KYOWA ELECTRONIC INSTRUMENTS CO., LTD.

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EDS-40A
COMPACT RECORDER

INSTRUCTION MANUAL FOR SOFTWARE

Thank you for purchasing a product of KYOWA ELECTRONIC INSTRUMENTS CO., LTD.
Please read this manual carefully to ensure the long life and reliability of the product.
The product should not be used in any manners other than as described in this manual.

This manual covers only the Software operating instructions.
For details on the EDS hardware operating instructions, please refer to the "Instruction Manual for Hardware."

CONTENTS

NOTATIONS USED IN THIS INSTRUCTION MANUAL

Certain notations are used as necessary to urge the reader's attention to information that requires special attention in the use of the EDS-40A Compact Recorder Software (hereinafter referred to as the Software), and to information provided for reference purposes.

Examples of Notations

NOTE

The information provided merits special attention in the use of the Software.

MEMO

The information provided is useful as a reference.

PRECAUTIONS FOR USE OF THIS SOFTWARE

NOTE

When using this software, do not use the PC with the following settings or allow the PC to remain in the conditions described. Or, the software may not operate correctly:

- Set a screensaver to activate automatically.
- Enable energy-saving functions such as the sleep mode for the monitor or system.
- Allow software other than this Software to remain running.
- Allow virus-protection software or other software to activate automatically while this Software is running.
- Allow the PC to be accessed from the network continuously, or allow the PC to access the network continuously.

NOTE

The communication ports of “21,” “1010,” and “30400” are used for the communication between the PC and EDS-400A (or EDS-450A).
When routers, fire wall, etc. are used for communication, make sure that above communication ports are not shutdown.

* Regarding settings of routers, fire wall, etc., confirm the network administrator and set them.

1 INTRODUCTION

1.1 OVERVIEW

EDS-40A Compact Recorder Software consists of two components: "Control software," which controls the EDS-400A series EDS-400A/EDS-450A Compact Recorder from the PC via a LAN interface and collects recorded data; and "Data Display Software," which displays the recorded data that have been collected.

This manual explains the operation of the above Software components.

For details on the EDS-400A Series Compact Recorder, refer to the "Instruction Manual for Hardware."

1.2 OPERATING ENVIRONMENT

The Software is operated on Windows 2000/XP. Operating environment for the PC and peripheral is summarized below:

[Operating Environment]

CPU	Pentium III 700 MHz or equivalent, or faster
OS	Windows 2000 Professional XP Professional / XP Home Edition
Memory	256 MB or more
Interface	10BASE-T/100BASE-TX
Hard-disk drive	10 MB or more of free disk space (excluding space for storage of measured data)
Display	Resolution: 1024 × 768 pixels or higher Display colors: Full-color or better
Disk device	CD-ROM device (used for Software installation, etc.)

*Note: Software operation is not guaranteed on all PC models, even when their specifications satisfy the above operating environment.

2 INSTALLING THE SOFTWARE

2.1 BEFORE INSTALLING

Confirm the PC and peripherals are correctly connected before installing the Software.

When installing the Software to the PC operating Windows 2000/XP, you must log in as a user in the "Administrator" group.
For details, check the Windows bundled instruction manual.

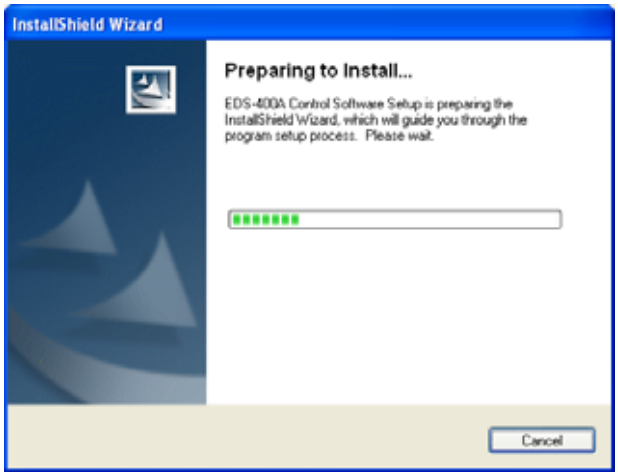
2.2 INSTALLING THE SOFTWARE

1) Turn on the PC power and start up the Windows.
   Close all applications that are currently running.

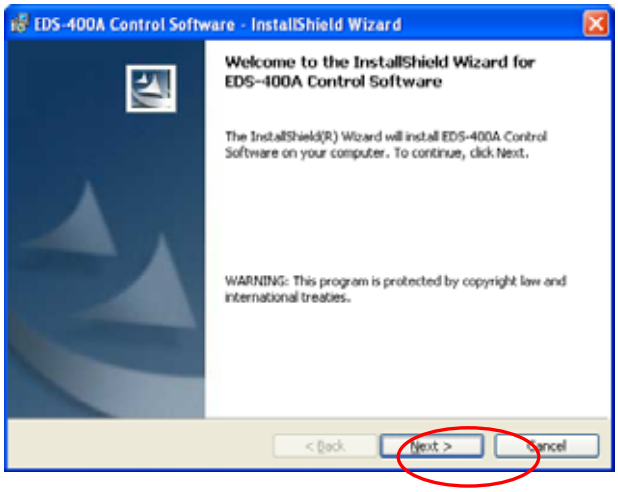
2) Set the EDS-40A setup CD in the CD-ROM drive.

3) From **My Computer**, double-click **Setup.exe** in the /**EDS_40A/English** folder of the CD-ROM and execute **setup exe**.

4) After the installer is activated, click **Next** on the current window.

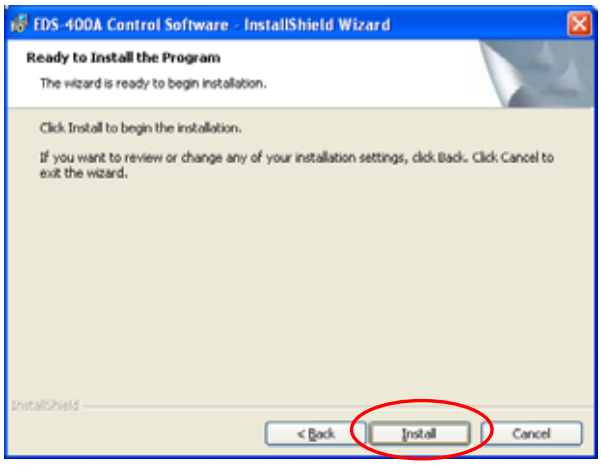


The installer is activating



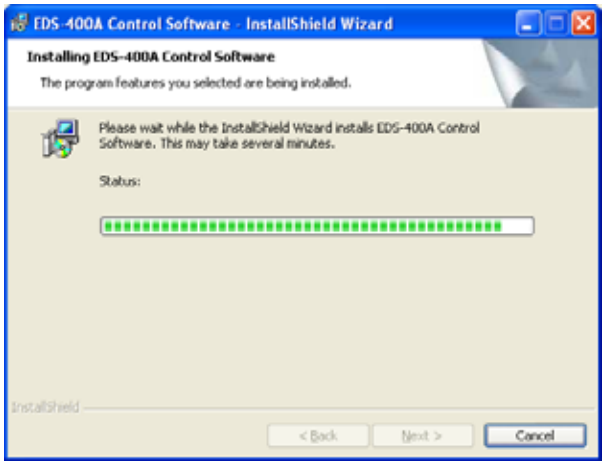
Click **Next**.

5) Click **Install.**
Installation of the Software is started.
The Software installation folder **C:/Program Files/EDS400A** is fixed.

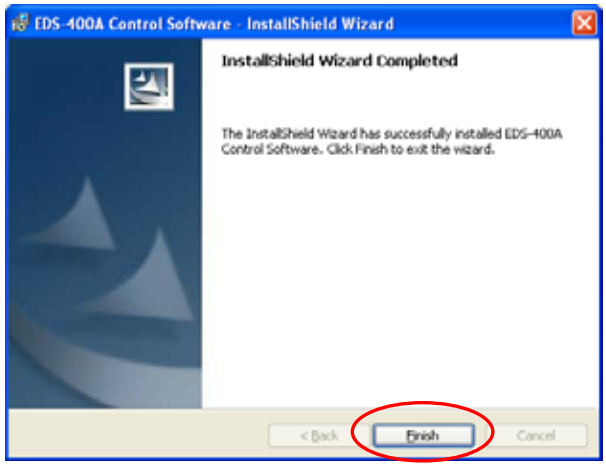


Click **Install.**

6) When the installation is terminated, click **Finish**.



The system is installing the Software.



Click **Finish**.

The Software is now installed.

2.3 UNINSTALLING (REMOVING) THE SOFTWARE

1) On the Windows menu, select **Control Panel.**

2) On the **Control Panel**, click **Add/Remove Programs**.
If your system is operating on WindowsXP, click **Add or Remove Programs**.

3) On the **ADD/Remove Programs** (**Add or Remove Programs**) window, select **EDS400A Control Software,** and then click **Remove**.

4) Click **OK** in the displayed dialog box to remove the Software.

The Software is now uninstalled.

2.4 STARTING AND EXITING THE SOFTWARE

2.4.1 Starting the Software

Click **Start** button, point to **Programs**, point to **EDS400A** and then select **EDS400A Control Software** or **EDS400A Data Display Software.**

2.4.2 Exiting the Software

Point to **File** on the top left of the main window of the Software, and then click **Exit**.

MEMO

When the Software is installed in the PC, the Instruction Manual is also installed in the PC.
Click **Start** button on the Windows menu and select **Program**. Select **EDS400A** from the **Program**.
Then, select **Hardware Instruction Manual** or **Software Instruction Manual** from the **EDS400A**.

* To see the Instruction Manuals, note that the Acrobat Reader should be installed in your PC.

3 NETWORK SETTING ON THE PC

Before using the EDS-400A (or EDS-450A), it is required to set network on your PC for connecting the EDS-400A (or EDS-450A) via LAN. This section describes details for setting the network.

The following describes the network setting on the PC side to have a one-on-one connection between the EDS-400A (or EDS-450A) and the PC.

- Network Settings on the PC side

IP address	192.	168.	0.	100
Subnet mask	255.	255.	255.	0
Default gateway	0.	0.	0.	0

- Factory Network Settings on the EDS-400A (or EDS-450A) side (Prior to shipment)

IP address	192.	168.	0.	1
Subnet mask	255.	255.	255.	0
Default gateway	0.	0.	0.	0

- Windows XP → 3.1 "WindowsXP"
- Windows 2000 → 3.2 "Windows2000"

In case the PC is already connected to other different network, confirm the Network Administrator before setting the network.

NOTE

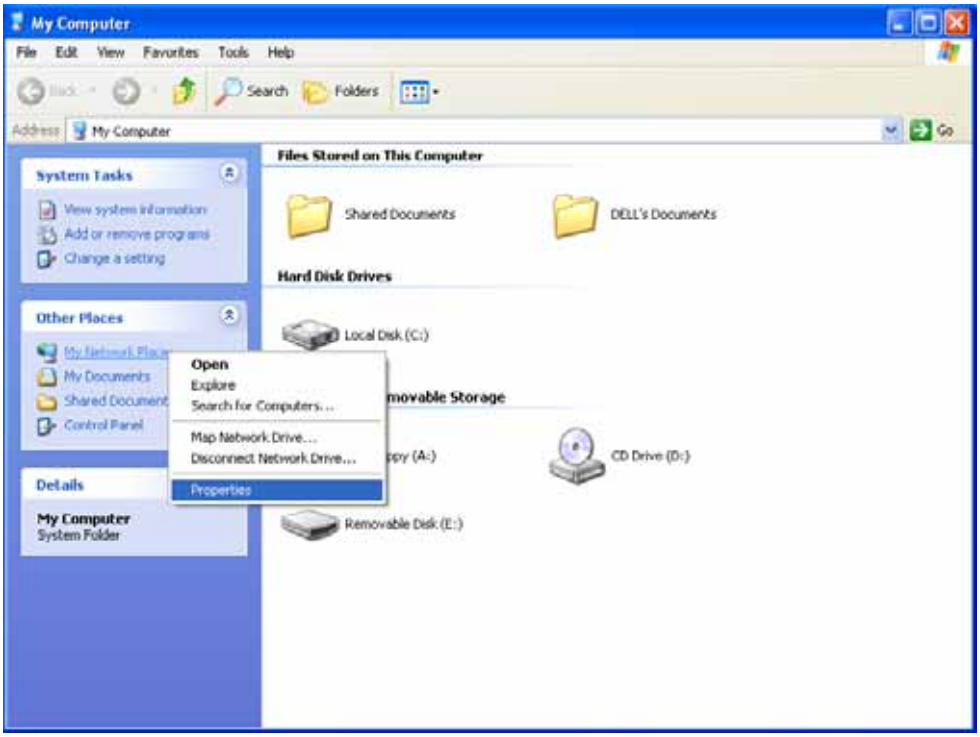
When changing the IP address of the EDS-400A (or EDS-450A), set the IP address of the PC to the above setting once to have the PC and the EDS-400A (or EDS-450A) in communication available state.

For how to change the IP address of the EDS-400A (or EDS-450A), see "4.3.12 Network Setting Dialog Box."

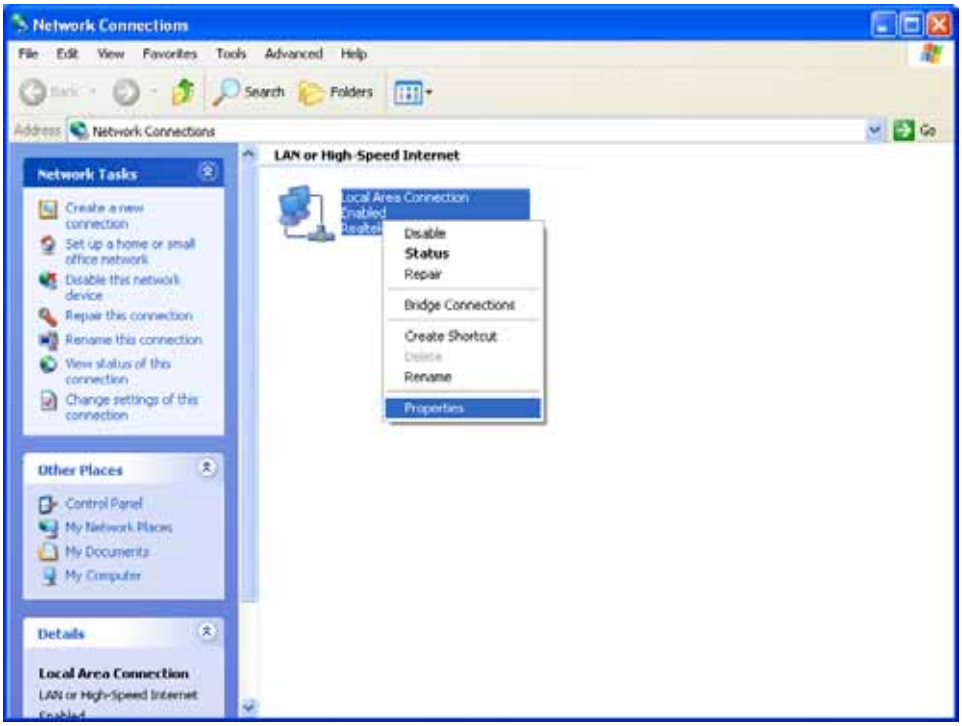
3.1 WINDOWS XP

1) Click **Start** on Windows and then click **My Computer**.

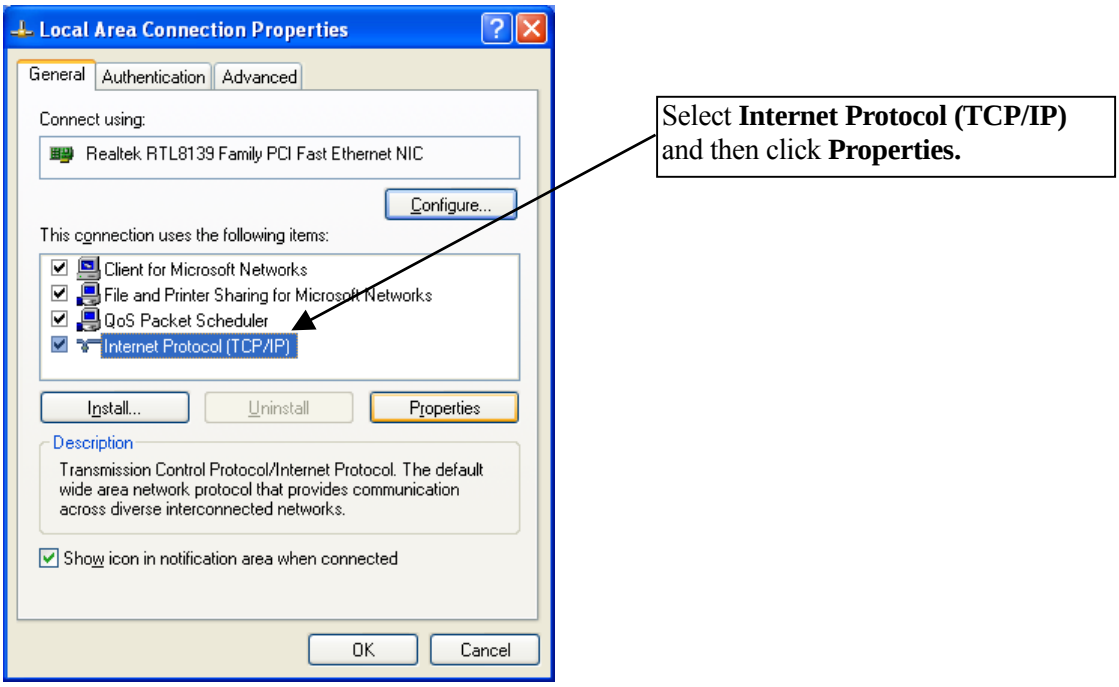
2) Right-click **My Network Places,** which is located on the left side of the **My Computer** window, and then click **Properties**.



