OTC
DAIHEN Corporation

Welding Waveform Display

smart wave viewer

INSTRUCTION MANUAL
Model: K-7323

Ensure to read this
instruction manual
thoroughly for safe and
proper use of the product.

DAIHEN Corporation

Forward

Thank you for downloading OTC's smart wave viewer (the welding waveform display software).

This Instruction Manual (hereafter referred to as "this manual") explains the following points for correct use of the product.

- Outline of the software
- Starting, setting up, and using the software
- Troubleshooting

Store this manual in a safe place along with the welding power source instruction manual so that it can be referred whenever necessary.

Important Information

Use of the Product

The smart wave viewer software is used to display graphs of data collected from the welding power source during welding, such as current, voltage, and wire feeding speed.

Once you install this software application onto a PC, you can easily visualize welding data in graph format.

Safe Use of the Product

For safe use of the product (hereafter referred to as welding power source), ensure to follow the instructions below:

- This manual is intended for workers who are familiar with the listed terminologies. If this product is going to be operated or serviced by workers who are not familiar with the terminology, the responsibility falls on the customer to provide thorough training on operation and safety.

- This equipment and this manual are for use only by persons trained and experienced in the safety operation of welding equipment.

- For protection from possible injury or damage in the equipment, be sure to read and follow the safety information in this manual. Do not use it for purposes not indicated in the manual.

- Make sure that installation/operation/maintenance of the welding power source and welding machine is performed by a qualified personnel with sufficient knowledge and skills.

- If this manual is lost or damaged, immediately contact your dealer.

Copyright

This manual is copyrighted and all rights are reserved by OTC. Any part of the manual shall not be copied, photocopied, or reproduced without the prior consent of OTC.

Service and Support

See the back cover for contact numbers and mailing addresses. When contacting your dealer for service, you are required to provide the following information:

- Name, address, telephone number

- Product model, manufacture year, serial number, and software version number

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1 Outline

1.1 System Requirements

Before installing smart wave viewer, confirm that the PC that the software will be installed on fulfills the following requirements.

- OS

  Windows XP (English version) or later

- Memory

  128 MB or more

- Hard disk space

  10 MB or more free space

- Display

  - 16-bit color (High Color) or greater
  - Resolution: 1024×768 pixels or greater

1.2 Using Smart Wave Viewer

The smart wave viewer software application is used to display graphs of data collected from the welding power source during welding, such as current, voltage, and wire feeding speed.
Data for the current, voltage, and wire feeding speed during welding is collected in the welding power source, which can then be loaded to a USB memory device as a simplified data log. (Below, the simplified data log is referred to as "welding power source output data".)
Once you install this software application, you can read the welding power source output data with the PC and visualize the welding data in graph format.

Of the following 6 types of welding data, you can select three to be loaded onto the USB memory device. For the welding data selection method, refer to "Simplified data log function" in the "Instruction manual for welding power source".

- Welding current set value

- Welding voltage set value

- Wire feeding speed set value

- Welding current actual value

- Welding voltage actual value

- Wire feeding speed actual value

2 Smart Wave Viewer Installation and Uninstallation

2.1 Installation

Use the following procedure to install smart wave viewer.

> ╱ **TIPS**
> - Access the following download site to download smart wave viewer:
>   - URL：http://www.daihen.co.jp/yosetsu/other/download.html
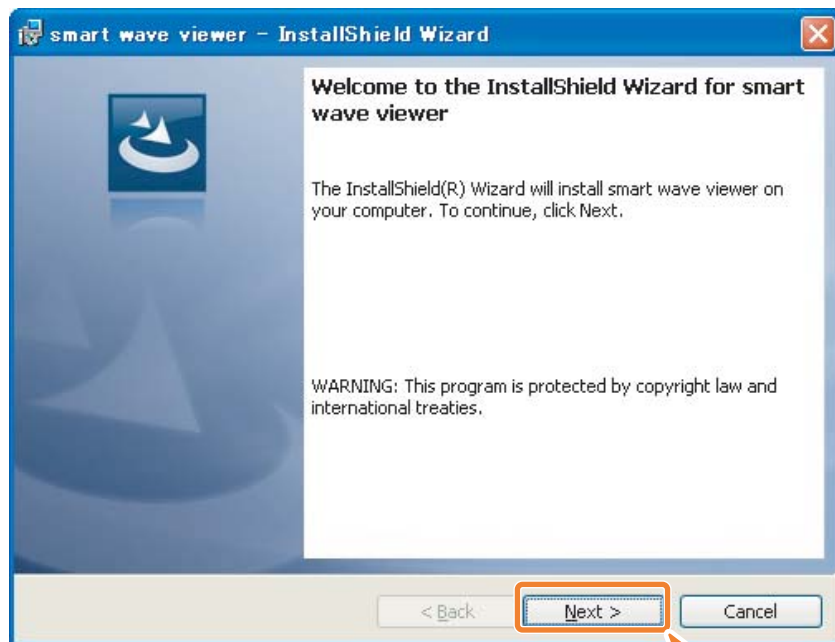
STEP

