

 **DEBUGSCOPE**
MIZOU PROJECT JAPAN with RORZE

Point detector Instruction Manual

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Introduction

Trademark

Microsoft, Windows is the registered brand or trademark of Microsoft Corporation located in the United States for the United States and other countries. Official name of Windows is Microsoft Windows Operating System.

Pentium, Core Duo, Core 2 Duo, Atom Core i3, Core i5 and Core i7 are the registered brand of Intel Corporation and its subsidiaries for the United States and other countries.

Disclaimer

We would like you to understand in advance that we are not responsible for the damage which is caused by use or unusable this product or attached software to customers or the third party. We also have no legal responsibilities for the damaged which is caused by negligent use, use without paying attention to descriptions in caution or warning or act of providence. Even though we are informed such usage in advance, we are not responsible for the damage.

Screen of PC in this English manual is different from the actual one in some cases. We do not compensate the damage resulting from wrong descriptions in this manual.

Introduction

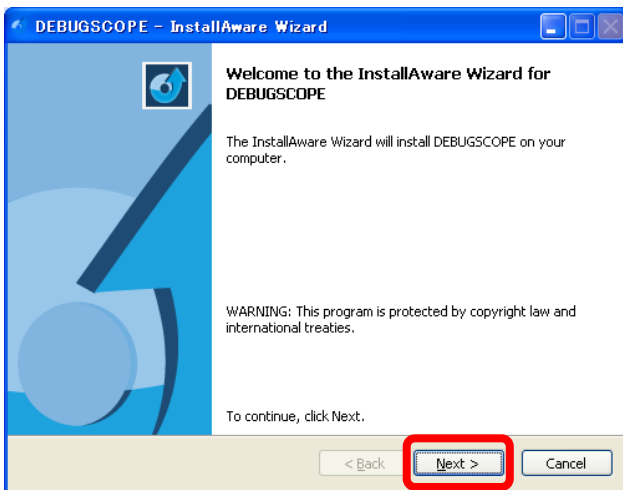
Installation of software

Installation of software

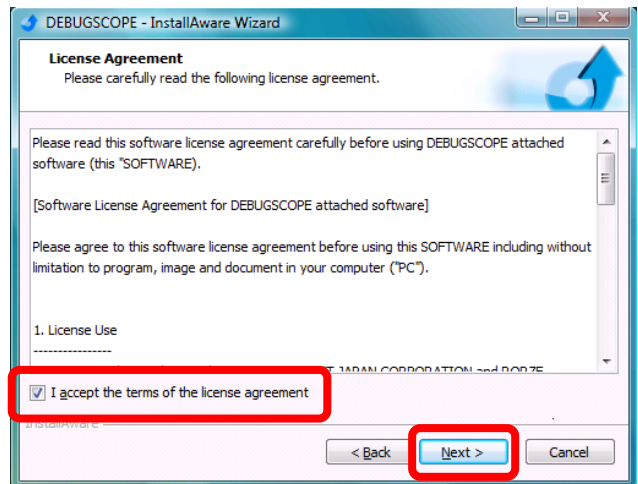
Insert an installation CD in CD-ROM drive. If CD is inserted, installation is started automatically. If it is not started automatically, open the CD-ROM and execute setup.exe file in CD-ROM to start installer.



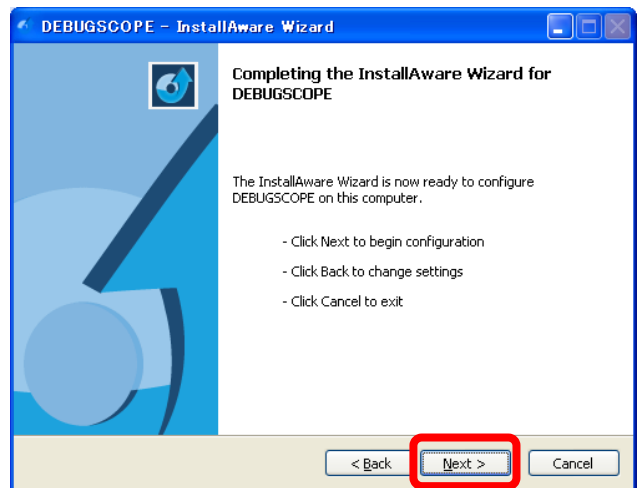
- Select the language in accordance with environment in use and click "OK" button.



- Click "Next >" button.

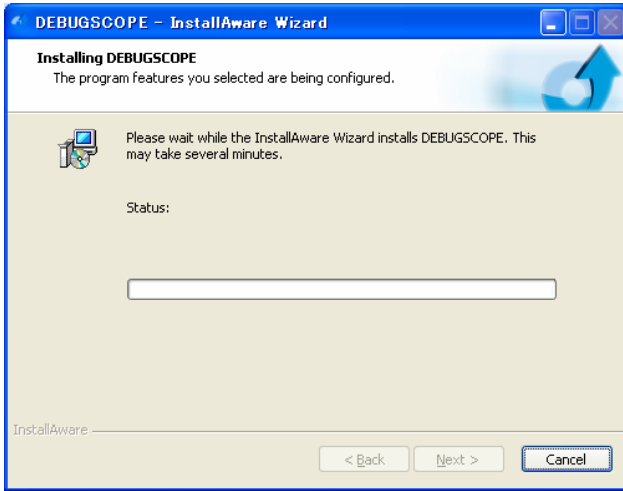


- Tick the box located left below of the license agreement and click "Next >".

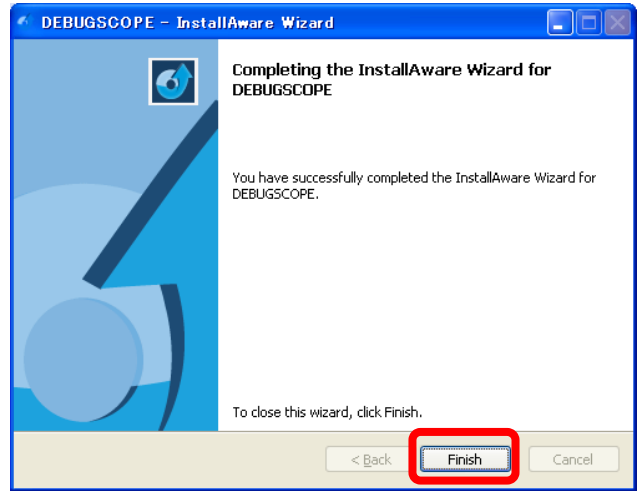


- After information of installation is confirmed, Click "Next >" button.

Introduction



- The software is installed.



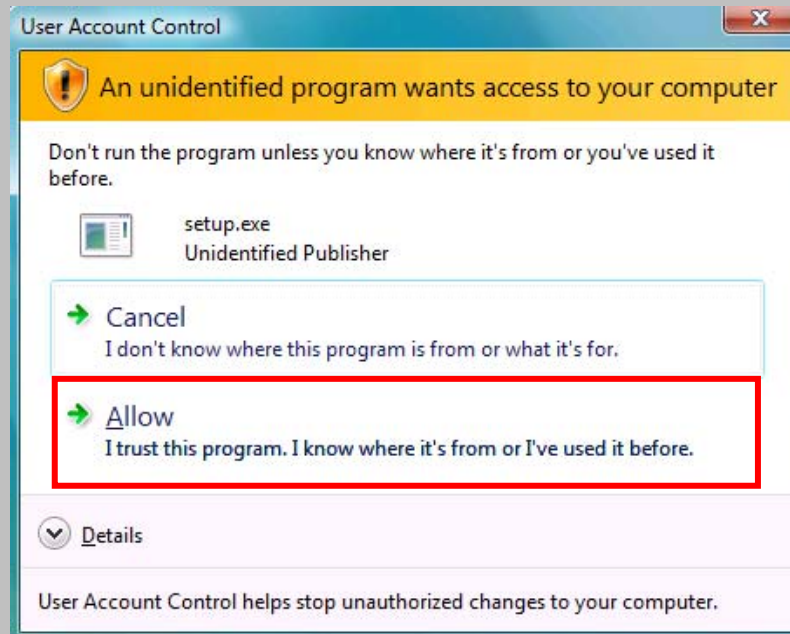
- After installation is completed, the above message is shown. Click "Finish" button to close window.



About the influence of User Account Control (Windows Vista/7)

When you enable User Account Control (UAC) on Windows Vista/7, the following screen is displayed after double-clicking Setup.exe.

When the following screen is displayed, click "Allow" and continue installation.