3) On the **Network Connections** window, right-click **Local Area Connection**, and then click **Properties**.



4) From the **Local Area Connection Properties** dialog box, select **Internet Protocol (TCP/IP)** and then click **Properties.**

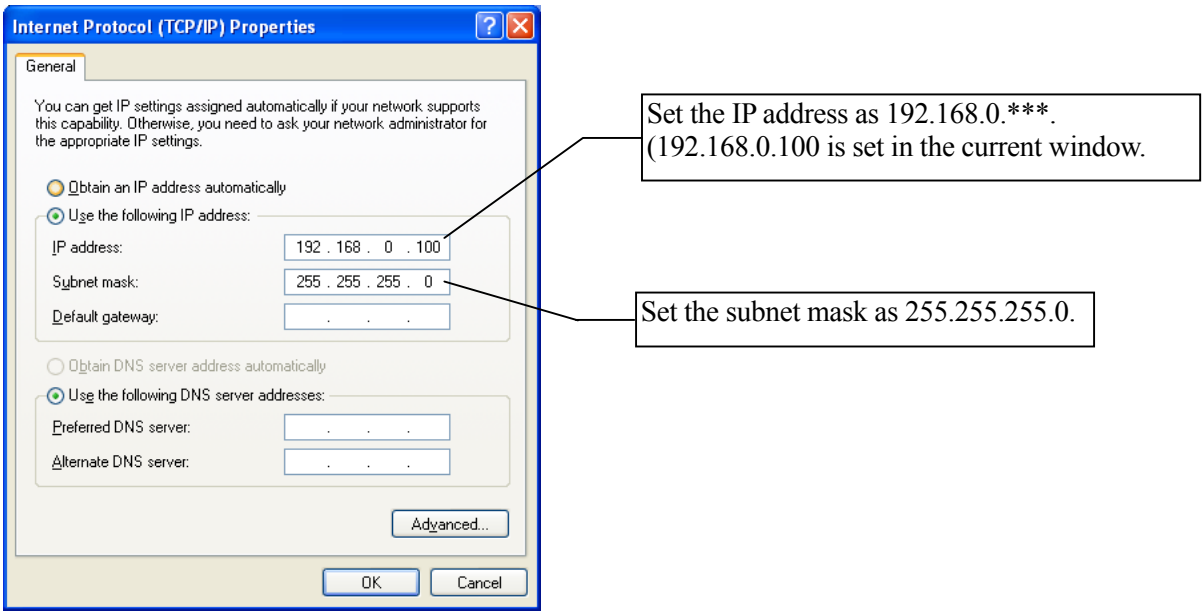


5) In the **Internet Protocol (TCP/IP) Properties** dialog box, enter as follows:

- IP address "192.168.0.***"
- Subnet mask "255.255.255.0"

Click **OK** to close the dialog box.

Note) "***" in the IP address can be freely set with numbers ranging from 1 to 255 that is different from the IP address of the EDS-400A (or EDS-450A).
When connecting the PC to the EDS-400A (or EDS-450A) with the IP address previously set prior to shipment, set the IP address of the PC with numbers ranging from 2 to 255.



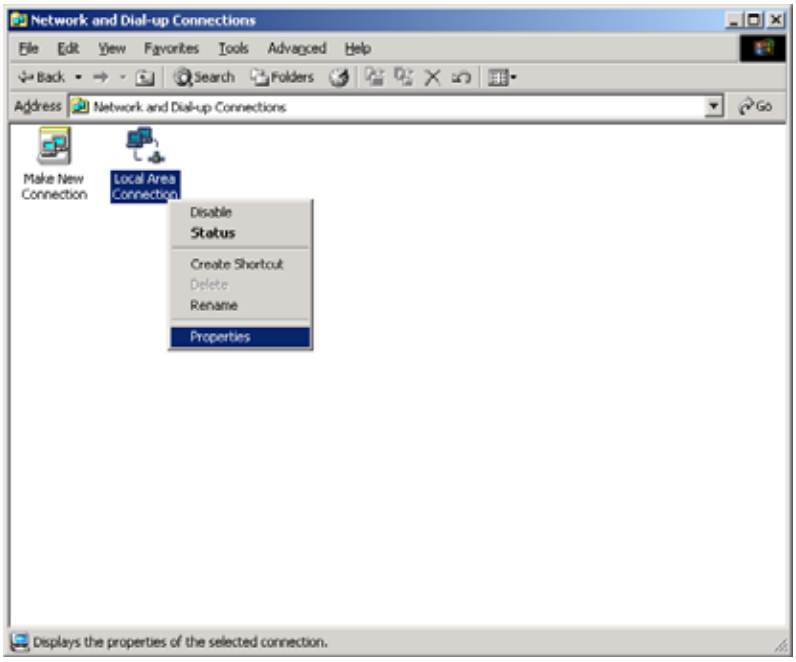
6) In the **Local Area Connection Properties** dialog box, click **OK** to close the dialog box.

7) The setting is complete.

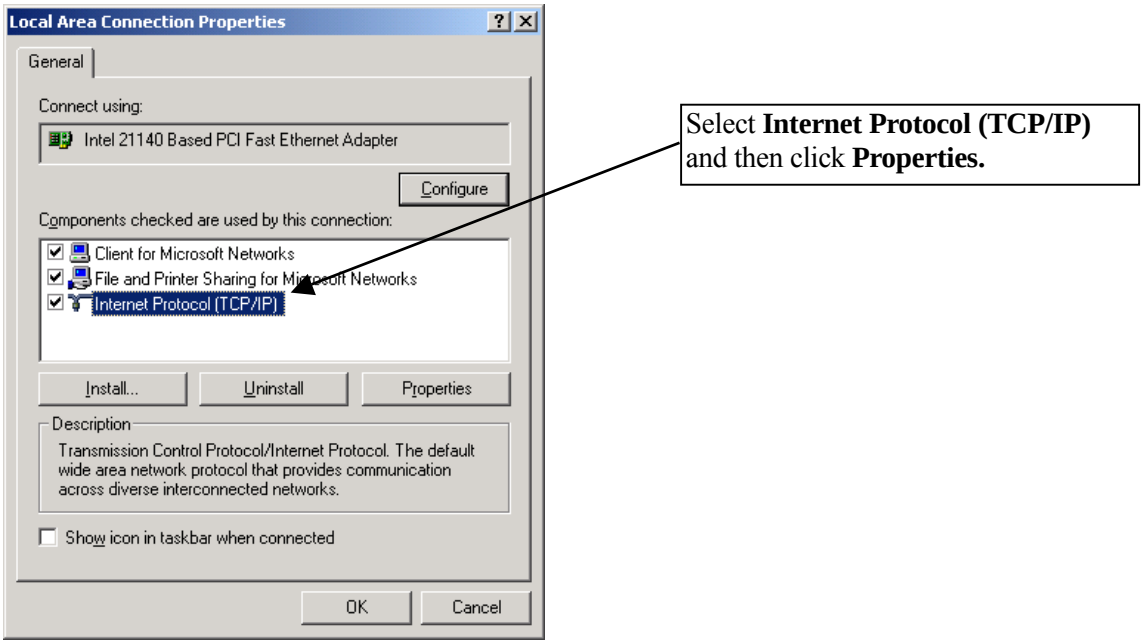
3.2 WINDOWS 2000

1) Click **Start** button on Windows, point to **Settings** and then click **Network and Dial-up Connections.**

2) Right-click **Local Area Connection** and then click **Properties**.



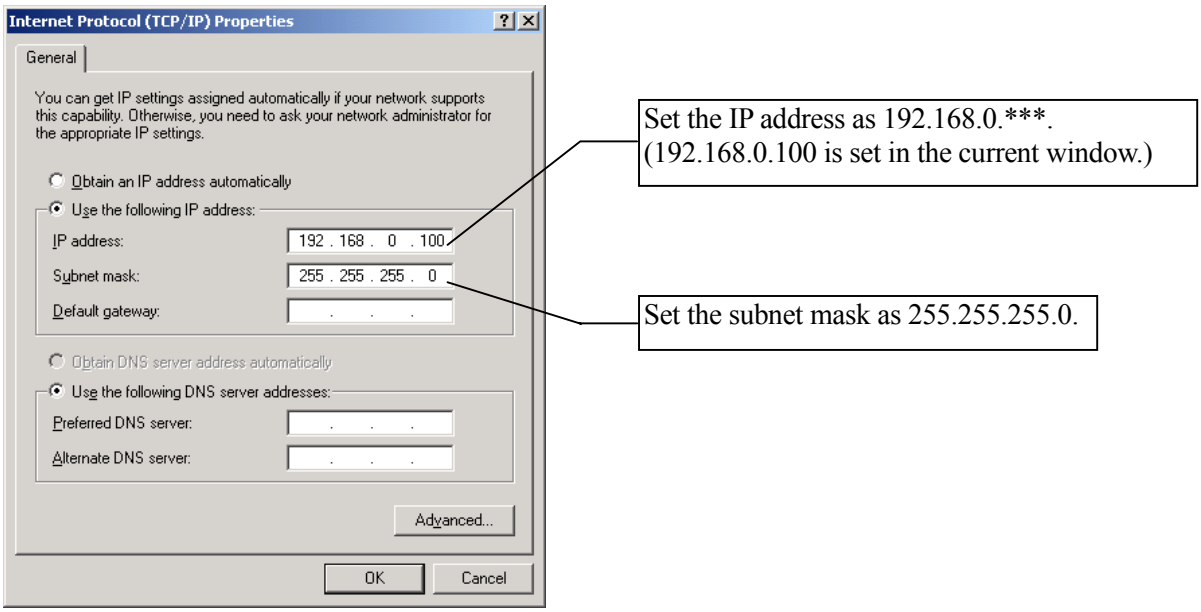
3) In the **Local Area Connection Properties** dialog box, select **Internet Protocol (TCP/IP)** and then click **Properties.**



4) In the **Internet Protocol (TCP/IP) Properties** dialog box, enter as follows:
   - IP address: "192.168.0.***"
   - Subnet mask: "255.255.255.0"

   Click **OK** to close the dialog box.

   Note) "***" in the IP address can be freely set in the range from 1 to 255 that is different from the IP address of the EDS-400A (or EDS-450A).
   When connecting the PC to the EDS-400A (or EDS-450A) with the IP address previously set prior to shipment, set the IP address of the PC in the range from 2 to 255.



5) In the **Local Area Connection Properties** dialog box, click **OK** to close the dialog box.

6) The setting is complete.

4 CONTROL SOFTWARE

The Control Software lets you perform various settings and control tasks relating to the EDS-400A (or EDS-450A) and collect recorded data via a LAN interface.

For how to connect the EDS-400A (or EDS-450A) to the PC, refer to "3-4 CONNECTING TO THE PC" in the Instruction Manual for Hardware.

4.1 STARTING AND EXITING THE CONTROL SOFTWARE

4.1.1 Starting the Control Software

Click **Start** button on Windows, point to **Programs**, select **EDS400A** and then click **EDS400A Control Software**.

4.1.2 Exiting the Control Software

Point to **File** on the top left of the main window, and then select **Exit**.

4.2 FUNCTIONS

4.2.1 EDS-400A Control Functions

A maximum of eight EDS-400As with ID numbers from 0 to 7 can be controlled at the same time. The channels assigned to each EDS-400A are defined as follows according to the ID numbers of the respective units:

Since the EDS-450A is only solely used and not for multiple use, only one EDS-450A is controlled.

EDS-400A with ID No. 0	Channels 1 to 4
EDS-400A with ID No. 1	Channels 5 to 8
EDS-400A with ID No. 2	Channels 9 to 12
EDS-400A with ID No. 3	Channels 13 to 16
EDS-400A with ID No. 4	Channels 17 to 20
EDS-400A with ID No. 5	Channels 21 to 24
EDS-400A with ID No. 6	Channels 25 to 28
EDS-400A with ID No. 7	Channels 29 to 32

(→ 4.3.11 Configuration Dialog Box)

4.2.2 Various Measurement Functions

The following measurement functions are available, depending on the selected operation mode.

Manual: The measured data is recorded manually.
(→ 4.4.1 Manual Measurement)

Analog trigger: The measured data is recorded when the data of the specified trigger channel satisfies the trigger conditions.
(→ 4.4.2 Analog Trigger Measurement)

External trigger <EDS-400A only>:
Measured data is recorded when the external trigger signal satisfies the trigger conditions. (→ 4.4.3 External Trigger Measurement)

4.2.3 Loading/Saving a Measuring Condition Information File

Specified measuring conditions can be saved in a measuring condition file under the desired name (extension: E4C). By loading an applicable measuring condition file, you can retrieve the desired measuring conditions as used in the past.

The following conditions are saved:

Title, sampling frequency, number of record data, number of repetitions, operation mode, channel condition, trigger conditions, graph condition

If the conditions are saved as a measuring condition file (condition.ks2) in a CF card, setting can be performed for every EDS-400A (or EDS-450A) unit, separately.

The following conditions are saved:

Title, sampling frequency, number of record data, number of repetitions, operation mode, channel conditions, trigger conditions

4.2.4 Displaying Data on Graph

While monitoring data, you can graph out data of each measuring channel.

Select the desired graph from "Waveform graph," "Bar graph" and "Real-time collection graph" using the graph selector control, and then display data in the selected graph format.

Waveform graph: A maximum of 8 channels of measured data can be displayed as a waveform graph. The data for each display channel is shown numerically at the same time.
(→ 4.3.7 Waveform Graph)

Bar graph: A maximum of eight channels of measured data can be displayed as a bar graph. The data for each display channel is shown numerically at the same time.
(→ 4.3.8 Bar Graph)

Real-time collection: Among measured data collected and transferred in real-time from the EDS-400A (or EDS-450A), a maximum of 8 channels of the selected data can be displayed.
Real-time collection graph is only displayed when the sampling frequency is 10 kHz or less and when data is recorded in manual measurement mode.
(→ 4.3.9 Real-Time Collection Graph)

NOTE

Data displayed on “Waveform graph” or on “Bar graph” is an instantaneous value and not the entire recorded data.

4.2.5 Collecting/Saving Measured Data

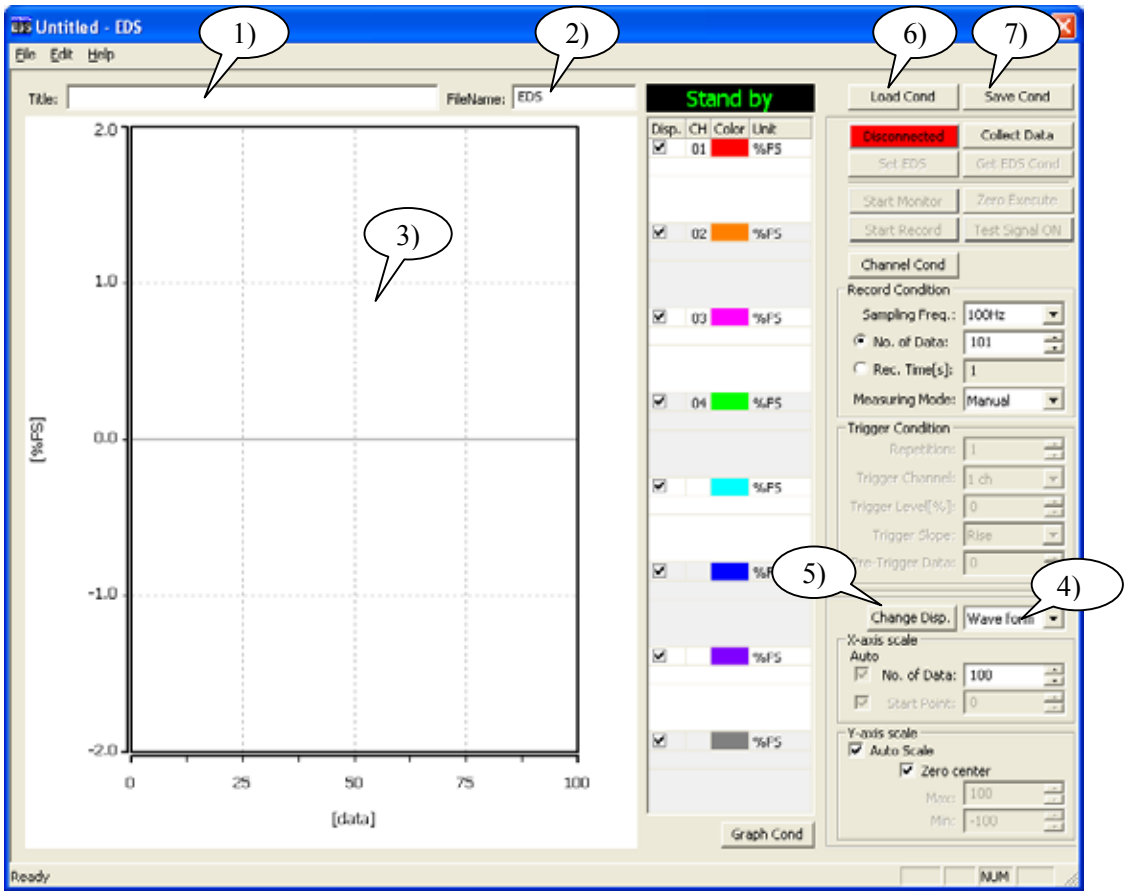
This function is capable of collecting and saving the record data file (extension: KS2) in the PC. The measured data is saved in the record data file using the KYOWA standard format together with the following measuring conditions. (→ 4.5 DATA COLLECTION)

Title, sampling frequency, number of record data, measuring mode, channel conditions, trigger conditions

4.3 WINDOW SPECIFICATIONS

4.3.1 Main Window

This is the initial window to be displayed when the Software is started up. On the main window, you can control the EDS-400A (or EDS-450A), set and operate measuring conditions, display data on graph, show data values and collect data, and so on.



1) **Title**
Input a title using a maximum of 40 characters. Neither double quotation mark (") nor comma (,) can be used.

2) **File Name**
Input a file name for saving the record data file, using a maximum of 10 alphanumeric characters.

