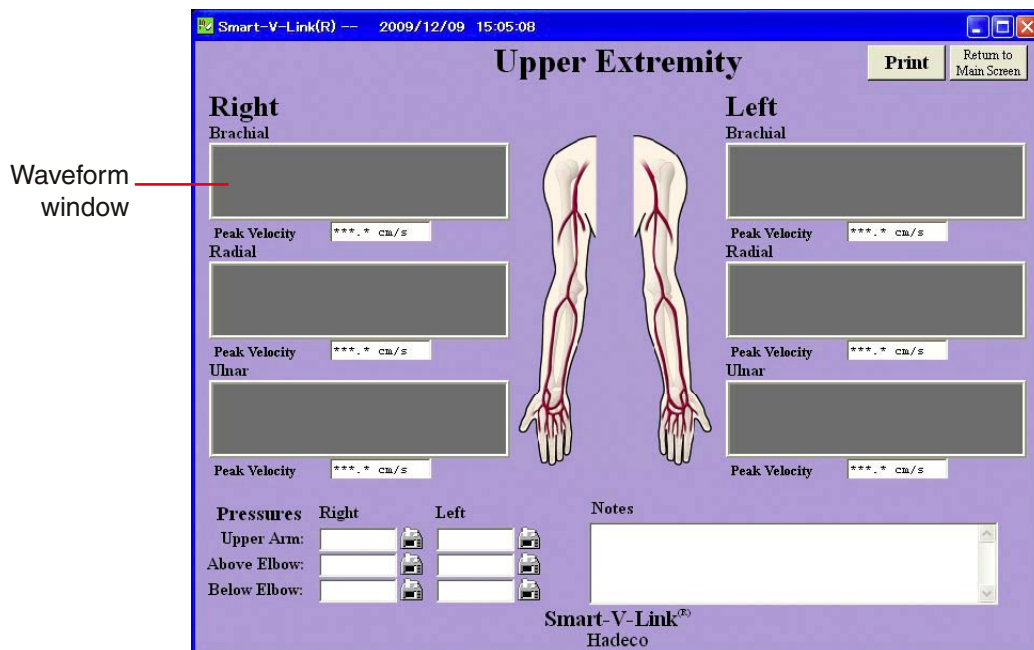
Click **Print** to print the waveform if desired.

*Note : Gain unification*

*To unify all the amplitude scales of waveforms in waveform window, go to Option and check the check box of **Gain Unification** in Other Settings.*



# UPPER EXTREMITY SEGMENTAL



## (1) Brachial

Click the waveform window to measure blood velocity of brachial artery with Doppler. Monitor Screen will appear and real time waveform and numerical data received from Doppler will be shown.

The peak velocity is calculated based on the first 3 beat average and will be displayed on the Upper Extremity screen.

See the section "[Monitoring Screen](#)" for details.

## (2) Radial, Ulnar

Click each waveform window to measure the site and operate the same way as 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, Below Elbow, and Above Elbow for both sides.

If Pressure Menu on Option Screen is active, pressures can be measured with Doppler with pressure capability by clicking on each Pressure icon . See the section "[Pressure Monitor](#)" for details.

#### (5) Notes

Notes can be typed in the box up to 15 lines at your disposal.

#### (6) Enlarging waveform

After freezing waveform, right-click the waveform window to observe it in large size. See "[Enlarging Waveform](#)" for details.

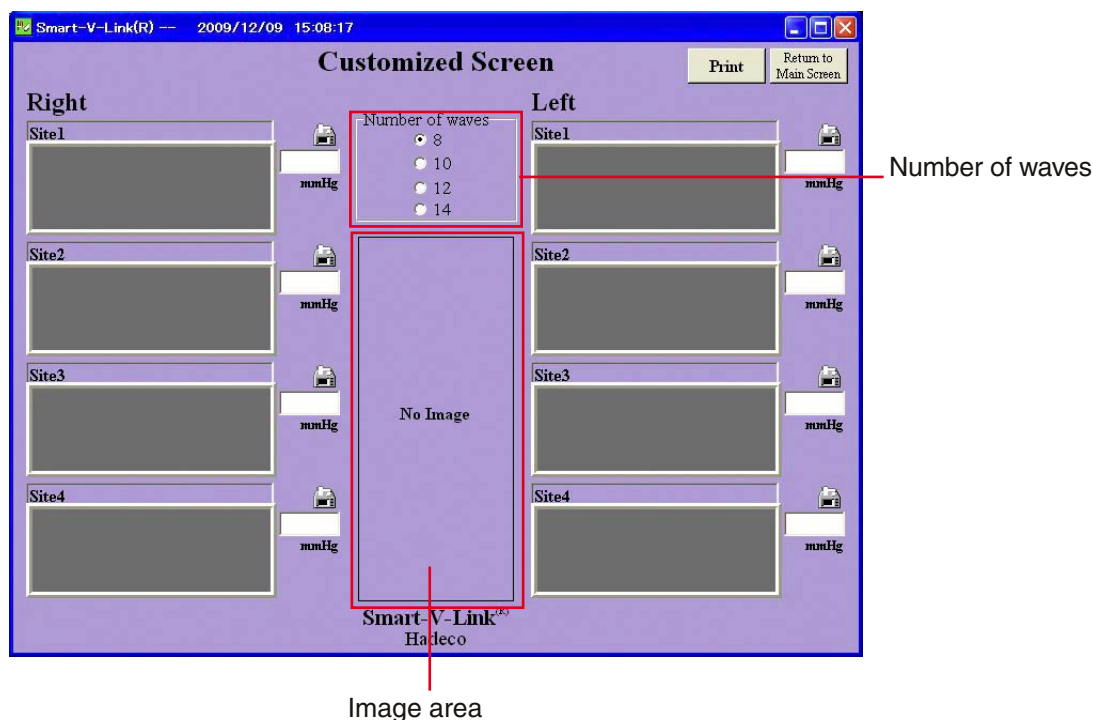
#### (7) Printing report

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

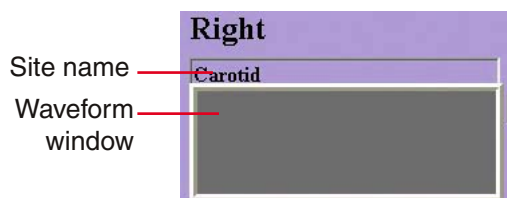
*Note : Gain unification*

*To unify all the amplitude scales of waveforms in waveform window, go to Option and check the check box of **Gain Unification** in Other Settings.*

# CUSTOMIZED SCREEN



Customized Screen allows you to create your own test module with specific site names that other modules don't include. The number of sites can be selected from 8, 10, 12, and 14.




- (1) Type the name of site you wish to include in site name box. Typing same site names in one side may cause trouble on downloading.

## (2) Measurement

Click one of waveform windows to start monitoring the waveform with Doppler, PPG or Pnemo on arterial mode. Monitor Screen will appear and real-time waveform and numerical data received from Doppler will be shown. See the section "[Monitoring Screen](#)" for details.

## (3) Pressures

Type the pressure in the box right side of each waveform window.