Basic operation

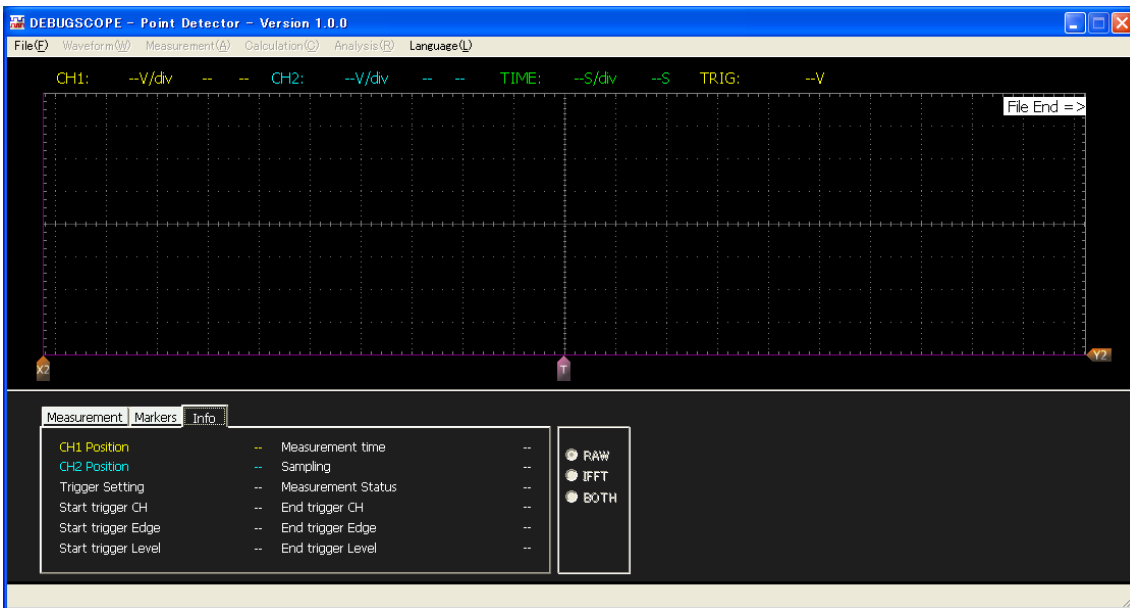
Basic operation

The point detector (referred to as "software" hereinafter) reads the point detector data file (referred to as "data file" hereinafter) output by "Oscilloscope function" (-> Refer to the **DEBUGSCOPE Instruction Manual**) of DEBUGSCOPE, and displays the voltage waveform. This software is available whether the main body is connected or not.

Start software

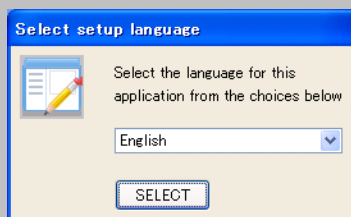
Method to start

- 1 To start the software, select "Start" -> "All programs" -> "DEBUGSCOPE" -> "Point Detector".



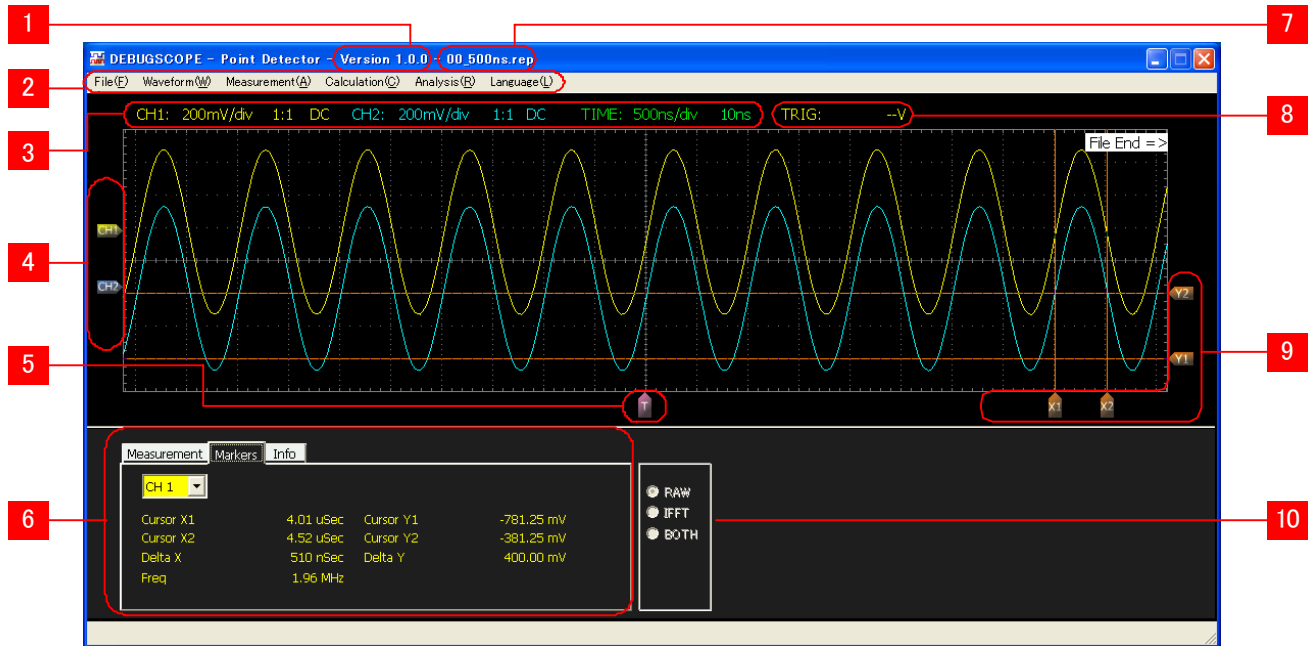
Dialogue to select the language at initial startup

- Dialogue to select the language is shown at initial startup. Select the language in accordance with environment in use.



Basic operation

Description of software screen (Main screen)



Main screen when waveform is displayed

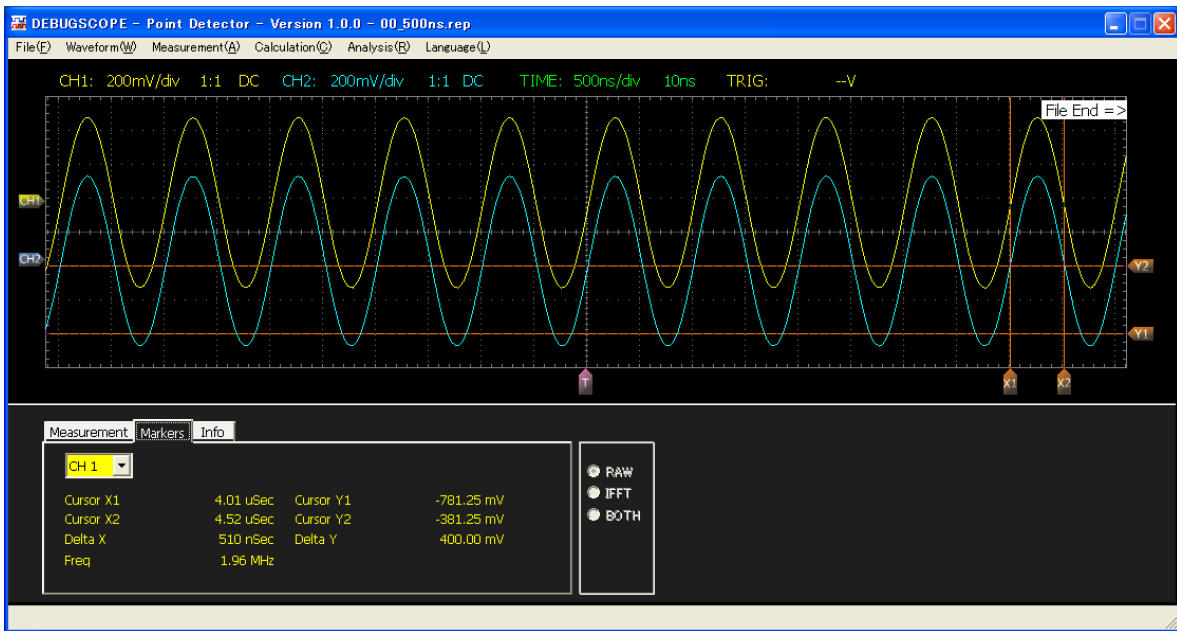
- | | |
|---|---|
| <p>1 • Version
Show this software version</p> <p>2 • Menu
Make setting</p> <p>3 • Display of measurement range
Display setting of voltage range and so on at measurement</p> <p>4 • Voltage position
Display voltage position at measurement</p> <p>5 • Trigger position
Display trigger point</p> <p>6 • Control tab
Switch each tab</p> | <p>7 • Display of file name
Display file name which is being opened</p> <p>8 • Display of trigger level
Display trigger level voltage</p> <p>9 • Cursor
Display voltage/time cursor</p> <p>10 • IFFT setting
Set waveform when IFFT is on</p> |
|---|---|

Basic operation

Read of data file

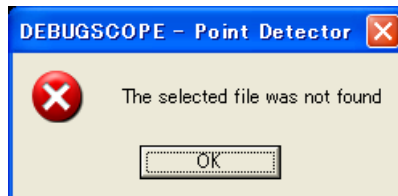
Operation

- 1 Click "File" -> "Open" in menu. Or hold down "Ctrl" key and press "O" on the key board. Select data file. When it is read properly, recorded waveform is shown.