3) **Graph block**
A graph is displayed here.

4) **Graph selector control**
Use this control to select a desired graph (waveform graph, bar graph or real-time collection graph).
- Waveform graph → 4.3.7 Waveform Graph
- Bar graph → 4.3.8 Bar Graph
- Real-time collection graph → 4.3.9 Real-Time Collection Graph

5) **Change Disp.** button
Use this button to redraw a graph by applying the new setting made in the graph selector control, X-axis Scale, and Y-axis Scale.

6) **Load Cond** button

Use this button to load a measuring condition file.

Load a condition file in the PC

A condition file (extension: E2C) saved in the PC will be loaded.
Cannot load while "Connecting LAN."

Load from the CF card connected to the PC

A condition file (condition.ks2) will be loaded from the CF card connected to the PC.
Cannot load while "Connecting LAN."

(→ 4.3.4 Condition Load Dialog Box)

Load a condition file from the CF card in the EDS

A condition file (condition.ks2) in the CF card inserted in the EDS-400A (or EDS-450A) will be loaded.

7) **Save Cond** button

Use this button to save the measuring condition file.

Save the condition file in PC

The condition file (extension: E2C) will be saved in the PC.

Save in the CF card connected to PC

The condition file (condition.ks2) will be saved in the CF card connected to the PC.
Cannot save while "Connecting LAN."

Save the condition file in the EDS

The condition file (condition.ks2) will be saved in the CF card inserted in the EDS-400A (or EDS-450A).

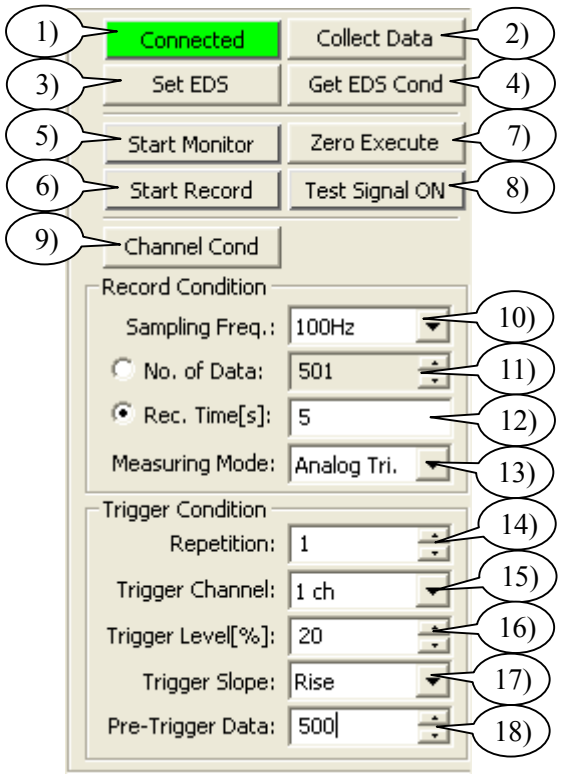
8) **Status Display**

Operating status of the EDS-400A (or EDS-450A) is displayed.

- Recording is Stopped — Waiting for recording data.
  Changing the settings of measuring conditions is allowed only in this state.
- Monitoring — Monitoring data.
  No operations are allowed except for "Zero Execute," "Test Signal ON/OFF," "Start Record," and "Graph selector control."
- Recording — Recording data.
  No operations are allowed except for "Stop Record," "Test Signal ON/OFF," and "Graph selector control."
- Waiting trigger — Waiting to be triggered

4.3.2 Measurement Control Block

Control of EDS-400A (or EDS-450A) and setting of measuring conditions are performed in the measurement control block.



1) **Disconnected** from LAN/**Connected** to LAN button
Clicking this button will cause the PC to connect to/disconnect from the EDS-400A (or EDS-450A)

2) **Collect Data** button
Collect from EDS
Data is collected from EDS and saved.
(→ 4.5.1 Collect From EDS-400A (or EDS-450A).
Collect from CF card in PC
Data is collected from the CF card mounted in the PC and then saved.
(→ 4.5.2 Collect From CF Card)
Save data displayed in real-time
Data is collected in **real-time** and then saved.
(→ 4.5.3 Save Real-Time Data)

3) **Set EDS** button
Clicking this button will allow you to set measuring conditions in the EDS-400A (or EDS-450A).

4) **Get EDS Cond** button
Clicking this button will allow you to obtain the measuring conditions set in the EDS-400A (or EDS-450A).

5) **Start Monitor/Stop Monitor** button
Clicking this button will start/stop monitoring data.

6) **Start Record/Stop Record** button
Clicking this button will start/stop recording data.

7) **Zero Execute** button
Clicking this button will enable zero suppression.
The result of zero suppression will be displayed only when an error occurred.

OK:	The result of zero suppression is normal.
NG:	The result of zero suppression is abnormal.
Not Executed:	Zero suppression or measurement is OFF.

8) **Test Signal ON/Test Signal OFF**
Clicking this button will output/stop the test signal (+50% of the set range).

9) **Channel Cond** button
Clicking this button will enable you to change the measuring conditions for each channel.
A dialog box will be displayed for the setting channel conditions.
(→ 4.3.3 Channel Condition Dialog Box)

10) **Sampling Freq.**
Set sampling frequency [Hz] to be used during measurement.
1, 2, 5, 10, 20, 50, 100, 200, 500, 1000, 2000, 5000, 10000, 20000, 100000 Hz.

11) **No. of Data**
Specify the number of data to be recorded (0 to 500000000).
The number of data that can be recorded will vary depending on the free space in the CF card.
If the operation mode is **Manual**, you can record until the CF card is full by setting 0 in **No. of Data**.

NOTE

If you want to perform synchronous recording by cascade connecting multiple EDS-400As, do not set "0" to **No. of Data.** Or, correct data recording may not be obtained.

12) **Rec. Time[s]**
Input the recording time.

13) **Measuring Mode**
Select the type of measurement (**Manual**, **Analog Tri.** or **Ex. Tri.**)

NOTE

The EDS-450A is not provided with external trigger function. Therefore, do not set "Ex. Tr.

14) **Repetitions**
Set the number of times recording will be repeated (0 to 999). This setting will be applied in non-manual measuring modes.
If 0 is set as the number of repetitions, measurement will continue until recording is stopped.

15) **Trigger Channel**
Set the trigger channel to be applied in the analog trigger mode.

16) **Trigger Level[%]**
Set the trigger level (-99% to 99% of range FS) to be used as a reference for triggering.

17) **Trigger Slope**
Set the slope (**Rise, Fall** or **Both**) in which a trigger will be issued for the specified trigger level.

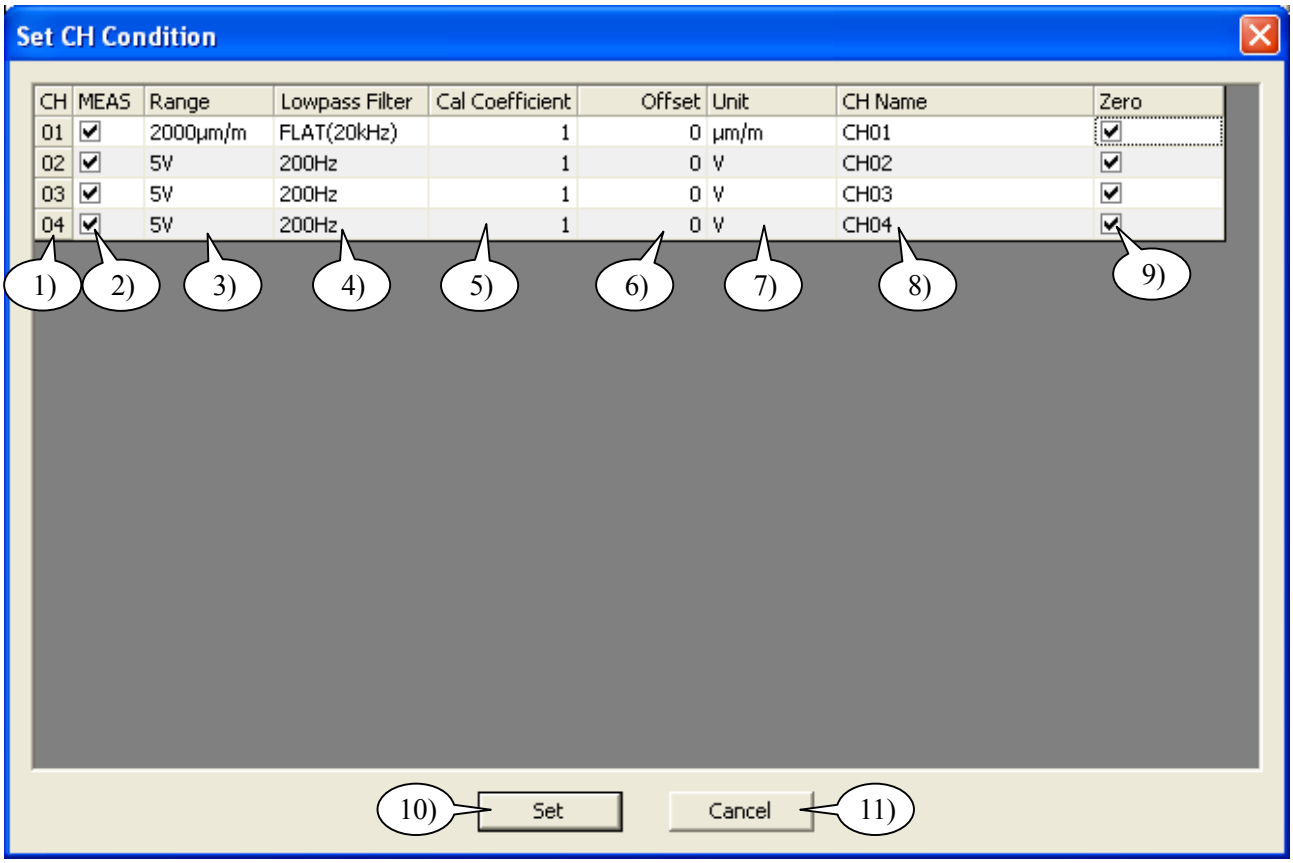
18) **Pre-Trigger Data**
Set the number of data before a trigger is issued (0 to 1000). This setting will be applied in measuring modes other than manual.

NOTE

When setting the number of repetitions to more than 255, it is required to format the CF card with "FAT32."
When trigger level is set to low level, data recording may be triggered with noise.

4.3.3 Channel Conditions Dialog Box

Clicking the **Channel Cond** button in the measurement control block will display this dialog box.
In the **Set CH Condition** dialog box, you can set measuring conditions for each channel.



1) **CH**
The channel number is displayed.

2) **MEAS** checkbox
Set whether to measure or not each channel. Select this box for the channel you want to measure.
Channel with no check mark shall be range OFF.

3) **Range**
Set the measurement range for each channel.
Strain: 1000, 2000, 5000, 10000, 20000 µm/m
Voltage: 1, 2, 5, 10, 20 V

4) **Lowpass Filter**
Set the low-pass filter for each channel.
FLAT (20 kHz), 2 kHz, 200 Hz, 20 Hz

5) **Cal Coefficient**

Set the calibration coefficient to be the multiplier for the measured data of each channel.
As the calibration coefficient, set the conversion coefficient to an appropriate engineering value (physical quantity) corresponding to the input sensor of each channel, the gage factor-compensation coefficient used during strain measurement, or an appropriate compensation coefficient (lead-wire compensation coefficient) if an extension cable is used.
The specified calibration coefficient will be applied to the measured data of each channel.
If you don't want to apply any calibration coefficient, set "1."

6) **Offset**

Set the offset for each channel using a physical quantity (i.e. the value after multiplying the calibration coefficient).
The specified offset will be applied to the measured data for each channel.
If you don't want to set offset, set "0."

7) **Unit**

Set the unit. Choose from the units shown below, or input another unit as desired.

με	ε	mV	V	mA	A	mm	cm
m	°C	°F	gf/cm2	kgf/mm2	kgf/cm2	kgf/m2	mmHg
kPa	Mpa	g	kg	ton	gf	kgf	tonf
N	kgf•mm	kgf•cm	kgf•m	Nm	Ω	kΩ	MΩ
%	DB	ppm	cm/s	m/s	m/min	km/h	Hz
kHz	MHz	°	deg	rad	kN	kNm	kW
rpm	cm/s2	m/s2	G	daN	mile/h	*100kpa	deg/s
msec	Sec	min	hour				

8) **CH Name**

Input a comment string for each channel.

9) **Zero** check box

Channels can be balanced by clicking the **Zero Execute** button in the measurement control block. Check the box for channels you want to balance.

10) **Set** button

Clicking this button will apply the settings made in the **Set CH Condition** dialog box to the measuring conditions and close the **Set CH Condition** dialog box.

11) **Cancel** button

Clicking this button will close the **Channel Conditions** dialog box.
The settings made in the **Set CH Condition** dialog box will not be applied to the measuring conditions.

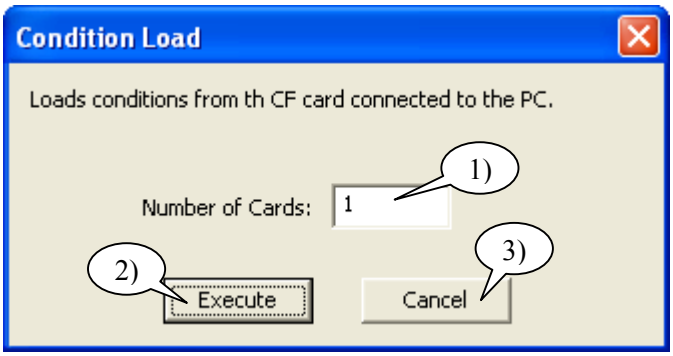
MEMO

The physical value is obtained using the formula below, based on the specified calibration coefficient, offset and range:

$$\text{Physical value[unit]} = \frac{\text{Measured data (A-D value)}/}{29789} \times \text{Range} \times \text{Cal Coefficient} + \text{Offset}$$

4.3.4 Condition Load Dialog Box

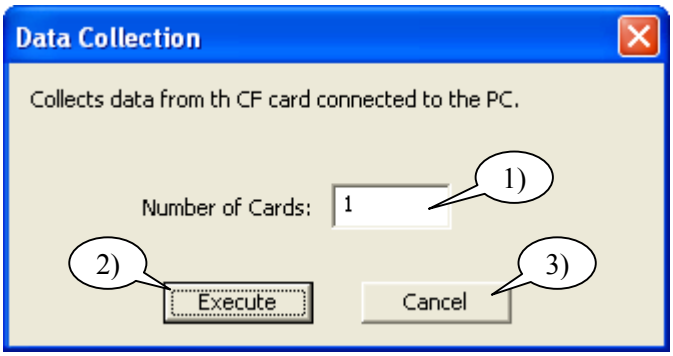
Select **Load Cond** button on the main window. Then, select **Load from the CF card connected to the PC** from the **Load Cond** button to display this dialog box.
In the **Condition Load** dialog box, you can set the number of CF cards to be loaded.



1) **Number of Cards**: Set the number of CF cards (1 to 8) to be loaded.
For the EDS-450A, set the number of CF cards to "1."
2) **Execute** button: Clicking this button will close the **Condition Load** dialog box, whereupon the system will display the **File Selection** dialog box.
3) **Cancel** button: Clicking this button will cancel the condition load and close the **Condition Load** dialog box.

4.3.5 Data Collection Dialog Box

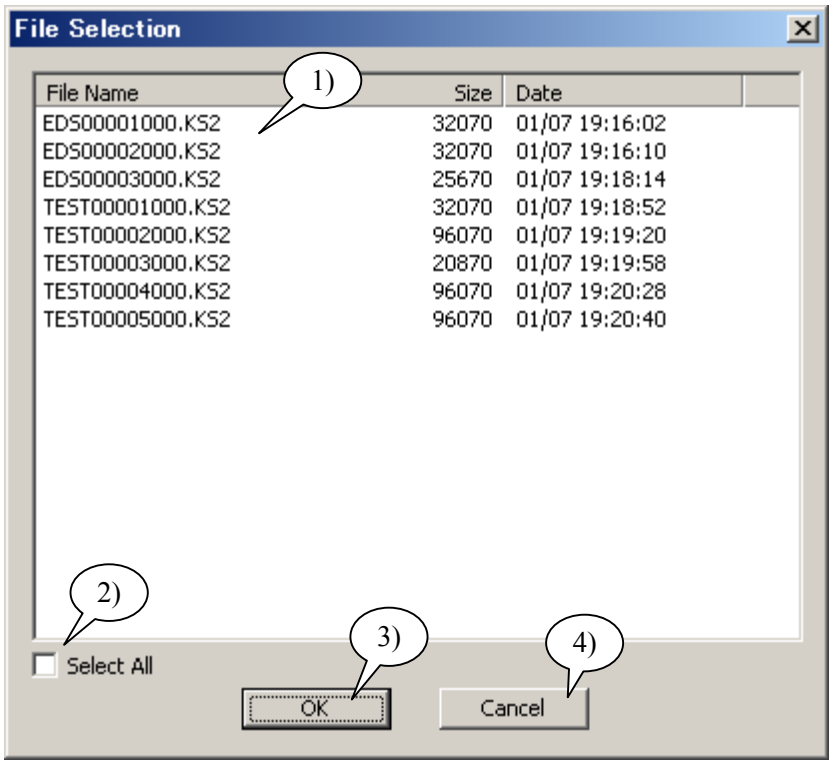
Select **Collect Data** button on the measurement control block window. Then, select **Collect from CF card in PC** from the **Collect Data** button to display this dialog box.
In the **Data Collection** dialog box, you can set the number of CF cards to be collected.



1) **Number of Cards**: Set the number of CF cards (1 to 8) to be collected.
For the EDS-450A, set the number of CF cards to "1."
2) **Execute** button: Clicking this button will close the **Data Collection** dialog box, whereupon the system will display the **File Selection** dialog box.
3) **Cancel** button: Clicking this button will cancel data collection and close the **Data Collection** dialog box.