1. Extract the contents of the ZIP file and double-click "SETUP.EXE" file.

SETUP.EXE

2. The "Welcome to the InstallShield Wizard for smart wave viewer" screen is displayed. Confirm the contents of the screen, and then click the "Next" button.
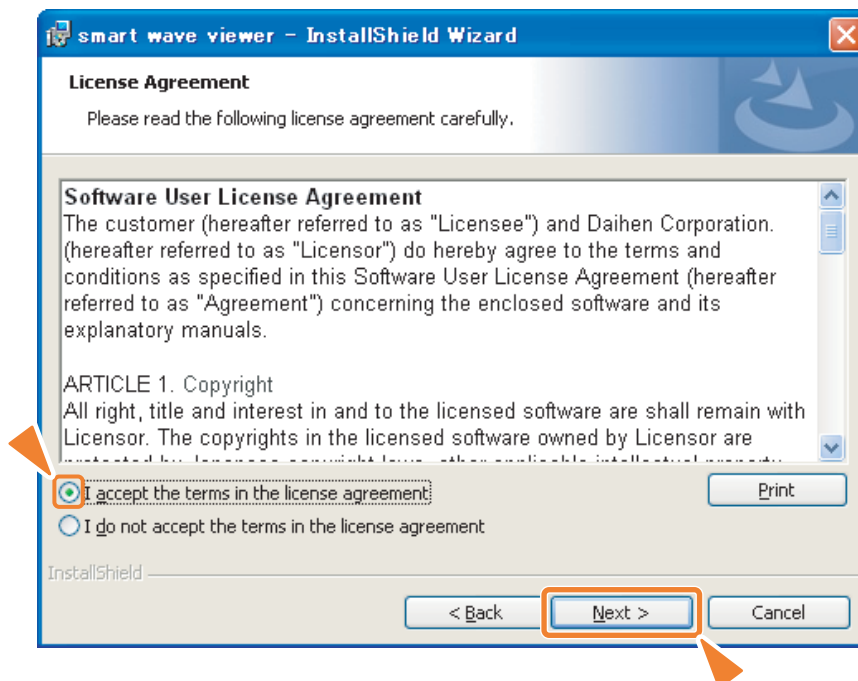
3. The "License Agreement" screen is displayed. Confirm the contents of the software user license agreement.
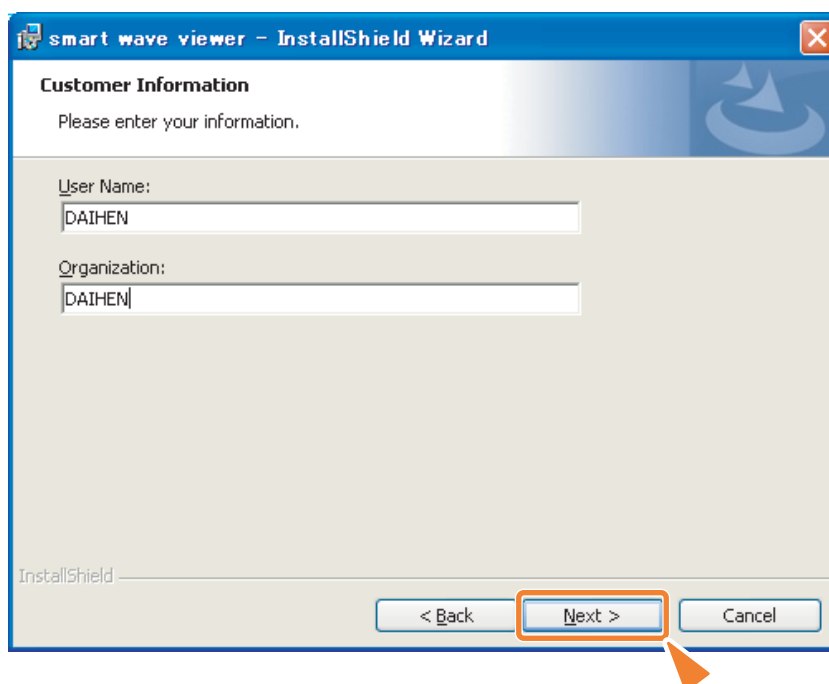   To agree to the contents of the user license agreement, select "I accept the terms of the license agreement", and then click the "Next" button.

   / **NOTE**
   - To print out the contents of the user license agreement, click the "Print" button.

4. The "Customer Information" screen is displayed. Enter your name and your company's name, and then click the "Next" button.

5. The "Destination Folder" screen is displayed. Confirm the installation directory for the software, and then click the "Next" button.

/ NOTE

• If necessary, click the "Change" button and change the installation directory.
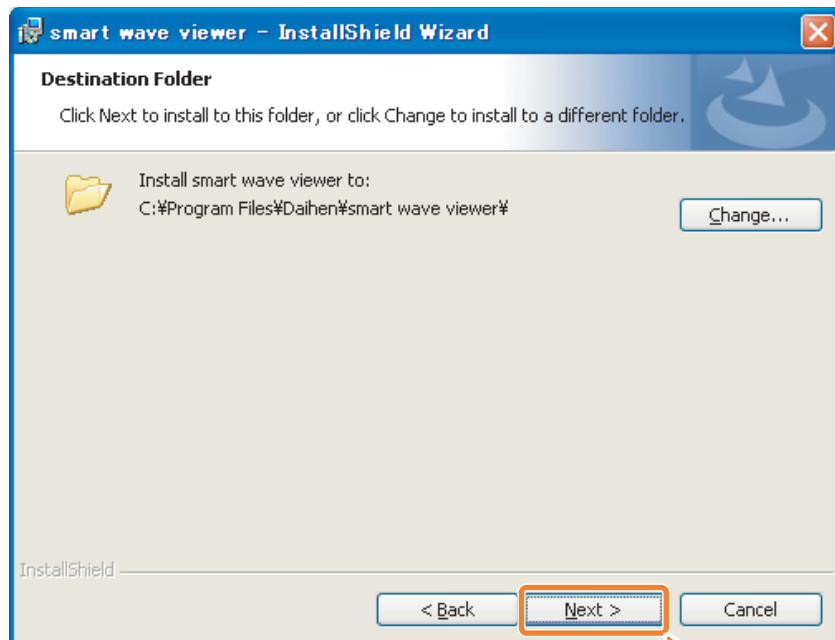
6. The "Ready to Install the Program" screen is displayed. Confirm the contents of "Current Settings", and then click the "Install" button.

