

INSTRUCTION MANUAL
EDX-5000A
MEMORY RECORDER/ANALYZER
[For EDX-3000B compatible software]

Thank you for purchasing KYOWA's product EDX-5000A.

Read this Instruction Manual carefully in order to make full use of the high performance capabilities of the product.

Do not use the product in methods other than described in this Manual

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Notations used in the instruction manual

This Manual describes the operation and functions of the ELA-55A software (EDX-3000B compatible software) running on the EDX-5000A.

Certain notations are used as necessary to attract your attention to information that requires special care when handling the product, and to information provided for reference purposes.

NOTE

Essential precautions required when handling the ELA-55A.

MEMO

Reference items required when handling the ELA-55A.

For the EDX-5000A, see separate volume of "EDX-5000A MEMORY RECORDER/ANALYZER INSTRUCTION MANUAL (FOR HARDWARE)."

Important safety instructions for using the ELA-55A

1. Prohibited matters

- Both the ELA-55A and the ETA-55A (operating software for the EDX-5000A device) cannot be started up concurrently on the EDX-5000A.
- Reverse engineering the ELA-55A is prohibited.

2. Precautions for use

- The ELA-55A interface assumes the use of a mouse and keyboard.
Connect a mouse and keyboard to USB ports on the EDX-5000A to use the ELA-55A.
- The ELA-55A is to be used with the EDX-5000A. The ELA-55A is not guaranteed to function properly on other PCs.
- Response times may slow down depending on the number of numeric windows/graph windows displayed. If the response feels laggy, reduce the number of numeric windows/graph windows displayed.
- To startup the ELA-55A from the desktop screen, select the ELA-55A startup icon from the Start menu.

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1 Outline

This Instruction Manual describes method for controlling the EDX-5000A by using the ELA-55A.

Connect sensors

Connect a sensor to the dedicated input cable.
Connect the dedicated input cable to the EDX-5000A conditioner card.

Connecting a mouse and keyboard

Connect a mouse and keyboard to USB ports on the EDX-5000A.

Start the EDX-5000A

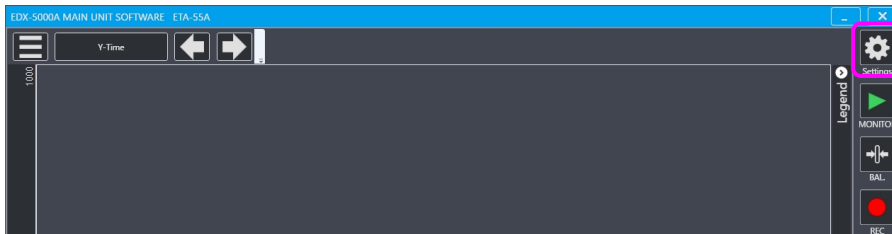
POWER button



Hold down the POWER button on the front of the EDX-5000A for two seconds or more to startup the EDX-5000A.

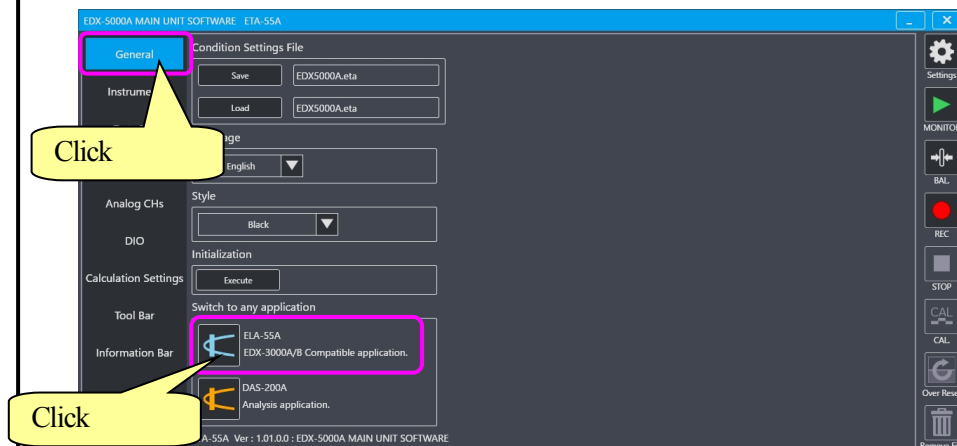
Switching to the ELA-55A

When the ETA-55A (EDX-5000A device software) starts up, select “Settings” on the toolbar.



Select the “General” tab to display the “General” screen.

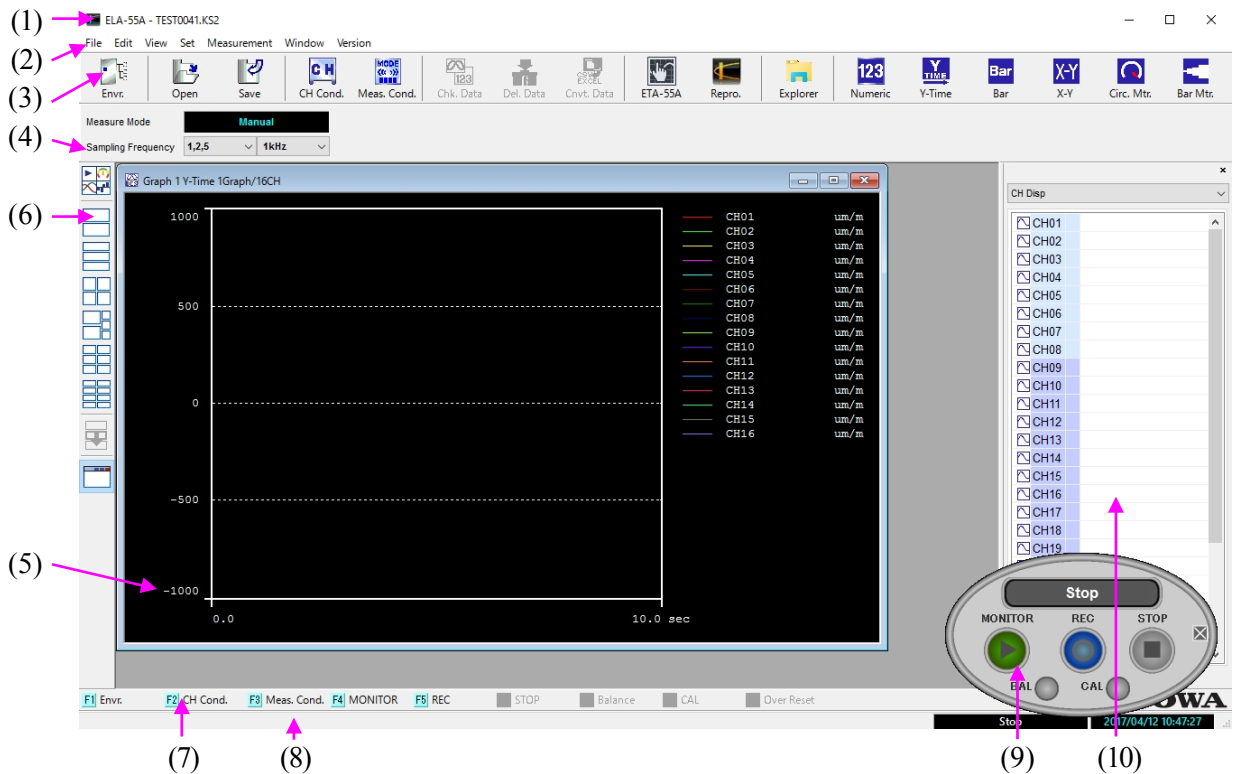
Under “switch the application”, select “ELA-55A” to start up the ELA-55A.



Starting up the ELA-55A will shut down the ETA-55A.

Starting up the ELA-55A

Starts the EDX-5000A and the following main window appears.



- | | |
|--------------------------|---|
| (1) Main Title Bar | Displays model, setting of synchronous operation, data file name, and file title. |
| (2) Menu Bar | Provided with pull-down menus. |
| (3) Tool Bar | Icons of various menu bar functions are displayed.
You can add, remove, and sort icons arbitrary. |
| (4) Meas Mode Bar | Displays current Meas mode, sampling frequency, the number of recorded data, and recording time. |
| (5) Window | Data is numerically displayed or is displayed on a graph. |
| (6) Window Display Bar | For sorting windows and for showing or hiding the title bar of the window. |
| (7) Function Key Bar | Displays the registered tool bar buttons on the function key.
You can add or remove the registered tool bar button arbitrary. |
| (8) Status Bar | Displays measuring state, recording state and the current time. |
| (9) Meas Operation Panel | Measures the data by using buttons on the Meas Operation Panel with a feeling like using a remote controller. |
| (10) CH Display Bar | Displays the current measuring channels or data checking channels.
You can set the target CH on the display by dragging the target CH. |

Setting environment

Click the File - Environment... or click the **Envr** icon from the toolbar to open the Set Environment window.
Click the "Configuration" tab and set items in the Synchronous operation and Control mode.
Click the **OK** button to close the window.

Channel conditions

Click the Set - Set CH Condition... or click the **CH Cond** icon from the toolbar to open the Set CH Condition window.

Click the [Analog CH] tab, set the Mode, Range, Calibr. const., Unit, etc. for every CH on the Set CH Condition window.

Click the [DIO] tab, set the digital input/output port (DIO port) on the Set CH Condition window.

After the internal sensitivity compensation, click the **OK** button to close the window.

Measuring conditions

Click the Set - Set Measure Condition... or select the **Meas. Cond** icon from the toolbar to open the Set Measure Condition window.

Click the [Measure Mode] tab.

Set Measure Mode, Sampling Frequency, and Number of data/CH on the [Measure Mode] tab.

Click the [Data File] tab.

Set the Data Save Folder, File Name, and File No. on the [Data File] tab.

Click the **OK** button to close the window.

Display windows

Click the Window and a desired window or click the desired icon from the toolbar to display the target data window.

Measure data

Click the **MONITOR** button on the Meas Operation Panel.

The measurement starts and the EDX-5000A becomes monitoring state. The measured data appears on windows.

If the **REC** button is pressed, the recording of measured data starts according to the Measure mode.

Click the **STOP** button or after finishing recording the data for the pre-set Number of data/CH, the EDX-5000A gets back to monitoring state.

For measuring the data again, click the **MONITOR** button.

Checking Data

Click the Measurement – Latest Recorded Data File or click the Check Data icon from the toolbar to display the data checking dialog box.

For unnecessary data, click the Measurement – Delete the Latest Recorded Data File or click the Del Data icon from the tool bar for deleting.

For measuring the data again, click the **MONITOR** button.

Reproducing data, analysis

To display the recorded data in detail, to cut out, to convert file and to analysis the recorded data, click the File – Reproduce Data... or Repro. icon from the toolbar for reproducing the data.

Exiting the EDX-5000A

Press the **POWER** button on the front panel for 2 seconds while monitoring the data and the EDX-5000A exits.

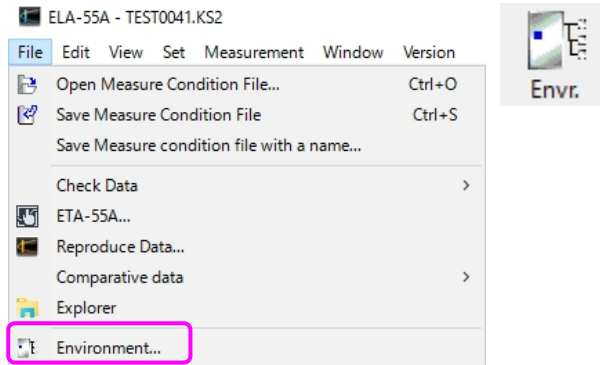
The next time you reboot the EDX-5000A, the EDX-5000A starts with the measuring conditions and window at the end of the previous exit.

2 Setting environment

This section describes how to set recording, the card configuration, and the real-time processions.

Open the Set Environment window by any of the following.

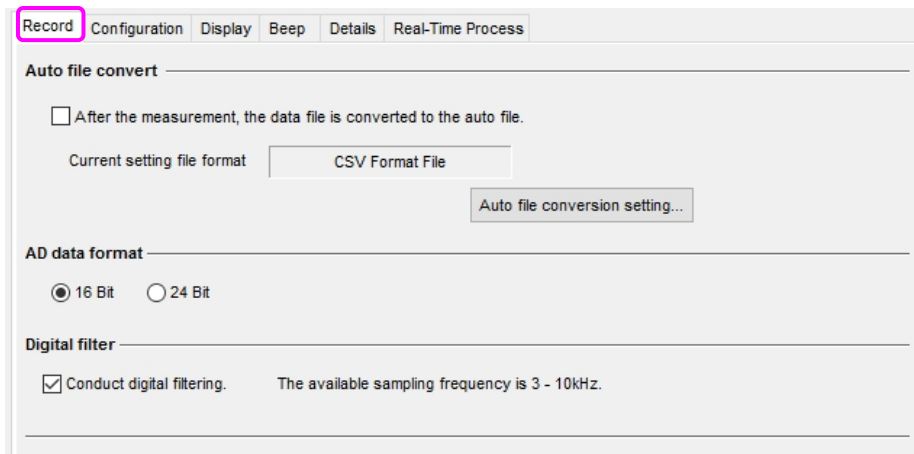
- Click the File - Environment....
- Click the **Envr.** icon from the toolbar.



2 - 1 [Record] tab

This section describes how to set convert the data file after the measurement.

Click the [Record] tab.



■Converting the data file after the measurement

To automatically convert the KS2 file format to another after the measurement, put a check mark to the check box next to the "After the measurement, data is automatically converted into CSV format file."

Click the **Set Automatic Conversion...** button and the following Set Conversion window appears.
Set conditions on the Set Conversion window.

NOTE

Before executing the CAN/analog data conversion, check the following.

The EGPC-50A is mounted in the EDX-5000A.

One or more check marks exists on the "Measurement" column on the ECAN Condition Setting window.

File conversion examples

File Format	Original file name	Data Save file name
CSV Format File	TEST0000.KS2	TEST0000.CSV (NOTE 1)
XLS Format File	TEST0000.KS2	TEST0000.XLS (NOTE 1)
XLSX Format File	TEST0000.KS2	TEST0000.XLSX (NOTE 1)
RPCIII Format File	TEST0000.KS2	TEST0000.rsp (NOTE 2)
Data conversion:CAN-Analog	TEST0000.KS2 TEST0000.E4A	TEST0000_CA.KS2 (NOTE 3)

(NOTE 1) When recording the CAN data, the ELA-55A also saves the CAN data of the TEST0000.E4A in the same Data Save folder.

(NOTE 2) When recording the CAN data, the ELA-55A does not save the CAN data of the TEST0000.E4A.

(NOTE 3) When recording the CAN data, the ELA-55A also saves the CAN data of the TEST0000.E4A in the same Data Save folder.

The ELA-55A also saves the CAN data of the TEST0000.E4A as the analog channel data.

■AD data format

Select the AD data format.

16 Bits/24 Bits

■Digital filtering

Apply digital filtering to reduce the amount of noise during data acquisition.

Select the “Apply digital filtering.” check box to apply digital filtering.

NOTE

The sampling frequencies available for selection are limited to within the 3 to 10 kHz band when applying digital filtering.

2 - 2 Setting Configuration

A computer name, version, IP address, and information of conditioner cards are displayed on the **Configuration** dialog box.

Record
Configuration
Display
Beep
Details
Real-Time Process

Computer Name	Version	IP Address	Check Device	Card	Option Card
edx-5000a-123	1.01	172.17.32.146	Flash	CVM-40A	Not installed
				CDV-40AS1	
				CDV-40A-F M15	
				CDV-40A	

Read the configuration of the connecting devices...
Detailed information...

Synchronous operation

Standalone
Synchronous master (ID No. : 0)
Synchronous slave

☒
☐
☐
ID No. 1

The number of connecting slaves 1

Slave-EDX model EDX-5000A
The number of connecting EDX-5000A 0

Control mode

Offline
Online

☒
☐

Switchover Oscillator

☒ Internal
☐ External
Switchovers oscillator when DPM card exists in the conditioner card.

2 - 2 - 1 Synchronous Operation

Synchronous operation

☒ Standalone
 ☐ Synchronous master (ID No. : 0)
 ☐ Synchronous slave

The number of connecting slaves: 1

Slave-EDX model: EDX-5000A
 The number of connecting EDX-5000A: 0

Select the synchronous operation of the EDX-5000A.

“Standalone”

For using only one EDX-5000A.

“Synchronous master”

For using multiple EDX-5000A units in synchronous operation with the target EDX-5000A as master unit.

If the “Synchronous master” is checked, it is required to set the number of slave units of the EDX-5000A.

Synchronous master (ID No. : 0)

☒

The number of connecting slaves: 1

Slave-EDX model: EDX-5000A

“Synchronous slave”

For using multiple EDX-5000A units in synchronous operation with the target EDX-5000A unit as a slave.

If the “Synchronous slave” is checked, it is required to set the ID No.

Synchronous slave

☒

ID No.: 1

The number of connecting EDX-5000A: 0

For synchronous operating the multiple EDX-5000A units, set any one EDX-5000A to the master and others to slave units.

In addition, it is required to set all the ID numbers of the slave units to different ID numbers.

Example of configuration when using 3 EDX-5000A units in synchronous operation is described as follows.

Between the CONT.OUT terminal on the rear panel of the master EDX-5000A and CONT.IN terminal on the rear panel of the slave EDX-5000A and between their CONT.OUT terminal on their rear panel of the slave EDX-5000A and CONT.IN terminal on the rear panel of the slave EDX-5000A are connected with the synchronous cables.

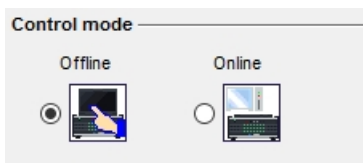


Synchronous cable: —

NOTE

- Update all EDX software and firmware that perform synchronous operation to the latest version.
For the latest version, refer to our website (<https://www.kyowa-ei.com>).
- Match the AD data format of all EDXs that perform synchronous operation.
- When synchronizing using conditioner card DPM-42B/A (-F) or DPM-42B-I (-F), synchronization settings of the oscillator signal may be required depending on the measurement status.
For details, refer to the separate volume “INSTRUCTION MANUAL EDX-5000A MEMORY RECORDER/ANALYZER (FOR HARDWARE) 4-3-1 Connectings and Settings for Synchronous Operation”.
- Some features are disabled during synchronous operation.
For details, refer to the separate volume “INSTRUCTION MANUAL EDX-5000A MEMORY RECORDER/ANALYZER (Main Unit Software Manual) Chap. II Section 4.2 Limitation and precautions”.
- When performing synchronous operation using different EDX models, supported connection methods are limited.
For details, refer to the precautions in the separate volume entitled "INSTRUCTION MANUAL EDX-5000A MEMORY RECORDER/ANALYZER (FOR HARDWARE) 4-3-2 Precautions when synchronizing different models".

2 - 2 - 2 Control Mode



Click the control mode of the EDX-5000A.

“Offline” For operating the EDX-5000A by itself.

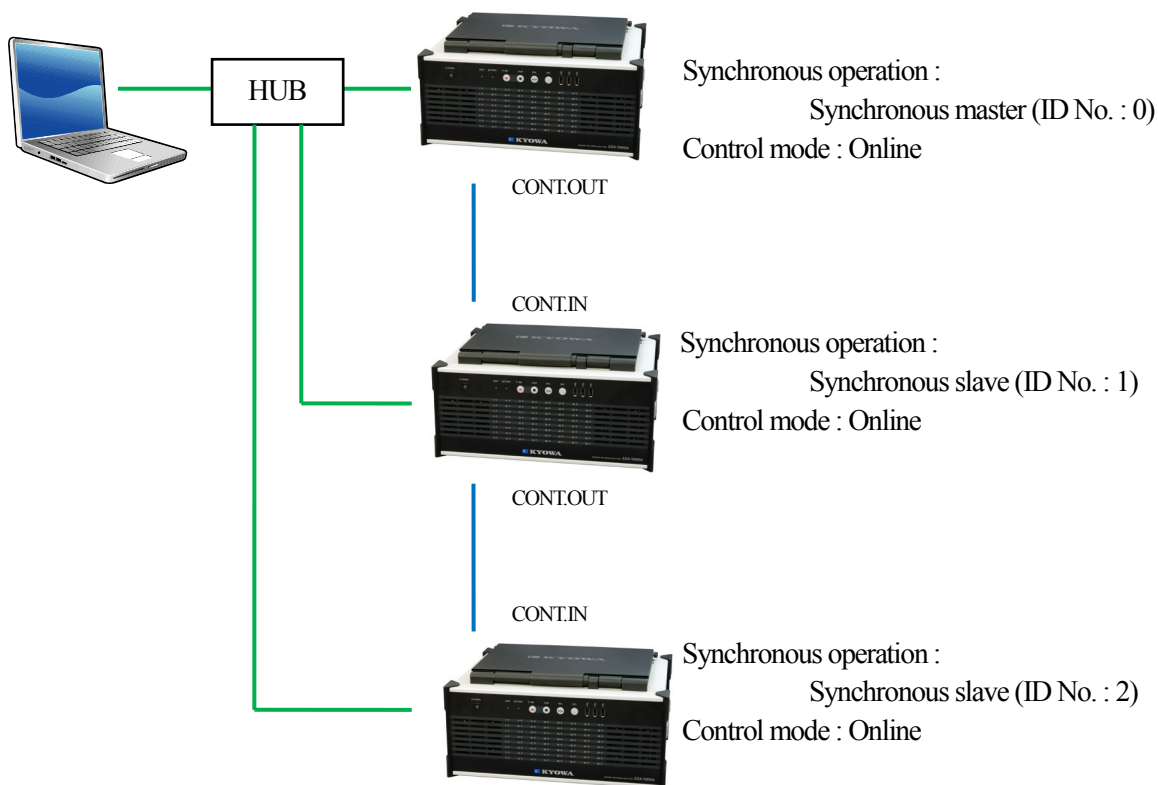
“Online” For operating the EDX-5000A by using the installed software (DCS-100A) in the PC.

For operating the EDX-5000A with the DCS-100A, set the control modes of all EDX-5000A units to **Online** and set synchronous operation of all EDX-5000A units to **Synchronous master** or **Slave**.

■ **Example 1 :** For operating one EDX-5000A with the DCS-100A.



■ **Example 2 :** For operating three EDX-5000A units with the DCS-100A.



Synchronous cable : —

LAN cable : —

2 - 2 - 3 Switchover Oscillator

Switchover Oscillator

☒ Internal ☐ External Switchovers oscillator when DPM card exists in the conditioner card.

Switch the oscillator when using the DPM card as the conditioner card.

“Interior” or “Exterior”

2 - 2 - 4 Detailed information

Read the configuration of the connecting devices...

Detailed information...

Click the **Detailed information..** button.

The following Detailed information window appears.

You are able to check the EDX-5000A information.

Detailed information

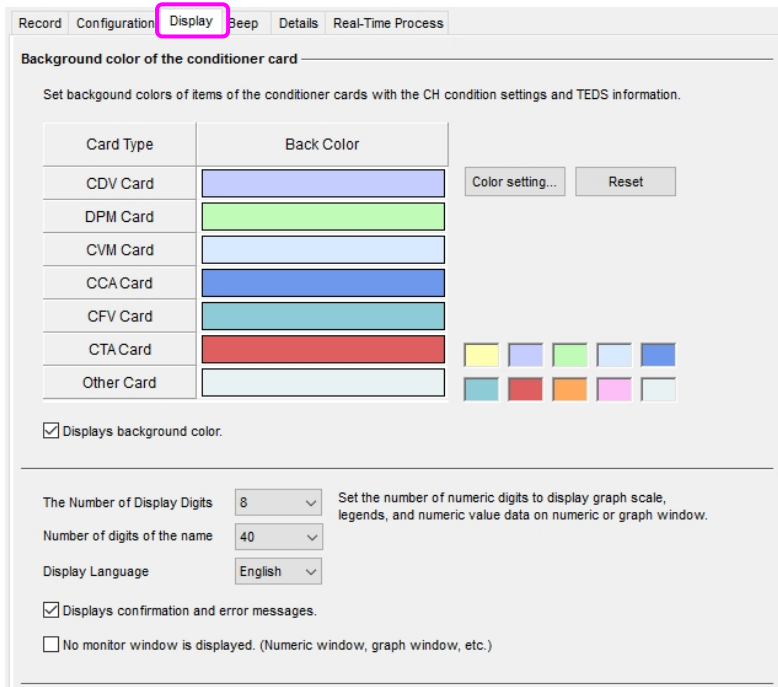
Computer Name	Info
edx-5000a-123	1:CVM-40A (KYWCV000) 0027:4
	2:CDV-40AS1 (348050034) 000B:0
	3:CDV-40A-FM15(KYWCDV000) 0016:6
	4:CDV-40A (348050013) 0002:0
	5:***
	6:***
	7:***
	8:***
	9:***
	10:***
	EMF-55A Firm Ver : 1.01
	MSY-55A FPGA Ver : 0101
	SUB-55A FPGA Ver : 01.00 ROM Ver : 01.00.00
	DLP-80A FPGA Ver : 0001

Save...

Close

2 - 3 [Display] tab

This section describes how to set display conditions.
Click the [Display] tab.



Card Type	Back Color
CDV Card	Light Blue
DPM Card	Light Green
CVM Card	Light Blue
CCA Card	Blue
CFV Card	Teal
CTA Card	Red
Other Card	Light Blue

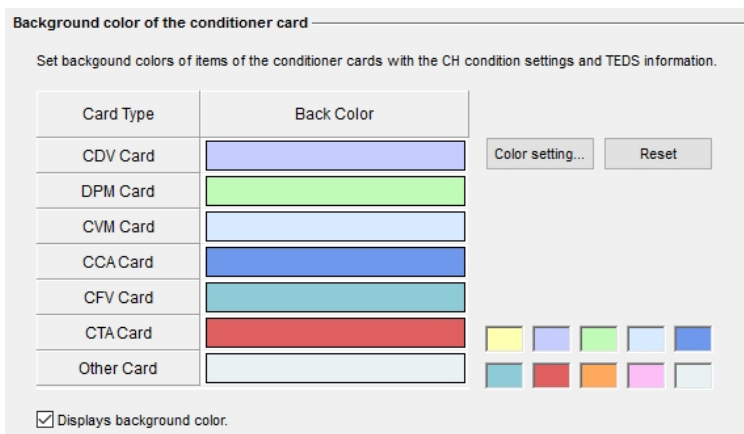
☒ Displays background color.

The Number of Display Digits: 8
Number of digits of the name: 40
Display Language: English

☒ Displays confirmation and error messages.
☐ No monitor window is displayed. (Numeric window, graph window, etc.)

2 - 3 - 1 Background color of the conditioner card

Sets the background colors of every conditioner card on the Set CH Condition window.



Card Type	Back Color
CDV Card	Light Blue
DPM Card	Light Green
CVM Card	Light Blue
CCA Card	Blue
CFV Card	Teal
CTA Card	Red
Other Card	Light Blue

☒ Displays background color.

Color setting... button

Click the target color on the Color dialog box to set the background color of the target conditioner card.

Reset button

Resets the item to the default status.

To valid the settings of the background color on the Set CH Condition window, put a check mark to the check box next to the "Displays background color."

[Operation example 1]

This section describes how to change the background color of the CDV card by using the background color list.

(1) Click the current background color of the CDV card.

Card Type	Back Color
CDV Card	
DPM Card	
CVM Card	
CCA Card	
CFV Card	
CTA Card	
Other Card	

Click

(2) Click the target color from background color list.



(3) The background color of the CDV card is changed.

Card Type	Back Color
CDV Card	
DPM Card	
CVM Card	
CCA Card	
CFV Card	
CTA Card	
Other Card	

[Operation example 2]

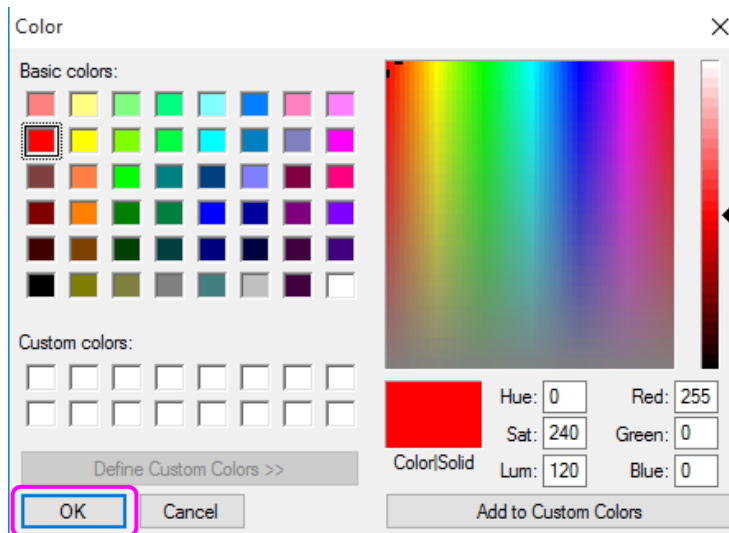
This section describes how to change the background color of the CDV card by using the Color dialog box.

- (1) Click the current background color of the CDV card.
- (2) Click the Color setting... button or double-clicks the background color of the CDV card.

The Color dialog box appears.



- (3) Click the target color on the Color dialog box and click the OK button.



- (4) The background color of the CDV card is changed.

Card Type	Back Color
CDV Card	
DPM Card	
CVM Card	
CCA Card	
CFV Card	
CTA Card	
Other Card	

2 - 3 - 2 The number of display digits

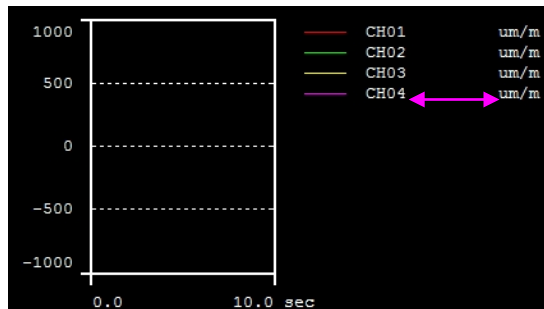
The Number of Display Digits	8	Set the number of numeric digits to display graph scale, legends, and numeric value data on numeric or graph window.
Number of digits of the name	40	
Display Language	English	

Set the number of numeric digits to display graph scale, legends, and numeric value data on Numeric windows/Graph windows. (Range: 6 to 11 digits)

If the number of numeric values exceeds the specified numeric display range, it shall be expressed in exponential notation.

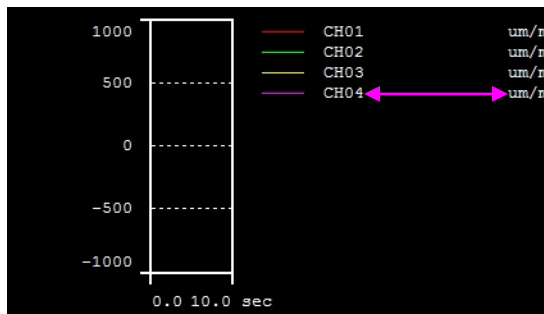
▪ The number of display digits: 6

CH01	um/m
CH02	um/m
CH03	um/m
CH04	um/m



▪ The number of display digits: 11

CH01	um/m
CH02	um/m
CH03	um/m
CH04	um/m



■The number of display digits and Deci Digits on the Set CH Condition window

When the number of digits is pre-known, you are able to widen the range of the Numeric windows/Graph windows by making the number of display digits smaller.

The Deci Digits on the Set CH Condition window specifies the Number of decimals of the numerical data, on the Numeric windows/Graph windows.

However, note that the actual Number of decimals of the numerical data does not always match the pre-set Digits on the Set CH Condition window.

Specify the valid number of decimals as follows.

- (1) Calculate the maximum value by using the setting range, calibration constant and offset.
- (2) Get the number of integer digits of the maximum value, calculated in the item (1).
- (3) To specify the actual Number of decimals, subtract the number of integer digits (2) from the number of display digits, pre-set on the Set Environment window.

▪ **Range : 1000μm/m, Calibration constant : 1.0, Offset : 0.0**

Calculate the maximum value

$$\text{Maximum value} = 1000 \times 1.0 + 0.0 = 1000$$

Calculate the number of integer digits

The number of integer digits = 4

[Example 1]

The number of display digits : 11

11 (The number of display digits) - 1 (sign : $\pm$) - 4 (the number of integer digits) - 1 (decimal point) = 5

Display format : $\pm^{****}.*****$

Based on the result, the valid number of decimals is 0 to 5.

If you set the number of decimals 6 or more, the number of decimals is 5.

[Example 2]

The number of display digits : 6

$$6 \text{ (The number of display digits)} - 1 \text{ (sign : } \pm) - 4 \text{ (the number of integer digits)} - 1 \text{ (decimal point)} = 0$$

Display format : $\pm****$

Based on the result, the valid number of decimals is 0 only.

- **The number of display digits and valid deci digits**

Deci Digits	The number of display digits					
	6	7	8	9	10	11
0(*****))	✓	✓	✓	✓	✓	✓
1(*****.)		✓	✓	✓	✓	✓
2(*****.**)			✓	✓	✓	✓
3(*****.***))				✓	✓	✓
4(*****.****))					✓	✓
5(*****.*****))						✓
6(***.*****))						
7(**.*****))						
8(*.*****))						

✓ : Valid

▪ **When the Deci Digits is “Auto” on the Set CH Condition window**

The ELA-55A calculates the maximum value and specify the display format by using the maximum value and the number of display digits.

Maximum value	The number of display digits and display format		
	6	8	11
±100000	±1E±05	±100000	±100000
±10000	±10000	±10000	±10000
±1000	±1000	±1000.0	±1000.0
±100	±100.0	±100.00	±100.00
±10	±10.00	±10.000	±10.000
±1	±1.000	±1.0000	±1.0000
±0.1	±0.100	±0.1000	±0.1000
±0.01	±0.010	±0.0100	±0.0100
±0.001	±0.001	±0.0010	±0.0010
±0.0001	±0.000	±0.0001	±0.0001

[Example]

When the measured data is 0.012345, the numeric format is as follows.

Numeric of Display Range Digits	Numeric Display
6	0.012
7	0.0123
8	0.01234
9	0.012345
10	0.012345
11	0.012345

2 - 3 - 3 Number of digits of the name

The Number of Display Digits
8

Set the number of numeric digits to display graph scale, legends, and numeric value data on numeric or graph window.

Number of digits of the name
40

Display Language
English

Sets the "number of digits of the name" on numeric windows' legend and graph windows' legend. (Range: 10, 20, 30, and 40 digits) When the channel name exceeds the "number of digits of the name", the channel name within the "number of digits of the name" appears.

[Example]

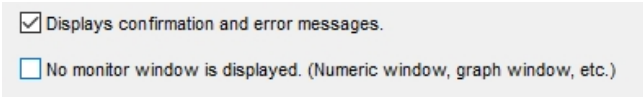
Channel name of CH01: ABCDEFGHIJKLMN

Number of digits of the name: 10 digits

The channel name of 10 digits (ABCDEFGHIJ) appears as follows.

CH01	ABCDEFGHIJ	um/m
CH02		um/m
CH03		um/m
CH04		um/m

2 - 3 - 4 Message Dialog Box



The image shows a settings window with two checkboxes. The first checkbox is checked and is followed by the text "Displays confirmation and error messages." The second checkbox is unchecked and is followed by the text "No monitor window is displayed. (Numeric window, graph window, etc.)"

☒	Displays confirmation and error messages.
☐	No monitor window is displayed. (Numeric window, graph window, etc.)

- If you release a checkmark in the box next to the Displays confirmation and error messages., no message appears when the various procession finished correctly or when error happened.
When the control mode of the EDX-5000A is set to Online, no message appears regardless of checkmark in the box next to the Displays confirmation and error messages.
- If you put a checkmark in the box next to the No monitor window is displayed (Numeric window, graph window, etc.), no monitor window appears.

2 - 4 [Beep] tab

This section describes how to set beep sound of the EDX-5000A.
Click the [Beep] tab.

The screenshot shows the 'Beep' tab in the software interface. At the top, there are tabs for 'Record', 'Configuration', 'Display', 'Beep' (which is highlighted with a pink box), 'Details', and 'Real-Time Process'. Below the tabs, the 'Operating beep sound' section has a dropdown menu set to 'ON (high pitch)'. The 'Emitting condition of the beep sound for an excessive input' section has a dropdown menu set to 'None' and a text description: 'Set condition of the beep sound that emits for an excessive input during recording time.' At the bottom, there is a checkbox labeled 'Emit beep sound while the EDX-5000A is not under recording.' which is currently unchecked.

■Operating beep sound

Selects the beep sound to be emitted while monitoring data, recording data, stopping, and executing balance adjustment.

OFF/ON (high pitch)/OFF (low pitch)

■Emitting condition of the beep sound for an excessive input

Selects the beep sound to be emitted when an input of one CH exceeds the pre-set value (Chk. Val. (Up)/Chk. Val. (Down) pre-set on the Set CH Condition window).

Note that the beep sound for an excessive input is always the high-pitch beep sound.

None/Beep is generated only when input over/Beep is generated until STOP/PAUSE

To emit the beep sound while not monitoring data, put a check mark to the check box next to the "Emit beep sound while the EDX-5000A is not under recording."

2 - 5 [Details] tab

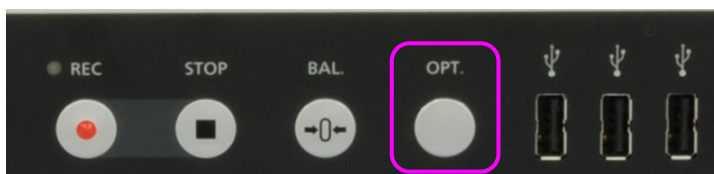
This section describes how to set detailed conditions.

Click the [Details] tab.

■Option switch

Select the operation of the "OPT." switch on the EDX-5000A front.

- | | |
|------------------------------|---|
| No setting | No operation is started. |
| Start monitoring | The EDX-5000A starts monitoring data.
The same operation is available by clicking the "Measurement" - "MONITOR." |
| Delete the recorded data | The EDX-5000A deletes the latest data file after the measurement.
The same operation is available by clicking the "Measurement" - "Delete the Latest Recorded Data File". |
| CAL | The EDX-5000A outputs the CAL or stops outputting the CAL.
The same operation is available by clicking the "Measurement" - "Output/Stop CAL." |
| Over Reset | Reset the exceeding state to the previous state [before exceeding the check value (up) or check value (down)].
The same operation is available by clicking the "Measurement" - "Over Reset." |
| Manually output the CAN data | The EDX-5000A manually outputs the pre-set data frame.
The same operation is available by clicking the "Measurement" - "Manually output the CAN data." |



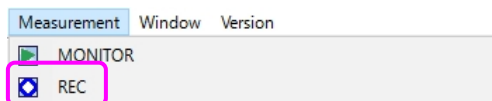
■Operation method

- To disable the PAUSE function, put a check mark to the check box next to the "Do not use the PAUSE function while recording data."

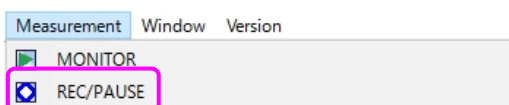
MEMO

The REC/PAUSE button on the Meas Operation Panel and the Measurement's drop-down menu varies with the PAUSE function state.

- PAUSE function: Disabled state



- PAUSE function: Enabled state



■Balance standard value (0.1 to 50.0%)

Set the balance standard value.

Balance standard value (0.1 to 50.0 %) —

5.0

■First Channel Number

If you change the first channel number of the slave according to the number of slots in the chassis, turn on the check mark.

Check mark OFF (default settings) :

The first channel number is displayed in steps of 80 CH, regardless of the number of slots in the chassis.

Master : CH01 -

Slave 1: CH81 -

Slave 2: CH161 -

Check mark ON :

Adjust the first channel number of the slave to the number of slots of the chassis.

Example) When synchronous operation is performed on the master (8 slot chassis), slave 1 (8 slot chassis), and slave 2 (10 slot chassis), the first channel number is as follows.

Master : CH01 -

Slave 1: CH65 -

Slave 2: CH129 -

NOTE

- This settings is invalid when EDX-5000A is set to standalone.
This is the same operation as when the check mark is OFF.
- During synchronous operation, it is not possible to take over this setting of the master to the slave.
Check this setting for each EDX-5000A.
- The channel numbers of the arithmetic operations start from 81 CH irrespective of this setting.

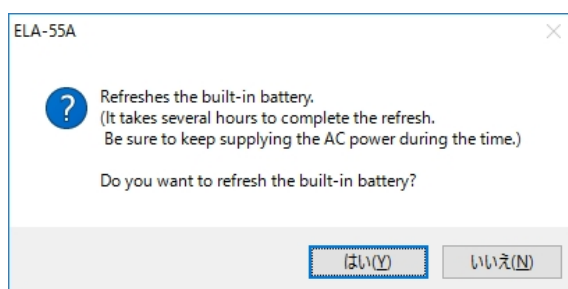
■Built-in battery

▪ Refresh (force-discharge)

A built-in battery is installed in the EDX-5000A to avoid issues caused by momentary power-loss during operation. While the EDX-5000A typically runs on an AC power supply that is constantly charging, a momentary voltage fluctuation or other such incident will cause the built-in battery to take over powering the EDX-5000A.

The built-in battery must be kept sound by being refreshed (performing a complete discharge and recharge) on a periodic basis.

- (1) Select the Refresh button, and then select the Yes button when the following message appears.



- (2) This will start the refresh (force-discharge).
- (3) The status of the refresh (force-discharge) process will be displayed on the "BATTERY LED" as follows.
Discharging Flashing green light
Charging Green light lights up
- (4) After the battery has been completely discharged it will take around two hours for the battery to return to a fully charged state and be ready for normal use.

If the battery fully charges in under one hour after a complete discharge the built-in battery is likely to be faulty, and the battery should be judged to be in an abnormal condition.

NOTE

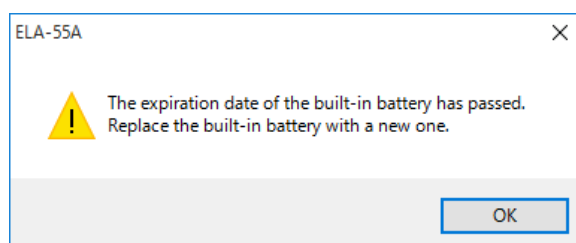
Perform a battery refresh (force-discharge) around once a month. The expiration date for a built-in battery is one year.

Be sure to periodically replace the built-in battery. When not periodically replaced, the built-in battery will deteriorate to a point where it may not be able to provide backup power in case the AC power supply cuts out.

MEMO

The following message will appear when starting up the ELA-55A when the expiration date of the built-in battery has elapsed.

If you see this message, replace the built-in battery as soon as possible.



2 - 6 [Real-Time Process] tab

Click the [Real-Time Process] tab.

Record Configuration Display Beep Details **Real-Time Process**

Recording moving image

☒ No ☐ Record a moving image with a High speed camera. ☐ Record a moving image with a Webcam.

Arithmetic processing

☒ No ☐ Yes

FFT analysis

☒ No ☐ Yes

■Recording moving image

Click the desired procession.

“No”

No recording is conducted.

“Recording a moving image with a High speed camera.”

For recording the moving image as well as the measured data at the same time by using the high speed camera, etc.

“Recording a moving image with a Webcam.”

For recording the moving image as well as the measured data at the same time by using the Web cam.

■Arithmetic processing

Click the desired procession.

“No”

No arithmetic procession is conducted.

“Yes”

Conducts arithmetic procession.

If you click the “Yes,” the measured data is conducted four arithmetic operations. And the calculated result is saved in the window or data file as calculated data.

Open the Set Calculation Condition dialog box for setting the arithmetic processing.

■FFT analysis

Click the desired procession.

“No”

No FFT analysis is conducted.

“Yes”

Conducts FFT analysis.

If you click the “Yes,” the analysis results can be displayed on the FFT Analysis dialog box.

MEMO

The EDX-5000A can conduct real-time processions at the same time such as arithmetic processing the data as well as recording moving image by using the Web cam.

NOTE

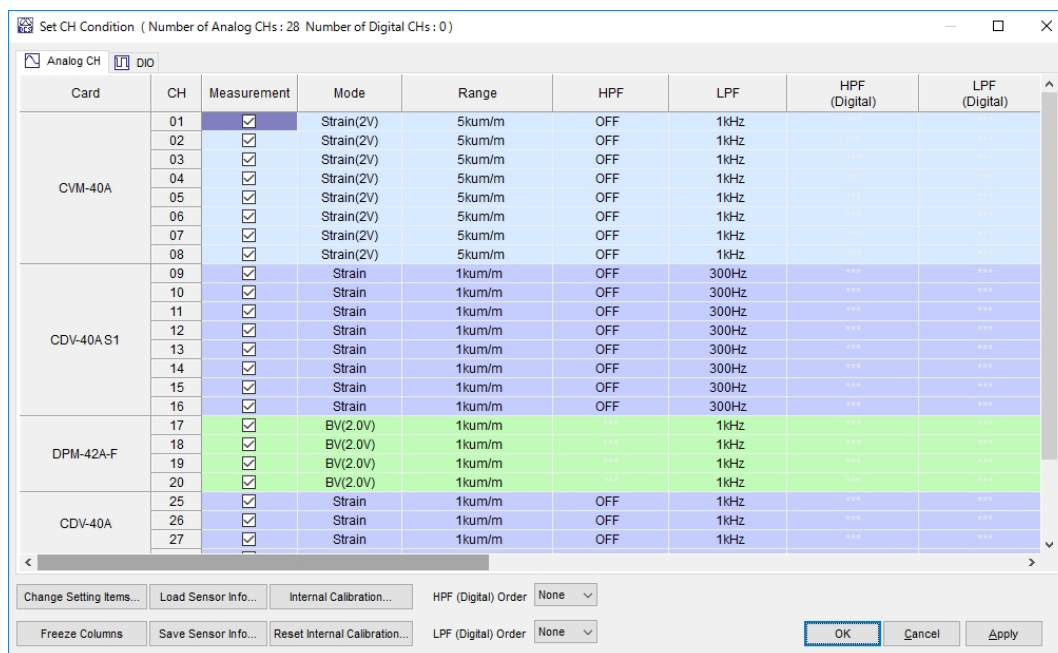
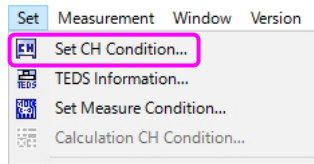
Available Meas Mode and sampling frequency are restricted based on the selected real-time processions.

3 Channel condition

This section describes how to set the measurement ON/OFF, Mode, Range, Calibration constant, Unit, for every CH.

Open the Set CH Condition window by any of the following.

- Click the Set – Set CH Condition...
- Click the **CH Cond.** icon from the toolbar.



Change Setting Items... button

Setting items displayed on the window are added, removed, or stored.

Freeze Columns button

Freeze columns ON/OFF

It allows you to keep some of your data in the same place as you scroll through the rest of your spreadsheet.

Load Sensor Info... button

Loads the sensor information (Calibr. const. ,rated capacity rated output, etc.) from the sensor information file(CSV format) for setting the channel conditions.

Save Sensor Info... button

Saves the sensor information (Calibr. const. , rated capacity rated output, etc.) as the sensor information file (CSV format).

Comp IntSense... button

Performs the internal sensitivity compensation.

Perform an internal sensitivity compensation when a sensor is connected.

Initialize the result of Comp IntSense... button

Initializes the compensated internal sensitivity.

HPF (Digital) Order

The order of high-pass filter (digital).

LPF (Digital) Order

The order of low-pass filter (digital).

OK button

Determines the pre-set contents and closes the window.

Cancel button

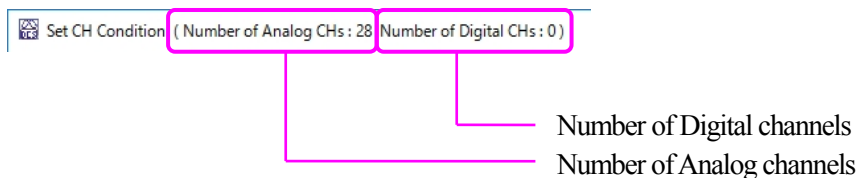
Cancels the pre-set contents and closes the window.

Apply button

Determines the current set contents.

■Title Bar

The number of analog channels and digital channels required to measure that are set on the current **Set CH Condition** dialog box are displayed on the title bar.

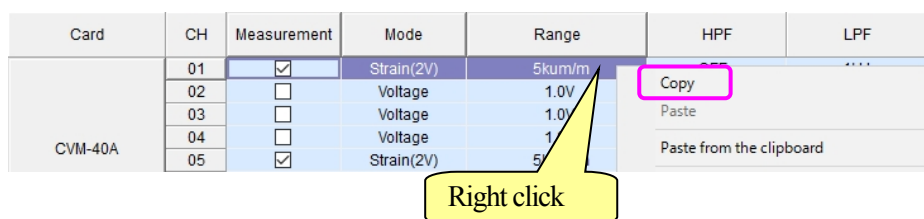


■To copy and paste

This section describes how to copy the setting items to the other channels.

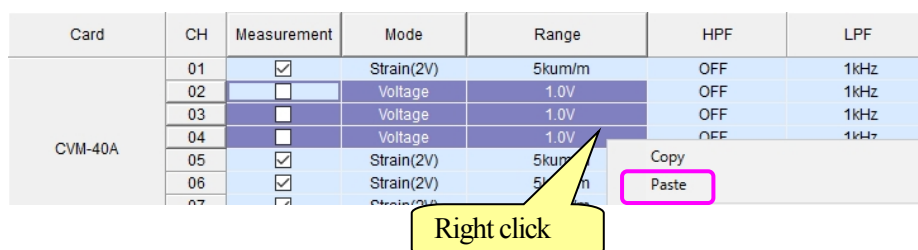
- (1) Drag the setting item of the copy source CH and right-click.

Select the Copy from the pop-up menu.

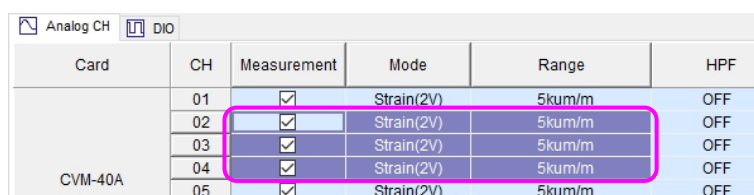


- (2) Drag the channels to be paseted and right-click.

Select the Paste from the menu.

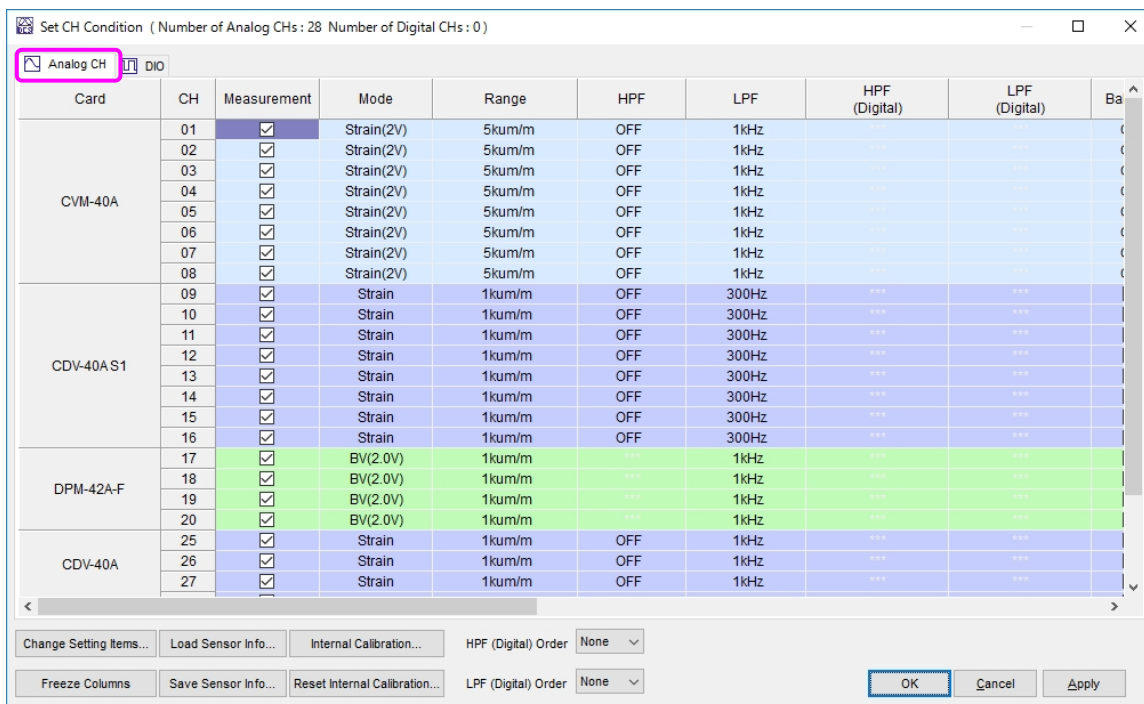


- (3) The setting items of the copy source are pasted to the setting items of the destination.



3 - 1 Analog channel condition

This section describes how to set measurement ON/OFF of analog channels, mode, range, CAL coefficient, offset, and unit. Select the **Analog CH** tab on the **Set CH Condition** dialog box.



3 - 1 - 1 Setting items

●ID-No.

Displays the ID number of the EDX-5000A.

●Device Name

Displays the device name of the EDX-5000A.

●Card

Displays a model of the current installed conditioner card.

●CH

Displays the CH No.

●ID-CH

Displays the ID-CH number.

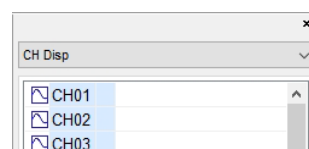
[Example]

The ID1-01 indicates the CH01 of the ID No.1.

●Measurement

Put a checkmark on the measurement target CH box.

The target measurement channels are displayed on the CH Display Bar of the main window as shown in the right.



NOTE

Be sure to measure at least one analog channel.

●Mode

Select the channel mode.

The available items vary with the current conditioner cards in the EDX-5000A.

●Range

Select the range.

The available items vary with the current conditioner cards in the EDX-5000A.

Since the **Range** is coupled with **Meas Range** item, when selecting and setting the **Meas Range**, the **Range** is automatically set.

●Meas Range

Select the Meas Range.

Numeric value of the Meas Range is obtained by multiplying the Range and the Calibr. const.

Since the Range is coupled with Meas. Range item, when changing the Meas. Range, the Range is automatically changed.

●HPF / LPF

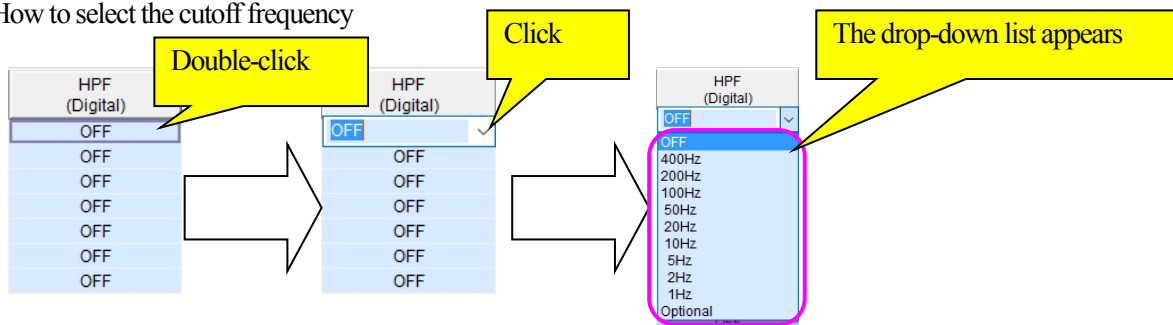
Select the cutoff frequency of the high-pass filter / low-pass filter.

The available items vary with the current conditioner cards in the EDX-5000A.

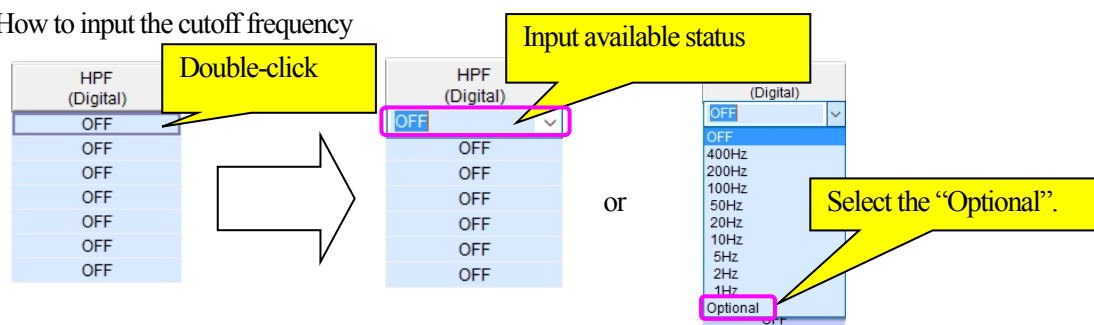
●HPF (Digital) / LPF (Digital)

Select/input the cutoff frequency for the digital filtering.

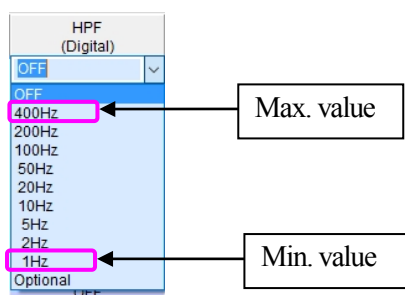
- How to select the cutoff frequency



- How to input the cutoff frequency



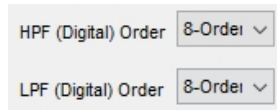
You can also input an arbitrary value during the input available status.



An arbitrary value should be within the Min. value and Max. value on the list.

Select the order of high-pass filter (digital)/low-pass filter (order), on the Set CH Condition window.

None/1-Order/2-Order/3-Order/4-Order/5-Order/6-Order/7-Order/8-Order



HPF (Digital) Order 8-Order ▾
LPF (Digital) Order 8-Order ▾

MEMO

- To conduct the digital filtering, put a check mark to the check box next to the "Conduct digital filtering, on the [Record] tab on the Set Environment window.
- Before setting the digital filter, check whether the sampling frequency (Fs) and cutoff frequency (Fc) satisfy the following conditions.
Fs/Fc = 2.5 to 1000, Fs: 3Hz or larger, Fc: Integer
[Example]
Fs = 5 kHz,
MaxFc=5000[Hz]/2.5=2000[Hz] , MinFc=5000[Hz]/1000=5[Hz]
The range of the Fc: 5 to 2000 [Hz]
- When using the HPF (Digital) and LPF (Digital) in combination, the cutoff frequency (fc) of the HPF (Digital) and that of the LPF (Digital) should be as follows.
 $fc(HPF) < fc(LPF)$

●Balance

Put a check mark to the check box next to the target channel.

Putting a check mark may be not available due to the conditioner card model and Mode.

●Offset Zero

Put a check mark to the check box next to the target channel.

The apparent measured value becomes 0 by setting the measured value, while monitoring data, as the offset value.

To initialize the offset value to 0, click the "Measurement" - "Initialize Offset Zero."

●CAL

Put a check mark to the check box next to the target channel.

Putting a check mark may be not available due to the conditioner card model and Mode.

●CAL Range

Select the output value of the CAL.

The available items vary with the current conditioner cards in the EDX-5000A.

●Int CAL

Put a check mark to the check box next to the target channel.

Putting a check mark may be not available due to the conditioner card model and Mode.

●Input cable

Select input cables.

Available items vary with conditioner cards.

For details, see the following table.

●Cable correction value

Enter cable correction values when using custom-made cables.

You are able to enter the cable correction values when selecting the “Custom Cable” in the “Input cables” column.

Table Input cables and cable correction value statuses

Conditioner cards	Input cables	Cable correction value statuses
CDV-40B series	U-40 ~ 48 (0.5m)	Invalid (unable to enter numbers, *** appears.)
	U-39 (1.0m)	
	U-38 (1.5m)	
	Custom Cable	Valid (able to enter numbers) ^{NOTE}
CVM-40A/41A series	U-121 (0.5m)	Invalid (unable to enter numbers, *** appears.)
	U-122 (1.0m)	
	U-123 (1.5m)	
	Custom Cable	Valid (able to enter numbers) ^{NOTE}
Other conditioner cards	***	Invalid (***appears.)

NOTE) The available “cable correction values” are 0 to 50

NOTE

The internal sensitivity compensation uses the input cable No. and custom-made cable correction values. After changing the input cable No. and custom-made cable correction values, be sure to execute the internal sensitivity compensation again.

●Rated Capacity (Sensor Phys. Value)

Set the Rated Capacity of input sensors together with the Rated Output.

When changing the Rated Capacity, the Calibr. const. is automatically changed.

●Rated Output (Sensor Output)

Set the Rated Output of input sensors together with the Rated Output.

When changing the Rated Output, the Calibr. const. and Rated output (mV/V) are automatically changed.

●Rated Output(mV/V)

Input the Rated Output of input sensors. The item is valid when the Mode is "Strain."

When changing the Rated Output (mV/V), the Calibr. const. and Rated output are automatically changed.

●Calibr. const.

Set Calibr. const. to be multiplied to the measured data.

For Calibr. const., set coefficient that converts data into engineering value (physical quantity) corresponding to input sensors of CHs and compensation coefficient (lead wire compensation coefficient) to be used for gage compensation for gage factor compensation coefficient or extension cable in strain measurement.

(Initial value: 1, setting range: -1×10^8 to -1×10^{-8} , 1×10^{-8} to 1×10^8)

When changing the Calibr. const., the Rated Capacity is automatically changed.

●Offset

Set Offset value in engineering value (a value multiplied by the CAL coefficient).

Offset is set when a certain value is added for the measured value.

(Initial value: 0, setting range: -1×10^8 to -1×10^{-8} , 0, 1×10^{-8} to 1×10^8)

MEMO

Use the following formula.

Physical quantity = The cut-out data $\times$ Calibr. const. + Offset

●Unit

Select the appropriate unit.

Double-click the target CH or press the **SPACE** key to display the Set Unit window.

Select the appropriate unit from the unit list.

Set Unit CH01

KS2 Format unit

☒ um/m ☐ e ☐ mV ☐ V ☐ mA ☐ A

☐ mm ☐ cm ☐ m ☐ degC ☐ degF ☐ 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 ☐ OHM

☐ kOHM ☐ MOHM ☐ % ☐ dB ☐ ppm ☐ cm/s

☐ m/s ☐ m/min ☐ km/h ☐ Hz ☐ kHz ☐ MHz

☐ deg ☐ deg ☐ rad ☐ kN ☐ kNm ☐ kW

☐ rpm ☐ cm/s2 ☐ m/s2 ☐ G ☐ daN ☐ mile/h

☐ *100kpa ☐ deg/s ☐ msec ☐ sec ☐ min ☐ hour

☐ user1 ☐ user2 ☐ user3

OK Cancel

MEMO

If the relevant unit is not on the Set Unit window, users can register up to 3 original units (User's unit).

☐ user1 ☐ user2 ☐ user3

●Chk. Val. (Up)

Set the Chk. Val. (Up) of the Range in percent figures. (Setting range: -100 to 100%)

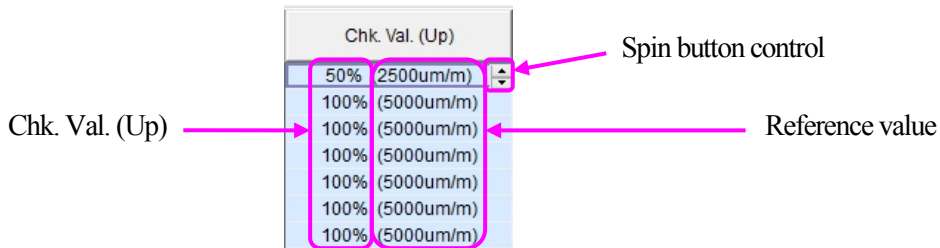
By setting the Chk. Val. (Up) and Chk. Val. (Down), you can detect erroneous status (the measured data of a CH exceeds the Check Values).

After exceeding the Chk. Val. (Up), numbers on numeric/graph windows will be displayed in red.

Double-click the target CH item or press the **SPACE** key to be in input available state.

In addition, use the spin button to change the value.

(For the exceeding values and over reset, see “5 - 1 2 To display the exceeding value”.)



●Chk. Val. (Down)

Set the Chk. Val. (down). (Setting range: -100 to 100%)

Set the Chk. Val. (Down) in the same manner as the Chk. Val. (Up).

(For the exceeding values and over reset, see “5 - 1 2 To display the exceeding value”)

MEMO

Values described in parenthesis (), in the Chk. Val. (Up) Chk. Val. (Down), are reference physical quantities.

●Deci Digits

Select the number of digits below the decimal point. (See “2 - 3 - 2 The number of display digits”.)

●CH Name

Input comments within 40 characters.

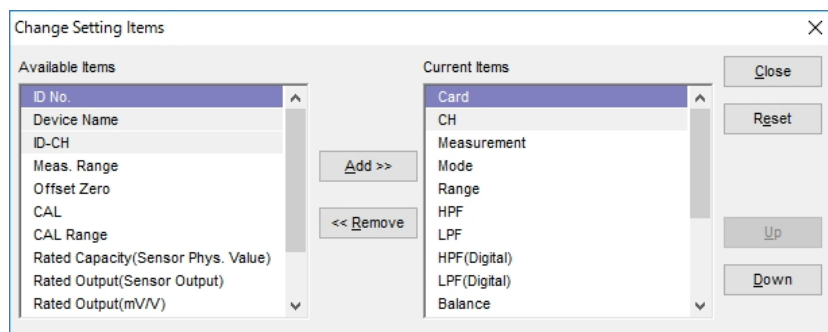
Double-click the target CH item or press the **SPACE** key to be in input available state.