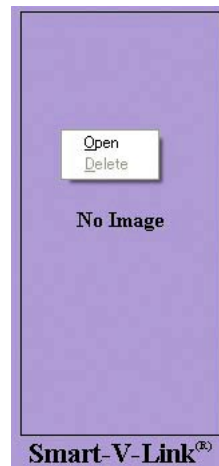
If Pressure Menu on Option Screen is active, pressures can be measured with Doppler with pressure capability by clicking on each Pressure icon . See the section "[Pressure Monitor](#)" for details.

(4) **Printing waveform**

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

(5) **Image**

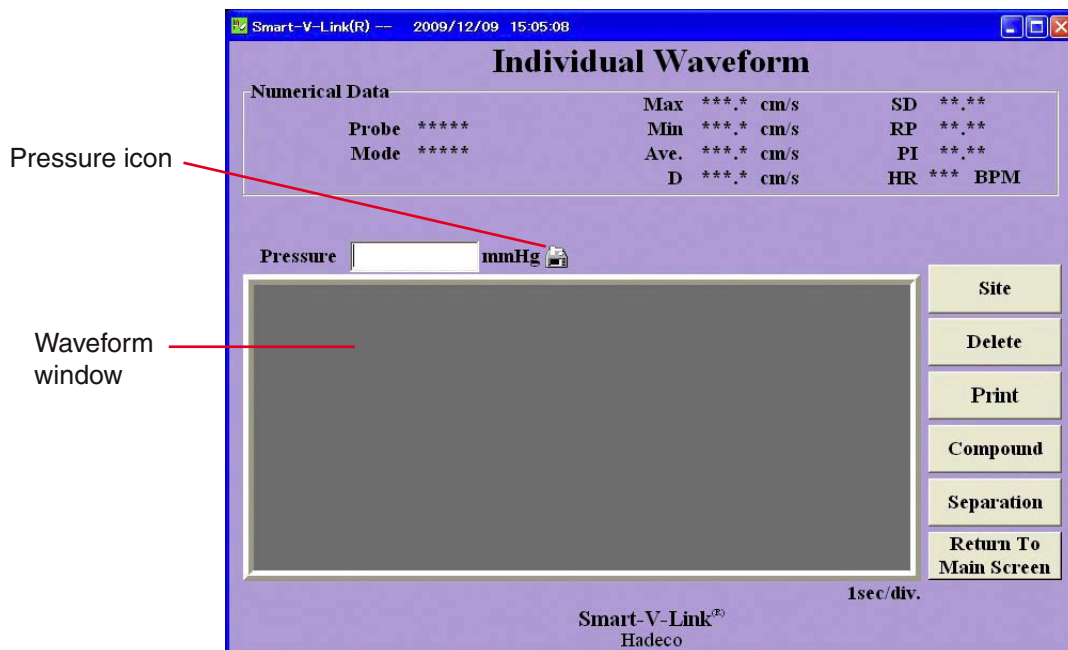
Custom image can be pasted on image area. Right click on the image area and select Open to open an image or Delete to delete the image on the image area.



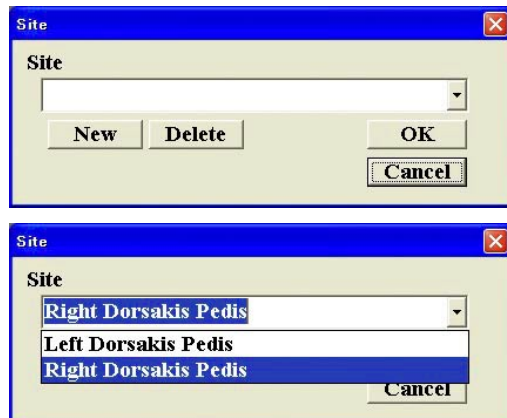
*Note : Gain unification*

*To unify all the amplitude scales of waveforms in waveform window, go to Option and check the check box of **Gain Unification** in Other Settings.*

# INDIVIDUAL WAVEFORM

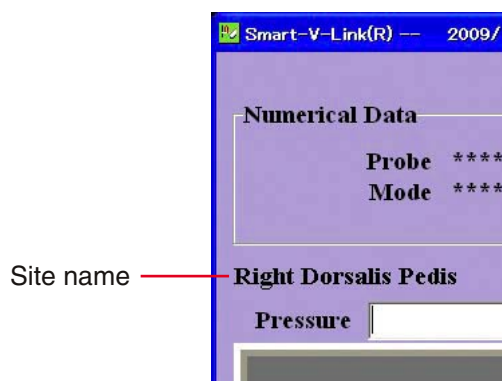


## (1) Typing site name



Click Site to display the Site input box and type the name of it. Click **OK** for saving and it will be shown on left above of waveform window. All the site names saved by clicking **OK** or **New** in the site box can be selected from pull-down menu for future input.

Select the site in pull-down menu and click **Delete** to delete it.




## (2) Measurement

Click the waveform window to start monitoring the waveform with Doppler, PPG or Pnemo on arterial mode. Monitor Screen will appear and real-time waveform and numerical data received from Doppler will be shown. See the section "[Monitoring Screen](#)" for details.

## (3) Pressure

Type the pressure in the box above waveform window.

If Pressure Menu on Option Screen is active, pressures can be measured with Doppler with pressure capability by clicking on Pressure icon . See the section "[Pressure Monitor](#)" for details.

## (4) Printing waveform

Click **Print** to print the report if desired. For the print procedure, see the section of "[Print Report](#)" in this manual, however the Print Range can not be selected.

(5) Clicking **Delete** makes deletion of the waveform.

## (6) Retuning to ABI Main Screen

Click **Return to Main Screen** to return to the ABI Main Screen.

Numerical data

Parameters	Abbrs.	Definitions
Systolic velocity [cm/s] or Doppler shift [kHz]	Max	
Minimum velocity [cm/s] or Doppler shift [kHz]	Min	
Mean velocity [cm/s] or Doppler shift [kHz]	Ave.	
Diastolic velocity [cm/s] or Doppler shift [kHz]	D	
S/D ratio	SD	$SD = S / D$
Resistance Parameter	RP	$RP = (S - D) / S$ RP = 1 if waveform goes below base line.
Pulsatility Index	PI	$PI = (\text{Peak-to-peak}) / MN$ $PI \leq 99.99$
Heart rate [bpm]	HR	