The copying of files (installation) will begin.
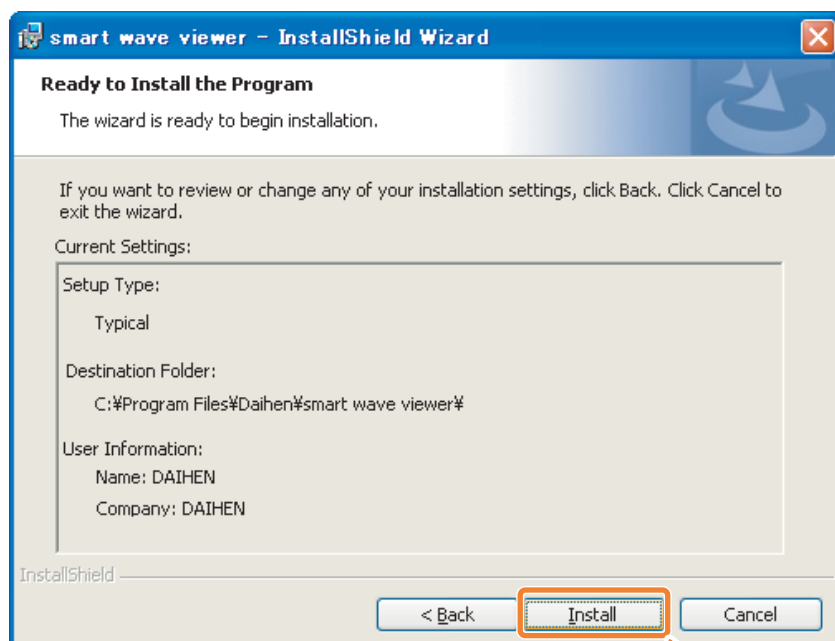
7. When the file copying (installation) is completed, a "Smart Wave Viewer" shortcut is created on the desktop and the "InstallShield Wizard Completed" screen is displayed. Click the "Finish" button.

This completes the installation procedure.

2.2 Uninstallation

Use the following procedure to uninstall smart wave viewer.