4.3.6 File Selection Dialog Box

If **Collect from EDS** is selected from **Collect Data** button or **Collect from CF card in PC** is selected and after connecting the first CF card to the PC, a **File Selection** dialog box is displayed.
In the **File Selection** dialog box, you can select the data file you want to collect.
You can select multiple data files at the same time.
In addition, data recorded by connecting multiple EDS-400A units is automatically combined into 1 file when the data is collected.



1) File list: Select the data file you want to collect. Multiple files can be selected.
2) **Select All** checkbox: Select this box if you want to collect all data files shown in the file list.
3) **OK** button: Clicking this button will close the **File Selection** dialog box, and the system will then start collecting the selected data file(s).
4) **Cancel** button: Clicking this button will cancel data file collection and close the **File Selection** dialog box.

NOTE

If **Collect from EDS** is selected from **Collect Data** button, no second appears on the Date column.

When data is recorded by connecting multiple EDS-400A units, a file name and the size of the master unit are displayed.

After collecting data through online, a sand clock is displayed for a certain time for merging and saving the recorded data.

While collecting data via on-line, control switches and "CONT.IN" input connectors of the EDS s are locked.
When communication error occurs such as disconnection of LAN during data collection, turn off the EDS power switch once to unlock key operation.

If power failure occurs while recording data, a size '0' file is created.

Before collecting the recorded data, do not forget to check free space capacity of the folder for saving the recorded data, which is set in pull down menu **Data File** in **File(F)** of the **Configuration** main menu..

When collecting data of multiple EDS-400As through online, take care that a file with the same name does not exist in the slave unit, or no data is correctly collected.

MEMO

Data collection time through online when CF card of 128 MB is used. (Reference value)

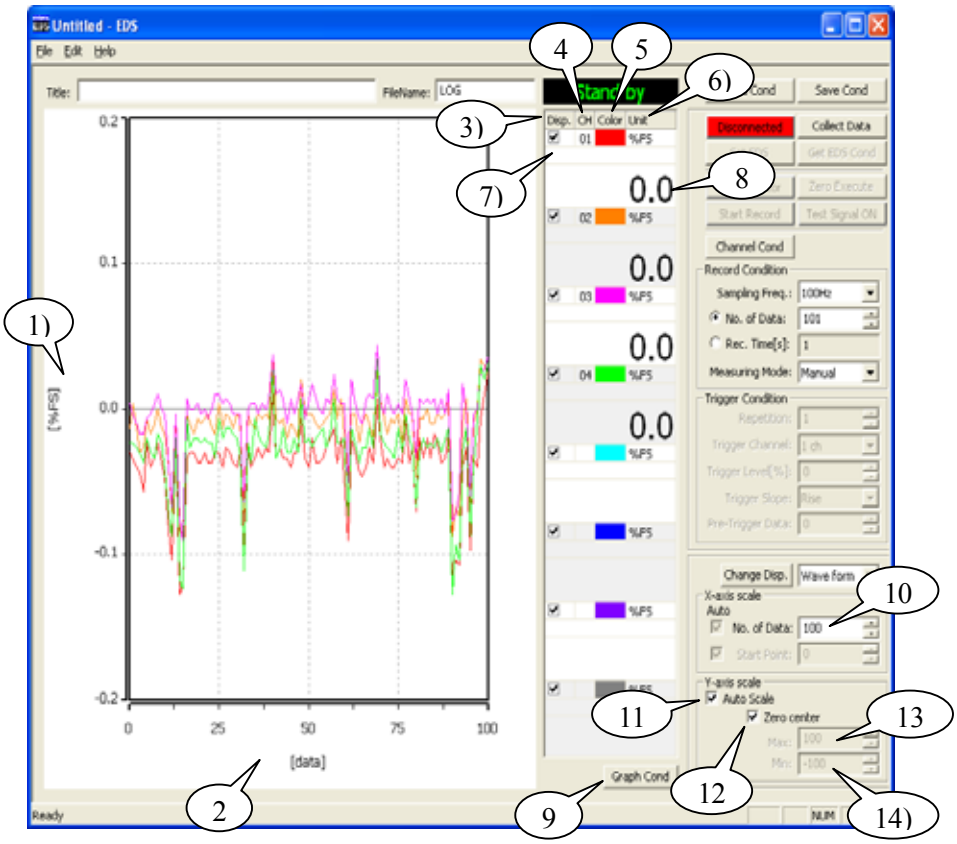
When data is collected through online from the CF card that is fully recorded with 128 MB data, the required time for collecting data is shown in the following.

Using 1EDS: Approx. 8 minutes
Using 2 EDSs: Approx. 18 minutes
Using 4 EDSs: Approx. 35 minutes
Using 8 EDSs: Approx. 1 hour and 20 minutes

* The above times include data merging time.
* Data collection time when the PC is operated on WindowsXP with Celeron(R)2 having memory 504 MB and with transfer speed 100 Mbps.
  Note that data collection time varies with PC processing capacity or data transfer speed.

4.3.7 Waveform Graph

Selecting **Waveform Graph** in the graph selector control on the main window will display a waveform graph. A maximum of eight channels of measured data is displayed on the waveform graph.
The data for each display channel is shown numerically at the same time.



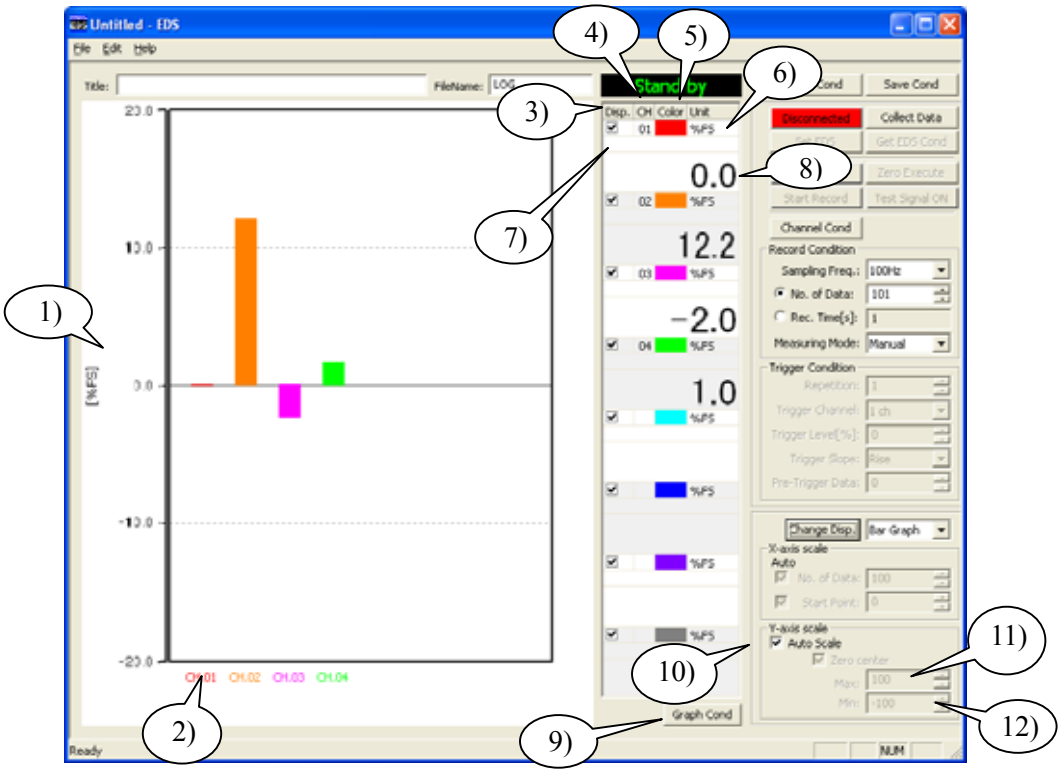
1)	Y-axis scale:	The Y-axis scale of the graph is displayed. The scale is fixed at [%FS].
2)	X-axis scale:	The X-axis scale (displayed data point number) of the graph is displayed.
3)	**Disp.** checkbox:	Add/remove a checkmark to change whether or not to display the graph.
4)	**CH:**	The displayed channel number is shown.
5)	**Color**:	The line color used to draw a graph is displayed.
6)	**Unit:**	The display unit of the value is shown.
7)	**Name**:	The channel name is displayed.
8)	**Value**:	Values of the channel data shown on the graph are numerically displayed in [%FS] or physical quantities.
9)	**Graph Cond** button:	Clicking this button will open the dialog box for setting the graph display conditions. (→ 4.3.10 Graph Conditions Dialog Box)
10)	**No. of Data**:	Set the number of data to be displayed on the X-axis. A maximum of 1,200 points can be displayed.
11)	**Auto Scale** checkbox:	Set whether or not to use the auto-scale function for the Y-axis.
12)	**Zero center** checkbox:	0 of the Y-axis scale is always shown at the center.
13)	**Max:**	The maximum Y-axis value can be changed.
14)	**Min:**	The minimum Y-axis value can be changed.

MEMO

Data displayed on “Waveform graph” is an instantaneous value and not the entire recorded data.

4.3.8 Bar Graph

Selecting **Bar Graph** in the graph selector control on the main window will display a bar graph.
A maximum of eight channels of measured data are displayed on the bar graph. The data for each display channel is shown numerically at the same time.



1)	Y-axis scale:	The Y-axis scale of the graph is displayed. The scale is fixed at [%FS].
2)	X-axis:	The displayed channel number is shown.
3)	**Disp.** checkbox:	Add/remove a checkmark to change whether or not to display the graph.
4)	**CH:**	The displayed channel number is shown.
5)	**Color**:	The line color used to draw a graph is displayed.
6)	**Unit:**	The display unit of the value is shown.
7)	**Name**:	The channel name is displayed.
8)	**Value**:	Values of the channel data shown on the graph are numerically displayed in [%S] or physical quantity.
9)	**Graph Cond** button:	Clicking this button will open the dialog box for setting the graph display conditions. (→ 4.3.10 Graph Conditions Dialog Box)
10)	**Auto Scale** checkbox:	Set whether or not to use the auto-scale function for the Y-axis.
11)	**Max:**	The maximum Y-axis value can be changed.
12)	**Min:**	The minimum Y-axis value can be changed.

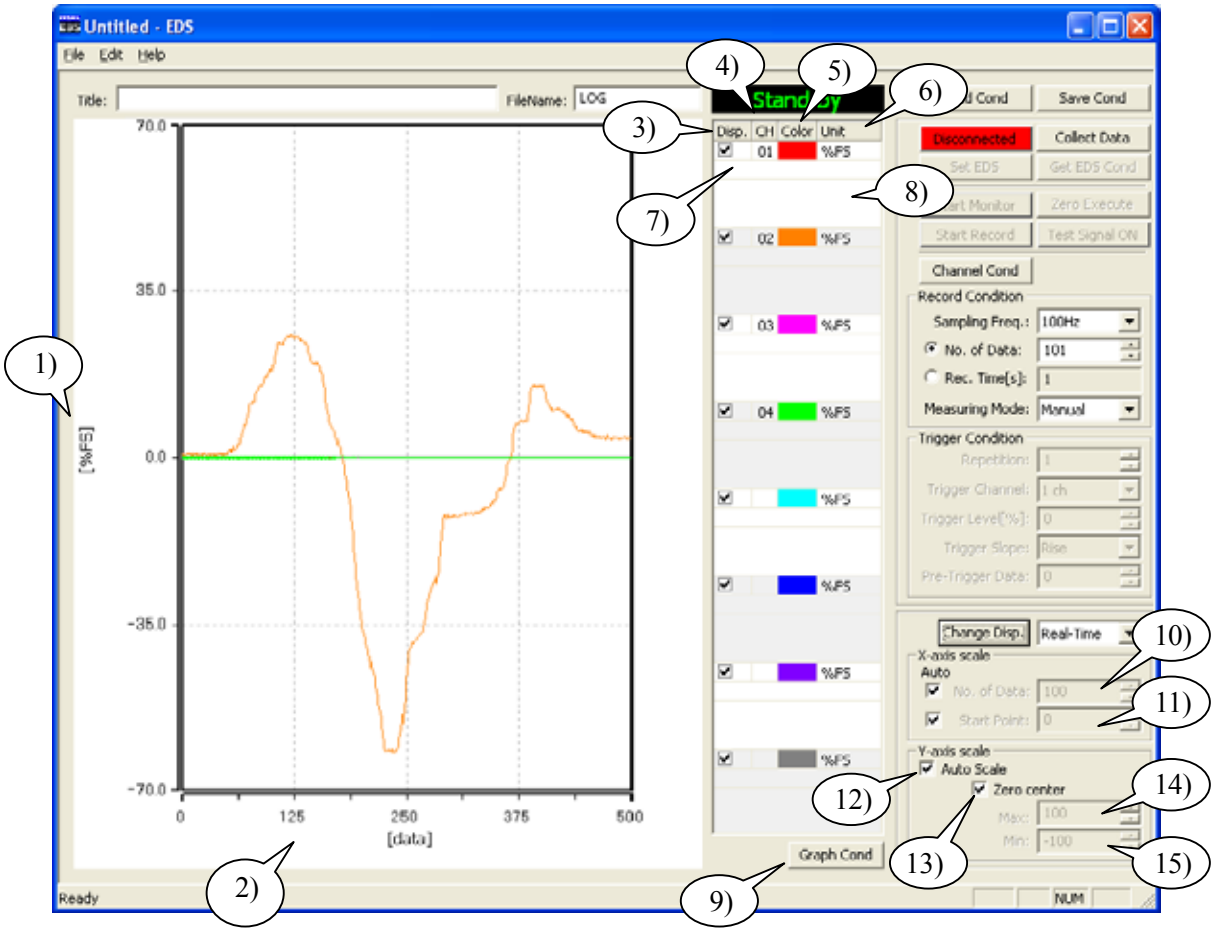
MEMO

Data displayed on “Bar graph” is an instantaneous value and not the entire recorded data.

4.3.9 Real-Time Collection Graph

Selecting **Real-Time Collection** in the graph selector control on the main window will display a waveform graph.

On a real-time collection graph, among the measured data that is transferred in real-time from the EDS-400A (or EDS-450A) during data recording, a maximum of 8 channels of measured data are displayed on waveform graph. The real-time collection graph is displayed at a sampling frequency of 10 kHz or less and only when data is recorded via manual measurement as well as when graph is displayed in the monitor mode.



1)	Y-axis scale:	The Y-axis scale of the graph is displayed. The scale is fixed at [%FS].
2)	X-axis scale:	The X-axis scale (displayed data point number) of the graph is displayed.
3)	**Disp.** checkbox:	Add/remove a checkmark to change whether or not to display the graph.
4)	**CH**:	The displayed channel number is shown.
5)	**Color**:	The line color used to draw a graph is displayed.
6)	**Unit**:	The display unit of the value is shown.
7)	**Name**:	The channel name is displayed.
8)	**Value**:	Values of the channel data shown in the real-time collection graph are numerically displayed.
9)	**Graph Cond** button:	Clicking this button will open the dialog box for setting the graph display condition. (→ 4.3.10 Graph Condition Dialog Box)
10)	**No. of Data**:	Set the number of data to be displayed on the X-axis.
11)	**Start Point**:	Set the position to begin displaying the X-axis data.
12)	**Auto Scale** checkbox:	Set whether or not to use the auto-scale function for the Y-axis.
13)	**Zero center** checkbox:	0 of the Y-axis scale is always shown at the center.
14)	**Max**:	The maximum Y-axis value can be changed.
15)	**Min**:	The minimum Y-axis value can be changed.

NOTE

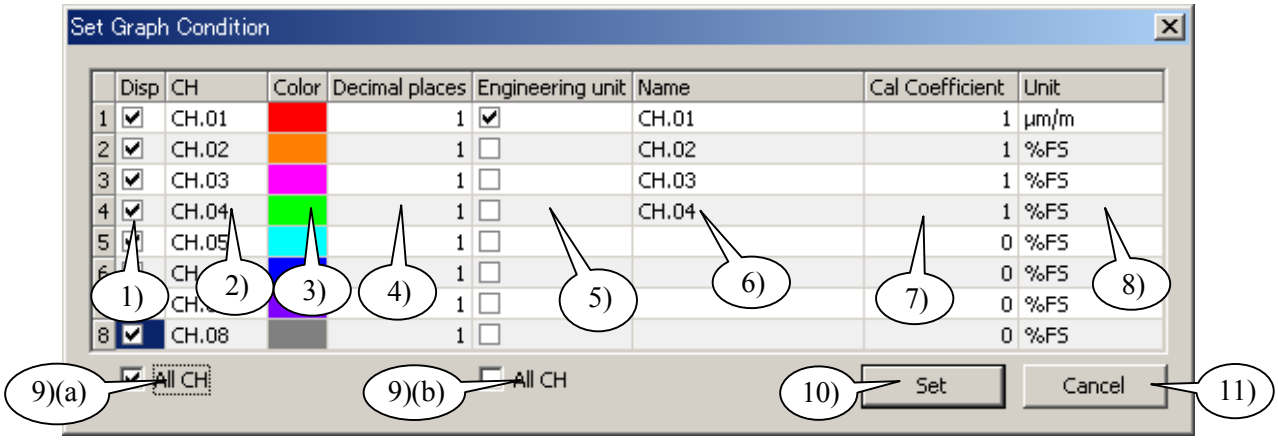
When monitoring the collected data on the real-time collection graph while recording data with the following settings, you cannot operate the **Change Disp.** button.

Using 8 EDSs:	Set sampling frequency to 500 Hz or more.
Using 7 EDSs:	Set sampling frequency to 1 kHz or more.
Using 6 EDSs:	Set sampling frequency to 2 kHz or more.
Using 4 to 5 EDSs:	Set sampling frequency to 5 kHz or more.
Using 2 to 3 EDSs:	Set sampling frequency to 10 kHz or more.

Forbidden condition for operating the **Change Disp.** button is designated by **EDS.ini** in the same folder as the **EDS400A Control Software** file. For how to change the display, see "6. "CHANGE DISP." BUTTON SETTING FILE."