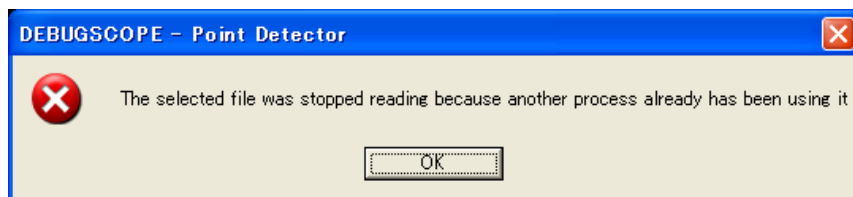


If the following error message is shown, check the specified data file.

- If the specified data file does not exist, the following message is shown.



- If the specified data file is being opened by other software, the following message is shown.



Basic operation

- If the specified data file is not point detector data acquired by DEBUGSCOPE, the following message is shown.



Data file cannot be used except this software

The point detector data file consists of binary data only for this software. Do not open it by a text editor such as a memo pad. Or do not edit the data. It may cause a damage to the data file.

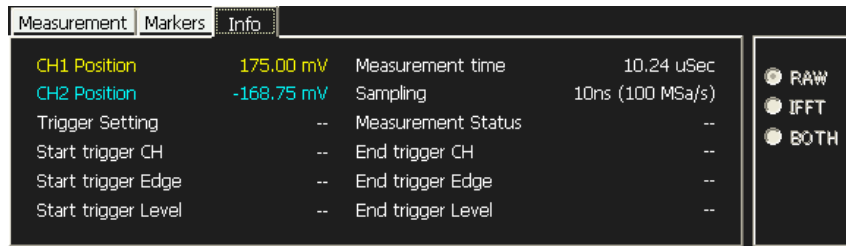
Basic operation

Display of data file properties

Setting information when point detector data is output can be displayed.

Operation

Click "Info" tab in the main screen.



The following table shows the items of property Display/Nondisplay of the data file.

(○: Display —: Nondisplay)

CH1 Position	○	Measurement time	○
CH2 Position	○	Sampling	○
Trigger Setting	—	Measurement Status	—
Start trigger CH	—	End trigger CH	—
Start trigger Edge	—	End trigger Edge	—
Start trigger Level	—	End trigger Level	—

The following table shows the description of each property.

CH1 Position	Display voltage position of CH1
CH2 Position	Display voltage position of CH2
Measurement time	Display time to record data
Sampling	Display sampling period and sampling frequency

Basic operation

Selection of displayed waveform

The waveform of CH1 and CH2 to be displayed on the screen can be selected.

Operation procedure in the main screen

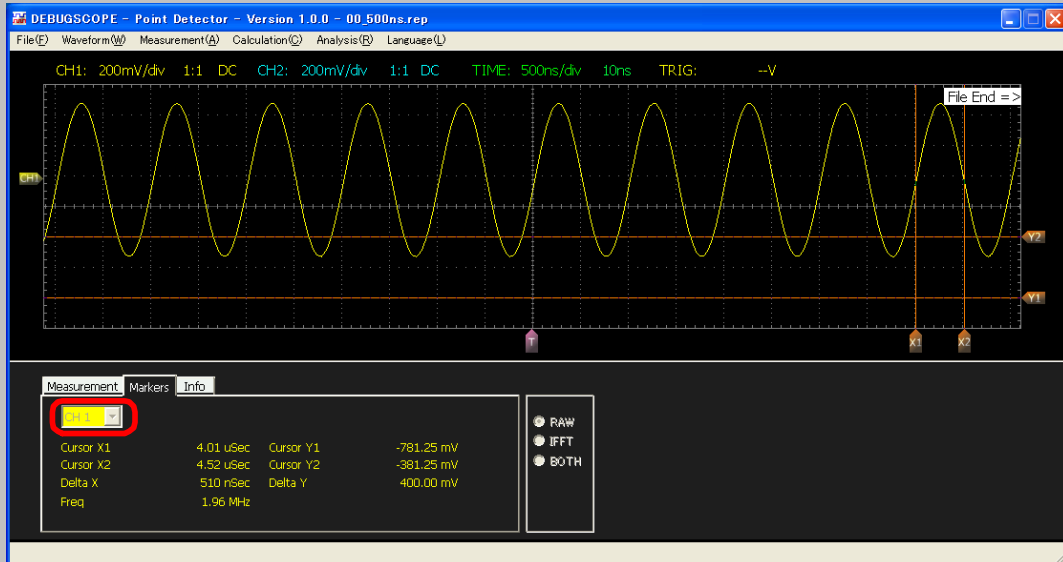
Select "Waveform" -> "CH1", "CH2" or "BOTH" in menu.

Show CH1 only	<ul style="list-style-type: none"> • "Waveform" -> "CH1" in menu • "Shift" + "F1"
Show CH2 only	<ul style="list-style-type: none"> • "Waveform" -> "CH2" in menu • "Shift" + "F2"
Show both CH1 and CH2	<ul style="list-style-type: none"> • "Waveform" -> "BOTH" in menu • "Shift" + "F3"



Displayed waveform

- In case that only "CH1" is shown, marker and trigger channel is "CH1" only. FFT shows "CH1" only.



Basic operation

Use of cursor

Measure voltage and frequency by cursor.

Operation procedure in the main screen

1 Switch the tab in the main screen to "Markers".

2 Select a channel to be measured.



* In the setting of the waveform display, the channel set to non-display is not available.

-> Refer to "Selection of displayed waveform" in P9

3 Move horizontal cursor Y1 and Y2 , and vertical cursor X1 and X2 to measure.

The following table shows the description of cursor display.

Cursor X1	Show the time of vertical cursor X1.
Cursor X2	Show the time of vertical cursor X2.
DeltaX	Show the absolute value of the difference between X1 and X2.
Frequency	Show the frequency of DeltaX.
Cursor Y1	Show the voltage value of horizontal cursor Y1.
Cursor Y2	Show the voltage value of horizontal cursor Y2.
DeltaY	Show the absolute value of the difference between Y1 and Y2.



Initial cursor position at the start

- When this software is started for the first time, vertical cursor X1 and X2 are in the left end of the screen. Since X1 and X2 have overlapped, X1 will be displayed if X2 is moved.
- Horizontal cursor Y1 and Y2 are in the lower right of the screen. Since Y1 and Y2 have overlapped, Y1 will be displayed if Y2 is moved.

Basic operation

Operation procedure when FFT is shown





1

Show FFT.

-> Refer to "Use of FFT" in P15

```
v1 : 46.582 KHz    h1 : 12.308 dBV
v2 : 50.000 KHz    h2 : -68.462 dBV
DeltaV: 3.418 KHz  DeltaH: 80.769 dBV    IFFT ON
```

2

Move horizontal cursor H1  and H2 , and vertical cursor V1  and V2  to measure.

The following table shows the description of cursor display.

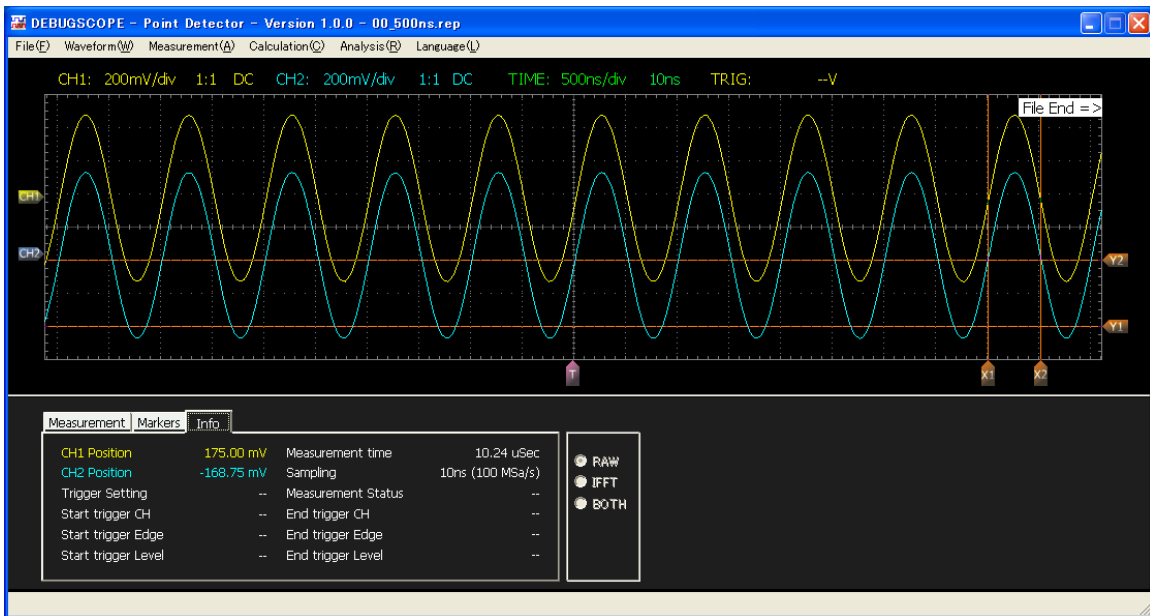
v1	Show the value of vertical cursor V1.
v2	Show the value of vertical cursor V2.
DeltaV	Show the absolute value of the difference between v1 and v2.
h1	Show the value of horizontal cursor H1.
h2	Show the value of horizontal cursor H2.
DeltaH	Show the absolute value of the difference between h1 and h2.