STEP

1. From the Start menu, select "Control Panel".

2. The Control Panel screen is displayed. Double-click "Add or Remove Programs".

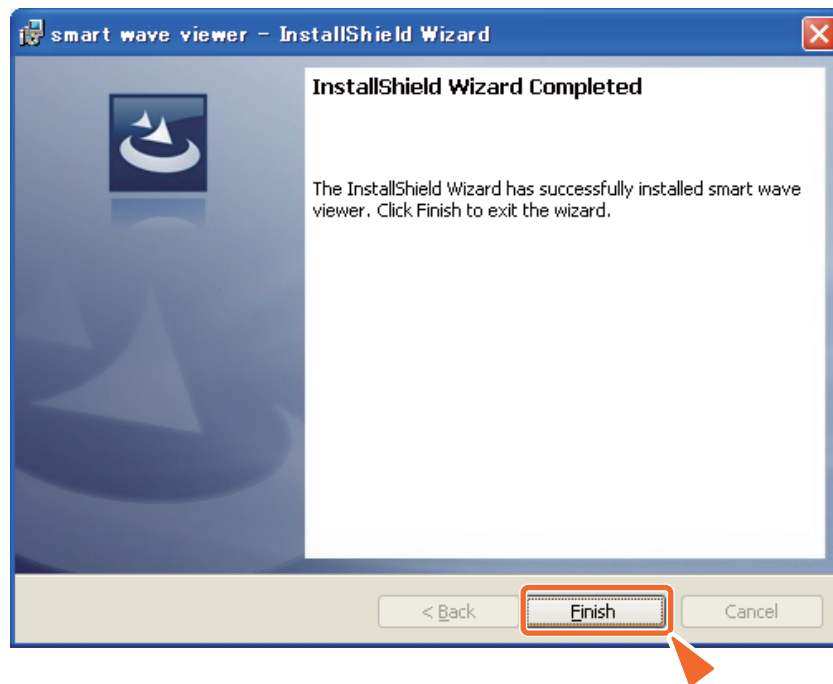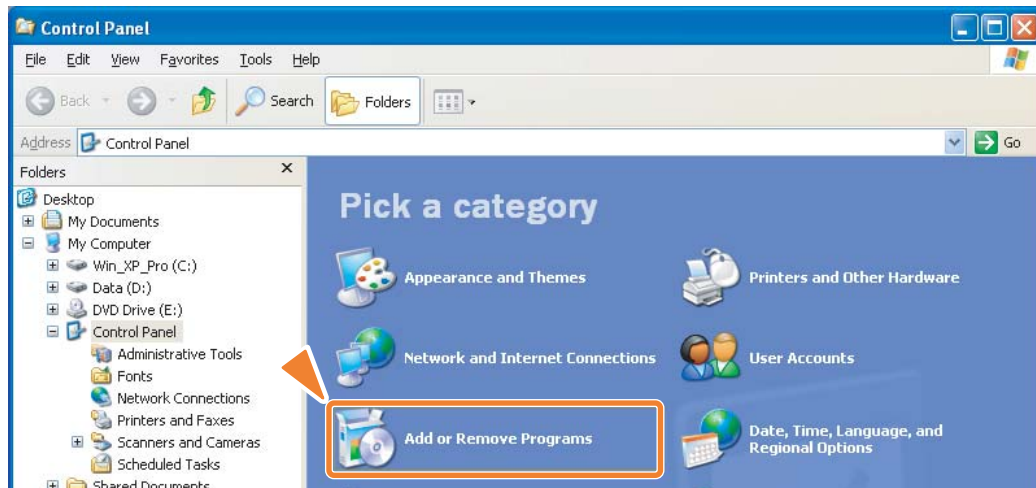*3.* The "Add or Remove Programs" screen is displayed. Select "Change or Remove Programs", and then select "smart wave viewer". Then, click the "Remove" button.
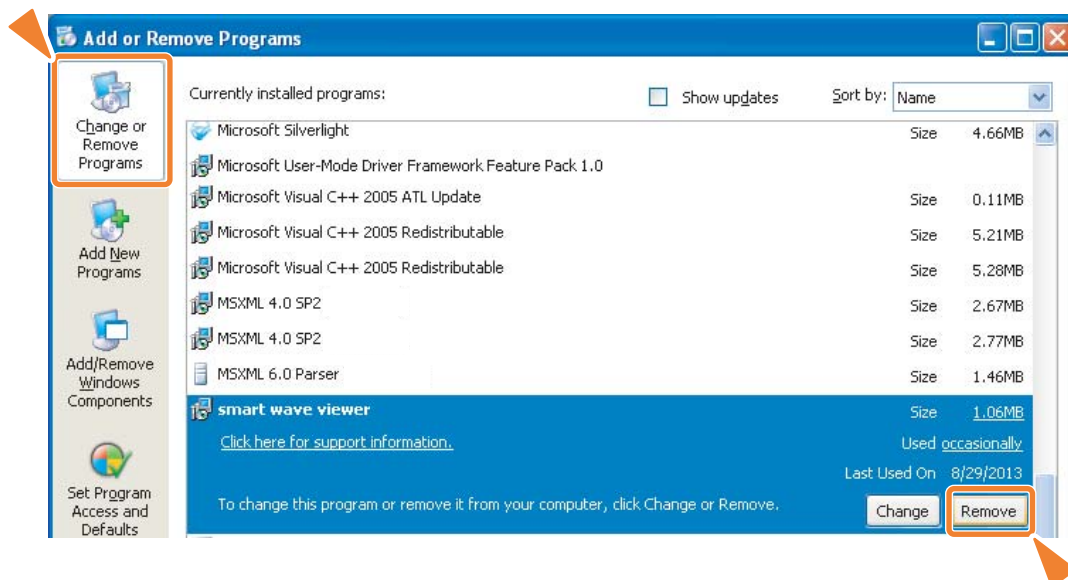
4. The "Add or Remove Programs" dialog box is displayed. Click "Yes".

The uninstall process will begin.

5. When uninstallation is complete, the "Smart Wave Viewer" shortcut will be deleted from the desktop.
Close the "Add or Remove Programs" screen and the Control Panel.

This completes the uninstallation procedure.

3 Starting and Exiting Smart Wave Viewer

3.1 Starting the Software Program

Use the following procedure to start smart wave viewer.

STEP

1. Start Windows.

2. Double-click the "Smart Wave Viewer" shortcut that was created on the desktop.
Smart wave viewer will start.

3.2 Exiting the Software Program

Use the following procedure to exit smart wave viewer.