# Chapter 7 : DATA OPERATIONS

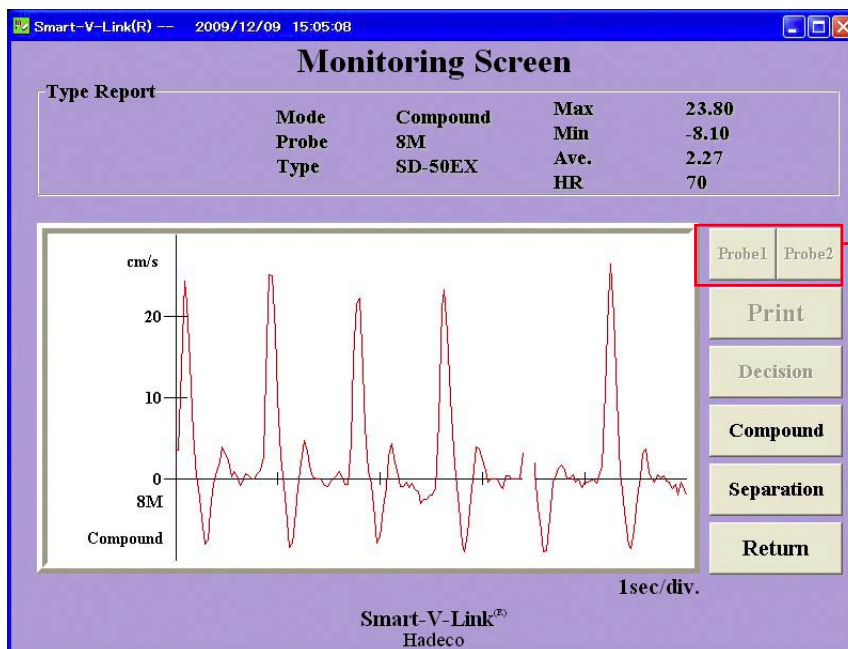
## MONITORING SCREEN

By clicking waveform window on each testing module, Smart-V-Link goes to Monitoring Screen to start monitoring waveforms and numerical data received from Doppler. There are 2 types of Monitoring Screen, ZCC \*<sup>1</sup> and FFT \*<sup>2</sup>. Smart-V-Link selects suitable screen automatically for each Doppler connected.

\*1 ZCC: Zero crossing counter, ordinary continuous wave

\*2 FFT: Fast Fourier Transform

### 1. ZCC MONITORING SCREEN

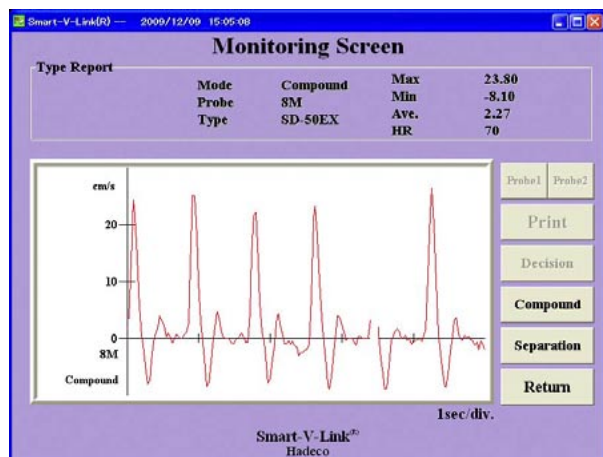


Probe selection buttons become clickable if Doppler with 2 probe connectors or Smartdop 30EX with built-in PV is connected. See "Chapter 3. Quick Start" - "2. Measuring Blood Velocity" for details.

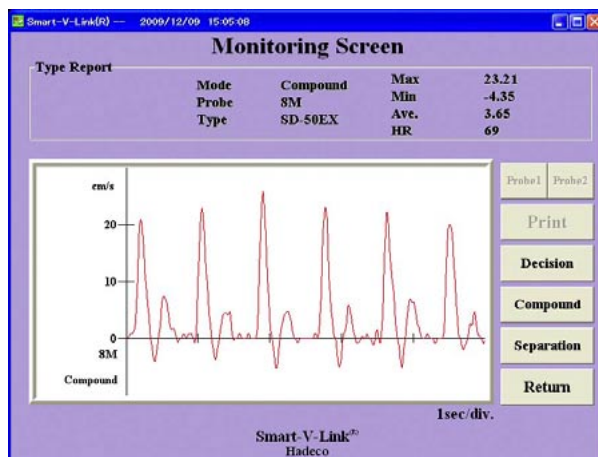
- (1) It starts displaying waveforms as soon as Monitoring Screen appears and you can observe vascular conditions.
- (2) When in Doppler mode, you can change the waveform mode by clicking **Compound** to display combined bidirectional waveform or **Separation** for directionally separated dual-trace waveform.

- (3) When Doppler with 2 probe connectors (Smartdop 30EX) is connected, probe selection buttons become clickable. Click to select the probe.
- (4) Wait at least 5 seconds after the waveform becomes stable and press the probe button or the space bar on the keyboard to freeze the waveform of latest 5 seconds.
- (5) Click Print to activate the printer on Doppler to print real-time waveform out, if desired.
- (6) If the frozen waveform is satisfactory, click **Decision** to save the data to the memory of the computer and it'll go back to the previous screen. If it's not satisfied, press the probe button or the space bar to go back to monitoring mode again.
- (7) To go back to the previous screen without saving the data, click **Return**.

Measurement mode



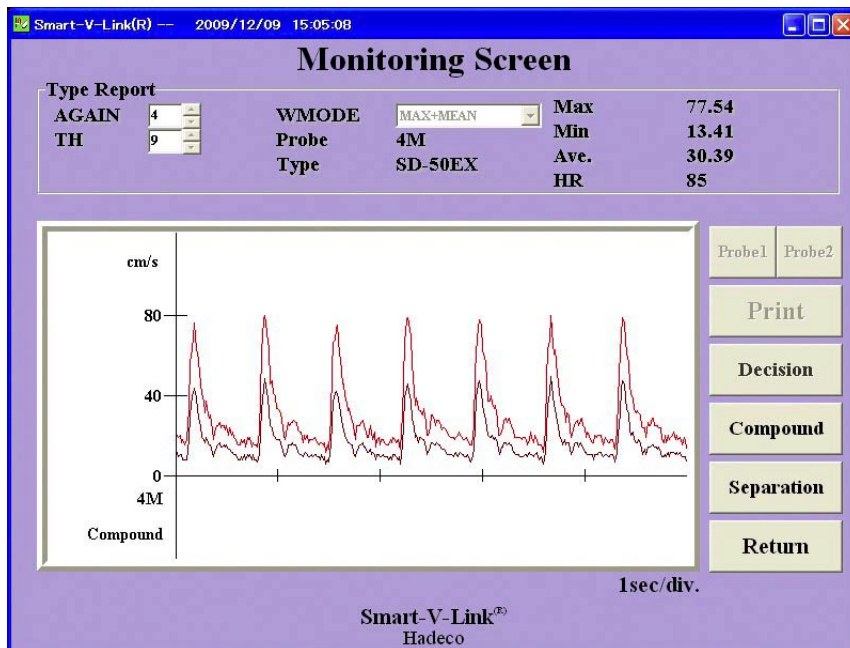
Freeze mode



Numerical data

Parameters	Abbrs.	Definitions
Systolic velocity [cm/s] or Doppler shift [kHz]	Max	
Minimum velocity [cm/s] or Doppler shift [kHz]	Min	
Mean velocity [cm/s] or Doppler shift [kHz]	Ave.	
Heart rate [bpm]	HR	

## 2. FFT MONITORING SCREEN



*An example of Monitor Screen using with Smartdop 50EX-F*

FFT mode is available when using with Smartdop 50EX-F or DVM-4300T. It can be used in the same procedures as those for ordinary Doppler measurement.

In addition to standard parameters, Wave Mode (WMODE), Analog Gain (AGAIN) and Threshold (TH) are displayed on the screen. Choose Wave Mode from the pull-down menu, and adjust the values of Analog Gain and Threshold to get optimal waveform.