Input the target comments.

3 - 1 - 2 Change Setting Items

Click the **Change Setting Items** button to display the following dialog box.

Setting items displayed on the **Set CH Condition** dialog box are added, removed, or sorted.



Add >> button Item currently not on the window is added to the **Set CH Condition** dialog box.

<< Remove button Item currently displayed on the window is removed from the **Set CH Condition** dialog box.

Close button Determines the setting item and closes the dialog box.

Reset button Resets the item to the default state.

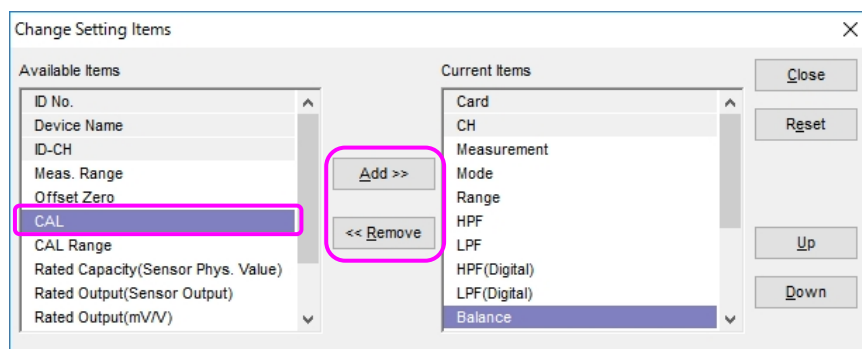
Up button For moving the target item to up.

Down button For moving the target item to down.

■Operation Example

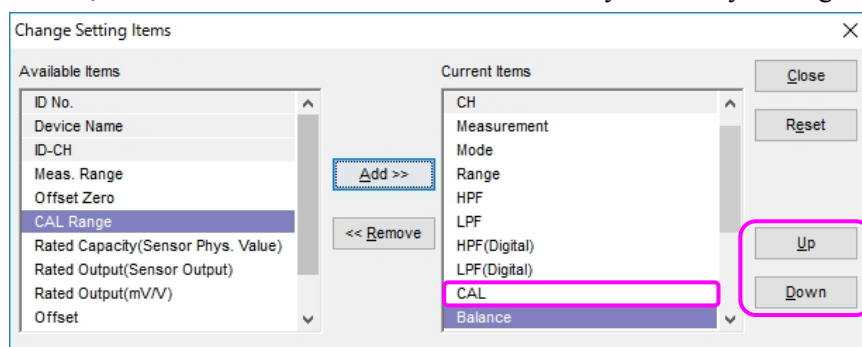
Procedures for adding the CAL setting item to the **Set CH Condition** dialog box are described below.

- (1) Select **CAL** in **Available Items**, move the cursor to a location in **Current items** where you want to inset the selected item and then, click the **Add >>** button.



- (2) The **CAL** is added to **Current Items**.

In addition, items in the **Current Items** can be moved to any location by clicking the **Up** or **Down** button.



- (3) Finally, click the **Close** to exit the **Change Setting Items** dialog box.

3 - 1 - 3 Compensating internal sensitivity

Always compensate the internal sensitivity after connecting sensors to the EDX-5000A units.

Compensate the internal sensitivity of every conditioner card as follows.

- CDV-40B (-F)

- (1) Strain mode Check the bridge resistance of the strain gage (full bridge system) or bridge resistance of the strain gage transducer. Compensate the sensitivity.
- (2) Voltage mode Compensate the internal zero point.

- DPM-42B (-F)

- (3) Check the bridge resistance of the strain gage (full bridge system) or bridge resistance of the strain gage transducer. Compensate the sensitivity.

Be sure to conduct the item (1) and (3) with the actual sensor connected.

After mounting a new conditioner card or after changing the slot to be mounted, conduct the item (2).

■Operation method for the internal sensitivity compensation

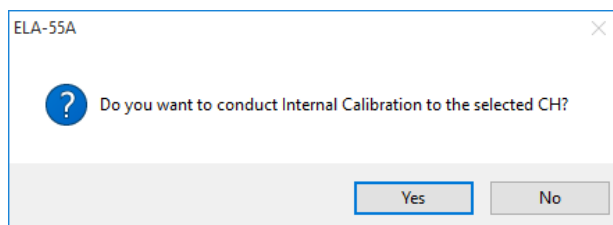
- (1) Put a check mark to the check box next to the target channel.

Card	CH	Int. CAL
CVM-40A	01	☒
	02	☒
	03	☒
	04	☒
	05	☒
	06	☒
	07	☒
	08	☒

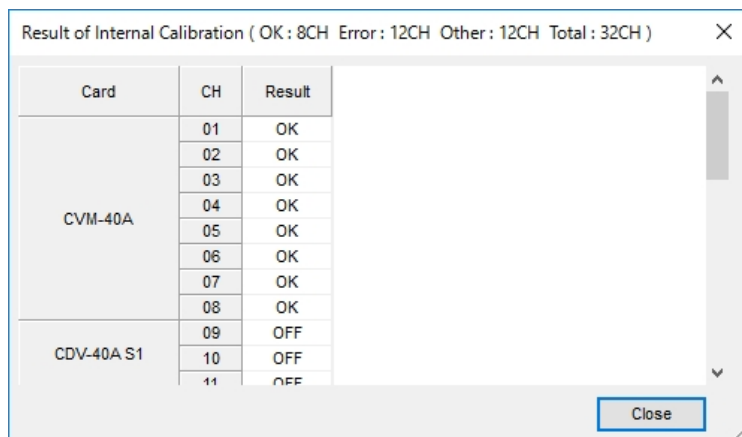
- (2) Click the **Internal Calibration...** button.

The following message appears.

Click the **Yes** button.



(3) The following window appears.



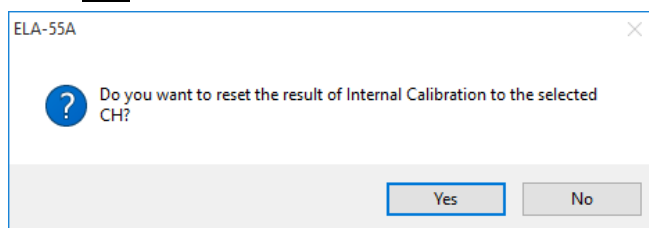
OK	Correctly compensated
Sensor Error	In strain mode: Sensor is not connected, sensor is defective, the bridge resistance of the sensor is outside range of 120 ohm to 1,000 ohm. In voltage mode: The conditioner card may be defective. Please contact our sales office or private agent.
OFF	Not included

■Operation method for initializing the compensated internal sensitivity

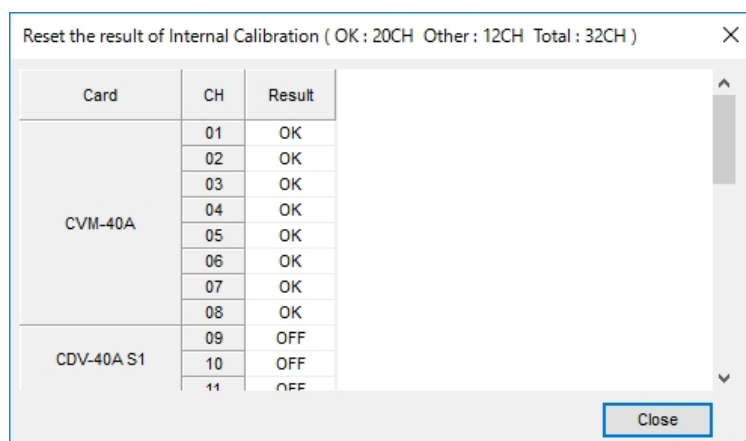
(1) Click the **Reset Internal Calibration...** button.

The following message appears.

Click the **Yes** button.



(2) The results of the internal calibration are initialized and the initialized results are displayed on the **Reset the result of Internal Calibration** dialog box.

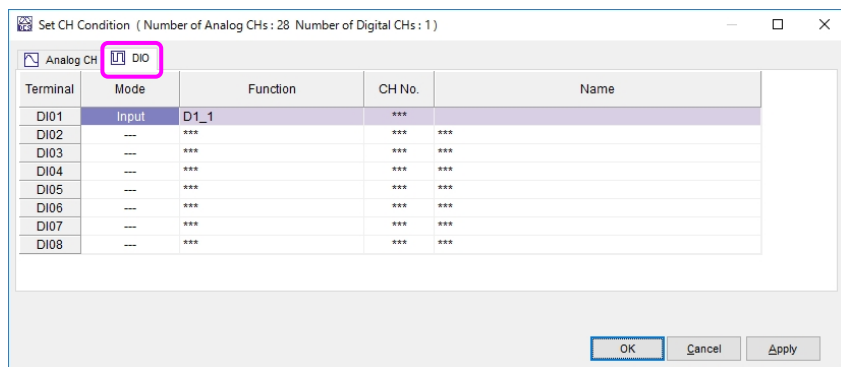


3 - 2 DIO conditions

Since the EDX-5000A has the digital input/output port (DIO port), the ELA-55A is able to input/output the 8-bit digital signal. The ELA-55A is able to assign the remote control function (start, stop, balance adjustment, etc.) by using the digital signal inputs.

The ELA-55A assigns the input/output to 8 terminals of the DIO port.

Select the **DIO** tab on the **Set CH Condition** dialog box.



3 - 2 - 1 Setting items

●Terminal

The terminal name of the DIO.

●Mode

Select the target item from the following.

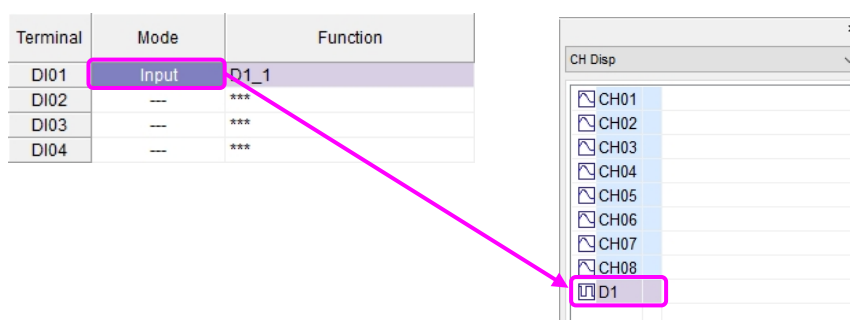
“Input”

When a Mode is "Input"

The ELA-55A enables the digital channels.

The ELA-55A is able to monitor/record the digital signals.

The channels to be measured appear on the CH Disp bar on the main window.



“Output”

When the Mode is "Output"

Outputs the digital signal based on the timing, pre-set on the “Function” column.

“Remote control”

When the Mode is "Remote control"

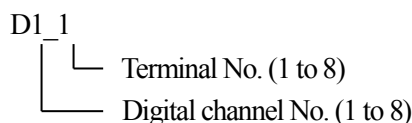
As you input the digital signal, the ELA-55A works based on the setting, pre-set on the “Function” column.

●Function

Set the function. The function varies with the "Mode".

When the Mode is "Input"

The Bit No.



When the Mode is "Output"

Select the output timing of the digital signal.

"Recording"	Output the digital signal during the recording.
"Trigger Signal"	Output the digital signal during the trigger recording.
"BUSY"	Outputs the digital signal during the Balance adjustment.
"AD"	Outputs the digital signal during the A/D conversion.

When an analog channel exists

"While exceeding (Anle-CH)"	Outputs the digital signal while the analog channel exceeds the pre-set Chk. Val. (Up)/Chk. Val. (Down).
"Anle-CH exceeded"	Outputs the digital signal after the analog channel exceeds the pre-set Chk. Val. (Up)/Chk. Val. (Down) once.

When an ECAN-CH exists

"While exceeding (ECAN-CH)"	Outputs the digital signal while the ECAN-CH exceeds the pre-set Maximum/Minimum.
"ECAN-CH exceeded"	Outputs the digital signal after the ECAN-CH exceeds the pre-set Maximum/Minimum once.

When the Mode is "Remote control"

Select the operation when inputting the digital signal.

"MONITOR"	Starts monitoring data.
"STOP"	Executes the same operation as the "STOP" switch on the EDX-5000A.
"REC/PAUSE"	Executes the same operation as the "REC/PAUSE" switch on the EDX-5000A.
"Balance"	Executes the same operation as the "BAL" switch on the EDX-5000A.
"Option switch"	Executes the same operation as the "OPT." switch on the EDX-5000A.

●Name

When the Mode is "Input", input the Name within 40 characters.

Double-click the target item or press the SPACE key to be in input available state.

Input the target names.

NOTE

To select the "Remote control" mode, make sure the EDX-5000A is 1 stand-alone or is master unit in synchronous operation.

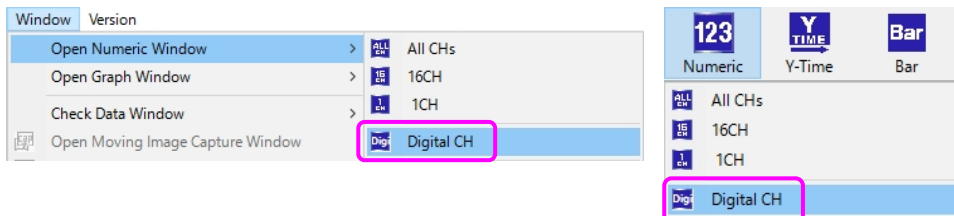
3 - 2 - 2 To display the digital channels on the numeric windows/graph windows

The ELA-55A displays the digital channels on the Numeric windows/Graph windows.

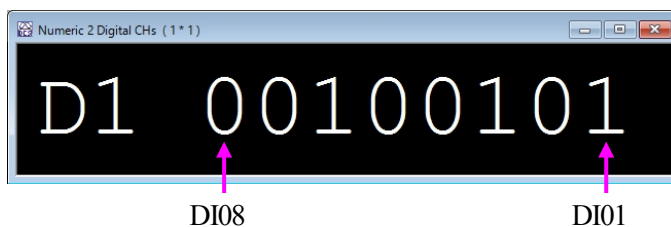
■To display the numeric window

Open the Numeric window (digital channel) by any of the following.

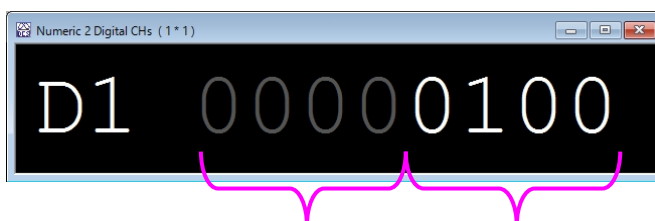
- Click the Window - Open Numeric Window - Digital CH.
- Click the **Numeric** icon from the toolbar. Click the Digital CH.



■Numeric window



When the Mode is "Output" or "Remote control", the bit appears in a neutral color between the character color and background color.

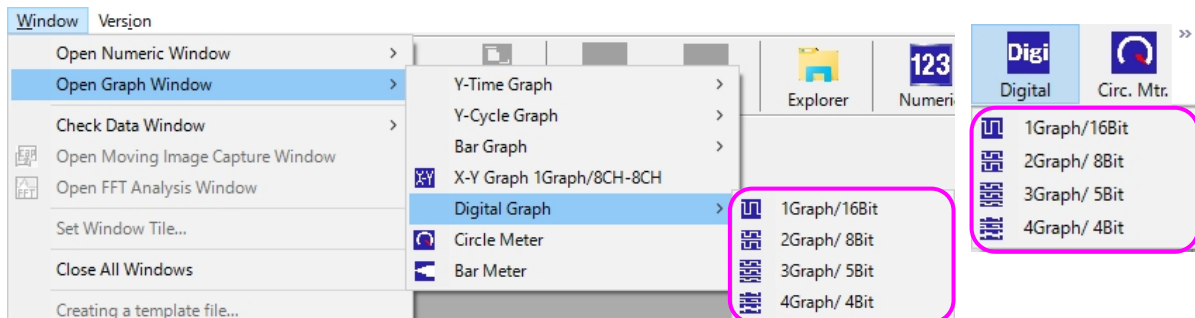


“Output” Mode or “Remote control” Mode “Input” Mode

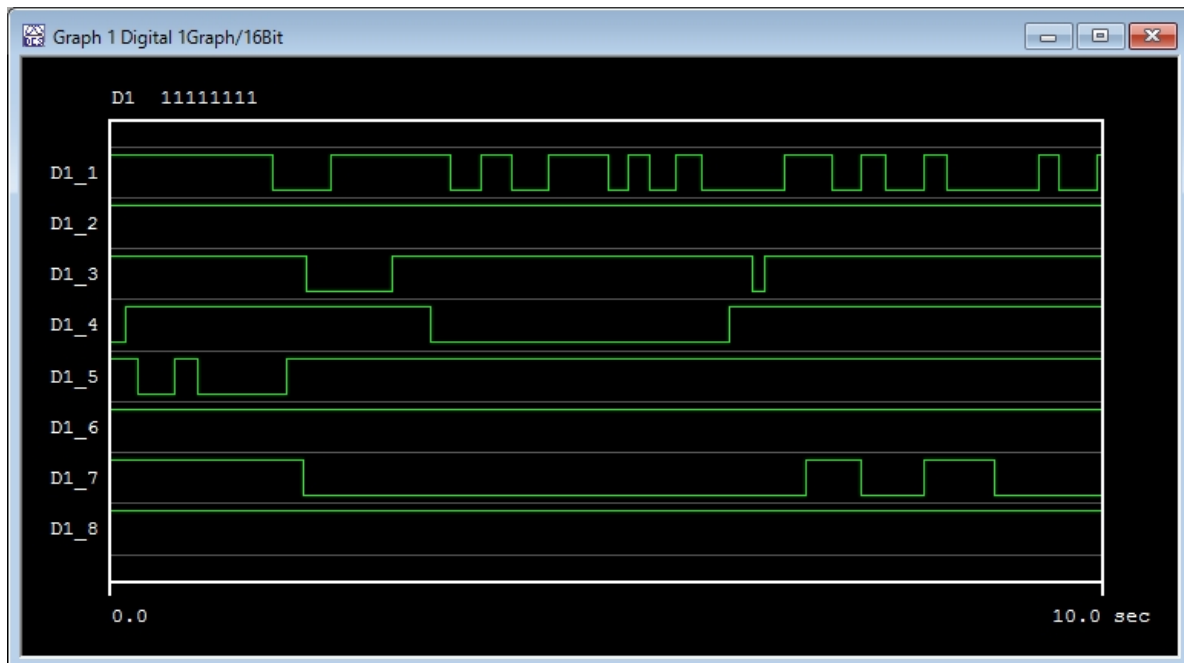
■To display the graph

Open the Graph window (digital channel) by any of the following.

- Click the Window - Open Graph Window - Digital Graph.
- Click the **Digital** icon from the toolbar. Click the target graph.



■Digital graph

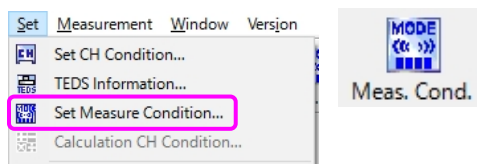


4 Measuring Conditions

This section describes how to set the measure mode conditions (Meas Mode, Sampling Frequency, and Number of data/CH, etc.) and Data File.

Open the Set Measure Condition window by any of the following.

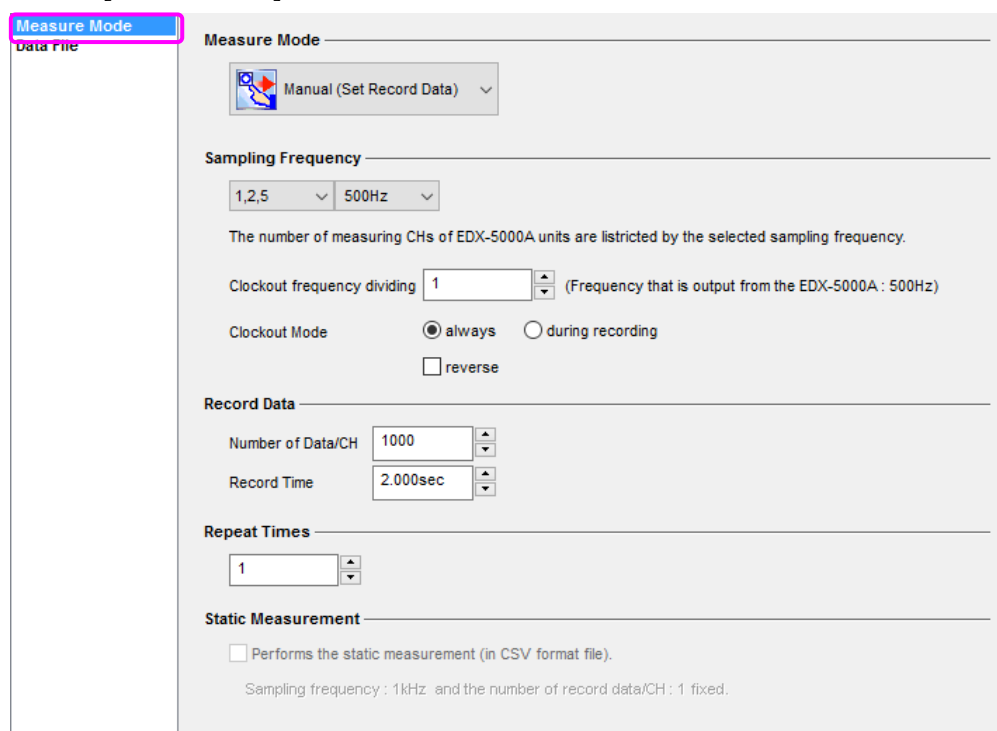
- Click the Set - Set Measure Condition....
- Click the **Meas. Cond.** icon from the toolbar.



4 - 1 [Measure Mode] tab

This section describes how to set Measure Mode, Sampling Frequency, and Number of data/CH on the [Measure Mode] tab.

Click the [Measure Mode] tab.



■Measure Mode

Select the target item from the following.

Manual	Manually starts and stops the data recording.
Manual (Set Record Data)	Manually starts the data recording and records data for the pre-set Number of data/CH.
Interval	Automatically records data at the pre-set time interval.
Analog Trigger	Automatically starts recording data when measured value of the specified analog channel satisfies the analog trigger conditions.
Digital Trigger	Automatically starts recording data when measured value of the specified CH satisfies the digital trigger conditions.
Ext trigger	Automatically starts recording data when the external trigger signal is input.
Complex trigger	Automatically starts recording data when the trigger conditions, including the 4 channels of analog trigger, external trigger manual trigger, digital trigger, and ECAN trigger are satisfied.

■Sampling Frequency

Select the sampling frequency.

The selected sampling frequency is common to all channels.

Sampling Frequency	Selections
1,2,5 system	1Hz, 2Hz, 5Hz, 10Hz, 20Hz, 50Hz, 100Hz, 200Hz, 500Hz, 1kHz, 2kHz, 5kHz, 10kHz, 20kHz, 50kHz, 100kHz, 200kHz
2n system	2Hz, 4Hz, 8Hz, 16Hz, 32Hz, 64Hz, 128Hz, 256Hz, 512Hz, 1.024kHz, 2.048kHz, 4.096kHz, 8.192kHz, 16.384kHz, 32.768kHz, 65.536kHz, 131.072kHz
External clock	Input the sampling frequency of the external clock signal.

MEMO

The sampling frequency of 2n system is used for making the frequency resolution of the FFT analysis result to the nice round numeric value.

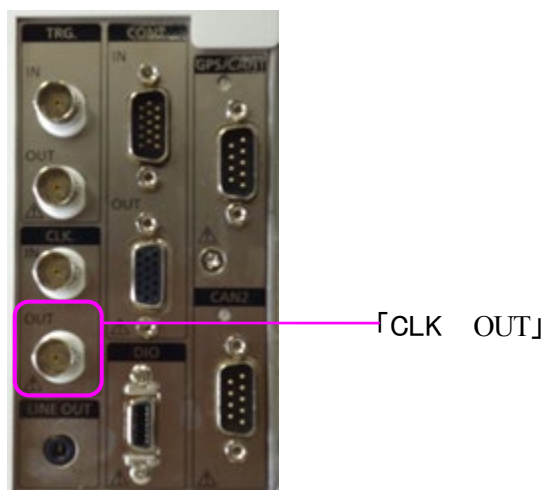
Sampling Frequency	Resolution of FFT (2048) analysis result
4.096kHz	1.0000Hz

- Set the clock out frequency dividing. (Setting range: : 1 to 65534)

The EDX-5000A can output clock (arbitrary divided internal sampling clock).

It allows the EDX-5000A and the external device (other manufacture made logger, high speed camera, etc) work together in measuring data.

The EDX-5000A outputs the external clock output from the CLK OUT terminal on the rear panel of the EDX-5000A in the following.



MEMO

For the setting clockout mode, see separate volume of "EDX-5000A MEMORY RECORDER/ANALYZER INSTRUCTION MANUAL (FOR HARDWARE)."

■Number of Data / CH and Record Data

If you click other than **Manual** in the **Meas Mode**, input the number of recorded data or recording time.
The **Number of Data** work with the **Record Data**. You can set either two items.

■Repeat Times

Set the repeat times. (Setting range: 1 to 9999)

■Static Measurement

To perform the static measurement, put a check mark to the check box next to the "Performs the static measurement (in CSV format file)." (For details, see “ 5 - 1 3 .”)

4 - 2 [Interval] tab

Select the “Interval” on the Set Meas Condition window to display the [Interval] tab in the left.
Click the [Interval] tab.

■Operation method

(1) To set the interval start date and time, put a check mark to the box next to the “**Set Interval Start Time**” and set the date.

The start time will be several seconds after the **REC** button is pressed if putting no check mark.

(2) Set the interval time.

NOTE

- “Recording time + 10 sec or more” should be set as the interval time.
- If the **REC** button is pressed after the interval start time, is passed, the interval time and repeat times are automatically calculated from the current time and if the repeat time is left, the interval measurement is continued.

When the interval measurement is already finished for the preset repeat times, a message appears and the interval measurement finishes.

4 - 3 [Analog Trigger] tab

Select the “Analog Trigger” on the Set Meas Condition window to display the [Analog Trigger] tab in the left.
Click the [Analog Trigger] tab.

Measure Mode
Analog Trigger
Data File

Analog Trigger

	CH No.	Slope	Level (Physical Value)	
Start Trigger	01	Positive	2500	-5000 - 5000 um/m
End Trigger	01	Positive	2500	-5000 - 5000 um/m
Pre Trigger Data(Delay)	Number of Data/CH	1000	0 - 466033	
	Time	1.000sec	0 - 00:07:46	
Post Trigger Data(Delay)	Number of Data/CH	1000	0 - 466033	
	Time	1.000sec	0 - 00:07:46	

☒ Set End Trigger.

Repeat Times

1

■Operation method

(1) Select trigger CH No. that starts and ends recording data.

(2) Set **Slope** (how to cross the data on the slope for the trigger level).

Positive Triggered when the measured value of the trigger CH crosses the trigger level upward.

Negative Triggered when the measured value of the trigger CH crosses the trigger level downward.

MEMO

- Trigger slope: Positive, Trigger level value: 100
Triggered when the measured data (less than 100) increases 100 or more.
... 96 97 98 99 100 101 102 103 104 105 ...
└─ Measured data which satisfies the trigger conditions.
- Trigger slope: Negative, Trigger level value: 100
Triggered when the measured data (more than 100) decreases 100 or less.
... 103 102 101 100 99 98 97 96 95 94 ...
└─ Measured data which satisfies the trigger conditions.

(3) Input the trigger level value (value to be triggered) in physical quantity.

Input available range is displayed on the right.

- (4) To record the data before starting the recording, input Prev Trigger Data (Delay) with time (unit: sec) or with the number of data/CH.

Setting available range of delay amount is shown on the right of the data entry field.

MEMO

The maximum value of the pre-trigger data delay and post-trigger data delay are obtained as follows.

Maximum value of the data delay = $8,388,608 / (\text{Data size} \times \text{The number of channels})$

The number of data bytes can be calculated using the following formulas.

• When the AD data format is 16 bits :

The number of data bytes = $(\text{the number of measuring channels} \times 2) \times \text{the sampling frequency}$

• When the AD data format is 24 bits :

The number of data bytes = $(\text{the number of measuring channels} \times 4) \times \text{the sampling frequency}$

• When performing arithmetic processing in real time :

The number of data bytes = $(\text{the number of measuring channels} \times 8) \times \text{the sampling frequency}$

*The number of measuring channels is the total of the number of analog channels and digital channels, and the number of arithmetic channels.

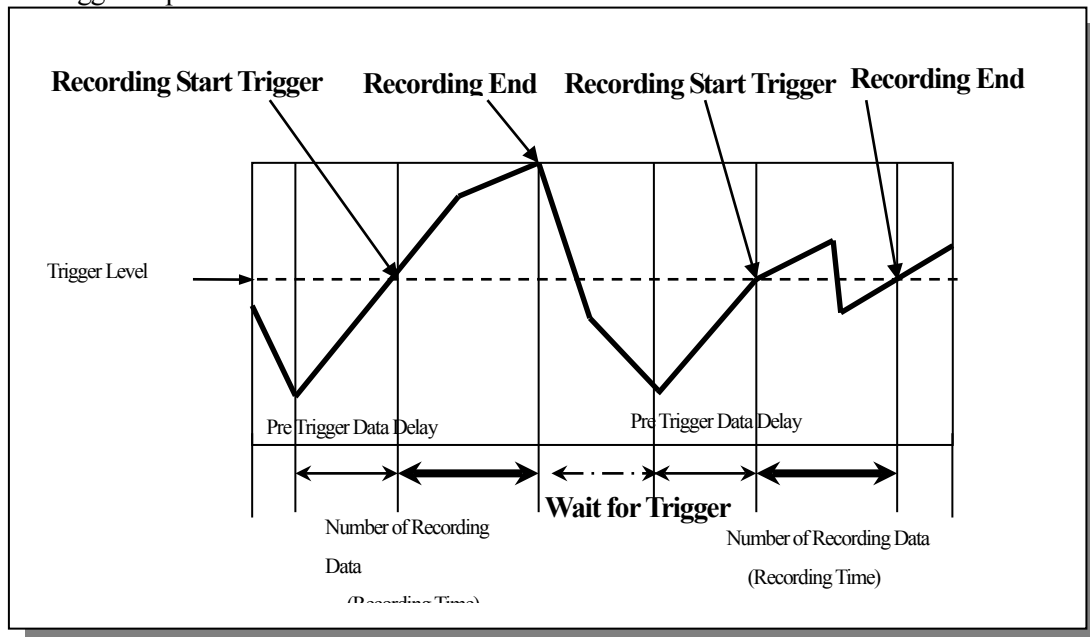
- (5) To set the end trigger, put a check mark to the check box next to the "Set End Trigger." Set the conditions of the End Trigger in a same manner as the Start Trigger.

- (6) Input the number of repeat times.

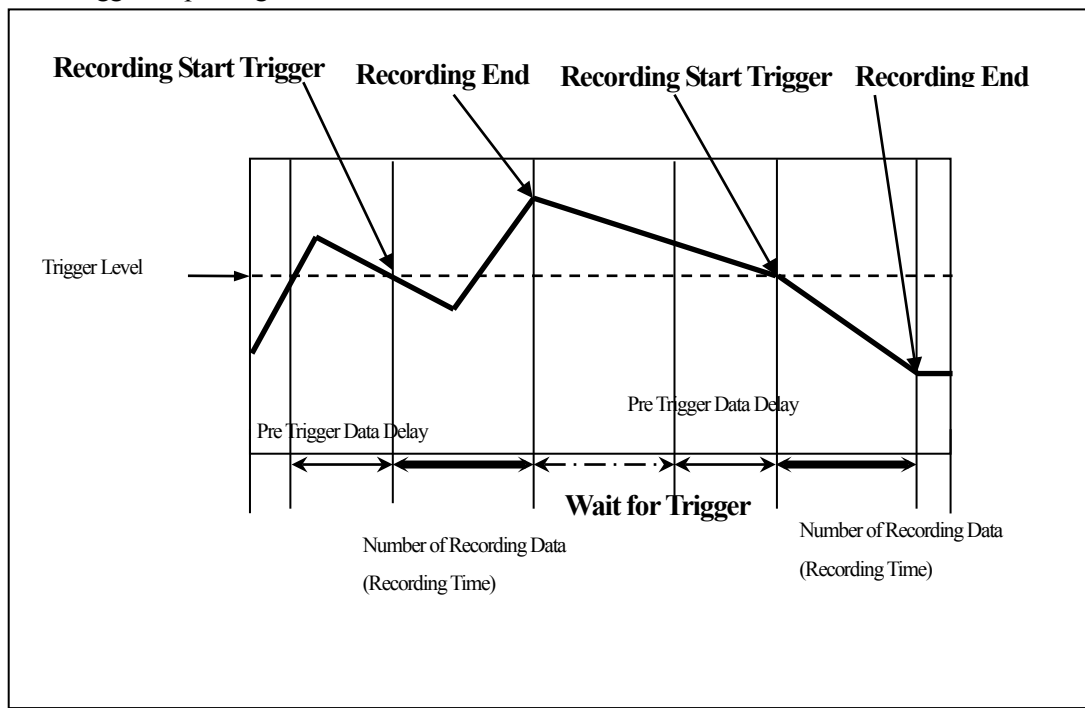
■Example of trigger slope with stat trigger

After satisfying the start trigger conditions, the ELA-55A starts recording and records the pre-set Number of data/CH.

Start Trigger Slope: Positive



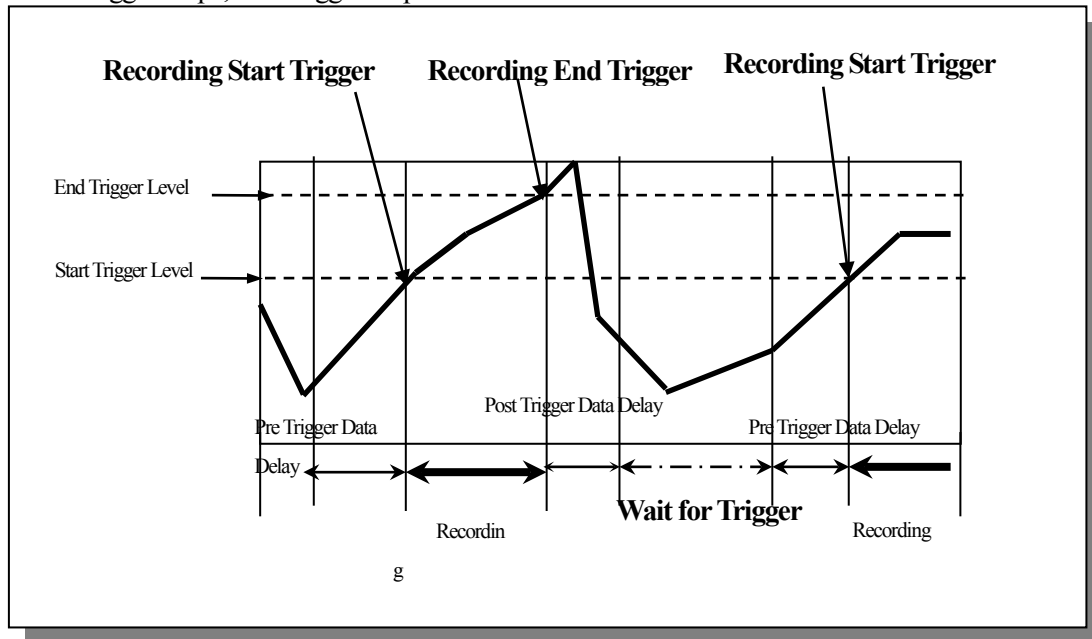
Start Trigger Slope: Negative



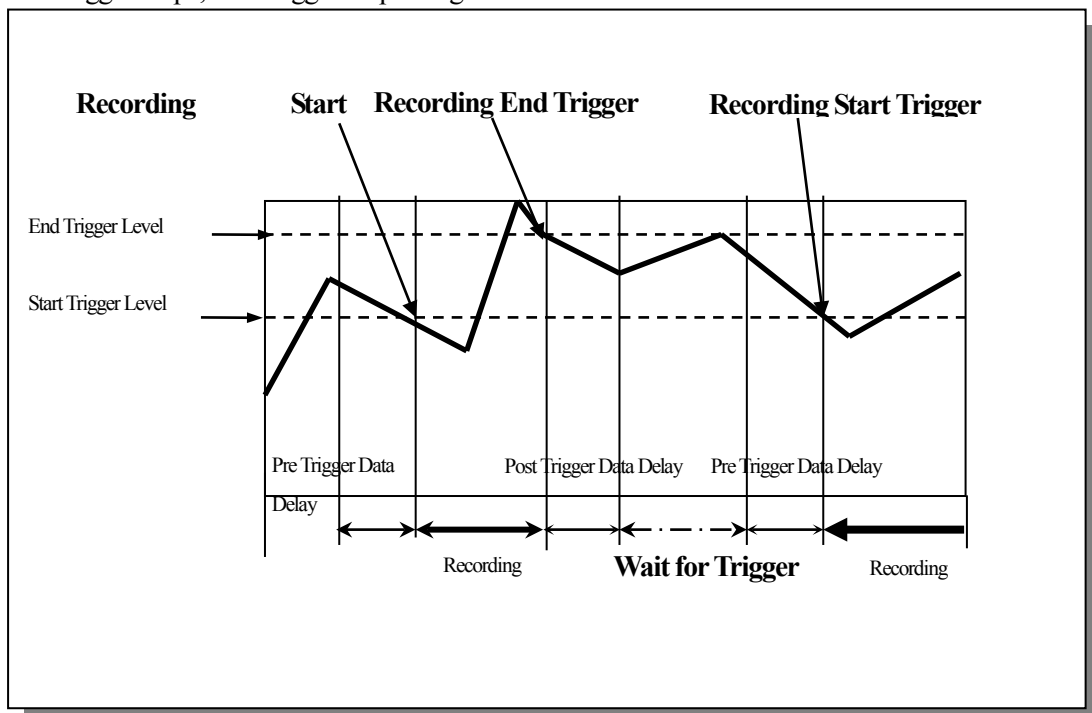
■ **Example of trigger slope with end trigger.**

After satisfying the start trigger conditions, the ELA-55A starts recording and records data until satisfying the end trigger conditions.

Start Trigger Slope, End Trigger Slope: Positive



Start Trigger Slope, End Trigger Slope: Negative



4 - 4 [Digital Trigger] tab

Select the "Digital Trigger" on the Set Meas Condition window to display the [Digital Trigger] tab in the left.
Click the [Digital Trigger] tab.

Measure Mode
Digital Trigger
Data File

Digital Trigger

	Bit	Level
Start Trigger	D1_1	1
End Trigger	D1_1	1

Pre Trigger Data(Delay) Number of Data/CH 1000 0 - 466033
Time 1.000sec 0 - 00:07:46

Post Trigger Data(Delay) Number of Data/CH 1000 0 - 466033
Time 1.000sec 0 - 00:07:46

☒ Set End Trigger.

Repeat Times

1

MEM

The "Digital Trigger" appears, on the Set Meas Condition window, when a digital channel is included in the target.

■Operation method

- (1) Select the target bit to be triggered.

You are able to select the Input Mode bit, pre-set on the Set DIO Condition window.

In the synchronous operation, you are able to select the Input Mode bit, pre-set on the Set DIO Condition window of the synchronous master unit.

- (2) Select the trigger level value (value to be triggered).

0/1

- (3) To record data before starting the recording, set the Pre Trigger Data (Delay) in time (sec) or number of data/CH. Input available range is displayed on the right.

- (4) To set the end trigger, put a check mark to the check box next to the "Set End Trigger."

Set the conditions of the End Trigger in a same manner as the Start Trigger.

NOTE

To use the Digital Trigger, make sure the single "Input" Mode exist on the Set DIO Condition window.

To use the Digital Trigger in the synchronous operation, make sure the single "Input" Mode exist on the Set DIO Condition window on the master unit.

- (5) Input the number of repeat times.

4 - 5 [External Trigger] tab

Select the Ext Trigger on the Set Meas Condition window to display the [Ext Trigger] tab in the left.
Click the [Ext Trigger] tab.

Measure Mode
Ext Trigger
Data File

Ext Trigger

Start Trigger Slope Positive

End Trigger Slope Positive

Pre Trigger Data(Delay) Number of Data/CH 1000 0 - 466033
Time 1.000sec 0 - 00:07:46

Post Trigger Data(Delay) Number of Data/CH 1000 0 - 466033
Time 1.000sec 0 - 00:07:46

☒ Set End Trigger.

Repeat Times
1

■Operation method

- (1) Select the trigger slope (how to cross the trigger level) from the following.
Positive/Negative
- (2) To record data before starting the recording, set the Pre Trigger Data (Delay) in time (sec) or number of data/CH.
Input available range is displayed on the right.
- (3) To set the end trigger, put a check mark to the check box next to the "Set End Trigger."
Set the conditions of the End Trigger in a same manner as the Start Trigger.
- (4) Input the number of repeat times.

4 - 6 [Complex Trigger] tab

Select the Complex Trigger on the Set Meas Condition window to display the [Complex Trigger] tab in the left.
Click the [Complex Trigger] tab.

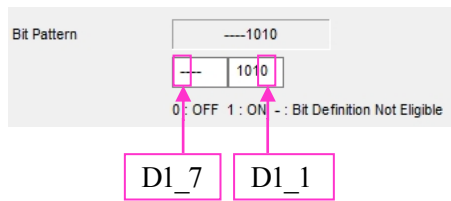
■Operation method

- (1) Set logical AND OR conditions for the 4 channels of the analog trigger and digital trigger, external trigger, ECAN trigger, and manual trigger.

Click the **Analog trigger** button or **Digital trigger** button to open the following window.

Select the “None”, “Analog Trigger”, “Digital Trigger” for setting the conditions.

When the Trigger is "None", the EDX-5000A is triggered when the measured value of the digital channel is the same value as the pre-set "Bit Pattern".



On the above window, the EDX-5000A is triggered when the digital channel is D1_1=0, D1_2=1, D1_3=0, and D1_4=1.

Click the **Ext Trigger** button. The external trigger condition changes in due order from the "Ext Trigger: ON: Positive" - "Ext Trigger: ON: Negative" - "Ext Trigger: OFF."

Click the **Manual Trigger** button. The Manual trigger condition changes in due order from the "Manual Trigger: ON" - "Manual-Trigger: OFF".

To record data, with the "Manual Trigger: ON", click the **REC** button during the "waiting to be triggered" status.

Select the logical AND operator or logical OR operator.

The series of valid trigger conditions are displayed in blue line.

- (2) To record data before starting the recording, set the Pre Trigger Data Delay in time or number of data/CH.
Input available range is displayed on the right.
- (3) To set the end trigger, put a check mark to the check box next to the "Set End Trigger."
Set the conditions of the End Trigger in a same manner as the Start Trigger.
- (4) Input the number of repeat times.

4 - 7 [Data file] tab

This section describes how to set relating items of data files.

Click the [Data File] tab.

The screenshot shows the 'Data File' tab selected in the 'Measure Mode' sidebar. The main area contains the following fields:

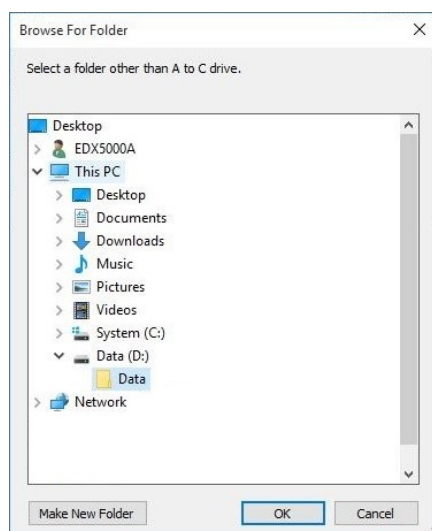
- Set Save Folder:** A text box containing 'D:\Data\' and a 'Browse...' button.
- Data File Name:** A text box containing 'TEST0000.KS2'.
- File Name:** A text box containing 'TEST'.
- File Title:** An empty text box.
- File No.:** A numeric input field with '0' and up/down arrow buttons.

■Set Save Folder

Set the Set Save Folder for saving the collected data file.

Click the **Browse...** button to display the Browse For Folder.

Select the target folder.



NOTE

Choose the folder except the A - C drive.

■File Name

Set a file name within 20 characters.

■File Title

Set a file name within 40 characters.

■File No.

Set a file No. (Setting range: 0 to 9999)

You are able to record data up to File No. 9999.

■Data File Name

Data file names are specified as shown below.

Measure Mode	Data File Name
Manual	$\boxed{\text{TEST}}\boxed{0000} \cdot \text{KS2}$ (1) (2)
Manual (Set Record Data) when the repeat time is 1.	
Manual (Set Record Data) when the repeat times is 2 or larger.	$\boxed{\text{TEST}}\boxed{0000} _ \Delta \boxed{0000} \cdot \text{KS2}$ (1) (2) (3)
Interval	
Analog trigger	
Digital trigger	
External trigger	
Complex trigger	

(1) File Name

(2) File No.

(3) The repeat time

The file number is incremented by one after every recording.

The repeat times is automatically incremented by one after every recording
According to the Measure mode, alphabet is added in the Δ part before the 4-dig repeat times.

M: Manual (Set Record Data),

I: Interval

A: Analog Trigger

D: Digital Trigger

E: External Trigger,

C: Complex Trigger

NOTE

Since the KS2 format data file existing at the save destination of the acquired data file is not overwritten, it may be automatically changed to a number higher than the set file number.

Example:

Name: "TEST", No.: "0001"

(1) If the file "TEST0000.ks2" exists: 0001(No change)

(2) If the file "TEST0001.ks2" exists: 0002(Changed)

(3) If the file "TEST1000.ks2" exists: 1001(Changed)

(4) If the file "TEST9999.ks2" exists: 0001(Cannot start monitor)

The above process applies only the KS2 format data file in the master unit.

Other data files may be overwritten with the same name.

Data files that may be overwritten:

(1) KS2 format data file in the slave unit

(2) E4A format data file (CAN)

(3) NMEA format data file (GPS)

(4) CSV format data file

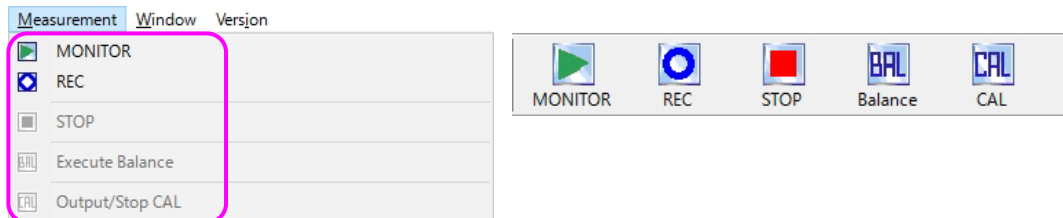
(5) RSP format data file (RPC III)

(6) AVI format data file (movie)

5 Measuring data

Execute measurements by any of the following.

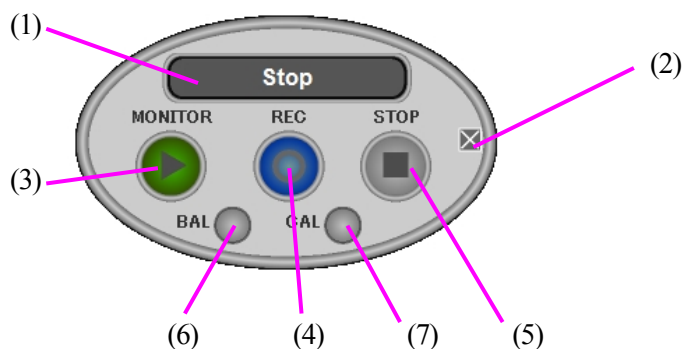
- Click the Measurement's drop-down menu.
- Click the Measurement's icon from the toolbar.
- Click the Measurement's button from the Meas Operation Panel.



MEMO

On the default state, icons related to the measurements are not displayed on the toolbar.
For displaying the buttons, select the "View" - "Control Bar" - "Tool Bar" - "Customize..." to display the Customize Toolbar dialog box.

5 - 1 Meas operation panel



(1) Display state

Displays the measurement state.

Stop	Stopping the measurement.
Monitoring	In the process of monitor measurement.
Recording	Recording data.
Pausing	Pausing recording during the manual measurement.
Wait for Intvl	Interval measurement condition is not satisfied
Wait for Trg	Trigger measurement condition is not satisfied

(2) button

Closes the Meas Operation Panel.

(3) button

Starts monitoring data.

The same operation is available by clicking the "Measurement" - "MONITOR."

(4) button

Manual measurement: Starts recording.

Interval measurements: Waiting for the interval measurement.

Trigger measurement: Waiting for the trigger.

The same operation is available by clicking the "Measurement" - "REC"

(5) button

Stops recording data or stops monitoring data.

The same operation is available by clicking the "Measurement" - "STOP."

(6) button

Executes balance and displays the Balance result window.

The same operation is available by clicking the "Measurement" - "Execute Balance."

(7) button

Outputs the CAL in the order of Output +CAL → Output -CAL → Stop.

The same operation is available by clicking the "Measurement" - "Output/Stop CAL."

MEMO

To hide the Meas Operation Panel, click the View - Control Bar - Meas Operation Panel - Disp to release a check mark.

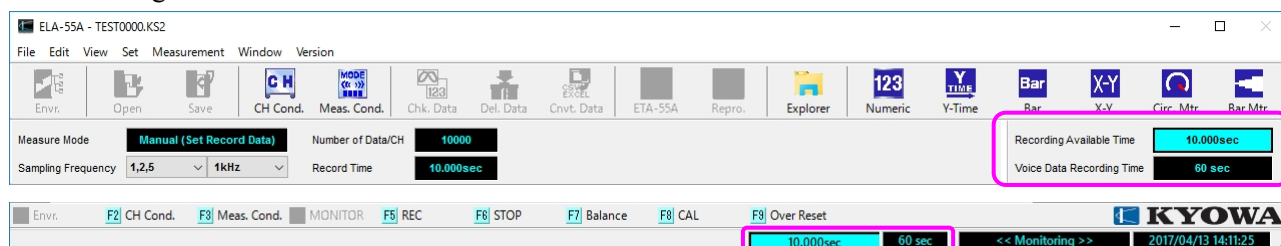
To show the Meas Operation Panel, click the View - Control Bar - Meas Operation Panel - Disp to put a check mark.

5 - 2 Measuring mode bar and status bar

Various items are displayed on the measuring mode bar and status bar.

■Recording available time and voice data recording time

When the ELA-55A starts monitoring data, the "recording available time" and "voice data recording time" appear on the measuring mode bar and status bar.



- The "recording available time" is as follows.

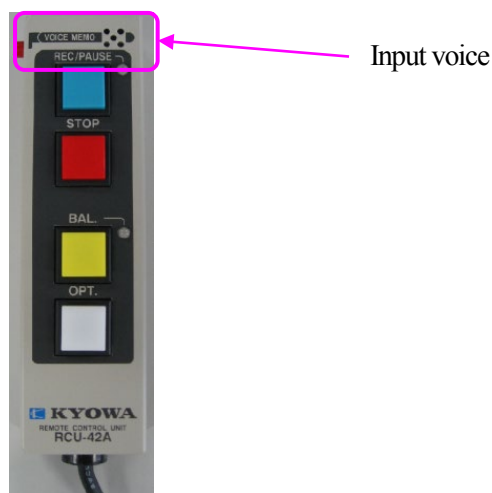
When the number of recording data is specified, by using the number of recording data and sampling frequency, the "recording available time" is calculated.

When the number of recording data is not specified, the maximum recording available time appears.

- When you start recording data, the "recording available time" starts decreasing.



- The "voice data recording time" indicates the remaining time of the voice recording available time.
(Use the remote controller for recording voice.)



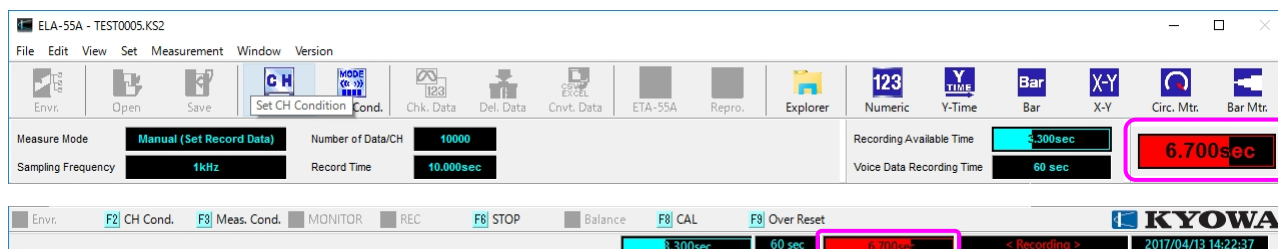
MEMO

- When selecting the "Manual (Set Record Data)" and "Interval" or when executing trigger measurements without setting the end trigger, the number of recording data is specified.
- When selecting the "Manual" or when executing measurements with setting the end trigger, the number of recording data is not specified.
- When executing trigger measurements without setting the end trigger, the "recording available time" is obtained as follows.

"Recording Available Time" = (The number of recording data + Pre Trigger Data Delay)/Sampling frequency

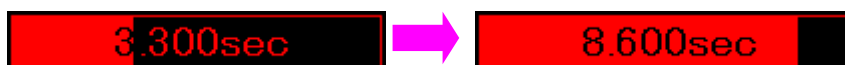
■Recording time

When the ELA-55A starts monitoring data, the "recording time" (elapsed time after the recording starts) appears on the measuring mode bar and status bar.



- When the number of recording data is specified, the bar indicates the "recording time."

When you start recording data, the "recording time" starts increasing.



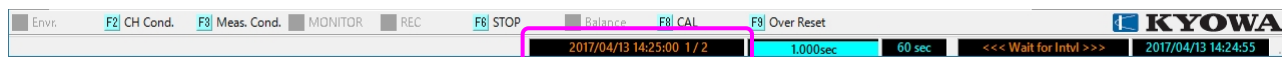
MEMO

When executing trigger measurements without setting the end trigger, the "recording available time" is obtained as follows.

"Recording Available Time" = (The number of recording data + Pre Trigger Data Delay)/Sampling frequency

■Measuring conditions

When the ELA-55A becomes "Wait for Intvl (Waiting for the interval measurement)" during interval measurements or "Wait for Trg (Waiting for the trigger)" during the trigger measurements, measuring conditions appear on the status bar.



●Interval conditions

2017/04/13 14:26:30 1 / 2

The "data recording start time" and "the number of repeat times" appear.

●Analog trigger conditions

CH01 > 2500.00um/m 1 / 10

The "trigger CH", "trigger level", and "the number of repeat times" appear.

●Digital trigger conditions

D1_1 Level:0 1 / 10

The "trigger bit", "trigger level", and "the number of repeat times" appear.

●External trigger conditions

Ext Trigger Signal Positive 1 / 10

The number of repeat times appears.

●Complex trigger conditions

Complex Trigger 1 / 10

The number of repeat times appears.

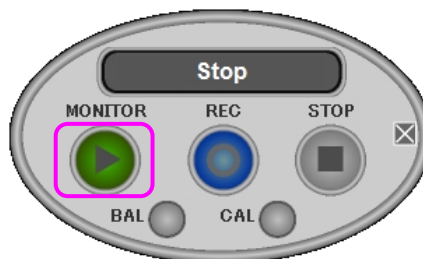
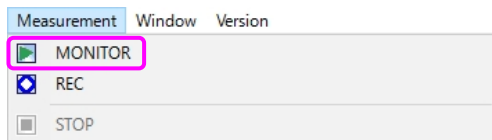
5 - 3 Manual measurement

This section describes measurement flow when the Measure mode is “Manual” mode or “Manual (Set Record Data)” mode.

■Operation method

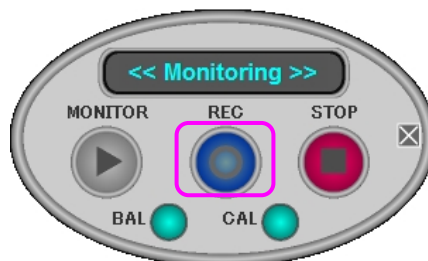
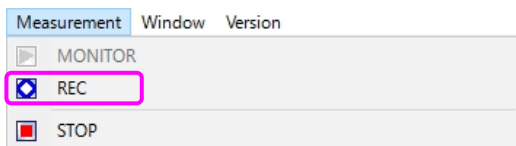
(1) Starts monitoring data by any of the following.

- Click the Measurement - MONITOR.
- Click the **Monitor** icon from the toolbar.
- Click the **MONITOR** button from the Meas Operation Panel.



(2) Starts recording data by any of the following.

- Click the Measurement - REC.
- Click the **Record** icon from the toolbar.
- Click the **REC** button from the Meas Operation Panel.



(3) Recording starts and the recording status appears on the status bar.



(4) To pause the data recording, with the PAUS function in enabled state, execute any of the following operation during recording data.

To restart the data recording, execute any of the following operation during pausing.

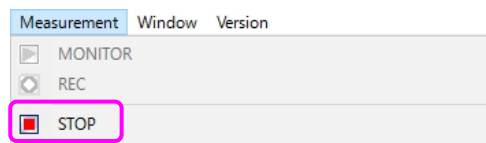
- Click the Measurement - REC/PAUSE.
- Click the **REC/PAUSE** icon from the toolbar.
- Click the **REC/PAUSE** button from the Meas Operation Panel.

MEMO

Enable/Disable the PAUSE function on the [Detail] tab on the Set Environment window.

(5) Stops recording data by any of the following.

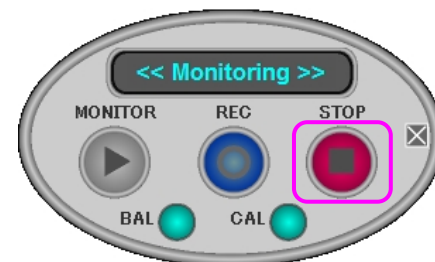
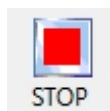
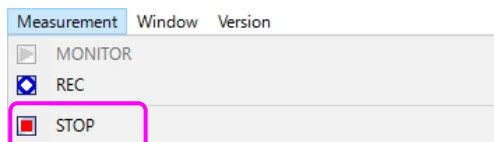
- Click the Measurement - STOP
- Click the Stop icon from the toolbar.
- Click the STOP button from the Meas Operation Panel.



When Measure mode is the "Manual (Set Record Data)" mode, the ELA-55A records data until satisfying the Record Data on the Measure Mode window.

(6) Stops monitoring data by any of the following.

- Click the Measurement - STOP
- Click the Stop icon from the toolbar.
- Click the STOP button from the Meas Operation Panel.



5 - 3 - 1 Repeated recording

When selecting the "Manual (Set Record Data)", you are able to execute the repeated recording by setting the number of repeat times.

When recording data for a long time, a data file is created by every pre-set number data (or by every pre-set time) by executing the repeated recording.

■Measuring conditions

- The Meas mode is "Manual (Set Record Data)."
- You are not able to pause the recording operation (by clicking the Measurement - REC/PAUSE or REC/PAUSE icon) while recording data

NOTE

For the repeated recording, you need to set 5 seconds or longer as the record time.

■Operation method

(1) Open the Set Measure Condition window by any of the following.

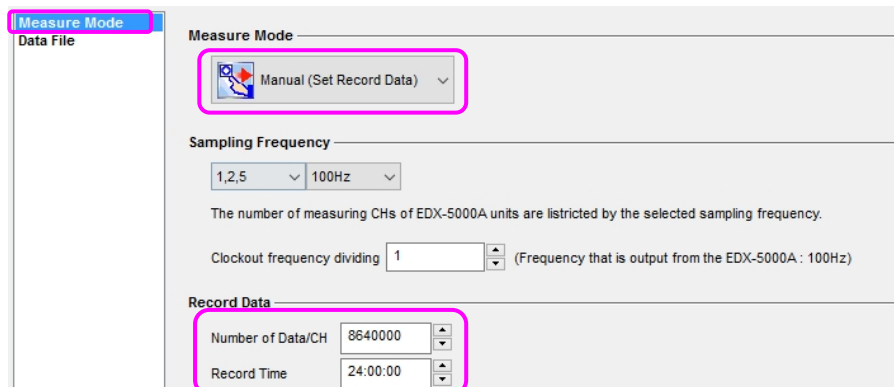
- Click the Set - Set Measure Condition....
- Click the Meas. Cond icon from the toolbar.

(2) Select the [Measure Mode] tab.

Select the "Manual (Set Record Data)".

Select the Number of Data/CH or Record Time.

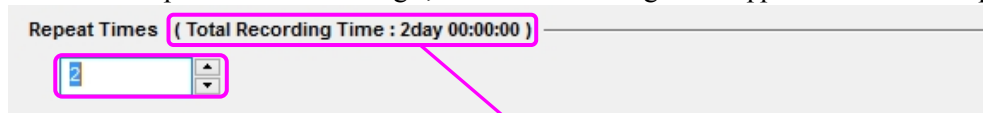
The number of recording data or data-recording time saved in one file is determined.



(3) Select the Repeat Times. (Setting range: 1 to 9999)

The ELA-55A records data by every pre-set number data (or by every pre-set time) for the number of repeat times.

When the "Repeat Times" is 2 or larger, the "Total Recording Time" appears next to the "Repeat Times."



Total Recording Time

2 days = Record Time 24:00:00 × Record Time 2

(4) The ELA-55A starts recording as follows.

(Suppose the recording starts at 8:00, data file name is DATA, and File No. is 0000.)

First day, The recording starts at 8:00.

Saved in the DATA0000_M0000.KS2.

Second day, 8:00

Saved in the DATA0000_M0001.KS2.

Third day, The recording ends at 8:00.

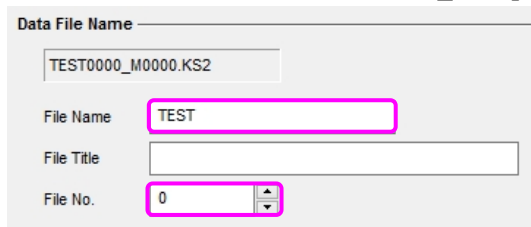
After executing the measurement for the pre-set number of repeat times, the ELA-55A becomes monitoring state.

If you stop the repeated recording by clicking the Measurement - REC/PAUSE or **REC/PAUSE** icon during the repeated recording, the ELA-55A becomes monitoring state.

■Data File Name

The "Data File Name" is determined by using the items and the "Repeat Times" on the Set Meas Condition window.

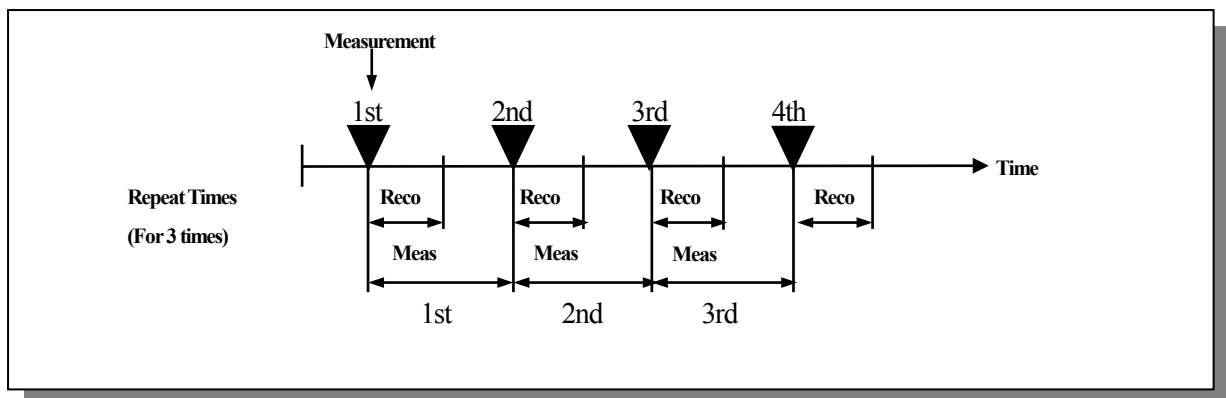
- When the Repeat Times is 1.
Data File Name: File name + File No.KS2
- When the Repeat Times is 2 to 9999.
Data File Name: File name + File No._M Repeat Times.KS2



5 - 4 Interval measurement

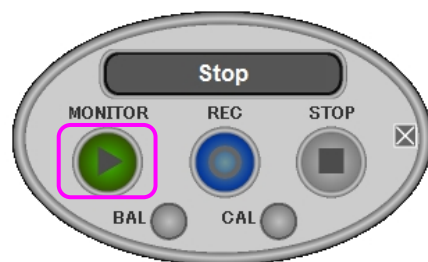
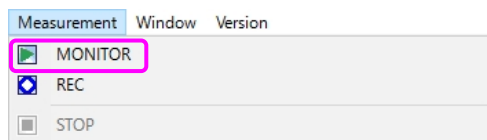
This section describes measurement flow when the Measure mode is "Interval" mode.

The Interval measurement automatically records data at the pre-set time interval until satisfying the Record Data on the Measure Mode window.