STEP

1. In the "menu", click the "Exit" button. Or, click the "close" button ("x" button).
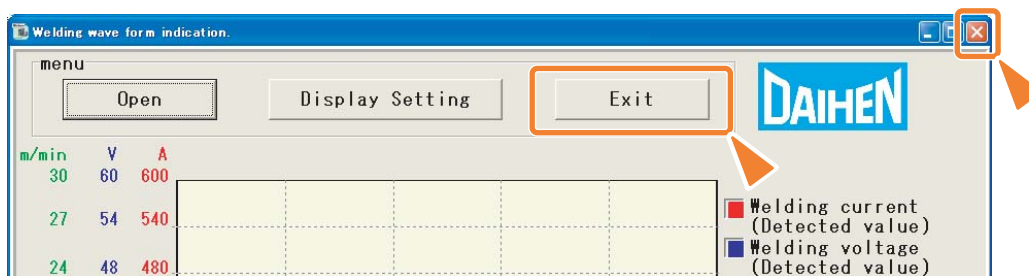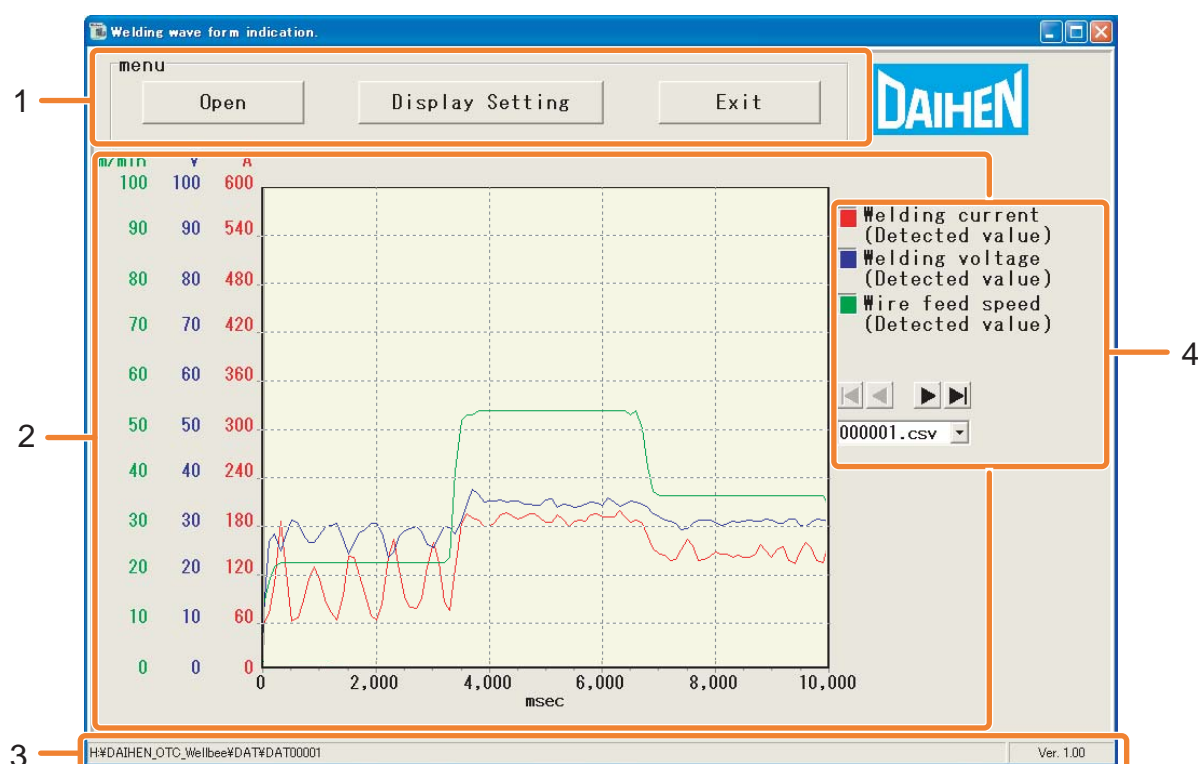Smart wave viewer will exit.

4 Operation of Smart Wave Viewer

4.1 Main Screen

When smart wave viewer is started, the main screen shown below is displayed.
The following is an explanation of the items displayed on the main screen.

No.	Name	Contents
1	Menu	This menu is used to operate smart wave viewer. It contains the following buttons: • "Open" button: loads welding power source output data. (☞ 4.2 Loading Data and Displaying Graphs) • "Display Setting" button: sets the displays of graphs. (☞ 4.4 Graph Display Settings) • "Exit" button: exits smart wave viewer. (☞ 3.2 Exiting the Software Program)
2	Graph Display Pane	Displays welding power source output data as graphs of current, voltage, and wire feeding speed during welding. Refer to the welding power source instruction manual for how to output welding power source output data. Refer to "5. Configuration of Welding Power Source Output Data" for information about the welding power source output data.
3	Status Bar	Displays the file path of the welding power source output data file, as well as the version number of smart wave viewer.
4	Graph Display Changing Area	Used to change the display of the graph in the graph display pane. (☞ 4.3 Changing the Graph Display)

4.2 Loading Data and Displaying Graphs

The following is an explanation of the procedures for loading welding power source output data to smart wave viewer and then displaying it as graphs.

STEP

1. Save the welding power source output data to a USB memory device.
The welding power source output data is saved as a CSV file.

2. Start smart wave viewer. (☞ 3.1 Starting the Software Program)

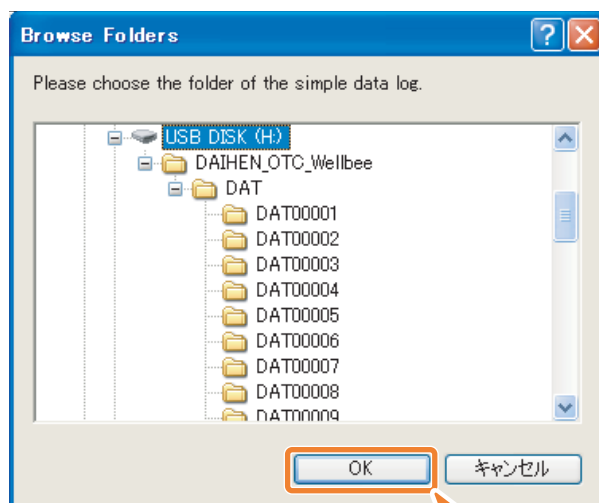*3.* Connect the USB memory device with the saved welding power source output data to the PC.

4. In the "menu", click the "Open" button.

```
menu
  [ Open ]      [ Display Setting ]      [ Exit ]
```
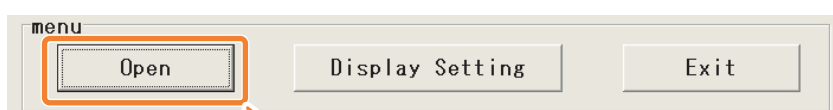
5. The "Browse Folders" dialog box is displayed. Select the folder where the welding power source output data is stored, and then click the "OK" button.
Graphs will be displayed in the Graph Display Pane.
If the "Cancel" button is clicked, the loading of data will be cancelled.