4.3.10 Graph Conditions Dialog Box

Clicking the **Graph Cond** button on the main window will display this dialog box.



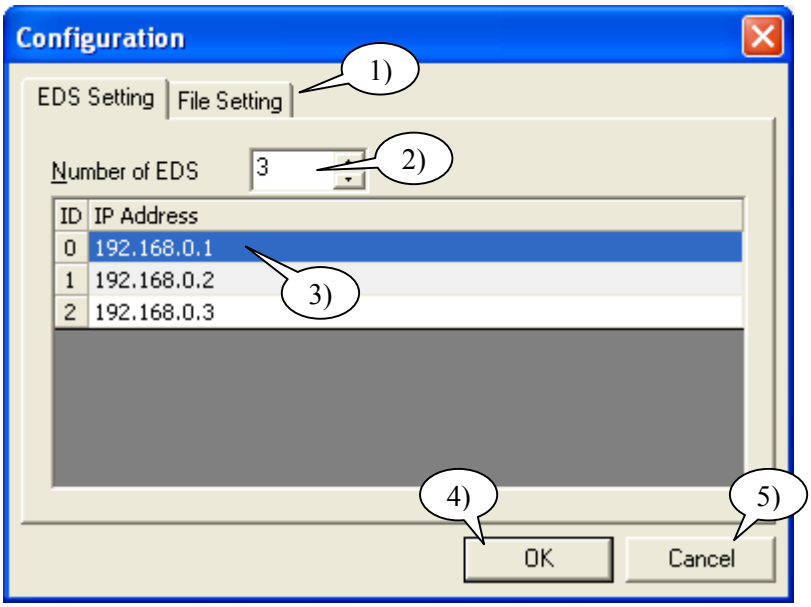
1) **Disp** checkbox
   Add/remove a checkmark to change whether or not to display the graph.
2) **CH**
   Set the channel to be displayed.
3) **Color**
   Set the color of the graph.
4) **Decimal Places**
   Set the number of digits below decimal point.
5) **Engineering unit** checkbox
   Set display form of numeric values on "Waveform graph" and "Bar graph."
   When checked, data is displayed in engineering unit and when not checked, data is displayed in [%FS].
6) **Name**
   Channel name of the selected channel is displayed.
7) **Cal Coefficient**
   CAL coefficient of the selected channel is displayed.
8) **Unit**
   Displays the unit of the graph. When Engineering unit checkbox is checked, engineering unit is displayed.
9) **All CH** checkbox
   (a) Changes whether or not **Disp** checkbox is marked in bulk.
   (b) Changes whether or not **Engineering unit** checkbox is marked in bulk.
10) **Set** button
    Clicking this button will reflect the setting made in **Graph Condition** dialog box, then close the **Graph Conditions** dialog box.
11) **Cancel** button
    Clicking this button will close the **Graph Condition** dialog box.
    Settings made in the **Graph Condition** dialog box will not be applied.

4.3.11 Configuration Dialog Box

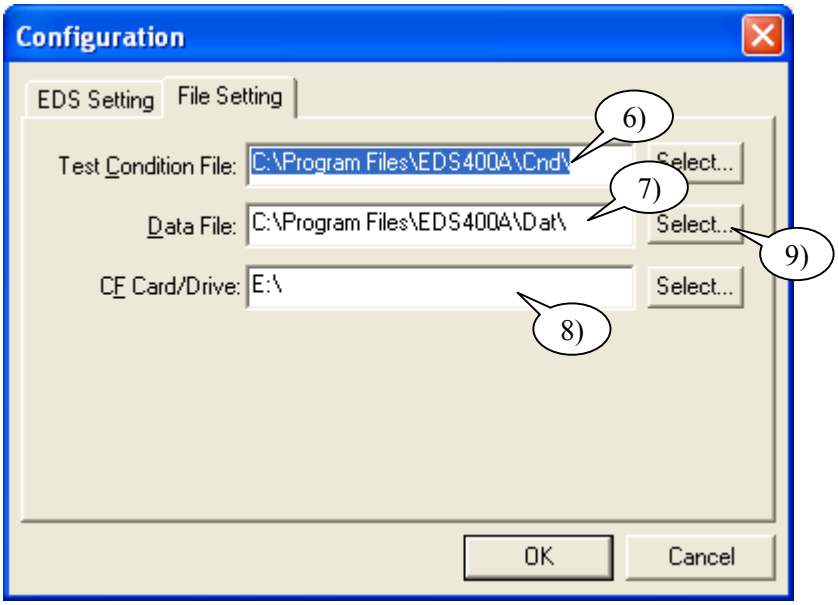
On the **File** menu, select **Configuration** to display this dialog box.

In the **Configuration** dialog box, you can specify the EDS conditions to be used and the default display position for each file.

Cannot select configuration of the EDS-400A (or EDS-450A) while "Connecting LAN."



1) **EDS Setting, File Setting**: Select the item you want to set.
2) **Number of EDS** units: Set the number of EDS-400A units (1 to 8) to be connected. For the EDS-450A, set the number of units to "1."
3) **IP Address**: Set the IP address for every EDS-400A (or EDS-450A).
4) **OK** button: Clicking this button will reflect the settings made in the dialog box and close the **Configuration** dialog box.
5) **Cancel** button: Clicking this button will close the **Configuration** dialog box. The settings made in the dialog box will not be applied.



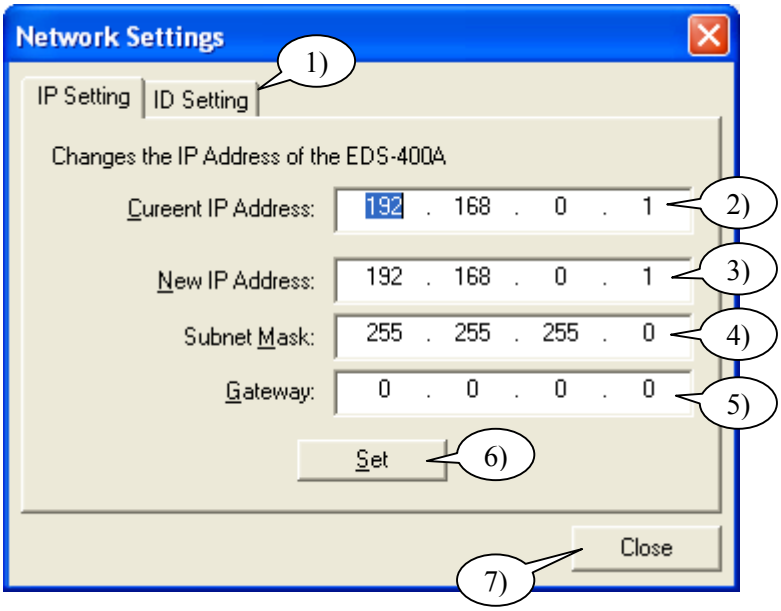
6) **Test Condition File**: Set the default folder to be displayed that contains the test-condition files.
7) **Data File**: Set the default folder to be displayed that contains the data files.
8) **CF Card/Drive**: Set the CF card drive.
9) **Select** button: Clicking this button will display the **Folder Selection** dialog box.

4.3.12 Network Settings Dialog Box

On the **File** menu, select **Set Network** to display this dialog box.

In the **Network Settings** dialog box, you can change the network settings of the EDS-400A (or EDS-450A).

Cannot change network settings of the EDS-400A (or EDS-450A) while "Connecting LAN."



1) **IP Setting, ID Setting**: Select the desired item.
2) **Current IP Address**: Set the current IP address of the desired EDS-400A (or EDS-450A). IP address of the 1st unit is displayed as default.
3) **New IP Address**: Set a new IP address for the EDS-400A (or EDS-450A).
4) **Subnet Mask**: Set a new subnet mask for the EDS-400A (or EDS-450A).
5) **Gateway**: Set a new gateway address for the EDS-400A (or EDS-450A).
6) **Set** button: Clicking this button will enter the network conditions specified in the dialog box in the EDS-400A (or EDS-450A). After the conditions have been set, shut down and restart the EDS-400A (or EDS-450A) to apply the new settings.
7) **Close** button: Clicking this button will close the **Network Settings** dialog box.

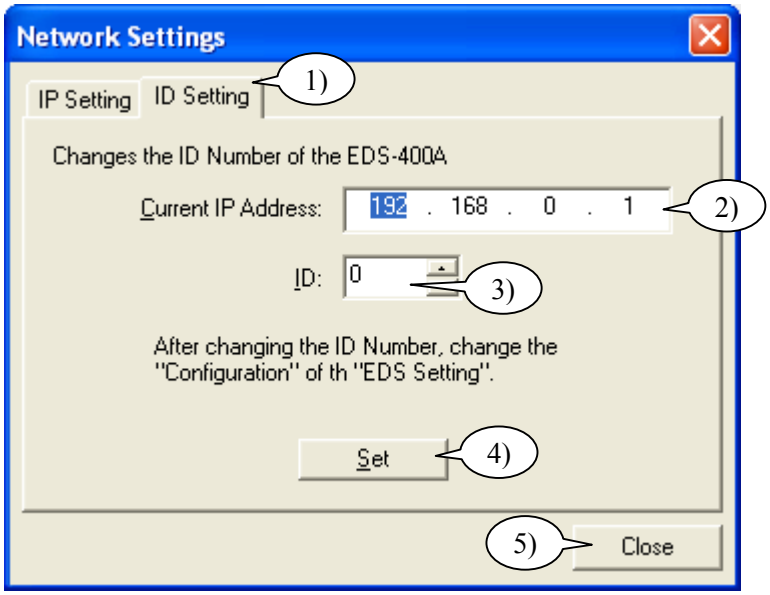
NOTE

- When changing the IP address of the EDS-400A (or EDS-450A), it is required to change the network setting of the PC to have the EDS-400A (or EDS-450A) and PC in communication available state. For how to change the network on the PC side, see "3. SETTING NETWORK ON THE PC SIDE."
- When purchasing multiple EDS-400As and when setting IP addresses for the purchased units, set IP addresses by connecting the EDS-400As one after another to the PC. At this time, take care that IP addresses of each of the EDS-400As do not duplicate.
- When operating your PC on WindowsXp, it is required to restart your PC every time the IP address of the EDS-400A (or EDS-450A) is changed considering the network setting.

MEMO

~ Procedures for Changing the IP Address ~
1) Input items 2) to 5) on the **Network Settings** dialog box.
2) Click **Set** button.
3) Exit this Software.
4) Power OFF the EDS-400A (or EDS-450A) main body.
5) Power ON the EDS-400A (or EDS-450A) main body.
   (At this time, the IP address is changed.)
6) Start up the Software.
7) Change the IP address of the **Configuration** dialog box.
   (→ 4.3.11 Configuration Dialog Box)
8) Click **Disconnected** button and check communication is in normal state.

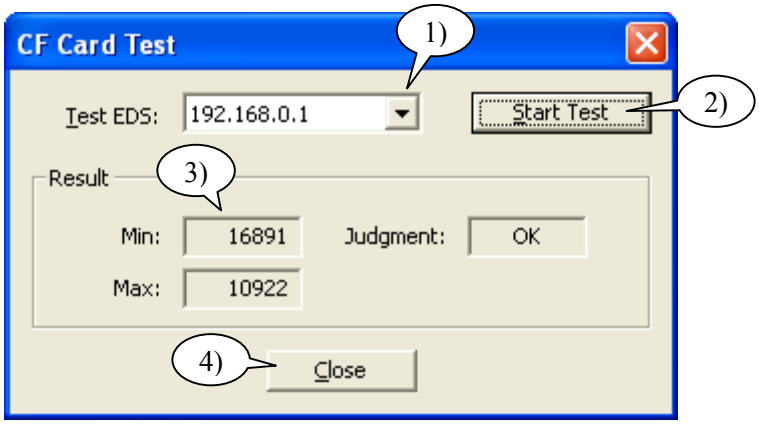
After changing the IP address of the EDS-400A (or EDS-450A), if it becomes unable to have communication with the PC, restart the PC once again. Then, the correct communication state may be restored.



1) **IP Setting**, I**P Setting**: Select the item you want to set.
2) **Current IP Address**: Set the current IP address of the EDS-400A (or EDS-450A) you want to change.
   IP address of the 1st unit is displayed as default.
3) **ID**: Set a new ID number (0 to 7).
   For the EDS-450A, set the ID number of "0."
4) **Set** button: Set network conditions preset in the dialog box to the EDS-400A (or EDS-450A)s.
   After setting is completed, power OFF the EDS-400A (or EDS-450A) and power ON once again. Then, the preset conditions are reflected on the EDS-400A (or EDS-450A).
5) **Close** button: Clicking this button will close the **Network Settings** dialog box.

4.3.13 CF Card Test Dialog Box

On the **File** menu, select **CF Card Test** to display the **CF Card Test** dialog box.
In the **CF Card Test** dialog box, you can test the writing speed to a CF card and display the results.
Cannot execute CF Card Test while "Connecting LAN."

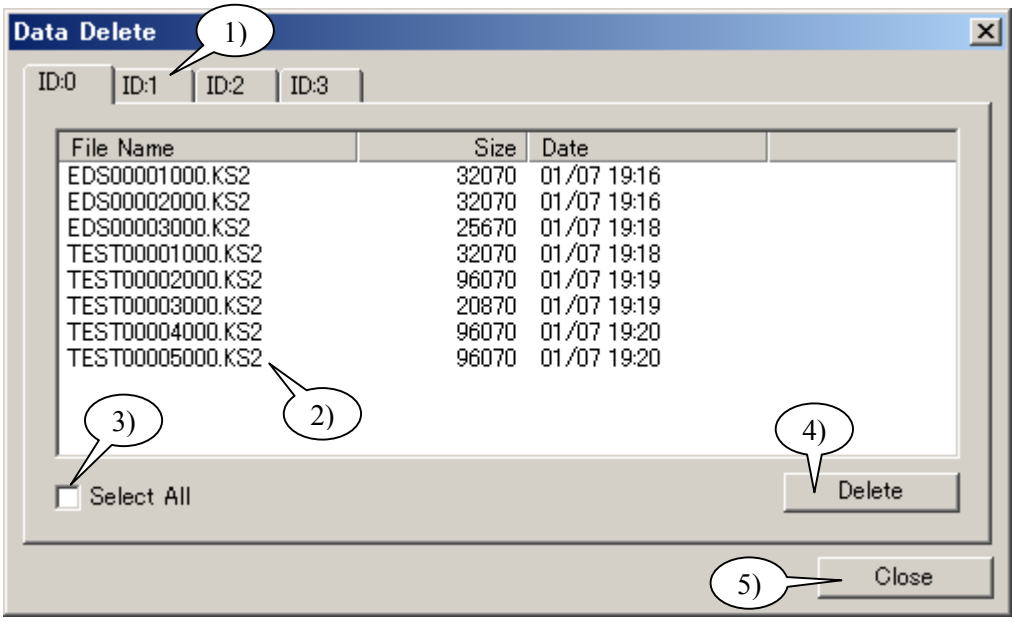


1) **Test EDS**: Select the EDS-400A (or EDS-450A) to perform the CF card test.
2) **Start Test** button: Clicking this button will perform the CF card test.
3) **Judgment**: The results of CF card test are displayed here.
   Min: The minimum writing speed is displayed.
   Max: The maximum writing speed is displayed.
   Judgment: The judgment result (OK/NG) is displayed in accordance with the writing speed.
4) **Close** button: Clicking this button will close the **CF Card Test** dialog box.

4.3.14 Data Delete Dialog Box

On the **File** menu, select **Delete Data** to display the **Data Delete** dialog box.

In the **Data Delete** dialog box, you can select and delete desired data in the CF card from each EDS-400a (or EDS-450A).



1) **ID** tab: Select the desired EDS to be deleted.
The number of EDSs set in **Units** of **Configuration** is displayed for every EDS.
2) File list: A list of data is displayed. Select the data to be deleted.
3) **Select All**: Select this box to delete all the data displayed on the file list.
4) **Delete** button: Clicking this button will delete the selected data file(s).
5) **Close** button: Clicking this button will close the **Data Deletion** dialog box.

NOTE

If **Select All** is selected, condition setting file (condition.ks2) is also deleted.

If power failure occurs while recording data, a size 0 file is created.

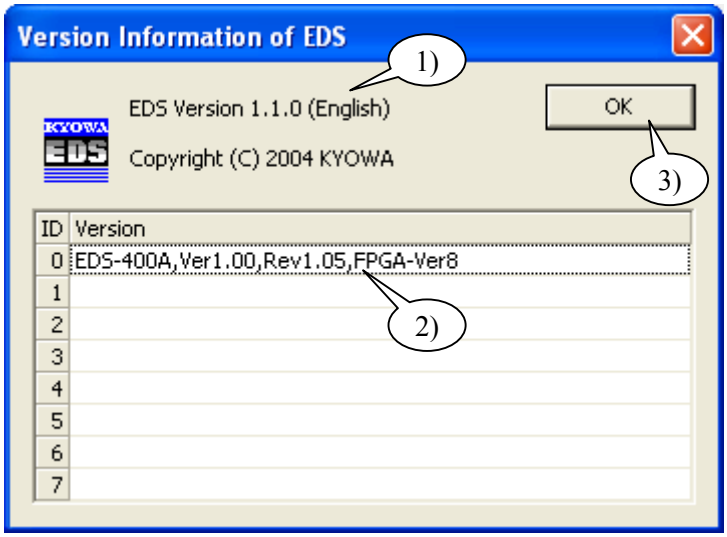
Depending on the CF card characteristics, if writing or deleting data is repeatedly performed, writing speed may be decreased.
It is recommended to periodically format the CF card.

When formatting the CF card, always write “EDS-400A” on the volume label. If it is written with other names or if it left blank, no correct data may be recorded.

4.3.15 Version Information of EDS Dialog Box

On the **Help** menu, select **About EDS** to display this dialog box.

The **Version Information of EDS** dialog box displays the Software version and the version of the connected EDS-400A (or EDS-450A).