Basic operation

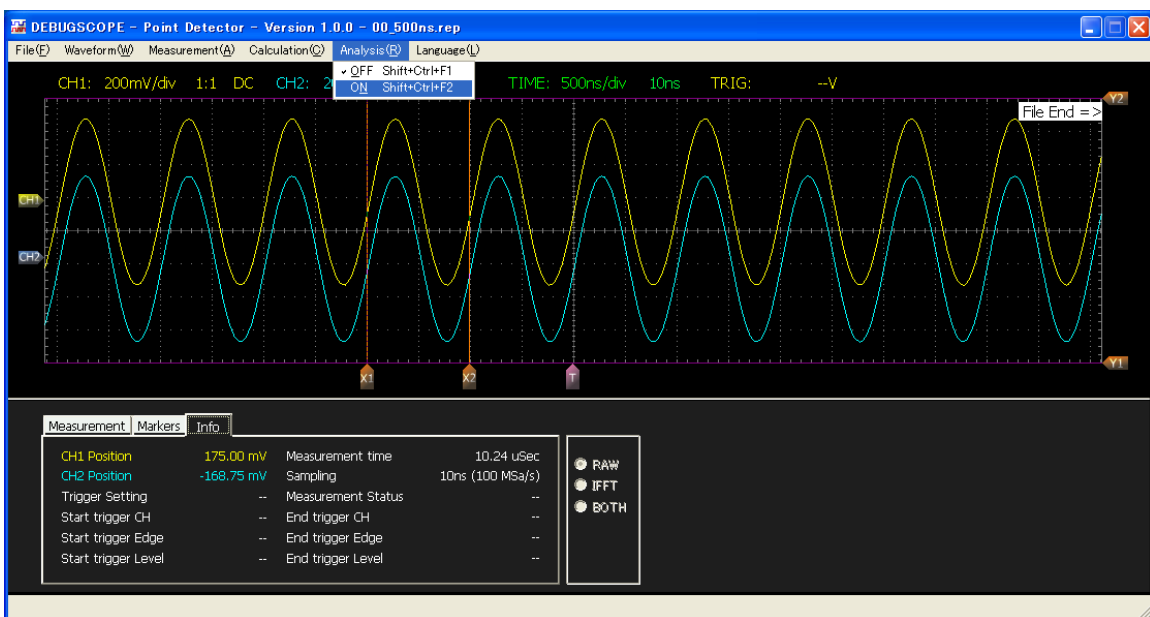
Analysis of data

Operation

- 1 Click "File" -> "Open" in menu. Or hold down "Ctrl" key and press "O" on the key board. Select data file. When it is read properly, recorded waveform is shown.



- 2 Click "Analysis" -> "ON" in menu.

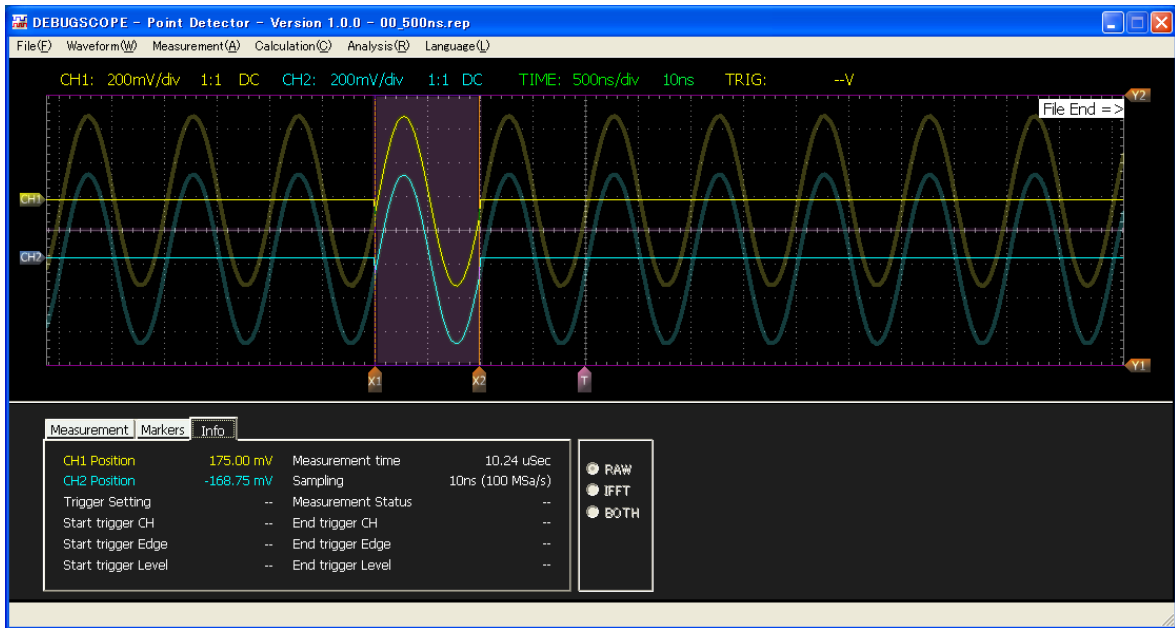


Basic operation

3

Acquired data waveform and data waveform after analysis are displayed at the same time. Each waveform can be distinguished according to the brightness of the display.

Acquired data waveform	Dark
Data waveform after analysis	Bright



The area between vertical cursor X1 and X2 is the time width of the window function. The shape of the translucent mask in the above figure shows the shape of the window function. The window function can be set using "FFT viewer". -> Refer to "Use of FFT" in P15

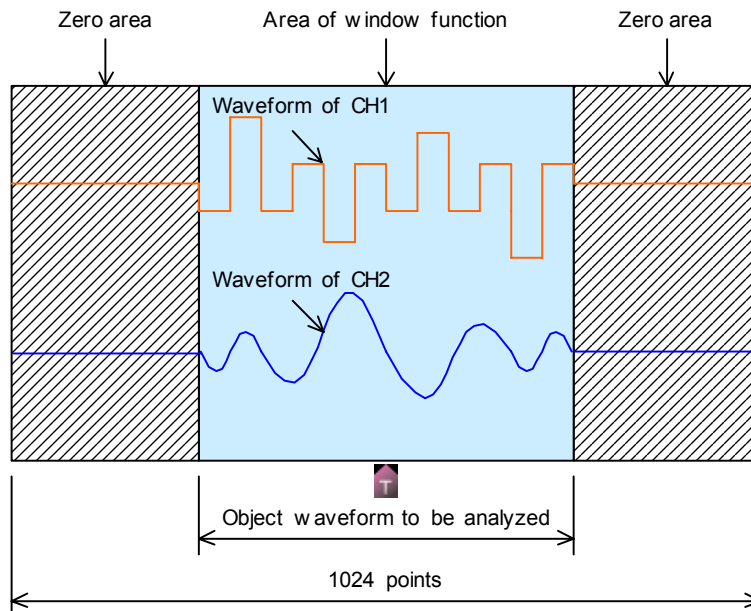
Basic operation

Method of analysis

The following process is performed automatically after deciding the scope of analysis by using the vertical cursor X1 and X2.