NOTE

• The welding power source output data is usually saved to the USB memory device in the following folder: "DAIHEN_OTC_Welbee\DAT\DATxxxxx"

```
Browse Folders
Please choose the folder of the simple data log.
  USB DISK (H:)
    DAIHEN_OTC_Wellbee
      DAT
        DAT00001
        DAT00002
        DAT00003
        DAT00004
        DAT00005
        DAT00006
        DAT00007
        DAT00008
        DAT00009
  [ OK ]   [ キャンセル ]
```

NOTE

• After starting the software program, nothing is displayed in the Graph Display Pane, and the buttons will not respond until the data folder is opened.

• If the selected folder does not have welding power source output data in it, the Graph Display Pane will not change.

• If the same folder is opened a second time, the Graph Display Pane will not change.

• When a data folder is selected, the oldest data in the folder (the contents of 000001.CSV) will be displayed.

4.3 Changing the Graph Display

The following is an explanation of the display and the buttons for changing the graph display.

No.	Name	Button	Contents
1	Graph Display Buttons	🟥	(Button is pressed in):The graph corresponding to the color of the button is displayed.
		🟥	(Button is not pressed in): The graph is not displayed.
			Selects "Display"/"Do not display" for the graph of each sampling item. Clicking each button cycles between "Display"/"Do not display". When this software program is started, all items are set to "Display" by default. While the software program is running, changes to these settings will be kept.
2	Graph Display Data Names		Displays the data names of the sampling items. The colors of the buttons correspond to the colors of each graph.
3	Graph Control Buttons	⏮	Displays the graph of the oldest welding waveform. If the oldest welding waveform graph is being displayed, this button cannot be used.
		◀	Displays the next (older) welding waveform graph. If the oldest welding waveform graph is being displayed, this button cannot be used.
		▶	Displays the next (newer) welding waveform graph. If the newest welding waveform graph is being displayed, this button cannot be used.
		⏭	Displays the newest welding waveform graph. If the newest welding waveform graph is being displayed, this button cannot be used.
4	Graph Selection List Box		A list of welding power source output data files in the data folder is displayed. Clicking the pull-down menu and then clicking one of the displayed file names will display the welding waveform graphs of that file. The Graph Selection List Box cannot be used when there is only one welding power source output data file in the data folder.

4.4   Graph Display Settings

The display of graphs can be changed by changing the settings of "Settlement of the scale" and "Setup of a pile up" in the "Setting of wave form indication" dialog box.
"Settlement of the scale" is used to change the displayed scale for the graph for optimal display of the graph. "Setup of a pile up" is used to display welding waveforms on top of one another to compare the current, voltage, and wire feeding speed between different welding events.

The following is an explanation of the procedures for changing the settings of the graph display.

STEP

1. In the "menu", click the "Display Setting" button.

2. The "Setting of wave form indication" dialog box will be displayed. Click either the "Settlement of the scale" tab or the "Setup of a pile up" tab.
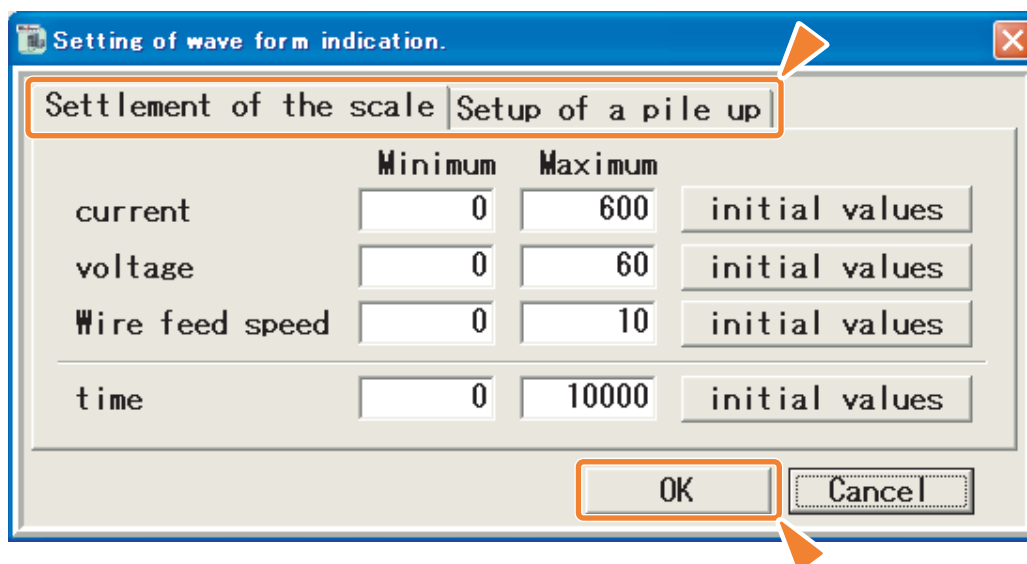
3. Set each setting item.

> **NOTE**
> * Refer to the following sections for how to set "Settlement of the scale" and "Setup of a pile up":
>   - Settlement of the scale: (4.4.1 Settlement of the Scale)
>   - Setup of a pile up: (4.4.2 Setup of a Pile Up)

4. After changing the setting of each item, click the "OK" button to refresh the graph display using the changed settings.
If the "Cancel" button is clicked, the graph display will not be refreshed.