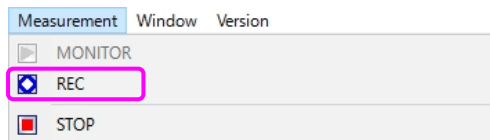


■Operation method

- (1) Starts monitoring data by any of the following.
 - Click the Measurement - MONITOR.
 - Click the **Monitor** icon from the toolbar.
 - Click the **MONITOR** button from the Meas Operation Panel.



- (2) Displays the "Wait for Intvl" by any of the following.
 - Click the Measurement - REC/PAUSE.
 - Click the **REC/PAUSE** icon from the toolbar.
 - Click the **REC** button from the Meas Operation Panel.



On the status bar, interval measurement start date, the number of repeat times, and measurement state appear.



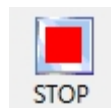
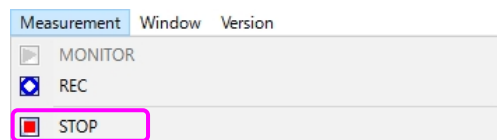
(3) Recording starts and the recording status appears on the status bar.



(4) After executing the measurement for the pre-set repeat times, the ELA-55A becomes monitoring state.

(5) Stops monitoring data by any of the following.

- Click the Measurement - STOP
- Click the Stop icon from the toolbar.
- Click the STOP button from the Meas Operation Panel.



5 - 5 Analog trigger measurement

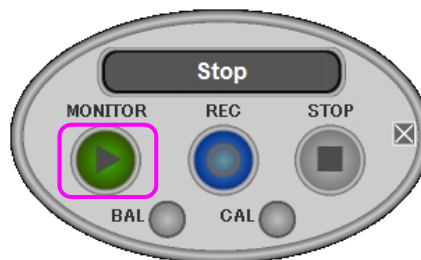
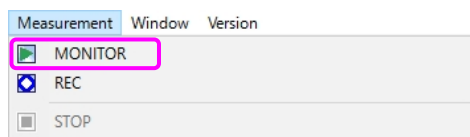
This section describes measurement flow when the Measure mode is “Analog Trigger” mode.

The “Analog trigger” mode measurement automatically starts recording data when measured value of the specified analog channel satisfies the start trigger conditions and records data until satisfying the Record Data on the Measure Mode window or until satisfying the end trigger conditions.

■Operation method

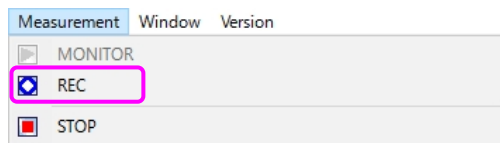
(1) Starts monitoring data by any of the following.

- Click the Measurement - MONITOR.
- Click the **Monitor** icon from the toolbar.
- Click the **MONITOR** button from the Meas Operation Panel.



(2) Displays the "Wait for Trg" by any of the following.

- Click the Measurement - REC/PAUSE.
- Click the **REC/PAUSE** icon from the toolbar.
- Click the **REC** button from the Meas Operation Panel.



On the status bar, trigger CH, trigger level, the number of repeat times, and measurement state appear.



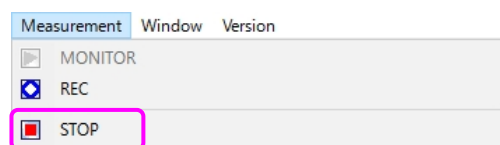
(3) Recording starts and the recording status appears on the status bar.



(4) After executing the measurement for the pre-set repeat times, the ELA-55A becomes monitoring state.

(5) Stops monitoring data by any of the following.

- Click the Measurement - STOP
- Click the **Stop** icon from the toolbar.
- Click the **STOP** button from the Meas Operation Panel.



5 - 6 Digital trigger measurement

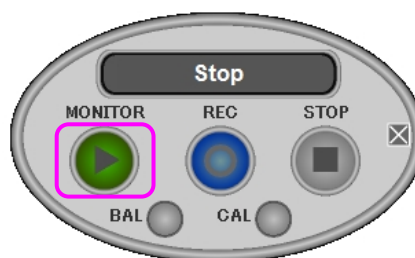
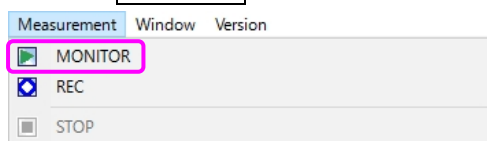
This section describes measurement flow when the Meas mode is "Digital Trigger" mode.

The "Digital Trigger" mode measurement automatically starts recording data when measured value of the specified analog channel satisfies the start trigger conditions and records data until satisfying the Record Data on the Measure Mode window or until satisfying the end trigger conditions.

■Operation method

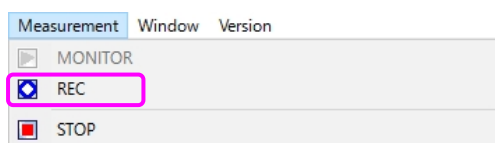
(1) Starts monitoring data by any of the following.

- Click the Measurement - MONITOR.
- Click the **Monitor** icon from the toolbar.
- Click the **MONITOR** button from the Meas Operation Panel



(2) Displays the "Wait for Trg" by any of the following.

- Click the Measurement - REC/PAUSE.
- Click the **REC/PAUSE** icon from the toolbar.
- Click the **REC** button from the Meas Operation Panel.



On the status bar, trigger CH, trigger level, the number of repeat times, and measurement state appear.



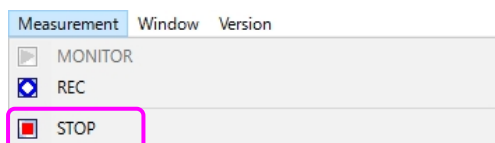
(3) Recording starts and the recording status appears on the status bar.



(4) After executing the measurement for the pre-set repeat times, the ELA-55A becomes monitoring state.

(5) Stops monitoring data by any of the following.

- Click the Measurement - STOP
- Click the **Stop** icon from the toolbar.
- Click the **STOP** button from the Meas Operation Panel.



5 - 7 External trigger measurement

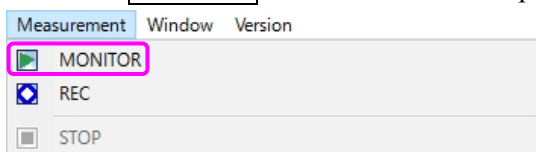
This section describes measurement flow when the Meas mode is “External Trigger” mode.

The “External Trigger” mode measurement automatically starts recording data when the external trigger signal is input and records data until satisfying the Record Data on the Measure Mode window or until satisfying the end trigger conditions.

■Operation method

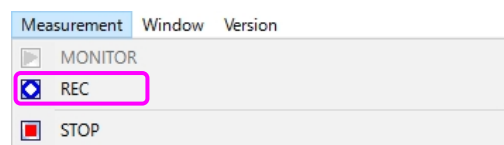
(1) Starts monitoring data by any of the following.

- Click the Measurement - MONITOR.
- Click the **Monitor** icon from the toolbar.
- Click the **MONITOR** button from the Meas Operation Panel.



(2) Displays the "Wait for Trg" by any of the following.

- Click the Measurement - REC/PAUSE.
- Click the **REC/PAUSE** icon from the toolbar.
- Click the **REC** button from the Meas Operation Panel.



On the status bar, the number of repeat times and measurement state appear.



(3) When the external trigger signal is input, the ELA-55A starts recording data.

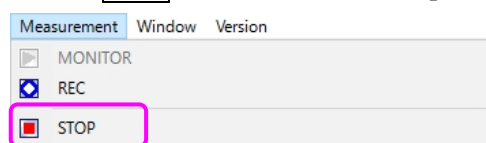
The recording status appears on the status bar.



(4) After executing the measurement for the pre-set repeat times, the ELA-55A becomes monitoring state.

(5) Stops monitoring data by any of the following.

- Click the Measurement - STOP
- Click the **Stop** icon from the toolbar.
- Click the **STOP** button from the Meas Operation Panel.



5 - 8 Complex trigger measurement

This section describes measurement flow when the Meas mode is "Complex Trigger" mode.

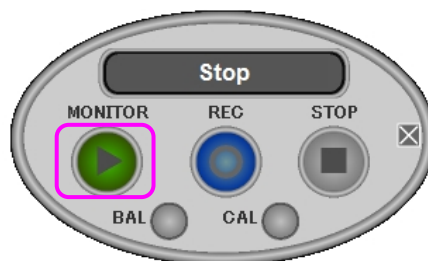
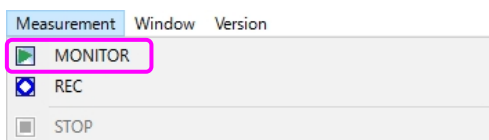
The "Complex Trigger" measurement automatically starts recording data when the trigger conditions, including 4 channels of analog triggers, external trigger, and manual trigger, are satisfied and records data until satisfying the Record Data on the Measure Mode window or until satisfying the end trigger conditions.

For the analog trigger specifications and external trigger specifications, see "5 - 5 Analog trigger measurement" and "5 - 7 External trigger measurement"

■Operation method

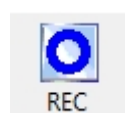
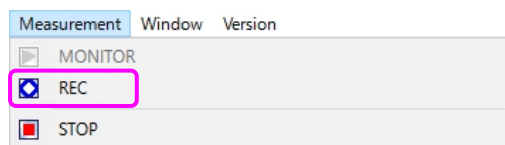
(1) Starts monitoring data by any of the following.

- Click the Measurement - MONITOR.
- Click the **Monitor** icon from the toolbar.
- Click the **MONITOR** button from the Meas Operation Panel.



(2) Displays the "Wait for Trig" by any of the following.

- Click the Measurement - REC/PAUSE.
- Click the **REC/PAUSE** icon from the toolbar.
- Click the **REC** button from the Meas Operation Panel.



On the status bar, the number of repeat times and measurement state appear.



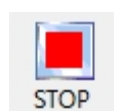
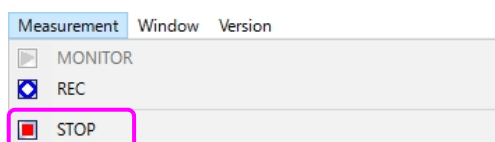
(3) Recording starts and the recording status appears on the status bar.



(4) After executing the measurement for the pre-set repeat times, the ELA-55A becomes monitoring state.

(5) Stops monitoring data by any of the following.

- Click the Measurement - STOP
- Click the **Stop** icon from the toolbar.
- Click the **STOP** button from the Meas Operation Panel.



5 - 9 Balance adjustment

Balancing should be performed during monitoring data or during pausing.

Balancing cannot be performed while the ELA-55A is in stopped state and is recording data.

■Operation method

(1) Open the Set CH Condition window by any of the following.

- Click the Set - Set CH Condition....
- Click the **CH Cond** icon from the toolbar.

(2) Put a check mark to the target channel on the “Balance” column on the Set CH Condition window.



MEMO

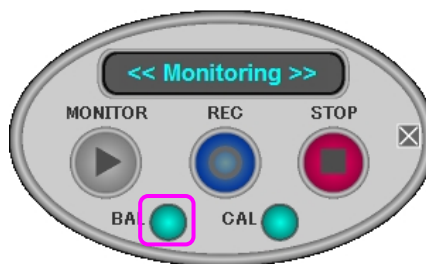
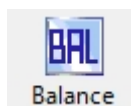
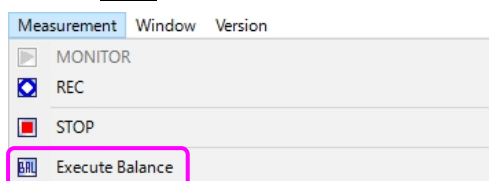
When the *** appears on the “Balance” column, you are not able to compensate the balancing of the target CH.

(3) Start monitoring data by any of the following.

- Click the Measurement - MONITOR.
- Click the **Monitor** icon from the toolbar.
- Click the **MONITOR** button from the Meas Operation Panel.

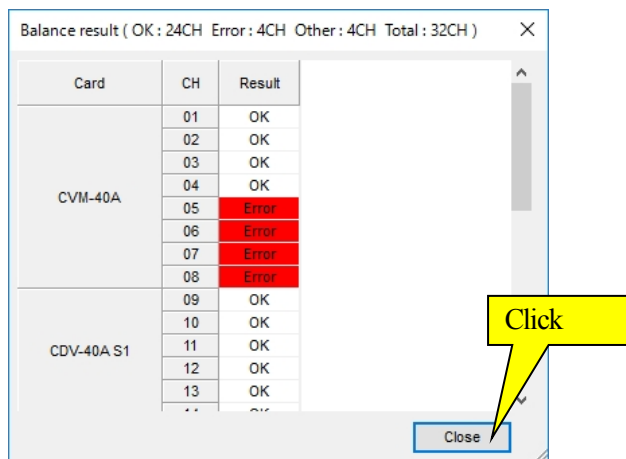
(4) Execute the balance adjustment by any of the following.

- Click the Measurement – Execute Balance.
- Click the **Balance** icon from the toolbar.
- Click the **BAL** button from the Meas Operation Panel.



(5) The following Balance result window appears.

Click the **Close** button to monitor data again.



Passed	Correctly compensated.
Error	Error
Sensor Error	In strain mode: Sensor is not connected, sensor is defective, the bridge resistance of the sensor is outside range of 120 ohm to 1,000 ohm. In voltage mode: The conditioner card may be defective. Please contact our sales office or private agent.
OFF	Not included.
***	Not available.

5 - 1 0 To output CAL / To stop CAL

Calibration (CAL) is a function that forcibly input analog, equivalent to 50% or 100% specified range, to every channel in order to confirm that channels are properly operating.

The ELA-55A inputs the CAL value with a sensor connected.

The measured data while outputting the CAL is the output value of each channel + CAL value

■Operation method

(1) Open the Set CH Condition window by any of the following.

- Click the Set - Set CH Condition....
- Click the **CH Cond** icon from the toolbar.

(2) Put a check mark to the check box next to the target channel on the “CAL” column on the Set CH Condition window.

Select the output value of the CAL on the CAL Range.

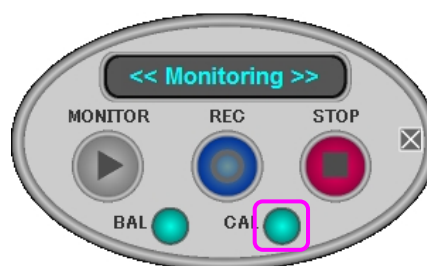
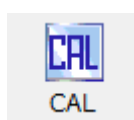
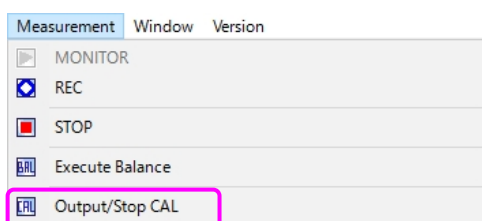
CAL	CAL Range
☒	100%
☒	100%
☒	100%
☒	100%
☒	100%
☒	100%
☒	100%
☒	100%
☒	100%

(3) Start monitoring data by any of the following.

- Click the Measurement - MONITOR.
- Click the **Monitor** icon from the toolbar.
- Click the **MONITOR** button from the Meas Operation Panel.

(4) Output the CAL by any of the following.

- Click the Measurement - Output/Stop CAL.
- Click the **CAL** icon from the toolbar.
- Click the **CAL** button from the Meas Operation Panel.



The ELA-55A outputs the CAL in the order of Stop → Output +CAL → Output -CAL → Stop.

(5) The outputting state appears on the status bar.



5 - 1 1 Offset zero

Offset Zero is a function that substitute the current measured data into the offset value on the Set CH Condition window for canceling the apparent measured value (to 0).

When the "Mode" is strain, by conducting the balance adjustment, the measured is around 0.

When the "Mode" is not strain, substitute the current measured value into the offset value for cancellation (to 0).

By using the offset zero function, you are able to easily substitute the current measured value into the offset value.

■Operation method

(1) Open the Set CH Condition window by any of the following.

- Click the Set - Set CH Condition....
- Click the **CH Cond** icon from the toolbar.

(2) Put a check mark to the check box next to the target channel on the "Offset Zero" column on the Set CH Condition window.



MEMO

When the *** appears on the "Offset Zero" column, you are not able to compensate the offset zero of the target CH.

(3) Start monitoring data by any of the following.

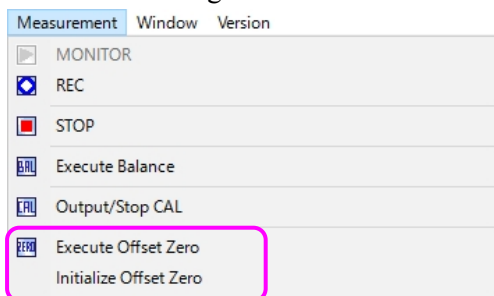
- Click the Measurement - MONITOR.
- Click the **Monitor** icon from the toolbar.
- Click the **MONITOR** button from the Meas Operation Panel.

(4) Click the Measurement - Exec Offset Zero.

The current measured data changes to the offset value.

Click the Measurement - Initialize Offset Zero.

The offset value changes to 0.



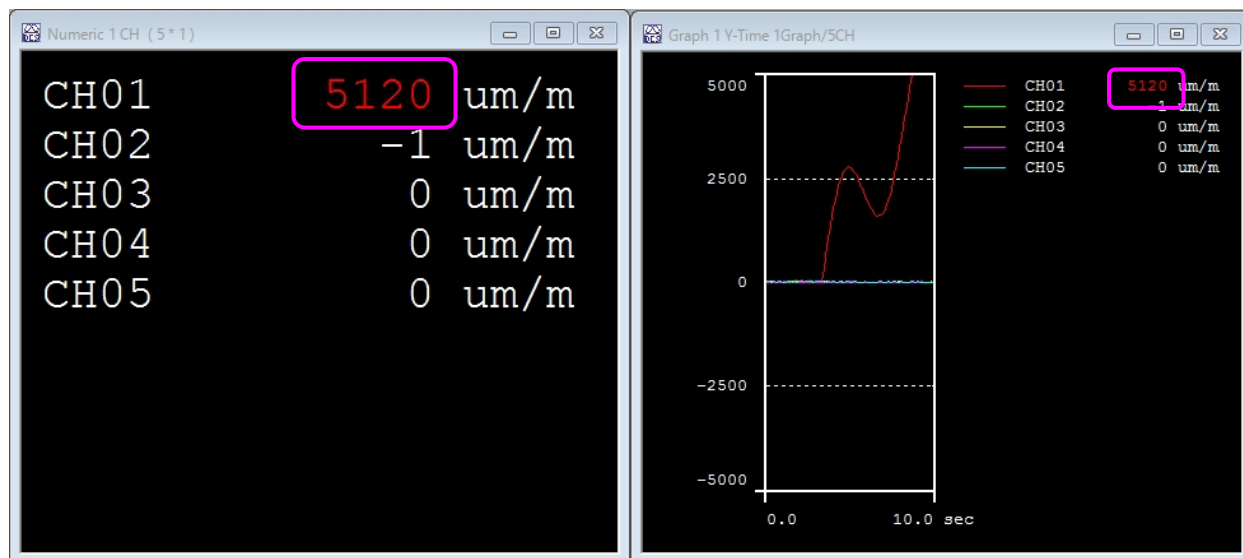
5-1 2 To display the exceeding value

When the measured data exceeds the Chk. Val. (Up) or Chk. Val. (Down) once during monitoring and recording data, since then, the measured value on Numeric windows/Graph windows are displayed in red.

With this function, you are able to check that the input value of every channel is exceeding or not.

[Example]

The measured data of the CH01 exceeded the Chk. Val. (Up) value.



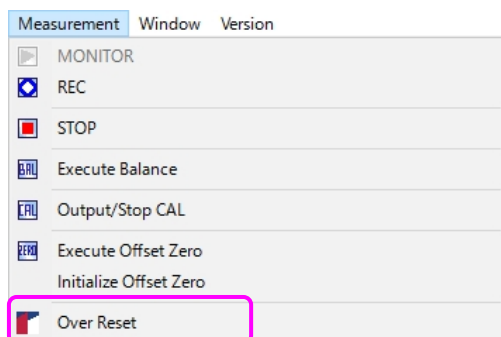
MEMO

- For setting the Chk. Val. (Up) and Chk. Val. (Down), click the Set - Set CH Condition... for displaying the Set CH Condition window.
- The state of exceeding value is cleared at the start of monitoring and returns to the normal state (state before exceeding value).

■ Operation method for the over reset

Reset the exceeding state to the previous state [before exceeding the check value (up) or check value (down)] by any of the following.

- Click the Measurement – Over Reset.
- Click the **Over Reset** icon from the toolbar.



5 - 1 3 Static measurement

The Measure mode is "Manual" and "Interval" modes only.

Every time you start a recording, the static measurement applies a moving-average function to measured data (averaging value data) and saves it to one CSV format file.

The averaging value data appears on the Numeric Lists of numeric windows and Y-Cycle graphs on graph windows.

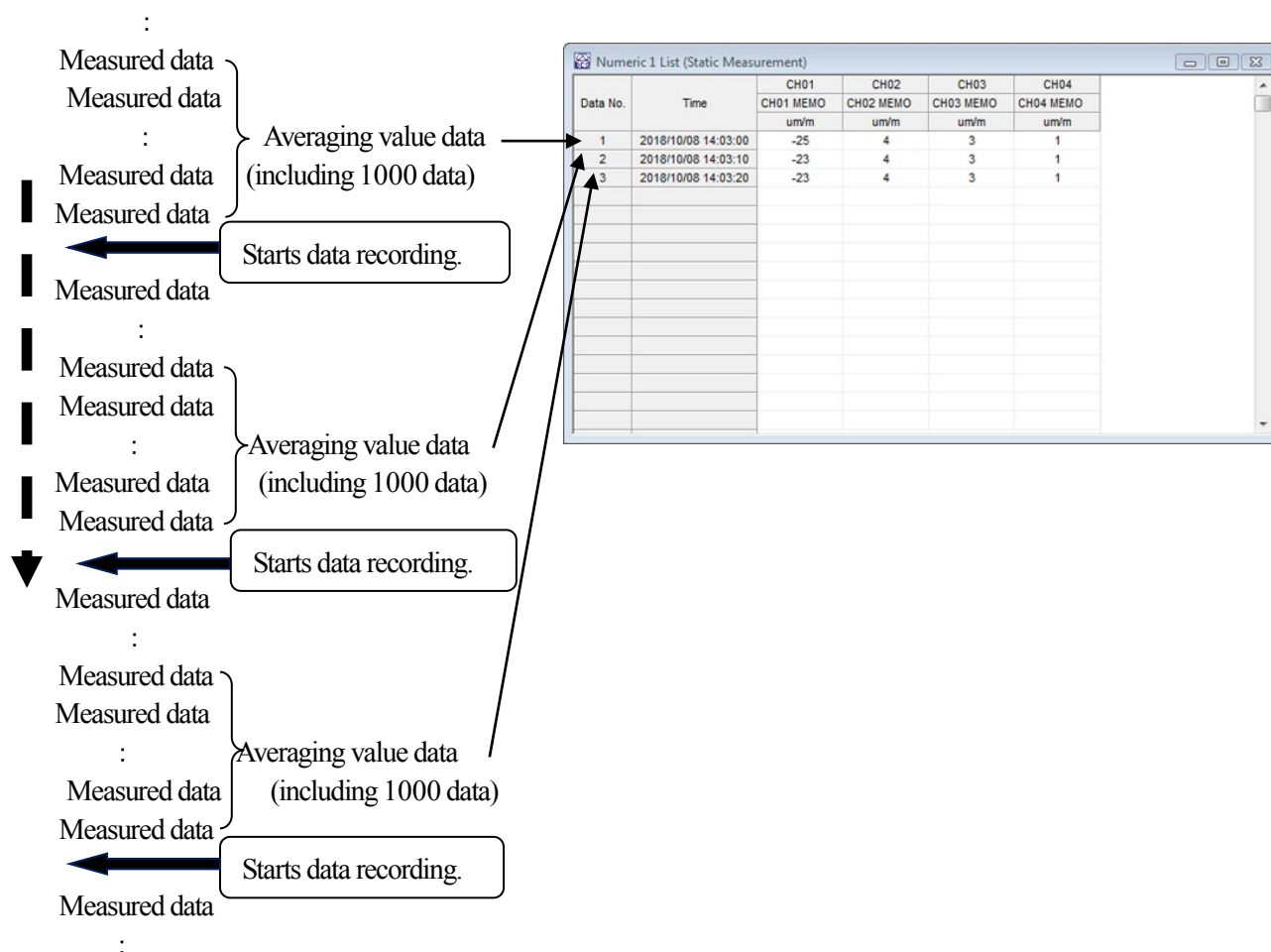
■Measuring conditions

- The Synchronous operation is "Standalone."
- The Control mode is "Offline."
- The Meas mode is "Manual" and "Interval" modes only.
- The sampling frequency is 1 kHz fixed.
- The CAN data and the GPS data is not available.

■Operation flow

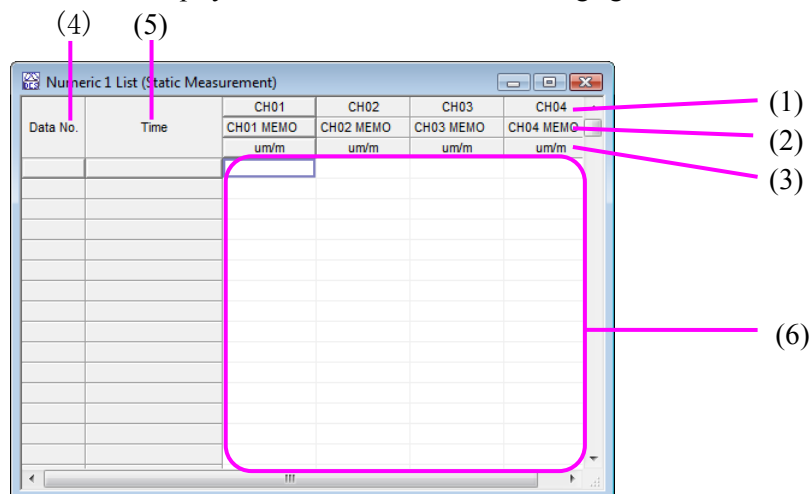
The averaging value data is the average value immediately after starting the recording.

The averaging value data indicates the average value of 1000 data immediately after starting the recording.



5 - 1 3 - 1 To display the list on numericid window

For the static measurement, the Numeric Lists on numeric windows are available.
You are able to display the latest 1000 items of the averaging value data on the list.



- (1)CH No.
- (2)The comment of the channel
- (3)The unit of the channel
- (4)Data No.
- (5)Time
- (6)The averaging value data of the channel

MEMO

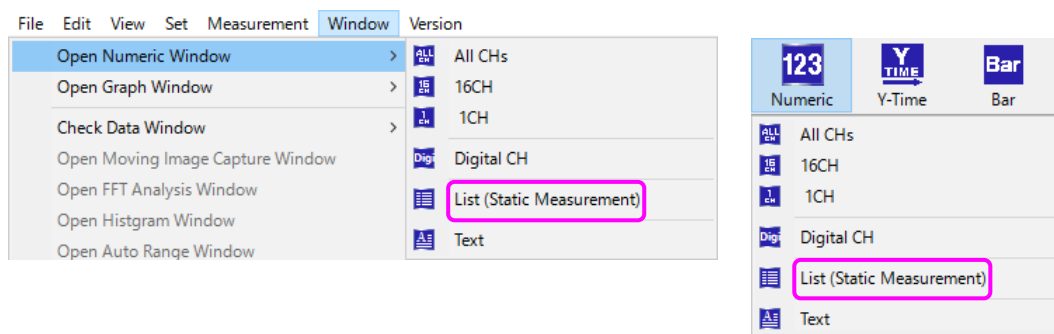
The "Static measurement" appears on the title on the Numeric Lists of numeric windows and Y-Cycle graphs on graph windows.



■How to display

Open the numeric window by any of the following.

- Click the Window - Open Numeric Window - List (Static Measurement).
- Point to **Numeric** icon from the toolbar and select the List (Static Measurement).



● **To hide the target CH column**

To hide the target CH column, press the **Delete** key.

(1) Point a mouse cursor onto the target channel.

Data No.	Time	CH01	CH02	CH03	CH04
		CH01 MEMO	CH02 MEMO	CH03 MEMO	CH04 MEMO
		um/m	um/m	um/m	um/m

(2) Press the **Delete** key to hide the target CH column.

Data No.	Time	CH01	CH04
		CH01 MEMO	CH04 MEMO
		um/m	um/m

● **To change the order of channels**

To change the order of channels, drag and drop the fixed cells.

(1) Drag the target fixed cells.

Data No.	Time	CH01	CH02	CH03	CH04
		CH01 MEMO	CH02 MEMO	CH03 MEMO	CH04 MEMO
		um/m	um/m	um/m	um/m

(2) Drop them to change the order of channels.

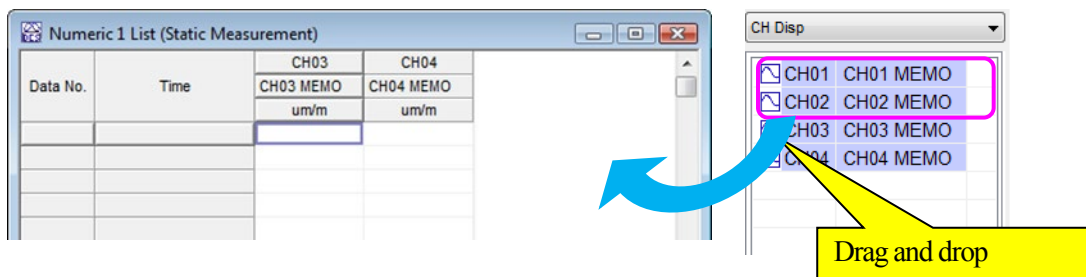
Data No.	Time	CH01	CH03	CH02	CH04
		CH01 MEMO	CH03 MEMO	CH02 MEMO	CH04 MEMO
		um/m	um/m	um/m	um/m

● **To display the target channels.**

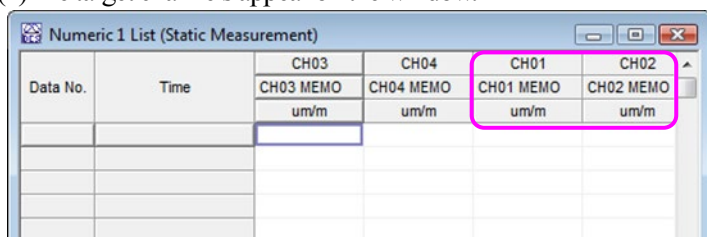
To display the target channels, drag and drop the channels on the CH Disp bar to the Numeric List window.

(1) Select the target channels on the CH Disp Bar.

Drag and drop them to the Numeric List window to display the target channels.



(2) The target channels appear on the window.



5 - 1 3 - 2 Data file name

The name of the CSV format file is determined by using the items on the Set Measure Condition window.

The name of the CSV format file: File name File No. . CSV

The screenshot shows the 'Set Measure Condition' window. It has two main sections: 'Set Save Folder' and 'Data File Name'. The 'Set Save Folder' section shows a text box with 'D:\Data\'. The 'Data File Name' section contains a text box with 'TEST0000.CSV'. Below this, there are three input fields: 'File Name' (containing 'TEST'), 'File Title' (empty), and 'File No.' (containing '0'). The 'File Name' and 'File No.' fields are highlighted with pink boxes.

MEMO

If the CSV format file having the same name already exists in the destination folder, the averaging value data is added to the existing file.

NOTE

You cannot reproduce the CSV format files with the ELA-55A.

5 - 1 3 - 3 Manual measurement

This section describes measurement flow when Meas mode is "Manual".

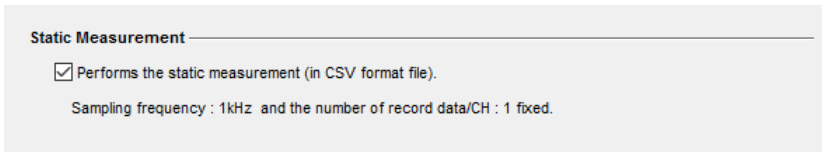
■Operation method

(1)Open the Set Measure Condition window by any of the following.

- Click the Set - Set Measure Condition....
- Click the Meas. Cond. icon from the toolbar.

(2)Click the "Measure Mode" on the left and select "Manual."

(3)Put a check mark to the check box next to the "Performs the static measurement (in CSV format file)."



(4)Start monitoring data by any of the following.

- Click the Measurement - MONITOR.
- Click the Monitor icon from the toolbar.
- Click the MONITOR button from the Meas Operation Panel.

The ELA-55A becomes the monitoring state.

The averaging value data appears on windows other than the Numeric Lists of numeric windows and Y-Cycle graphs of graph windows.

(5)Record data by any of the following.

- Click the Measurement - REC.
- Click the **REC** icon from the toolbar.
- Click the **REC** button from the Meas Operation Panel.

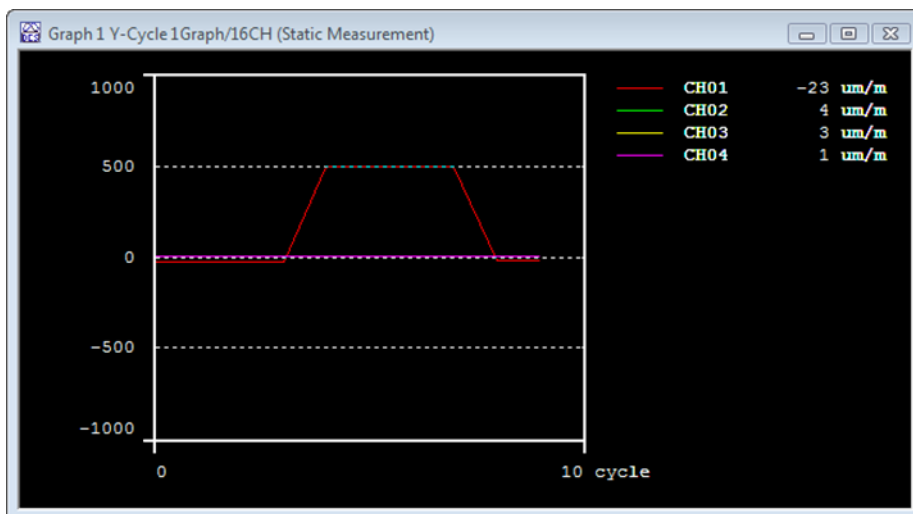
The averaging value data is saved in the CSV format file.

It appears on the Numeric Lists of numeric windows and Y-Cycle graphs of graph windows.

[Example]

Suppose the ELA-55A recorded data for 10 times.

Numeric 1 List (Static Measurement)					
Data No.	Time	CH01	CH02	CH03	CH04
		CH01 MEMO	CH02 MEMO	CH03 MEMO	CH04 MEMO
		um/m	um/m	um/m	um/m
1	2018/12/08 14:03:00	-25	4	3	1
2	2018/12/08 14:03:10	-23	4	3	1
3	2018/12/08 14:03:20	-23	4	3	1
4	2018/12/08 14:03:30	-23	4	3	1
5	2018/12/08 14:03:40	378	4	3	1
6	2018/12/08 14:03:50	443	4	3	1
7	2018/12/08 14:04:00	544	4	3	1
8	2018/12/08 14:04:10	576	4	3	1
9	2018/12/08 14:04:20	-18	4	3	1
10	2018/12/08 14:04:30	-24	4	4	1
11	2018/12/08 14:04:40	-24	4	3	1



(6)Stop monitoring data by any of the following.

(When recording data, the file No. is incremented by one after.)

- Click the Measurement - STOP
- Click the **Stop** icon from the toolbar.
- Click the **STOP** button from the Meas Operation Panel.

5 - 1 3 - 4 Interval measurement

This section describes measurement flow when the Measure mode is "Interval" mode.

(1) Open the Set Measure Condition window by any of the following.

- Click the Set - Set Measure Condition....
- Click the **Meas. Cond.** icon from the toolbar.

(2) Click the "Measure Mode" on the left and select "Interval."

(3) Put a check mark to the check box next to the "Performs the static measurement (in CSV format file)."

(4) Click the Interval from the left and set the interval conditions.

NOTE

For the static measurement, you need to set 11 seconds or longer as the interval time.

(5) Start monitoring data by any of the following.

- Click the Measurement - MONITOR.
- Click the **Monitor** icon from the toolbar.
- Click the **MONITOR** button from the Meas Operation Panel.

The ELA-55A becomes the monitoring state.

The averaging value data appears on windows other than the Numeric Lists of numeric windows and Y-Cycle graphs of graph windows.

(6) Displays the "Wait for Trg" by any of the following.

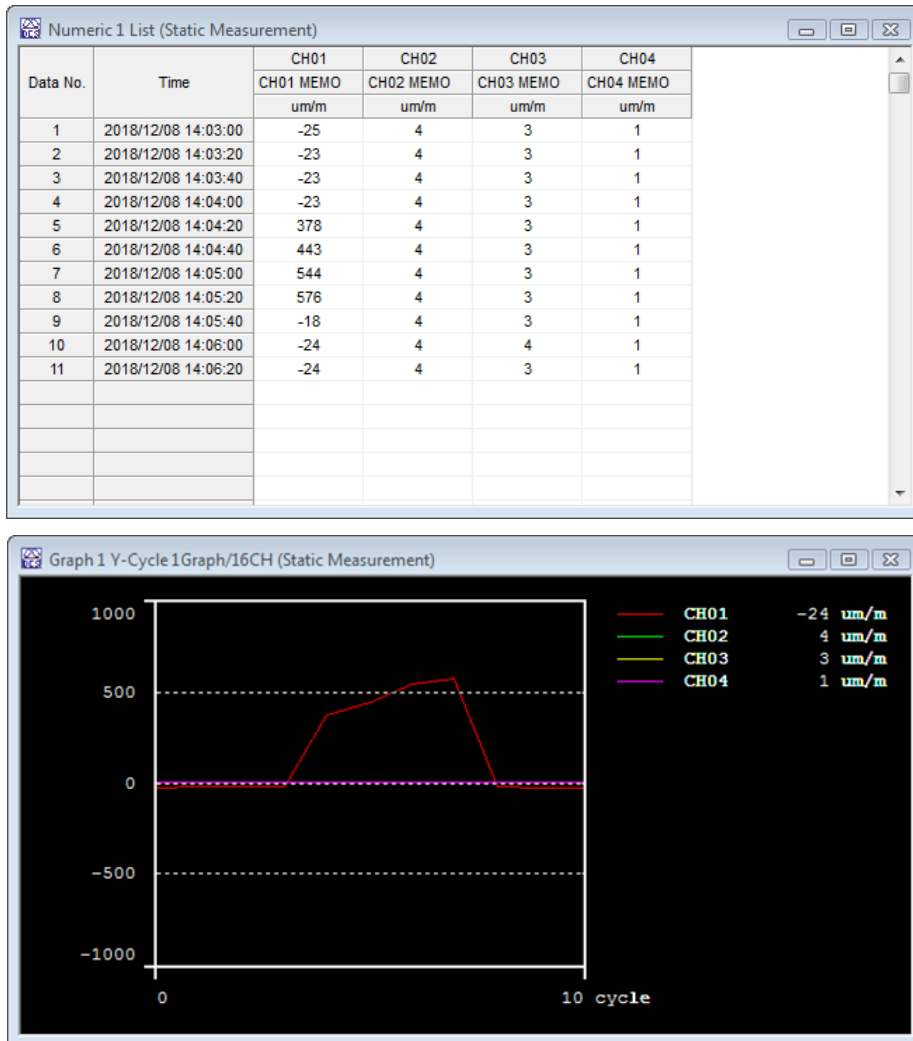
- Click the Measurement - REC.
- Click the **Record** icon from the toolbar.
- Click the **REC** button from the Meas Operation Panel.

Every time the recording start time will come, the averaging value data is saved in the CSV format file. It appears on the Numeric Lists of numeric windows and Y-Cycle graphs of graph windows.

[Example]

Suppose the ELA-55A recorded data with the following conditions.

Recording start time: 2018/12/08 14:03:00, the number of repeat times: 10, interval time: 20 seconds



After satisfying the Record Data on the Measure mode window or after executing the operations as described below, the ELA-55A becomes the monitoring state.

(When recording data, the file No. is incremented by one after.)

- Click the Measurement - STOP
- Click the **Stop** icon from the toolbar.
- Click the **STOP** button from the Meas Operation Panel.

(7) Stop monitoring data by any of the following.

- Click the Measurement - STOP
- Click the **Stop** icon from the toolbar.
- Click the **STOP** button from the Meas Operation Panel.

6 Loading TEDS sensor information

The EDX-5000A is capable of loading Transducer Electronic Data Sheet (TEDS) sensor information and capable of setting the most appropriate range, Calibr. const., unit, etc automatically.

(Note that the EDX-5000A is not able to load all the TEDS sensor information.)

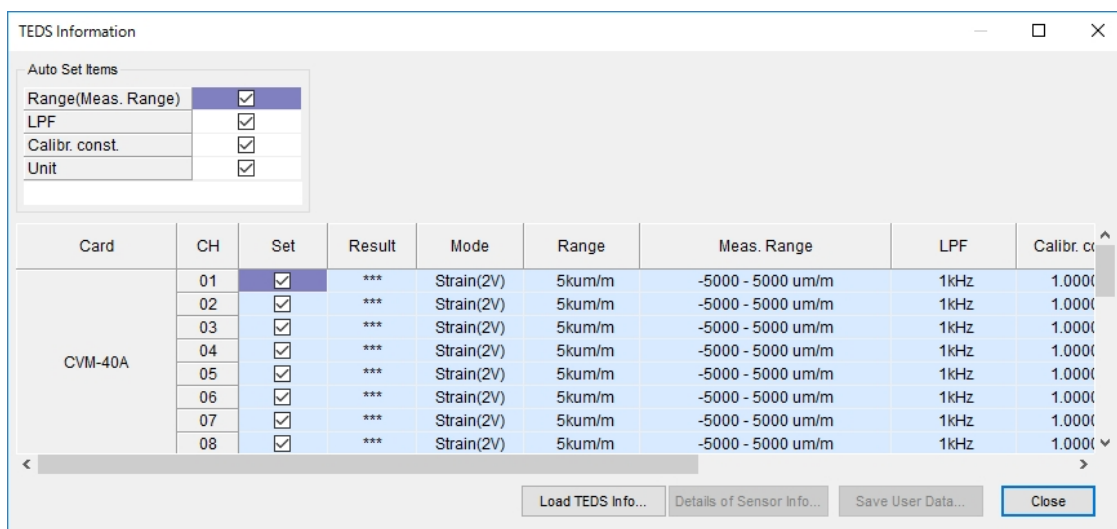
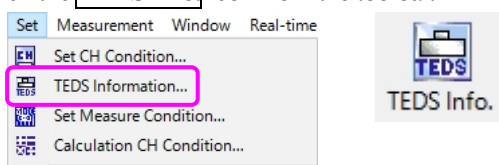
The available conditioner cards and available template IDs are as follows.

Conditioner Card	Template ID	Sensor Type
CDV-40B (-F)	30	Voltage-output sensor
	33	Strain Gage Sensor
DPM-42B (-F)	33	Strain Gage Sensor
CCA-40A (-F)	0	Piezoelectric accelerometer
	24	Piezoelectric accelerometer
	25	Piezoelectric accelerometer
CVM-40A	30	Voltage-output sensor
	33	Strain Gage Sensor
	0, 24, 25	Piezoelectric accelerometer

■How to display

Open the TEDS Information window by any of the following.

- Click the Set - TEDS information....
- Click the **TEDS Info** icon from the toolbar.



6 - 1 To load the TEDS sensor information

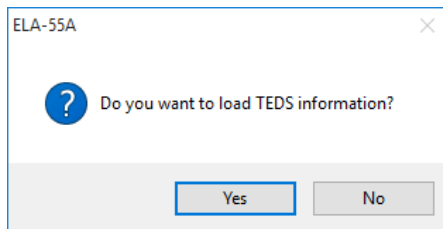
After executing the loading of the TEDS sensor information, the ELA-55A loads the TEDS information of all the sensor-mounted channels.

■Operation method

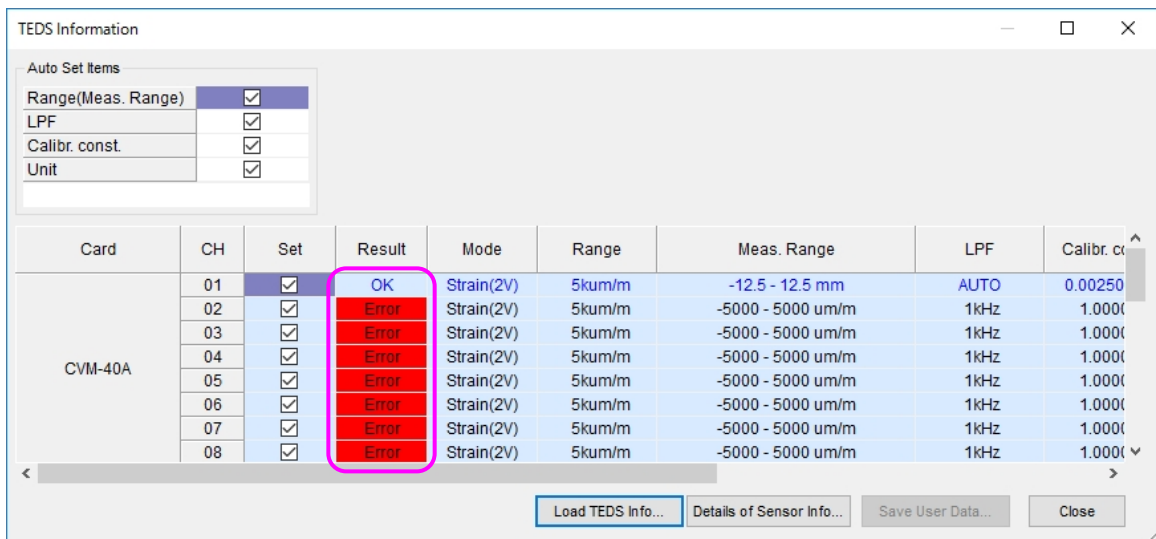
(1) Click the **Load TEDS info...** button.

(2) The following dialog appears.

Click the **Yes** button for loading.



(3) After completing the loading, the following window, indicating "OK" or "Error" appears.



6 - 1 - 1 To change the range and meas range

This section describes how to change the pre-set Range and Meas Range automatically after loading the TEDS information.

Mode	Range	Meas. Range	LPF
Strain(2V)	10kum/m	-25 - 25 mm	AUTO
Strain(2V)	5kum/m	-12.5 - 12.5 mm	1kHz
Strain(2V)	5kum/m	-25 - 25 mm	1kHz
Strain(2V)	5kum/m	-125 - 125 mm	1kHz
Strain(2V)	5kum/m	-250 - 250 mm	1kHz
Strain(2V)	5kum/m	-1250 - 1250 mm	1kHz
Strain(2V)	5kum/m	OFF	1kHz
Strain(2V)	5kum/m	-5000 - 5000 um/m	1kHz
Strain(2V)	5kum/m	-5000 - 5000 um/m	1kHz

MEMO

When the Range (Meas Range) is changed, the background color becomes yellow.
You are not able to change the Mode, Unit, LPF, Calibr. const., CH Name, etc. on this window.
You are able to change the above items on the Set CH Condition window.

6 - 1 - 2 To write user data

This section describes how to write the changed user data into the TEDS sensor (manufacture ID: KYOWA only) after loading the TEDS information.

■Operation method

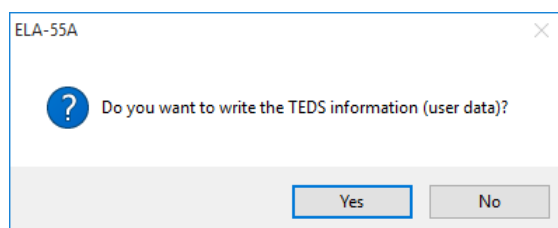
- (1) After loading the TEDS information, change the user data and put a check mark to the check box next to the target item.

When the user data is changed, the background color becomes yellow.

User Data	User Data Change
KYOWA	☒

- (2) Click the **Save User Data...** button.

The following message appears. Click the **Yes** button.



- (3) The ELA-55A writes the user data into the TEDS sensor.

6 - 1 - 3 Details of TEDS sensors

This section describes how to set detailed TEDS information of the target sensor.

MEMO

- You are able to press the **Details of Sensor Info...** button only when the TEDS information is correctly loaded.
- For details of items displayed on the Details of Sensor Information window, contact the TEDS sensor manufacturer.

■Operation method

Click the **Details of Sensor Info...** button.

The Details of Sensor Information window appears.

TEDS Properties	Values
CH No.	01
Unique Registration Number	0x030000001874B72D
Manufacture ID	58
Model Number	99
Version Letter	A
Version Number	5
Serial Number	4123456
Template ID	33
Physical Measurand	mm
Minimum physical value	0.000
Maximum physical value	5.00000
Transducer Electrical Signal Type	Bridge Sensor
Minimum electrical output [V/V]	0.000
Maximum electrical output [V/V]	0.00100000
Mapping Method	Linear
Bridge Type	FULL
Bridge element impedance [Ohm]	350.000
Response Time [sec]	0.472485
Excitation level, nominal [V]	2.00000
Excitation level, min [V]	1.00000
Excitation level, max [V]	6.00000
Calibration Date	2005/04/14
Calibration Initials	TED
Calibration Period [days]	365
Measurement location ID	0
User Data1	KYOWA
User Data2	ABCDE,987650000,20050414,0

<< Prev CH Next CH >> Close

Prev CH button Displays the detailed information of the previous CH.

Next CH button Displays the detailed information of the next CH.

Close button Closes the window.

6 - 2 To apply TEDS information to the channel conditions

This section describes how to set the loaded TEDS information to the channel conditions, based on the pre-set conditions, after loading the TEDS information and closing the TEDS Information window.

6 - 2 - 1 The “Set” column

After loading the TEDS information, put a check mark to the target channel.

CH	Set
01	☒
02	☒
03	☒
04	☒

MEMO

After loading the TEDS information, irrespective of a check mark, the ELA-55A loads the TEDS information of all channels.

6 - 2 - 2 Setting items

After loading the TEDS information, put a check mark to the target item.

You are able to put a check mark or release a check mark before loading TEDS information and after loading TEDS information.

Auto Set Items	
Range(Meas. Range)	☒
LPF	☒
Calibr. const.	☒
Unit	☒

NOTE

The Auto Set Items window is for all channels. You are not able to set items of every channel.

■Range (Meas Range)

To set the Mode and Range to the channel conditions, put a check mark to the target item.

MEMO

- The Mode and Range are automatically calculated from the sensor type and rated capacity.
- The Meas Range is the maximum measuring range based on the Range and Calibr. const.
Check the Meas Range as a reference for selecting the Range.
- For a sensor with the rated capacity not stated on the TEDS information window, the Range is set to its maximum value.

[Example]

For a piezoelectric accelerometer connected to the CCA-40A, since the rated capacity is not stated on the TEDS information window, the Range is set to its maximum value.

■LPF

To set the Mode and LPF to the channel conditions, put a check mark to the target item.

MEMO

To set the LPF, be sure to connect a TEDS sensor to the CDV-40B/DPM-42A.

Note that when a conditioner card with anti-aliasing filters (CDV-40B-F, DPM-42A-F, or CCA-40A-F) is used and the sampling frequency is set to 100 Hz or higher, the LPF is AUTO.

For TEDS sensors connected to conditioner cards other than the above, no low pass filter is set.

■Calibr. const.

To set the Calibr. const. to the channel conditions, put a check mark to the target item.

NOTE

The ELA-55A loads the Calibr. const. from the TEDS information. The ELA-55A does not load the Offset.

■Unit

To set the Unit to the channel conditions, put a check mark to the target item.

MEMO

- When the not available unit is stated in the TEDS information, the unit 'mm' is used.
- If the 'Pa' unit is stated in the TEDS information, convert values into 'kPa' or 'MPa' by using the rated capacity.
- For the CCA-40A, the unit is m/s².

■CH Name

To set the User data to the CH Name, included in the channel conditions, put a check mark to the target item.

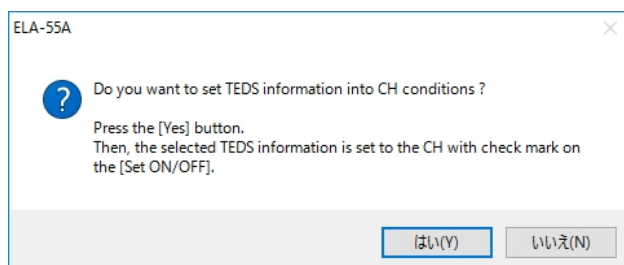
The CH Name is the user data of the ID=58 (Kyowa Electronic Instruments Co., Ltd.) TEDS sensor.

6 - 2 - 3 To apply TEDS information to the channel conditions

Click the **Close** button.

The following message appears.

Click the **Yes** button to set the channel conditions.



NOTE

To set the channel conditions, put a check mark on the "Set" column of the target CH as well as put a check mark next to the target item on the Auto Set Items window.

Make sure the target channel conditions have check marks on the "Set" column and on the Auto Set Items window.

7 Real-Time Processing

7 - 1 Recording moving image with web cam

The EDX-5000A can monitor and record moving image data (maximum resolution: 640×480 , maximum frame rate: 30- fps) from a webcam and measured data at the same time.

The recorded moving image data is saved in different file (extension: AVI) from the measured data.

After the measurement is finished, it is capable of reproducing the moving image data synchronized with graph waveform.

Capable of saving the testing scene as a memo to the moving image data.

7 - 1 - 1 Restrictions

- The EDX-5000A can monitor and record the moving image data as follows.

Resolution	Maximum 640×480
Frame Rate	Maximum 30fps

- When recording moving image, the measured data and moving image data recording cannot be started at the same time.

Time lag between the recording start time of the measured data and moving image data is maximum 1 second.

- Only the moving image data is recorded in the AVI file and no voice data and no stop motion data are saved in the AVI file.

- The EDX-5000A can record the moving image data with the Control mode set to **Online** and Synchronous operation set to **Standalone** and **Synchronous master**.

(See “2 - 2 - 1 Synchronous Operation” and “2 - 2 - 2 Control Mode”)

- Meas mode that can record moving image data is **Manual** and **Manual (Set Record Data)** only.

The EDX-5000A cannot record the moving image data with other than Manual mode.

(See “4 - 1 [Measure Mode] tab”.)

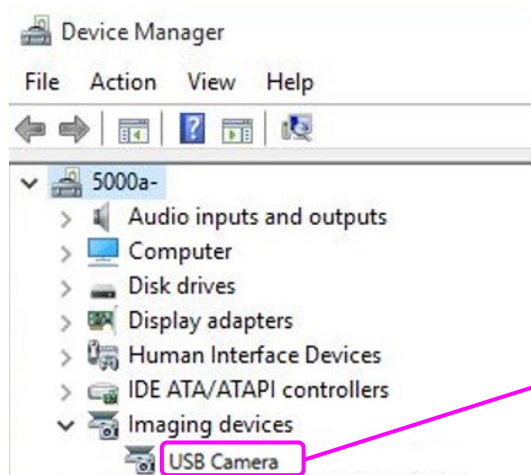
Even when the **Meas Mode** is **Manual** or **Manual (Set Record Data)**, recording cannot be paused by any pausing operation during recording data.

- Available sampling frequency for data recording is MAX. 10 kHz.

7 - 1 - 2 Preparation for Webcam

- When recording moving image with the EDX-5000A, use the Webcam that the OS recognizes it as an imaging device. Capable of checking whether the connected Webcam to the PC is recognized as the imaging device by checking the **Imaging devices** item in the **Device Manager** dialog box.

Click the **Start** button - **Control Panel** - **Hardware and Sound** - **Device Manager** and check the inside of the **Imaging devices** item on the **Device Manager** dialog box. (See the following figure.)



Recognized webcam as an imaging device

- When selecting the Webcam for recording moving image, for USB interface, select the USB video class (UVC) compatible Webcam or Direct X compatible Webcam.
For IEEE I1394 interface, select the Direct X compatible Webcam.
- When connecting the Webcam to the EDX-5000A, be sure to connect only 1 Webcam.
Or, the EDX-5000A cannot record moving image correctly.
- When connecting a Web camera to the EDX-5000A, connect it to the USB port on the back of the EDX-5000A.

MEMO

The USB video class (UVC) compatible Webcam uses a standard driver of the EDX-5000A.

Therefore, no Webcam driver installed is necessary.

Only by inserting the Webcam to the USB connector of the EDX-5000A, the standard driver is automatically installed and the Webcam can be used.

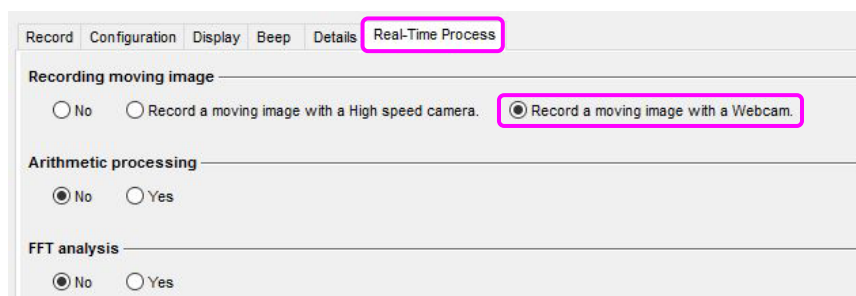
However, for the USB video class (UVC) compatible Webcam with dedicated driver, it is recommended to install the driver.

7 - 1 - 3 Operation Method of Recording Moving Image

(1) Open the **Set Environment** window with any of the following operations.

- Click the **File** - **Environment...**.
- Click the **Envr.** icon from the toolbar.

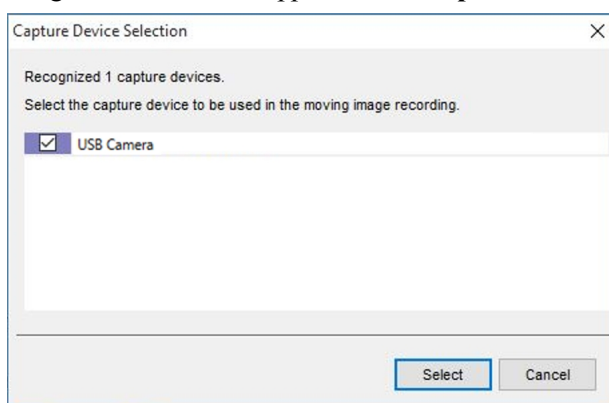
(2) Click the **Real-Time Process** on the **Set Meas Condition** dialog box, click the **Record a moving image with a Webcam** in the **Recording moving image** and click the **OK** button to close the **Set Meas Condition** dialog box.



(3) Connect the webcam to the EDX-5000A.

After the webcam is recognized by the EDX-5000A, the following message appears.

The recognized device name appears on the **Capture Device Selection** window.



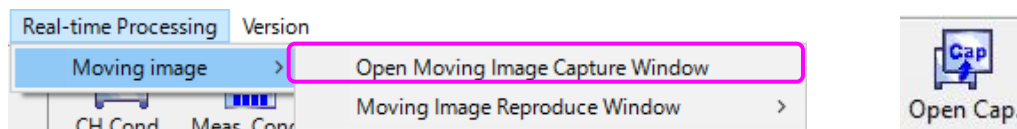
(4) Select capture devices to be used on the **Capture Device Selection** window.

You can select up to 1 capture devices.

Put a checkmark in the box next to the target devices and click **Select** button.

(5) The EDX-5000A recognizes the Webcam and the following **Real-time Processing** - **Moving image** - **Open Moving Image Capture Window** and **Open Cap.** icon on the toolbar become valid.

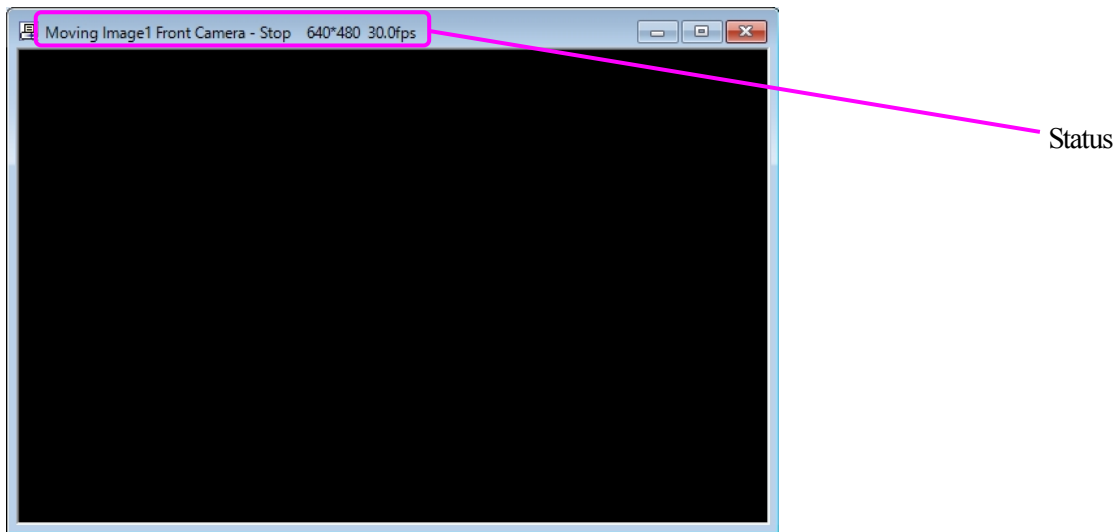
Click the **Open Moving Image Capture Window** or **Open Cap.** icon from the toolbar.



(6) The following **Moving Image Capture** window appears.

Moving images from the Webcam appears on the **Moving Image Capture** window.

On the title bar of the **Moving Image Capture** window, a device name of the Webcam, a status indicating the action state of the recording moving image and setting conditions (resolution and frame rate) are displayed.

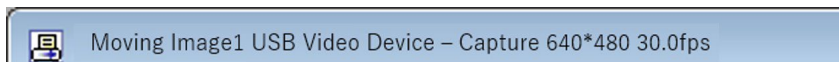


Display of the status varies with the action state of the recording moving image.

“**Preview**”: Monitoring the moving images from the Webcam on the **Moving Image Capture** window.



“**Capture**”: Monitoring the moving image from the Webcam on the **Moving Image Capture** window and saving the picture images from the webcam as the moving image data to a file.

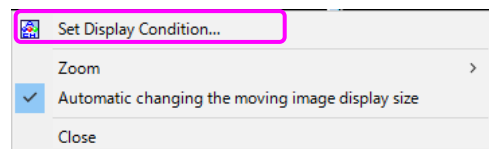
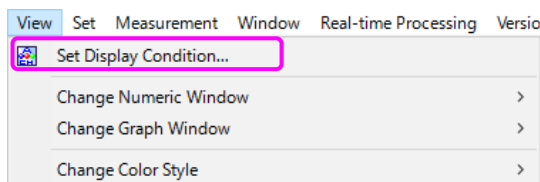


“**Stop**”: Stopping the monitoring.

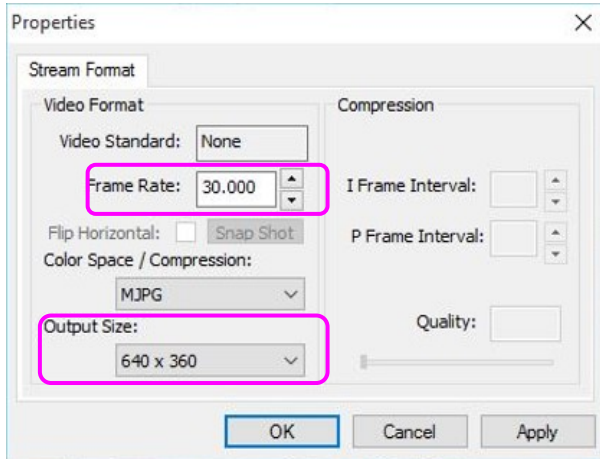


(7) Activate the target moving image capture window and open the **Properties** dialog box by either of the following operation.

- Click the **View** – **Set Display Condition...**.
- Click the **Disp Condition** icon from the toolbar.
- Right click on the **Moving Image Capture** window and the following pop-up menu appears. Click the **Set Display Condition...** on the pop-up menu.



(8) Set the resolution (Output Size) and Frame rate on the **Properties** dialog box.



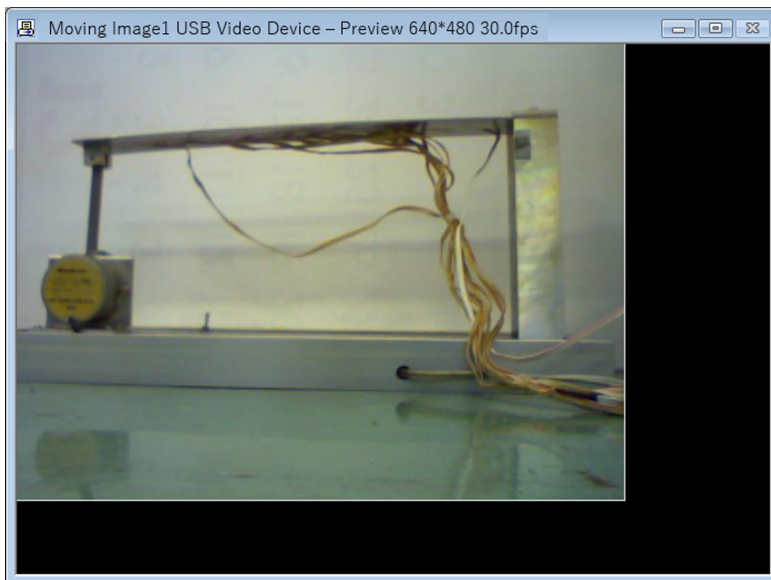
MEMO

Available Resolution (Output Size) and Frame Rate varies every Webcam.
Refer to the Webcam Instruction Manual and set the properties.