Within the scope of analysis	Original data × Window function
Outside the scope of analysis	Original data × 0

The following figure shows the analyzed waveform resulting from the execution of this process. By setting data other than the object waveform to 0, the unnecessary frequency component is removed before FFT calculation. (Equivalent to zero padding process in FFT calculation)



Calculation function

Calculation function

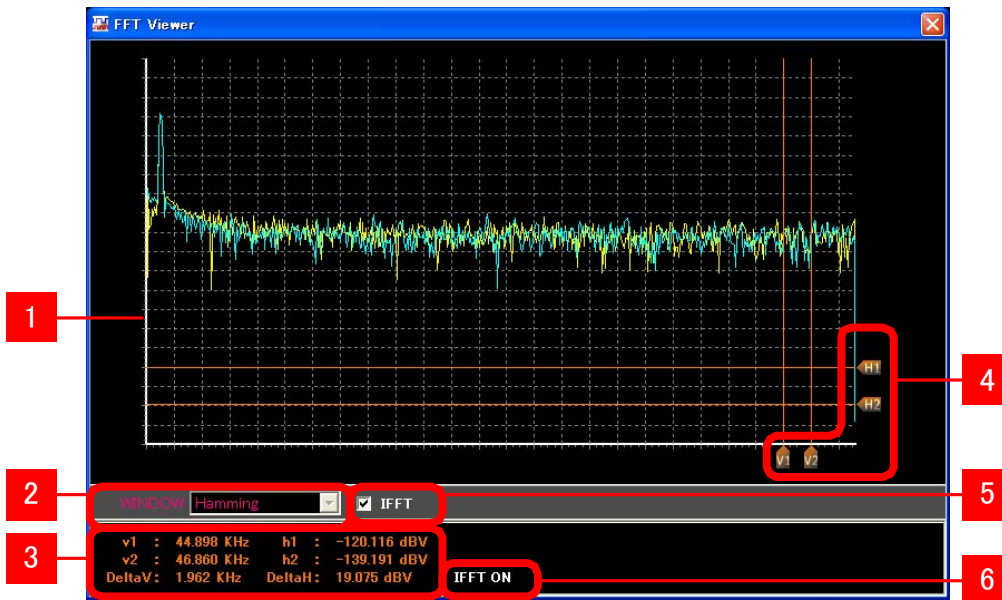
Use of FFT

Measured signal waveform can be calculated by FFT, and shown in spectral display.

- Number of data :1024 points
- Window function :None•Hanning•Hamming•Blackman•Blackman-Harris

Operation procedure

Click "Calculation" -> "FFT" in menu and "FFT Viewer" is shown.



- | | |
|--|--|
| <p>1 ● FFT
Show FFT of CH1 and CH2</p> <p>2 ● Window function
Set window function</p> <p>3 ● Cursor display
Show frequency and the value of spectrum</p> <p>4 ● Cursor
Measure data with this cursor</p> | <p>5 ● IFFT
Switch ON/OFF of IFFT</p> <p>6 ● IFFT display
Display ON/OFF of IFFT</p> |
|--|--|

Calculation function

Setting of window function

Switch FFT window function by "WINDOW" list box in FFT display.

Type of window function : None • Hanning • Hamming • Blackman • Blackman-Harris

Measurement by cursor

Frequency and spectrum value can be measured by cursor. **-> Refer to "Use of cursor" in P10**



Automatic measurement when FFT is displayed

- When FFT is displayed, "FPEAK" (peak frequency) and "FFTMAX" (peak level) of automatic measurement function are shown.

Measurement		Markers		Info	
MAX	0.20V	MAX	0.21V		
MIN	-0.20V	MIN	-0.21V		
P-P	0.40V	P-P	0.41V		
MEAN	0.00V	MEAN	0.00V		
FPEAK	976.56Hz	FPEAK	976.56Hz		
FFTMAX	-8.902dB	FFTMAX	-6.748dB		

Calculation function

Use of IFFT (inverse FFT)

IFFT (inverse transform of FFT) function can be used if tick the checkbox in FFT display.

Filter with various frequency characteristics are available by use of IFFT, and those filters can set cutoff frequency by cursor operation.

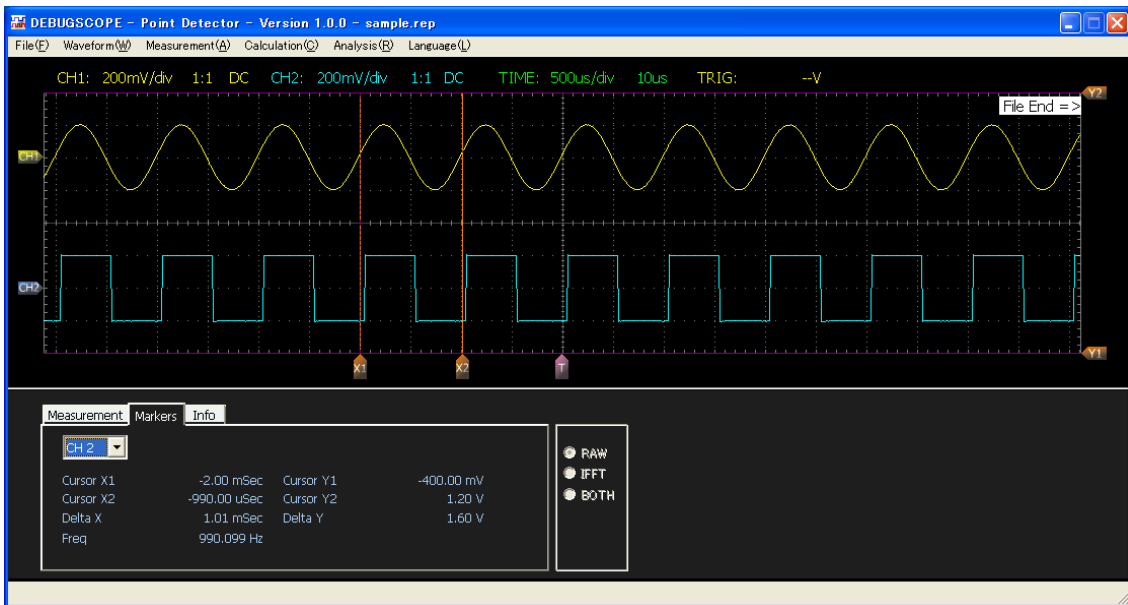
FFT display screen and the main screen are used in IFFT.

(Note: IFFT function cannot be used when "Analysis" is ON.)

Example of bandpass filter creation

The following is an example of extracting basic frequency (1KHz) from square wave with 1KHz.

- 1 Reproduce square wave with 1KHz.
The following shows square wave with 1KHz of CH2.



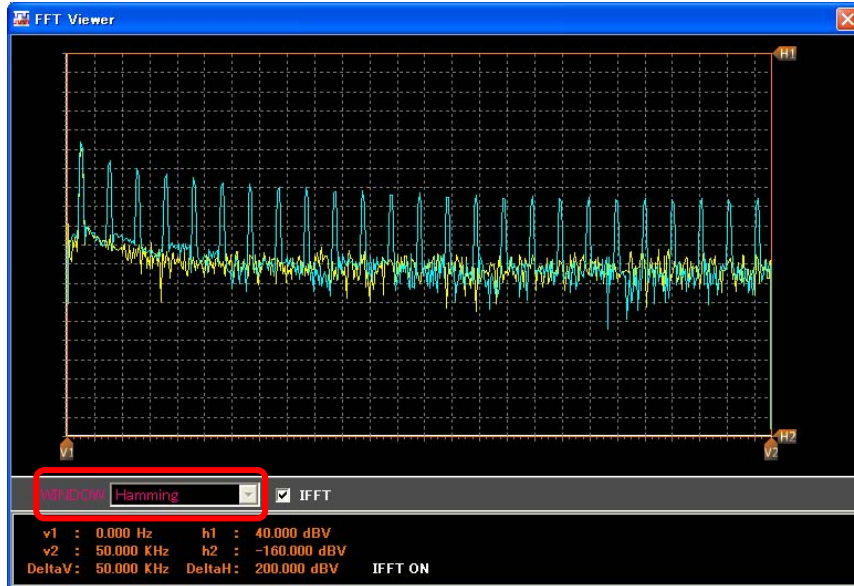
- 2 Click "Calculation" -> "FFT" in menu to show FFT Viewer.

Calculation function

3

Tick "IFFT" checkbox.

* Window function is automatically set to "Hamming".

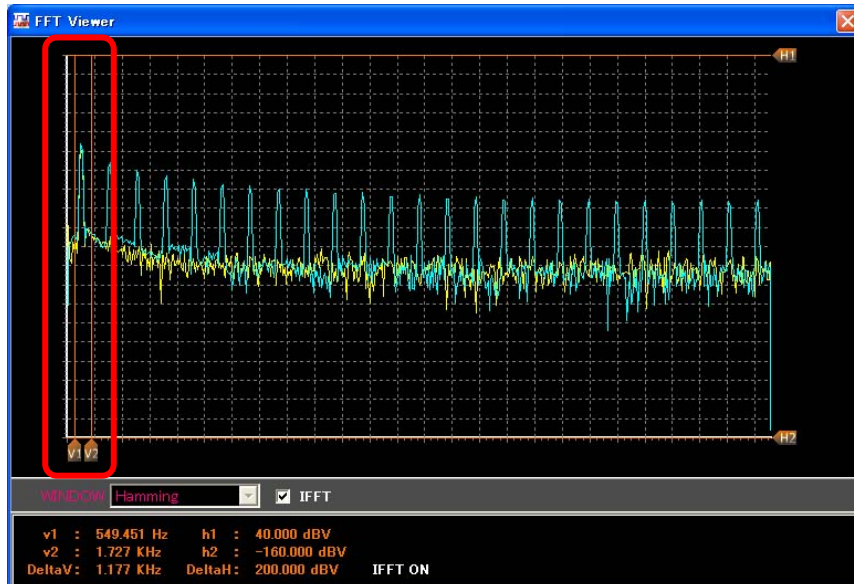


4

Sandwich a part of spectrum in square wave by vertical cursors V1 and V2 as shown below.