4.4.1 Settlement of the Scale

This is an explanation of the buttons and display of "Settlement of the scale".
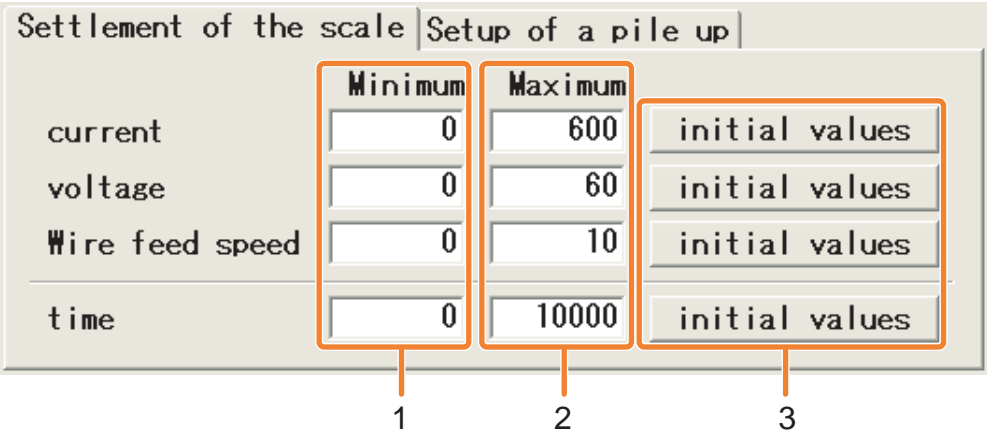
No.	Name	Contents
1	Minimum	Input the maximum and minimum display values to determine the scale of the graph. Scale settings for "current", "voltage", and "Wire feed speed" will be applicable only when the corresponding welding waveform data is included in the welding power source output data.
2	Maximum	
3	"initial values" buttons	These buttons return the graph display scales to their default minimum/maximum values.

4.4.2   Setup of a Pile Up

This is an explanation of the buttons and display of "Setup of a pile up".
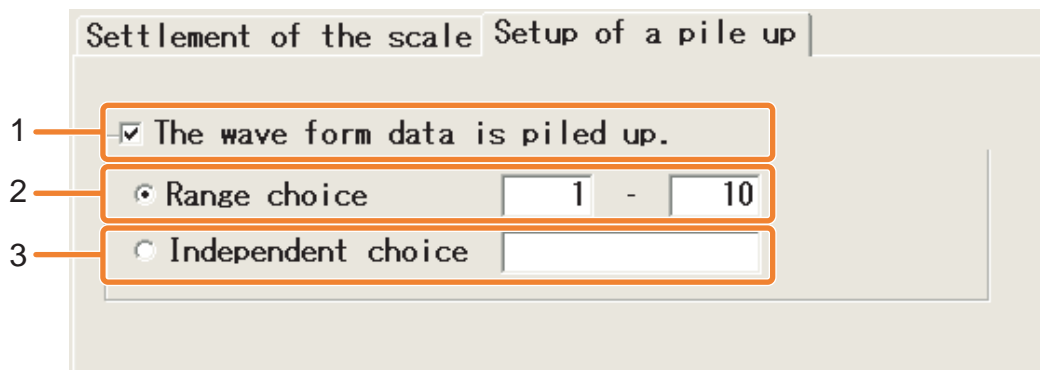
No.	Name	Contents
1	The wave form data is piled up.	Checking the "The wave form data is piled up." checkbox will display welding waveform graphs on top of one another. Click the check box to check or uncheck it.
2	Range choice	Displays a chronological sequence of welding waveform graphs on top of one another.
3	Independent choice	Displays a non-chronological sequence of welding waveform graphs on top of one another. Input the sequence like "1,3,5-8".

NOTE

- Until the "Open" button of the "menu" is clicked, the "The wave form data is piled up." checkbox cannot be checked (enabled).

- When the "Open" button of the "menu" is clicked, the settings of "Setup of a pile up" are returned to their default values.

- If the "The wave form data is piled up." checkbox is not checked, "Range choice" or "Independent choice" cannot be set.

- Welding waveform graphs displayed on top of one another will be displayed using dotted lines.

- Up to 10 welding waveform graphs can be displayed on top of one another. Settings to display more than 10 graphs at once will not be applied.
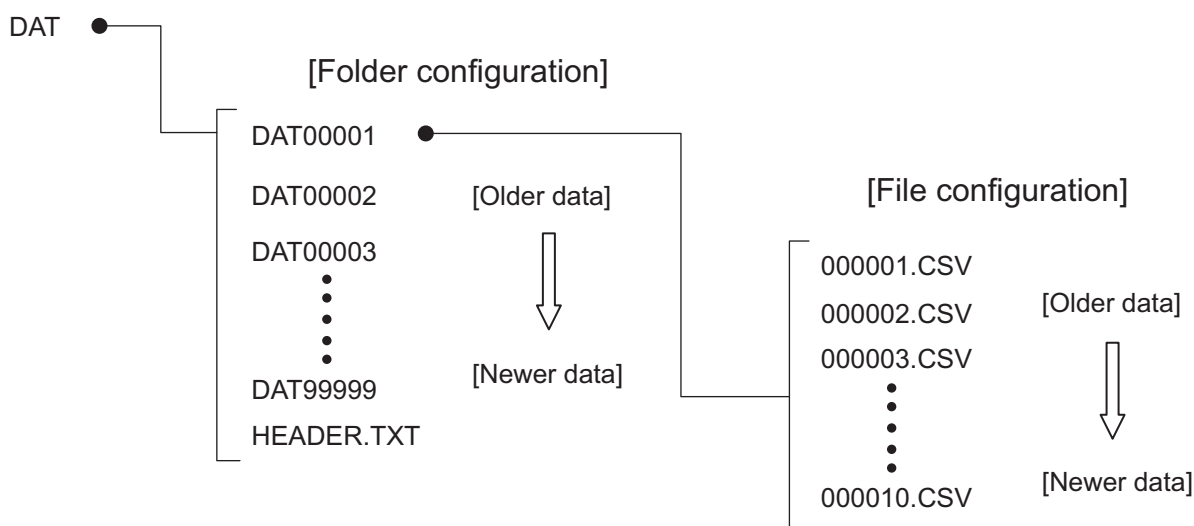
TIPS

- Graphs are displayed using the scale of the currently displayed sampling items. For welding waveforms with differing sampling items that are displayed on top of one another, some contents of the data may not be displayed due to the current scale settings. Refer to "5. Configuration of Welding Power Source Output Data" for information about sampling items.