*Note: While using with DVM-4300T with TCD probe (2 MHz), parameter Depth will be displayed to adjust the focal depth.*



## Numerical data

Parameters	Abbrs.	Descriptions
Gain	GAIN	Analog gain selected.
Threshold	TH	Threshold of noise reducing selected.
Waveform mode	WMODE	Selected from MAX+MEAN, MAX and MEAN
Systolic velocity [cm/s] or Doppler shift [kHz]	Max	Depends on WMODE. Value of MAX waveform when MAX+MEAN selected.
Minimum velocity [cm/s] or Doppler shift [kHz]	Min	Depends on WMODE. Value of MAX waveform when MAX+MEAN selected.
Mean velocity [cm/s] or Doppler shift [kHz]	Ave.	Depends on WMODE. Value of MAX waveform when MAX+MEAN selected.
Heart rate [bpm]	HR	

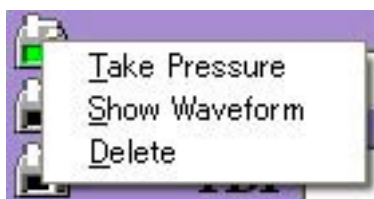
# PRESSURE MONITOR

---


This mode is available when Doppler with pressure capability is connected and Pressure Menu is active on Option Screen. See the section "**Option**" for details.

## 1. Pressure icon and Pressure Menu

- (1) After clicking Pressure icon  , Pressure Menu (dialog box below) will appear.



Take Pressure option is available only when Smartdop 30EX is connected. When in other cases, it is dimmed.

*Note : When pressure waveform has been saved the Pressure icon appears like .*

- (2) Select **Take Pressure** to measure blood pressure with Doppler, **Show Waveform** to display pressure waveform on Pressure Monitor screen which is previously determined, or **Delete** to delete the pressure waveform.

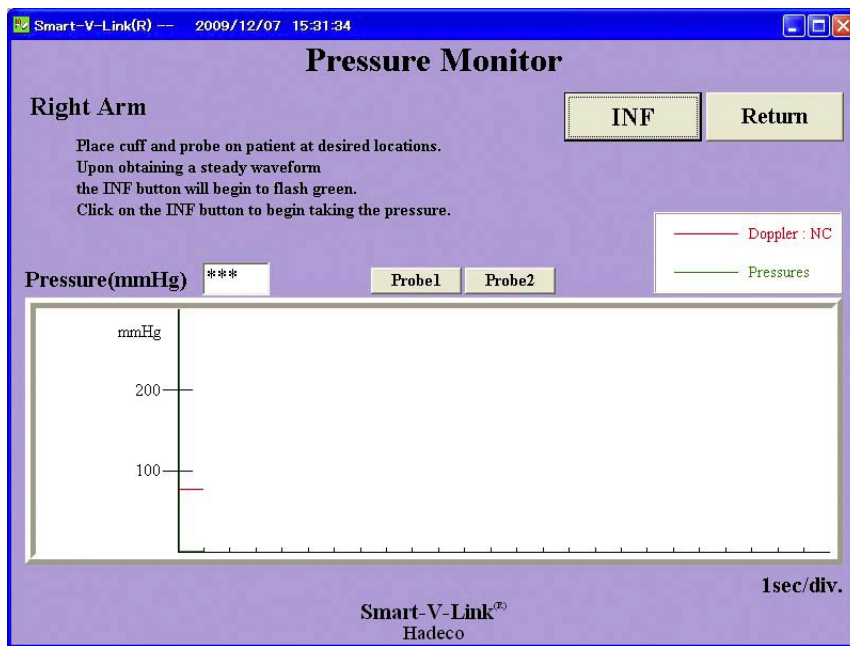
*Note : When pressure waveform is not saved, Show Waveform and Delete options gray out and are not selectable.*

*When on Customized Screen and Individual Waveform screen, **Take Pressure** on Pressure menu is divided into 2 modes because Smartdop 30EX has 2 different procedures depend on type of cuff connected. Choose either one of 2 modes for taking pressure.*



## 2. Taking Pressure

- (1) When **Take Pressure** has been selected, Smart-V-Link goes to **Pressure Monitor** screen and starts monitoring of pressure waveform.



- (2) Set the cuff on the patient and connect the tubing to Doppler, and place the probe on the site.
- (3) Select **PROBE 1** or **PROBE 2** if 2-probe type Doppler is connected.

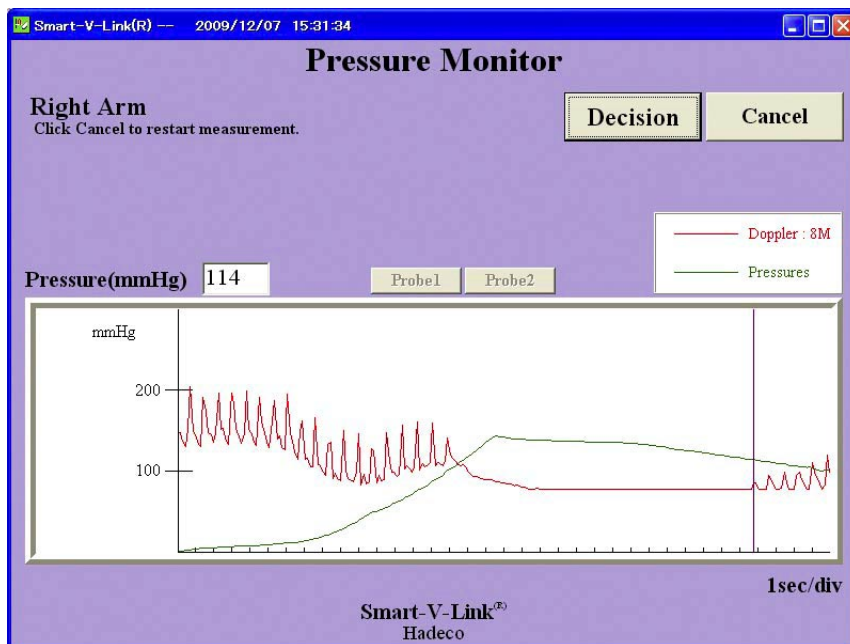
*Note : The guidances for procedures are displayed above the waveform window.*

- (4) When waveform becomes stable, **INF** will turn green and flash to let you know it's ready for the measurement. Click INF to proceed and built-in cuff inflator will start inflating the cuff.

If INF does not turn green and flash due to arrhythmia, straight click INF to proceed the measurement on manual.

Click **DUMP** to cancel the measurement and dump the cuff.

- (5) Follow the guidance or see the operating manual comes with Doppler unit for taking blood pressure.
- (6) When the measurement is completed, blood pressure and pressure waveform will be displayed.




The purple vertical line crossing waveforms indicates the point which Smart-V-Link has determined as a systolic pressure. The line can be moved by dragging and the pressure can be changed.

If the result is satisfactory, click **Decision** to save the data to the memory of the computer and it'll go back to the previous screen. If it's not satisfied, press the probe button or the space bar, or click **Cancel** to go back to monitoring mode again.