• Cursor V1 :549.451Hz

• Cursor V2 :1.727KHz



Calculation function

5

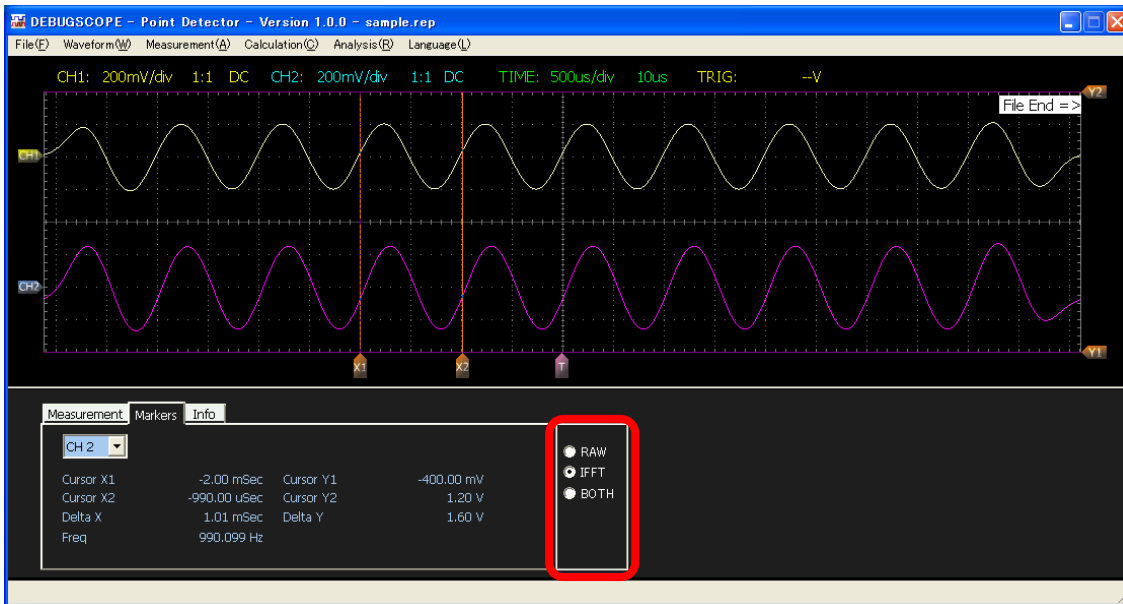
The result of inverse conversion is shown in the main screen.

Change radio button of "RAW", "IFFT" and "BOTH" in the lower right of the main screen to "IFFT" or "BOTH".

Setting and waveform are as follows.

RAW	Only measured waveform is shown.
IFFT	Only waveform where IFFT is performed is shown.
BOTH	Both measured waveform and waveform of IFFT are shown.

In case that radio button is set to "IFFT", only waveform where IFFT is performed is shown.



The following table shows Color of line and Definition of waveform.

Yellow	Waveform of CH1
Blue	Waveform of CH2
White	Waveform after IFFT of CH1
Purple	Waveform after IFFT of CH2

Calculation function

Use of X-Y display

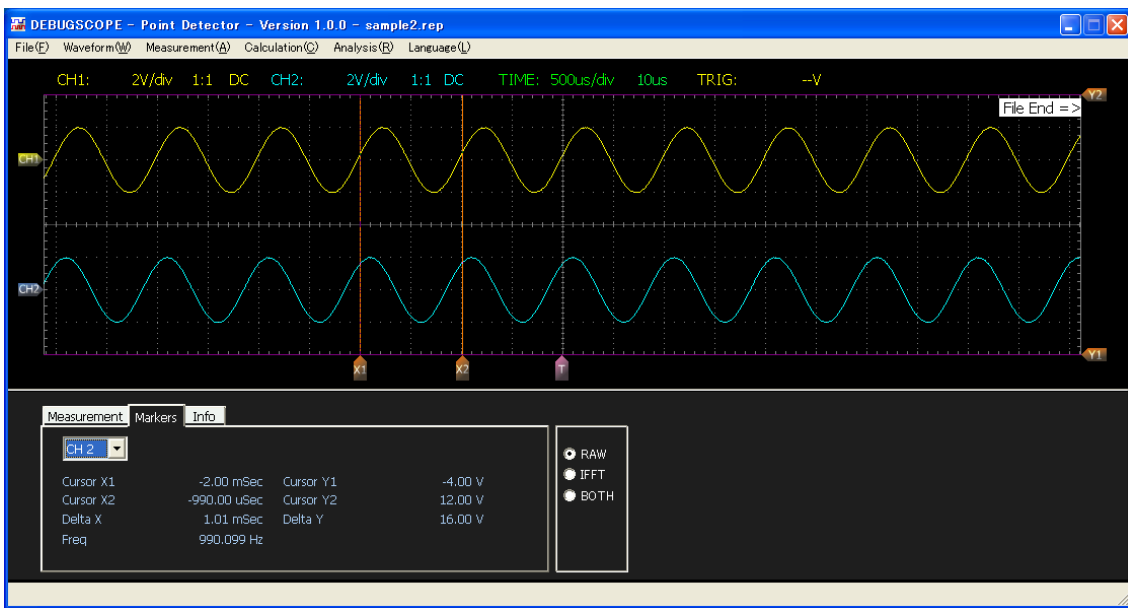
Operation procedure

Click "Calculation" -> "X-Y" in menu to show X-Y Viewer.

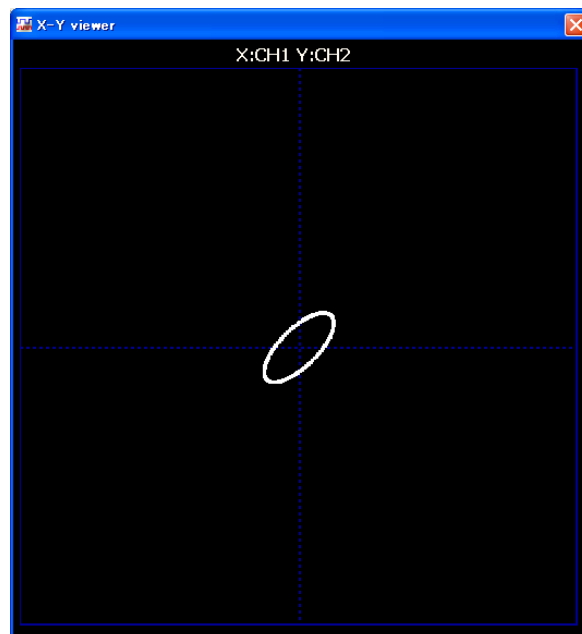
CH1 shows horizon (X-axis) and CH2 shows vertical (Y-axis).

The following figures show input signal waveform display and X-Y display.

- CH1: Frequency 1kHz, sine wave, phase 0°
- CH2: Frequency 1kHz, sine wave, phase 45°



The following figure is the X-Y display of the input signal waveform in the above figure.



Calculation function

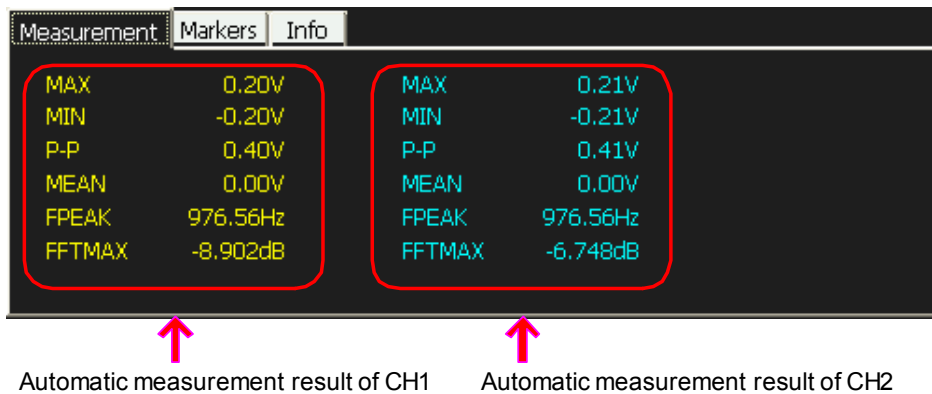
Use of automatic measurement function

MAX (maximum value), MIN (minimum value), P-P (peak to peak), MEAN (average), FPEAK (peak frequency) and FFTMAX (peak value) of waveform data which is shown in the screen can be automatically measured per channel.

Operation procedure

- 1 Click "Measurement" -> "BOTH" in menu.
 - If only CH1 use automatic measurement, click "Measurement" -> "CH1" in menu.
 - If only CH2 use automatic measurement, click "Measurement" -> "CH2" in menu.
 - If automatic measurement is not used, click "Measurement" -> "None" in menu.