5 Configuration of Welding Power Source Output Data

This is an explanation of the welding power source output data's folder configuration, file configuration, and file (CSV file) contents.

When the welding power source output data log (CSV files for each welding operation) of the welding power source is output, the data is saved in the "DAIHEN_OTC_Welbee\DAT" folder (hereon referred to as the "DAT" folder) of the USB memory device. If the "DAT" folder does not exist, it will be created automatically during the output process.
In the "DAT" folder, the folder "DAT00001" will be created, and the CSV files will be saved in the "DAT00001" folder.

```
DAT  ●
       │
       │         [Folder configuration]
       │
       └── DAT00001 ●                              [File configuration]
            DAT00002   [Older data]                 │
            DAT00003        ⇓          ┌── 000001.CSV
               ⋮                        │    000002.CSV    [Older data]
               ⋮         [Newer data]   │    000003.CSV         ⇓
            DAT99999                     │       ⋮
            HEADER.TXT                   │       ⋮         [Newer data]
                                        └── 000010.CSV
```

5.1 Folder Configuration

Each time the welding power source output data is output from the welding power source, a new folder is created, and CSV files are saved in that folder. The folders that are created are named using an incremental numbering system in chronological order. (「DAT00001」→「DAT00002」→「DAT00003」→・・・・→「DAT99999」)
After the "DAT99999" folder is created, if additional welding power source output data is to be output, delete the "DAT00001" folder and all of it's contents. Then, re-create the "DAT00001" folder inside the "DAT" folder.
The name of the folder containing the latest welding power source output data is shown in the "HEADER.TXT" file in the "DAT" folder.

5.2 File Configuration

The contents of the welding power source output data accumulated in the welding power source are saved as 1 file (CSV format) for each welding operation (welding start to welding stop).

The files that are created are named using an incremental numbering system in chronological order following the welding power source output data accumulated in the welding power source. The maximum number of continuous numbers varies according to the contents of the welding power source output data log accumulated in the welding power source.

5.3   CSV File Contents

When a CSV file is opened, the welding data is displayed as shown below (when opened using Microsoft Excel).

	A	B	C	D
1	Time [msec]	Current detected value [A]	Voltage detected value [V]	Feeding speed actual value [m/min]
2	0	48	6.2	1.2
3	100	61	15.3	1.7
4	200	99	16.3	2
5	300	178	14	2.1
6	400	114	16.2	2.1
7	500	52	18	2.1
8	600	56	17.5	2.1
9	700	78	16.1	2.1
10	800	105	15.2	2.1
11	900	120	15.1	2.1
12	1000	104	16.1	2.1
13	1100	75	17.1	2.1
14	1200	63	17.3	2.1

The first row contains the data item names, and the second row and below displays the data for the time between welding start and welding end, current, voltage, and wire feeding speed.

The time intervals (column A) display the relative time from the welding start, with 0 used as the welding start time.
The time intervals differ according to the simplified log settings (F53: sampling interval), and will be one of the following three patterns:

Setting	Timer Interval (Column A)
1	10msec
2	100msec
3	1000msec(1sec)

The contents of the recorded current, voltage, and wire feeding speed data differ according to the welding power source's simplified data log settings (F52: sampling items). The contents are recorded using one of the following eight patterns:

Setting	Data (Column B)	Data (Column C)	Data (Column D)
1	Current detected value [A]	Voltage detected value [V]	Feeding detected value [m/min]
2	Current command value [A]	Voltage command value [V]	Feeding command value [m/min]
3	Current command value [A]	Current detected value [A]	Voltage detected value [V]
4	Current command value [A]	Current detected value [A]	Feeding detected value [m/min]
5	Current detected value [A]	Voltage command value [V]	Voltage detected value [V]
6	Voltage command value [V]	Voltage detected value [V]	Feeding detected value [m/min]
7	Current detected value [A]	Feeding command value [m/min]	Feeding detected value [m/min]
8	Voltage detected value [V]	Feeding command value [m/min]	Feeding detected value [m/min]

6 Troubleshooting

6.1 Error Messages

If one of the following error messages is displayed, investigate the cause and take the appropriate measures.

Error Message	Cause	Solution
The simple data log file could not open.	When loading the data (☞ 4.2 Loading Data and Displaying Graphs), a file in the selected folder is currently being used by another application.	Check that no other application are using any of the files in the folder. If another application is using a file, close the file in that application, and then try loading the data again.
	When loading the data (☞ 4.2 Loading Data and Displaying Graphs), there are no CSV files in the selected folder.	Select the welding power source output data.
The simple data log file does not exist in the folder.	When loading the data (☞ 4.2 Loading Data and Displaying Graphs), a file created using a non-standard format is included in the selected folder.	Select the welding power source output data.