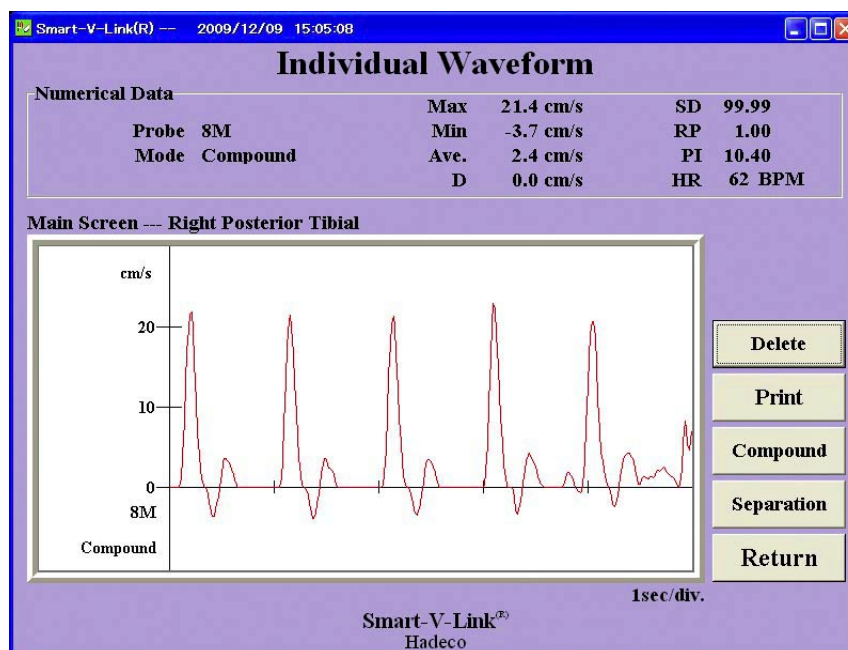
### 3. Showing Waveform

- (1) When **Show Waveform** is selected, Smart-V-Link will go to **Pressure waveform Screen**, and the waveforms are shown in the waveform window.

### 4. Deleting Waveform

- (1) Select Delete to delete pressure waveform. The Pressure icon will change to .

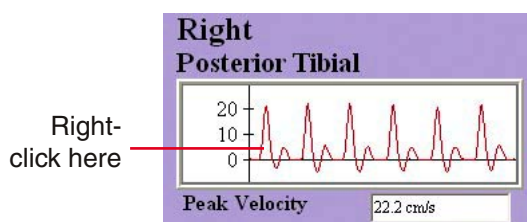
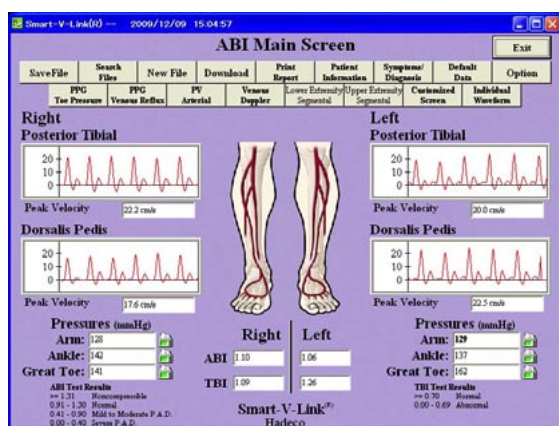
# ENLARGING WAVEFORM



An example of Main Screen - Right Posterior Tibial

Right-click each waveform window of each test module to enlarge the waveform for observation. This function is not available on PPG Venous Reflux and Venous Doppler studies.

See the section "**Individual Waveform**" as for the numerical parameters shown on the upper part of Individual Waveform screen.



## An example

- (1) The sample shown above is the waveform of posterior tibial artery picked out from ABI Main Screen.
- (2) To display the enlarged waveform, right-click the waveform window of posterior tibial on the ABI Main Screen.
- (3) The Individual Waveform screen will appear with enlarged waveform and numerical parameters. You can change the waveform mode. (Compound or Separation)
- (4) To print out this screen, click **Print**. Choose the printer in the print dialog screen and click **OK**.
- (5) Clicking **Delete** makes deletion of the waveform.
- (6) To go back to the previous screen, click **Return**.

# DOWNLOAD

Click memory No.

Choose test module and site in which the data will be saved.

Memory No.	Data Stored	Test Module	Site
1	Yes	Blood Pressure	Right Ankle
2	Yes	Blood Pressure	Left Ankle
3	Yes	Blood Pressure	Right Arm
4	Yes	Blood Pressure	Left Arm
5	Yes	PPG Toe Pressure	Right 1st Digit
6	Yes	PPG Toe Pressure	Right 2nd Digit
7	No	Not Selected.	Not Selected.
8	No	Not Selected.	Not Selected.
9	No	Not Selected.	Not Selected.

Download capability is available for the following Doppler models:

Bidop ES-100V3, Smartdop 30EX, Smartdop 45 and Smartdop 50EX

Waveform memory data of the specified Dopplers can be downloaded to the testing modules assigned on this screen.

*Note : With Smartdop 50EX-F, spectrum data (SPEC mode) cannot be copied.*

If **Download** is selected when measurement data have not been saved on ABI Main Screen, a confirmation dialog box shown left will appear. Click **Yes** for saving the data.

When Smartdop 30EX, Smartdop 45, or Smartdop 50EX-F is connected, additional 3 columns, **Data Type**, **Patient Data** and **Blood Pressure**, can be displayed by moving horizontal scroll bar.

Memory No.	Test Module	Site	Blood Pressure
1	Blood Pressure	Right Ankle	Yes
2	Blood Pressure	Left Ankle	Yes
3	Blood Pressure	Right Arm	Yes
4	Blood Pressure	Left Arm	Yes
5	PPG Toe Pressure	Right 1st Digit	Yes
6	PPG Toe Pressure	Right 2nd Digit	Yes
7	Not Selected.	Not Selected.	No
8	Not Selected.	Not Selected.	No
9	Not Selected.	Not Selected.	No

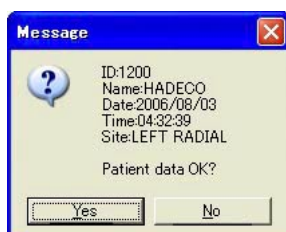
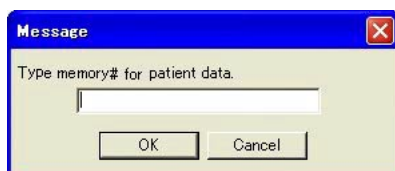
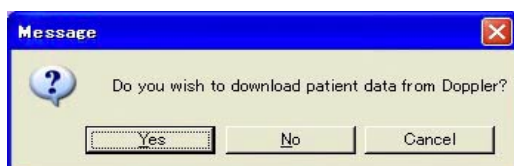
Scroll bar

## 1. Assigning download location

- (1) A catalog of the waveform memory will be displayed right after going to Download screen. Data Stored column in the catalog shows if waveform data has been stored on each Memory No. by showing Yes.
- (2) Click memory number with saying Yes for Data Stored to be assigned.
- (3) Choose the test module and the site from pull-down menu in which the data will be saved.
- (4) Click **Clear** or **All clear** to clear the assigned test module and site for single or all memory numbers, respectively.
- (5) Click **Preview** to preview the waveform on preview window.
- (6) Click **Patient Data Preview** to preview it when Smartdop 45 is connected.
- (7) After getting all the memory numbers assigned for test module and site, click **Save As Default** to set it as default for future Download uses.