- 2 Change the tab to "Measurement".



Automatic measurement result of CH1

Automatic measurement result of CH2

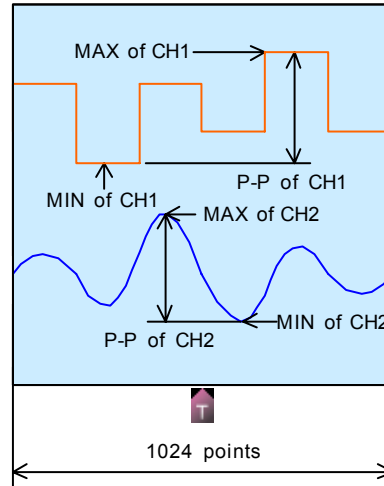
*** "FPEAK" and "FFTMAX" of automatic calculation can be shown only when FFT is used.**

MAX	Show maximum value of voltage of displayed waveform
MIN	Show minimum value of voltage of displayed waveform
P-P	Show amplitude (peak-to-peak voltage) of displayed waveform
MEAN	Show average value of displayed waveform
FPEAK	Show maximum spectral frequency of FFT
FFTMAX	Show maximum value of FFT

Calculation function

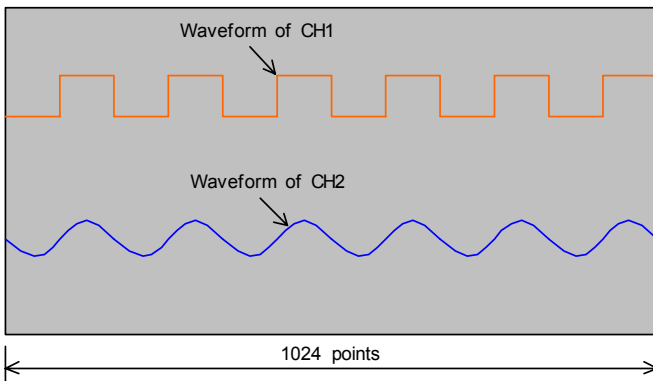
"MAX", "MIN", "P-P", "MEAN"

The maximum/minimum value, amplitude and average of the displayed waveform (1024 points) are displayed.

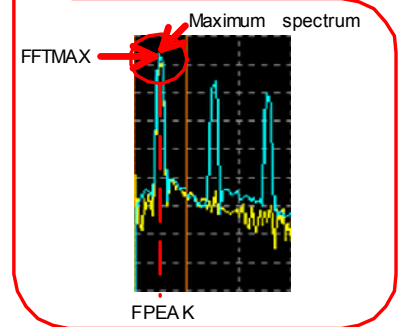


"FPEAK", "FFTMAX"

- "FFTMAX" displays the maximum value of the spectrum data obtained by carrying out FFT operation of waveform data per data unit (1024 points).
- "FPEAK" displays the frequency that the spectrum reaches the maximum value.



Measurement			
Markers			
Info			
MAX	0.20V	MAX	0.21V
MIN	-0.20V	MIN	-0.21V
P-P	0.40V	P-P	0.41V
MEAN	0.00V	MEAN	0.00V
FPEAK	976.56Hz	FPEAK	976.56Hz
FFTMAX	-8.902dB	FFTMAX	-6.748dB



Utility function

Utility function

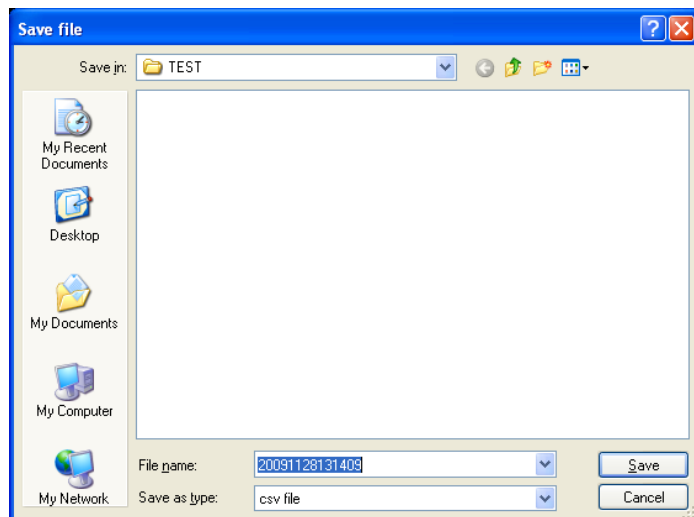
Output of CSV (comma-separated) file

Screen data (1,024 data) and FFT data which are being shown is CSV output.

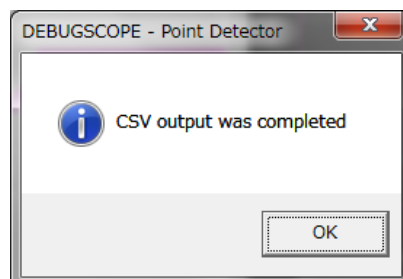
Operation procedure

1 Select "File" -> "CSV output" in menu.

2 Name CSV file and save it.



3 Click "OK".



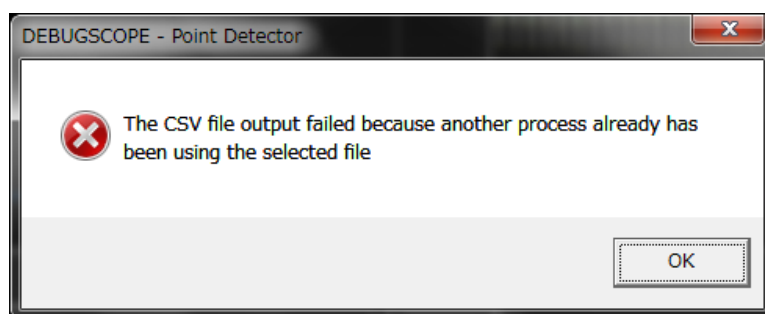
Utility function



CSV file output function

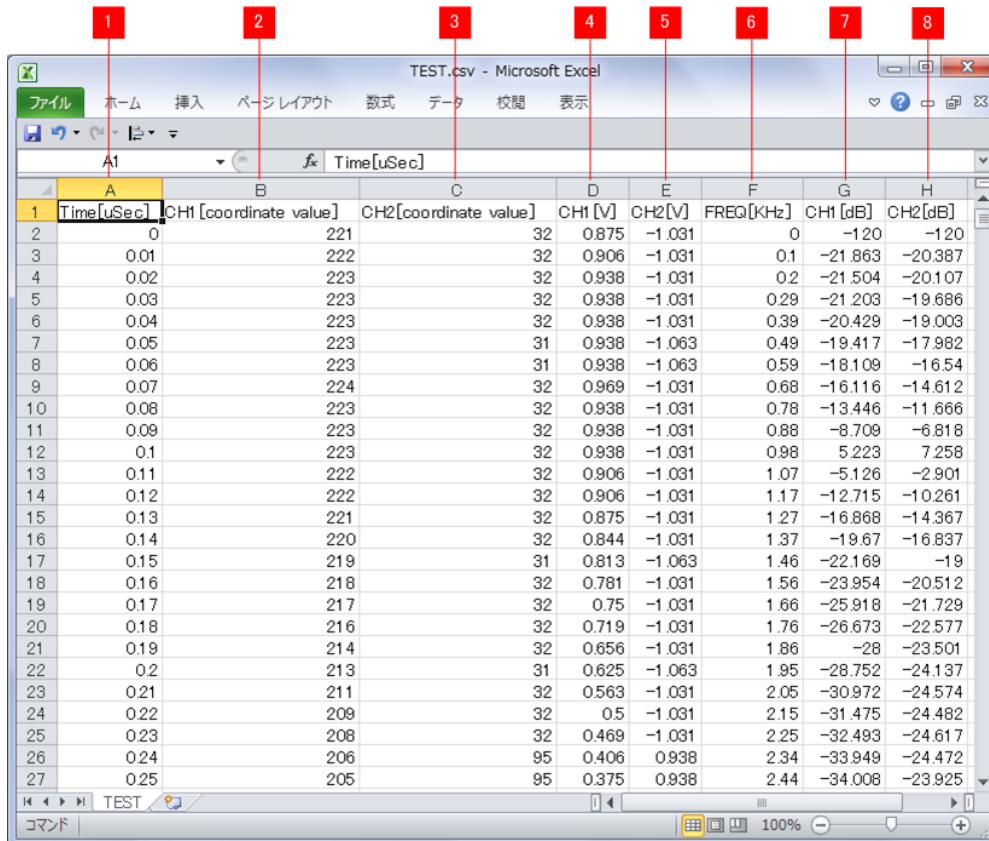
- When "FFT Viewer" is shown, FFT data (512 points) is also CSV output.

- When a CSV file which has been opened by other software is trying to be overwritten and saved, the following alarm is shown. Change the file name.