(9) Starts monitoring data with any of the following operations.

- Click the **Measurement** – **MONITOR**.
- Click the **MONITOR** icon from the toolbar.
- Click the **MONITOR** button on the Meas Operation Panel.

(10) Measurement starts, the measured data is monitored on the numerical window or graph window and the moving image from the Webcam is monitored on the **Moving Image Capture** window synchronized with the measuring action.



(11) Starts recording data with any of the following operations.

- Click the **Measurement** – **REC/PAUSE**.
- Click the **REC/PAUSE** icon from the toolbar.
- Press the **REC/PAUSE** button on the Meas Operation Panel.

(12) Recording starts, the measured data is saved in the data file (Extension: KS2) and the moving image from the Webcam is saved in the following moving image file (Extension: AVI) as the moving image data synchronized with the measuring action.

Moving image file name: Data file name + _001. AVI

[Example] Measuring data save file name: TEST0000.KS2 file.

The moving image file name becomes TEST0000_001.AVI.

Moving image save folder: Same folder as the data file of the measured data.

(13) The EDX-5000A stops data recording and becomes monitoring state with any of the following operations.

(Automatically ends when the number of recording data/CH is satisfied.)

- Click the **Measurement** – **STOP**.
- Click the **STOP** icon from the toolbar.
- Click the **STOP** button on the Meas Operation Panel.

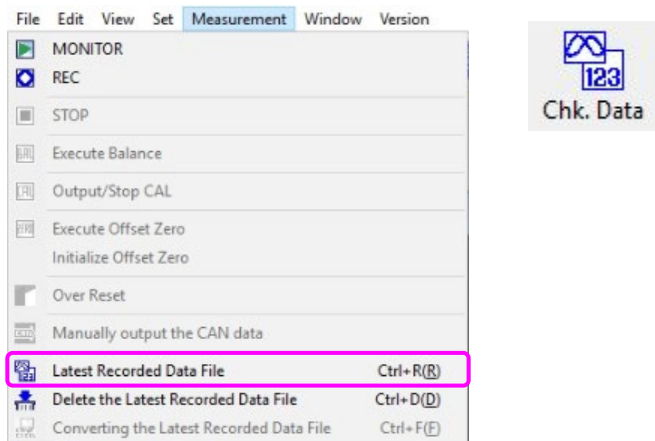
(14) Recording stops and the EDX-5000A stops saving the moving image data.

7 - 1 - 4 Operation Method of Reproducing Moving Image

7 - 1 - 4 - 1 Moving Image Reproducing Window

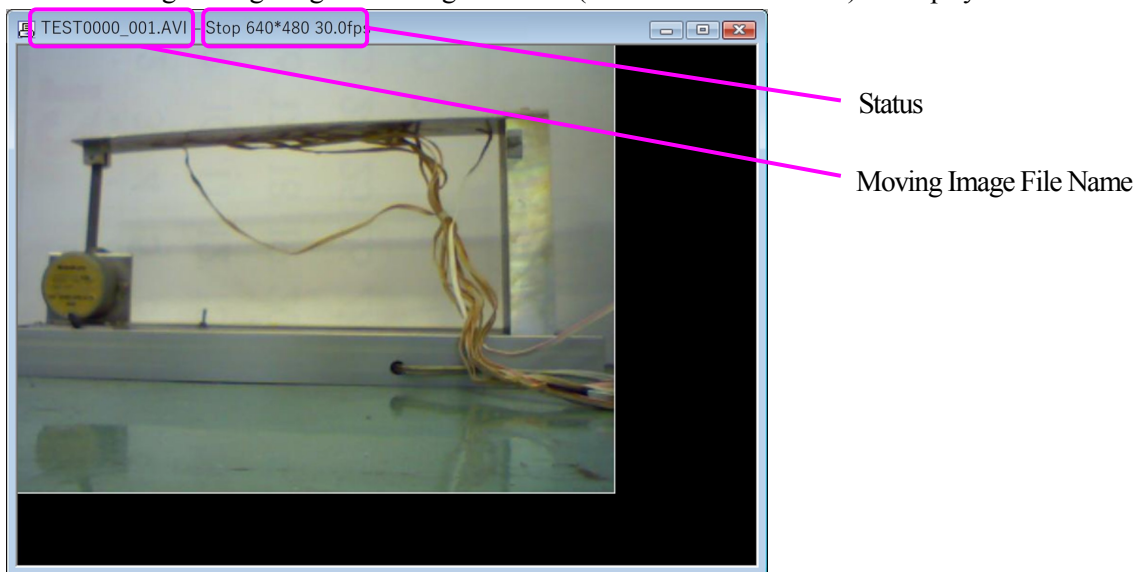
(1) After the measurement, activate the **Moving Image Capture** window with either of the following operation with the EDX-5000A stopped.

- Click the **Measurement** – **Latest Recorded Data File**.
- Click the **Chk. Data** icon from the toolbar.



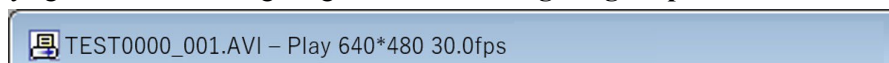
(2) The following **Moving Image Reproduce** window appears.

On the title bar of the **Moving Image Capture** window, a device name of the Webcam, a status indicating the action state of the recording moving image and setting conditions (resolution and frame rate) are displayed.

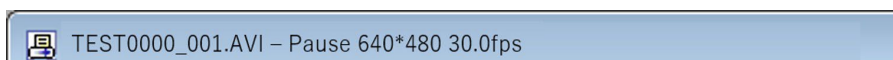


The display of the status varies with the action state of the reproducing moving image as follows.

“**Play**”: Playing the selected moving image file on the **Moving Image Reproduce** window.



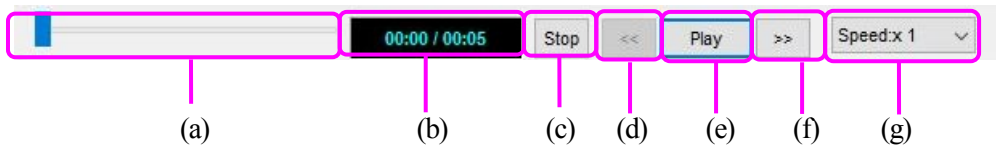
“**Pause**”: Pausing during playing the moving image file.



“**Stop**”: Stopping the reproducing.



- (3) At the same time when the **Moving Image Reproduce** window appears, the following Moving Image Reproduce Operation bar appears at the bottom of the main window.

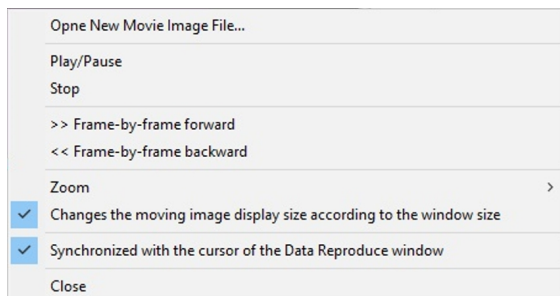


- (a) Slider
Displays the current display position.
By dragging the knob of the slider with a mouse, the display frame can be changed.
- (b) Current display position
Displays the current display frame time and total time of the moving image file.
By double clicking this Current display position, the display can be changed from the current display position to current display frame No. and the total number of frames of the moving image files.



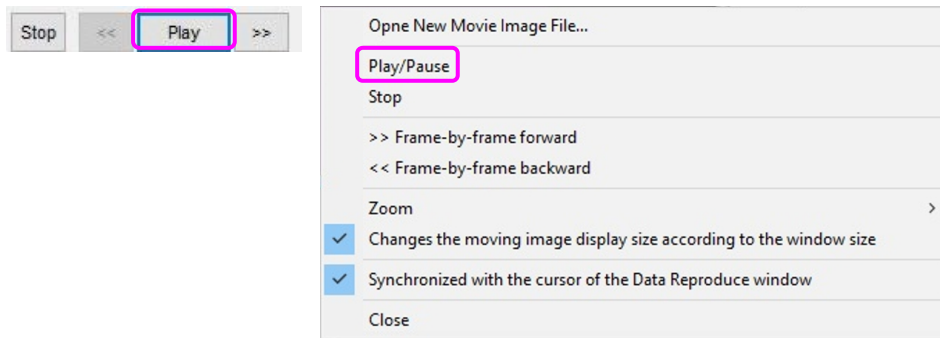
- (c) **Stop** button
Stop the **Moving Image Reproduce** window.
- (d) **<<** button
Move backward the current display frame for 1 frame.
- (e) **Play/Pause** button
Play or pause the **Moving Image Reproduce** window.
- (f) **>>** button
Move forward the current display frame for 1 frame.
- (g) Reproduce speed changing control
Changes the moving image reproduce speed.
($\times 1/20$, $\times 1/10$, $\times 1/5$, $\times 1/2$, $\times 1$, $\times 2$, $\times 5$, $\times 10$, $\times 20$)

Right-click the **Moving Image Reproduce** window and the following pop-up menu appears.

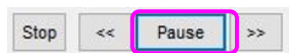


- Open New Movie Image File... Used for changing the target moving image file on the **Moving Image Reproduce** window. Select the **Open New Movie Image File...**, the **Open Movie Image File** window appears again. Select the target moving image file.
- Play/Pause
Play or pause the **Moving Image Reproduce** window.
- Stop
Stop the **Moving Image Reproduce** window.
- >>> Frame-by-frame forward
Move forward the current display frame for 1 frame.
- <<< Frame-by-frame backward
Move backward the current display frame for 1 frame.
- Zoom
Select the moving image display size of the **Moving Image Reproduce** window
(25%, 50%, 75%, 100%, 125%, 150%, 175%, 200%)
- Changes the moving image display size according to the window size
Automatically changes the moving image display size according to the current window size.
- Synchronized with the cursor of the Data Reproduce window
Put a checkmark when displaying the display frame of the **Moving Image Reproduce** window synchronized with the cursor of the **Data Reproduce** window.

- (4) Click the **Play** button on the Moving Image Reproduce Operation bar or click the **Play/Pause** on the pop-up menu.
The moving image is reproduced on the **Moving Image Reproduce** window.

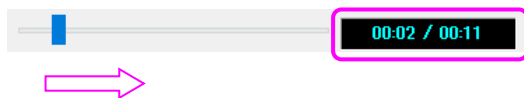


- (5) During reproducing the moving image, the **Play** button on the Moving Image Reproduce Operation bar changes to the **Pause** button.



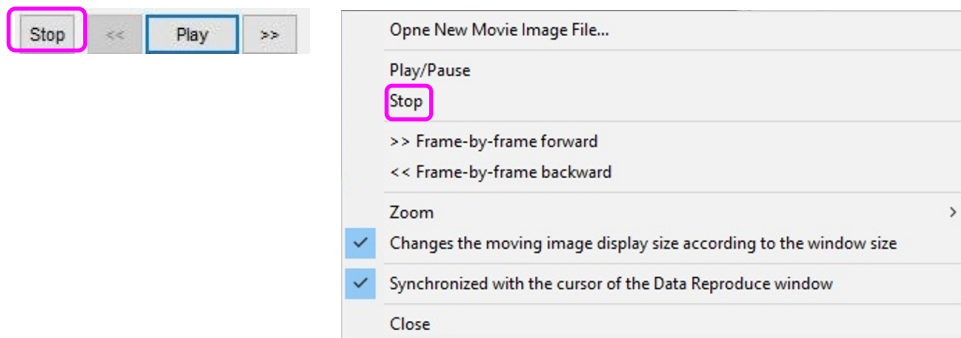
The knob of the slider moves with the display frame and the current display frame time is displayed on the Moving Image Reproduce Operation bar.

In the following figure, the knob of the slider is at the 2 seconds position.



- (6) When reproducing the moving image on the **Moving Image Reproducing** window is finished, the status becomes **Pause** as follows.

- (7) For reproducing the moving image again, click the **Stop** button on the Moving Image Reproduce Operation bar or click the **Stop** menu on the pop-up menu and change the status display to **Stop** of item 3).

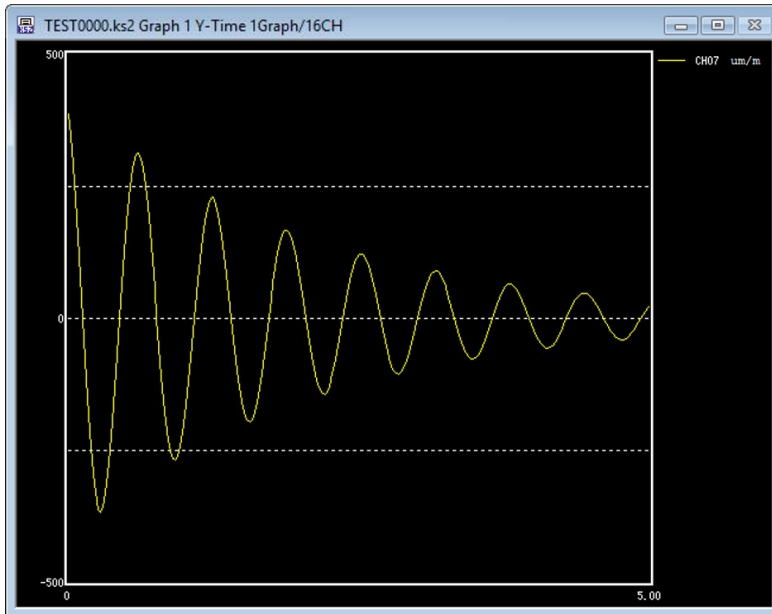


7 - 1 - 4 - 2 Synchronizing Data Reproduce window and Moving Image Reproduce window

(1) After the measurement, activate the **Moving Image Capture** window with either of the following operation with the EDX-5000A stopped.

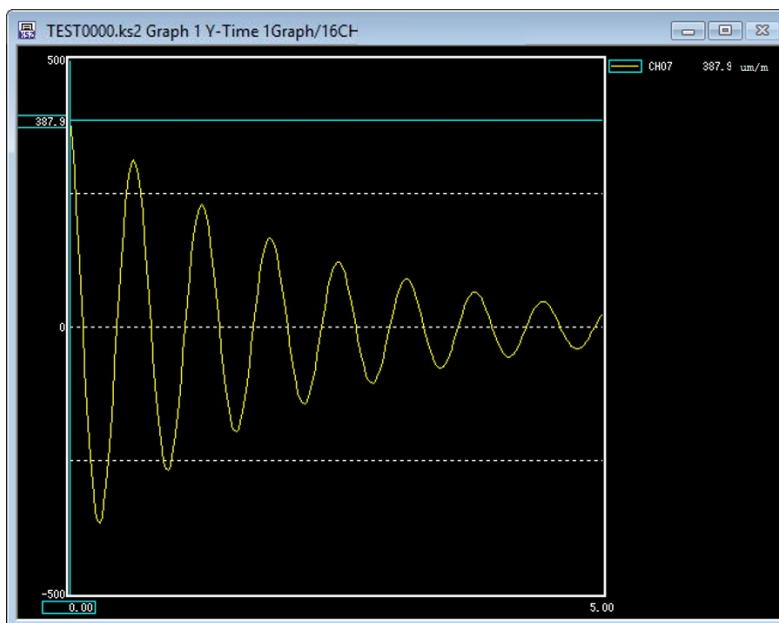
- Click the **Measurement** – **Latest Recorded Data File**.
- Click the **Chk. Data** icon on the toolbar.

(2) The following moving image reproducing window appears.



(3) Displays the cursor with the following operations.

- Click the **View** – **Cursor**.
- Click the **Cursor** icon from the toolbar.
- Right-click on the moving image reproducing data file and the pop-up menu appears. Click the **Cursor** to display the cursor.



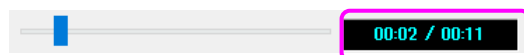
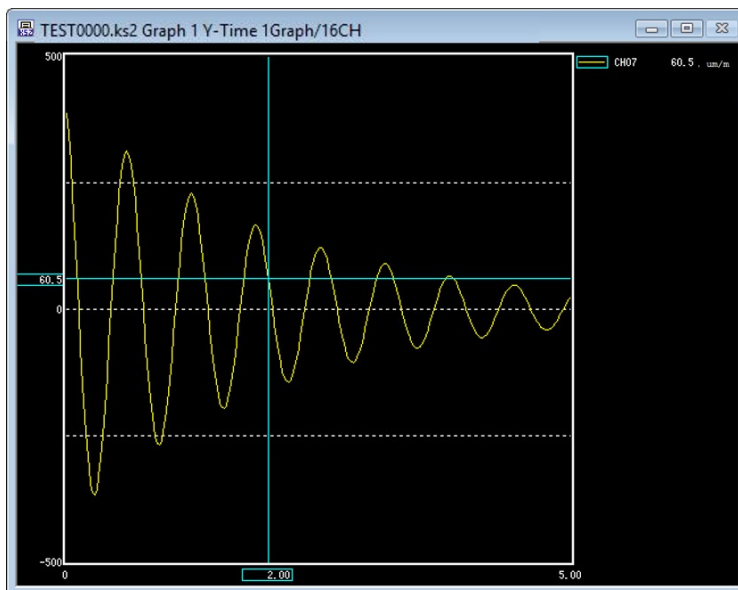
(4) Right-click on the moving image reproducing data file and the pop-up menu appears.

Click the **Synchronized with the cursor of the Data Reproduce window.**

(5) Click the **Play** button on the Moving Image Reproduce Operation or click the **Play/Pause** on the pop-up menu.

The moving image is reproduced on the **Moving Image Reproduce** window and synchronized with it, the cursor on the **Data Reproduce** window moves.

In the following figure, the knob of the slider is at the 2 seconds position.



7 - 2 Arithmetic processing

By setting the result data of the preset arithmetic expressions as calculation CH data, it is capable of monitoring and recording the result data and measured data at the same time.

Capable of setting maximum 64 calculation CHs.

The calculation CH data and measured data is saved in the same file.

7 - 2 - 1 Restrictions

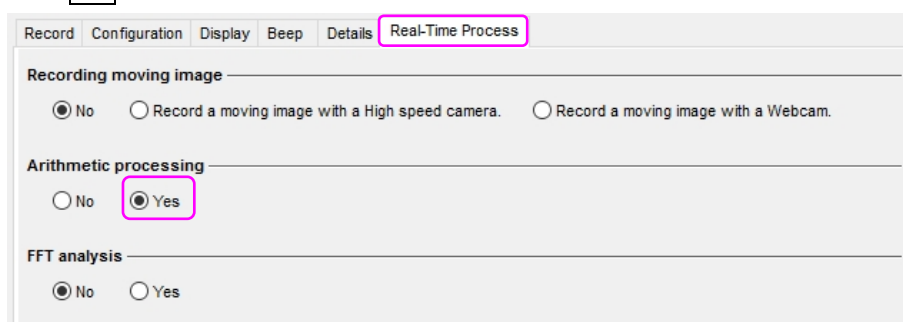
- The arithmetic operation is available when the Synchronous operation is set to **Standalone**.
- Available sampling frequency for arithmetic procession is MAX. 10 kHz.
- Even when the Meas Mode is **Manual** or **Manual (Set Record Data)**, recording cannot be paused by any pausing operation during recording data.

7 - 2 - 2 Calculation CH Condition Window Displaying Method

(1) Open the **Set Environment** window with either of the following operations.

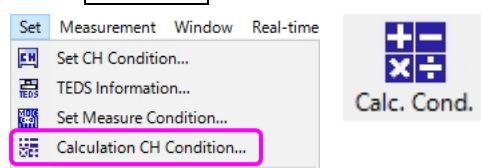
- Click the **File** - **Environment...**
- Click the **Envr.** icon from the toolbar.

(2) Click the **Real-Time Process** on the **Set Environment** window, click the **Yes** in the **Arithmetic processing** and click the **OK** button to close the **Set Environment** window.



(3) Open the **Set Calculation Condition** window with either of the following operations.

- Click the **Set** - **Calculation CH Condition...**
- Click the **Calc Cond** icon from the toolbar.



(4)Following **Set Calculation CH Condition** window appears.

- Change Setting Items...

Setting items on the window are added, removed, or sorted.
- Display function window...

Display the **Calculation Function** window describing the selectable calculation functions to the arithmetic expressions.
Using the **Calculation Function** window enables you to input the calculation functions easily.
- Display matrix window...

Display the **Matrix** window.
Using the **Matrix** window enables you to input determinants easily.
- Load condition...

Load the pre-saved **Calculation condition file**.
- Save condition...

Save the current calculation conditions as the **Calculation condition file** to the PC.
- OK

Determine the set contents and close the **Set Calculation CH Condition** window.
- Cancel

Cancel the set contents and close the **Set Calculation CH Condition** window.

7 - 2 - 3 **Setting Calculation CH Conditions**

(1) **Calculation CH**

Displays the **Calculation CH**. (CH81 ~CH144)

(2) **Calculation**

Put a check mark on the calculation target CH box.
The checked calculation CHs become valid. After measuring the measurement CHs, automatically calculates the checked calculation CHs (calculation of the arithmetic expressions).
Be sure to input the Arithmetic expressions to the checked calculation target CHs.

(3) Arithmetic expression

Input Arithmetic Expression within 200 characters. Double-click the desired **Calculation CH** item or press the **SPACE** key to be in input available state. Input the desired arithmetic expression.

- The usable expression to the **Arithmetic expression** is arithmetic expression using such as Measurement CH, Calculation CH, Operator, and Calculation function.

(See the following table.)

Available CH No.	Measurement CH or calculation CH
Operator +, -, *, /, ^, (,)	+ : Addition - : Subtraction * : Multiplication / : Division ^ : Power Parenthesis (): Specify calculation priority
Calculation Function	See “ 7 - 2 - 4 Calculation Function ”

- Place the cursor to the target arithmetic expression and press the **DEL** key to clear it.
- Sample of the arithmetic expression

Example 1: CH02 – (CH01 + CH03)/2

Subtract the average value of the measurement CH01 data and CH03 data from the measurement CH02 data.

Example 2: CH02 * 2/2.05 + 500

After compensating the gage factor to the measurement CH02 data obtained from the strain gage with gage factor 2.05, add 500 (μm/m).

For gage factor compensation, coefficient setting function of converting engineering value is more easy to use.

- When the entered arithmetic expressions are incorrect, they are displayed in red as follows.

In the following example, when the measurement CHs are from CH01 to CH08, the incorrect arithmetic expressions are displayed in red. That is because in the arithmetic expression of the calculation CH81, “CH70” is incorrect CH No., in the arithmetic expression of the calculation CH83, “) ” is needed, and in the arithmetic expression of the calculation CH85, no arithmetic expression is entered.

Calculation CH	Calculation	Arithmetic expression
81	☒	CH1+CH70
82	☒	SIN(CH05)
83	☒	COS((CH02+CH03)*5
84	☒	CH05
85	☒	
86	☒	CH07/1000
87	☐	
88	☐	

NOTE

When using the calculation CHs in the **Arithmetic expression**, use the calculation CHs (source CH) having small CH No. than that of the destination CH.

After measuring the measurement CHs, the arithmetic expressions of the checked calculation CHs are calculated in due order from the small CH No. as follows.

(Following CH81, CH83, and CH85 are calculation CHs.)

Example

CH81: 2500 ← Use the CH81 result.

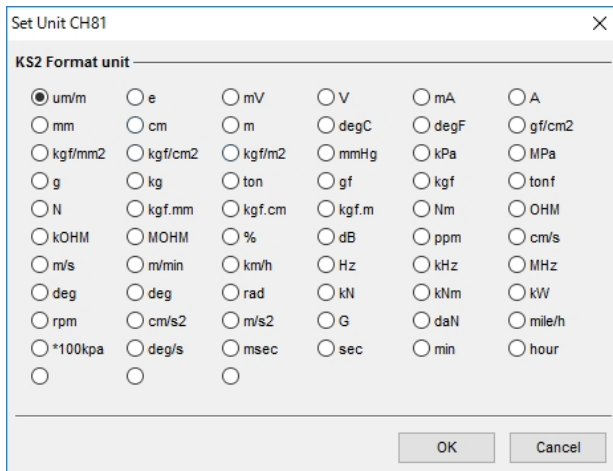
CH83: (CH01 + CH05 + CH08)/3 + CH81 ← Use the CH83 result.

CH85: CH04 + CH83

(4) Unit

Set unit according to calculation result.

Double-click the target calculation CH or press the **SPACE** key to display the following Set Unit window. Select the relevant unit from the unit list



The image shows a dialog box titled "Set Unit CH81" with a close button (X) in the top right corner. Below the title bar is a section labeled "KS2 Format unit". Inside this section is a grid of radio buttons, each followed by a unit symbol. The units are arranged in 6 rows and 6 columns. The first row includes units like um/m, e, mV, V, mA, and A. The second row includes mm, cm, m, degC, degF, and gf/cm2. The third row includes kgf/mm2, kgf/cm2, kgf/m2, mmHg, kPa, and MPa. The fourth row includes g, kg, ton, gf, kgf, and tonf. The fifth row includes N, kgf.mm, kgf.cm, kgf.m, Nm, and OHM. The sixth row includes kOHM, MOHM, %, dB, ppm, and cm/s. The seventh row includes m/s, m/min, km/h, Hz, kHz, and MHz. The eighth row includes deg, deg, rad, kN, kNm, and kW. The ninth row includes rpm, cm/s2, m/s2, G, daN, and mile/h. The tenth row includes *100kpa, deg/s, msec, sec, min, and hour. At the bottom of the dialog box are two buttons: "OK" and "Cancel".

(5) Deci Digits

Set the number of digits below decimal point of numeric value display

(See “2 - 3 - 2 The number of display digits”)

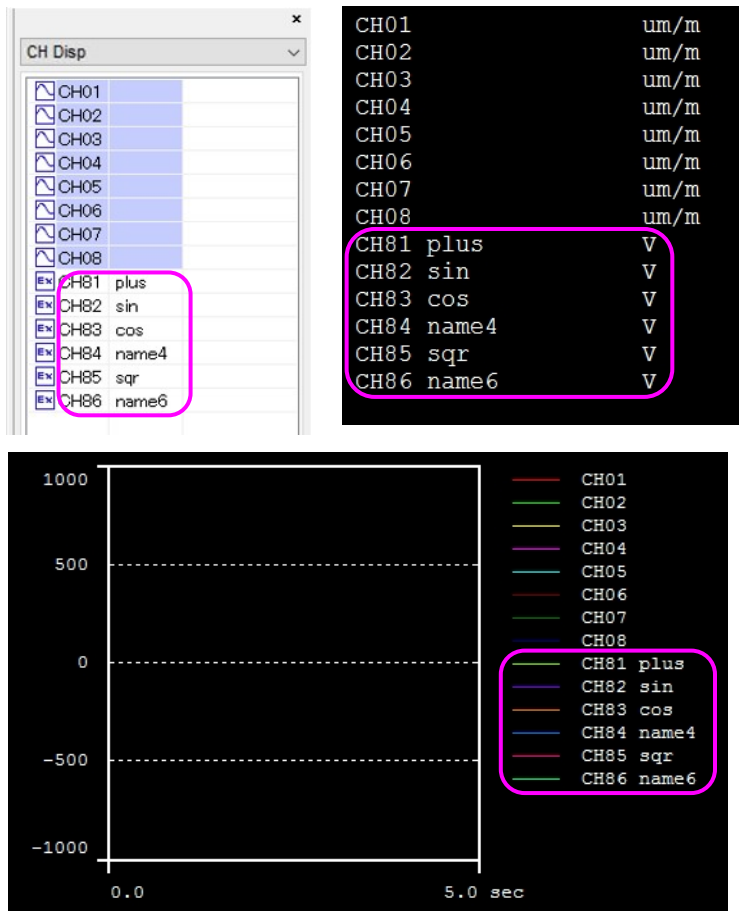
(6) CH Name

Input **CH Name** comment strings within 40 characters.

Double-click the target calculation CH or press the **SPACE** key to be in input available state. Input desired comment character string.

Place the cursor to the target **CH Name** and press the **DEL** key to clear it.

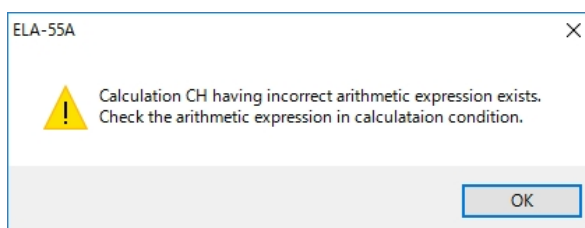
After setting the items from (1) to (6), click the **OK** button and close the **Set Calculation CH Condition** window. Calculation CHs are added to the **CH Disp Bar** on the main window. Then, calculation CHs can be displayed on the numerical window and graphical window.



NOTE

When the incorrect arithmetic expressions exist in the checked **Calculation CH** and if the **OK** button is clicked, the following message appears.

Correct the incorrect arithmetic expressions.



7 - 2 - 4 Calculation Function

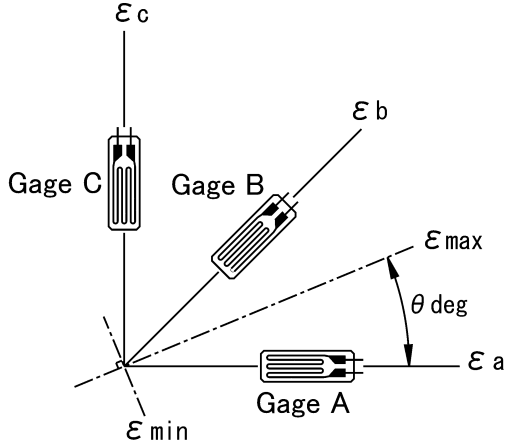
Usable calculation functions to the arithmetic expressions are described below.

- SQR(nn)** Square Root Function
Obtain square root of the specified argument.
Ex.) SQR (CH01) When the CH01 data is 8.78, the calculation result shall be 2.9631.
- ABS(nn)** Absolute Function
Obtain absolute value of the specified argument.
Ex.) ABS (CH01) When the CH01 data is -8.78, the calculation result shall be 8.78.
- SIN(nn)** SIN Function
Obtain sine of the specified argument.
The argument is in radians.
Ex.) SIN (CH01) When the CH01 data is 8.78, the calculation result shall be 0.69102.
- COS(nn)** COS Function
Obtain cosine of the specified argument.
The argument is in radians.
Ex.) COS (CH01) When the CH01 data is 8.78, the calculation result shall be -0.79923.
- TAN(nn)** TAN Function
Obtain tangent of the specified argument.
The argument is in radians.
Ex.) TAN (CH01) When the CH01 data is 8.78, the calculation result shall be -0.75200.
- ASIN(nn)** ASIN Function
Obtain arcsine of the specified argument.
The return value is in radians.
When the argument is -1 or less, the argument is -1.
When the argument is +1 or more, the argument is +1.
EX.) ASIN (CH01) When the CH01 data is 0.5, the calculation result shall be -0.52360.
- ACOS(nn)** ACOS Function
Obtain arccosine of the specified argument.
The return value is in radians.
When the argument is -1 or less, the argument is -1.
When the argument is +1 or more, the argument is +1.
EX.) ACOS (CH01) When the CH01 data is 0.5, the calculation result shall be 1.0472.
- ATAN(nn)** ATAN Function
Obtain arctangent of the specified argument.
The return value is in radians.
EX.) ATAN (CH01) When the CH01 data is 0.5, the calculation result shall be 0.46365.

- DSIN(nn)** DSIN Function
 Obtain arcsine of the specified argument.
 The return value is in degrees.
 When the argument is -1 or less, the argument is -1.
 When the argument is +1 or more, the argument is +1.
- DCOS(nn)** DCOS Function
 Obtain arccosine of the specified argument.
 The return value is in degrees.
 When the argument is -1 or less, the argument is -1.
 When the argument is +1 or more, the argument is +1.
- DTAN(nn)** DTAN Function
 Obtain arctangent of the specified argument.
 The return value is in degrees.
- LOG(nn)** LOG Function (Common Logarithm)
 Obtain common logarithm of the specified argument.
 EX.) LOG (CH01) When the CH01 data is 8.78, the calculation result shall be 0.94349.
- LN(nn)** LN Function (Natural Logarithm)
 Obtain natural logarithm of the specified argument.
 EX.) LN (CH01) When the CH01 data is 8.78, the calculation result shall be 2.1725.
- EXP(nn)** EXP Function (Exponent)
 Obtain exponent (e^x) of the specified argument.
 EX.) EXP (CH01) When the CH01 data is 8.78, the calculation result shall be 6502.9.

This section describes analytical function using 3-axis rosette gage.

Three strain gages denoted by A, B, and C are located as shown in the following figure.



where,

argument $\epsilon_a, \epsilon_b, \epsilon_c$: CH Nos.

E : Young's modulus (unit $\times 10^6$)

ν : POison's ration.

●**HMX($\epsilon_a, \epsilon_b, \epsilon_c$)** Maximum Principal Strain Function

Obtain the maximum principal strain from the measurement CH data.

Example) HMX (CH01, CH02, CH03)

When each of the measurement CH data items are CH01: 671 $\mu\text{m/m}$, CH02: 740 $\mu\text{m/m}$, CH03: 914 $\mu\text{m/m}$, the calculation result shall be 924.86 $\mu\text{m/m}$.

Expression

$$\epsilon_{\max} = \frac{1}{2} \left[\epsilon_a + \epsilon_c + \sqrt{2 \left\{ (\epsilon_a - \epsilon_b)^2 + (\epsilon_a - \epsilon_c)^2 \right\}} \right]$$

●**HMN($\epsilon_a, \epsilon_b, \epsilon_c$)** Minimum Principal Strain Function

Obtain the minimum principal strain from the measurement CH data.

Example) HMN (CH01, CH02, CH03)

When each of the measurement CH data items are CH01: 671 $\mu\text{m/m}$, CH02: 740 $\mu\text{m/m}$, CH03: 914 $\mu\text{m/m}$, the calculation result shall be 660.14 $\mu\text{m/m}$.

Expression

$$\epsilon_{\min} = \frac{1}{2} \left[\epsilon_a + \epsilon_c - \sqrt{2 \left\{ (\epsilon_a - \epsilon_b)^2 + (\epsilon_a - \epsilon_c)^2 \right\}} \right]$$

●**HSM($\epsilon_a, \epsilon_b, \epsilon_c$)** Maximum Shearing Strain Function

Obtain the maximum shearing strain from the measurement CH data.

Example) HSM (CH01, CH02, CH03)

When each of the measurement CH data items are CH01: 671 $\mu\text{m/m}$, CH02: 740 $\mu\text{m/m}$, CH03: 914 $\mu\text{m/m}$, the calculation result shall be 264.71 $\mu\text{m/m}$.

Expression

$$\gamma_{\max} = \sqrt{2 \left\{ (\epsilon_a - \epsilon_b)^2 + (\epsilon_b - \epsilon_c)^2 \right\}}$$

●**SMX($\epsilon_a, \epsilon_b, \epsilon_c, E, \nu$)** Maximum Principal Stress Function

Obtain the maximum principal stress from the measurement CH data.

Example) SMX (CH01, CH02, CH03, 0.205, 0.3)

When each of the measurement CH data items are CH01: 671 $\mu\text{m/m}$, CH02: 740 $\mu\text{m/m}$, CH03: 914 $\mu\text{m/m}$, Young's modulus: 205 GPa (Input to arithmetic expression: 0.205), and Poisson's ratio: 0.3, the calculation result shall be 252.96 MPa.

Expression

$$\sigma_{\max} = \frac{E}{2(1-\nu^2)} \left[(1+\nu)(\epsilon_a + \epsilon_c) + (1-\nu) \times \sqrt{2\{(\epsilon_a - \epsilon_b)^2 + (\epsilon_b - \epsilon_c)^2\}} \right]$$

●**SMN($\epsilon_a, \epsilon_b, \epsilon_c, E, \nu$)** Minimum Principal Stress Function

Obtain the minimum principal stress from the measurement CH data.

Example) SMN (CH01, CH02, CH03, 0.205, 0.3)

When each of the measurement CH data items are CH01: 671 $\mu\text{m/m}$, CH02: 740 $\mu\text{m/m}$, CH03: 914 $\mu\text{m/m}$, Young's modulus: 205 GPa (Input to arithmetic expression: 0.205), and Poisson's ratio: 0.3, the calculation result shall be 211.22 MPa.

Expression

$$\sigma_{\min} = \frac{E}{2(1-\nu^2)} \left[(1+\nu)(\epsilon_a + \epsilon_c) - (1-\nu) \times \sqrt{2\{(\epsilon_a - \epsilon_b)^2 + (\epsilon_b - \epsilon_c)^2\}} \right]$$

●**SSM($\epsilon_a, \epsilon_b, \epsilon_c, E, \nu$)** Maximum Shearing Stress Function

Obtain the maximum shearing stress from the measurement CH data.

Example) SSM (CH01, CH02, CH03, 0.205, 0.3)

When each of the measurement CH data items are CH01: 671 $\mu\text{m/m}$, CH02: 740 $\mu\text{m/m}$, CH03: 914 $\mu\text{m/m}$, Young's modulus: 205 GPa (Input to arithmetic expression: 0.205), and Poisson's ratio: 0.3, the calculation result shall be 20.872 MPa.

Expression

$$\tau_{\max} = \frac{E}{2(1+\nu)} \times \sqrt{2\{(\epsilon_a - \epsilon_b)^2 + (\epsilon_b - \epsilon_c)^2\}}$$

●**DEG($\epsilon_a, \epsilon_b, \epsilon_c$)** Principal Strain Direction Function

Obtain direction of the principal strain from the measurement CH data.

Set angle of gage A direction to 0° (Degree). When strain amount of gages A and C is $\epsilon_a < \epsilon_c$, the angle shall be gage A and minimum principle strain. ($E_{\min}$).

Example) DEG (CH01, CH02, CH03)

When each of the calculation CH data items are CH01: 671 $\mu\text{m/m}$, CH02: 740 $\mu\text{m/m}$, CH03: 914 $\mu\text{m/m}$, the calculation result shall be 11.685°.

Expression

$$\theta = \frac{1}{2} \tan^{-1} \left[\frac{2\epsilon_b - \epsilon_a - \epsilon_c}{\epsilon_a - \epsilon_c} \right]$$

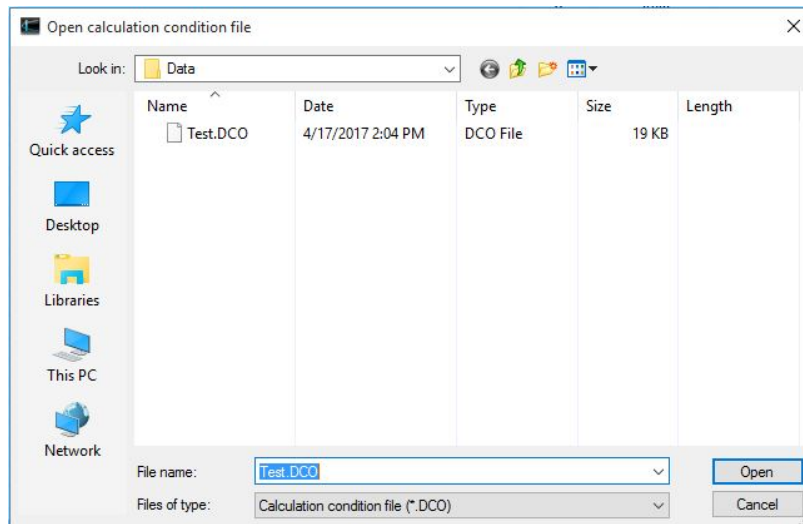
7 - 2 - 5 Setting Window Functions

■Load Condition

Loads the pre-saved calculation CH condition file and sets the calculation CH conditions.

Select the **Load condition** button and the following **Open calculation condition file** window appears.

Select the **Calculation CH condition file**, press the **Open** button, load the calculation CH condition from the selected **Calculation CH condition file** for setting.

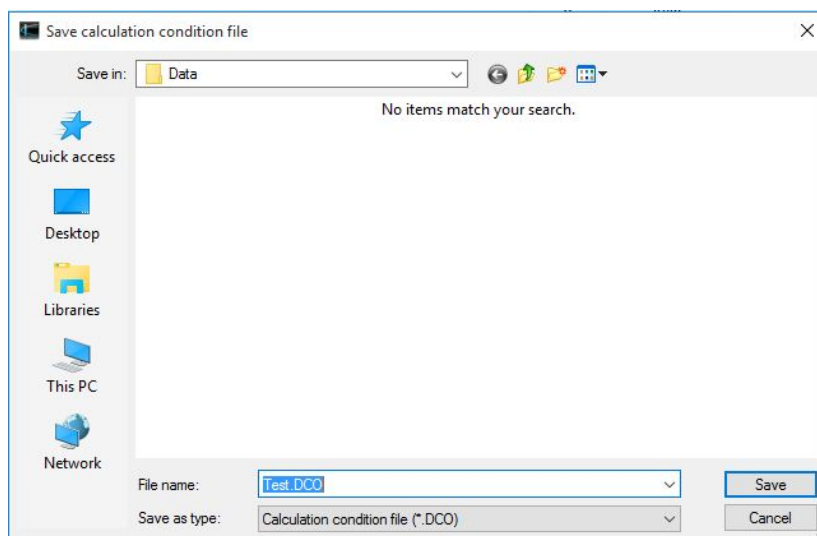


■Save Condition

Save the calculation CH conditions on the current **Set Calculation CH Condition** window as a **Calculation CH condition file**.

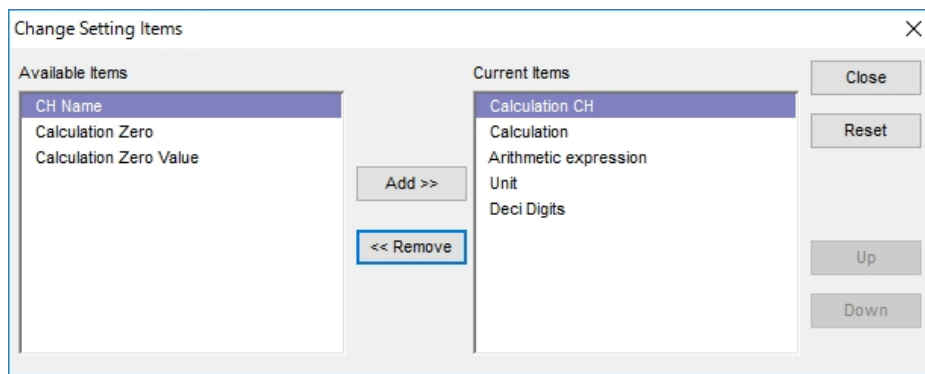
Select the **Save condition** button and the following **Save calculation condition file** window appears.

Input the **File name**, click the **Save** button and save the calculation CH conditions on the current **Set Calculation CH Condition** window as a **Calculation CH condition file**.



■Change Setting Items

Select the **Change Setting Items...** button and the following **Change Setting items** window appears.
Setting items on the window are added, removed, or sorted.



Add>>.....Item currently not on the window is added to the **Set Calculation CH Condition** window.

<<Remove.....Item currently displayed on the window is removed from the **Set Calculation CH Condition** window.

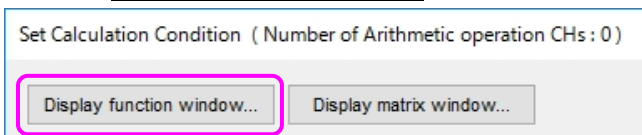
Close.....Determine the setting contents and close the window.

Reset.....Reset the setting items to the default state.

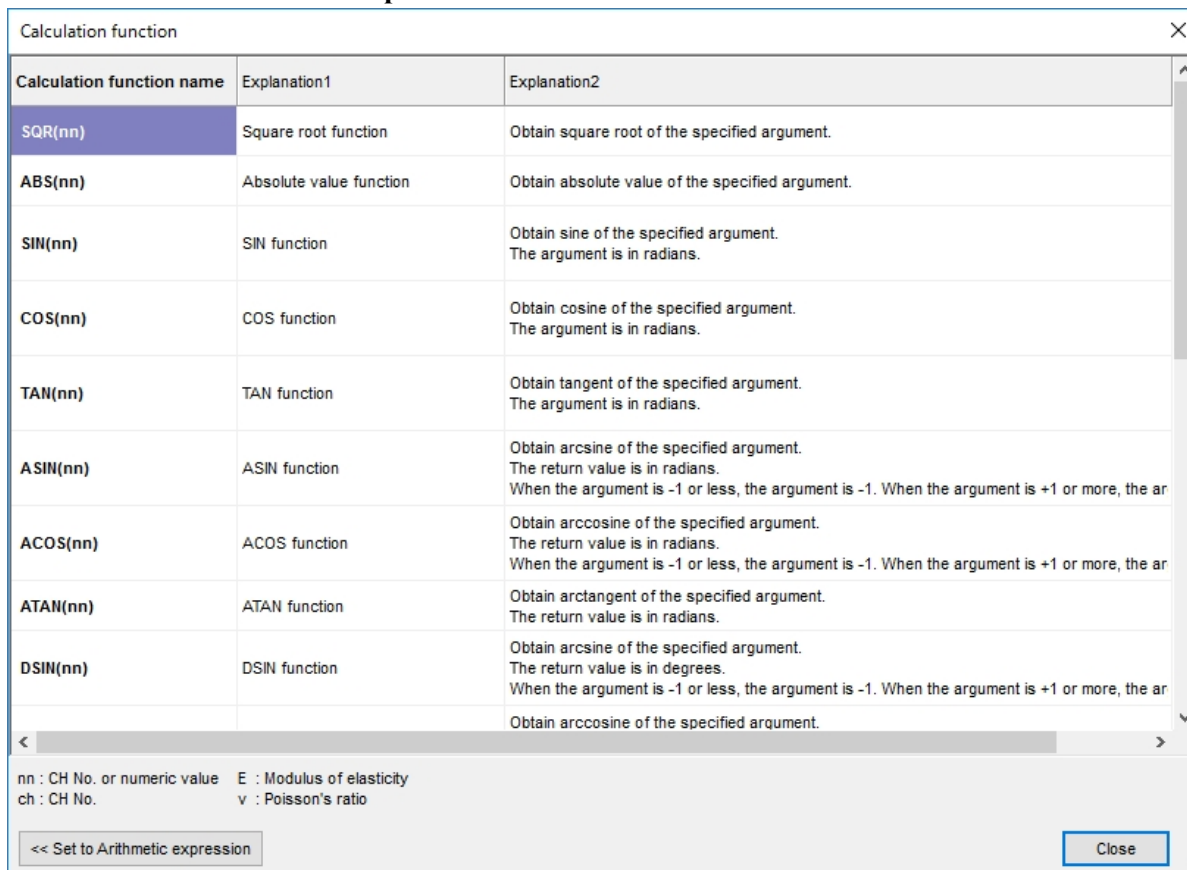
Up/Down.....Sort the current setting items.
Select the target setting items and click **Up** or **Down** button.

■ Calculation function window

Click the **Display function window...** button and the following **Calculation function** window appears.

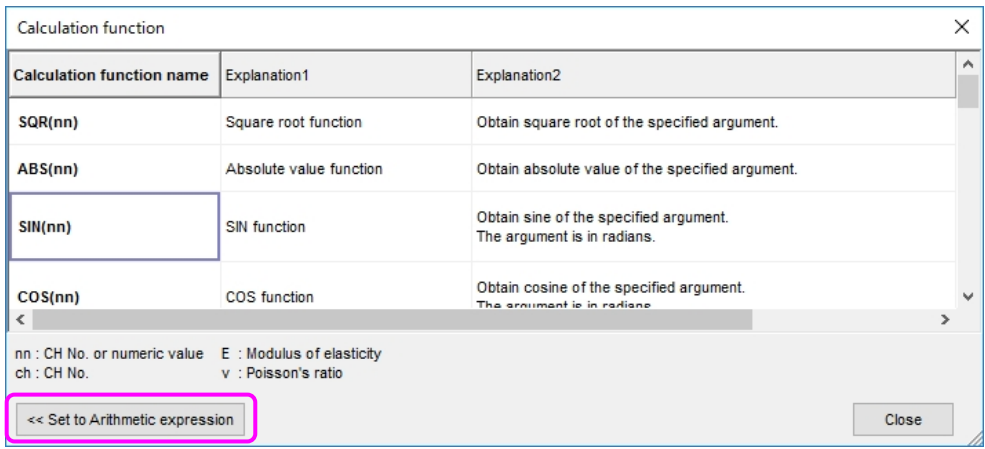


By pressing the **<-Set to Arithmetic expression** button on the **Calculation function** window, the target calculation function is set to the **Arithmetic expression** on the **Set Calculation CH Condition** window.



An example for setting the SIN function to the arithmetic expressions of the calculation CH81 to CH84 on the **Set Calculation CH Condition** window is shown below.

- (1) On the **Set Calculation CH Condition** window. Select the **Arithmetic expression** items of the calculation CH81 to CH84, then select the SIN (nn) on the **Calculation function** window and click the **<-Set to Arithmetic expression** button on the **Calculation function** window.

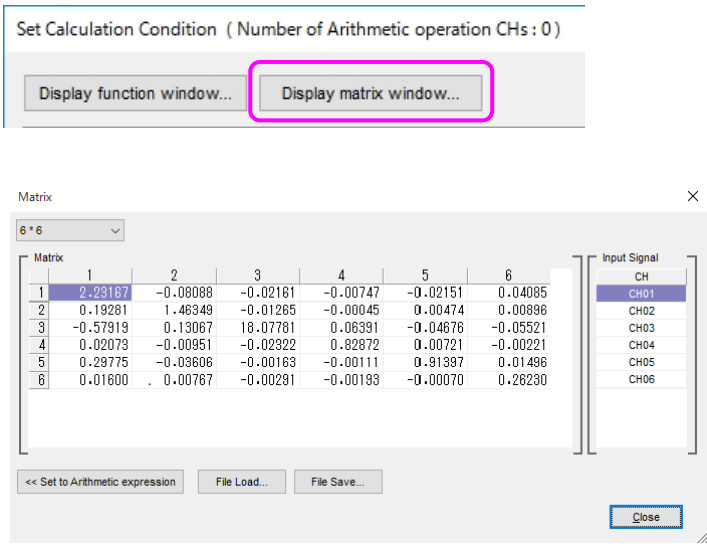


- (2) The SIN function is set to the **Arithmetic expression** items of calculation CH81 to CH84.

Calculation CH	Calculation	Arithmetic expression
81	☐	SIN(nn)
82	☐	SIN(nn)
83	☐	SIN(nn)
84	☐	SIN(nn)
85	☐	

■Matrix window

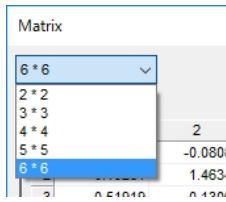
Click the **Display matrix window...** button and the following **Matrix** window appears.



- <-Set to Arithmetic expression** Set the determinant of current set conditions to the arithmetic expressions on the **Set Calculation CH Condition** window.
- File Load...** Load the pre-saved matrix condition file.
(The matrix condition file is CSV format file.)
- File Save...** Save the current set conditions as a matrix condition file to the PC.
- Close** Determine the setting contents and close the window.

(1) Matrix type

Matrix type is selectable from “2×2”, “3×3”, “4×4”, “5×5”, and “6×6.”



(2) Matrix

Input matrix component within 20 characters.

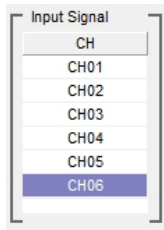
Double-click the desired item or press the **SPACE** key to be in input available state. Input desired matrix component.

	1	2	3	4	5	6
1	2.23167	-0.08088	-0.02161	-0.00747	-0.02151	0.04085
2	0.19281	1.46349	-0.01265	-0.00045	0.00474	0.00896
3	-0.51919	0.13067	18.07781	0.06391	-0.04676	-0.05521
4	0.02073	-0.00951	-0.02322	0.82872	0.00721	-0.00221
5	0.29775	-0.03606	-0.00163	-0.00111	0.91397	0.01496
6	0.01600	0.00767	-0.00291	-0.00193	-0.00070	0.26230

Place the cursor to the target **Arithmetic expression** and press the **DEL** key to clear it.

(3) Input Signal

Select the measurement CH or calculation CH used for components of the input signal.



Determinant (6 × 6) is set to the arithmetic expression on the **Set Calculation CH Condition** window as follows.

Matrix	Input Signal											
$\begin{pmatrix} a_{11} & a_{12} & a_{13} & a_{14} & a_{15} & a_{16} \\ a_{21} & a_{22} & a_{23} & a_{24} & a_{25} & a_{26} \\ a_{31} & a_{32} & a_{33} & a_{34} & a_{35} & a_{36} \\ a_{41} & a_{42} & a_{43} & a_{44} & a_{45} & a_{46} \\ a_{51} & a_{52} & a_{53} & a_{54} & a_{55} & a_{56} \\ a_{61} & a_{62} & a_{63} & a_{64} & a_{65} & a_{66} \end{pmatrix}$	$\begin{pmatrix} ch_1 \\ ch_2 \\ ch_3 \\ ch_4 \\ ch_5 \\ ch_6 \end{pmatrix}$											
CH ₁	=	$a_{11} \times ch_1$	+	$a_{12} \times ch_2$	+	$a_{13} \times ch_3$	+	$a_{14} \times ch_4$	+	$a_{15} \times ch_5$	+	$a_{16} \times ch_6$
CH ₂	=	$a_{21} \times ch_1$	+	$a_{22} \times ch_2$	+	$a_{23} \times ch_3$	+	$a_{24} \times ch_4$	+	$a_{25} \times ch_5$	+	$a_{26} \times ch_6$
CH ₃	=	$a_{31} \times ch_1$	+	$a_{32} \times ch_2$	+	$a_{33} \times ch_3$	+	$a_{34} \times ch_4$	+	$a_{35} \times ch_5$	+	$a_{36} \times ch_6$
CH ₄	=	$a_{41} \times ch_1$	+	$a_{42} \times ch_2$	+	$a_{43} \times ch_3$	+	$a_{44} \times ch_4$	+	$a_{45} \times ch_5$	+	$a_{46} \times ch_6$
CH ₅	=	$a_{51} \times ch_1$	+	$a_{52} \times ch_2$	+	$a_{53} \times ch_3$	+	$a_{54} \times ch_4$	+	$a_{55} \times ch_5$	+	$a_{56} \times ch_6$
CH ₆	=	$a_{61} \times ch_1$	+	$a_{62} \times ch_2$	+	$a_{63} \times ch_3$	+	$a_{64} \times ch_4$	+	$a_{65} \times ch_5$	+	$a_{66} \times ch_6$

a_{nm} : Matrix component of the matrix condition

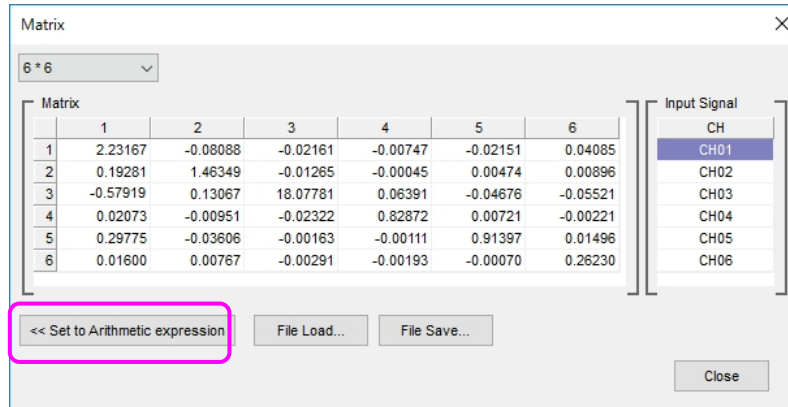
ch_n : Measurement CH or calculation CH used for components of the input signal

CH_n : Calculation CH where determinants of the matrix conditions are set.

(n: 1 to 6)

An example for setting the determination (6×6) to the arithmetic expressions of the calculation CH81 to CH84 on the **Set Calculation CH Condition** window is shown below.

- (1) Set the **Matrix** and **Input Signal** on the **Matrix** window.
- (2) Select the **Arithmetic expression** items of calculation CH81 to CH86 on the **Set Calculation CH Condition** window and click the **<< Set to Arithmetic expression** button.



- (3) Determinations are set to the calculation CH81 to CH86.

Display function window...		Display matrix window...	
Calculation CH	Calculation	Arithmetic expression	
81	☐	2.23167*CH01-0.08088*CH02-0.02161*CH03-0.00747*CH04-0.02151*CH05+0.04085*CH06	
82	☐	0.19281*CH01+1.46349*CH02-0.01265*CH03-0.00045*CH04+0.00474*CH05+0.00896*CH06	
83	☐	-0.57919*CH01+0.13067*CH02+18.07781*CH03+0.06391*CH04-0.04676*CH05-0.05521*CH06	
84	☐	0.02073*CH01-0.00951*CH02-0.02322*CH03+0.82872*CH04+0.00721*CH05-0.00221*CH06	
85	☐	0.29775*CH01-0.03606*CH02-0.00163*CH03-0.00111*CH04+0.91397*CH05+0.01496*CH06	
86	☐	0.01600*CH01+0.00767*CH02-0.00291*CH03-0.00193*CH04-0.00070*CH05+0.26230*CH06	

■File format of matrix condition

File format of matrix condition is described as follows.

2.23167, -0.08088, -0.02161, -0.00747, -0.02151, 0.04085 0.19281, 1.46349, -0.01265, -0.00045, 0.00474, 0.00896 -0.57919, 0.13067, 18.07781, 0.06391, -0.04676, -0.05521 0.02073, -0.00951, -0.02322, 0.82872, 0.00721, -0.00221 0.29775, -0.03606, -0.00163, -0.00111, 0.91397, 0.01496 0.01600, 0.00767, -0.00291, -0.00193, -0.00070, 0.26230	}	Matrix component
---	---	------------------

7 - 3 FFT analysis

The FFT analysis function is able to analyze the measured data real-time on the FFT analysis window. The FFT analysis function is able to analyze maximum 4-channel data/window. The FFT analysis function is able to save the analysis results as the DAS-200A FFT analysis result file (CSV format file).

7 - 3 - 1 Restrictions

Available sampling frequency for the FFT analysis procession is MAX. 10 kHz.

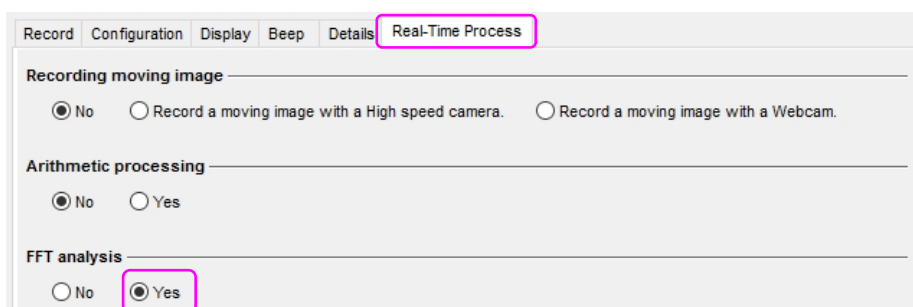
7 - 3 - 2 FFT analysis window

■To display the FFT analysis window

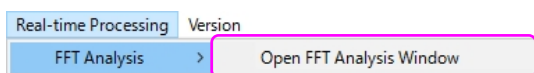
(1) Open the **Set Environment** window with any of the following operations.

- Click the **File** – **Environment...**.
- Click the **Envr.** icon from the toolbar.

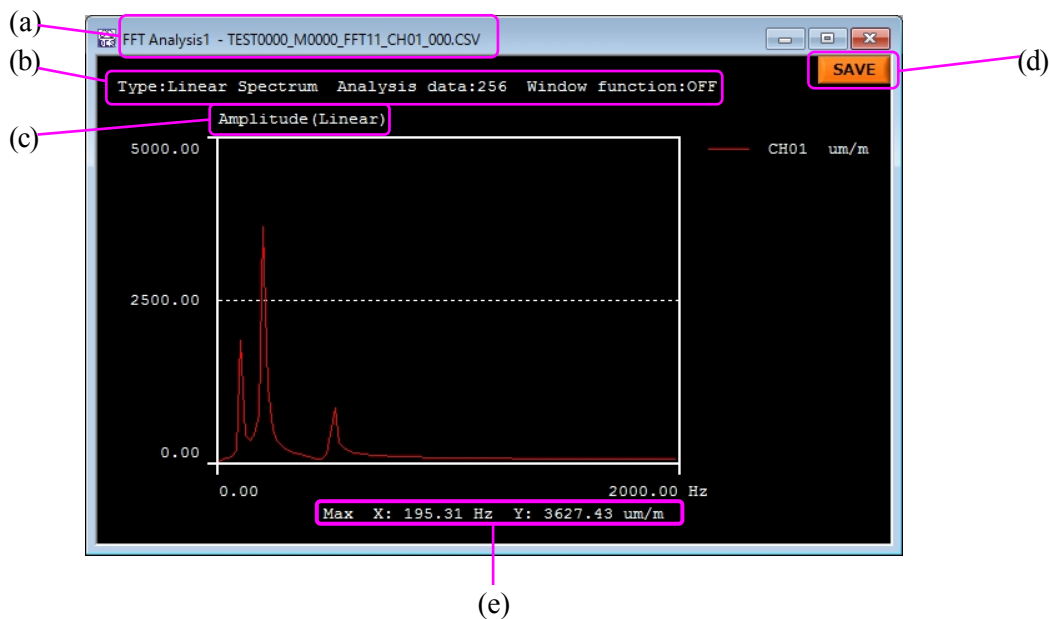
(2) Click the **Real-Time Process** on the **Set Environment** window, click the **Yes** in the **FFT analysis** and click the **OK** button to close the **Set Environment** window.



(3) Click the Real-time Processing - FFT Analysis - Open FFT Analysis Window or click the **FFT** icon from the toolbar.



(4) The following window appears.



- | | |
|-------------------------|---|
| (a) Title bar | The window No. and FFT analysis result file name appear. |
| (b) Analysis conditions | Current type of analysis, the number of analysis data, and window function appear. |
| (c) Analysis results | Current analysis result data appears. |
| (d) SAVE button | Saves the analysis results, currently displaying on the graph, in the FFT analysis result file.
To enable the SAVE button, display the analysis results on the graph.
Enabled : SAVE Disabled : SAVE |
| (e) Maximum amplitude | The maximum amplitude appears when the analysis result data is "Amplitude (linear)." |

MEMO

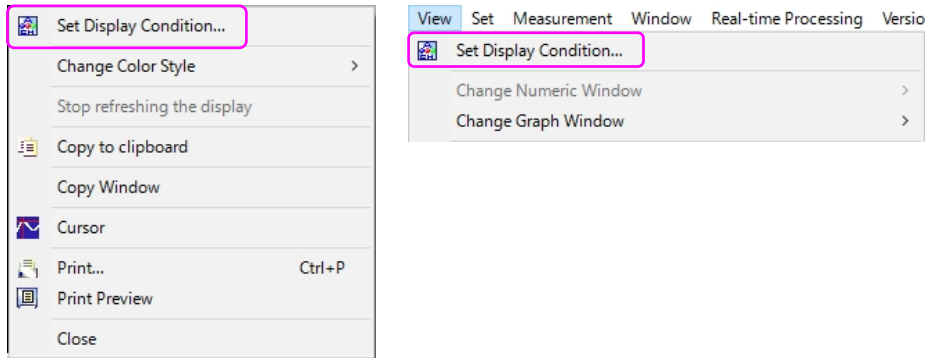
The ELA-55A is able to display up to 8 FFT analysis windows.

7 - 3 - 2 - 1 To set analysis conditions and display conditions

This section describes how to select the analysis conditions and display conditions on the Set Display Condition... window.

■To display the Set Display Condition... window

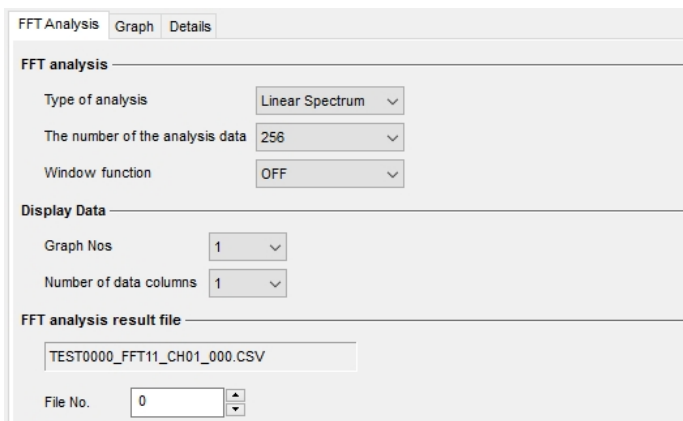
- (1) Right-click the FFT analysis window and click the **Set Display Condition...** or activate the FFT analysis window and click the View - Set Display Condition....



- (2) The Set Display Condition... window appears.

■[FFT analysis] tab

This section describes how to set the following [FFT analysis] tab.
Select the FFT analysis conditions on the [FFT analysis] tab.