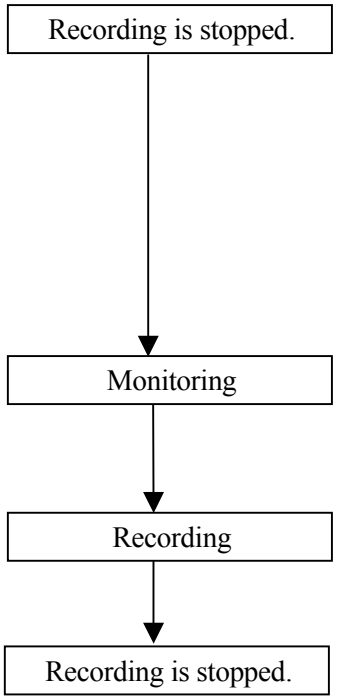


1) Software version: The version of the Software is displayed.
2) Hardware version: The version of the connected EDS-400A (or EDS-450A) is displayed.
3) **OK** button: Clicking this button closes the **Version Information of EDS** dialog box.

4.4 MEASUREMENT OPERATION

4.4.1 Manual Measurement

Clicking the **Start Record** button on the main window will start recording the measured data.
When recording of the specified number of data is completed or when **Stop Record** button is clicked, the recording stops. Click the **Start Monitor/Stop Monitor** button to monitor the measuring data.

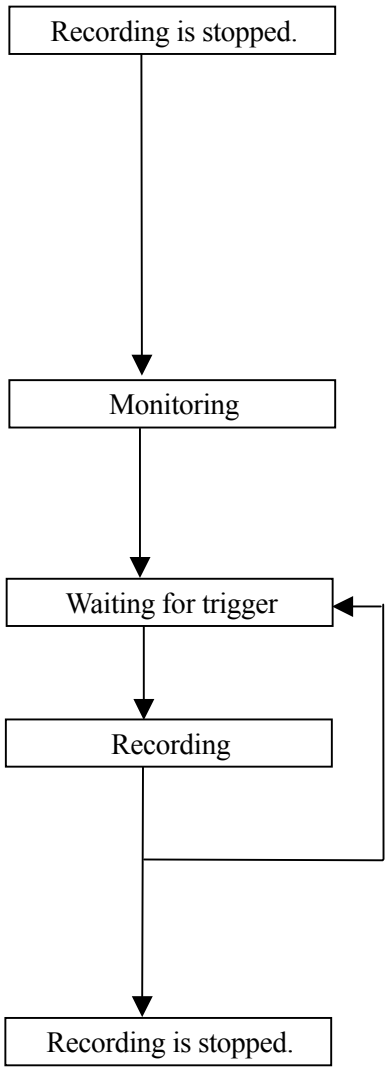


1) Set conditions for each channel.
   (→ 4.3.3 Channel Condition Dialog Box)
2) Set **Measuring Mode** to **Manual**.
   (→ 4.3.2 Measurement Control Block)
3) Select **Sampling Freq.**.
4) Set **No. Of Data** or **Rec. Time[s]**.
5) Click **Set EDS** and set EDS-400A (or EDS-450A) measuring conditions.
6) Click **Start Monitor/Stop Monitor** to start monitoring data.
7) If required, select and perform **Zero Execute** or **Test Signal ON**.
8) Click **Start Record** to start recording measured data.
9) Upon recording the specified number of data, or when **Stop Record** is clicked, the recording stops.

When data is recorded with sampling frequency having 10 kHz or less, the recorded data is automatically transferred to the PC from the EDS-400A (or EDS-450A)
Under certain conditions, such as when the available space on the hard-disk drive is small or the PC or network processing speed is slow, a message appears indicating that error occurred when receiving data on the PC side. However, data recording of the EDS-400A (or EDS-450A) is not affected by the message.
(→ 4.5.3 Save Real-Time Data)

4.4.2 Analog Trigger Measurement

Upon clicking **Start Record** button, it becomes in trigger wait state. And when measured data of the preset trigger channel satisfies the determined trigger conditions, it starts recording the measured data.
When completing the recording of the specified number of data or when **Stop Record** button is clicked, it stops recording the measured data.



1) Set conditions for each channel.
(→ 4.3.3 Channel Condition Dialog Box)
2) Set **Measuring Mode** to **Analog Trig.**
(→ 4.3.2 Measurement Control Block)
3) Select **Sampling Freq.**
4) Set **No. Of Data** or **Rec. Time[s]**.
5) Set **Repetition**, T**rigger Channel**, **Trigger Level**, **Trigger Slope**, **Pre-Trigger Data**.
6) Click **Set EDS** and set EDS-400A (or EDS-450A) measuring conditions.

7) Click **Start/Stop Monitor** to start monitoring data.
8) If required, select and perform **Zero Execute** or **Test Signal ON**.

9) Click **Start Record** to be in trigger wait state.

10) When the preset trigger conditions are satisfied, it starts recording the measured data.

11) After recording of the specified number of data is completed, it becomes in trigger wait state once again for the number of times preset in **Repetition**.

12) After data recording the specified number of times preset in **Repetition** or when **Stop Record** button is clicked, it stops recording data.

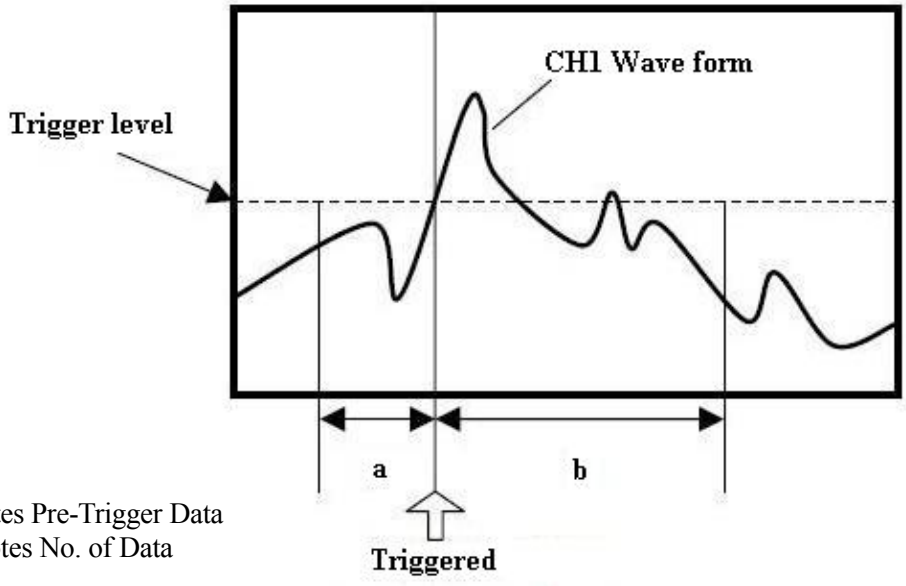
NOTE

After clicking the **Start Record** button, no data is triggered even if trigger conditions are satisfied during data processing time (approximately 1 second) until it becomes in trigger wait state

After recording of the specified number of data is complete, no data is triggered even if trigger conditions are satisfied during data processing time (approximately 1 second) until it becomes in trigger wait state once again.

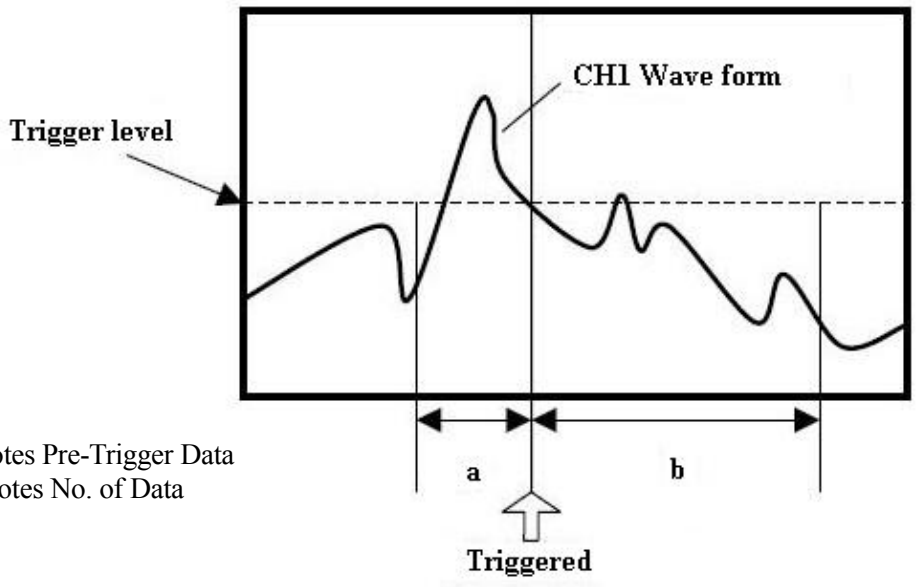
In analog trigger measurement, according to the preset trigger conditions, it becomes triggered at a position as shown in the following examples (1 to 3). (with Trigger Channel set to CH1).

- Example 1 When Trigger Slope is set to **Rise**
  Triggered when waveform of channel 1 exceeds the trigger level.
  If the waveform of the channel 1 is larger than the trigger level from before the time when it is in trigger wait state, the waveform lowers the trigger level once and it becomes triggered when the waveform exceeds the trigger level once again.



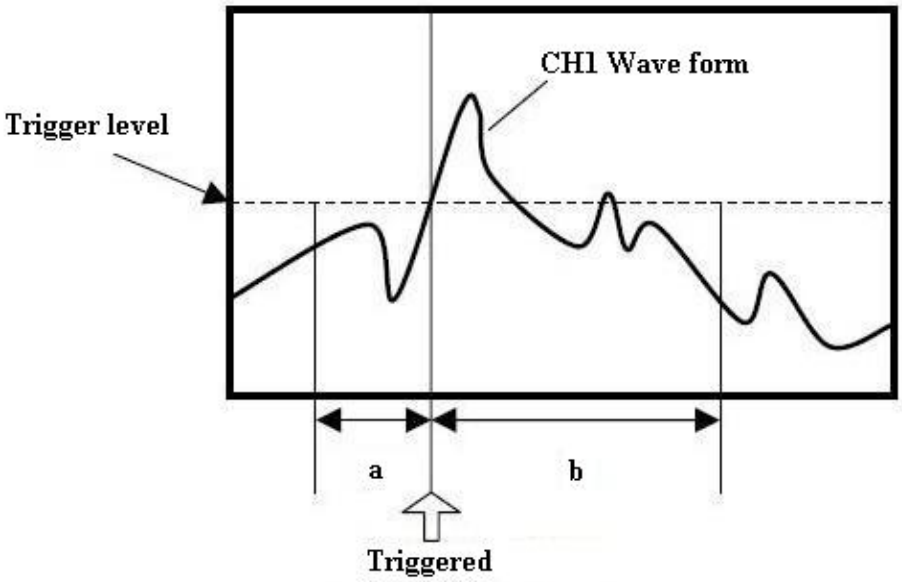
Where, a denotes Pre-Trigger Data
b denotes No. of Data

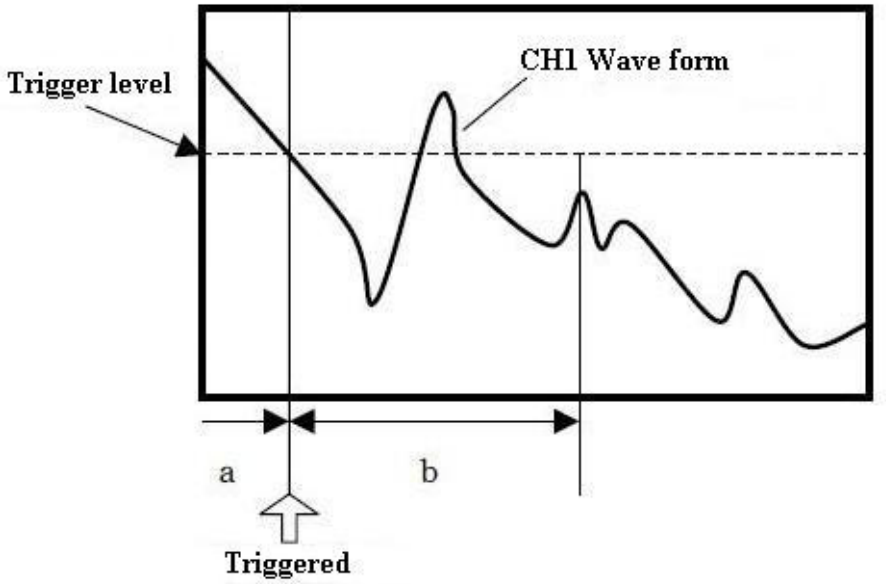
- Example 2 When Trigger Slope is set to **Fall**
  Triggered when waveform of channel 1 lowers the trigger level.
  If the waveform of the channel 1 is smaller than the trigger level from before the time when it is in trigger wait state, the waveform exceeds the trigger level once and it becomes triggered when the waveform lowers the trigger level once again.



Where, a denotes Pre-Trigger Data
b denotes No. of Data

- Example 3 When Trigger Slope is set to both **Rise** and **Fall**
  Triggered when waveform of channel 1 exceeds or lowers the trigger level.





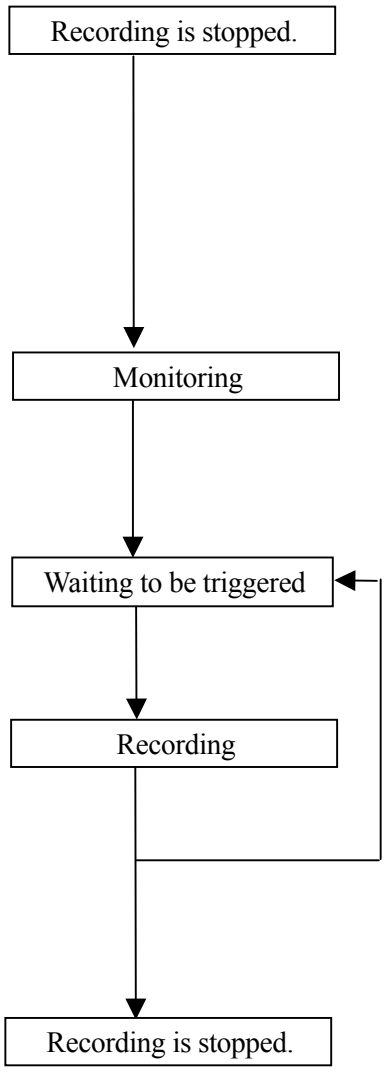
Where, a denotes Pre-Trigger Data
b denotes No. of Data

NOTE

When trigger level is set to a low level, data recording may be triggered with noise.

4.4.3 External Trigger Measurement <Only EDS-400A>

Upon clicking the **Start Record** button on the main window, it becomes in trigger wait state. And when external trigger signal is entered, it starts recording the measured data.
When recording of the specified number of data is completed or when **Stop Record** button is clicked, it stops recording the measured data.



1) Set conditions for each channel.
   (→ 4.3.3 Channel Condition Dialog Box)
2) Set **Measuring Mode** to External Trig.
   (→ 4.3.2 Measurement Control Block)
3) Select **Sampling Freq.**
4) Set **No. Of Data** or **Rec. Time[s]**.
5) Set **Repetition** and **Pre-Trigger Data**.
6) Click **Set EDS** and set EDS-400A measuring conditions.
7) Click **Start/Stop Monitor** to start monitoring data.
8) If required, select and perform **Zero Execute** or **Test Signal ON.**
9) Click **Start Record** to be in trigger wait state.
10) When external trigger signal is entered, it starts recording the measured data.
11) After recording of the specified number of data is completed, it becomes in trigger wait state once again for the number of times preset in **Repetition**.
12) After data recording is completed for the specified number of data preset in **Repetition o**r when **Stop Record** button is clicked, it stops recording data.

NOTE

After clicking the **Start Record** button, no data is triggered even if trigger conditions are satisfied during data processing time (approximately 1 second) until it becomes in trigger wait state

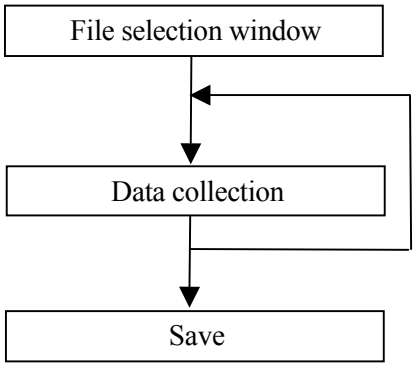
After recording of the specified number of data is completed, no data is triggered even if trigger conditions are satisfied during data processing time (approximately 1 second) until it becomes in trigger wait state once again.

4.5 DATA COLLECTION

4.5.1 Collect from EDS-400A (or EDS-450A)

Data is collected from the EDS-400A (or EDS-450A) via LAN, and then saved in the data file folder selected in **Configuration**. (→ 4.3.11 Configuration Dialog Box)

If data is recorded with multiple units connected, the recorded data will be combined into a single file.



1) Click **Collect Data** and select **Collect from EDS**.
2) Select desired file.
   (→ 4.3.6 File Select Dialog Box)
3) Data is collected from all connected units.
4) Data files are saved.
   When data is collected from multiple units, data files are combined and saved as a single data file.

NOTE

While EDS collects data via on-line, each control switch of the EDS and "CONT.IN" input are locked and inhibited.
When the communication error occurs such as cutting-off LAN signal under data collection, turn off the EDS power switch once to unlock key operation.

MEMO

Data collection time through online when CF card of 128 MB is used. (Reference value)

When data is collected through online from the CF card that is fully recorded with 128 MB data, the required time for collecting data is shown in the following.