## 2. Downloading

- (1) When the assigning is completed, click **Download** to download all the waveform memory data to the assigned locations.
- (2) With Smartdop 45, if patient information is stored in waveform memory, the dialog box shown left will appear. Click **Yes** or **No** to download waveform data with or without patient information, respectively.
- (3) If **Yes** is chosen, memory# dialog box will appear. Type the memory number you wish to download patient information from with checking Patient Data column in Download table.
- (4) Click **OK** to display patient data for confirmation.



*Note : You can look see the patient data beforehand on the Download screen by clicking **Patient Data Preview** button.*

- (5) Click **Yes** in the Patient Preview Message box to download, or **No** to input another memory number. (Go to (3) of this section).

*Note : Memory# to download patient information has to be typed since multiple patient information may have been saved on Smartdop 45 while Smart-V-Link only takes one patient a file.*

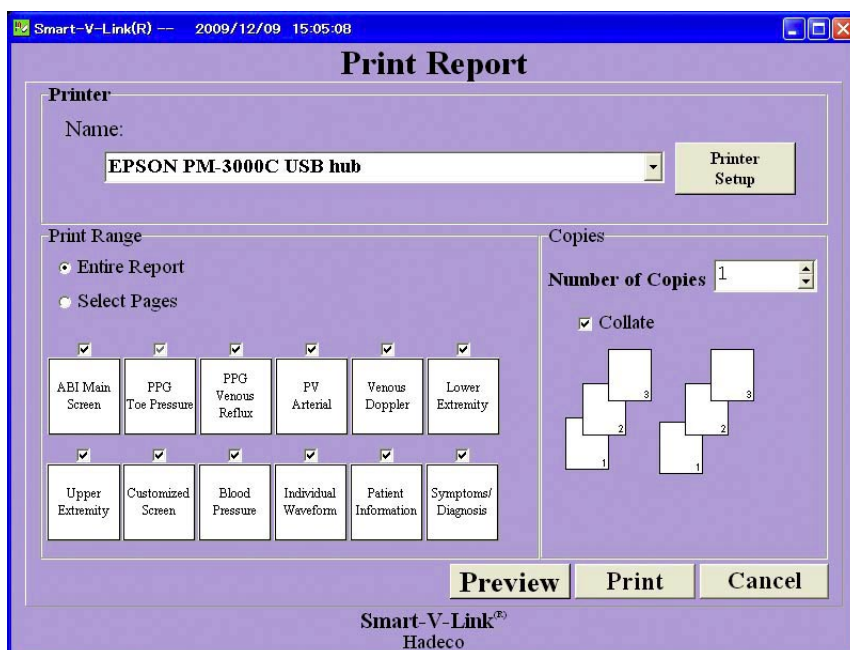
#### *Error message*

*In the following cases of data mismatch, the data will not be assigned anywhere and an error message will be displayed after download process is completed.*

- *PPG-DC data is assigned to non Venous Reflux screen.*
- *Non PPG-DC data is assigned to Venous Reflux screen.*
- *PV-DC data, not available on Smart-V-Link, is assigned.*
- *Blood pressure waveform is assigned to non Pressure module.*
- *Heart rate waveform data, not available on Smart-V-Link, is assigned.*
- *FFT spectrum data, not available on Smart-V-Link, is assigned.*
- *Etc.*



# PRINT REPORT



## (1) Printer

Choose the printer you use for printing from the pull-down menu. Click **Printer Setup** to display printer setup dialog box of Windows for printing options.

## (2) Print Range

Click on **Entire Report** for printing all the pages, or click on **Select Pages** and put a tick in all the check boxes for the pages you wish to print out.

Checking Blood Pressure check box makes to print pressure waveforms end of each test module report.

## (3) Copies

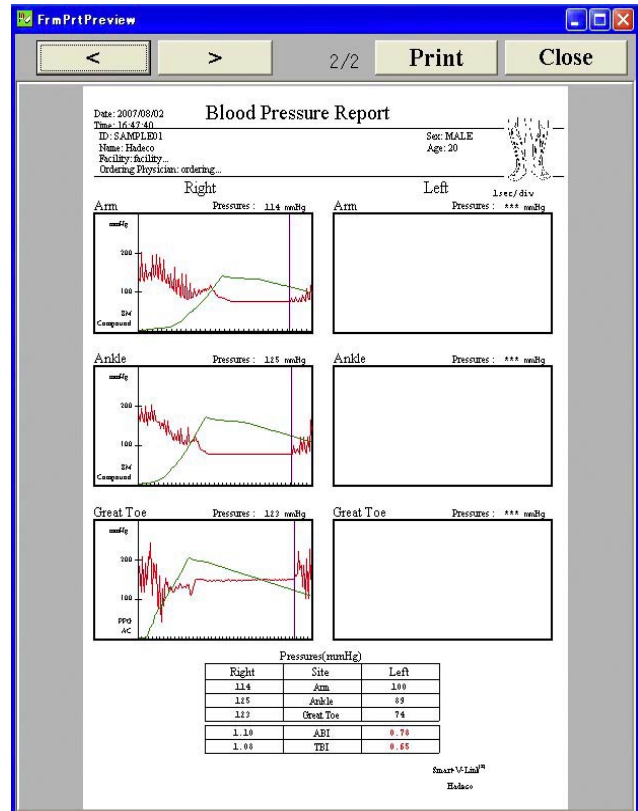
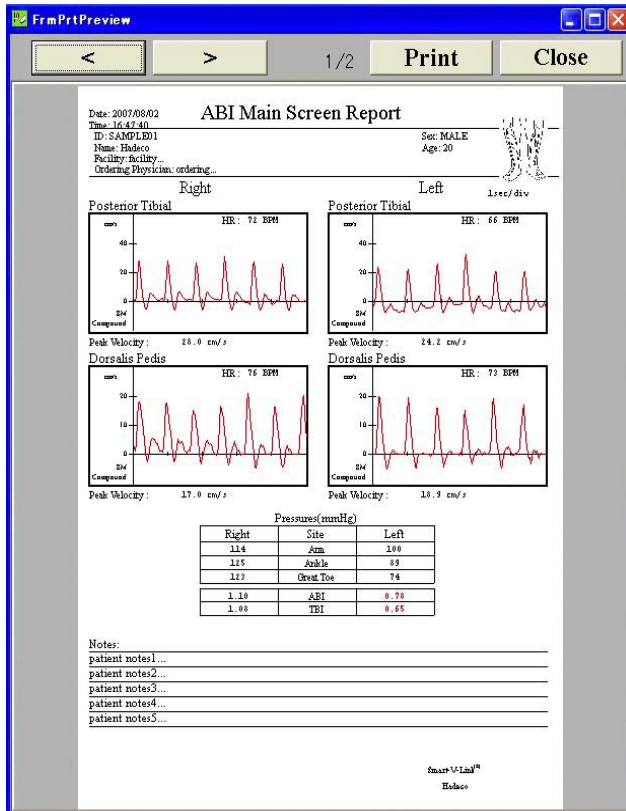
Set the number of copies. Check **Collate** to collate pages.