(1) FFT analysis

- | | |
|-----------------------------|--|
| Type of analysis | Select the type of analysis.
Linear spectrum, power spectrum, cross spectrum, auto-correlation, cross-correlation |
| The number of analysis data | Select the number of FFT analysis data.
256/512/1024/2048/4096/8192 |
| Window function | Select the FFT analysis window function.
OFF, Hanning, Hamming, Fejer, Blackman, Gaussian |

(2) Display Data

- | | |
|------------------------|--|
| Graph Nos | Select the number of graphs on the FFT analysis window.
The number of channels to be displayed is maximum 1 channel.(Setting range: 1 to 4) |
| Number of data columns | Select the number of data columns on the graph.(Setting range: 1 to 2) |

(3) FFT analysis result file

File name The FFT analysis result file name, saving the analysis results, appear.
FFT analysis result file names are specified as shown below.

(a)_FFT(b)(c)_CH(d)(f). CSV

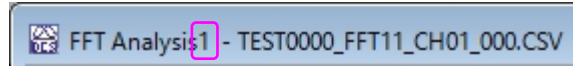
(a)KS2 format file name

The data file name for saving the measured data

(b)Window No.

ID No. of the FFT analysis window

The window No. appears on the window title bar as follows.



(c)Graph No.

ID No. of the graph for displaying the analysis results

(d)CH No.

CH No. of the target channel

(f)File No.

Select the file No.

As the ELA-55A saves the analysis results, the file No. increments automatically.

Setting range: 0 to 9999

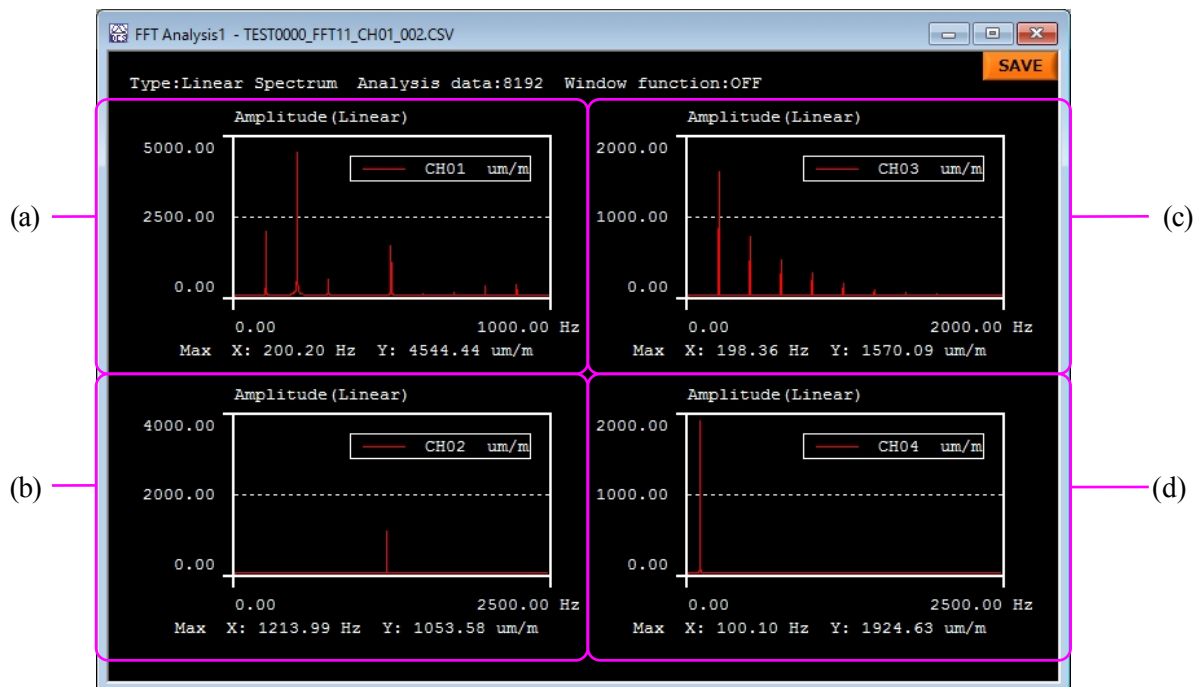
[Example 1]

Suppose the conditions are as follows.

KS2 format file: TEST0000.KS2, Type of analysis: Linear spectrum, Window No.: 1,

Graph Nos: 4, File No.: 2

The ELA-55A saves the analysis results in the following FFT analysis result file.



(a) Graph 1

FFT analysis result file name: TEST0000_FF11_CH01_002.CSV

(b) Graph 2

FFT analysis result file name: TEST0000_FF12_CH02_002.CSV

(c) Graph 3

FFT analysis result file name: TEST0000_FF13_CH03_002.CSV

(d) Graph 4

FFT analysis result file name: TEST0000_FF14_CH04_002.CSV

[Example 2]

Suppose the conditions are as follows.

KS2 format file: TEST0001.KS2, Type of analysis: Cross spectrum, Window No.: 3, Graph Nos: 2,
File No.: 4

The ELA-55A saves the analysis results in the following FFT analysis result file.



(a) Graph 1

FFT analysis result file name: TEST0001_FF31_CH01-02_004.CSV

(b) Graph 2

FFT analysis result file name: TEST0001_FF32_CH03-04_004.CSV

■[Graph] tab

This section describes how to set the following [Graph] tab.

The ELA-55A displays the [Graph] tabs for the number of graphs.

(1) Display Data

Select the target channels, analysis result data, colors, and width
--- on the CH No.: Does not analyze data.

- The number of target channels varies with the type of analysis.

Type of Analysis	Number of target channels
Linear spectrum Power spectrum Auto-correlation	1
Cross spectrum Cross-correlation	2

- The analysis result data varies with the type of analysis.

Type of Analysis	Analysis result data
Linear spectrum Cross spectrum	Amplitude (linear) Amplitude (logarithm) Phase
Power spectrum	Amplitude (linear) Amplitude (logarithm)
Auto-correlation Cross-correlation	Correlation

MEMO

- Channels on the CH Disp Bar are able to be set on the FFT analysis window by drag-and-drop operations.
 - The **Change channel** button appears on the left on the FFT analysis windows, when you point the mouse cursor on the left (or the **Change channel** button appears on the right on the FFT analysis windows, when you point the mouse cursor on the right).
- The **Change channel** button enables you to change the channels to be analyzed.

(2)X Axis Scale

Select the scale value, the number of divisions, and deci digits of the scale value on the x axis.

(3)Y Axis Scale

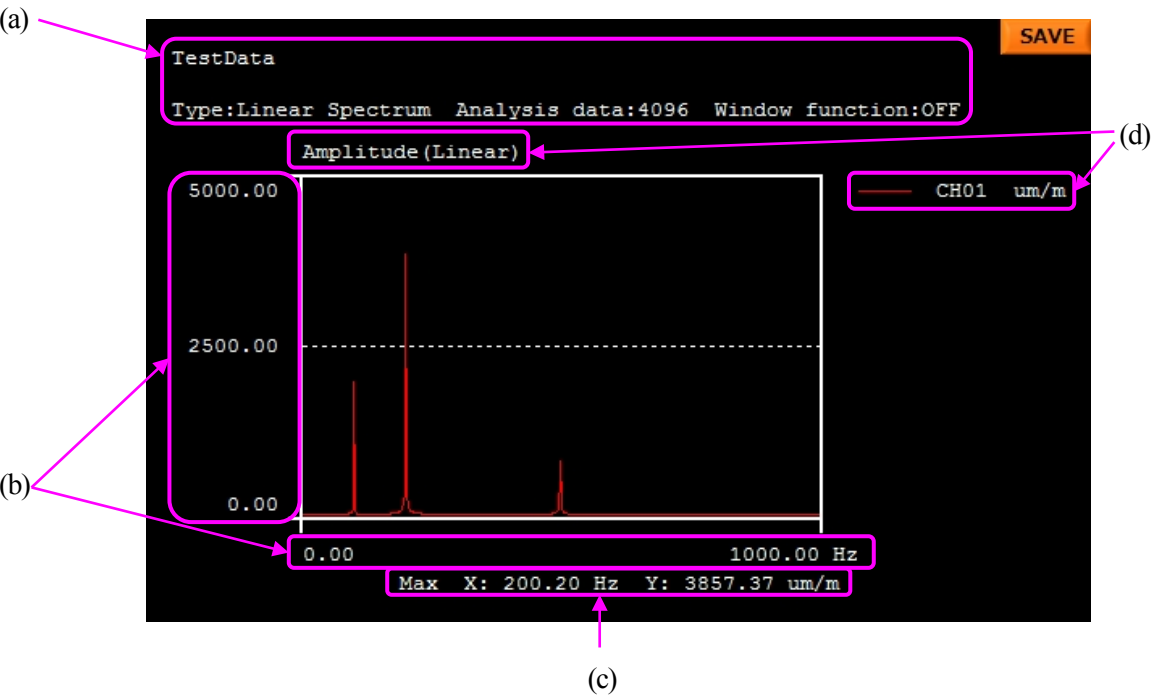
Select the scale value, the number of divisions, and deci digits of the scale value on the y axis.

■[Details] tab

This section describes how to set the following [Details] tab.

For the title section and legent section, see " 1 1 - 1 - 2 - 2 "

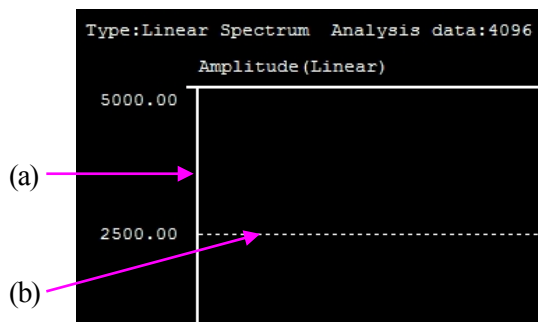
(1) Font



To set the fonts on the FFT analysis window, set them on the "Font" section.

Font			
	Font Name	Size	Color
(a)	Title	Courier New	10
(b)	Scale	Courier New	10
(c)	Axis Label	Courier New	10
(d)	Legend	Courier New	10

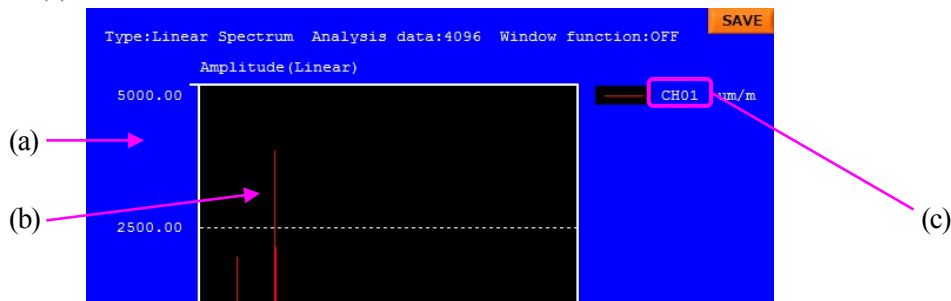
(2) Line



To set the lines on the FFT analysis window, set them on the "Line" section.

Line			
	Width	Style	Color
(a) Frame Line	2	Solid	
(b) Split Line	1	Dot	
Cursor	1	Solid	

(3) Color



To set the colors on the FFT analysis window, set them on the "Color" section.

Color	
(a) Window Background	
(b) Graph Background	
(c) Value (Normal)	

7 - 3 - 2 - 2 To analyze data

This section describes how to analyze data on the FFT analysis window.

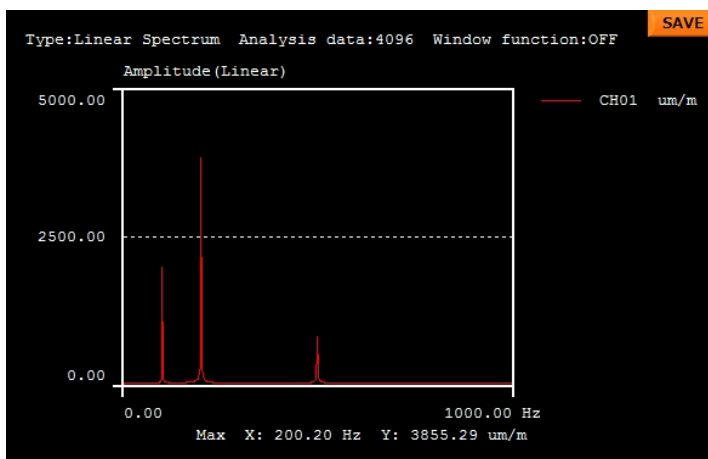
(1) Activate the FFT analysis window.

Select the analysis conditions and display conditions on the Set Display Condition... window.

(2) Starts monitoring data by any of the following.

- Click the Measurement - MONITOR.
- Click the **Monitor** icon from the toolbar.
- Click the **MONITOR** button from the Meas Operation Panel.

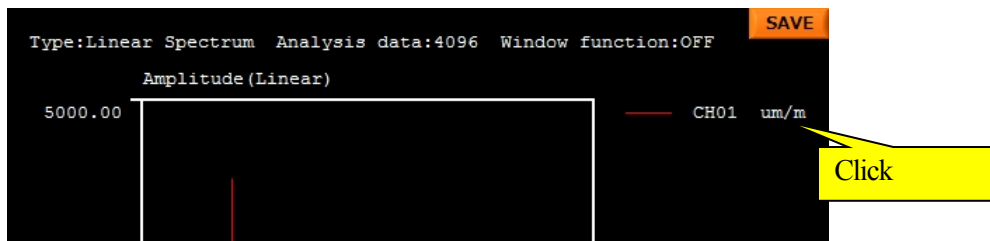
(3) After getting the measured data for the number of analysis data, the ELA-55A analyzes the data and displays the analysis results on graphs.



MEMO

As the ELA-55A gets the measured data for the number of analysis data, the ELA-55A analyzes the data and updates the analysis results on graphs.

(4) Click the **SAVE** button to save the analysis results, currently displaying on the graph, in the FFT analysis result file.



NOTE

- To save the analysis results, click the **SAVE** button on each window.
- The ELA-55A does not save the analysis results by any of the following.
 - Click the **Measurement - REC**.
 - Click the **Record** icon from the toolbar.
 - Click the **REC** button from the Meas Operation Panel.

To save the analysis results, click the **SAVE** button on each window.

(5) As the ELA-55A saves the analysis results, the file No. increments automatically.

The **SAVE** button is disabled until the ELA-55A gets the measured data for the number of analysis data.

7 - 3 - 2 - 3 FFT analysis result file

The FFT analysis result file format is described as follows.

The FFT analysis result file includes the measured data, before the FFT analysis, and analysis result data.

"FFT_FILE"	(1) File title
"ID No.", "ELA-55A"	(2) ID No.
"Title", ""	(3) Title
"Test Date", "2014/10/01", "18:08:52"	(4) Analyzed date and time
"Sampling Rate(Hz)", 10000	(5) Measured sampling frequency
"FFT Type", "Linear spectrum"	(6) Type of analysis
"Window Function", "OFF"	(7) FFT analysis window function
"Data/CH", 8192	(8) The number of data
"FFT Point Nos", 8192	(9) The number of FFT analysis data
"FFT Data Nos", 4096	(10) The number of analysis result data Note 1
"Data Interval (Hz)", 1.220703	(11) FFT analysis data intervals
"Average Times", 1	(12) FFT analysis average times (1 fixed)
"Shift Data Nos", 0	(13) The number of the shift data while averaging
"Unit", "μe", "μe", "°", "dB"	(14) Measured data units and analysis result data units
"Data No.", "CH-A1 data", "Amplitude", "Phase", "Logarithmic Amplitude"	(15) Data item names on and after the next line.
1,-2297.813,1.0000e-15,0.0000,-373.5031	(16) Measured data and analysis result data
:	
4096,-4396.563,0.3281065,-0.01730974,-83.18274	
4097,-4411.406	
:	
8192,-4971.406	

[Note 1]

The number of analysis result data varies with the type of analysis.

Type of Analysis	Analysis result data
Linear spectrum Cross spectrum Power spectrum	The number of data/2
Auto-correlation Cross-correlation	The number of data/4

7 - 3 - 3 Definition of FFT analysis

7 - 3 - 3 - 1 Definition of various spectrums

This software is designed to obtain various spectrums by FFT (Fast Fourier Transform). In order to express the FFT results in real amplitude (Coefficient of Fourier series), real number and imaginary number of FFT analysis results, that is a complex form of Fourier series, are doubled, respectively to be used as FFT results.

$$(X_a = R_a + jI_a)$$

Since DAS-200A functions to obtain the average of object time series data before signal waveform is subjected to FFT analysis and compensate the time series data (subtraction), it is not applicable for DC component.

This section describes details of various spectrums processing in this software.

■Linear spectrum

This software serves to obtain the amplitude and phase spectrums of object signal waveform.

The amplitude spectrum is defined by real amplitude of Fourier series to be regarded as half amplitude (0 to peak value) of frequency components. It is expressed in the unit of signal waveform (example: V, $\mu\text{m/m}$, etc.)

Logarithmic display of the amplitude spectrum is a relative display with maximum amplitude of frequency components set to "0" dB. The phase spectrum is expressed by -180 to 180 (degree).

Subscript a in the following equation denotes "Analysis CH-A".

$$\text{Amplitude } |X_a| : \sqrt{R_a^2 + I_a^2}$$

$$\text{Logarithm (dB)} : 20 \log \frac{|X_a|}{|X_a|_{\max}}, \quad |X_a|_{\max} : \text{Maximum amplitude}$$

$$\text{Phase } \theta_a : \tan^{-1} \frac{I_a}{R_a}$$

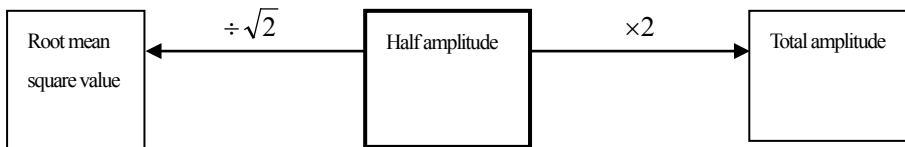
Suppose amplitude spectrum $|X_a|$ is compared with the amplitude spectrum $|C_a|$ that is based on complex form of Fourier series C_a . Then, the amplitude spectrum is doubled as shown in the following equation.

$$|C_a| = \sqrt{C_a \cdot C_a^*} = \sqrt{\left(\frac{a_a - jb_a}{2}\right) \cdot \left(\frac{a_a + jb_a}{2}\right)} = \frac{1}{2} |X_a|$$

where, C_a : Complex form of Fourier series

a_a, b_a : Coefficients of Fourier series

In addition, relations between half amplitude of amplitude spectrum and root mean square value (rms), and between total amplitude (p-p value) are described in the following.



■Power spectrum

Power spectrum is a square value of the linear spectrum amplitude. It is expressed in the unit of square value of signal waveform (example: V², etc.)

Logarithmic display of the power spectrum is a relative display with maximum amplitude of frequency components set to "0" dB.

Subscript a in the following equation denotes "Analysis CH-A".

$$\text{Amplitude} \quad |X_a|^2 : R_a^2 + I_a^2$$

$$\text{Logarithm} \quad (dB) : 10 \log \frac{|X_a|^2}{|X_a|_{\max}^2}$$

Suppose $|X_a|^2$ is compared with the power spectrum $|C_a|^2$ that is based on complex form of Fourier series C_a . Then, the power spectrum shall be 4 times as large the value as shown in the following equation.

$$|C_a|^2 = C_a \cdot C_a^* = \left(\frac{a_a - jb_a}{2} \right) \cdot \left(\frac{a_a + jb_a}{2} \right) = \frac{1}{4} (a_a^2 + b_a^2) = \frac{1}{4} |X_a|^2$$

where, C_a : Complex form of Fourier series
 a_a, b_a : Coefficients of Fourier series

■Cross spectrum

The amplitude becomes a product of 2 signal frequency components and the phase expresses the relative difference of both phases. Subscripts a and b in the following equation denotes "Analysis CH-A" and "Analysis CH-B", respectively.

Logarithmic display of the amplitude spectrum is a relative display with maximum amplitude of frequency components set to "0" dB. The phase spectrum is expressed by -180 to 180 (degree).

$$\text{Amplitude} \quad X_{ab} : X_b \cdot X_a^* = \sqrt{R_{ab}^2 + I_{ab}^2} \quad , X_a^* : \text{Complex conjugate number of } X_a$$

$$\text{Logarithm} \quad (dB) : 20 \log \frac{X_{ab}}{X_{ab \max}} \quad , X_{ab \max} : \text{Maximum amplitude}$$

$$\text{Phase} \quad \theta_{ab} : \tan^{-1} \frac{I_{ab}}{R_{ab}}$$

$$(\text{Note}) \quad X_{ab} = X_b \cdot X_a^* = R_{ab} + jI_{ab}$$

■Auto-correlation function

When the object signal waveform is displaced on the time axis, similarity with the original waveform is displayed and the value shall be between +1 and -1 that is normalized by a value of time lag "0."

F^{-1} The auto-correlation function is obtained by calculating Fourier inverse transformation (F^{-1}) of power spectrum $|X_a|^2$.

Subscript a in the following equation denotes "Analysis CH-A".

$$\frac{F^{-1} |X_a|^2}{F^{-1} |X_a(0)|^2}$$

■Cross correlation function

When either one of 2 signal waveforms is displaced on the time axis, similarity with the other signal waveform is displayed and the value shall be between +1 and -1 that is normalized by a value of time lag "0."

F^{-1} The cross correlation function is obtained by calculating Fourier inverse transformation (F^{-1}) of cross spectrum $|H_{ab}|$. Subscripts a and b in the following equation denotes "Analysis CH-A" and "Analysis CH-B", respectively.

$$\frac{F^{-1}|H_{ab}|}{F^{-1}|H_{ab}(0)|}$$

7 - 3 - 3 - 2 Supplementary description

■Time series data and FFT analysis result

When analysis object time series data is sampling frequency $\Delta t \times N$ (Number of data) = Cycle (Analysis interval), the k -order frequency f_k and base frequency f_1 are expressed as follows.

$$f_k = \frac{k}{T} = \frac{k}{N\Delta t}$$

$$f_1 = \frac{1}{T} = \frac{1}{N\Delta t}$$

Maximum order frequency is considered as $k = N/2$ and maximum analysis frequency is obtained by the following equation.

$$f_{N/2} = \frac{1}{2\Delta t}$$

Analysis frequency of the finite Fourier series is decomposed to components in the matter of double integers ($k = 1, 2, 3 \dots N/2$) from f_1 to $f_{N/2}$.

($k=0$ is DC component)

The above mentioned base frequency f_1 shall be a frequency resolution (Δf) of Fourier series.

In addition, it is the maximum analysis frequency that can be analyzed by $f_{N/2}$ and is called Nyquist frequency.

The FFT analysis in ELA-55A obtains $k=0, 1, 2, 3 \dots N/2-1$ ($N/2$) of data and the actual maximum analysis frequency is $f_{N/2-1}$.

For example, when sampling fundamental frequency 10k Hz (Sampling frequency $\Delta t = 10^{-4}$ sec) and the number of analysis data $N = 4096$ are subjected to FFT analysis, the cycle T (analysis interval) becomes 0.4096 sec. Therefore, base frequency f_1 (= frequency resolution Δf) becomes 2.44 Hz and the maximum analysis frequency, $f_{N/2-1} = 4.99756$ kHz.

8 Functions when the EGPC-50A is mounted

8 - 1 CAN conditions

The ECAN Condition Setting window includes the following conditions of the EGPC-50A.

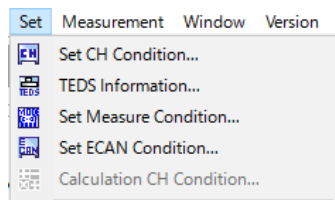
- Receiving Cond Sets the conditions of the data frame to be received.
- Output Start Cond Sets the conditions of the data frame to be transmitted when the A/D conversion starts.
- Output Stop Cond Sets the conditions of the data frame to be transmitted when the A/D conversion stops.
- Output Interval Cond Sets the conditions of the data frame to be transmitted at the pre-set interval.
- Output Manual Cond Sets the conditions of the data frame to be transmitted at the arbitrary timing.
- Comm Cond Sets the communication conditions of the CAN communication.

MEMO

- The data frame indicates the data packet of the CAN communication.
- The [Output Start Cond] tab, [Output Stop Cond] tab, [Output Interval Cond] tab, and [Output Manual Cond] tab is the condition setting tabs for outputting the CAN data.
For details, see separate volume of "EDX-5000A MEMORY RECORDER/ANALYZER INSTRUCTION MANUAL (FOR HARDWARE)."

Open the Set ECAN Condition Setting window by any of the following.

- Click the Set - Set ECAN Condition....
- Click the **ECAN Cond.** icon from the toolbar.



ECAN Condition Setting (Number of using CHs : 0)

Nothing

☐ Merge cells

CAN-CH E0-***	Mea...	CAN-ID Name (Message)	Port No.	Format	Frame ID	Data Length (Byte)	CAN-CH Name (Signal)	Start Bit	Bit Length	Data Type	Endian	Ca
001	☐		1	Standard	---	8		0	16	Signed	Big	
002	☐		1	Standard	---	8		0	16	Signed	Big	
003	☐		1	Standard	---	8		0	16	Signed	Big	
004	☐		1	Standard	---	8		0	16	Signed	Big	
005	☐		1	Standard	---	8		0	16	Signed	Big	
006	☐		1	Standard	---	8		0	16	Signed	Big	
007	☐		1	Standard	---	8		0	16	Signed	Big	
008	☐		1	Standard	---	8		0	16	Signed	Big	
009	☐		1	Standard	---	8		0	16	Signed	Big	
010	☐		1	Standard	---	8		0	16	Signed	Big	
011	☐		1	Standard	---	8		0	16	Signed	Big	
012	☐		1	Standard	---	8		0	16	Signed	Big	
013	☐		1	Standard	---	8		0	16	Signed	Big	
014	☐		1	Standard	---	8		0	16	Signed	Big	
015	☐		1	Standard	---	8		0	16	Signed	Big	
016	☐		1	Standard	---	8		0	16	Signed	Big	
017	☐		1	Standard	---	8		0	16	Signed	Big	
018	☐		1	Standard	---	8		0	16	Signed	Big	
019	☐		1	Standard	---	8		0	16	Signed	Big	
020	☐		1	Standard	---	8		0	16	Signed	Big	
021	☐		1	Standard	---	8		0	16	Signed	Big	
022	☐		1	Standard	---	8		0	16	Signed	Big	
023	☐		1	Standard	---	8		0	16	Signed	Big	
024	☐		1	Standard	---	8		0	16	Signed	Big	
025	☐		1	Standard	---	8		0	16	Signed	Big	
026	☐		1	Standard	---	8		0	16	Signed	Big	
027	☐		1	Standard	---	8		0	16	Signed	Big	
028	☐		1	Standard	---	8		0	16	Signed	Big	

Change Setting Items.. button

Setting items displayed on the window are added, removed, or sorted.
(For details, See “ 3 - 1 - 2 Change Setting Items”)

Freeze Columns button

Freeze columns ON/OFF

It allows you to keep some of your data in the same place as you scroll through the rest of your spreadsheet.

Load Condition... button

Loads the previously saved condition file (.ECF and .CAN).

ECF file: ECAN condition file

CAN file: CAN condition file

Save Condition... button

Saves the current ECAN conditions into the ECAN condition file (.ECF).

Load CANdb File... button

Loads the CANdb file (.DBC) for setting the CAN conditions.

(For details, See “ 8 - 3 CANdb”)

OK button

Determines the pre-set contents and closes the window.

Cancel button

Cancels the pre-set contents and closes the window.

Apply button

Determines the current set contents.

■Common buttons

Insert button

Inserts the rows.

Delete button

Deletes the rows.

Up/Down button

Moves the target row upward/downward.

Filter by list

Select the filter item.

Word box

Input the character string for filtering data.

■ECAN conditions, common operations

For coping setting items, pasting setting items, and pasting from the clipboard, see “3 - 1 Analog channel condition.”

■Clear

The ELA-55A is able to initialize the selected items into the initial value.

(1) Select the items and right-click.

Select the “Clear” from the pop-up menu.

Shortcut: **DELETE** key

CAN-CH EO-***	Mea...	CAN-ID Name (Message)	Port No.	Format	Frame ID	Data Length (Byte)	CAN-CH Name (Signal)	Start Bit	Bit Length	Data Type	Endian	Ca
001	☒	Sample-ID01	1	Standard				16	32	Float	Big	
002	☒	Sample-ID01	1	Standard				0	16	Signed	Big	
003	☒	Sample-ID01	1	Standard				0	1	Signed	Big	
004	☒	Sample-ID01	1	Standard				0	1	Signed	Big	
005	☒	Sample-ID01	1	Standard				0	1	Signed	Big	
006	☐	Sample-ID01	1	Standard				0	1	Signed	Big	
007	☐	Sample-ID01	1	Standard				0	1	Signed	Big	
008	☐	Sample-ID01	1	Standard				0	1	Signed	Big	
009	☐	Sample-ID01	1	Standard				0	1	Signed	Big	

(2) The initial value appears.

CAN-CH EO-***	Mea...	CAN-ID Name (Message)	Port No.	Format	Frame ID	Data Length (Byte)	CAN-CH Name (Signal)	Start Bit	Bit Length	Data Type	Endian	Ca
001	☐		1	Standard	---	8		0	1	Signed	Little	
002	☐		1	Standard	---	8		0	1	Signed	Little	
003	☒	Sample-ID01	1	Standard	000	8	ECAN-CH03	0	16	Signed	Big	
004	☒	Sample-ID01	1	Standard	000	8	ECAN-CH04	0	16	Signed	Big	
005	☐	Sample-ID01	1	Standard	---	8		0	1	Signed	Big	
006	☐	Sample-ID01	1	Standard	---	8		0	1	Signed	Big	
007	☐	Sample-ID01	1	Standard	---	8		0	1	Signed	Big	

■Insert

The ELA-55A is able to insert the rows.

(1) Select the rows.

Right-click the window and select the "Insert" from the pop-up menu or click the **Insert** button.

Shortcut: **INSERT** key

Receiving Cond Click Output Interval Cond Output Manual Cond Comm Cond												
Insert Up Down Word Bit Assignment... Delete Down Word ✓ Merge cells												
CAN-CH EO-***	Mea...	CAN-ID Name (Message)	Port No.	Format	Frame ID	Data Length (Byte)	CAN-CH Name (Signal)	Start Bit	Bit Length	Data Type	Endian	Ca
001	☒	Sample-ID01	1	Standard	100	8	ECAN-CH01	16	32	Float	Big	
002	☒	Sample-ID01	1	Standard	100	8	ECAN-CH02	0	16	Signed	Big	
003	☒	Sample-ID02	1	Standard	---	8	ECAN-CH03	0	16	Signed	Big	
004	☒	Sample-ID02	1	Standard	---	8	ECAN-CH04	0	16	Signed	Big	
005	☐		1	Standard	---	8		0	1	Signed	Little	
006	☐		1	Standard	---	8		0	1	Signed	Little	
007	☐		1	Standard	---	8		0	1	Signed	Little	
008	☐		1	Standard	---	8		0	1	Signed	Little	
009	☐		1	Standard	---	8		0	1	Signed	Little	
010	☐		1	Standard	---	8		0	1	Signed	Little	
011	☐		1	Standard	---	8		0	1	Signed	Little	

(2) The ELA-55A inserts the rows in front of the selection.

CAN-CH EO-***	Mea...	CAN-ID Name (Message)	Port No.	Format	Frame ID	Data Length (Byte)	CAN-CH Name (Signal)	Start Bit	Bit Length	Data Type	Endian	Ca
001	☒	Sample-ID01	1	Standard	100	8	ECAN-CH01	16	32	Float	Big	
002	☒	Sample-ID01	1	Standard	100	8	ECAN-CH02	0	16	Signed	Big	
003	☐		1	Standard	---	8		0	1	Signed	Little	
004	☐		1	Standard	---	8		0	1	Signed	Little	
005	☒	Sample-ID02	1	Standard	200	8	ECAN-CH03	0	16	Signed	Big	
006	☒	Sample-ID02	1	Standard	200	8	ECAN-CH04	0	16	Signed	Big	

Note that the ELA-55A does not add rows.

As you insert the rows, the data moves downward for the number of rows.

Note that the CAN-CH No. changes.

[Example]

Suppose the last channel data is data frame.

505	☐		1	Standard	---	8		0	1	Signed	Big
506	☐		1	Standard	---	8		0	1	Signed	Big
507	☐		1	Standard	---	8		0	1	Signed	Big
508	☐		1	Standard	---	8		0	1	Signed	Big
509	☒	Sample-ID03	1	Standard	300	8	ECAN-CH05	0	1	Signed	Big
510	☒	Sample-ID03	1	Standard	300	8	ECAN-CH05	0	1	Signed	Big
511	☒	Sample-ID04	1	Standard	400	8	ECAN-CH05	0	1	Signed	Big
512	☒	Sample-ID04	1	Standard	400	8	ECAN-CH05	0	1	Signed	Big

As you select 2 rows, the ELA-55A inserts 2 rows.

As you select 2 rows, the data moves downward for 2 rows.

The Sample-ID04 disappears.

505	☐		1	Standard	---	8		0	1	Signed	Big
506	☐		1	Standard	---	8		0	1	Signed	Big
507	☐		1	Standard	---	8		0	1	Signed	Big
508	☐		1	Standard	---	8		0	1	Signed	Big
509	☐		1	Standard	---	8		0	1	Signed	Big
510	☐		1	Standard	---	8		0	1	Signed	Big
511	☒	Sample-ID03	1	Standard	300	8	ECAN-CH05	0	1	Signed	Big
512	☒	Sample-ID03	1	Standard	300	8	ECAN-CH05	0	1	Signed	Big

•Delete

The ELA-55A is able to delete the rows.

(1) Select the rows.

Right-click the window and select the "Delete" from the pop-up menu or click the **Delete** button.

Shortcut: **CTRL** key + **DELETE** key

Insert

Up

Filter

Click

Bit Assignment...

Delete

Down

Word

Merge cells

CAN-CH EO-***	Mea...	CAN-ID Name (Message)	Port No.	Format	Frame ID	Data Length (Byte)	CAN-CH Name (Signal)	Start Bit	Bit Length	Data Type	Endian	Ca
001	☒	Sample-ID01	1	Standard	100	8	ECAN-CH01	16	32	Float	Big	
002	☒		ECAN-CH02				0	16	Signed	Big		
003	☒		ECAN-CH03				0	16	Signed	Big		
004	☒		ECAN-CH04				0	16	Signed	Big		
005	☐		1			8		0	1	Signed	Big	
006	☐		1			8		0	1	Signed	Big	
007	☐		1			8		0	1	Signed	Big	
008	☐		1			8		0	1	Signed	Big	
009	☐		1			8		0	1	Signed	Big	
010	☐		1			8		0	1	Signed	Big	
011	☐		1			8		0	1	Signed	Big	

Copy

Paste

Paste from the clipboard

Insert

Delete

Clear

Right click

(2) The ELA-55A deletes the selected rows.

CAN-CH	Mea...	CAN-ID Name (Message)	Port No.	Format	Frame ID	Data Length (Byte)	CAN-CH Name (Signal)	Start Bit	Bit Length	Data Type	Endian	Ca
001	☒		1	Standard	100	8	ECAN-CH01	16	32	Float	Big	
002	☒	Sample-ID01	1	Standard	100	8	ECAN-CH02	0	16	Signed	Big	
003	☐		1	Standard	---	8		0	1	Signed	Big	
004	☐		1	Standard	---	8		0	1	Signed	Big	
005	☐		1	Standard	---	8		0	1	Signed	Big	
006	☐		1	Standard	---	8		0	1	Signed	Big	

As you delete the rows, the data moves upward for the number of rows.

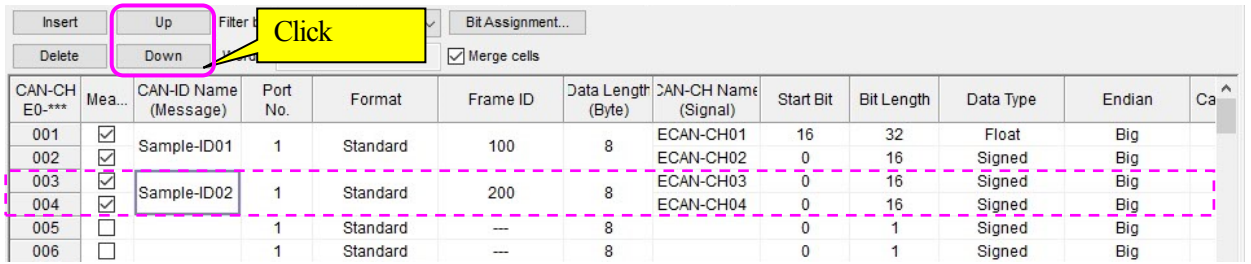
Note that the CAN-CH No. changes.

• Up/Down

The ELA-55A is able to move the target channel/data frame upward/downward.

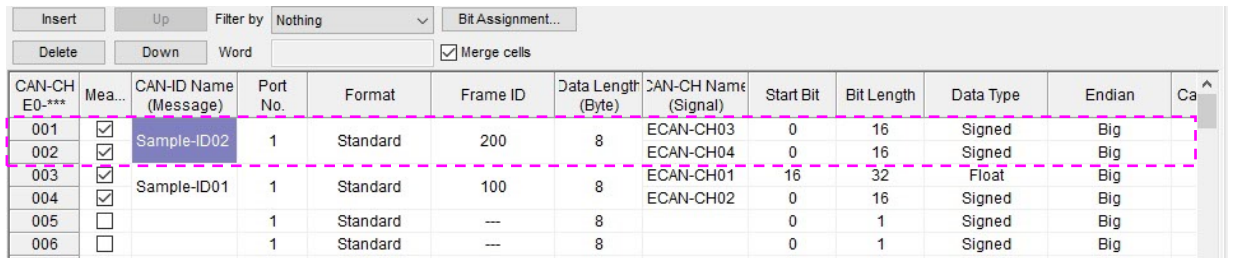
(1) Select the target channel or data frame.

Click the **Up** button or **Down** button.



CAN-CH E0-***	Mea...	CAN-ID Name (Message)	Port No.	Format	Frame ID	Data Length (Byte)	CAN-CH Name (Signal)	Start Bit	Bit Length	Data Type	Endian	Ca
001	☒	Sample-ID01	1	Standard	100	8	ECAN-CH01	16	32	Float	Big	
002	☒						ECAN-CH02	0	16	Signed	Big	
003	☒	Sample-ID02	1	Standard	200	8	ECAN-CH03	0	16	Signed	Big	
004	☒						ECAN-CH04	0	16	Signed	Big	
005	☐		1	Standard	---	8		0	1	Signed	Big	
006	☐		1	Standard	---	8		0	1	Signed	Big	

(2) The channel/data frame moves.



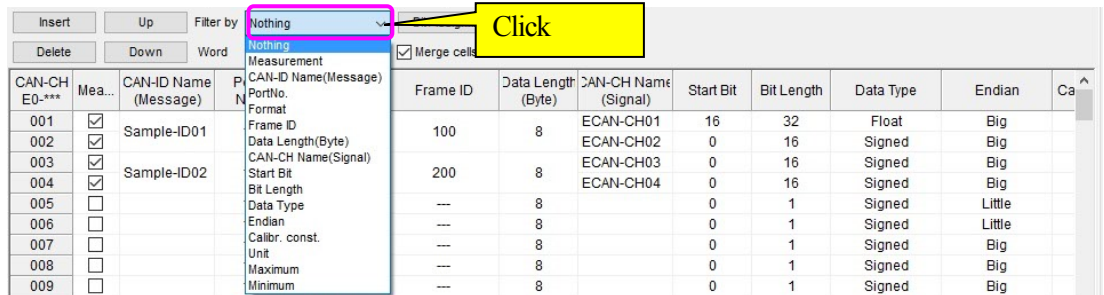
CAN-CH E0-***	Mea...	CAN-ID Name (Message)	Port No.	Format	Frame ID	Data Length (Byte)	CAN-CH Name (Signal)	Start Bit	Bit Length	Data Type	Endian	Ca
001	☒	Sample-ID02	1	Standard	200	8	ECAN-CH03	0	16	Signed	Big	
002	☒						ECAN-CH04	0	16	Signed	Big	
003	☒	Sample-ID01	1	Standard	100	8	ECAN-CH01	16	32	Float	Big	
004	☒						ECAN-CH02	0	16	Signed	Big	
005	☐		1	Standard	---	8		0	1	Signed	Big	
006	☐		1	Standard	---	8		0	1	Signed	Big	

When you select the merged cell, the merged cell (data frame) moves.

• Filtering

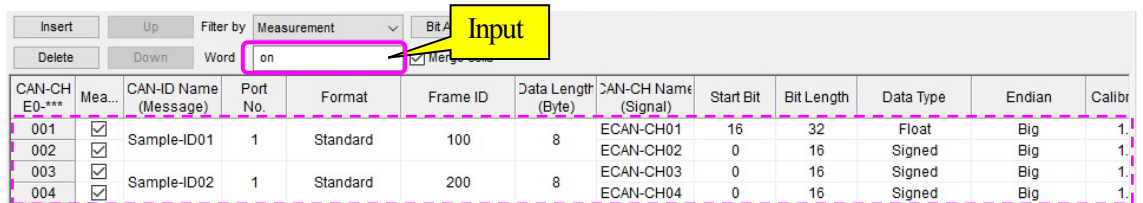
The ELA-55A is able to search the target channel by using the Filter by list and Word box.

(1) Select the filter item from the Filter by list.



CAN-CH E0-***	Mea...	CAN-ID Name (Message)	Port No.	Format	Frame ID	Data Length (Byte)	CAN-CH Name (Signal)	Start Bit	Bit Length	Data Type	Endian	Ca
001	☒	Sample-ID01	1	Standard	100	8	ECAN-CH01	16	32	Float	Big	
002	☒						ECAN-CH02	0	16	Signed	Big	
003	☒	Sample-ID02	1	Standard	200	8	ECAN-CH03	0	16	Signed	Big	
004	☒						ECAN-CH04	0	16	Signed	Big	
005	☐				---	8		0	1	Signed	Little	
006	☐				---	8		0	1	Signed	Little	
007	☐				---	8		0	1	Signed	Big	
008	☐				---	8		0	1	Signed	Big	
009	☐				---	8		0	1	Signed	Big	

(2) Input the character string in the Word box for filtering data.



CAN-CH E0-***	Mea...	CAN-ID Name (Message)	Port No.	Format	Frame ID	Data Length (Byte)	CAN-CH Name (Signal)	Start Bit	Bit Length	Data Type	Endian	Calibr
001	☒	Sample-ID01	1	Standard	100	8	ECAN-CH01	16	32	Float	Big	1
002	☒						ECAN-CH02	0	16	Signed	Big	1
003	☒	Sample-ID02	1	Standard	200	8	ECAN-CH03	0	16	Signed	Big	1
004	☒						ECAN-CH04	0	16	Signed	Big	1

The Word box is ignoring case.

The Word box is able to input a single word. The Word box is not able to use AND and OR between search words.

When the Filter by is "Measurement", "Output", or "Confirmation", input ON or OFF in the Word box.

ON: Channels with a check mark appear.

OFF: Channels without a check mark appear.

NOTE

The ELA-55A is not able to use the **Up** button/**Down** button while using Filter by.

8 - 1 - 1 Communication conditions

Select the [Comm Cond] tab on the ECAN Condition Setting window for settings.

Receiving Cond	Output Start Cond	Output Stop Cond	Output Interval Cond	Output Manual Cond	Comm Cond	
Port No.	CAN Comm Std	Comm Spee (kbps)	Sample Point	Sample Times	Resync Jump Width	Term Res...
1	High Speed CAN	500	87.5%(TSEG1:13, TSEG2:2, 48MHz)	1	2	OFF
2	High Speed CAN	500	87.5%(TSEG1:13, TSEG2:2, 48MHz)	1	2	OFF

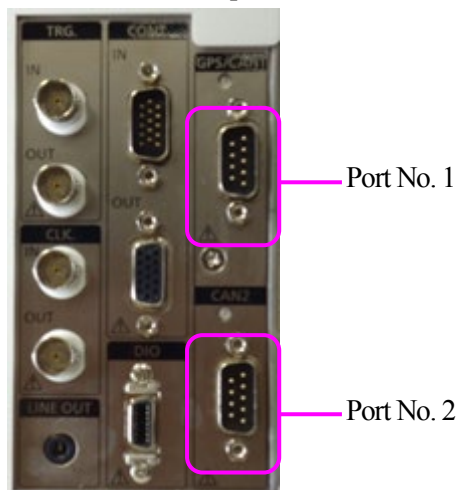
■Setting Items

(1) EDX-ID No.

The ID No. of the EDX-5000A with the EGPC-50A.

(2) Port No.

The communication port No.



(3) CAN Comm Std

High Speed CAN/Low Speed CAN

After changing the CAN communication standard, communication conditions are set as follows at first.

Item/CAN Comm Std	High Speed CAN	Low Speed CAN
Communication speed (kbps)	500	125
Sample Point	87.5 %(TSEG1:13, TSEG2:2, 48 MHz)	
Sample Times	1	
Resync Jump Width (SJW)	2	

(4) Comm Speed (kbps)

Select the communication speed.

The communication speed varies with the CAN communication standard.

High Speed CAN

1000, 800, 500, 250, 125, 100, 83.3, 62.5, 50, 33.3, 25, 20, 10

Low Speed CAN

125, 100, 83.3, 62.5, 50, 33.3, 25, 20, 10

(5) Sample Point

The sample point.

The pre-set communication speed changes the sample point automatically.

Communication speed	Sample point
1000kbps	75% (TSEG1:11, TSEG2:4, 48MHz)
800kbps	80 % (TSEG1:15, TSEG2:4, 48MHz)
Others	87.5 %(TSEG1:13, TSEG2:2, 48 MHz)

(6) Sample Times

The sample times. The sample times is a fixed value.

(7) Resync Jump Width

The resync jump width. The Resync jump width is a fixed value.

(8) Term Resist

Select the Term Resist ON/OFF.

8 - 1 - 2 Receiving conditions

Select the [Receiving Cond] tab on the ECAN Condition Setting window for settings.
The ELA-55A is able to set up to 512 channels on the EGPC-50A.

Title bar

Merge cells button

Bit assignment... button

Number of channels are displayed on the title bar.

Merges the rows of the same Frame ID.

(For details, see “8 - 1 - 2 - 1 To merge cell.”)

The Bit Assignment window appears for displaying the data field status.

(For details, see “8 - 1 - 2 - 2 Bit assignment window.”)

■Setting Items

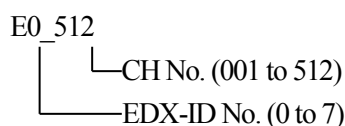
The [Receiving Cond] tab has the following items.

The [Receiving Cond] tab has the minimum items for measurements at the default status.

To add, remove, or sort the setting items, click the Change Setting Items... button.

(1) CAN-CH (E*-***)

The CH No. The CH No. of the EGPC-50A appears on graphs as "E*-***".



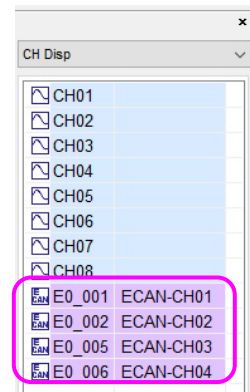
[Example]

Suppose the EDX-ID No. is 2 and the CH No. is 10.

The CAN-CH is E2-010.

(2) Measurement

The ELA-55A measures channels with a check mark on the "Measurement" column.
The ECAN-CHs to be measured are displayed on the CH Disp bar on the main window.



As you put a check mark to the check box in the "Measurement" column, the Frame ID appears automatically.
The same value of the adjacent Frame ID cell or 0 appears.

(3) Node Name

Input the Node No. (Within 40 characters).

Since the node indicates a device on the CAN network, the node is a device which transmits the data frame to the EDX-5000A.

(4) CAN-ID Name (Message)

Input the name of the data frame. (Within 40 characters).

(5) Port No.

Select the port No. for receiving the data frame.

1 to 2

(6) Format

Select the data frame format.

The data frame format is "Standard format" or "Extended format".

Select the target item from the following.

Standard (Standard format)/Extended (Extended format)

As you select the "Extended", the extension Frame ID appears automatically.

(7) Frame ID

Set the data frame ID. The Frame ID is hexadecimal number.

The Frame ID varies with the Format.

When the Format is standard: 0x0 to 0x7FF (11 bits)

When the Format is extended: 0x0 to 0xFFFFFFFF (29 bits)

To not use the Frame ID, select “---”.

Before selecting “---”, make sure the "Measurement" is OFF.

Be sure to set the same Frame ID value in the adjacent cells. Or, the ELA-55A automatically moves the channel to set the same Frame ID value in the adjacent cells.

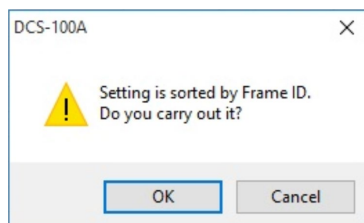
[Example]

Suppose the settings are as follows.

Click the **OK** button or **Apply** button on the ECAN Condition Setting window.

Insert	Up	Filter by	Nothing	Bit Assignment...								
Delete	Down	Word		☒ Merge cells								
CAN-CH E0-***	Meas...	CAN-ID Name (Message)	Port No.	Format	Frame ID	Data Length (Byte)	CAN-CH Name (Signal)	Start Bit	Bit Length	Data Type	Endian	Ca
001	☒	Sample-ID01	1	Standard	100	8	ECAN-CH01	0	32	Float	Big	
002	☒						ECAN-CH02	0	32	Float	Big	
003	☐			1	Standard	---	8		0	1	Signed	Big
004	☐	Sample-ID02	1	Standard	100	8	ECAN-CH03	0	32	Float	Big	
005	☒						ECAN-CH04	0	32	Float	Big	
006	☐			1	Standard	---	8		0	1	Signed	Big
007	☒	Sample-ID03	1	Extended	00000100	8	ECAN-CH05	0	32	Float	Big	
008	☐						ECAN-CH05	0	32	Float	Big	
009	☐			1	Standard	---	8		0	1	Signed	Big
010	☒	Sample-ID04	2	Standard	100	8	ECAN-CH07	0	32	Float	Big	
011	☒						ECAN-CH08	0	32	Float	Big	
012	☐			1	Standard	---	8		0	1	Signed	Big

The following message appears.



Click the **OK** button on the message window.

Insert	Up	Filter by	Nothing	Bit Assignment...								
Delete	Down	Word		☒ Merge cells								
CAN-CH E0-***	Mea...	CAN-ID Name (Message)	Port No.	Format	Frame ID	Data Length (Byte)	CAN-CH Name (Signal)	Start Bit	Bit Length	Data Type	Endian	Ca
001	☒	Sample-ID01	1	Standard	100	8	ECAN-CH01	0	32	Float	Big	
002	☒						ECAN-CH02	0	32	Float	Big	
003	☒						ECAN-CH03	0	32	Float	Big	
004	☒						ECAN-CH04	0	32	Float	Big	
005	☐		1	Standard	---	8		0	16	Signed	Big	
006	☐		1	Standard	---	8		0	16	Signed	Big	
007	☒	Sample-ID03	1	Extended	00000100	8	ECAN-CH05	0	32	Float	Big	
008	☒						ECAN-CH06	0	32	Float	Big	
009	☐		1	Standard	100	8		0	16	Signed	Big	
010	☒	Sample-ID04	2	Standard	100	8	ECAN-CH07	0	32	Float	Big	
011	☒						ECAN-CH08	0	32	Float	Big	

Merged the cells of the Frame ID 100.

The Extension Frame ID is different from the Standard Frame ID.

Although the Frame ID is 100, the Port No. is different.

Click the **Cancel** button on the message window.

Insert	Up	Filter by	Nothing		Bit Assignment...							
Delete	Down	Word			☒ Merge cells							
CAN-CH E0-***	Mea...	CAN-ID Name (Message)	Port No.	Format	Frame ID	Data Length	CAN-CH Name	Start Bit	Bit Length	Data Type	Endian	Ca
001	☒	Sample-ID01	1	Standard	100					Float	Big	
002	☒									Float	Big	
003	☐		1	Standard	---			0	1	Signed	Big	
004	☒	Sample-ID02	1	Standard	100	8	ECAN-CH03	0	32	Float	Big	
005	☒						ECAN-CH04	0	32	Float	Big	
006	☐		1	Standard	---	8		0	1	Signed	Big	
007	☒	Sample-ID03	1	Extended	00000100	8	ECAN-CH05	0	32	Float	Big	
008	☐						ECAN-CH05	0	32	Float	Big	

Appears in red.

The target cell, having the same Frame ID value, appears in red.

When the [Receiving Cond] tab has a red cell, you are not able to apply the settings.

To apply the settings, change the settings or click the **OK** button on the message window to move the channels.

(8) CAN-CH Name (Signal)

Input the name of the CAN-CH. (Within 40 characters).

(9) Data Length (Byte)

Set the data field's data size of the data frame.

1 byte to 8 bytes

The ELA-55A handles each data in the data field as a channel.

(10) Start Bit

The head position of the channel data in the data field. The Start Bit is binary digit.

0 bit to 63 bits

The Start Bit varies with the "Endian".

(11) Bit Length

Set the data size of the channel.

1 bit to 64 bits

NOTE

The Bit Length varies with the "Start Bit" and "Data Length (Byte)".

The setting range is as follows.

$\text{Data Length (Byte)} \times 8 \geq \text{Start Bit} + \text{Bit Length}$

[Example] Suppose the Start bit is 0 and Bit Length is 32.

The Data Length (Byte) is 4 to 8.

(12) Start Point

Set the head position of the channel data in the data field.

Although the Start Point is the same as the Start Bit, the formats are not the same.

The Start Point is XY (X: Byte No., Y: Bit No.).

00 to 77

As you change the Start Point, the new Start Bit appears automatically.

(13) End Point

Set the end position of the channel data in the data field.

The End Point is XY (X: Byte No., Y: Bit No.).

00 to 77

As you change the End Point, the new Bit Length appears automatically.

(14) Data Type

Select the type of the channel.

Signed	Signed integer-type data (1 to 64 bits)
Unsigned	Unsigned integer-type data (1 to 64 bits)
Float	Real type data (32 bits fixed)
Double	Real type data (64 bits fixed)

(15) Endian

Select the Endian of the channel.

Big/Little

(16) Calibr. const.

Set the constant for converting the channel value into the physical quantity.

Use the following formula.

$$\text{Physical quantity} = \text{Channel value} \times \text{Calibr. const.} + \text{offset}$$

The ELA-55A uses the Calibr. const. automatically.

To not use the Calibr. const., input "1.0".

(17) Offset

Set the offset to be added.

The ELA-55A uses the Offset automatically.

To not use the Offset, input "0.0".

(18) Unit

Select/input the appropriate unit.

Double-click the target CH or press the **ENTER** key to display the Set Unit window.

Set Unit CH81

KS2 Format unit

☒ um/m ☐ e ☐ mV ☐ V ☐ mA ☐ A

☐ mm ☐ cm ☐ m ☐ degC ☐ degF ☐ 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 ☐ OHM

☐ kOHM ☐ MOHM ☐ % ☐ dB ☐ ppm ☐ cm/s

☐ m/s ☐ m/min ☐ km/h ☐ Hz ☐ kHz ☐ MHz

☐ deg ☐ deg ☐ rad ☐ kN ☐ kNm ☐ kW

☐ rpm ☐ cm/s2 ☐ m/s2 ☐ G ☐ daN ☐ mile/h

☐ *100kpa ☐ deg/s ☐ msec ☐ sec ☐ min ☐ hour

☐ ☐ ☐

OK Cancel

Press the **SPACE** key to be in input available state.

Input the target unit.

Input the user arbitrary unit within 7 characters.

(19) Deci Digits

Select the number of digits below the decimal point.

When selecting the Auto, a number consisting of 5 digits (a sign not included) appears automatically.

(20) Maximum/Minimum

Set the CAN threshold values.

For details, see “3 - 2 DIO conditions.”

8 - 1 - 2 - 1 To merge cell

To merge cells of the same Frame ID, put a check mark to the check box next to the "Merge cells".

Merging cells enables you to view the data frame configuration much easily.

Click

Frame ID 0x100

Frame ID 0x00000200

Merged the cells of the same Frame ID.

CAN-CH E0-***	Mea...	CAN-ID Name (Message)	Port No.	Format	Frame ID	Data Length (Byte)	CAN-CH Name (Signal)
001	☒	Velocity	1	Standard	100	6	Velocity-X
002	☒	Velocity	1	Standard	100	6	Velocity-Y
003	☒	Velocity	1	Standard	100	6	Velocity-Z
004	☒	Engine	1	Extended	00000200	8	rpm
005	☒	Engine	1	Extended	00000200	8	temprature
006	☐		1	Standard	---	8	

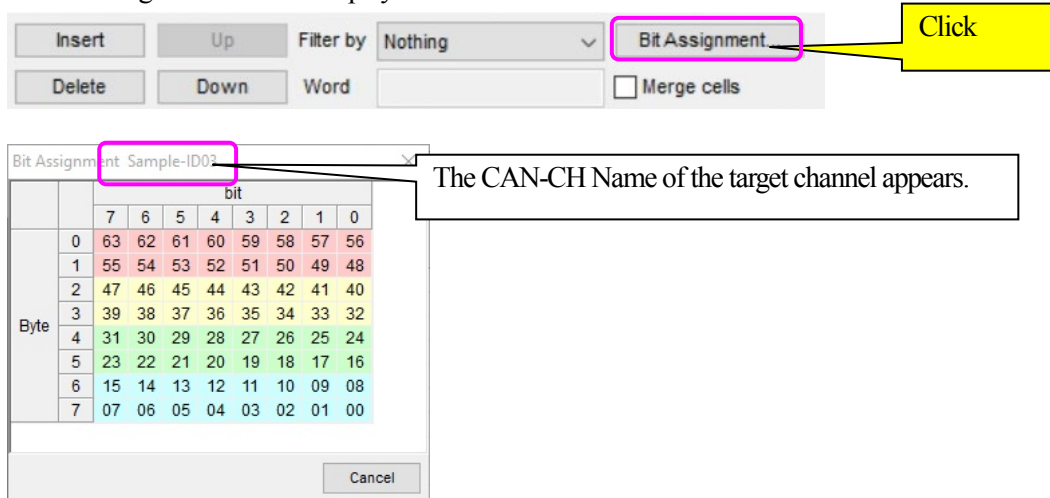
CAN-CH E0-***	Mea...	CAN-ID Name (Message)	Port No.	Format	Frame ID	Data Length (Byte)	CAN-CH Name (Signal)
001	☒	Velocity	1	Standard	100	6	Velocity-X
002	☒	Velocity	1	Standard	100	6	Velocity-Y
003	☒	Velocity	1	Standard	100	6	Velocity-Z
004	☒	Engine	1	Extended	00000200	8	rpm
005	☒	Engine	1	Extended	00000200	8	temprature
006	☐		1	Standard	---	8	

8-1-2-2 Bit assignment window

To open the Bit Assignment window, click the **Bit assignment...** button.

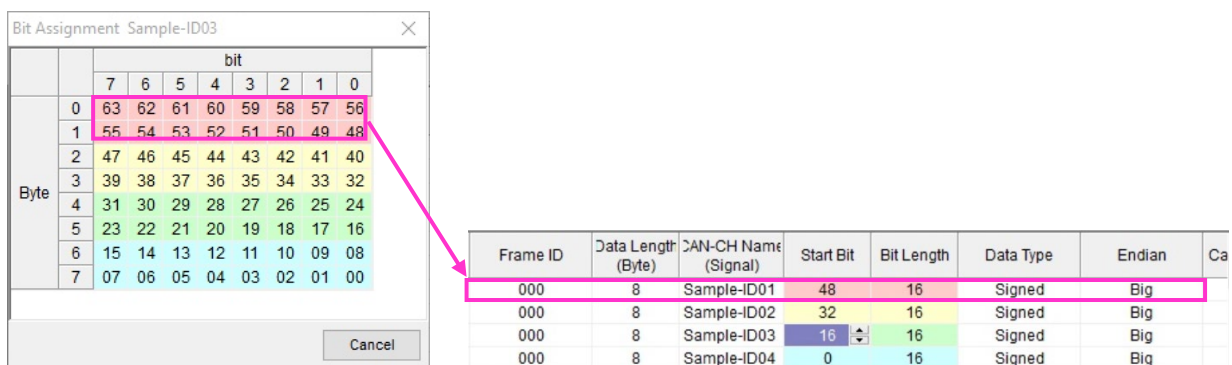
To close the Bit Assignment window, click the **Bit assignment...** button.

The Bit Assignment window displays the data field status.



Bit Assignment window

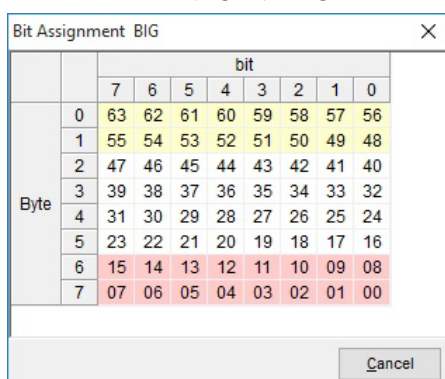
The cell colors of the Bit Assignment window are the same as that of the [Receiving Cond] tab.



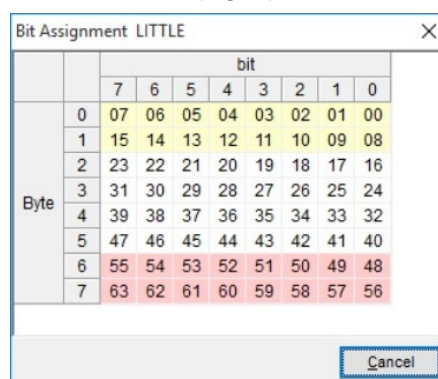
When the both Big Endian and Little Endian exist in the data frame, the Bit Assignment window appears based on the Endian of the target channel.

Frame ID	Data Length (Byte)	CAN-CH Name (Signal)	Start Bit	Bit Length	Data Type	Endian
000	8	BIG	0	16	Signed	Big
000	8	LITTLE	0	16	Signed	Little
---	8	SampleCH03	0	16	Signed	Big
---	8	SampleCH04	0	16	Signed	Big

CAN-CH Name (Signal) : Big



CAN-CH Name (Signal): Little



8 - 1 - 3 Output operations

Select the [Output Start Cond] tab, [Output Stop Cond] tab, [Output Interval Cond] tab, and [Output Manual Cond] tab on the ECAN Condition Setting window for setting the data frame.

The ELA-55A has 4 output operations.

The setting operations are common in [Output Start Cond] tab, [Output Stop Cond] tab, [Output Interval Cond] tab, and [Output Manual Cond] tab.

*The [Output Interval Cond] tab includes the Cycle.

The ELA-55A is able to set up to 32 data frames on each output operation.

Title bar

The "Number of Output IDs" appears.

Output test button

The CAN Output Test window appears.

(For details, see "8 - 1 - 3 - 2 Output test.")

Cycle box

Set the interval of the Interval output. ([Output Interval Cond] tab only.)

•Cycle box ([Output Interval Cond] tab only.)

The Interval output outputs the data frame at the pre-set cycle.

Set the cycle on the Cycle box.

0.1 to 100.0 sec.

For details, see "8 - 1 - 3 - 1 Output operations and output timing."

■Setting Items

(1) No.

The data frame No. to be output.

No.1 to No. 32

(2) Output

Set the data frame to be output.

The ELA-55A outputs the data frame with a check mark at the timing of each output operation.

(3) CAN-ID Name (Message)

Input the name of the data frame. (Within 40 characters).

(4) Port No.

Select the port No. to output the data frame.

1 to 2

(5) Format

Select the data frame format.

The data frame format is "Standard format" or "Extended format".

Select the target item from the following.

"Standard" (Standard format)

"Extended" (Extended format)

As you select the "Extended", the extension Frame ID appears automatically.

(6) Frame ID

Set the data frame ID. The Frame ID is hexadecimal number.

The Frame ID varies with the Format.

When the Format is standard: 0x0 to 0x7FF (11 bits)

When the Format is extended: 0x0 to 0x1FFFFFFF (29 bits)

To not use the Frame ID, select "---".

Before selecting "---", make sure the "Output" is OFF.

(7) Data Length (Byte)

Set the data field's data size of the data frame.

1 byte to 8 bytes

The Data Length (Byte) may limits the B0 to B7 settings.

[Example]

Suppose the Data Length (Byte) is 3.

B0 to B2: Available

B3 to B7: Not available

Suppose the Data Length (Byte) is 8.

B0 to B7: Available

(8) B0 to B7 (B: Byte)

Set the data field of the data frame.

The B0 to B7 is hexadecimal number.

0x00 to 0xFF

(9) Confirmation

To confirm the response after outputting the data frame, put a check mark to the check box in the “Confirmation” column.

The confirmation ON/OFF is whether the EDX-5000A receives the pre-set Rx Frame ID.

When the EDX-5000A does not receive the RX Frame ID, the EDX-5000A waits for the pre-set Time out (msec).

After the pre-set Time out (msec) has elapsed, the EDX-5000A outputs the next CAN data.

For details, see “8 - 1 - 3 - 1 Output operations and output timing.”

(10) Rx Frame ID

Set the Rx Frame ID.

The range of the Rx Frame ID is the same as that of the Frame ID.

The data frame format of the Rx Frame ID is the same as that of the Format.

(11) Time out (msec)

The confirmation ON/OFF is whether the EDX-5000A receives the pre-set Rx Frame ID.