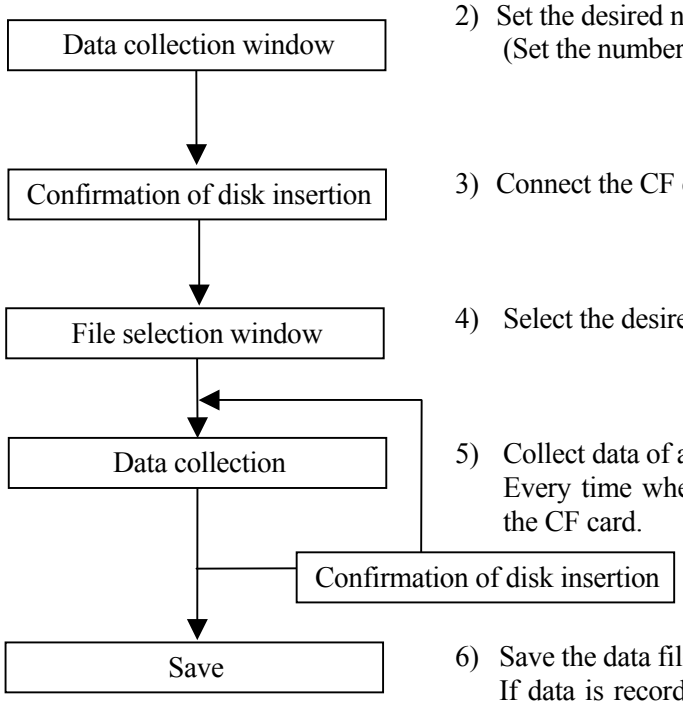
Using 1EDS:	Approx. 8 minutes
Using 2 EDSs:	Approx. 18 minutes
Using 4 EDSs:	Approx. 35 minutes
Using 8 EDSs:	Approx. 1 hour and 20 minutes

* The above times include data merging time.
* Data collection time when the PC is operated on WindowsXP with Celeron(R)2 having memory 504 MB and with transfer speed 100 Mbps.
  Note that data collection time varies with PC processing capacity or data transfer speed.

4.5.2 Collect from CF Card in the PC

Connect the CF card to the PC and collect and save data into a data file folder that is selected in **Configuration**

If data is recorded with multiple units connected, the recorded data will be combined in a single file.

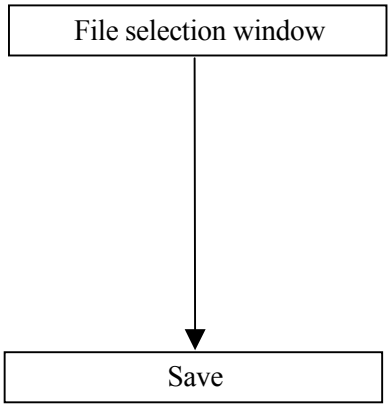


1) Click **Collect Data** button and select **Collect from CF Card**.
2) Set the desired number of CF cards.
   (Set the number of connected EDS units for recording data.)
   (→ 4.3.5 Data Collect Dialog Box)
3) Connect the CF card that was connected to the 1st EDS to the PC.
4) Select the desired file to be collected.
   (→ 4.3.6 File Select Dialog Box)
5) Collect data of all connected units.
   Every time when a message “Insert Xth CF card” appears, replace the CF card.
6) Save the data file.
   If data is recorded with multiple units connected, the recorded data will be combined into a single file

4.5.3 Save Data Displayed in Real-time

The data transferred in real-time via LAN from the EDS-400A (or EDS-450A) to the PC while recording, is saved into a data file folder that is selected in **Configuration**.

(→ 4.3.11 Configuration Dialog Box)



1) While recording data or after data is recorded, select **Real-time** in **Change Disp.** control to display the real-time collection graph. At this time, confirm that the recorded data is displayed on the graph.
(→ 4.3.9 Real-time Collection Graph)

2) Click **Collect Data** button and select **Save Data Displayed in Real-time.**.

3) Save the data file.

NOTE

When data is recorded in manual measuring mode with sampling frequency less than 10 kHz,, the recorded data of all measuring channels is automatically transferred from the EDS-400A (or EDS-450A) to the PC via LAN in real-time.
(Data of channels that is not selected in the real-time collection graph is also transferred to the PC.)

If free space of the hard disk is short or when processing speed of the PC or network speed is low, a message appears indicating that an error occurred when receiving data on the PC side.

When the above message appears, DO NOT SAVE THE REAL-TIME DATA.

However, data recorded in the EDS-400A (or EDS-450A) is not affected by the above error.
Select **Collect from EDS** or **Collect From CF Card** to collect the recorded data.
When monitoring the collected data on the real-time collection graph while recording data with the following settings, you cannot operate the **Change Disp.** button.

Using 8 EDSs:	Set sampling frequency to 500 Hz or more.
Using 7 EDSs:	Set sampling frequency to 1 kHz or more.
Using 6 EDSs:	Set sampling frequency to 2 kHz or more.
Using 4 to 5 EDSs:	Set sampling frequency to 5 kHz or more.
Using 2 to 3 EDSs:	Set sampling frequency to 10 kHz or more.

Forbidden condition for operating the **Change Disp.** button is designated by **EDS.ini** in the same folder as the **EDS400A Control Software** file. For how to change the display, see "6. "CHANGE DISP." BUTTON SETTING FILE."
When using the EDS-450A, it is not necessary to change the preset file.

5 DATA DISPLAY SOFTWARE

The Data Display Software lets you display recorded data on a graph or perform data conversion.

MEMO

To edit and analyze the recorded data, use the DAS-100A Data Analysis Software (separately sold).

~ Main Functions of the DAS-100A Data Analysis Software ~

- Graphically display maximum 8 data files.
- Statistical processing
- Arithmetic operations
- FFT analysis.
- Histogram analysis
- Filtering
- Differential/Integral processing
- Graph display, load/save analysis condition file
- Printing

5.1 STARTING AND EXITING THE SOFTWARE

5.1.1 Starting the Software

Click **Start** on Windows, point to **Programs**, point to **EDS400A** and then click **EDS400A Data Display Software**.

5.1.2 Exiting the Software

Point to **File** on the top left of the main window, and then click **Exit**.

5.2 FUNCTION SPECIFICATIONS

5.2.1 Loading a Record Data File

You can load a file created in the KYOWA standard format (extension: KS2) and display the data on graphs, convert it to CSV format.

5.2.2 Converting a Record Data File to CSV Format

You can specify a data range in the loaded record data file and convert the data in the specified range to CSV format.

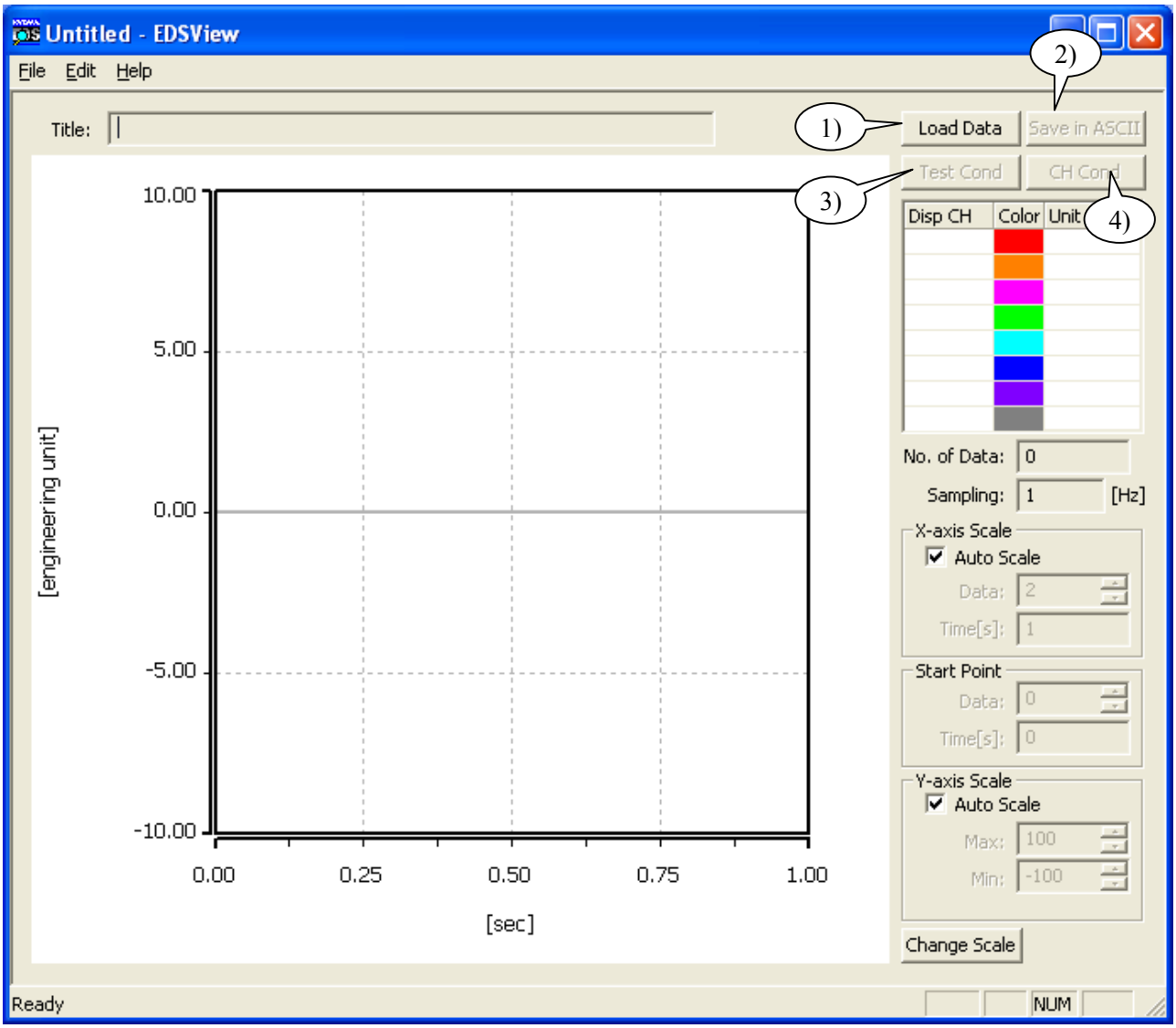
5.2.3 Displaying a Record Data File on Graph

A maximum of 8 channels can be displayed in the form of a single graph.

5.3 WINDOW SPECIFICATIONS

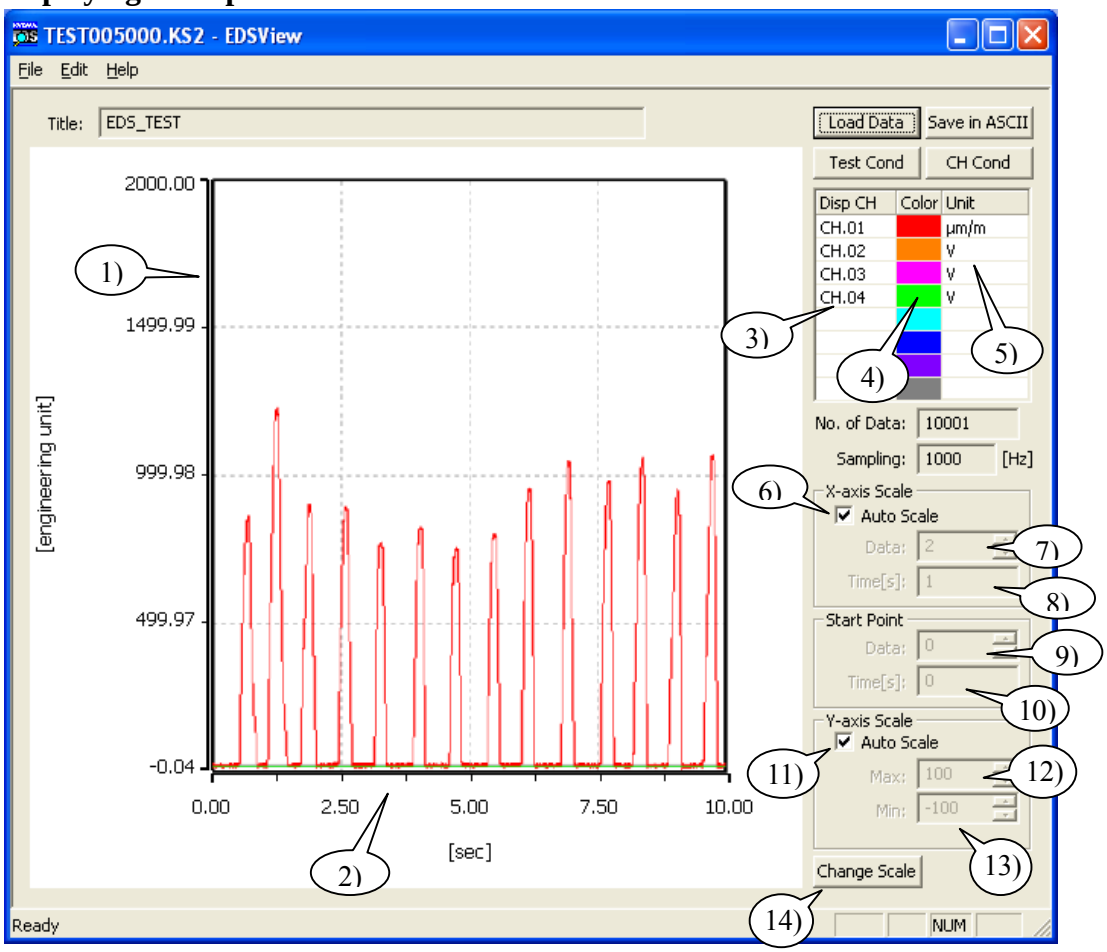
5.3.1 Main Window

This is the initial window to be displayed when the data display Software is started up. On this window, you can load record data files and perform other operations.



1) **Load Data** button: Use this button to load a record data file.
2) **Save in ASCII** button: Use this button to create/save a CSV file.
3) **Test Cond** button: Clicking this button will display the test conditions.
4) **CH Cond** button: Clicking this button will display the channel conditions.

5.3.2 Displaying a Graph



1) Y-axis scale: The Y-axis scale of the graph is displayed.
2) X-axis scale: The X-axis scale of the graph is displayed.
3) **Disp CH**: You can change the channel so that it displays a graph. The channel can be selected as desired.
4) **Line Color**: Use this button to change the line color used for drawing a graph.
5) **Unit**: The unit of the channel shown on the graph is displayed.
6) **Auto Scale**: Set whether or not to use the auto-scale function for the X-axis.
7) **Data**: Set the number of data to be displayed on the X-axis.
8) **Time [s]**: Set the display time for the X-axis.
9) **Data**: Specify the number of data corresponding to the point from which to start displaying the X-axis data.
10) **Time [s]**: Specify the time corresponding to the point from which to start displaying the X-axis data.
11) **Auto Scale**: Set whether or not to use the auto-scale function for the Y-axis.
12) **Max**: Input the maximum Y-axis value.
13) **Min**: Input the minimum Y-axis value.
14) **Change Scale**: The new scale will be applied to the graph.

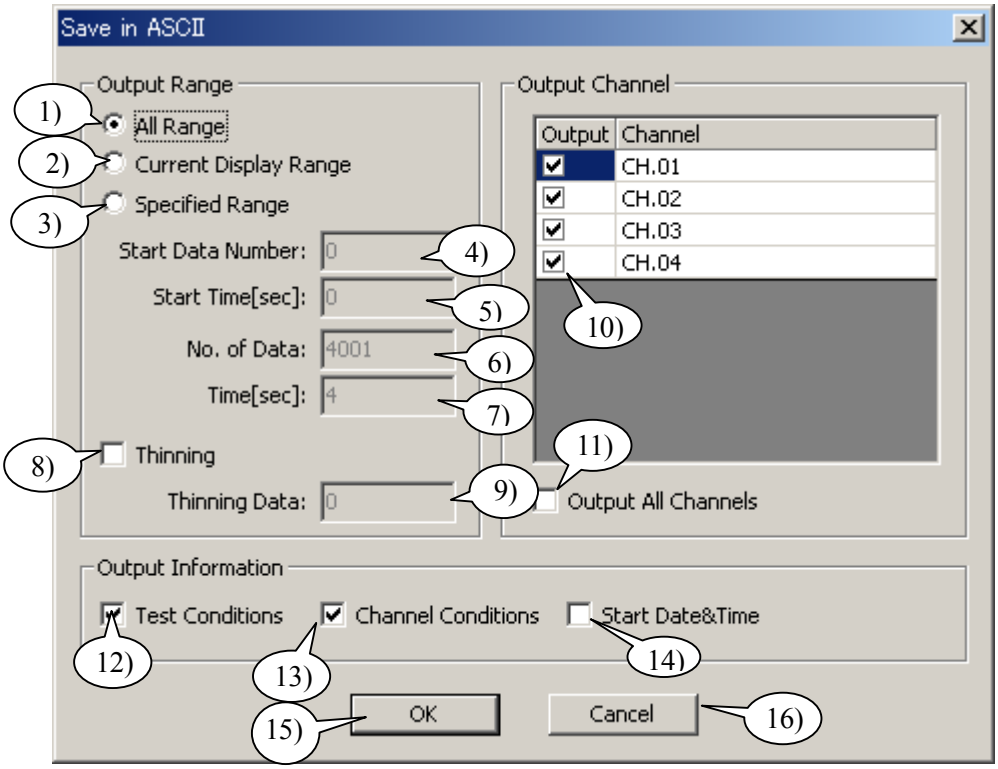
MEMO

All the reproduced data is indicated in physical quantity.
The physical quantity is calculated using the formula below, based on the specified calibration coefficient, offset and range preset for every channel.

$$\text{Physical quantity (unit)} = \frac{\text{Measured data (A-D value)}/}{29789} \times \text{Range} \times \text{Cal coefficient} + \text{Offset}$$

5.3.3 Save in ASCII Dialog Box

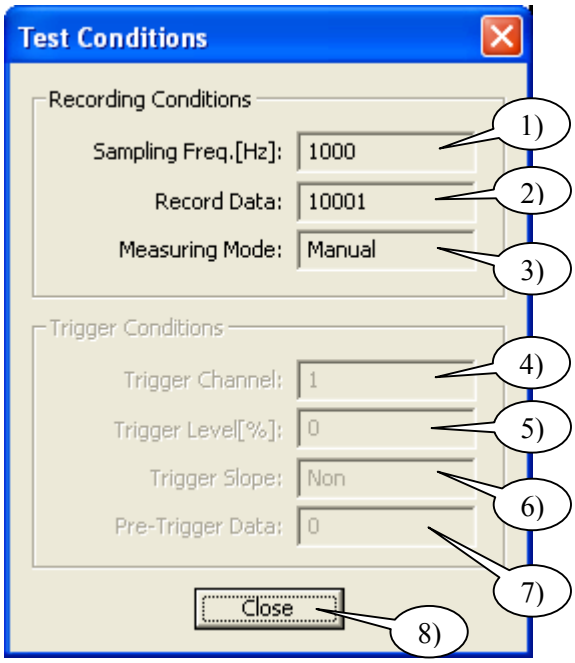
On the main window, click the **Save in ASCII** button to display this dialog box.
This dialog box lets you set the range and channel of data to be output in CSV format and save the data in a CSV file.