## (4) Preview

Click **Preview** to display the print preview.

(5) Click **OK** to print out or **Cancel** to go back to the previous screen without printing.

Print preview example (ABI Main Screen)



# Chapter 8 : SYSTEM SETTINGS and DATA PRESETTINGS

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## PATIENT INFORMATION

---

The screenshot shows a software window titled "Smart-V-Link(R)" with a timestamp of "2009/12/09 15:05:08". The window contains a form titled "Patient Information". The form has two main sections. The top section contains fields for "First Name:", "Last Name:", "ID:", "Sex:" (a pull-down menu), "Date of Birth:" (MM/DD/YYYY), "Age:" (a pull-down menu), "Height:", "Weight:", "Telephone Number:", and "Test Date:" (MM/DD/YYYY). The bottom section contains fields for "Facility:", "Performing Studies:", and "Ordering Physician:", all of which are pull-down menus. There are "Save" and "Return to Main Screen" buttons in the top right corner. The bottom of the window displays "Smart-V-Link(R)" and "Hadeco".

### (1) Name, ID, Telephone Number, Age, Date of Birth, Test Date, Height and Weight

Click each text area and type the information.

*Note :First Name, Last Name, & ID  
The symbol letters not acceptable  
for Windows file names cannot be  
used such as "/" and "?".*

### (2) Sex

Select MALE or FEMALE from the pull-down menu.

### (3) Facility, Performing Studies and Ordering Physician

Select the items from the pull-down menu or type them in.

- (4) Click **Save** to save the data to the memory of the computer.
- (5) Click **Return to Main Screen** to go back to ABI Main Screen.



If the data is not saved, the dialog box shown left will appear. Click **Yes** to save the data, **No** to return to ABI Main Screen without saving, or **Cancel**.

# SYMPTOMS / DIAGNOSIS

Smart-V-Link(R) 2009/12/09 15:05:08

## Symptoms / Diagnosis

**Print** **Save** **Return to Main Screen**

### Diagnosed Conditions

☐ Diabetes  years  
☐ Hypertension  years  
☐ Hyperlipidemia  
☐ Previous Vascular Surgery  
☐ Stroke (TIA)  
☐ Heart Disease  
☐ Angina  
☐ Syncope  
☐ Headaches  
☐ Vertigo  
☐ Other

### Risk Factors

☐ Cigarette/Tobacco Use  years smoked  packs per day  years quit  
☐ Sedentary  
☐ Oral Contraceptives  
☐ Other

### Current Signs & Symptoms

	Right Leg	Left Leg		Right Leg	Left Leg		Right Arm	Left Arm
Extremity Weakness	<input type="checkbox"/>	<input type="checkbox"/>	Rest Pain	<input type="checkbox"/>	<input type="checkbox"/>	Pain	<input type="checkbox"/>	<input type="checkbox"/>
Limb Hair Loss	<input type="checkbox"/>	<input type="checkbox"/>	Claudication	<input type="checkbox"/>	<input type="checkbox"/>	Aching	<input type="checkbox"/>	<input type="checkbox"/>
Skin Color Changes	<input type="checkbox"/>	<input type="checkbox"/>	<b>Pain Location :</b>			<b>Pain Location :</b>		
Stasis Dermatitis	<input type="checkbox"/>	<input type="checkbox"/>	Thigh/Buttock	<input type="checkbox"/>	<input type="checkbox"/>	Head	<input type="checkbox"/>	<input type="checkbox"/>
Trophic Nails	<input type="checkbox"/>	<input type="checkbox"/>	Calf	<input type="checkbox"/>	<input type="checkbox"/>	Neck	<input type="checkbox"/>	<input type="checkbox"/>
Gangrene	<input type="checkbox"/>	<input type="checkbox"/>	Arch	<input type="checkbox"/>	<input type="checkbox"/>	Shoulder	<input type="checkbox"/>	<input type="checkbox"/>
Edema	<input type="checkbox"/>	<input type="checkbox"/>	Toe	<input type="checkbox"/>	<input type="checkbox"/>	Upper Arm	<input type="checkbox"/>	<input type="checkbox"/>
Cellulitis	<input type="checkbox"/>	<input type="checkbox"/>	<b>Pain Relieved By :</b>			Forearm	<input type="checkbox"/>	<input type="checkbox"/>
Rubor	<input type="checkbox"/>	<input type="checkbox"/>	Rest	<input type="checkbox"/>	<input type="checkbox"/>	Hand	<input type="checkbox"/>	<input type="checkbox"/>
Ulcerations	<input type="checkbox"/>	<input type="checkbox"/>	Exercise	<input type="checkbox"/>	<input type="checkbox"/>	Finger	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Other <input type="text"/>			Legs Elevated	<input type="checkbox"/>	<input type="checkbox"/>			
			Legs Down	<input type="checkbox"/>	<input type="checkbox"/>			

### Notes

Smart-V-Link(R)  
Hadeco

- (1) Check the appropriate check boxes and type information in text boxes.
- (2) Click **Print** to print the report if desired.
- (3) Click **Save** to save the data to the memory of the computer.
- (4) Click **Return to Main Screen** to go back to ABI Main Screen.

Message

Do you wish to save data?

**Yes** **No** **Cancel**

If the data is not saved, the dialog box shown left will appear. Click **Yes** to save the data, **No** to return Main Screen without saving, or **Cancel**.

# DEFAULT DATA

Smart-V-Link(R) -- 2009/12/09 15:05:08

**Default Data** [Return to Main Screen](#)

**Facility**  
[Dropdown Menu]

**Address**  
[Text Area]

**Telephone Number**  
[Text Field]

**Performing Studies**  
[Dropdown Menu]

**Ordering Physician**  
[Dropdown Menu]

**New**  
**Change**  
**Delete**  
**Save**

Smart-V-Link(R)  
Hadeco

Click here to show pull-down menu.

**Default Data** [Return to Main Screen](#)

**Facility**  
[New...]

**Default Data** [Return to Main Screen](#)

**Facility**  
Hadeco Hospital

**Address**  
2-7-11 Arima  
Miyamae-ku  
Kawasaki, 216-0003

**Telephone Number**  
044-877-4361

**Performing Studies**  
[Empty]

**Ordering Physician**  
[Empty]

Default data typed in on this screen can be used in the pull-down menus on Patient Information screen.

## 1. Adding new data

### 1-1. Facility, Address and Telephone number

- (1) Click the text area of **Facility** and click on **New** button or select [New...] from the pull-down menu of the Facility.
- (2) Type new facility name.
- (3) Click the text area of **Address** and type the address of the facility. Press Enter key to go to the next line.
- (4) Click the text area of **Telephone Number** and type the telephone number of the facility.

### 1-2. Performing Studies and Ordering Physician

- (1) Click in the text area and click on **New** button right side of the screen or select [New...] from the pull-down menu.

- (2) Type the name of technician performing studies / ordering physician.