When the EDX-5000A does not receive the RX Frame ID, the EDX-5000A waits for the pre-set Time out (msec).

After the pre-set Time out (msec) has elapsed, the EDX-5000A outputs the next CAN data.

(12) Result

The result of the transmission test appears.

For details, see “8 - 1 - 3 - 2 Output test.”

8 - 1 - 3 - 1 Output operations and output timing

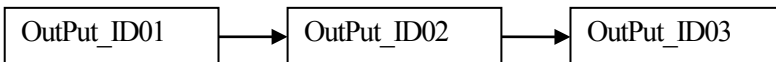
This section describes the output timing of each output operation.

The EDX-5000A does not output the all Output ON IDs at the same time.

The EDX-5000A outputs the Output ON IDs from the No.1.

Receiving Cond		Output Start Cond	Output Stop Cond	Output Interval Cond	Output Manual Cond	Comm Cond										
Insert		Up	Filter by	Nothing		Output test										
Delete		Down	Word													
No.	Outp...	CAN-ID Name (Message)	Port No.	Format	Frame ID	Data Length (Byte)	B0	B1	B2	B3	B4	B5	B6	B7	Co	
1	☒	OutPut_ID01	1	Standard	100	2	00	01	...	...	...	...	...	...		
2	☒	OutPut_ID02	1	Standard	200	4	12	34	56	78	...	...	...	...		
3	☒	OutPut_ID03	2	Standard	300	6	AA	BB	CC	DD	EE	FF	...	...		
4	☐		1	Standard	000	8	00	00	00	00	00	00	00	00		

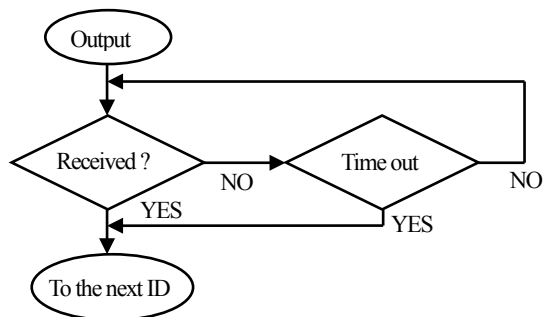
Suppose the settings are described as above. The EDX-5000A outputs the Output ON IDs as follows.



The EDX-5000A automatically adjusts the output interval of each ID.

The EDX-5000A outputs the Output ON IDs from the No.1.

The EDX-5000A outputs the next ID after receiving the pre-set Rx Frame ID or after the pre-set Time out (msec) has elapsed.

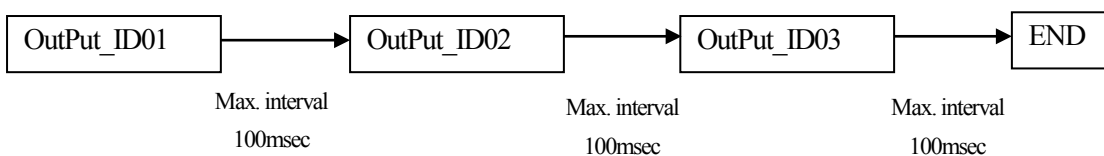


Receiving Cond		Output Start Cond		Output Stop Cond		Output Interval Cond		Output Manual Cond		Comm Cond				
Insert		Up		Filter by		Nothing		Output test						
Delete		Down		Word										
No.	Format	Frame ID	Data Length (Byte)	B0	B1	B2	B3	B4	B5	B6	B7	Confirmat...	Rx Frame ID	Time c ^ (mse)
1	Standard	100	2	00	01							☒	010	100
2	Standard	200	4	12	34	56	78					☒	020	100
3	Standard	300	6	AA	BB	CC	DD	EE	FF			☒	030	100
4	Standard	---	8	00	00	00	00	00	00	00	00	☐		

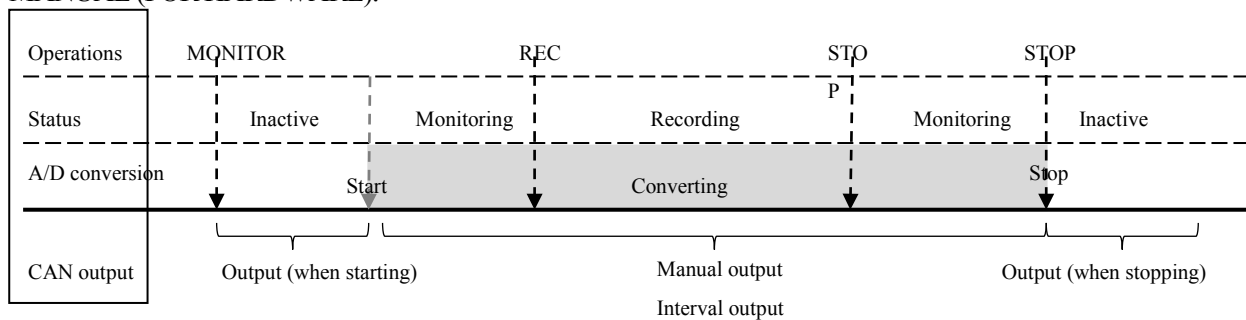
[Example]

Suppose the settings are described as above.

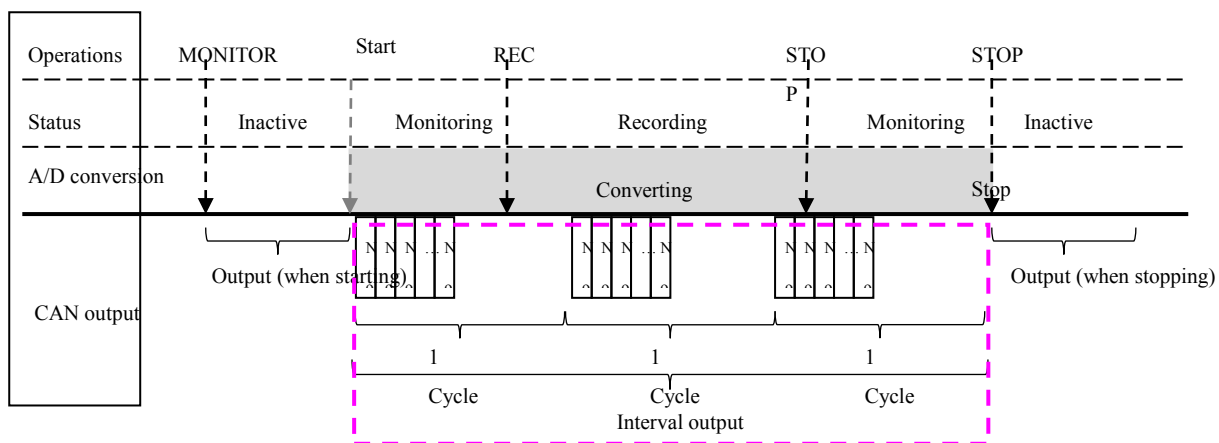
When the EDX-5000A does not receive the RX Frame ID and waits for the pre-set Time out (msec), the total time is approx. 300 msec.



The output timing and output operations are as follows. The output timing may vary with the Measure Mode. For details, see separate volume of "EDX-5000A MEMORY RECORDER/ANALYZER INSTRUCTION MANUAL (FOR HARDWARE)."



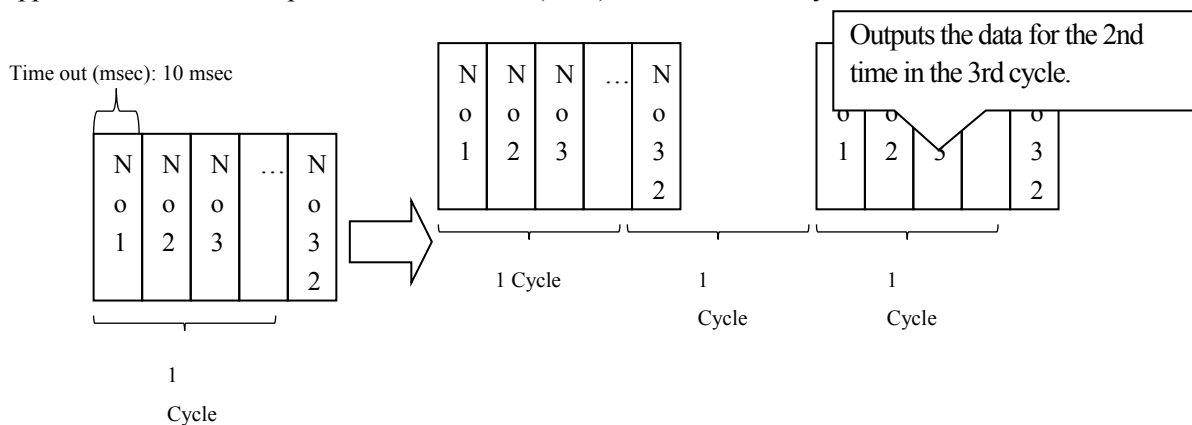
- Output (when starting)
Outputs the CAN data before starting the A/D conversion.
- Output (when stopping)
Outputs the CAN data after stopping the A/D conversion.
- Interval output
Outputs the CAN data at the pre-set cycle.
The output timing of the interval output is as follows.



When the total Time out (msec) is longer than the pre-set cycle, the EDX-5000A outputs data as follows.

[Example]

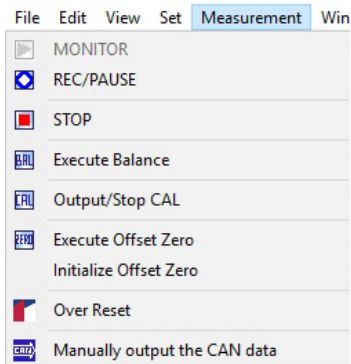
Suppose the Number of Output IDs is 32, Time out (msec) is 100 msec, and Cycle is 2.0 sec.



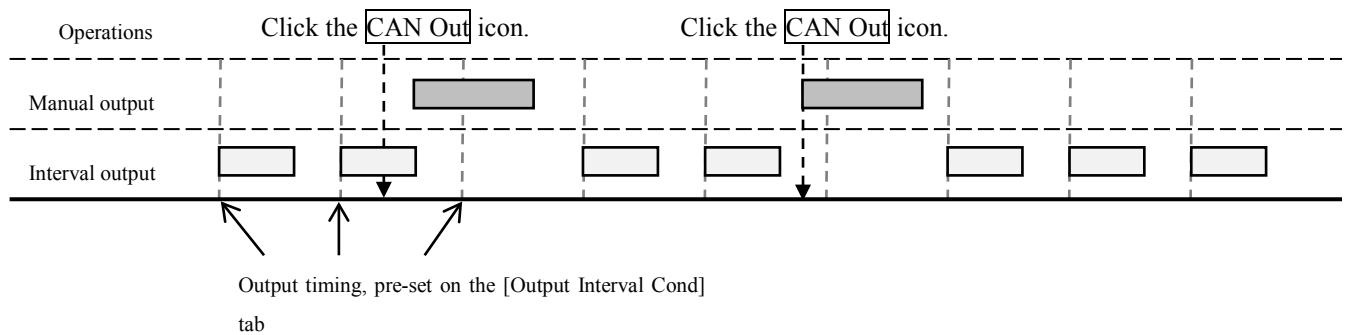
- Manual output

Outputs the CAN data manually.

Click the **CAN Out** icon from the toolbar or click the Measurement - Manually output the CAN data.



When you set the manual output and interval output at the same time, the EDX-5000A does not output the 2 CAN data at the same time. After outputting the CAN data of either output operation, the ELA-55A outputs the CAN data of another output operation.



8 - 1 - 3 - 2 Output test

The Output test confirms whether the EDX-5000A receives the pre-set Rx Frame ID.

- (1) To enable the **Output test** button, make sure the "Output" is ON and "Confirmation" is ON on the [Output Start Cond] tab, [Output Stop Cond] tab, [Output Interval Cond] tab, or [Output Manual Cond] tab.

Click the **Output test** button.

The CAN Output Test window appears.

No.	Outp...	CAN-ID Name (Message)	Port No.	Format	Frame ID	Data Length (Byte)
1	☒	OutPut_ID01	1	Standard	100	2
2	☒	OutPut_ID02	1	Standard	200	4
3	☒	OutPut_ID03	2	Standard	300	6
4	☐		1	Standard	000	8

Confirmation	Rx Frame ID	Time out (msec)	Result
☒	010	100	***
☒	020	100	***
☒	030	100	***

- (2) Click the **Check** button to execute the Output test.

The ELA-55A executes the output test with a check mark on the "Confirmation" column.

- (3) The output test results appear as follows.

OK: The EDX-5000A received the all pre-set Rx Frame IDs.
 Error: The EDX-5000A did not receive the all pre-set Rx Frame IDs.
 Communication error: The communication failed due to the communication conditions.

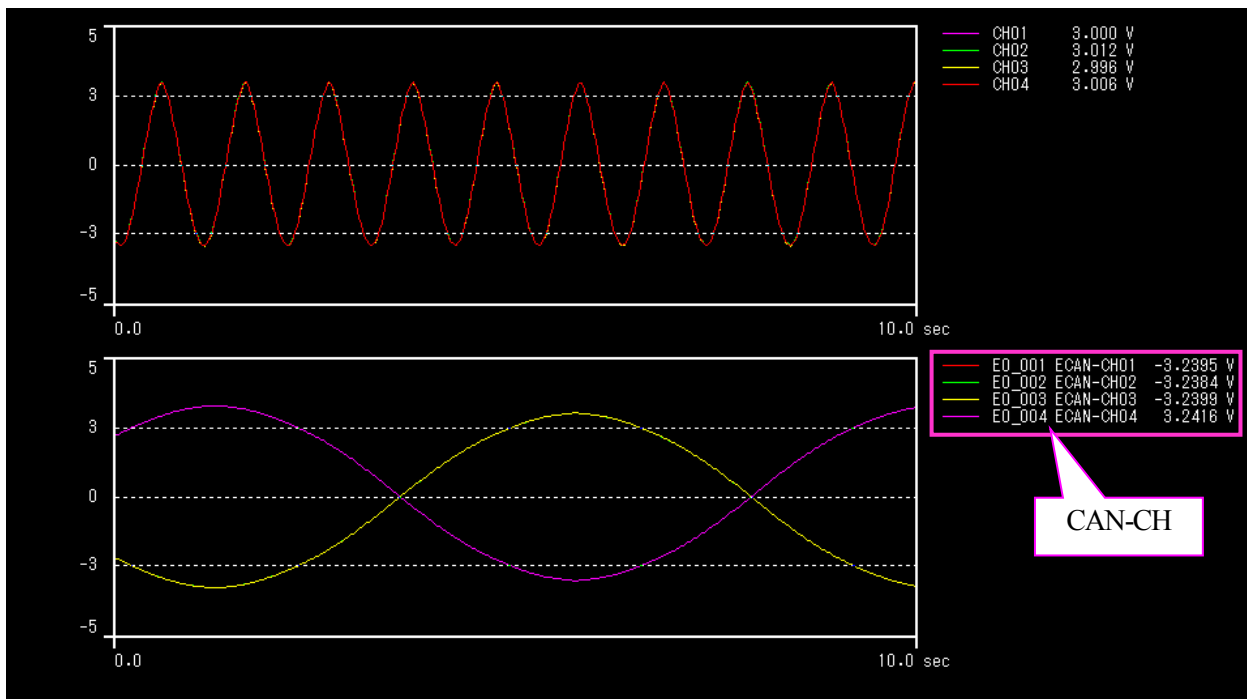
- (4) To check the output test result of each ID, see the "Result" column on the [Output Start Cond] tab, [Output Stop Cond] tab, [Output Interval Cond] tab, or [Output Manual Cond] tab.

Confirmation	Rx Frame ID	Time out (msec)	Result
☒	010	100	OK
☒	020	100	NG

OK: The EDX-5000A received the pre-set Rx Frame ID.
 Error: The EDX-5000A did not receive the pre-set Rx Frame ID.
 Communication error: The communication failed due to the communication conditions.

8-2 To monitor the CAN data

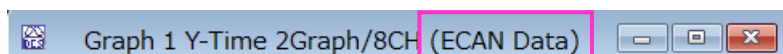
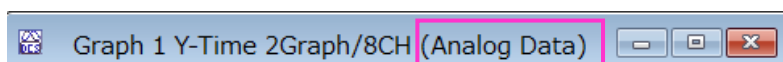
The ELA-55A displays the CAN data on the Numeric windows/Graph windows.



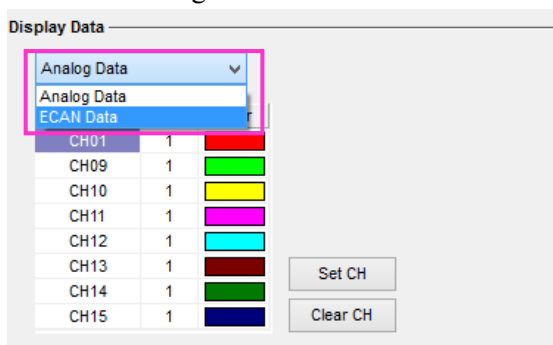
When the number of CAN-CH satisfies the following equation, the ELA-55A is not able to display the analog data and ECAN data on the same window. Select the target data (Analog data or ECAN data) on each window.

At this time, the ELA-55A thins the ECAN data automatically.

The number of CAN-CH × Sampling frequency > 131,072



Select the "Analog data" or "ECAN data" on the Set Display Condition... window.



MEMO

When the ELA-55A does not update the ECAN data after start monitoring data or when the ECAN data is not correct after start monitoring data, check the following items.

- Make sure the communication standard and communication speed are correct.

When the communication conditions are not correct.

The EGPC-50A LED lights up in red. (The EGPC-50A LED lights up in green when the communication conditions are correct.)

The ECAN bus status of the EDX-5000A is Error.

For details, see separate volume of "EDX-5000A MEMORY RECORDER/ANALYZER INSTRUCTION MANUAL (FOR HARDWARE)."

- The EGPC-50A has 2 ports. Make sure the Port No. are correct.
- The ELA-55A converts the received data into values, based on the Data Length (Byte), Start Bit, Bit Length, Data Type, and Endian on the [Receiving Cond] tab.
Make sure the items on the [Receiving Cond] tab are correct.

8 - 3 CANdb File

Capable of loading information from the CANdb file (DBC format) and capable of setting the information into the ELA-55A CAN conditions.

8 - 3 - 1 Restrictions

●Loadable CANdb files

Loadable CANdb files with the ELA-55A are as follows.

- | | |
|--------------------------------|--------------|
| ▪ File format | DBC format |
| ▪ The number of "Network Node" | Maximum 1024 |
| ▪ The number of "Message" | Maximum 2048 |
| ▪ The number of "Signal" | Maximum 4096 |

●Restrictions on setting the CAN

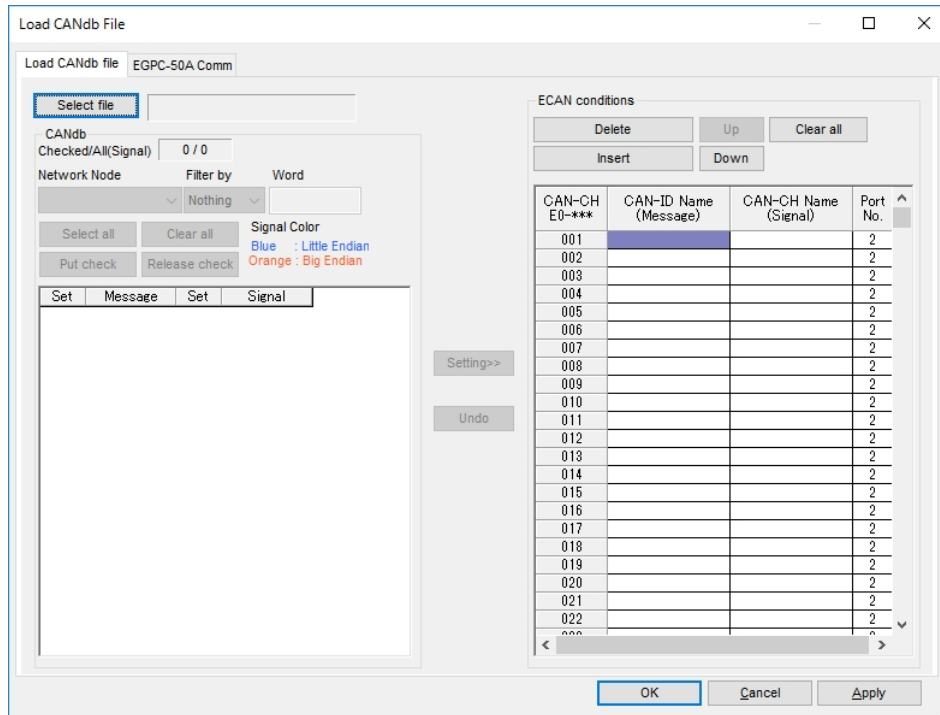
- The number of "Message" and "Signal": Maximum 512
- One original "Message" per one measuring instrument. You cannot set the same "Message" items.

8 - 3 - 2 Basic Operation Flow

This chapter explains the basic operating procedure to load CANdb file.

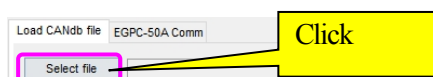
Open the Load CANdb file window

To open the Load CANdb File window, click the **Load CANdb File...** button in ECAN Condition Setting window.

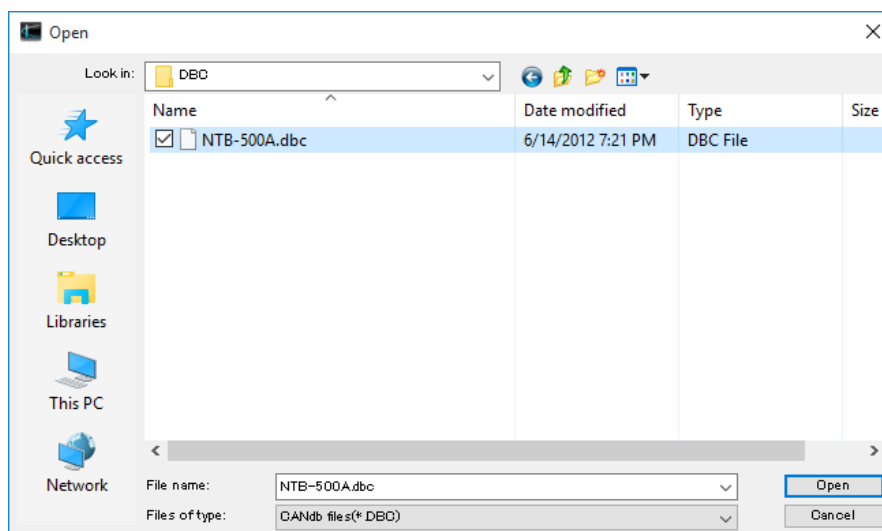


Load CANdb files

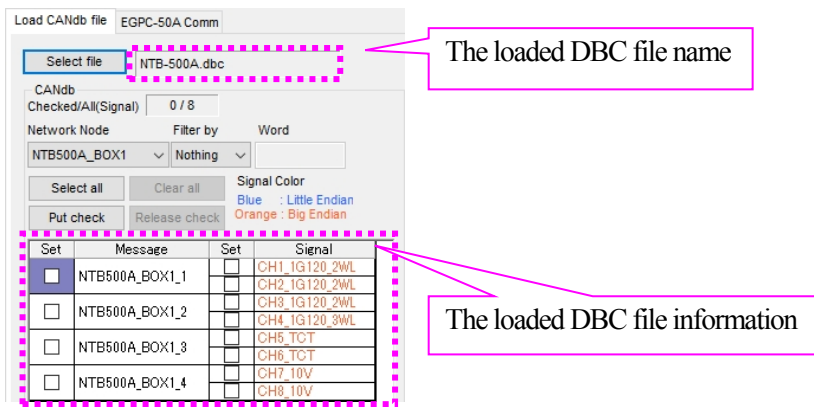
Click the **Select file** button on the Load CANdb File window to open the Open window.



Click the target DBC file. Click the **OK** button to close the window.



After the loading succeeded, contents in the DBC file appear on the table.



Select the "Message" and "Signal" to be set in the CAN conditions.

Select the "Message" and "Signal" to be set in the CAN conditions from the table.
(For details, see “ 8 - 3 - 3 Select the “Message” and “Signal” to be set in the CAN condition”)

Set the CANdb file information into the CAN conditions.

Click the **Setting** button to set the CANdb file information into the CAN conditions.
(For details, see “ 8 - 3 - 4 Set the CANdb file in formation into the CAN conditions”)

CAN communication conditions

Click the CAN comm tab.
Set the CAN communication conditions or the ECAN communication conditions.
(For details, see “ 8 - 1 - 1 Communication conditions”)

Close the Load CANdb file window

Click the **OK** button to close the window.

8 - 3 - 3 Select the “Message” and “Signal” to be set in the CAN condition

Select the CANdb file information to be set in the CAN conditions. Use check boxes to select items.
Items with check marks are set in the CAN conditions.

Note that the character color of "Signal" items in the CANdb file information vary with the "Byte Order". Little: Blue, Big : Orange

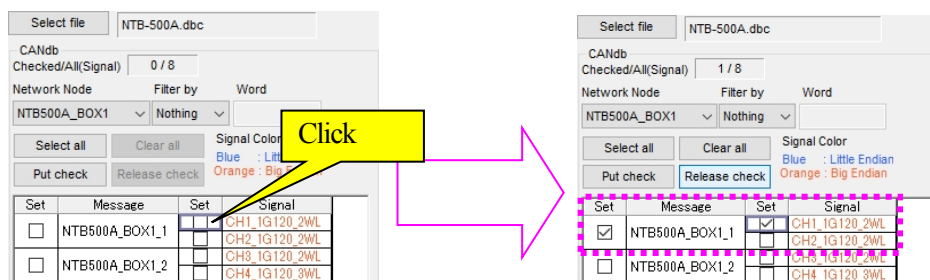
☐	NTB500A_BOX1_1	☐	CH1_4GL
		☐	CH2_4GL
☐	NTB500A_BOX1_2	☐	CH3_4GL
		☐	CH4_4GL

Little

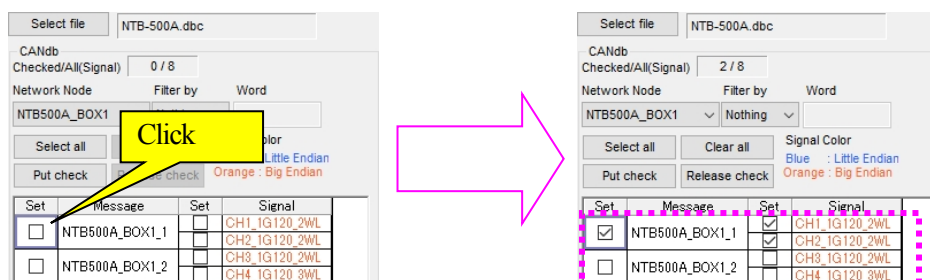
Big

8 - 3 - 3 - 1 Direct selection

Click the check box next to the target "Message" or next to the target "Signal" to be set in the CAN conditions.



If you put a check mark in front of the target "Signal", a check mark will appear next to the "Message" including the "Signal".



If you put a check mark in front of the target "Message", a check mark will appear next to the "Signal" included in the "Message".

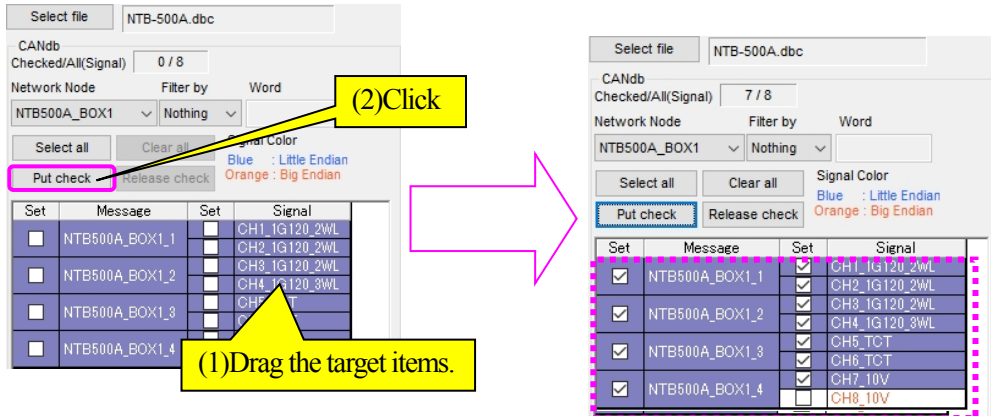
To release the check mark, click the check box.

8 - 3 - 3 - 2 Multiple selection

There are 2 ways to put multiple check marks on multiple check boxes; by using buttons and by using right-click.

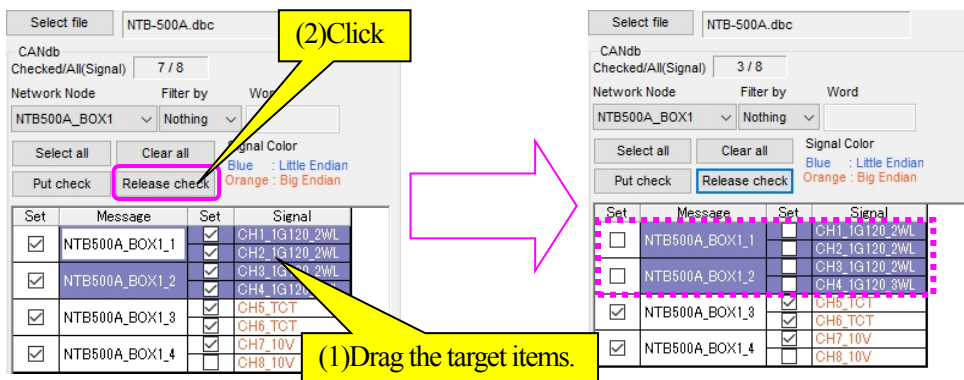
■Multiple selection by using buttons

- (1) Drag the target items.
- (2) Click the **Select all** button.



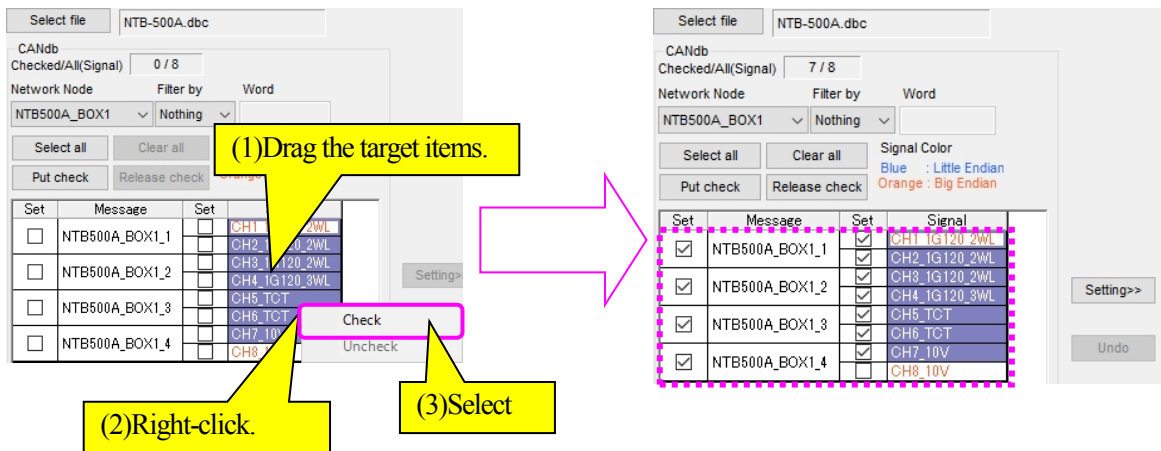
■Cancellation by using buttons

- (1) Drag the target items.
- (2) Click the **Release check** button.



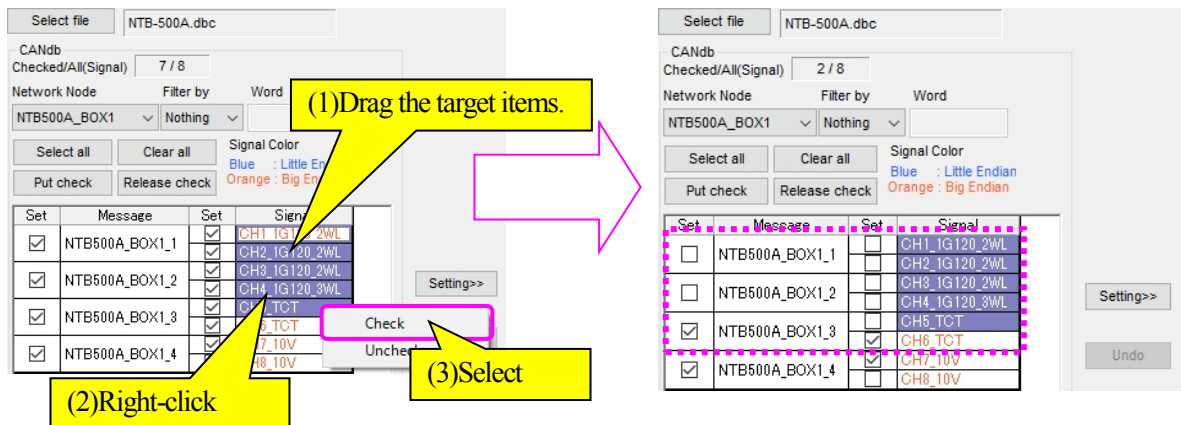
■Multiple selection by using right-click

- (1) Drag the target items.
- (2) Click the right mouse button on the window.
- (3) Select Check on the pop-up-menu.



■Cancellation by using right-click

- (1) Drag the target items.
- (2) Click the right mouse button on the window.
- (3) Select Check on the pop-up-menu.

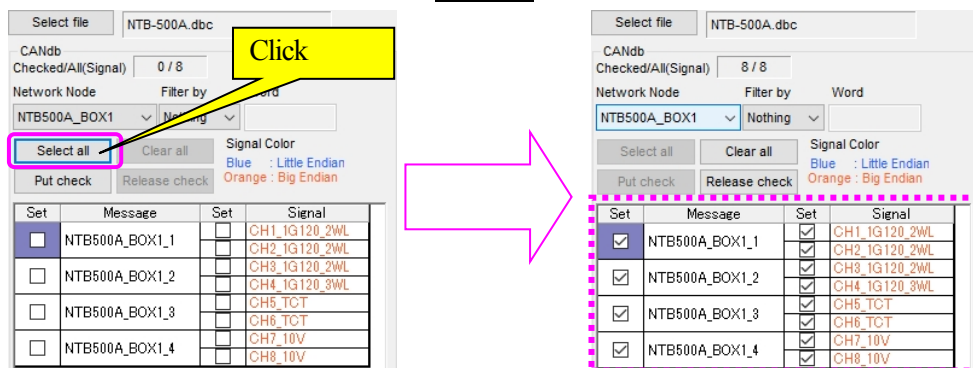


8 - 3 - 3 - 3 Select all

You can put/release check marks on all boxes by one-click operation.

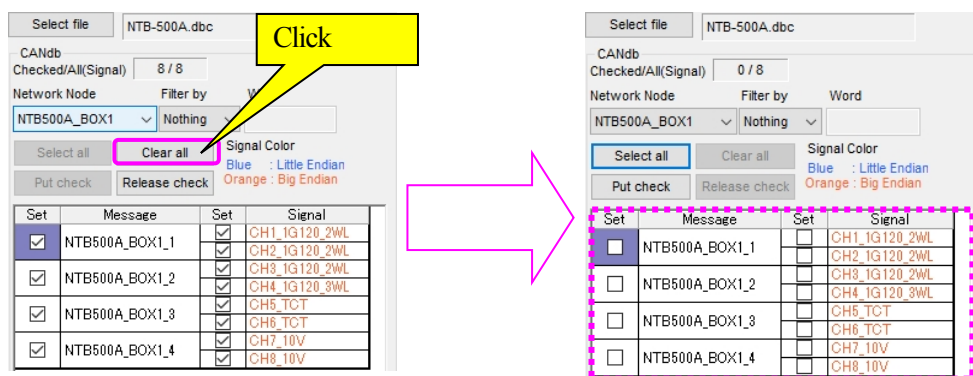
■Put check marks on all boxes

To put check marks on all boxes, click the **Select all** button.



■Release check marks on all boxes

To release check marks on all boxes, click the **Clear all** button.



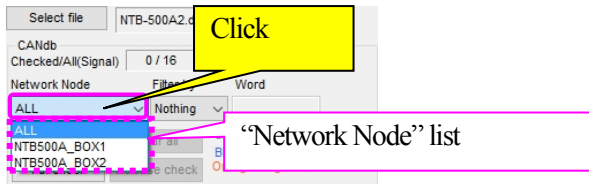
8 - 3 - 3 - 4 Search items on the CANdb file

This section describes how to display the target items easily by selecting the "Network Node" or by searching words included in the "Message" or "Signal".

■Select the "Network Node"

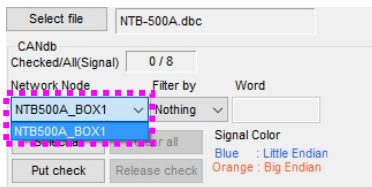
Select the "Network Node" to display "Message".

Click on the drop-down arrow in the Network Node combo box, list of Network Node items included in the loaded CANdb file appear. Select the target "Network Node" from the "Network Node" list.

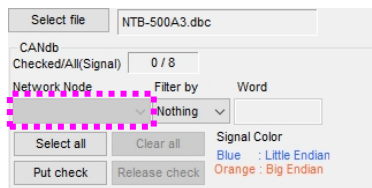


To display all "Message" items of all the "Network Node" items, click "ALL".

If there is only one "Network Node", "ALL" does not appear.



If there is no "Network Node" in the file, the "Network Node" combo box is invalid.



Example: When changing the "Network Node" from All to NTB500A_BOX1.

Network Node	Message	Signal
NTB500A_BOX1	NTB500A_BOX1_1	CH1_1G120_2WL
		CH2_1G120_2WL
	NTB500A_BOX1_2	CH3_1G120_2WL
		CH4_1G120_3WL
	NTB500A_BOX1_3	CH5_TCT
		CH6_TCT
	NTB500A_BOX1_4	CH7_10V
		CH8_10V
NTB500A_BOX3	NTB500A_BOX3_1	CH1_1G120_2WL
		CH2_1G120_2WL
	NTB500A_BOX3_2	CH3_1G120_2WL
		CH4_1G120_3WL
	NTB500A_BOX3_3	CH5_TCT
		CH6_TCT
	NTB500A_BOX3_4	CH7_10V
		CH8_10V

When changing the "Network Node" from All to NTB500A_BOX1 with the above DBC file, information of the NTB500A_BOX1 will appear.

Select file: NTB-500A2.dbc

CANdb: 0 / 16

Network Node: ALL Filter by: Nothing Word:

Select all Clear all Signal Color: Blue : Little Endian Orange : Big Endian

Put check Release check

Set	Message	Set	Signal
☒	NTB500A_BOX1_1	☐	CH1_1G120_2WL
☐	NTB500A_BOX1_2	☐	CH2_1G120_2WL
☐	NTB500A_BOX1_3	☐	CH3_1G120_2WL
☐	NTB500A_BOX1_4	☐	CH4_1G120_3WL
☐	NTB500A_BOX2_1	☐	CH5_TCT
☐	NTB500A_BOX2_2	☐	CH6_TCT
☐	NTB500A_BOX2_3	☐	CH7_10V
☐	NTB500A_BOX2_4	☐	CH8_10V

→

Select file: NTB-500A2.dbc

CANdb: 0 / 8

Network Node: NTB500A_BOX1 Filter by: Nothing Word:

Select all Clear all Signal Color: Blue : Little Endian Orange : Big Endian

Put check Release check

Set	Message	Set	Signal
☒	NTB500A_BOX1_1	☐	CH1_1G120_2WL
☐	NTB500A_BOX1_2	☐	CH2_1G120_2WL
☐	NTB500A_BOX1_3	☐	CH3_1G120_2WL
☐	NTB500A_BOX1_4	☐	CH4_1G120_3WL
☐		☐	CH5_TCT
☐		☐	CH6_TCT
☐		☐	CH7_10V
☐		☐	CH8_10V

Change the "Network"

■Search "Message" or "Signal"

This section describes how to search and display "Message" or "Signal" which includes words input in the "Word" box. Select the target item by using the Filter by combo box.

MEMO

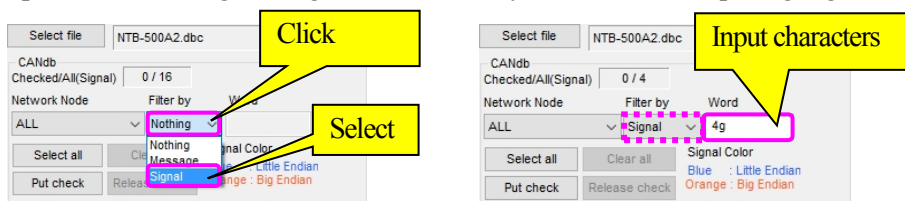
The system does not distinguish between uppercase and lowercase letters, input in the "Word" box.

Click on the drop-down arrow in the Filter by combo box, list of items appear.

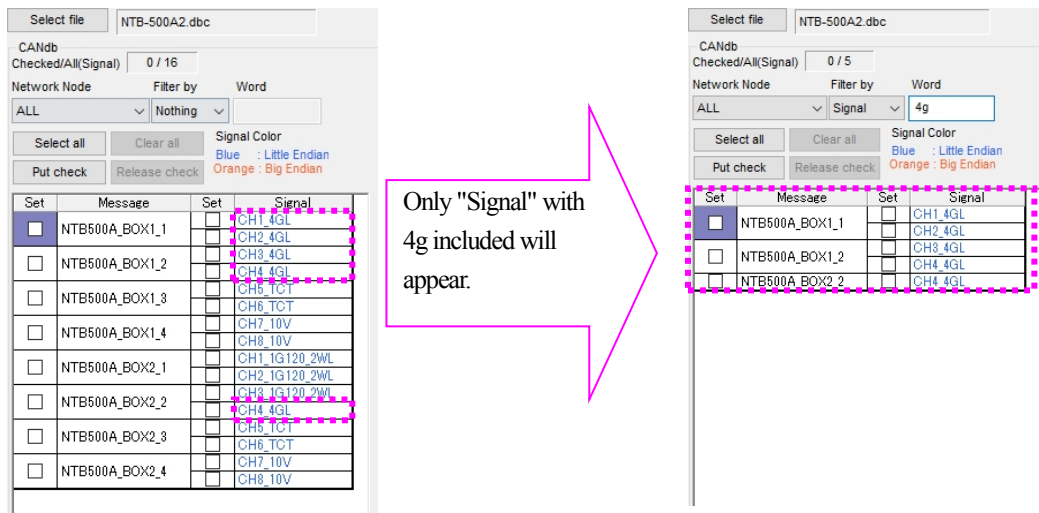
The following items will appear.

- "Nothing": Not search
- "Message": Search the character string from "Message".
- "Signal": Search the character string from "Signal".

Example: When selecting the "Signal" in the Filter by combo box and inputting "4g" in the "Word" box.



Only "Signal" with 4g included will appear.



8-3-3-5 Display details

Double-click the item in the "Signal" column. The CANdb detail window appears.

The screenshot shows the CANdb interface with the 'Signal' column highlighted. A yellow callout box with the text 'Double click' points to the 'CH1_4GL' signal in the list. To the right, the 'CANdb detail' window is open, displaying the details for the selected signal.

Double click

CANdb detail window

CANdb detail window details:

- Network nod: NTB500A_BOX1
- Message Name: NTB500A_BOX1_1
- Message ID: 0x100
- Message Type: Standard
- Data Length Code (DLC): 8
- Signal Name: CH1_4GL
- Startbit: 0
- Length[Bit]: 32
- Byte Order: Little
- Value type: Signed
- Factor: 1
- Offset: 0
- Minimum: -30000
- Maximum: 30000
- Unit: um/m

Bit	7	6	5	4	3	2	1	0
0	7	6	5	4	3	2	1	0
1	15	14	13	12	11	10	9	8
2	23	22	21	20	19	18	17	16
3	31	30	29	28	27	26	25	24
4	39	38	37	36	35	34	33	32
5	47	46	45	44	43	42	41	40
6	55	54	53	52	51	50	49	48
7	63	62	61	60	59	58	57	56

To display other detail information, click the item in the "Signal" column with the CANdb detail window appeared.

The screenshot shows the CANdb interface with the 'Signal' column highlighted. A yellow callout box with the text 'Click' points to the 'CH3_4GL' signal in the list. To the right, the 'CANdb detail' window is open, displaying the details for the selected signal.

Click

CANdb detail window details:

- Network nod: NTB500A_BOX1
- Message Name: NTB500A_BOX1_2
- Message ID: 0x101
- Message Type: Standard
- Data Length Code (DLC): 8
- Signal Name: CH3_4GL
- Startbit: 7
- Length[Bit]: 32
- Byte Order: Big
- Value type: Signed
- Factor: 1
- Offset: 0
- Minimum: -30000
- Maximum: 30000
- Unit: um/m

Bit	7	6	5	4	3	2	1	0
0	7	6	5	4	3	2	1	0
1	15	14	13	12	11	10	9	8
2	23	22	21	20	19	18	17	16
3	31	30	29	28	27	26	25	24
4	39	38	37	36	35	34	33	32
5	47	46	45	44	43	42	41	40
6	55	54	53	52	51	50	49	48
7	63	62	61	60	59	58	57	56

Signal Name: CH1_4GL

Startbit: 0

Length[Bit]: 32

Byte		Bit							
		7	6	5	4	3	2	1	0
0		7	6	5	4	3	2	1	0
1		15	14	13	12	11	10	9	8
2		23	22	21	20	19	18	17	16
3		31	30	29	28	27	26	25	24
4		39	38	37	36	35	34	33	32
5		47	46	45	44	43	42	41	40
6		55	54	53	52	51	50	49	48
7		63	62	61	60	59	58	57	56

Annotations:

- "Startbit" points to bit 0 of byte 0.
- "Signal" usage bit points to bit 1 of byte 0.
- "Message" usage bit points to bit 2 of byte 0.

The table in the CANdb detail window indicates the number of "Signal" usage bit in the "Message".
The blue cells indicate the "Signal" usage bit. The pink cell indicates the "Startbit".

Signal Name: CH1_4GL

Startbit: 0

Length[Bit]: 32

Byte		Bit							
		7	6	5	4	3	2	1	0
0		7	6	5	4	3	2	1	0
1		15	14	13	12	11	10	9	8
2		23	22	21	20	19	18	17	16
3		31	30	29	28	27	26	25	24
4		39	38	37	36	35	34	33	32
5		47	46	45	44	43	42	41	40
6		55	54	53	52	51	50	49	48
7		63	62	61	60	59	58	57	56

"Byte Order": Little

Signal Name: CH3_4GL

Startbit: 7

Length[Bit]: 32

Byte		Bit							
		7	6	5	4	3	2	1	0
0		7	6	5	4	3	2	1	0
1		15	14	13	12	11	10	9	8
2		23	22	21	20	19	18	17	16
3		31	30	29	28	27	26	25	24
4		39	38	37	36	35	34	33	32
5		47	46	45	44	43	42	41	40
6		55	54	53	52	51	50	49	48
7		63	62	61	60	59	58	57	56

"Byte Order": Big

Note that the table color vary with the "Byte Order" of the "Signal".

Little: Blue, Big: sOrange

8 - 3 - 4 Set the CANdb file in formation into the CAN conditions

Click the **Setting>** button to set the CANdb file information with checkmarks into the CAN conditions.
After the item is set into the CAN conditions, "Done" mark appears.

The interface consists of a left panel with a table of messages and signals, and a right panel with a table of CAN conditions.

Top Screenshot:

- Left Panel:**
 - Buttons: Select all, Clear all, Put check, Release check.
 - Signal Color: Blue (Little Endian), Orange (Big Endian).
 - Table:

Set	Message	Set	Signal
☒	NTB500A_BOX1_1	☒	CH1_4GL
☐	NTB500A_BOX1_2	☒	CH2_4GL
☐	NTB500A_BOX1_3	☐	CH3_4GL
☐	NTB500A_BOX1_4	☐	CH4_4GL
☐	NTB500A_BOX2_1	☐	CH5_TCT
☐	NTB500A_BOX2_2	☐	CH6_TCT
☐	NTB500A_BOX2_3	☐	CH7_10V
☐	NTB500A_BOX2_4	☐	CH8_10V
- Right Panel:**
 - Buttons: Setting>, Undo.
 - Table:

CAN-CH E0-***	CAN-ID Name (Message)	CAN-CH Name (Signal)	Port No.
001			1
002			1
003			1
004			1
005			1
006			1
007			1
008			1
009			1
010			1
011			1
012			1
013			1
014			1
015			1
016			1
017			1
018			1
019			1
020			1
021			1

Bottom Screenshot:

- Left Panel:**
 - Buttons: Select all, Clear all, Put check, Release check.
 - Signal Color: Blue (Little Endian), Orange (Big Endian).
 - Table:

Set	Message	Set	Signal
Done	NTB500A_BOX1_1	Done	CH1_4GL
Done	NTB500A_BOX1_1	Done	CH2_4GL
☐	NTB500A_BOX1_2	☐	CH3_4GL
☐	NTB500A_BOX1_3	☐	CH4_4GL
☐	NTB500A_BOX1_4	☐	CH5_TCT
☐	NTB500A_BOX2_1	☐	CH6_TCT
☐	NTB500A_BOX2_2	☐	CH7_10V
☐	NTB500A_BOX2_3	☐	CH8_10V
- Right Panel:**
 - Buttons: Setting>, Undo.
 - Table:

CAN-CH E0-***	CAN-ID Name (Message)	CAN-CH Name (Signal)	Port No.
003			1
004			1
005			1
006			1
007			1
008			1
009			1
010	NTB500A_BOX1_1	CH1_4GL	1
011		CH2_4GL	1
012			1
013			1
014			1
015			1
016			1
017			1
018			1
019			1
020			1
021			1

8 - 3 - 4 - 1 Position of the CAN condition

The ELA-55A sets the CANdb information into the CAN conditions, from the cursor position described on the right table.

The interface consists of two main panels. The left panel contains a table for setting CAN messages and signals, and the right panel contains a table for the CAN database.

Top Screenshot:

Left Panel (Message/Signal Settings):

Set	Message	Set	Signal
☒	NTB500A_BOX1_1	☒	CH1_4GL
☐	NTB500A_BOX1_2	☐	CH2_4GL
☐	NTB500A_BOX1_3	☐	CH3_4GL
☐	NTB500A_BOX1_4	☐	CH4_4GL
☐	NTB500A_BOX2_1	☐	CH5_TCT
☐	NTB500A_BOX2_2	☐	CH6_TCT
☐	NTB500A_BOX2_3	☐	CH7_10V
☐	NTB500A_BOX2_4	☐	CH8_10V

Right Panel (CAN Database):

CAN-CH E0-***	CAN-ID Name (Message)	CAN-CH Name (Signal)	Port No.
001			1
002			1
003			1
004			1
005			1
006			1
007			1
008			1
009			1
010			1
011			1
012			1
013			1
014			1
015			1
016			1
017			1
018			1
019			1
020			1
021			1

A callout "Cursor position" points to row 010 in the right table.

Bottom Screenshot:

Left Panel (Message/Signal Settings):

Set	Message	Set	Signal
Done	NTB500A_BOX1_1	Done	CH1_4GL
☐	NTB500A_BOX1_2	☐	CH2_4GL
☐	NTB500A_BOX1_3	☐	CH3_4GL
☐	NTB500A_BOX1_4	☐	CH4_4GL
☐	NTB500A_BOX2_1	☐	CH5_TCT
☐	NTB500A_BOX2_2	☐	CH6_TCT
☐	NTB500A_BOX2_3	☐	CH7_10V
☐	NTB500A_BOX2_4	☐	CH8_10V

Right Panel (CAN Database):

CAN-CH E0-***	CAN-ID Name (Message)	CAN-CH Name (Signal)	Port No.
001			1
002			1
003			1
004			1
005			1
006			1
007			1
008			1
009			1
010	NTB500A_BOX1_1	CH1_4GL	1
011		CH2_4GL	1
012			1
013			1
014			1
015			1
016			1
017			1
018			1
019			1
020			1
021			1

A callout "From here" points to row 010 in the right table. A pink arrow points from the "Done" status in the left panel to the updated row 010 in the right panel.

To add the "Signal" in the "MessageID", place the cursor on the CAN-ID.

The interface consists of a left panel for message management and a right panel for the CAN database table.

Left Panel (Message Management):

- Network Node: ALL
- Filter by: Nothing
- Word: (empty)
- Buttons: Select all, Clear all, Put check, Release check
- Signal Color: Blue : Little Endian, Orange : Big Endian
- Table with columns: Set, Message, Set, Signal

Right Panel (CAN Database Table):

CAN-CH E0-***	CAN-ID Name (Message)	CAN-CH Name (Signal)	Port No.
001			1
002			1
003			1
004			1
005			1
006			1
007			1
008			1
009			1
010	NTB500A_BOX1_1	CH1_4GL	1
011			1
012			1
013			1
014			1
015			1
016			1
017			1
018			1
019			1
020			1
021			1

Annotations:

- Click:** Points to the 'Setting>>' button in the left panel.
- Cursor position:** Points to the CAN-ID 'NTB500A_BOX1_1' in the table.
- From here:** Points to the signal list (CH1_4GL, CH2_4GL, etc.) in the left panel.

MEMO

To add the "Signal", the Frame ID (Message ID) and Format (Message Type) in the CAN conditions and the selected "Message ID" and "Message Type" in the CANdb should be the same.

■Precautions

The ELA-55A sets the CANdb information into the CAN conditions, from the cursor position. In the following table, the ELA-55A sets 4 CANdb information items.

The number of selected CANdb information is 16 channels.

In this case, the top 4 channels of the selected CANdb information will be set on the CAN conditions.

Network Node: ALL Filter by: Nothing Word:

Select all Clear all Signal Color
Blue : Little Endian
Orange : Big Endian

Put check Release check

Set	Message	Set	Signal
☒	NTB500A_BOX1_1	☒	CH1_4GL
☒	NTB500A_BOX1_2	☒	CH2_4GL
☒	NTB500A_BOX1_3	☒	CH3_4GL
☒	NTB500A_BOX1_4	☒	CH4_4GL
☒	NTB500A_BOX2_1	☒	CH5_TCT
☒	NTB500A_BOX2_2	☒	CH6_TCT
☒	NTB500A_BOX2_3	☒	CH7_10V
☒	NTB500A_BOX2_4	☒	CH8_10V
☒	NTB500A_BOX2_1	☒	CH1_1G120_2WL
☒	NTB500A_BOX2_2	☒	CH2_1G120_2WL
☒	NTB500A_BOX2_3	☒	CH3_1G120_2WL
☒	NTB500A_BOX2_4	☒	CH4_4GL
☒	NTB500A_BOX2_1	☒	CH5_TCT
☒	NTB500A_BOX2_2	☒	CH6_TCT
☒	NTB500A_BOX2_3	☒	CH7_10V
☒	NTB500A_BOX2_4	☒	CH8_10V

Setting>> Undo

CAN-CH E0-***	CAN-ID Name (Message)	CAN-CH Name (Signal)	Port No.
491			1
492			1
493			1
494			1
495			1
496			1
497			1
498			1
499			1
500			1
501			1
502			1
503			1
504			1
505			1
506			1
507			1
508			1
509			1
510			1
511			1
512			1

Cursor position

4 channels

Set

Selected CANdb information
The number of "Message": 8
The number of "Signal": 16 (for 16 channels)

Network Node: ALL Filter by: Nothing Word:

Select all Clear all Signal Color
Blue : Little Endian
Orange : Big Endian

Put check Release check

Set	Message	Set	Signal
Done	NTB500A_BOX1_1	Done	CH1_4GL
Don...	NTB500A_BOX1_2	Done	CH2_4GL
☒	NTB500A_BOX1_3	☒	CH3_4GL
☒	NTB500A_BOX1_4	☒	CH4_4GL
☒	NTB500A_BOX2_1	☒	CH5_TCT
☒	NTB500A_BOX2_2	☒	CH6_TCT
☒	NTB500A_BOX2_3	☒	CH7_10V
☒	NTB500A_BOX2_4	☒	CH8_10V
☒	NTB500A_BOX2_1	☒	CH1_1G120_2WL
☒	NTB500A_BOX2_2	☒	CH2_1G120_2WL
☒	NTB500A_BOX2_3	☒	CH3_1G120_2WL
☒	NTB500A_BOX2_4	☒	CH4_4GL
☒	NTB500A_BOX2_1	☒	CH5_TCT
☒	NTB500A_BOX2_2	☒	CH6_TCT
☒	NTB500A_BOX2_3	☒	CH7_10V
☒	NTB500A_BOX2_4	☒	CH8_10V

Setting>> Undo

CAN-CH E0-***	CAN-ID Name (Message)	CAN-CH Name (Signal)	Port No.
491			1
492			1
493			1
494			1
495			1
496			1
497			1
498			1
499			1
500			1
501			1
502			1
503			1
504			1
505			1
506			1
507			1
508			1
509	NTB500A_BOX1_1	CH1_4GL	1
510	NTB500A_BOX1_2	CH2_4GL	1
511		CH3_4GL	1
512		CH4_4GL	1

4 channel data will be set

After clicking the **Setting>** button, the CAN conditions will be shifted downward, from the cursor position. When the CAN conditions have pre-set data as follows, the last CAN conditions will be deleted.

Network Node: ALL
Filter by: Nothing
Word:

Select all Clear all
Put check Release check
Signal Color
Blue : Little Endian
Orange : Big Endian

Set	Message	Set	Signal
Done	NTB500A_BOX1_1	Done	CH1_4GL
Done		Done	CH2_4GL
Don...	NTB500A_BOX1_2	Done	CH3_4GL
Done		Done	CH4_4GL
Done	NTB500A_BOX1_3	Done	CH5_TCT
Don...	NTB500A_BOX1_4	Done	CH6_TCT
		Done	CH7_10V
		Done	CH8_10V
☒	NTB500A_BOX2_1	☒	CH1_1G120_2WL
☒		☒	CH2_1G120_2WL
☒	NTB500A_BOX2_2	☒	CH3_1G120_2WL
☒		☒	CH4_4GL
☒	NTB500A_BOX2_3	☒	CH5_TCT
☒		☒	CH6_TCT
☒	NTB500A_BOX2_4	☒	CH7_10V
☒		☒	CH8_10V

Setting>>

Undo

CAN-CH E0-***	CAN-ID Name (Message)	CAN-CH Name (Signal)	Port No.
488			1
489			1
490			1
491			1
492			1
493			1
494			1
495			1
496			1
497			1
498			1
499			1
500			1
501			1
502			1
503			1
504			1
505	NTB500A_BOX1_1	CH1_4GL	1
506		CH2_4GL	
507	NTB500A_BOX1_2	CH3_4GL	1
508		CH4_4GL	
509	NTB500A_BOX1_3	CH5_TCT	1
510		CH6_TCT	
511	NTB500A_BOX1_4	CH7_10V	1
512		CH8_10V	

Cursor position

Selected CANdb information

Set

Network Node: ALL
Filter by: Nothing
Word:

Select all Clear all
Put check Release check
Signal Color
Blue : Little Endian
Orange : Big Endian

Set	Message	Set	Signal
Don...	NTB500A_BOX1_2	Done	CH3_4GL
		Done	CH4_4GL
☐	NTB500A_BOX1_3	☐	CH5_TCT
☐	NTB500A_BOX1_4	☐	CH6_TCT
		☐	CH7_10V
		☐	CH8_10V
Done	NTB500A_BOX2_1	Done	CH1_1G120_2WL
Done		Done	CH2_1G120_2WL
Don...	NTB500A_BOX2_2	Done	CH3_1G120_2WL
Done		Done	CH4_4GL
Done	NTB500A_BOX2_3	Done	CH5_TCT
Don...	NTB500A_BOX2_4	Done	CH6_TCT
		Done	CH7_10V
		Done	CH8_10V

Setting>>

Undo

CAN-CH E0-***	CAN-ID Name (Message)	CAN-CH Name (Signal)	Port No.
488			1
489			1
490	NTB500A_BOX2_1	CH1_1G120_2WL	1
491		CH2_1G120_2WL	
492	NTB500A_BOX2_2	CH3_1G120_2WL	1
493		CH4_4GL	
494	NTB500A_BOX2_3	CH5_TCT	1
495		CH6_TCT	
496	NTB500A_BOX2_4	CH7_10V	1
497		CH8_10V	
498			1
499			1
500			1
501			
502			
503			
504			
505			
506			
507			1
508			1
509	NTB500A_BOX1_1	CH1_4GL	1
510		CH2_4GL	
511	NTB500A_BOX1_2	CH3_4GL	1
512		CH4_4GL	

Since the item is cleared from the ECAN conditions, the "Done" mark is cleared also.

Since the ECAN conditions were shifted downward, the "NTB500A_BOX1_3" and "NTB500A_BOX1_4" were deleted.

Newly set CANdb information

8 - 3 - 4 - 2 Overwrite the CAN conditions

To overwrite the CAN conditions, set the new "Message" to the CAN-ID which has the pre-set CAN conditions.

Since the item is already set on the CAN conditions, "Done" mark exists.

Set	Message	Set	Signal
Done	NTB500A_BOX1_1	Done	CH1_4GL
Done	NTB500A_BOX1_1	Done	CH2_4GL
Done	NTB500A_BOX1_2	Done	CH3_4GL
Done	NTB500A_BOX1_2	Done	CH4_4GL

Set the "Message" to the cursor position in the CAN conditions.

There are already-set CAN conditions in the cursor position.

CAN-CH E0-***	CAN-ID Name (Message)	CAN-CH Name (Signal)	Port No.
001	NTB500A_BOX1_1	CH1_4GL	1
002	NTB500A_BOX1_1	CH2_4GL	1
003			1
004			1
005			1
006			1
007			1
008			1

Since the item is overwritten, the "Done" mark is cleared also.

Set	Message	Set	Signal
	NTB500A_BOX1_1		CH1_4GL
Done	NTB500A_BOX1_2	Done	CH3_4GL
Done	NTB500A_BOX1_2	Done	CH4_4GL

After the item is set into the CAN conditions, "Done" mark appears.

The CAN conditions were correctly overwritten.

CAN-CH E0-***	CAN-ID Name (Message)	CAN-CH Name (Signal)	Port No.
001	NTB500A_BOX1_2	CH3_4GL	1
002	NTB500A_BOX1_2	CH4_4GL	1
003			1
004			1
005			1
006			1
007			1
008			1

8 - 3 - 4 - 3 Cancel the pre-set CAN conditions

To cancel the last setting action, click the **Undo** button. (Undo function)

You can only undo once.

The interface consists of a left sidebar with filters and a main table of CAN conditions.

Filters:

- Network Node: ALL
- Filter by: Nothing
- Word: (empty)
- Select all, Clear all, Put check, Release check
- Signal Color: Blue : Little Endian, Orange : Big Endian

Table 1 (Top Screenshot):

Set	Message	Set	Signal
☒	NTB500A_BOX1_1	☒	CH1_4GL
☐	NTB500A_BOX1_2	☐	CH2_4GL
☐	NTB500A_BOX1_3	☐	CH3_4GL
☐	NTB500A_BOX1_4	☐	CH4_4GL
☐	NTB500A_BOX2_1	☐	CH5_TCT
☐	NTB500A_BOX2_2	☐	CH6_TCT
☐	NTB500A_BOX2_3	☐	CH7_10V
☐	NTB500A_BOX2_4	☐	CH8_10V

Table 2 (Right Screenshot):

CAN-CH E0-***	CAN-ID Name (Message)	CAN-CH Name (Signal)	Port No.
001	NTB500A_BOX1_1	CH1_4GL	1
002			1
003			1
004			1
005			1
006			1
007			1
008			1
009			1
010			1
011			1
012			1
013			1
014			1
015			1
016			1
017			1
018			1
019			1
020			1

Table 3 (Bottom Screenshot):

Set	Message	Set	Signal
☒	NTB500A_BOX1_1	☒	CH1_4GL
☐	NTB500A_BOX1_2	☐	CH2_4GL
☐	NTB500A_BOX1_3	☐	CH3_4GL
☐	NTB500A_BOX1_4	☐	CH4_4GL
☐	NTB500A_BOX2_1	☐	CH5_TCT
☐	NTB500A_BOX2_2	☐	CH6_TCT
☐	NTB500A_BOX2_3	☐	CH7_10V
☐	NTB500A_BOX2_4	☐	CH8_10V

Table 4 (Right Screenshot):

CAN-CH E0-***	CAN-ID Name (Message)	CAN-CH Name (Signal)	Port No.
001			1
002			1
003			1
004			1
005			1
006			1
007			1
008			1
009			1
010			1
011			1
012			1
013			1
014			1
015			1
016			1
017			1
018			1
019			1
020			1

8 - 3 - 5 Edit the CAN conditions

This section describes how to sort CAN condition items.

8 - 3 - 5 - 1 Sort items

Sort the CAN condition items by using the **Up** button and **Down** button.

■Sort the CAN-ID

- (1) Select the CAN-ID.
- (2) Click the **Up** button or **Down** button.