Utility function

The following shows when CSV file is read by Excel.



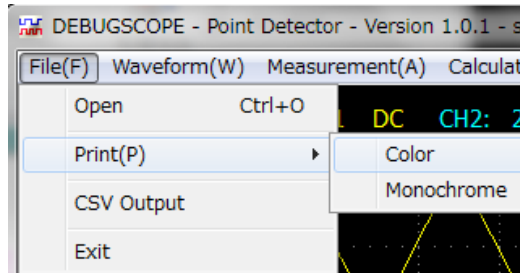
1	Time[***]	Sampling time of data currently displayed on the screen. Unit is shown at ***. Unit is varied in accordance with sampling setting.
2	CH1[coordinate value]	Coordinate value of CH1 Bottom in graph area is "0", top in graph area is "255"
3	CH2[coordinate value]	Coordinate value of CH2 Bottom in graph area is "0", top in graph area is "255"
4	CH1[V]	Voltage value of CH1
5	CH2[V]	Voltage value of CH2
6	FREQ[***]	Frequency of FFT Unit is shown at ***. Unit is varied in accordance with sampling setting.
7	CH1[dB]	Spectrum value (decibel) of CH1
8	CH2[dB]	Spectrum value (decibel) of CH2

Utility function

Use of print function

Operation procedure

- 1 Click "File" -> "Print" in menu. "Color" or "Monochrome" can be selected.



- 2 The screen (Main screen, FFT viewer and X-Y viewer) which is being shown is shown in preview screen. There is a field for comment in the bottom part of preview screen and comment can be entered.

- 3 Click "PRINT" button .

- 4 Click "CLOSE" button  to return to the main screen.

*** Please carry out neither operation of the mouse nor the keyboard after choosing "color" or "monochrome" until the preview screen is displayed.**

The image of the preview screen may not be normally displayed.

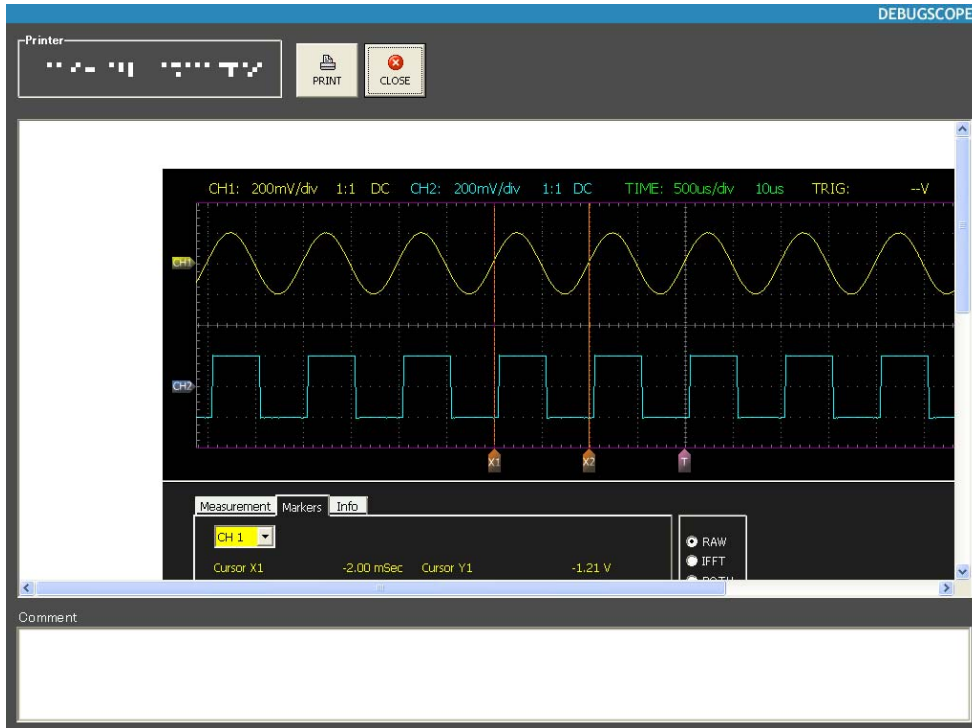
*** This product only supports that size of paper for printing is A4 and portrait orientation.**

Please note that it does not support landscape orientation , and size other than A4.

In case that size other than A4 is set, setting should be changed to A4 size.

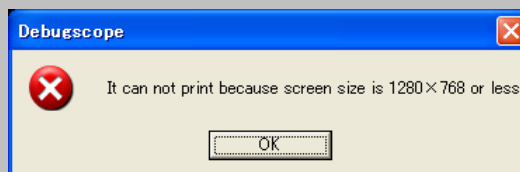
Setting of orientation for printing should be changed to "Portrait".

Utility function



Print function

- In accordance with processing speed of PC in use, it may take 10 sec. or so to show the above preview screen.
- Negative monochrome screen is printed by clicking "File" -> "Print" -> "Monochrome" in menu.
- Set a printer which is usually used by clicking "Control panel" -> "Printers and Faxes".
If a printer is changed when the software is starting up, the change is not reflected. If a printer which is normally used is changed, reboot the software after the printer is changed.
- If a printer which is usually used is not set, print function is not available.
- If resolution of PC in use is 1280×768 or lower, the following message is shown and print is not available. Increase resolution.



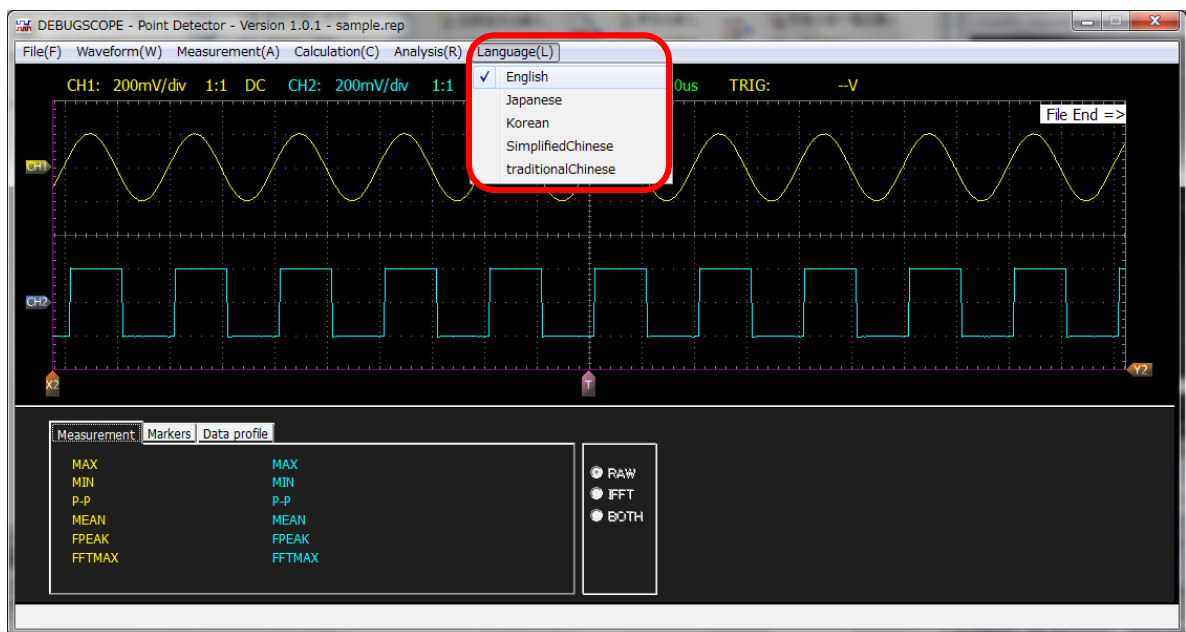
Utility function

Change of language

Language which is used in the software can be changed.

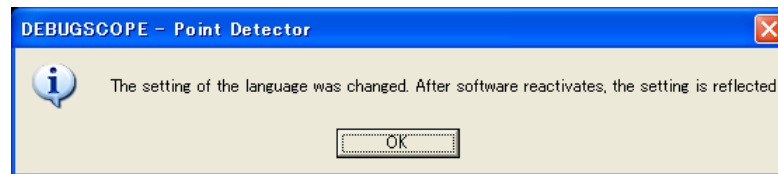
Operation procedure

- 1 Select "Language" in menu.
- 2 The language which is currently used is ticked.



Tick the language which is going to be used.

The following message is shown. Click "OK".



- 3 Restart the software.

Specifications

Specifications

Hardware requirements

Computer	PC/AT compatible machine which has the CPU of Pentium III, 600MHz and above.
Memory	Windows 2000 : 256MB Windows XP : 512MB Windows Vista : 1024MB Windows 7 : 2048MB
Disk device	CD-ROM drive
Display	Display adapter with 1280×768 pixels above and color 24bits or above
Peripheral device	Mouse, keyboard
OS	Microsoft Windows 2000 SP4, XP(32bit), Vista(32bit), 7(32bit)

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