## 2. Saving Default data

- (1) Click **Save** to save the default data.
- (2) Click **Return to Main Screen** to go back to ABI Main Screen.



If the data is not saved, the dialog box shown left will appear. Click **Yes** to save the data, **No** to go back to ABI Main Screen without saving or **Cancel**.

*NOTE : Save command saves all default data to the hard disk at once and subsequent Smart-V-Link use will revert to these data.*

## 3. Revising data

- (1) Select the data to be revised from appropriate pull-down menu.
- (2) Revise the data as necessary and click **Change** to complete the revising process or click **Delete** to cancel the revision.

Click here to show pull-down menu.

*Note : Pull-down menu is also available by pressing Up or Down arrow key on the keyboard.*

## 4. Deleting Data

(1) Select the deleting item from the pull-down menu.

(2) Click **Delete** to delete the item.

When facility data is deleted, the address and the telephone number corresponding to it are also deleted.

If you wish to delete only address or telephone number, select any of them and click Delete.

## 5. Setting Default on Patient Information screen

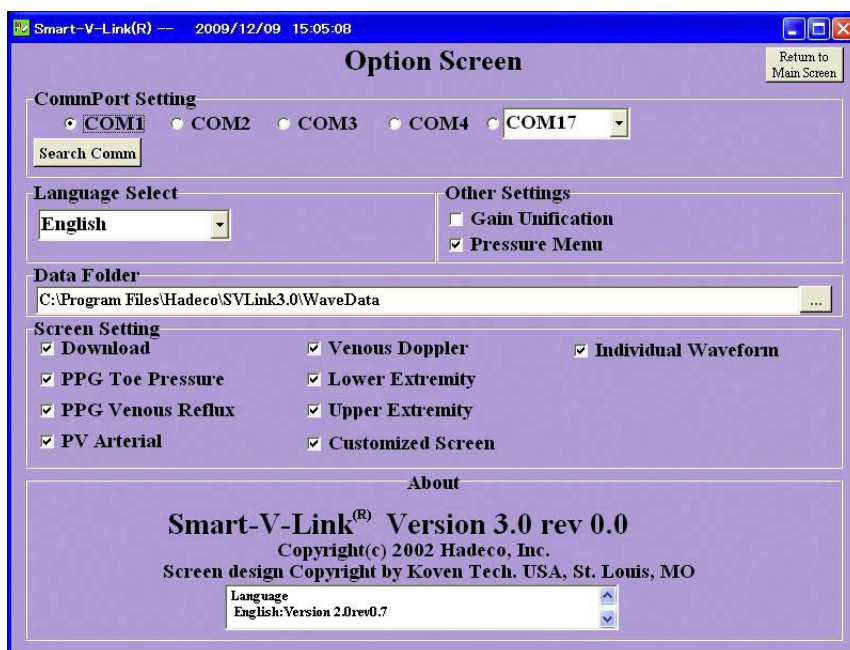
The default data shown on Patient Information screen can be specified as follows:

(1) Choose the default data from each pull-down menu on Default Data screen.

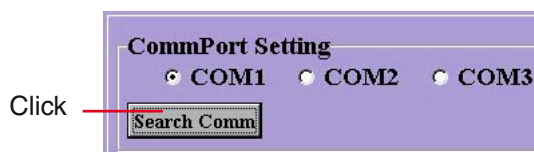
(2) Click **Save** and **Return to Main Screen**.



# OPTION



## (1) CommPort Setting



Connect Doppler to your computer and turn it on. Click **Search Comm** to search for connected Doppler. We recommend disconnecting all of other devices connected to COM ports on your computer beforehand.

The message dialog box shown left will appear. Click on **OK** to proceed.

Search Comm command will return COM port #(s) to which the Doppler is connected as shown in the picture below. If more than 2 Dopplers are connected, check the COM port connected the one you wish to use.



When using with Doppler with USB I/F (ex. Bidop ES-100V3, Smartdop 30EX and Smartdop 45 etc.), the USB cable driver should be installed beforehand. See "[Installing USB Cable Driver](#)" (Chapter 2 : Getting Started) to get to know how to install the driver and how to configure the CommPort Setting.

## (2) **Language Select**

Select your language from the pull-down menu.

## (3) **Gain Unification**

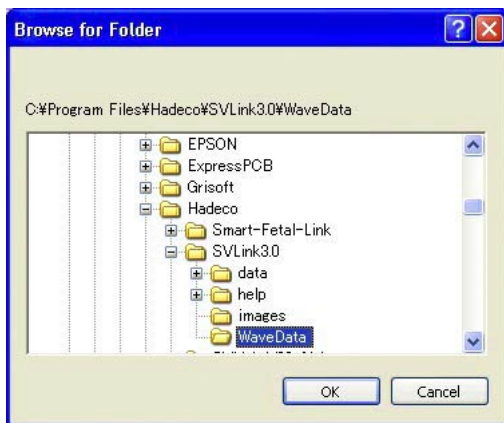
To unify all the amplitude scales of waveforms in each testing module, check **Gain Unification**.

## (4) **Pressure Menu**

Check Pressure Menu to activate the menu to take pressures with Doppler with pressure capability. The icon



will be displayed on ABI Main Screen, PPG Toe Pressure, PV Arterial, Lower Extremity Segmental, Upper Extremity Segmental and Individual Waveform screens, and Customized Screen.



## (5) **Default Data Folder**

To change default data folder, click the button "...". The dialog box shown left will be appear. Select a folder and click **OK**.

The path to the folder will be displayed below the label **Data Folder**. The folder specified here will be displayed on **Search Files** and **Save File** screens for initial browsing.

## (6) **Screen Setting**

Check the check boxes followed by the label of screen names which you wish to use.

In the menu on **ABI Main Screen**, the function buttons correspond to non-checked functions will be gray out and cannot be used.

# Chapter 9 : TROUBLESHOOTING

---

## 1. Smart-V-Link cannot be executed.

- a. Refer to the section "[System Requirements](#)" of this manual to make sure that your computer system meets the requirements of the Smart-V-Link software.
- b. Uninstall the Smart-V-Link, and reinstall it.

## 2. Search Comm command does not work correctly. (CommPort setting)

It has been reported in a rare case when using with Doppler with USB I/F that Search Comm cannot search the Doppler for the first time you run after installing USB cable driver.

To solve this problem, restart your computer once.



## 3. Communication Error 1

- a. Make sure if the Doppler unit is turned on.
- b. Check the connection from computer to Doppler and that the communication cable is proper for the Doppler and the computer.
- c. Refer to the section "[Option](#)" of this manual for the COM port setting.
- d. Click Return on the **Monitor Screen** to go back to previous screen, and then go to **Monitor Screen** again.



#### 4. Communication Error 2

- a. Go to Option screen.
- b. Connect Doppler to the computer and turn it on.
- c. Do the CommPort setting.

See the section "[Option](#)" of this manual for the details.

#### 5. The report cannot be printed out.

- a. Make sure the printer is turned on.
- b. Check the connection from computer to printer. If you use a network printer, check the network and the print server as well.
- c. Refer to the section "[Print Report](#)" of this manual, and set the settings again.





**Hadeco, Inc.**

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