(2)Click

CAN-CH E0-***	CAN-ID Name (Message)	CAN-CH Name (Signal)	Port No.
001	NTB500A_BOX1_1	CH1_4GL	1
002		CH2_4GL	
003	NTB500A_BOX1_2	CH3_4GL	1
004		CH4_4GL	

(1)Select

CAN-CH E0-***	CAN-ID Name (Message)	CAN-CH Name (Signal)	Port No.
001		CH3_4GL	
002	NTB500A_BOX1_2	CH4_4GL	1
003		CH1_4GL	
004	NTB500A_BOX1_1	CH2_4GL	1

You can move CAN-ID one by one.

■Sort the CAN-CH

- (1) Select the CAN-CH.
- (2) Click the **Up** button or **Down** button.

(2)Click

CAN-CH E0-***	CAN-ID Name (Message)	CAN-CH Name (Signal)	Port No.
001	NTB500A_BOX1_1	CH1_4GL	1
002		CH2_4GL	
003		CH3_4GL	
004	NTB500A_BOX1_2	CH4_4GL	1

(1)Select

CAN-CH E0-***	CAN-ID Name (Message)	CAN-CH Name (Signal)	Port No.
001		CH2_4GL	
002	NTB500A_BOX1_1	CH1_4GL	1
003		CH3_4GL	
004	NTB500A_BOX1_2	CH4_4GL	1

MEMO

You can move CAN-CH in the CAN-ID.

8-3-5-2 Clear items

This section describes how to delete or clear CAN conditions by using the **Delete** button and **Clear all** button.

■Clear the target items

- (1) Drag the target CAN-CH or CAN-ID.
- (2) Click the **Delete** button.

The remaining settings will be shifted upward.

Since the item is cleared from the CAN conditions, the "Done" mark is cleared also.

NOTE

The CAN conditions will be shifted upward for the number of deleted rows.
Note that the CAN-CH No. will be changed.

8-3-5-3 Clear all items

To clear all ECAN conditions, click the **Clear all** button.

The screenshot shows the CANdb software interface. On the left, there are filters for 'Network Node' (set to 'ALL') and 'Filter by' (set to 'Nothing'). Below these are buttons for 'Select all', 'Clear all', 'Put check', and 'Release check'. A 'Signal Color' legend indicates 'Blue : Little Endian' and 'Orange : Big Endian'. The main table lists CAN conditions with columns: CAN-CH, CAN-ID Name (Message), CAN-CH Name (Signal), and Port No. The 'Clear all' button is highlighted in a pink box at the top right of the table area.

CAN-CH	CAN-ID Name (Message)	CAN-CH Name (Signal)	Port No.
E0-***			
001	NTB500A_BOX1_1	CH1_4GL	1
002		CH2_4GL	1
003		CH3_4GL	1
004	NTB500A_BOX1_2	CH4_4GL	1
005		CH5_TCT	1
006	NTB500A_BOX1_3	CH6_TCT	1
007		CH7_10V	1
008	NTB500A_BOX1_4	CH8_10V	1
009		CH1_1G120_2WL	1
010	NTB500A_BOX2_1	CH2_1G120_2WL	1
011		CH3_1G120_2WL	1
012	NTB500A_BOX2_2	CH4_4GL	1
013		CH5_TCT	1
014	NTB500A_BOX2_3	CH6_TCT	1
015		CH7_10V	1
016	NTB500A_BOX2_4	CH8_10V	1
017			1
018			1
019			1
020			1
021			1

The screenshot shows the CANdb software interface after clicking the 'Clear all' button. The 'Clear all' button is now blue. The main table is empty. The left sidebar shows the 'Done' mark cleared from the conditions. A pink dashed box highlights the 'Clear all' button and the empty table.

CAN-CH	CAN-ID Name (Message)	CAN-CH Name (Signal)	Port No.
E0-***			
001			1
002			1
003			1
004			1
005			1
006			1
007			1
008			1
009			1
010			1
011			1
012			1
013			1
014			1
015			1
016			1
017			1
018			1
019			1
020			1
021			1

Since the item is cleared from the CAN conditions, the "Done" mark is cleared also.

8 - 3 - 6 Insert row

To insert a row, click the **Insert** button.

- (1) Select the cell above which you want to insert the new row.
- (2) Click the **Insert** button.

CAN-CH E0-***	CAN-ID Name (Message)	CAN-CH Name (Signal)	Port No.
001	NTB500A_BOX1_1	CH1_4GL	1
002		CH2_4GL	
003	NTB500A_BOX1_2	CH3_4GL	1
004		CH4_4GL	
005	NTB500A_BOX1_3	CH5_TCT	1
006		CH6_TCT	
007			1
008			1
009			1
010			1

CAN-CH E0-***	CAN-ID Name (Message)	CAN-CH Name (Signal)	Port No.
001	NTB500A_BOX1_1	CH1_4GL	1
002		CH2_4GL	
003			1
004			1
005			1
006			1
007	NTB500A_BOX1_2	CH3_4GL	1
008		CH4_4GL	
009		CH5_TCT	1
010	NTB500A_BOX1_3	CH6_TCT	1

A row is inserted above the selected CAN-ID cell.

NOTE

After clicking the **Insert** button, the ECAN conditions will be shifted downward, from the cursor position, for the number of rows to be inserted.

Note that the last channel settings will be deleted.

CAN-CH E0-***	CAN-ID Name (Message)	CAN-CH Name (Signal)	Port No.
490			1
491			1
492			1
493			1
494			1
495			1
496			1
497	NTB500A_BOX1_1	CH1_4GL	1
498		CH2_4GL	
499	NTB500A_BOX1_2	CH3_4GL	1
500		CH4_4GL	
501	NTB500A_BOX1_3	CH5_TCT	1
502		CH6_TCT	
503	NTB500A_BOX1_4	CH7_10V	1
504		CH8_10V	
505	NTB500A_BOX3_1	CH1_1G120_2WL	1
506		CH2_1G120_2WL	
507	NTB500A_BOX3_2	CH3_1G120_2WL	1
508		CH4_4GL	
509	NTB500A_BOX3_3	CH5_TCT	1
510		CH6_TCT	
511	NTB500A_BOX3_4	CH7_10V	1
512		CH8_10V	

CAN-CH E0-***	CAN-ID Name (Message)	CAN-CH Name (Signal)	Port No.
490			1
491			1
492			1
493			1
494			1
495			1
496			1
497	NTB500A_BOX1_1	CH1_4GL	1
498		CH2_4GL	
499	NTB500A_BOX1_2	CH3_4GL	1
500		CH4_4GL	
501	NTB500A_BOX1_3	CH5_TCT	1
502		CH6_TCT	
503	NTB500A_BOX1_4	CH7_10V	1
504		CH8_10V	
505			1
506			1
507	NTB500A_BOX3_1	CH1_1G120_2WL	1
508		CH2_1G120_2WL	
509	NTB500A_BOX3_2	CH3_1G120_2WL	1
510		CH4_4GL	
511	NTB500A_BOX3_3	CH5_TCT	1
512		CH6_TCT	

Since the ECAN conditions were shifted downward, the "NTB500A_BOX3_4" was deleted.

8 - 3 - 7 Error Message

Error messages when using the ELA-55A

N o.	Error messages	Contents
1	Failed to load the CANdb file.	Failed to load the selected DBC format file. Check the file.
2	The Message ID of the *** are already set. (*** is the repeating Message Name)	The selected "Message ID" of the "Message" is already set. Delete the same Frame ID (Message ID) and re-set it. To overwrite, see 8 - 3 - 4 - 2 Overwrite the CAN conditions.
3	You have selected too many Message. Some settings were not reflected.	The number of selected "Message" exceeds the CAN card's available number of CAN-IDs. The "Message" items, exceeding the CAN card's available number of CAN-IDs, will not be reflected.
4	You have selected too many Signal. Some settings were not reflected.	The number of selected "Signal" items within one "Message" is 9 or more. Be sure to set 8 "Signal" items per one CAN-ID. The 9th "Signal" and after will not be reflected.
5	You have selected too many Message, Signal. Some settings were not reflected.	The number of selected "Message" and the number of selected "Signal" exceed the CAN card's available settings.
6	If you insert CHs, Some Chs of last will be deleted. Do you carry out it?	After setting the CANdb information into the ECAN information, the last channel will be deleted since the ECAN conditions will be shifted downward. The message appears when the last channel has the pre-set ECAN conditions. For details, see 8 - 3 - 4 - 1 Position of the CAN condition.
7	Because your setting exceeded a configurable number CH, Some CH at the end will be deleted. Do you carry out it?	The ECAN conditions of the last channel will be deleted since the ECAN conditions will be shifted downward for the number of rows to be inserted. For details, see 8 - 3 - 6 Insert row.
8	Because your setting exceeded 512 CH, Some CH were not reflected.	The message appears when the selected CANdb information exceeds the available number of channels, when setting the CANdb information into the ECAN conditions. For details, see 8 - 3 - 4 - 1 Position of the CAN condition.

8 - 4 GPS sensor and measurements

This section describes how to record the GPS data/how to record data by using the GPS time data with the accessory GPS sensor.

NOTE

- (1) You are not able to use the GPS sensor under the following conditions.
 - The EGPC-50A is not installed in the standalone operation.
 - The EGPC-50A is not installed in the master unit in the synchronous operation.
 - The sampling frequency is "Ext Clock" on the Set Measure Condition window.
- (2) Before using the "time synchronization function", make sure the time zone, date and time on the PC are correct.

8 - 4 - 1 To connect the GPS sensor

Connect the accessory GPS sensor as follows.



Connect the accessory GPS sensor
into the GPS/CAN 1 port.

8 - 4 - 2 To confirm the EGPC-50A

This section describes how to confirm the EGPC-50A configuration.

(1) Open the Set Environment window by any of the following.

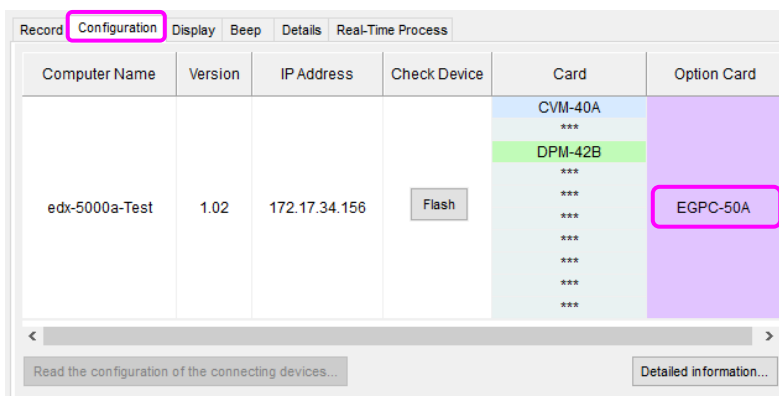
- Click the File - Environment....
- Click the  icon from the toolbar.

(2) Click the [Configuration] tab on the Set Environment window.

Make sure the EGPC-50A appears on the “Option Card” column on the [Configuration] tab.

When the EGPC-50A does not appear, select the EGPC-50A on the “Option Card” column on the [Configuration] tab.

(For details, see “2 - 2 Setting Configuration.”)



(3) Click the  button to close the window.

8 - 4 - 3 To record the GPS data

When recording the GPS data, the ELA-55A monitors/records the GPS data (latitude, longitude, speed, azimuth, etc.) as well as the measured data.

The ELA-55A saves the GPS data in the EDX-5000A data drive (in the NMEA format).

■Operation method

- (1) Connect the accessory GPS sensor.
(For details, see “8 - 4 - 1 To connect the GPS sensor.”)
- (2) Make sure the EGPC-50A appears on the “Option Card” column on the [Configuration] tab.
(For details, see “8 - 4 - 2 To confirm the EGPC-50A.”)
- (3) Open the Set Measure Condition window by any of the following.
 - Click the Set - Set Measure Condition....
 - Click the Meas. Cond icon from the toolbar.
- (4) Click the [Measure Mode] tab.
Put a check mark to the check box next to the "Records GPS data."

The screenshot shows the 'Measure Mode' window. The 'EGPC-50A' section at the bottom has a checkbox labeled 'Records GPS data.' which is checked and highlighted with a pink rectangle. Below it is an unchecked checkbox labeled 'Records data by using the time data received through the GPS sensor.'

- (5) Click the OK button to close the window.
- (6) Go to “5 Measuring data.”

8 - 4 - 4 To record the data by using the GPS time data

The ELA-55A records the data by using the GPS time data in the following 2 methods.

Point ZERO (manual) measurement

Starts the manual measurement at 0 msec by using the time data, received from the GPS satellite.

Interval (GPS synchronization) measurement

Starts the interval measurement at 0 msec by using the time data, received from the GPS satellite.

For details, see separate volume of "EDX-5000A MEMORY RECORDER/ANALYZER INSTRUCTION MANUAL (FOR HARDWARE)."

8 - 4 - 4 - 1 Point ZERO (manual) measurement

This section describes how to execute the Point ZERO (manual) measurement.

■Operation method

(1) Connect the accessory GPS sensor.

(For details, see "8 - 4 - 1 To connect the GPS sensor")

(2) Make sure the EGPC-50A appears on the "Option Card" column on the [Configuration] tab.

(For details, see "8 - 4 - 2 To confirm the EGPC-50A.")

(3) Open the Set Measure Condition window by any of the following.

- Click the Set - Set Measure Condition....
- Click the Meas. Cond. icon from the toolbar.

(4) Click the [Measure Mode] tab.

Put a check mark to the check box next to the "Records data by using the time data received through the GPS sensor."

(5) The Point ZERO (Manual) and Point ZERO (Manual n. of data) appear.

Select the target item from the following.

Point ZERO (Manual) Manually starts and stops the data recording.

Point ZERO (Manual n. of data) Manually starts the data recording and records data for the pre-set Number of data/CH.

The screenshot shows the 'Measure Mode' dialog box. On the left, there is a sidebar with 'Measure Mode' and 'Data File' tabs. The main area is titled 'Measure Mode'. At the top, there is a dropdown menu for 'Measure Mode' with a red box around it, showing 'Point ZERO (Manual n. of data)'. Below this is the 'Sampling Frequency' section with two dropdowns: '1,2,5' and '500Hz'. A note states: 'The number of measuring CHs of EDX-5000A units are listricted by the selected sampling frequency.' Below this is the 'Clockout frequency dividing' section with a dropdown set to '1' and a note: '(Frequency that is output from the EDX-5000A : 500Hz)'. The 'Clockout Mode' section has three options: 'always' (selected with a radio button), 'during recording' (radio button), and 'reverse' (checkbox). The 'Record Data' section has two dropdowns: 'Number of Data/CH' set to '1000' and 'Record Time' set to '2.000sec'. The 'Repeat Times' section has a dropdown set to '1'. The 'EGPC-50A' section has two checkboxes: 'Records GPS data.' (unchecked) and 'Records data by using the time data received through the GPS sensor.' (checked, with a red box around it).

(6) Click the **OK** button to close the window.

(7) Go to “5 - 3 Manual measurement.”

8 - 4 - 4 - 2 Interval (GPS synchronization) measurement

This section describes how to execute the Interval (GPS synchronization) measurement.

■Operation method

(1) Connect the accessory GPS sensor.

For details, see “8 - 4 - 1 To connect the GPS sensor.”)

(2) Make sure the ETIM-40A/EGPC-40A appears on the “Option Card” column on the [Configuration] tab.

(For details, see “8 - 4 - 2 To confirm the EGPC-50A.”)

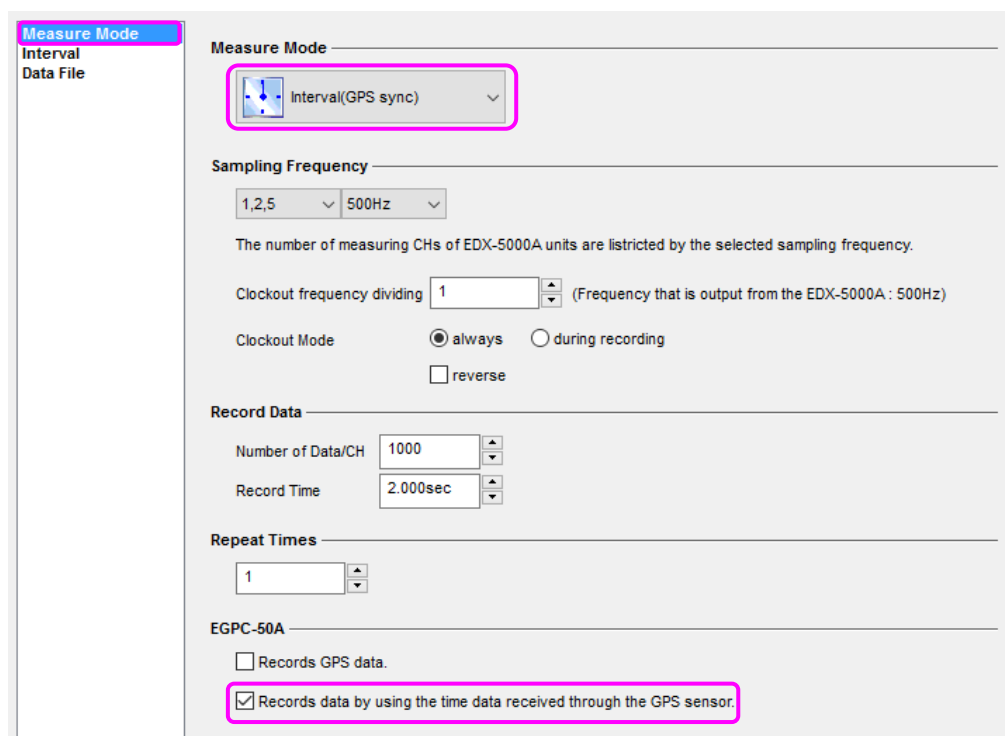
(3) Open the Set Measure Condition window by any of the following.

- Click the Set - Set Measure Condition....
- Click the **Meas. Cond** icon from the toolbar.

(4) Click the [Measure Mode] tab.

Put a check mark to the check box next to the "Records data by using the time data received through the GPS sensor."

(5) The “Interval (GPS sync) appears.



Measure Mode
Interval
Data File

Measure Mode
Interval(GPS sync)

Sampling Frequency
1,2,5 500Hz
The number of measuring CHs of EDX-5000A units are listricted by the selected sampling frequency.

Clockout frequency dividing 1 (Frequency that is output from the EDX-5000A : 500Hz)

Clockout Mode
☒ always ☐ during recording
☐ reverse

Record Data
Number of Data/CH 1000
Record Time 2.000sec

Repeat Times
1

EGPC-50A
☐ Records GPS data.
☒ Records data by using the time data received through the GPS sensor.

(6) Click the [Interval] tab .

Measure Mode
Interval
Data File

Start Time

☒ Set Interval Start Time.

2017/04/13 17:15:00 UTC Time 2017/04/13 08:15:00

If start date is not set, the date when [REC] button is pressed shall be the start date.

Interval Time

Day Hour Minute Second

0 0 1 0

Set interval time to a time more than 'record time (0.1000sec) + 10 second'.

Repeat Times

1

(7) Set the interval conditions (such as the Start Time, Interval Time, etc.)

(For details, see “4 - 2 [Interval] tab.”)

Click the **OK** button to close the window.

MEMO

The ELA-55A is able to set the Start Time in the Local Time or UTC Time.
The Local Time and UTC Time are linked.

Start Time

☒ Set Interval Start Time.

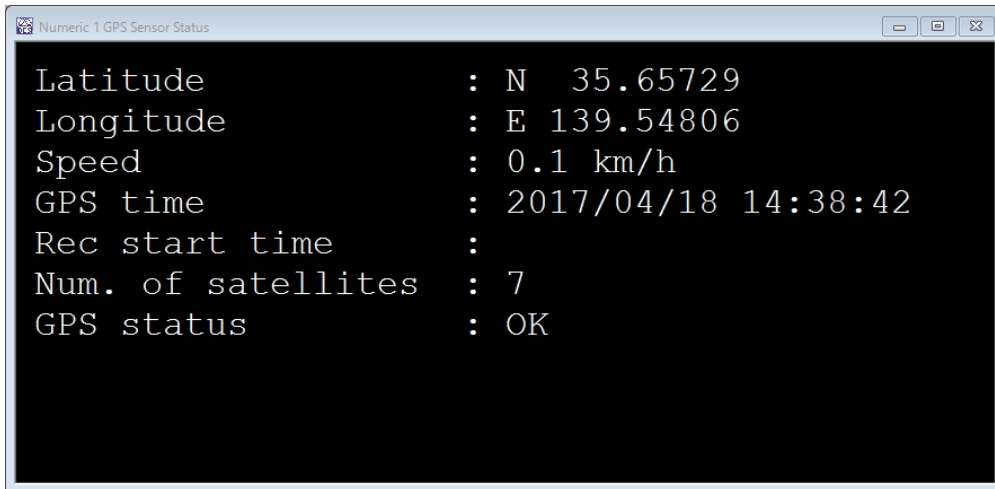
2017/04/13 17:15:00 UTC Time 2017/04/13 08:15:00

Local Time UTC Time

(8) Go to “5 - 4 Interval measurement.”

8 - 4 - 5 GPS sensor status window

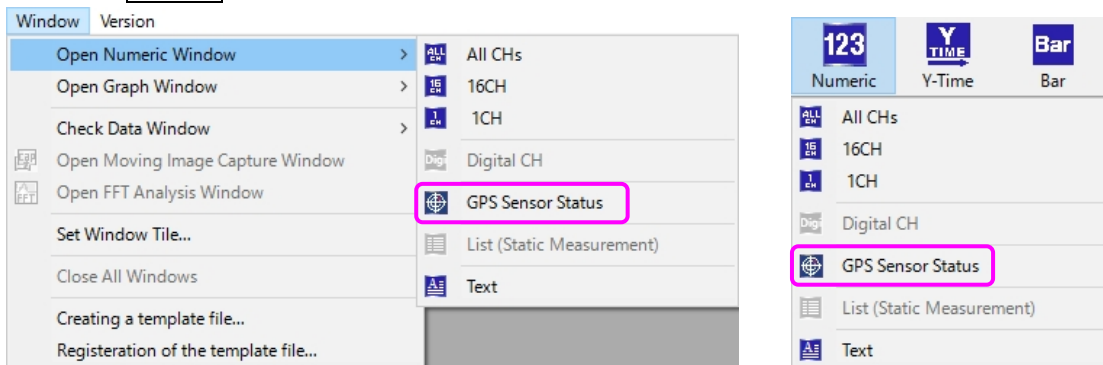
This section describes how to open the GPS sensor status window when recording the GPS data or when recording data by using the GPS time data.



■How to display

Open the GPS sensor status window by any of the following.

- Click the Window - Open Numeric Window - GPS sensor status.
- Click the **Numeric** icon from the toolbar. Click the GPS sensor status.

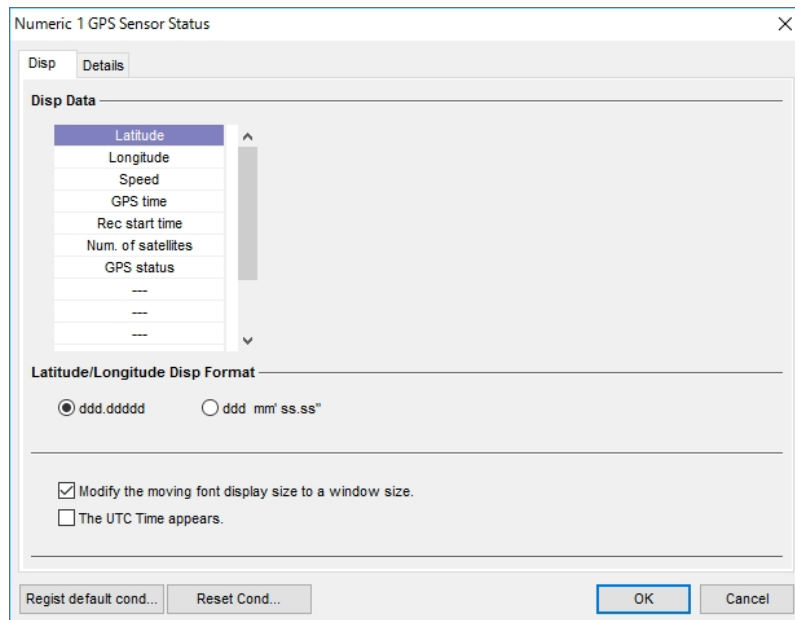


8-4-5-1 Set display condition... window

To set the display conditions of the GPS sensor status window, open the Set Display Condition... window.

Open the Set Display Condition... window by any of the following.

- Click the View - Set Display Condition....
- Right-click the window to display the pop-up-menu.
Click the Set Display Condition... on the pop-up-menu.
- Click the **Disp. Cond.** icon from the toolbar.
- Double-click the GPS sensor status window.



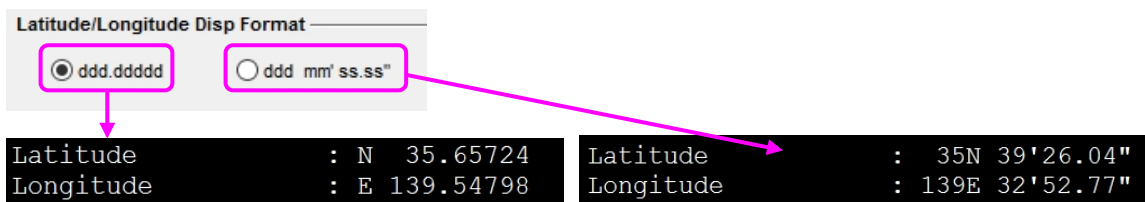
■Disp Data

Select the target item to be displayed on the GPS sensor status window.

Latitude	Latitude (N: North latitude, S: South latitude)
Longitude	Longitude (E: East longitude, W: West longitude)
Speed	Speed (km/h)
GPS time	Date and time of the GPS sensor
Rec start time	The next recording start time of the Point ZERO (manual) measurement/Interval (GPS synchronization) measurement.
Num. of satellites	The number of satellites in use Use the "Num. of satellites" as a guide when checking the receiving conditions.
GPS status	"OK" Non-differential GPS fix available The time synchronization function is available. "Error" Fix not available The time synchronization function is not available. NONE GPS sensor not connected.
Course	Traveling direction (°, TN: 0°)
Magnetic declination	Magnetic declination (+: East, -: West)
Sea level altitude	Altitude above sea level (m)
Geoid height	Geoid height (m)
Hzn. dltn. of prec.	Horizontal dilution of precision
Posn. dltn. of prec.	Position dilution of precision
Vert. dltn. of prec.	Vertical dilution of precision

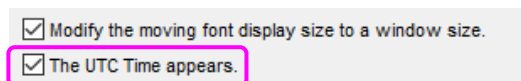
■ To select the latitude format/longitude format

Select the latitude format/longitude format.

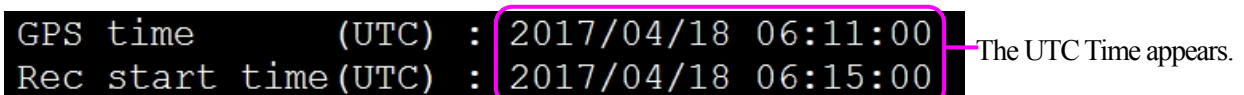


■ To change the time format (UTC Time/Local Time)

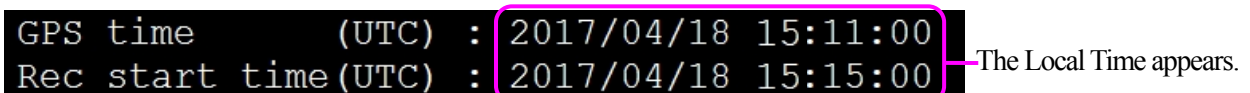
On the Set Display Condition... window, the ELA-55A is able to change the time format on the GPS sensor status window.



To display the UTC Time on the GPS sensor status window, put a check mark to the check box next to the "The UTC Time appears."



To display the Local Time on the GPS sensor status window, release a check mark from the box next to the "The UTC Time appears."



9 Saving and loading meas condition file

This section describes details of saving and loading Meas condition file.

9 - 1 To save the meas condition file with a file

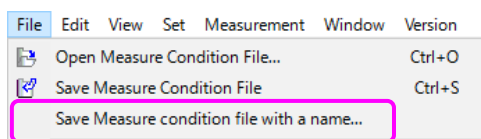
This section describes how to save the current Meas condition to the Meas condition file (Extension: E5T).

When the measurement is carried out with the same condition the next time, loading this Meas condition file enables to set Meas condition at a time.

The Meas condition file includes environment settings, channel conditions, measuring conditions, ECAN conditions, real-time processions, and display conditions on graphs and on numeric windows.

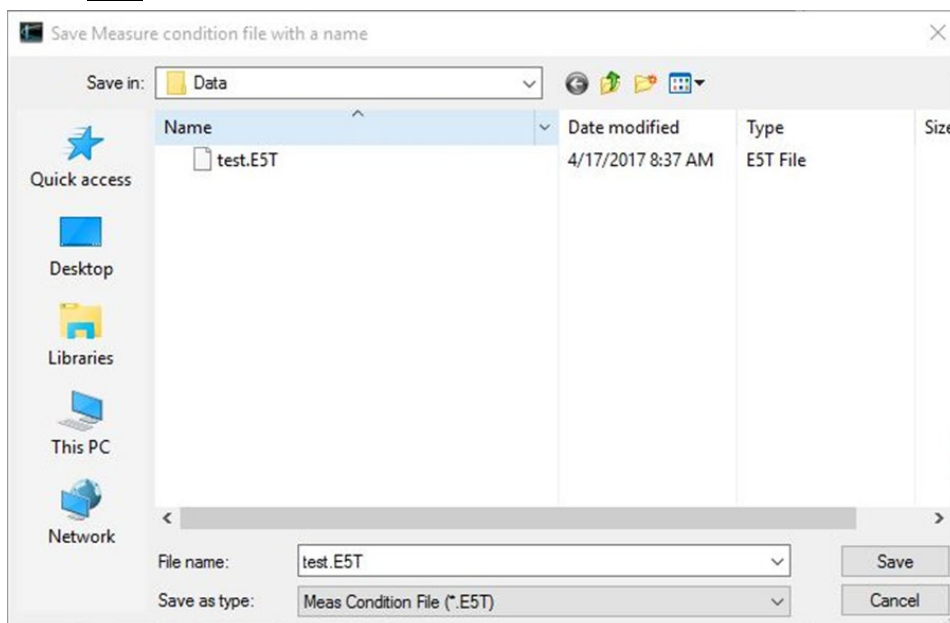
■Operation method

(1) Click the File - Save Meas Condition file with a name... to open the Save Meas Condition file with a name window.



(2) Select the Save in folder and input the File name.

Click the **Save** button.



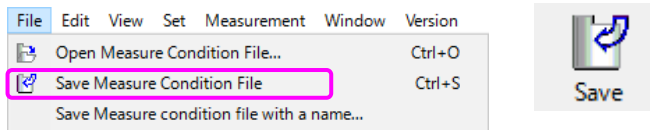
9 - 2 To save the meas condition file

This section describes how to save the current Meas condition to the existing Meas condition file (Extension: E5T).

■Operation method

Save the Meas condition file by any of the following.

- Click the File - Save Meas Condition File.
- Click the Save icon from the toolbar.



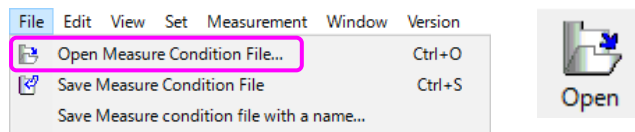
9 - 3 To open the meas condition file

This section describes how to load the previously saved Meas condition file (Extension: E5T).

■Operation method

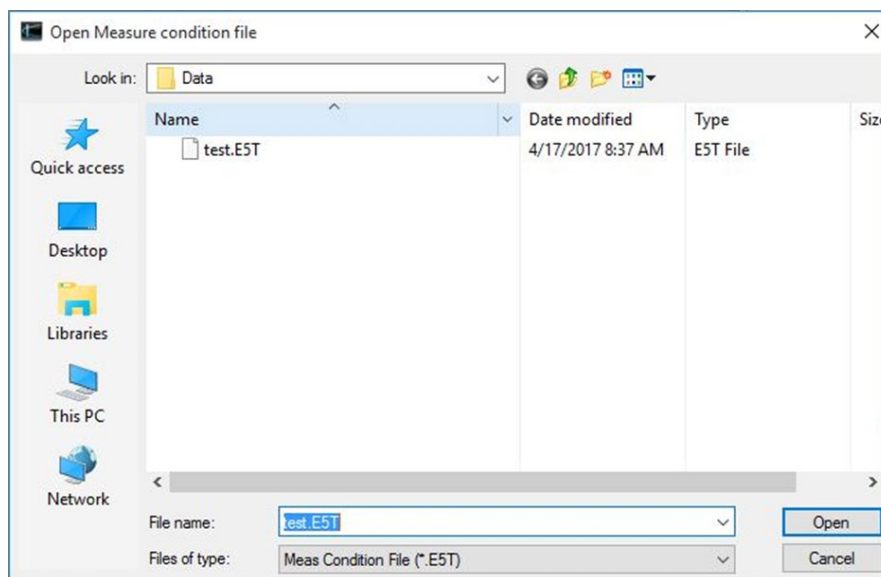
(1) Open the Open Measure Condition File window by any of the following.

- Click the File - Open Measure Condition File.
- Click the Open icon from the toolbar.



(2) Select the file name or folder name.

Click the **Open** button.



1 0 Saving and loading ME5 file

This section describes details of saving and loading ME5 file.

By loading ME5 file that created by DCS-100A to EDX-5000A, each conditions are set.

The ME5 file includes environment settings, channel conditions (excluding rated capacity and rated output), measuring conditions (excluding Data Save Folder), real-time processing conditions (excluding FFT and Webcam) and ECAN conditions.

Note that the displaycondition of ELA-55A is not included.

1 0 - 1 To use the ME5 file

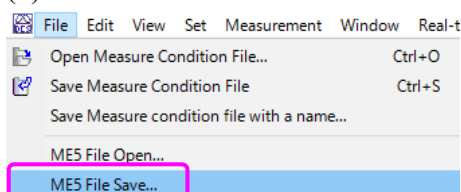
- (1) Set each conditions on DCS-100A according to measurement.
- (2) Save the ME5 file by DCS-100A (For details, see “IM-1182 INSTRUCTION MANUAL DCS-100A [FOR EDX-5000A OPERATION]”).
- (3) Move the ME5 file to EDX-5000A from PC using USB, etc.
- (4) Loading the moved ME5 file by ETA-55A or ELA-55A, then each conditions that are set on DCS-100A are reflected on EDX-5000A.

1 0 - 2 To save the ME5 file

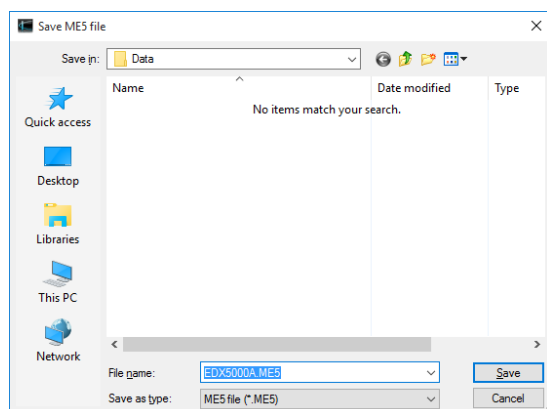
This section describes how to save the current each conditions to the ME5 file (Extension:ME5).

■Operation method

- (1)Click the File – ME5 File Save... to open the Save ME5 file window.



- (2)Select the Save in folder and input the File name.
Click the **Save** button.



MEMO

The name of ME5 file to save is as follows by the current setting of the Number of Connected Units.

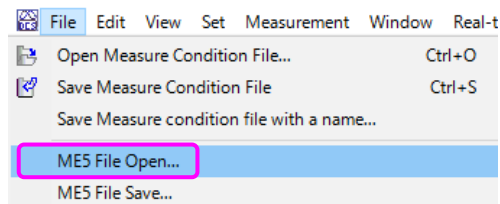
- 1 (standalone) file name. ME5
- More than 1 (multi units) file name_ Δ. ME5 Δ : 0~9 (ID No.)

1 0 - 3 To open the ME5 file

This section describes how to load the moved ME5 file (Extension:ME5).

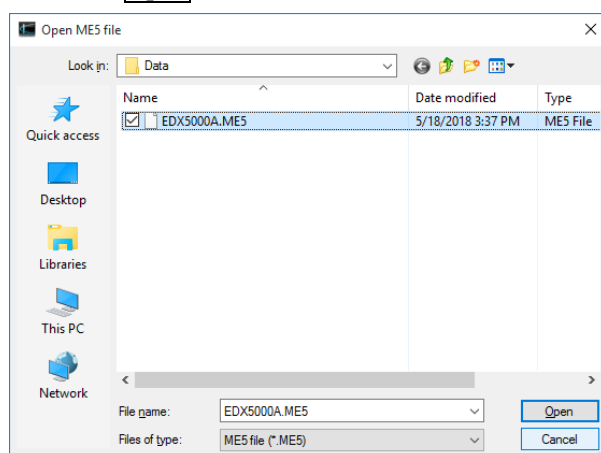
■Operation method

(1)Click the File – ME5 File Open... to open the Open ME5 file window.



(2)Select the file name or folder name.

Click the **Open** button.



NOTE

The ME5 file can not load when the number of slots, the type of conditioner cards or option card are different from the ME5 file's setting and EDX-5000A.

1 1 Window

1 1 - 1 Monitor window

This section describes how to display the monitor data on the Numeric windows/Graph windows in real time.

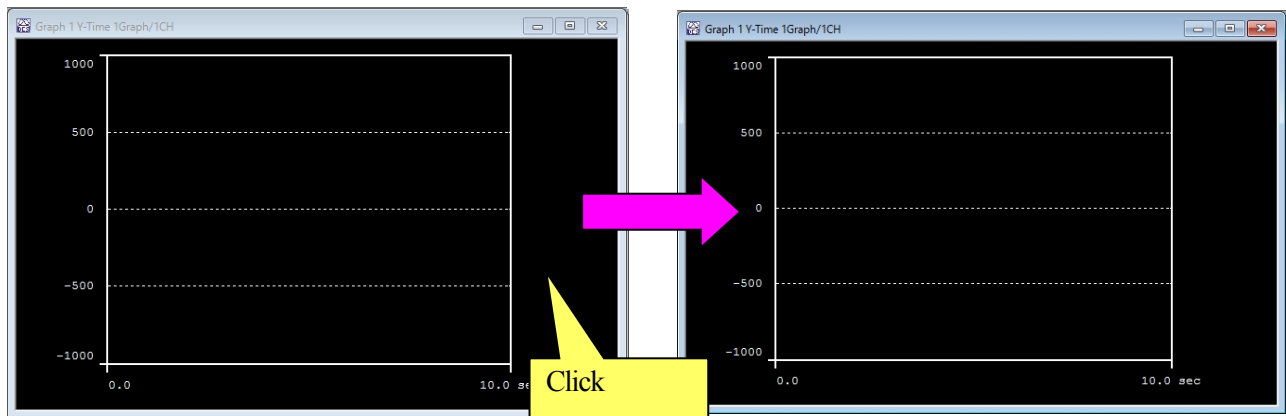
1 1 - 1 - 1 To activate

The menu bar, tool bar button, and function key are for the active Numeric windows/Graph windows.

To activate the Numeric windows/Graph windows, click the Numeric windows/Graph windows.

Inactive window

Active window

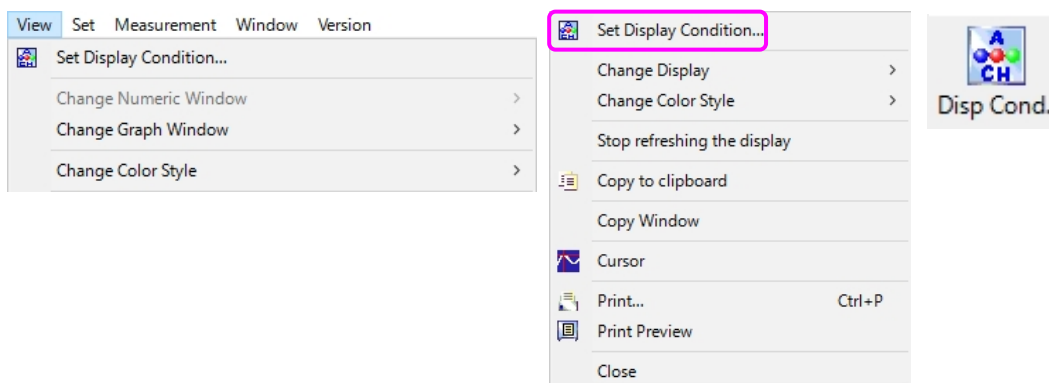


1 1 - 1 - 2 Set display condition window

This section describes the common operations that can be performed on the Set Display Condition... window.

■ To display the Set Display Condition... window.

- (1) Activate the Numeric windows/Graph windows.
- (2) Operate the ELA-55A by any of the following.
 - Click the View - Set Display Condition....
 - Right-click the Numeric windows/Graph windows to display the pop-up-menu.
Click the **Set Display Condition...** on the pop-up-menu.
(In the following example, the graph window is Y-Time Graph.)
 - Click the **Disp Cond** icon from the tool bar.
 - Double-click the Numeric windows/Graph windows.

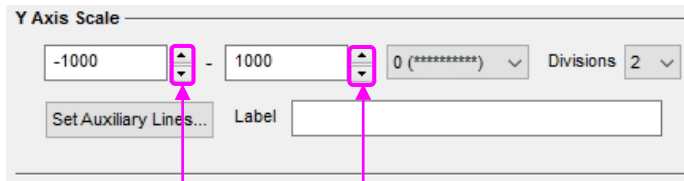


- (3) The Set Display Condition... window appears.

●Scale values on the graph windows

Select the scale values of graph windows by any of the following.

- Input numerical values directly.
- Click the spin button.
 Up arrow: Increases the numerical value in 1/2/5 step.
 [Example] 10 → 20 → 50 → 100
 Down arrow: Decreases the numerical value in 1/2/5 step.
 [Example] 10 → 5 → 2 → 1



Spin button on the y-axis scale.

●Auto scale button

Automatically sets the scale values, in accordance with the displayed data (monitor data and record data), in 1/2/5 step.

x-axis ON:  OFF: 

y-axis ON:  OFF: 

●Full scale (F.S.) button

Draws the displayed data (monitor data and record data), in the full scale value.

ON:  OFF: 

MEMO

- Calculate the F.S. value of every channel by using the following equation.

$$\text{F.S. value} = \text{Setting range} \times \text{Calibration constant} + \text{Offset}$$
- Automatically sets the scale values, in accordance with the setting range, calibration constant, and offset.

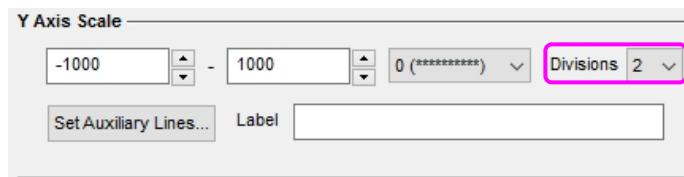
●Grid line button

Displays the grid lines on graphs.

x-axis ON:  OFF: 

y-axis ON:  OFF: 

Select the number of divisions from the following list.



The number of divisions on the y-axis

●Scale-linked button

Sets the positive (+) scale value in accordance with the negative (-) scale value.

[Example]

When you change the positive (+) scale value from 1000 to 2000, the ELA-55A automatically sets the negative (-) scale value from -1000 to -2000.

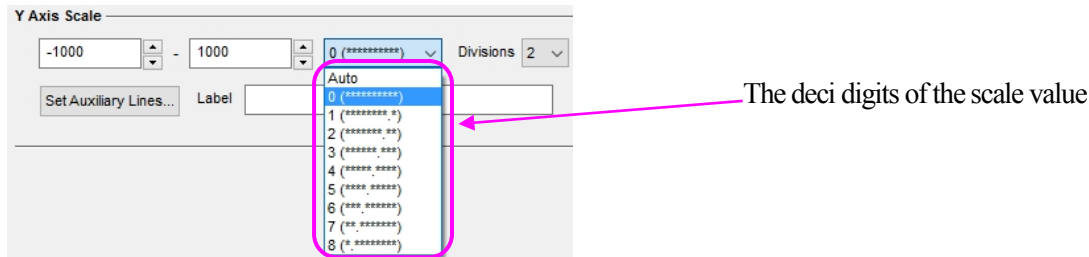
x-axis ON:  OFF: 

y-axis ON:  OFF: 

●Deci digits of the scale value

Sets the deci digits of the x-axis scale value/y-axis scale value.

Select the deci digits of the scale value from the following list.



●Auxiliary line button

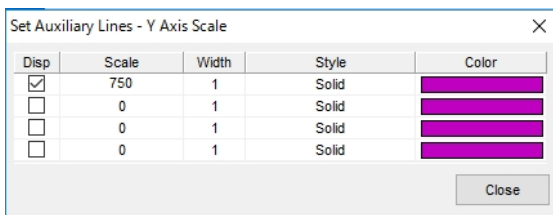
Displays the auxiliary lines on the graph.

(1) Click the **Auxiliary line** button of the target axis.



(2)The following window appears.

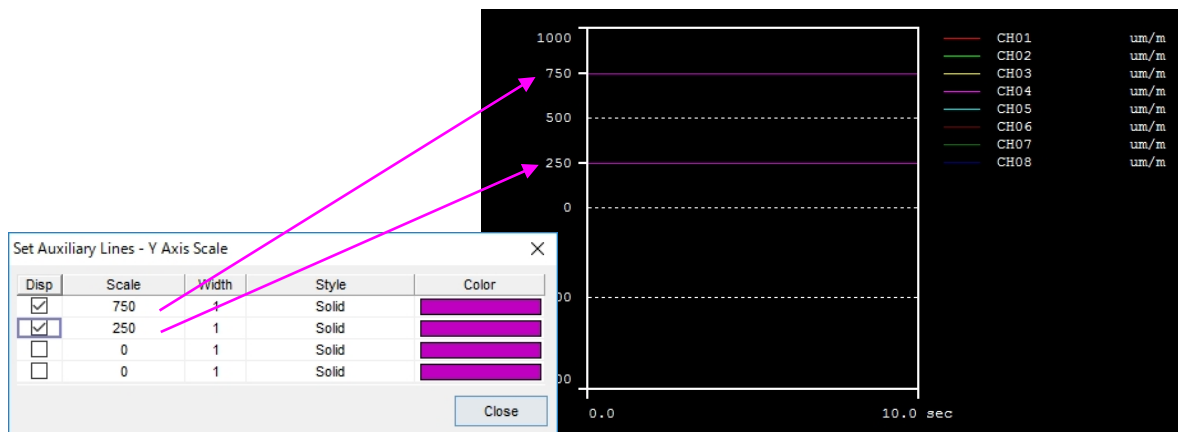
Put a check mark to the “Display” box and input the scale value.



(3) Then, click the **Close** button to close the window.

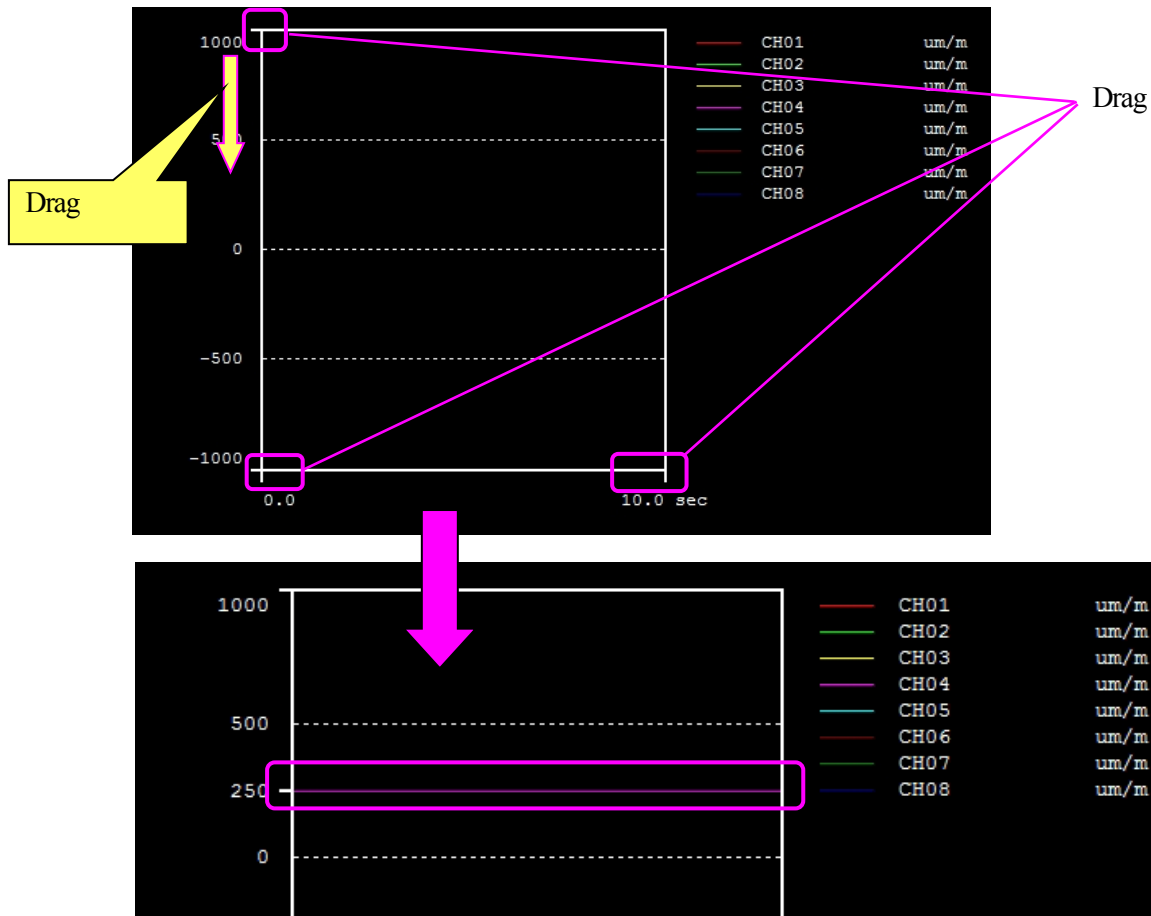
Click the **OK** button to close the Set Display Condition... window.

The auxiliary lines appear on the graph window.



▪ To move/delete the auxiliary lines on the graph window

To move the auxiliary line, drag the target section as follows..



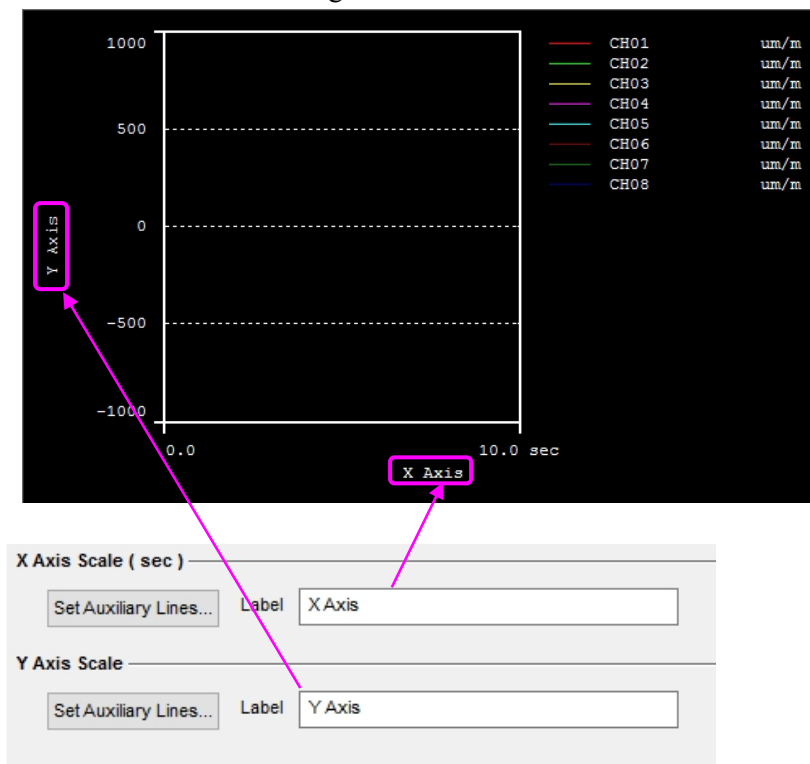
To delete the auxiliary line, drag the auxiliary line to the top/bottom of the graph.



●Axis label

Displays the axis label on the graph.

The number of character string is maximum 40.



1 1 - 1 - 2 - 1 To thin the data on the graph window

This section describes how to change the number of thinning data of the displayed data on the graph window.

Thinning

☐ Automatically thin data to a window size. The number of thinning data

(1) Automatically thin data to a window size.

Thins the data by deciding the number of thinning data automatically, based on the sampling frequency and current graph window size.

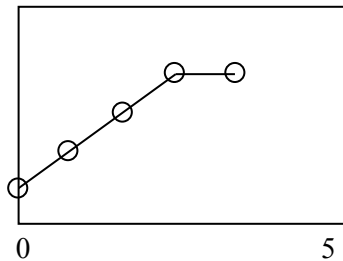
(2) The number of thinning data

Select the number of thinning data from the following list.

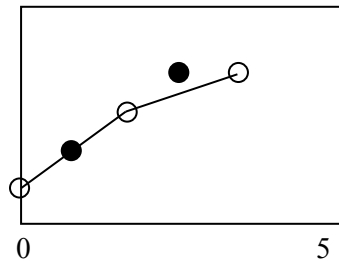
2/5/10/20/50/100/200/500/1000

"---": No thinning

- To not thin data, release a check mark next to the “Automatically thin data to a window size.” and select The number of thinning data “---”.
- The ELA-55A thins the data as follows.



The number of thinning data: ---



The number of thinning data: 2

○ Data to be drawn
● Data to be thinned

NOTE

The thinning operation is available on the Y-Time Graph and Digital Graph.
The thinning operation is not available on the Bar Graph, X-Y Graph, Circular Meter, and Bar Meter.

1 1 - 1 - 2 - 2 [Details] tab

This section describes how to set the following [Details] tab.
(In the following example, the graph window is Y-Time Graph.)

Graph 1 Y-Time 1Graph/8CH

GeneralGraphDetails

Title

☐ Display

Legends

CH No.	CH Name	Numeric	Unit

Left(Inside)Right(Inside)OutSide

☐☐☒

Font

	Font Name	Size	Color
Title	Courier New	10	
Scale	Courier New	10	
Axis Label	Courier New	10	
Legend	Courier New	10	

Line

	Width	Style	Color
Frame Line	2	Solid	
Split Line	1	Dot	
Cursor	1	Solid	

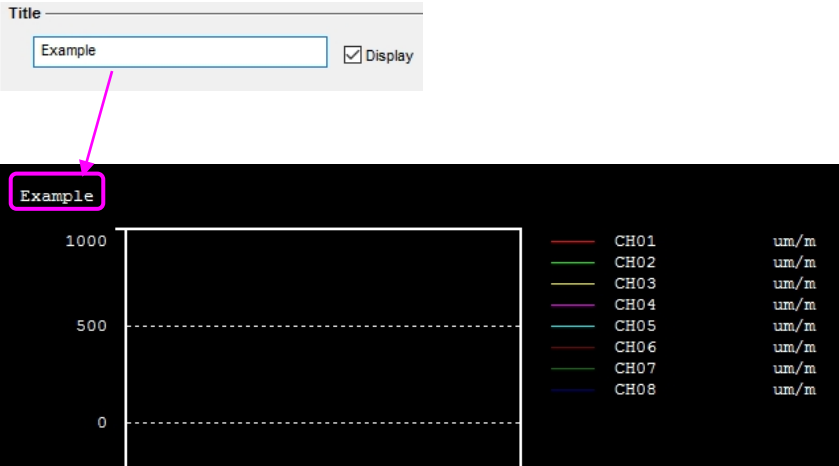
Color

Window Background	
Graph Background	
Value (Normal)	
Value (Over)	

Register default cond...Reset Cond...OKCancel

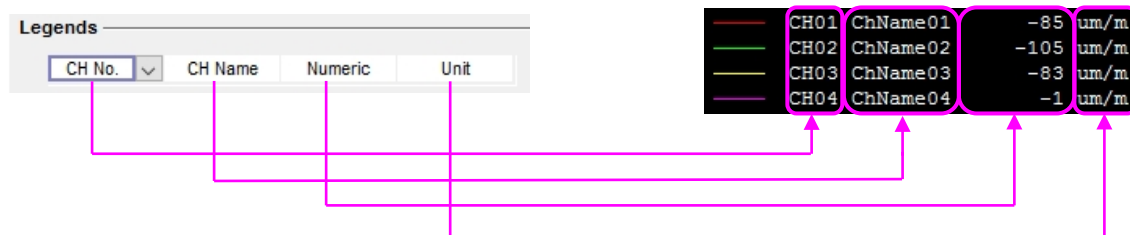
●To set the title

To set the title on the Numeric windows/Graph windows, set it on the "Title" section.
The number of character string is maximum 40.
Put a check mark to the box next to the “Display” to display the title on the Numeric windows/Graph windows.



● To set legends

(1) To set the legends, set them on the "Legends" section.

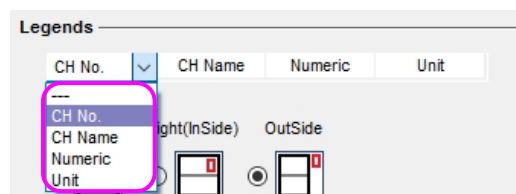


To set the legends.

Click the target box to display the list.

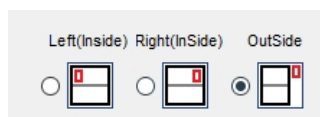
Select the target item from the list.

"—": No item

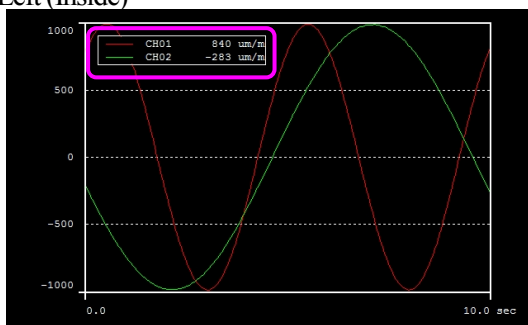


(2) Legend position

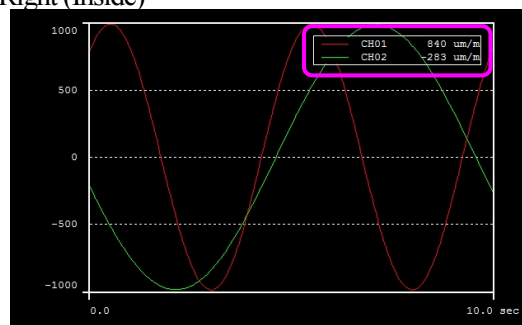
To set the legend position on the Y-Time Graph windows [excluding the 1 Graph/All CHs and 1 Graph/16 CH (DIV)] and X-Y Graph window, select the following item.



▪ Left (Inside)



▪ Right (Inside)



▪ Outside



MEMO

You are able to change the legend position by dragging the legends on the graph window.

● **To set the fonts.**

To set the fonts, sizes, etc., set them on the "Font" section.

Click the target box to display the list.

Select the target item from the list.

	Font Name	Size	Color
Title	Courier New	10	
Scale	Courier New		
Axis Label	Ebrima		
Legend	Franklin Gothic Medium		
Line			
Frame Line	Javanese Text		
Split Line	Leelawadee UI		
Cursor	Lucida Console		
Color			
Window Background	Microsoft Himalaya		
Graph Background	Microsoft JhengHei		
Value (Normal)	Microsoft JhengHei UI		
Value (Over)	Microsoft JhengHei Light		

	Font Name	Size	Color
Title	Courier New	10	
Scale	Courier New	5	
Axis Label	Courier New	6	
Legend	Courier New	7	
Line			
Frame Line	2	Solid	
Split Line	1	Dot	
Cursor	1	Solid	
Color			
Window Background			
Graph Background			
Value (Normal)			
Value (Over)			

Double-click the target color box to display the list.

Select the target item from the list.

● **To set the lines.**

To set the frame lines and grid lines on the graph window, set them on the "Line" section.

Click the target box to display the list.

Select the target item from the list.

▪ **Wide**

	Width	Style	Color
Frame Line	2	Solid	
Split Line	1	Dot	
Cursor	2	Solid	

▪ **Style**

	Width	Style	Color
Frame Line	2	Solid	
Split Line	1	Solid	
Cursor	1	Dash	

Double-click the target color box to display the list.

Select the target item from the list.

NOTE

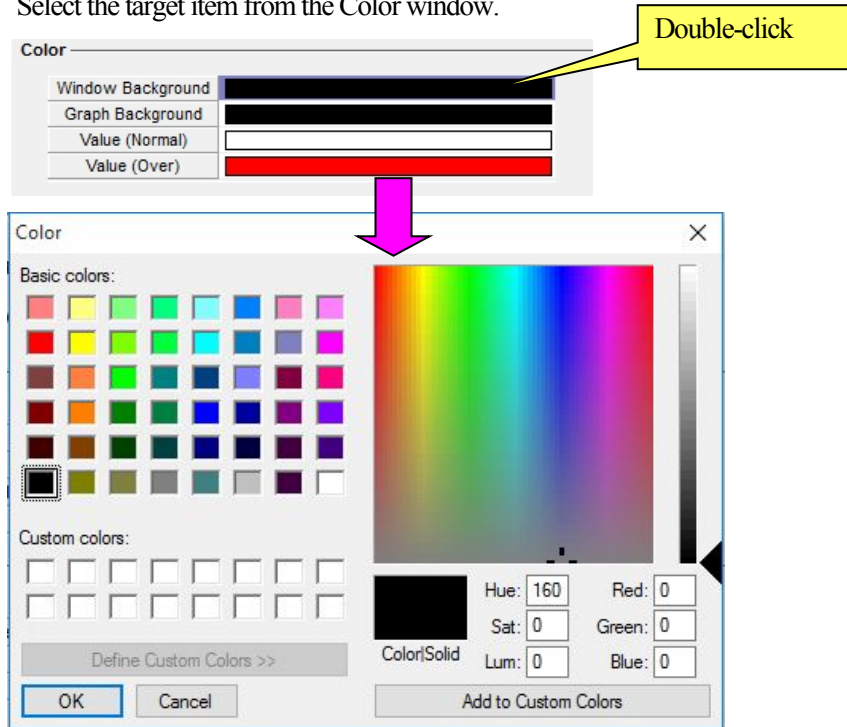
When the "Style" is Dash, Dot, Dash Dot, or Dash Dot Dot, the "Width" is 1 only.

● **To set the colors.**

To set the window background color, graph background color, etc., set them on the "Color" section.

Double-click the target box to display the Color window.

Select the target item from the Color window.



MEMO

The colors of the legend values are as follows.

When the value is within the setting range:

Value (Normal) color

When the value exceeds the setting range:

Value (Over) color

1 1 - 1 - 2 - 3 To register the default conditions

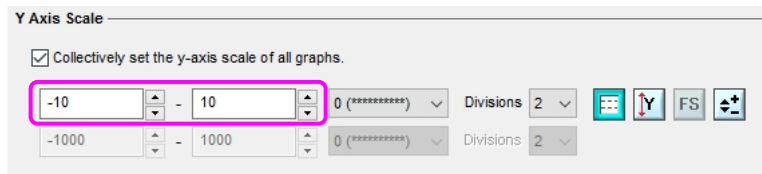
This section describes how to change the default conditions of the Numeric windows/Graph windows.



How to register the default conditions of the Y-Time Graph is described as follows.

(1) Change the conditions on the Set Display Condition... window.

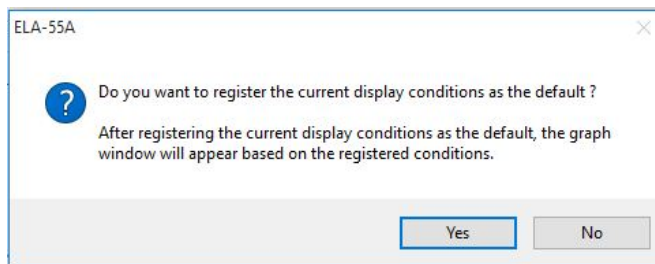
In the following example, the y-axis scale is changed to -10 and 10.



(2) Click the **Register default cond...** button.

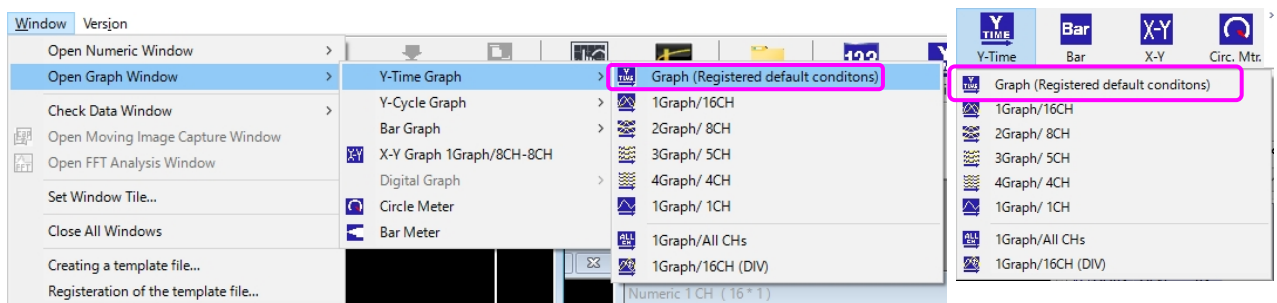
(3) The following message appears.