1) **All Range**: All data will be output.
2) **Current Display Range**: The range currently displayed on the graph will be output.
3) **Specified Range**: Specify the desired range.
4) **Start Data Number**: Set the data number from which output will start.
5) **Start Time[sec]**: Set the time at which output will start.
6) **No. of Data**: Set the number of data to be output.
7) **Time[sec]**: Set the duration of output.
8) **Thinning**: Select this box to output the data by thinning.
9) **Thinning Data**: Set the intervals at which data is thinned.
10) **Output Channel**: Select the channel you want to output.
11) **Output All Channels**: Select this box to output all channels.
12) **Test Conditions**: Test conditions will be added to the output data.
The conditions to be added include sampling frequency, number of record data, recording mode, trigger channel, trigger level, trigger slope and number of pre-trigger data.
13) **Channel Conditions**: Channel conditions will be added to the output data.
The conditions to be added include range, filter, calibration coefficient and offset. The unit and channel name will always be output, regardless of whether or not this box is selected.
14) **Start Date&Time** Date and time when the recorded data starts outputting data.
15) **OK** button: Clicking this button outputs a CSV file with the specified conditions.
16) **Cancel** button: Clicking this button cancels the ASCII save and close the ASCII dialog box.

5.3.4 Test Conditions Dialog Box

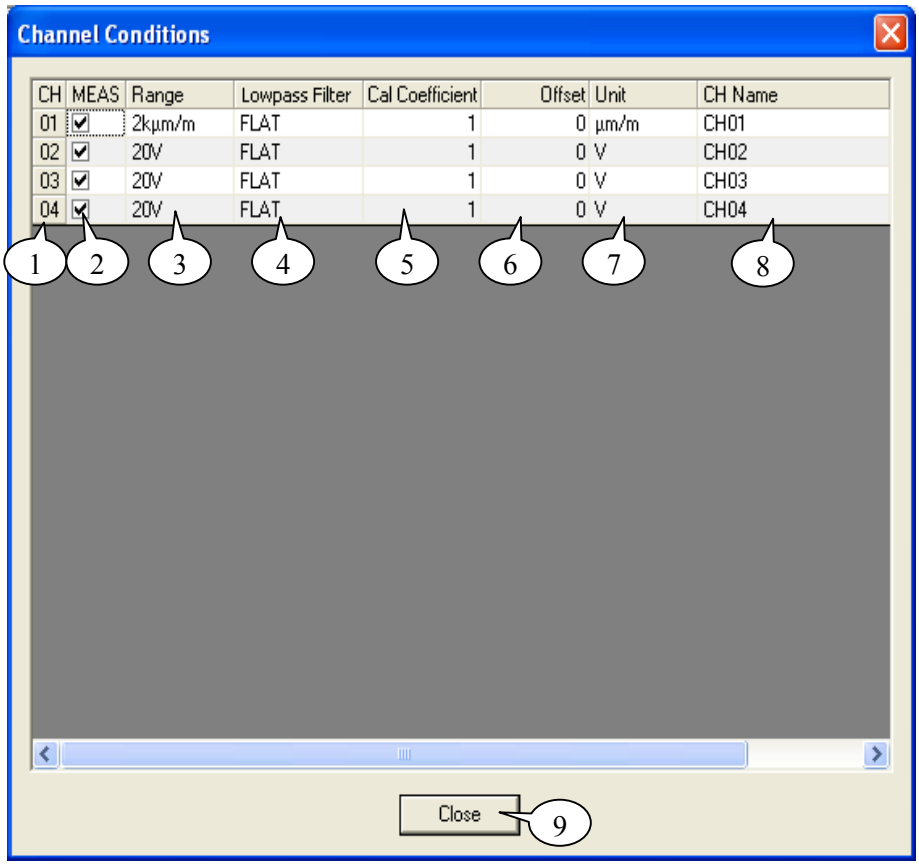
On the main window, click the **Test Conditions** button to display this dialog box.



1) **Sampling Freq.[Hz]**: The sampling frequency used in recording is displayed.
2) **Record Data**: The number of recorded data is displayed.
3) **Measuring Mode**: The measuring mode used in recording is displayed.
4) **Trigger Channel**: The trigger channel used in recording is displayed.
5) **Trigger Level[%]**: The trigger level used in recording is displayed.
6) **Trigger Slope**: The trigger slope used in recording is displayed.
7) **Pre-Trigger Data**: The number of pre-trigger data used in recording is displayed.
8) **Close:** Clicking this button will close the **Test Conditions** dialog box.

5.3.5 Channel Conditions Dialog Box

On the main window, click the **Channel Conditions** button to display this dialog box.



1) **CH**: The channel number is displayed.
2) **MEAS**: The measured channel is checked.
3) **Range**: The measurement range of each channel is displayed.
4) **Low pass Filter**: The low-pass filter of each channel is displayed.
5] **Cal Coefficient**: Calibration coefficient of the selected channel is displayed.
6) **Offset**: Offset of the selected channel is displayed.
7) **Unit**: **U**nit is displayed.
8) **CH Name**: **C**omment string assigned to each channel is displayed.
9) **Close** button: Clicking this button will close the **Channel Conditions** dialog box.

MEMO

All the reproduced data is indicated in physical quantity.
The physical quantity is calculated using the formula below, based on the specified calibration coefficient, offset and range preset for every channel.

$$\text{Physical quantity (unit)} = \frac{\text{Measured data (A-D value)}}{29789} \times \text{Range} \times \text{Cal Coefficient} + \text{Offset}$$

6 “CHANGE DISP” BUTTON SETTING FILE

While recording data by selecting the real-time collection graph with the following conditions, this Software is designed to forbid the operation of **Change Disp**. button.
To change the settings, rewrite **EDS.ini**. file in **C:/Program Files/EDS400A** folder.
When using the EDS-450A, it is not necessary to change the preset folder.

- Using 8 EDSs: Set sampling frequency to 500 Hz or more.
- Using 7 EDSs: Set sampling frequency to 1 kHz or more.
- Using 6 EDSs: Set sampling frequency to 2 kHz or more.
- Using 4 to 5 EDSs: Set sampling frequency to 5 kHz or more.
- Using 2 to 3 EDSs: Set sampling frequency to 10 kHz or more.

6.1 STARTING AND EXITING “CHANGE DISP” BUTTON SETTING FILE

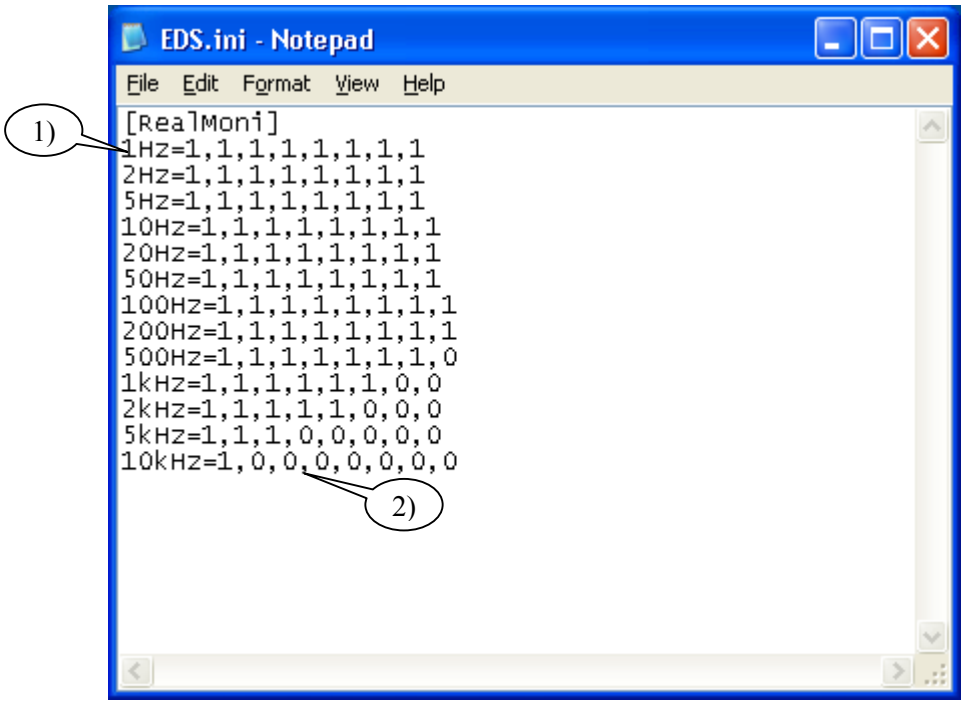
6.1.1 Starting the File

Start Windows Explorer, select menus in due order from **C drive**, **Program Files**, and **EDS400A** folder that is set for installing the EDS Control Software. And then, open **EDS.ini** file by using the **Notepad** program.

6.1.2 Exiting the File

After changing the desired setting, point to **File** and click **Save** to save the changed settings and then click **Exit.**

6.2 CHANGING SETTINGS OF "CHANGE DISP" BUTTON



1) **Sampling Frequency** Sampling frequency set for data recording conditions.
Do not change the determined numeric.

2) Number of Sync Operation Unit

The number of "1"s lined up from the left indicates the number of EDS-400As that allows the use of **Change Disp**. button.

Change the number of "1"s for every sampling frequency and set the number of EDS-400As that allows the use of **Change Disp**. button. Among the eight EDS-400As, input "0" for the rest of the EDS-400As.

Ex.) 2 kHz = 1,1,1,1,0,0,0,0

Suppose sampling frequency is set to 2 kHz. Using **Change Disp**. button is allowed for up to 4 EDS-400As during recording data by selecting real-time collection graph.

NOTE

Continuously input "1" from the left. Do not input "0" between "1"s or other numeric or no correct setting is available.

Assume that the large number of EDS-400As that allow the use of **Change Disp.** button is set. When pressing the **Change Disp**. button while recording data on the real-time collection graph, certain operations such as **Stop Record**, etc. may become faulty due to PC's processing capacity or transfer speed and the Software may freeze. At this time, execute **Stop Record** with **Start/Stop** button of the EDS-400A.

After changing the settings, press the **Change Disp.** button while recording data on the real-time collection graph and operate the EDS-400A by taking special care of the Software not to freeze.

7 ERROR MESSAGES

7.1 SOFTWARE ERROR MESSAGES

Error Messages	Description and Countermeasures
Cannot connect to xxx.xxx.xxx.xxx.	The following causes are suspected: No power is supplied to the EDS-400A (or EDS-450A). The EDS-400A (or EDS-450A) and the PC are not interconnected via LAN. The IP address of the EDS-400A (or EDS-450A) is different from the IP address set in the PC. Check the connection.
ID:xx network error	This message is displayed when the PC cannot connect to the EDS-400A (or EDS-450A) and the communication attempt fails. Retry LAN connection to the EDS.
Network error	
There is no recording channel.	Specify a recording channel
There is an EDS with no measuring channel.	Each EDS-400A (or EDS-450A) must have at least one recording channel. Check the channel conditions.
Too many channels for the sampling frequency	The maximum number of measuring channels allowed for each sampling frequency is shown below. 100kHz 1CH 50kHz 2CHs 20kHz 4CHs
File name is not specified.	File name to be saved in the EDS-400A (or EDS-450A) is not specified. Specify a file name.
File is not selected.	No file for data collection has been selected.
Test condition file [condition.ks2] cannot be transferred to the EDS.	Free space of the CF card inserted in the EDS-400A (or EDS-450A) is short, or the CF card cannot be used.
There is no space for real-time transfer.	Disk free space is short. Delete any unnecessary files.
There is not enough disk space.	
There is no work space.	
Data cannot be copied to the work space.	
Data file cannot be saved.	
CF card drive is not specified.	A drive is not specified for the CF card connected to the PC. On the **File** menu, specify the drive via Configuration.
There is no measured data.	Measured data is not included in the collected data. This error occurs when the data described below is collected. The data for which recording was stopped prior to trigger input, when an analog trigger or external trigger was set.

7.2 ERROR MESSAGES FROM THE EDS-400A (or EDS-450A)

Error Messages	Description and Countermeasures
(101) Command cannot be accepted during measurement.	A command has been issued that can only be used when measurement is not being performed.
(103) Measurement is not in progress.	A command has been issued that can be used only during measurement
(105) Measurement failed	This error occurs when the CF card speed is slow and data cannot be written. Use a high-speed CF card or decrease the sampling frequency.
(106) Buffer over for real-time data transfer	This error occurs when the PC processing speed or LAN speed is slow. Data transfer to the PC will be stopped but the EDS will continue recording.
(201) CF card is not inserted	Insert a CF card.
(202) CF card error	The CF card cannot be accessed. Insert a valid CF card.
(203) Insufficient CF card capacity	Delete unnecessary data from the CF card to maximize the available space.
(204) CF card directory is full with files.	There are too many files in the CF card. Delete any unnecessary data.
(301) Specified channel not found	Check the measurement/trigger channel information.
(302) Invalid measuring conditions	The measuring conditions contain error.
(501) Condition file cannot be opened.	This error occurs when no condition file (condition.ks2) is present when the READ button is pressed on the EDS. Write a condition file to the CF card.
(502) Invalid condition file	The content of the condition file (condition.ks2) is invalid.
(xxx) Undefined error	Report the code (shown in parentheses) to KYOWA.

8 SPECIFICATIONS

8.1 FUNCTIONAL OVERVIEW

This Software is operated on English Windows 2000/XP and allows the EDS-400A (or EDS-450A) to be controlled from the PC.
It lets the user set measuring conditions, record data, display graphs, convert data to CSV format, and so on.
Communication between the EDS-400A (or EDS-450A)and PC uses a LAN interface.

8.2 FUNCTIONS

- Set measuring conditions
- Control measurement execution
- Record data
- Monitor data
- Display graph
- Save/load measuring conditions
- Display recorded data on a graph and convert the data format

8.3 SETTING MEASURING CONDITIONS

Measuring targets:	Strain gage, strain-gage type transducer, voltage
Number of measuring channels:	Maximum 32 (EDS-400A x 8 units)
Sampling frequency:	1, 2, 5, 10, 20, 50, 100, 200, 500 Hz 1, 2, 5, 10, 20, 50, 100 kHz
Measuring modes:	Manual measurement, analog trigger measurement, external trigger measurement

7

8.4 MEASURING CHANNEL CONDITIONS

Measurement execution:	Enable measurement for each channel.
Range	Set a range for each channel. Strain: 1000, 2000, 5000, 10000, 20000 μm/m Voltage: 1, 2, 5, 10, 20 V and OFF
Low-pass filter:	Set a low-pass filter for each channel. Flat (20 kHz), 2 kHz, 200 Hz, 20 Hz
Calibration coefficient:	Set the value to be the multiplier of the measured data for each channel.
Offset:	Set the offset to add to the measured data of each channel (data after multiplying the calibration coefficient).
Unit:	Set the unit of measured data for each channel. Select from 60 preset units or input another unit as desired.
Channel name:	A comment can be input for each channel.
Zero suppression:	Set the zero suppression ON or OFF for each channel.

8.5 SAVING/LOADING MEASURING CONDITIONS

You can save measuring conditions and measuring channel conditions in a measuring condition file under the desired file name. Loading an applicable measuring condition file lets you reset the desired measuring conditions as used in the past.

8.6 DISPLAYING MONITORED DATA ON A GRAPH

You can display monitored data on a waveform graph or bar graph.

Waveform graph:	A graph on which the X-axis represents the number of monitored data. A maximum value of 1200 can be set as the number of displayable data. A maximum of eight channels can be displayed on a graph (with numeric data displayed simultaneously).
Bar graph:	A graph on which the X-axis represents the display channel. A maximum of eight channels can be displayed on a graph (with numeric data displayed simultaneously).
Real-time collection graph:	A graph on which the X-axis represents the number of recorded data. A maximum of eight channels can be displayed on a graph (with numeric data displayed simultaneously).

8.7 MEASURING MODES

You can select the desired measuring mode from manual measurement, analog trigger measurement or external trigger measurement.

Manual measurement:	Clicking the Start Record/Stop Record button will begin the recording of measurement data. Measured data corresponding to the specified number of record data will be saved in the EDS-400A (or EDS-450A). If the sampling frequency is 10 kHz or less, real-time data collection will be performed automatically.
Analog trigger measurement:	The recording of measurement data will start when the specified trigger channel satisfies the trigger conditions. Measured data corresponding to the specified number of record data will be saved in the EDS-400A (or EDS-450A) .
External trigger measurement:	The recording of measurement data will start when an external trigger signal is input. Measured data corresponding to the specified number of record data will be saved in the EDS-400A. Note that the EDS-450A is not provided with this external trigger function.

8.8 DATA REPRODUCTION

You can display a record data file on a graph or convert the data to CSV format.

Waveform graph:	A maximum of eight channels can be displayed.
File conversion to CSV format:	The data in the specified range can be extracted and converted to and saved in CSV format.

8.9 FILE TYPE

Measuring condition file:	Extension: E4C
Record data file:	KYOWA standard format (extension: KS2)