Click the **Yes** button.



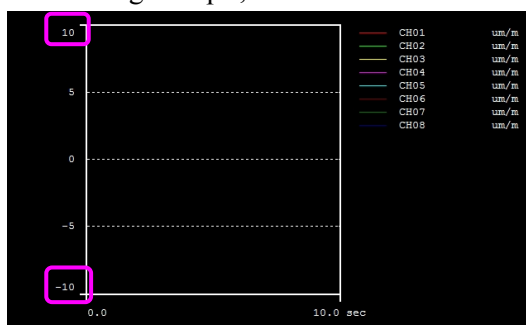
(4) Click the **OK** button to close the window.

(5) The Graph (Registered default conditions) appears on the graph window menu.



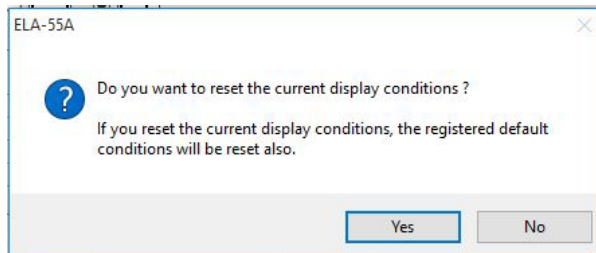
(6) Click The Graph (Registered default conditions) to open the Y-Time Graph based on the registered default conditions.

In the following example, the default conditions of the y-axis scale is -10 and 10.

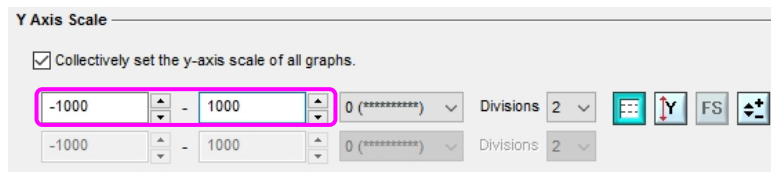


How to cancel the default conditions of the Y-Time Graph is described as follows.

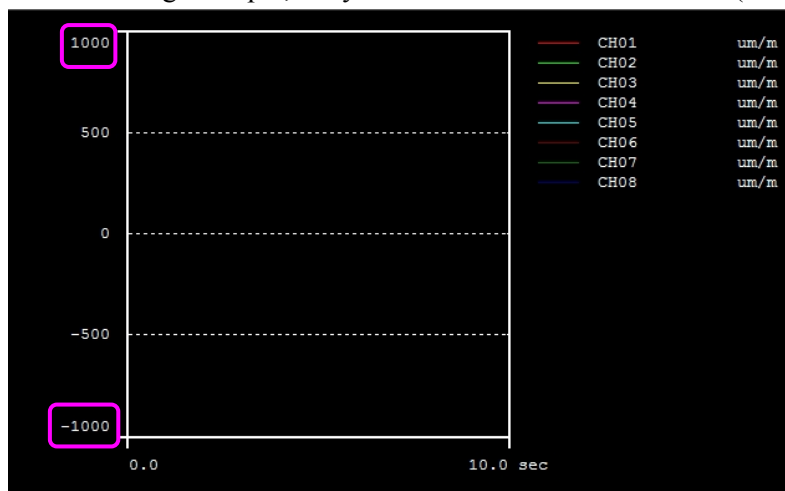
- (1) Click the **Reset Cond...** button.
- (2) The following message appears. Click the **Yes** button.



- (3) Change the conditions to the default conditions on the Set Display Condition... window.
In the following example, the y-axis scale is changed to the default conditions (-1000 and 1000).



- (4) Click the **OK** button to close the window.
- (5) The ELA-55A deletes the Graph (Registered default conditions) on the graph window menu.
- (6) Click The Y-Time Graph to open the Y-Time Graph based on the default conditions.
In the following example, the y-axis scale is default conditions (-1000 and 1000).



1 1 - 1 - 3 Graph windows

1 1 - 1 - 3 - 1 Y-Time graph

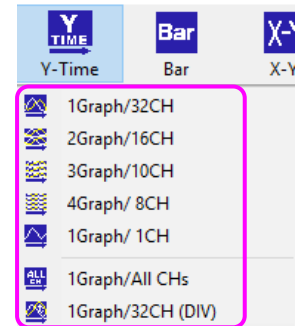
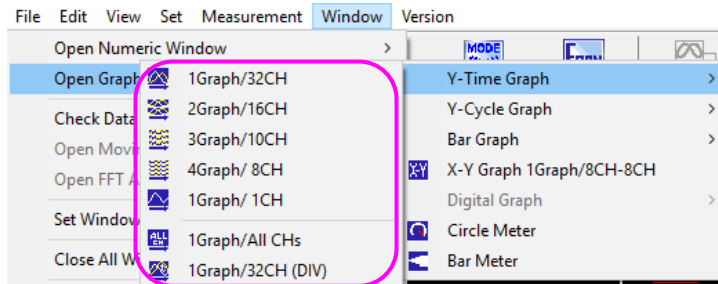
X-axis represents the time axis.

Single graph window is able to display maximum 32 channels.

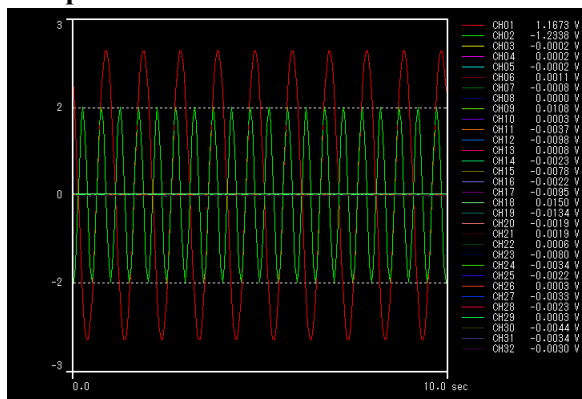
■ To display the Y-Time Graph

Open the Y-Time Graph window by any of the following.

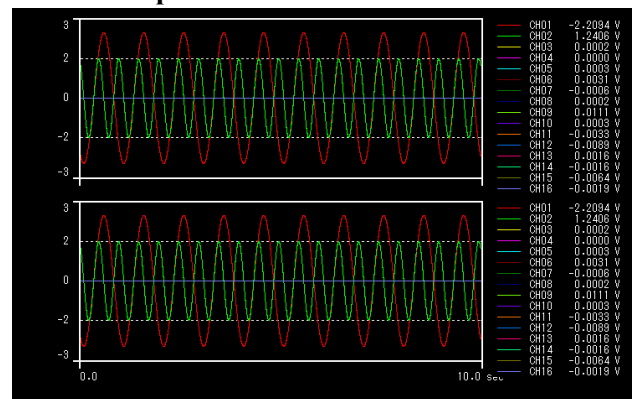
- Click the Window - Open Graph Window - Y-Time Graph.
- Click the **Y-Time** icon from the tool bar and click the target item on the pop-up-menu.



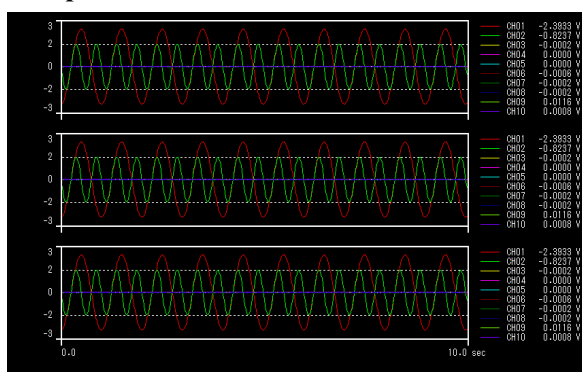
1Graph/32CH



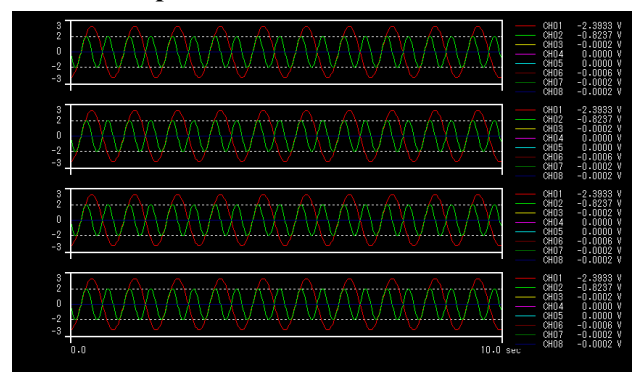
2Graph/16CH



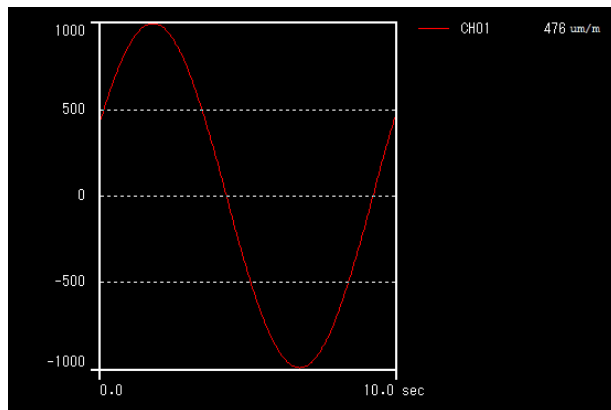
3Graph/10CH



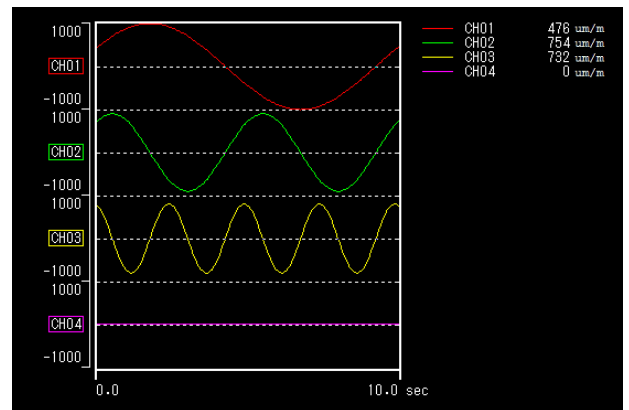
4Graph/8CH



1Graph/1CH



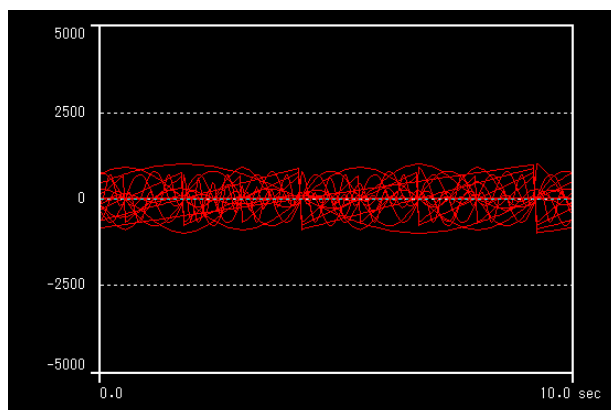
1Graph/16CH (DIV)



1Graph/All CHs

The 1Graph/All CHs is the time series graph which displays the all measuring channels in the same color.

The 1Graph/All CHs is designed to be used for checking whether the monitor data is exceeding the range or not.



■[General] tab

This section describes how to set the following [General] tab.

(1) Display data

Sets the number of graphs on the graph window and the number of channels on the graph.

Display Data	Graph Nos	Sets the number of graphs on the graph window. (Setting range: 1 to 10)
Graph Nos	1	
Number of data columns	1	Sets the number of data columns on the graph. (Setting range: 1 to 2)
Number of CHs / graph	16	Sets the number of channels to be displayed on one graph. (Setting range: 1 to 16/Graph Nos)

(2) X Axis Scale (sec)

Sets the scale value (sec), the number of divisions, and deci digits of the scale value on the x axis.

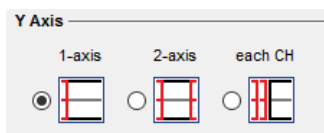
To set the each x-axis scale of multiple graphs, release a check mark from the check box next to the "Collectively set the x-axis scale of all graphs."

MEMO

On the Y-Time Graph on the MONITOR window, the minimum value of the x-axis scale value is 0 fixed.

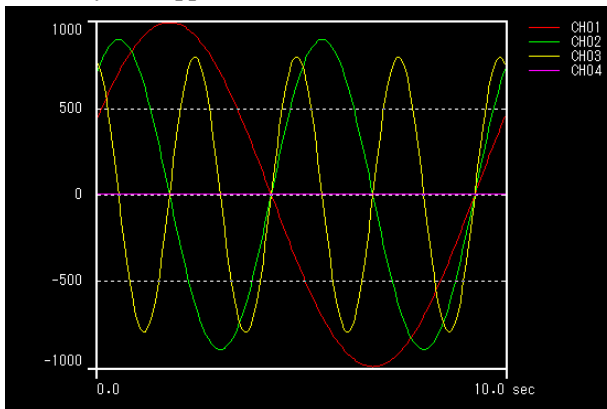
(3) Y Axis

Sets the number of y-axes on the graph.



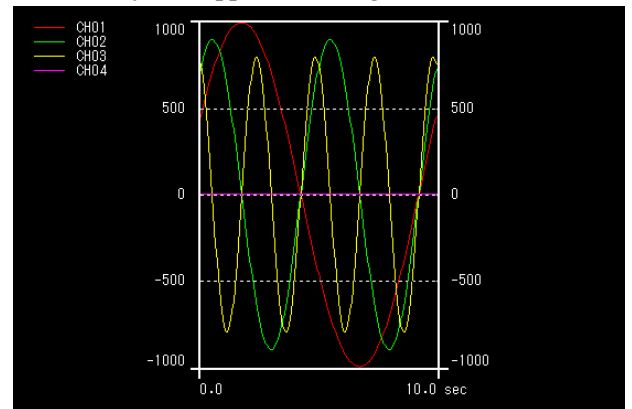
1-axis

The y-axis appears on the left side.



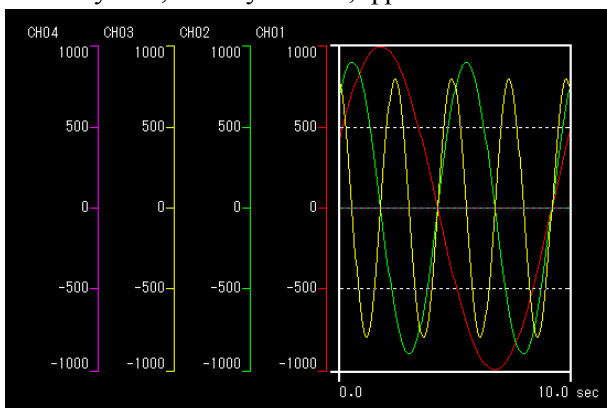
2-axis

The y axes appear on the right and left sides.



Each CH

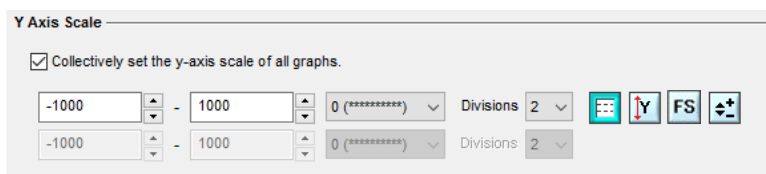
The y axes, of every channel, appear.



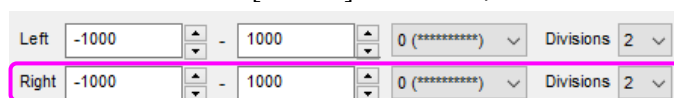
(4) Y Axis Scale

Sets the scale value, the number of divisions, and deci digits of the scale value on the y axis.

To set the each y-axis scale of multiple graphs, release a check mark from the check box next to the "Collectively set the y-axis scale of all graphs."



When the Y Axis on the [General] tab is 2-axis, the ELA-55A is able to set the y-axis on the right side as follows.



(5) Thinning

For details, see "1 1 - 1 - 2 - 1".

■[Graph] tab

This section describes how to set the following [Graph] tab.

The ELA-55A displays the [Graph] tabs for the number of graphs.

General Graph Details

Display Data

CH No.	Width	Color
CH01	1	Red
CH02	1	Green
CH03	1	Yellow
CH04	1	Magenta
CH05	1	Cyan
CH06	1	Brown
CH07	1	Dark Green
CH08	1	Dark Blue
CH09	1	Bright Green

Set CH

Clear CH

X Axis Scale (sec)

Set Auxiliary Lines... Label

Y Axis Scale

Set Auxiliary Lines... Label

(1) Display data

Sets the channels to be displayed, line color and line width on the graph.

--- on the CH No.: Hides the target graph line.

Set CH button: Sets the channels to be displayed automatically.

Clear CH button: The "---" appears on every CH No.

The Y Axis on the [General] tab is 1-axis.

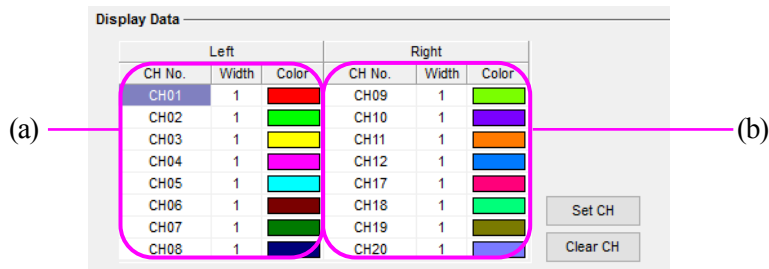
Display Data

CH No.	Width	Color
CH01	1	Red
CH02	1	Green
CH03	1	Yellow
CH04	1	Magenta
CH05	1	Cyan
CH06	1	Brown
CH07	1	Dark Green
CH08	1	Dark Blue
CH09	1	Bright Green

Set CH

Clear CH

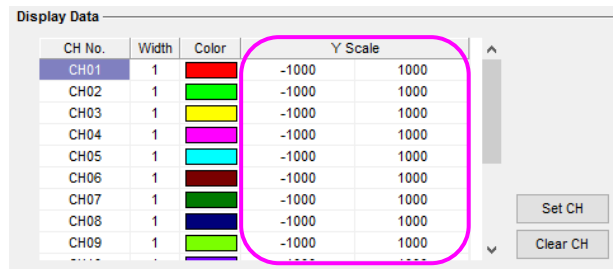
The Y Axis on the [General] tab is 2-axis.



- (a) For the y-axis on the left side
- (b) For the y-axis on the right side

The Y Axis on the [General] tab is each CH.

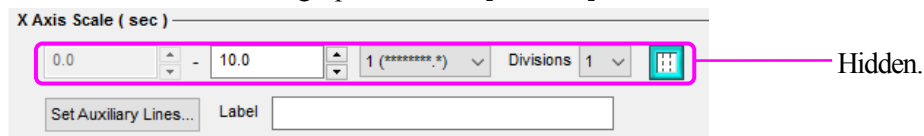
You are required to set the y-axis scale of each channel.



(2) X Axis Scale (sec)

Sets the scale value (sec), the number of divisions, and deci digits of the scale value on the x axis.

The following section is hidden when the check mark exists in the check box next to the “Collectively set the x-axis scale of all graphs.” on the [General] tab.



(3) Y Axis Scale

Sets the scale value, the number of divisions, and deci digits of the scale value on the y axis.

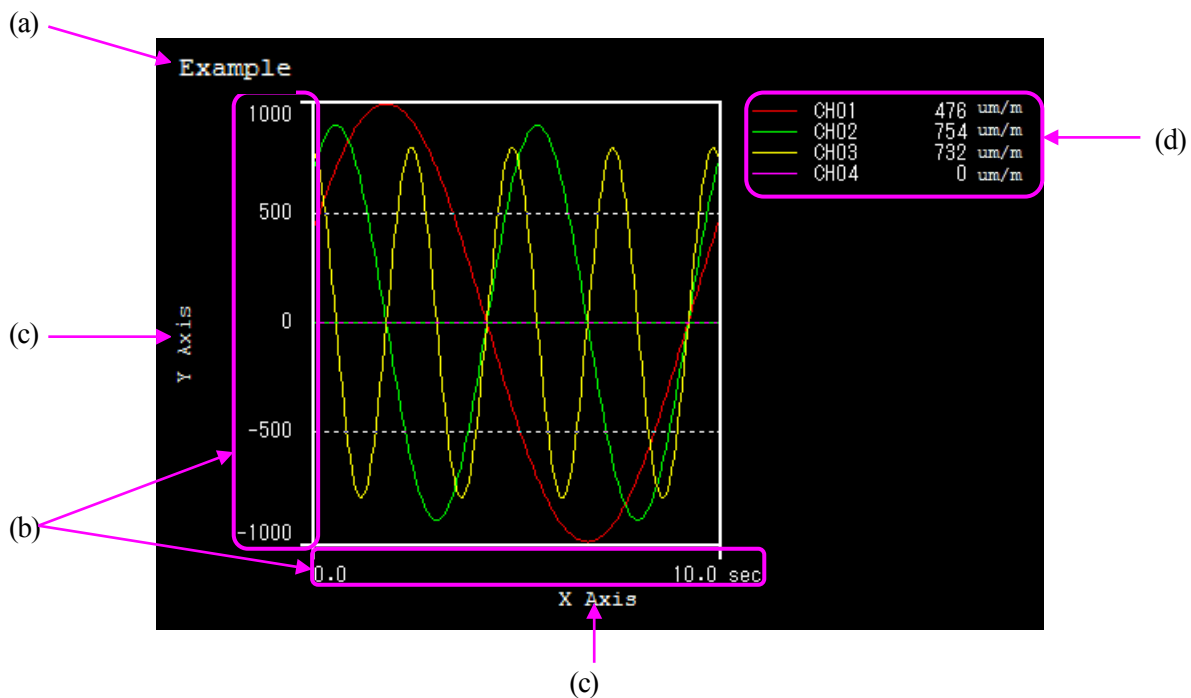
The following section is hidden when the check mark exists in the check box next to the “Collectively set the y-axis scale of all graphs.” on the [General] tab.



■[Details] tab

This section describes how to set the following [Details] tab.

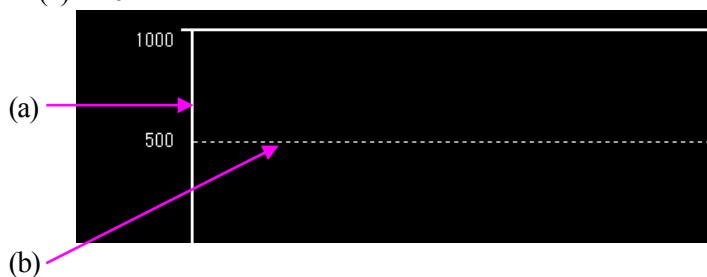
(1) Font



To set the fonts on the graph window, set them on the "Font" section.

Font			
	Font Name	Size	Color
(a) Title	Courier New	10	
(b) Scale	Courier New	10	
(c) Axis Label	Courier New	10	
(d) Legend	Courier New	10	

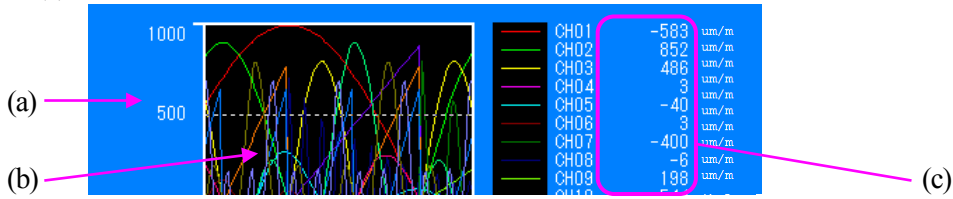
(2) Line



To set the lines on the graph window, set them on the "Line" section.

Line			
	Width	Style	Color
(a) Frame Line	2	Solid	
(b) Split Line	1	Dot	
Cursor	1	Solid	

(3) Color



To set the colors on the graph window, set them on the "Color" section.

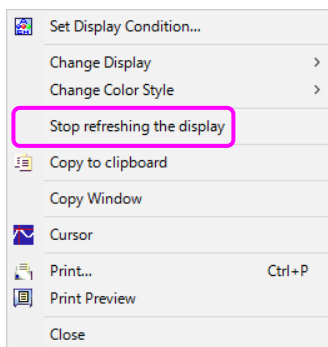


■ Stop refreshing the display

The Y-time graph is able to stop refreshing the display.

Right-click the Numeric windows/Graph windows to display the pop-up-menu.

Click the Stop refreshing the display on the pop-up-menu.



NOTE

- Only one window is able to stop refreshing the display.
- "1 Graph/All CHs" window cannot stop refreshing the display.

■Disp 24 Hour (Long Time)

When the settings satisfy below limitations, Y-Time graph can display data for 24 hours.

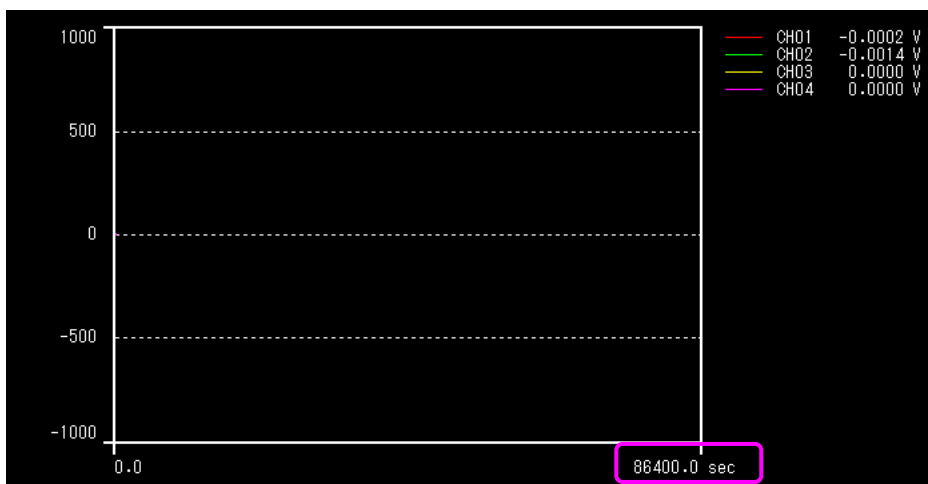
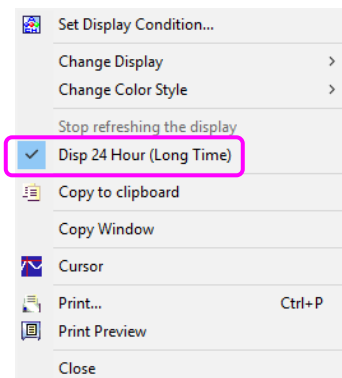
Limitations

- Sampling frequency is less than or equal 20 Hz.
- Sum of measurement channels (analog channel, arithmetic channel and CAN channel) is less than or equal 80.

Setting each conditions so that satisfy limitations, then right-click on the graph window to display the pop-up-menu.

Click the **Disp 24 Hour (Long Time)** on the pop-up-menu.

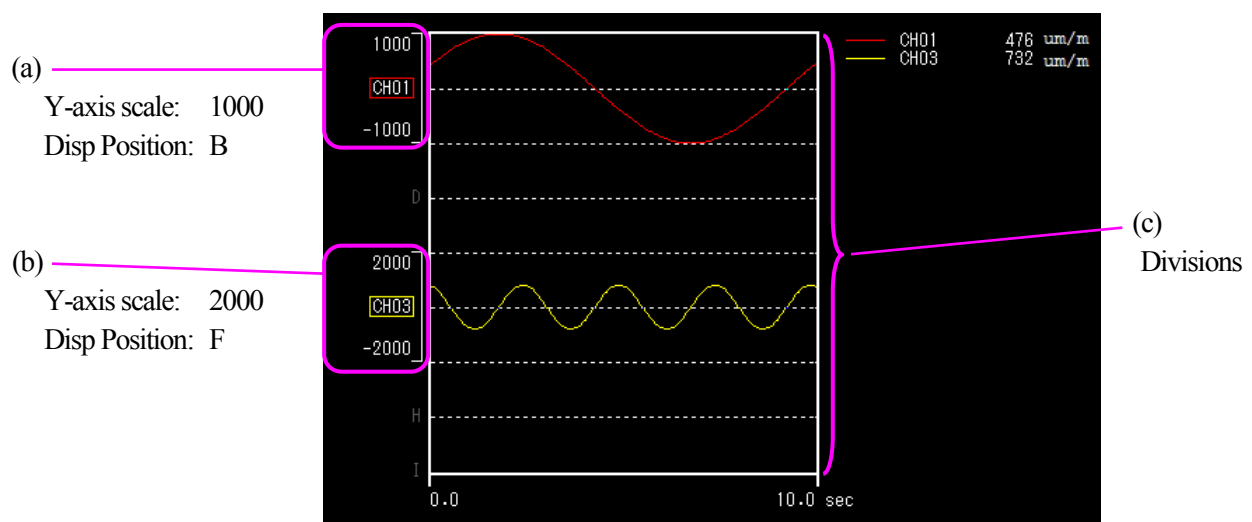
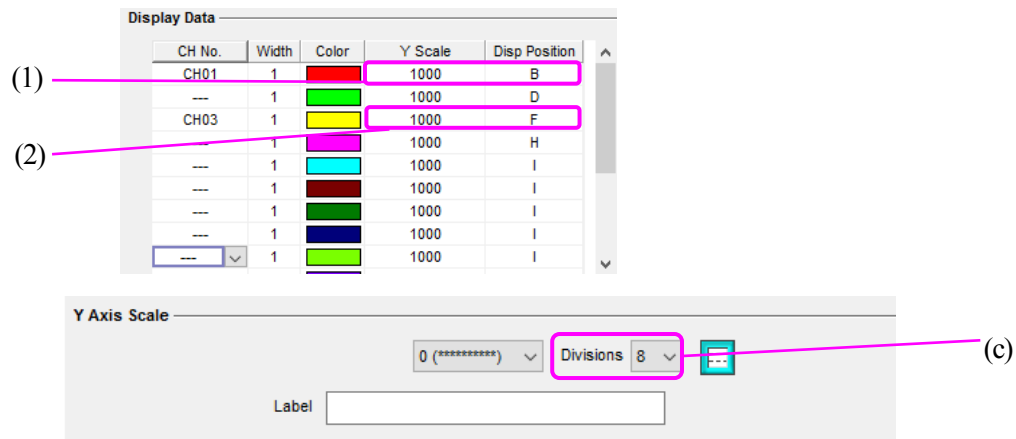
Then x-axis scale is able to display at most 24 hour (86400 sec).



1 1 - 1 - 3 - 2 Y-Time (DIV) graph

The Y-Time (DIV) Graph is the time series graph which is able to set the y-axis scale of each channel, by moving the ZERO point position (Disp Position) of channels to the arbitrary position on the y-axis grid line.

Set the ZERO point position (Disp Position) of channels and y-axis scale on the Set Display Condition... window - [Graph] tab - Display Data section.



1 1 - 1 - 3 - 3 Bar graph

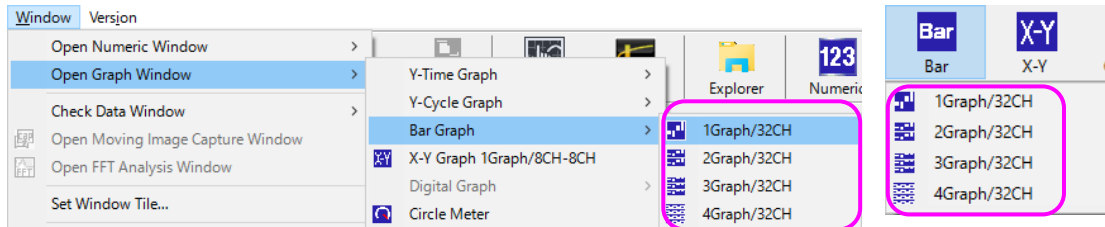
Displays the monitor data by using bars.

Single Bar Graph is able to display maximum 32 channels.

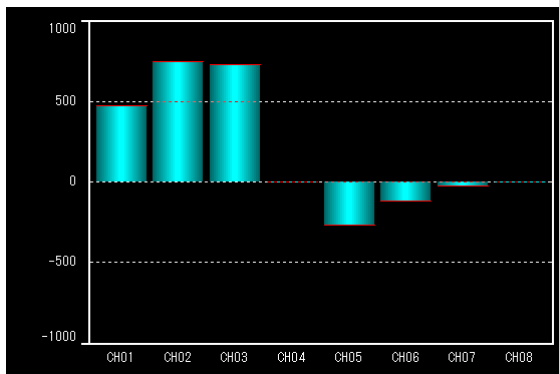
■To display the bar graph

Open the Bar Graph window by any of the following.

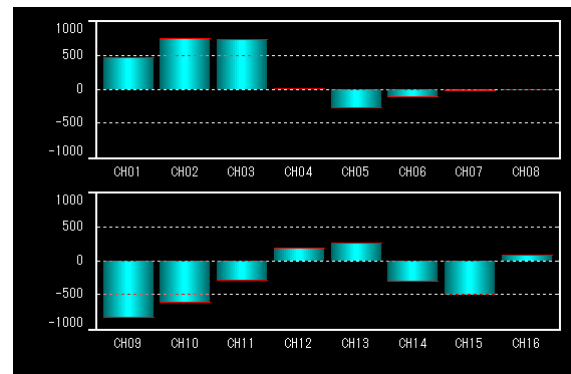
- Click the Window - Open Graph Window - Bar Graph.
- Click the  icon from the tool bar and click the target item on the pop-up-menu



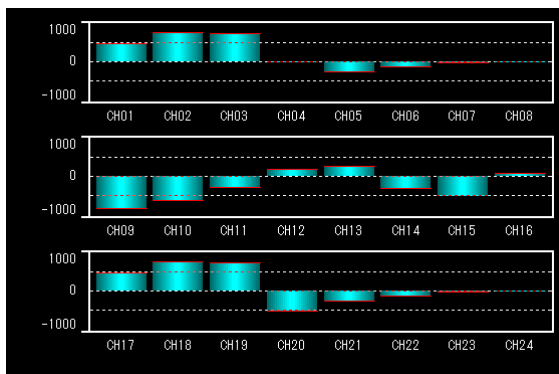
1Graph/32CH



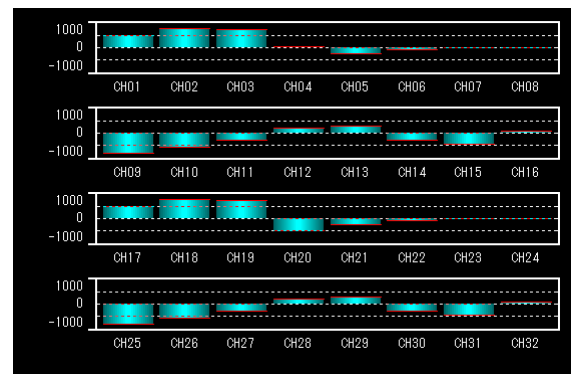
2Graph/32CH



3Graph/32CH



4Graph/32CH



■[Graph] tab

This section describes how to set the following [Graph] tab.
The ELA-55A displays the [Graph] tabs for the number of graphs.

Graph Details

Display Data

CH01	---	---	---
CH02	---	---	---
CH03	---	---	---
CH04	---	---	---
CH05	---	---	---
CH06	---	---	---
CH07	---	---	---
CH08	---	---	---

Set CH

Clear CH

Y Axis Scale

-1000 - 1000 0 (*****)

Divisions 2

Set Auxiliary Lines... Label

☒ With gradation.

☐ Display the peak values (maximum and minimum values).

(1) Display data

- Sets the channels to be displayed on the graph.
- on the CH No.: Hides the target graph line.
- Set CH button: Sets the channels to be displayed automatically.
- Clear CH button: The "---" appears on every CH No.

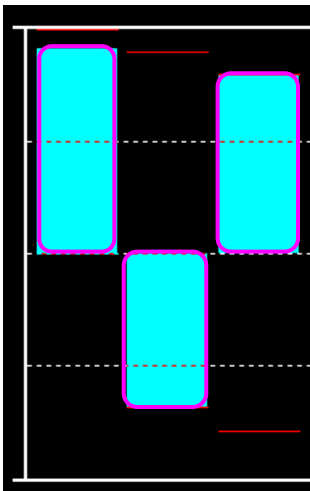
(2) Y Axis Scale

Sets the scale value, the number of divisions, and deci digits of the scale value on the y axis.

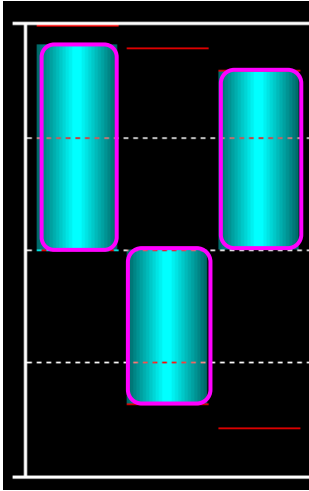
(3) Gradation

To display the bar graph with gradation color, put a check mark to the check box next to the "With gradation."

Without gradation



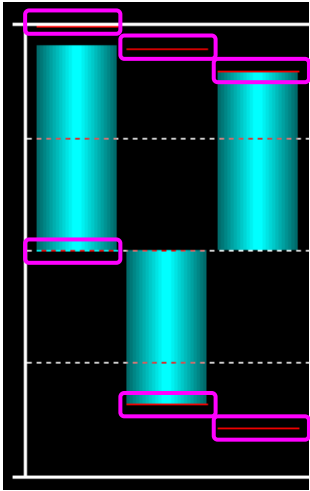
With gradation



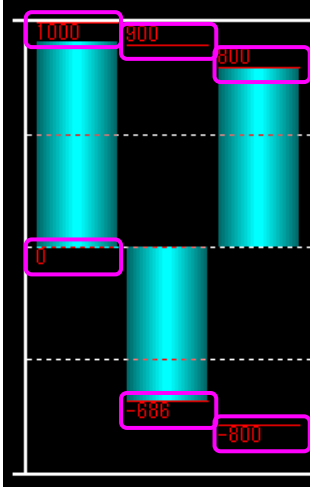
(4) Peak values (maximum and minimum values)

To display the peak value (maximum value), above the peak hold line, and peak value (minimum value), below the peak hold line, put a check mark to the check box next to the "Displays the peak values (maximum and minimum values)."

Without the peak values
(maximum and minimum values)



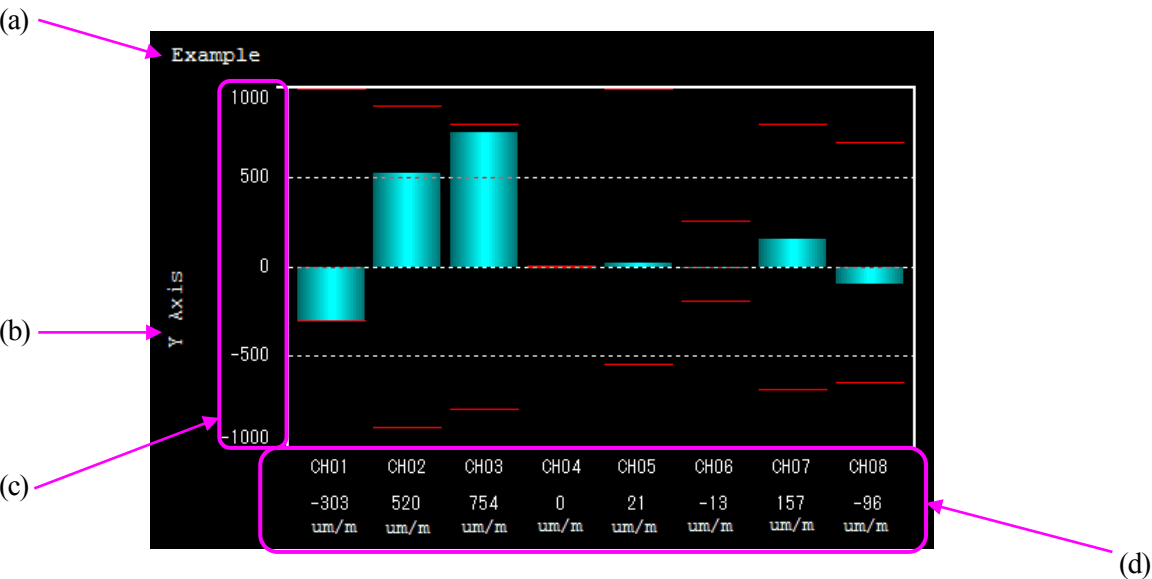
With the peak values
(maximum and minimum values)



■[Details] tab

This section describes how to set the following [Details] tab.

(1) Font



To set the fonts on the graph window, set them on the "Font" section.

(a)

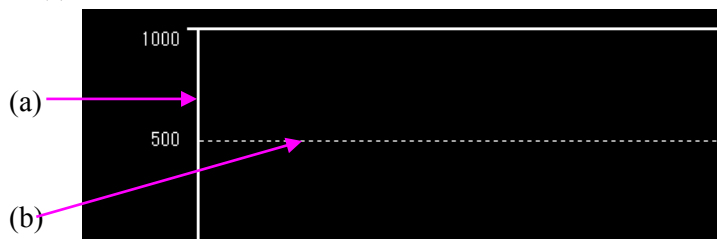
(b)

(c)

(d)

	Font Name	Size	Color
Title	Courier New	10	
Scale	Courier New	10	
Axis Label	Courier New	10	
Legend	Courier New	10	

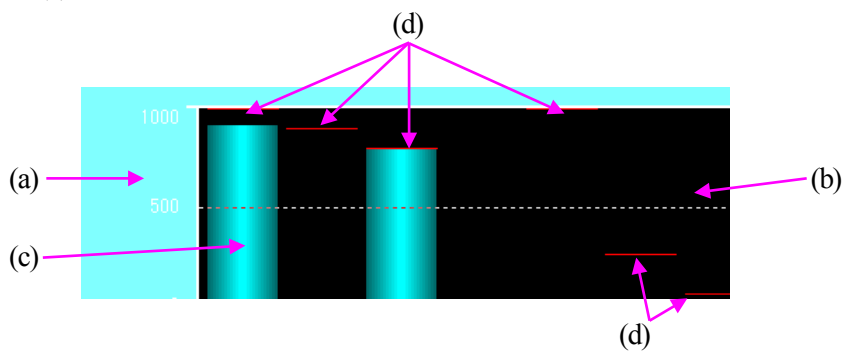
(2) Line



To set the lines on the graph window, set them on the "Line" section.

Line			
	Width	Style	Color
(a) Frame Line	2	Solid	
(b) Split Line	1	Dot	

(3) Color

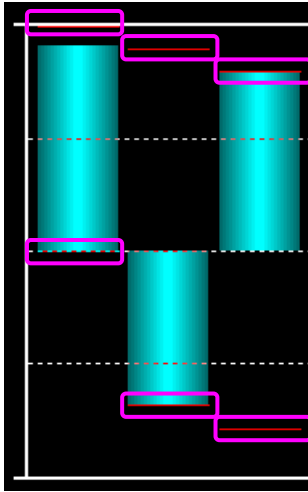


To set the colors on the graph window, set them on the "Color" section.

Color	
(a) Window Background	
(b) Graph Background	
(c) Bar	
(d) Bar Peak Hold Line	

■Peak hold

Holds the peak values (maximum and minimum values) of the monitor data and displays the peak hold lines of the peak values (maximum and minimum values).

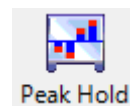
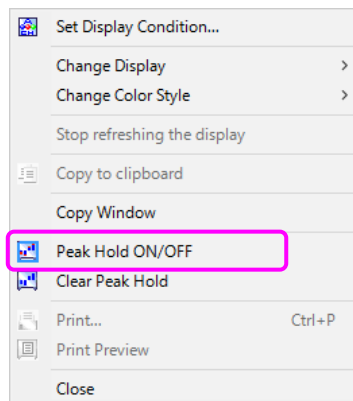
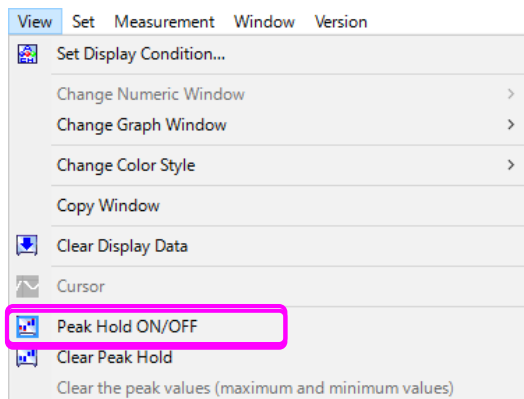


MEMO

The peak values (maximum and minimum values) indicate the maximum value and minimum value, after opening the graph window.

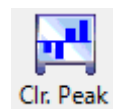
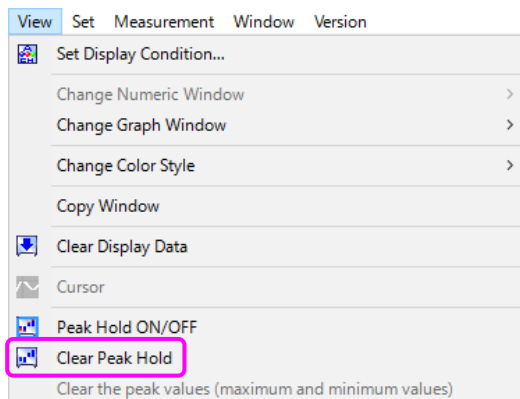
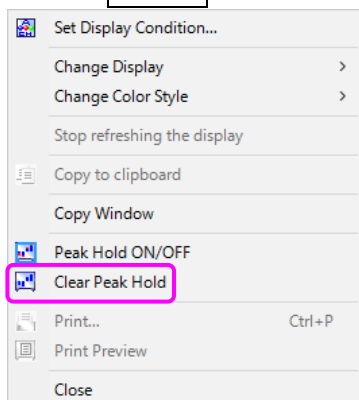
ON/OFF the peak hold value by any of the following.

- Click the View - Peak Hold ON/OFF.
- Right-click the Graph windows to display the pop-up-menu.
Click the **Peak Hold ON/OFF** on the pop-up-menu.
- Click the **Peak Hold** icon from the tool bar.



Clear the peak hold value by any of the following.

- Click the View - Clear Peak Hold.
- Right-click the Graph windows to display the pop-up-menu.
Click the **Clear Peak Hold** on the pop-up-menu.
- Click the **Clr. Peak** icon from the tool bar.



MEMO

- The ELA-55A clears the peak hold automatically when start monitoring data.
- The ELA-55A is able to clear the peak hold while monitoring data and while recording data.

1 1 - 1 - 3 - 4 X-Y graph

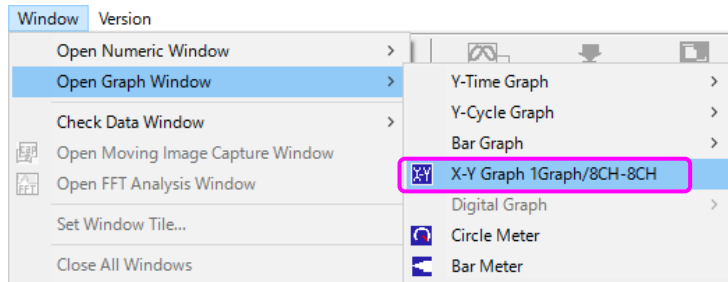
Relative graph that displays the monitor data on x-axis and y-axis.

Single graph window is able to display maximum 8 pairs (x-axis: 8 channels, y-axis: 8 channels).

■ To display the X-Y Graph

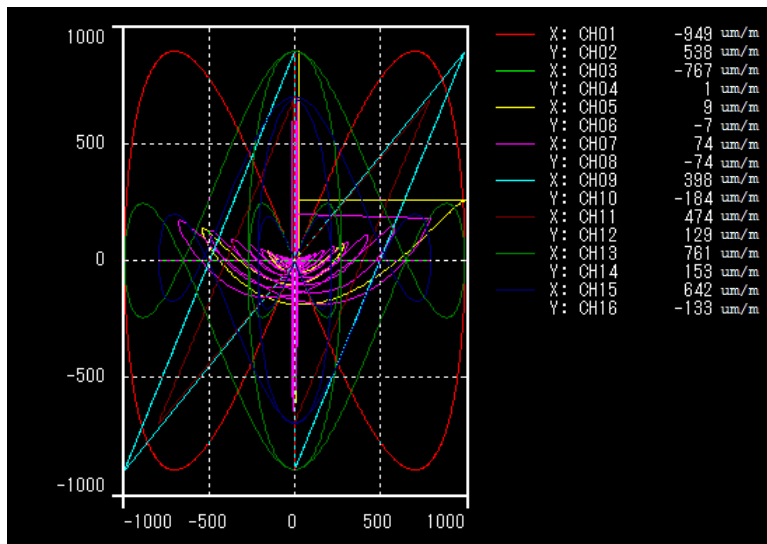
Open the X-Y Graph window by any of the following.

- Click the Window - Open Graph Window - X-Y Graph 1 Graph/8CH-8CH.
- Click the  icon from the tool bar.



X-Y Graph

c



■[Graph] tab

This section describes how to set the following [Graph] tab.

The screenshot shows the [Graph] tab interface with three main sections:

- Display Data:** A table with columns X-CH No., Y-CH No., Width, and Color. The first row shows CH01, CH02, 1, and a red color swatch. Subsequent rows show CH03, CH04, CH05, CH06, CH07, CH08, and then three rows of dashes (---) for X-CH No., each with a different color swatch. To the right of the table are buttons for "Set CH" and "Clear CH".
- X Axis Scale:** Includes input fields for scale values (-1000 to 1000), a dropdown for "0 (*****)", a "Divisions" dropdown set to 2, and icons for grid, X-axis, FS, and zoom. Below are buttons for "Set Auxiliary Lines..." and a "Label" input field.
- Y Axis Scale:** Similar to the X Axis Scale, with input fields, a dropdown, a "Divisions" dropdown set to 2, and icons for grid, Y-axis, FS, and zoom. Below are buttons for "Set Auxiliary Lines..." and a "Label" input field.

(1) Display data

Sets the channels to be displayed, line color and line width on the graph.

--- on the X-CH No.: Hides the target graph line.

--- on the Y-CH No.: Hides the target graph line.

Set CH button: Sets the channels to be displayed automatically.

Clear CH button: The "---" appears on every CH No.

(2) X Axis Scale

Sets the scale value, the number of divisions, and deci digits of the scale value on the x axis.

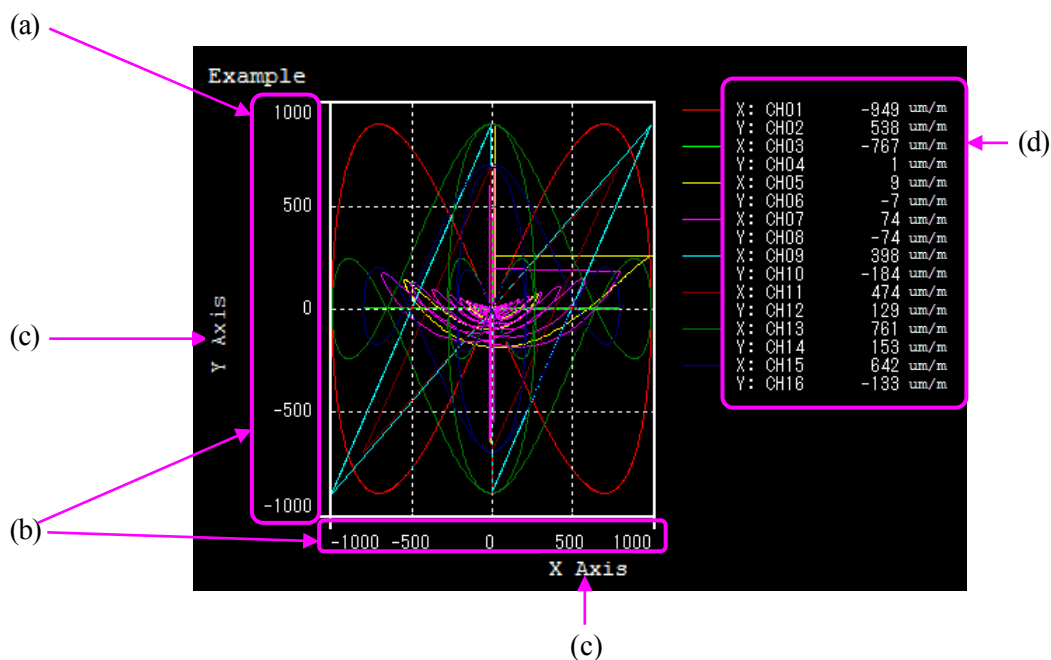
(3) Y Axis Scale

Sets the scale value, the number of divisions, and deci digits of the scale value on the y axis.

■[Details] tab

This section describes how to set the following [Details] tab.

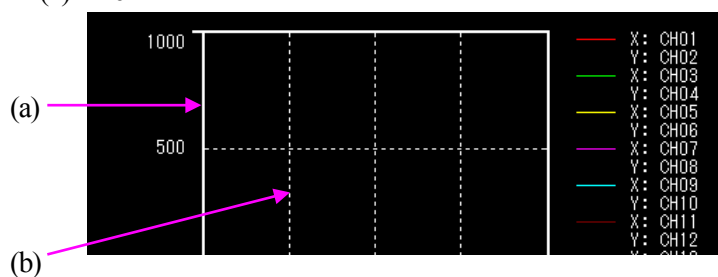
(1) Font



To set the fonts on the graph window, set them on the "Font" section.

Font			
	Font Name	Size	Color
(a) Title	Courier New	10	
(b) Scale	Courier New	10	
(c) Axis Label	Courier New	10	
(d) Legend	Courier New	10	

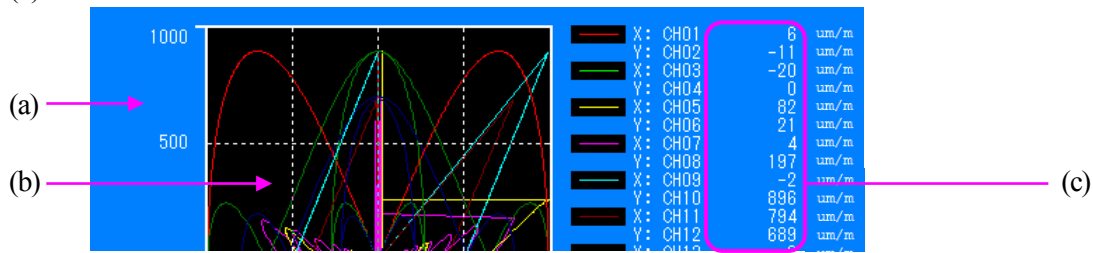
(2) Line



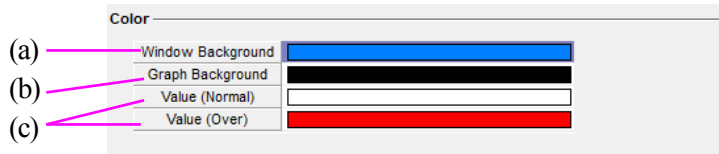
To set the lines on the graph window, set them on the "Line" section.

Line			
	Width	Style	Color
(a) Frame Line	2	Solid	
(b) Split Line	1	Dot	
Cursor	1	Solid	

(3) Color



To set the colors on the graph window, set them on the "Color" section.



1 1 - 1 - 3 - 5 Digital graph

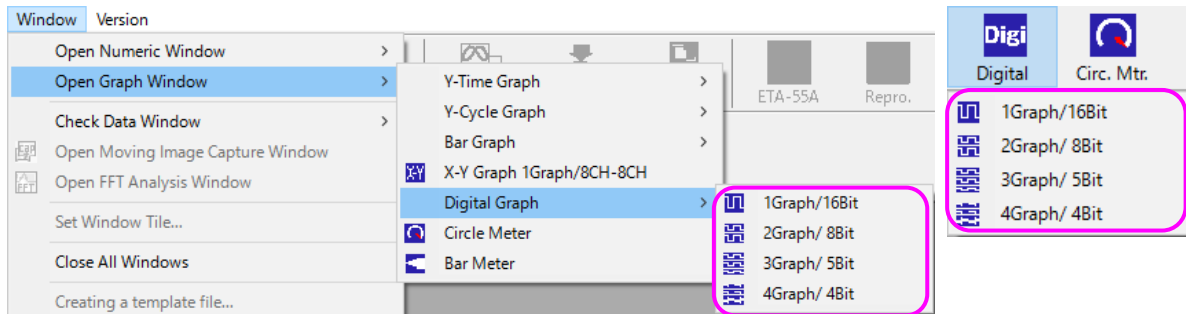
Displays the digital data in binary digit system.

Single graph window is able to display maximum 16 bits.

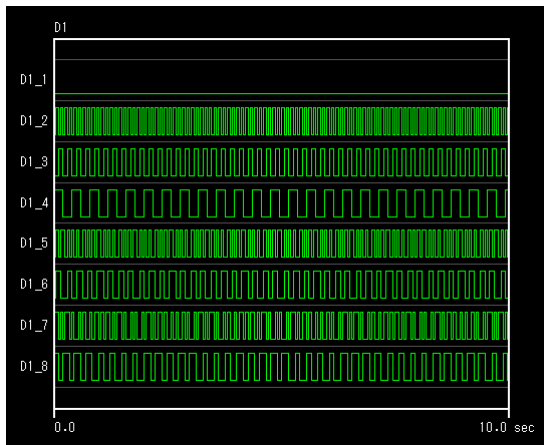
■To display the Digital Graph

Open the Digital Graph window by any of the following.

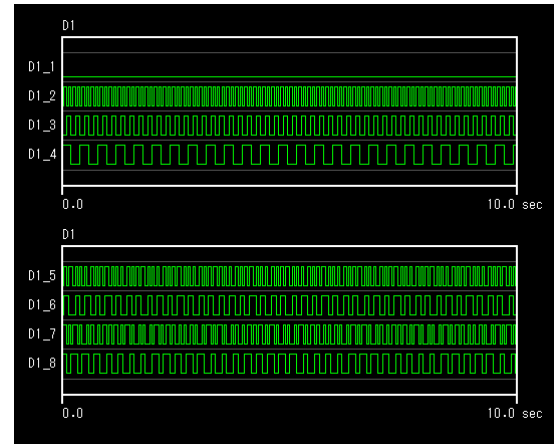
- Click the Window - Open Graph Window - Digital Graph.
- Click the **Digital** icon from the tool bar and click the target item on the pop-up-menu.



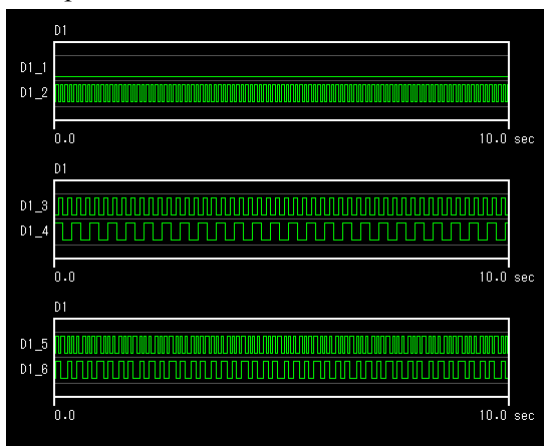
1Graph/16Bit



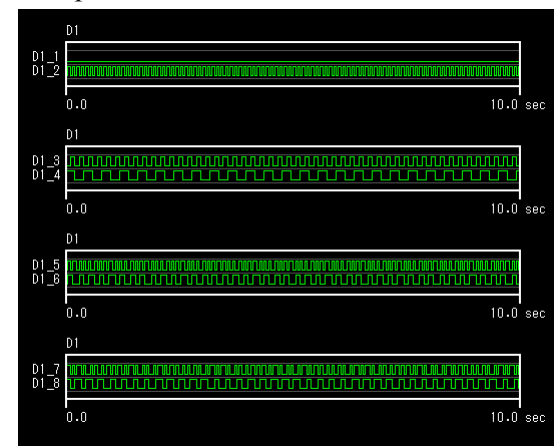
2Graph/8Bit



3Graph/5Bit



4Graph/4Bit



■[General] tab

For details, see "1 1 - 1 - 2 - 1".

■[Graph] tab

This section describes how to set the following [Graph] tab.

The screenshot shows the [Graph] tab interface with three main sections:

- Display Data:** A dropdown menu showing 'D1'.
- Bit Data:** A table with 8 rows (D1_1 to D1_8) and 2 columns. The first column contains bit identifiers, and the second column contains dashes ('---'). To the right of the table are two buttons: 'Set Bit' and 'Clear Bit'.
- X Axis Scale (sec):** A section with input fields for '0.0' and '10.0', a dropdown menu showing '1 (*****.*)', a 'Divisions' dropdown showing '1', and a grid icon. Below these is a 'Set Auxiliary Lines...' button and a 'Label' input field.

(1) Display data

Sets the channels to be displayed on the graph.

(2) Bit Data

Sets the target bit to be displayed on the graph.

---: Hides the target graph line.

Set bit button: Sets the bits to be displayed automatically.

Clear bit button: The "---" appears on every bit.

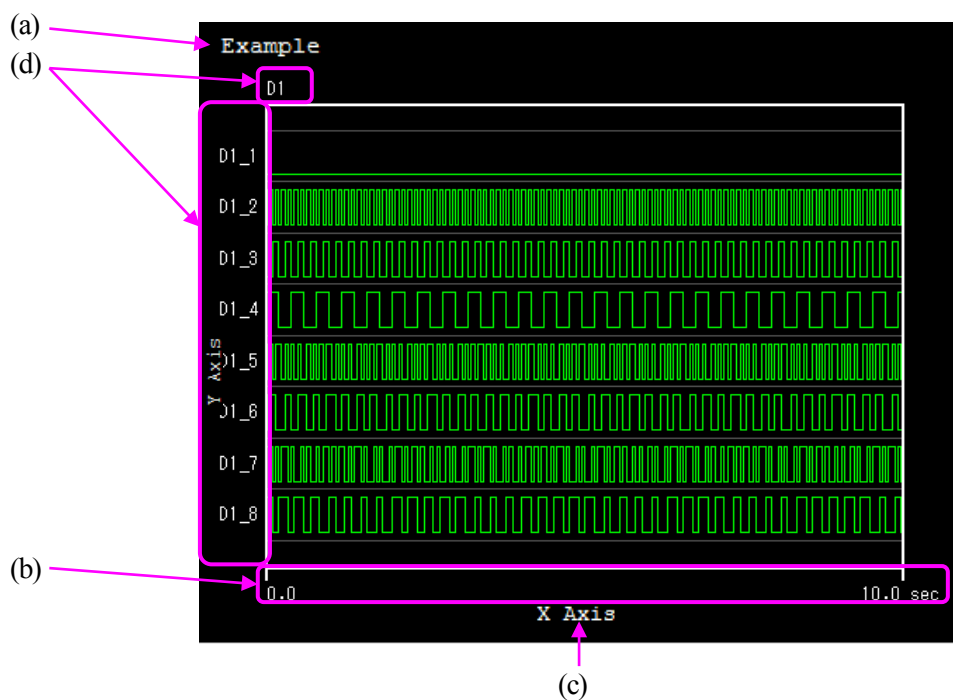
(3) X Axis Scale (sec)

Sets the scale value (sec), the number of divisions, and deci digits of the scale value on the x axis.

■[Details] tab

This section describes how to set the following [Details] tab.

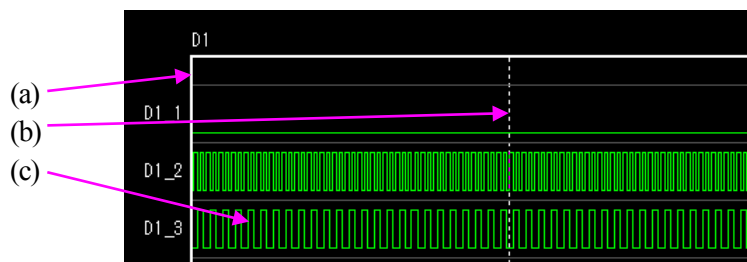
(1) Font



To set the fonts on the graph window, set them on the "Font" section.

Font				
	Font Name	Size	Color	
(a)	Title	Courier New	10	
(b)	Scale	Courier New	10	
(c)	Axis Label	Courier New	10	
(d)	Legend	Courier New	10	

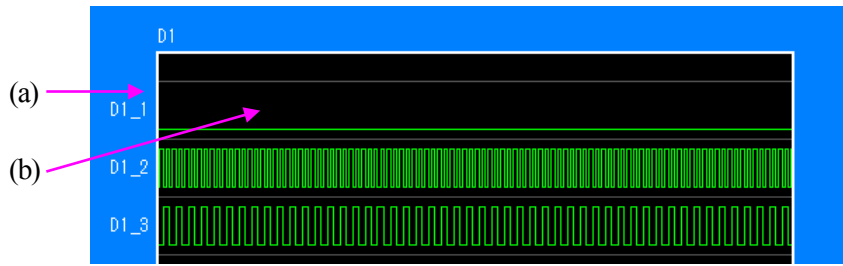
(2) Line



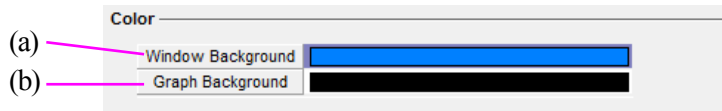
To set the lines on the graph window, set them on the "Line" section.

Line				
	Width	Style	Color	
(a)	Frame Line	2	Solid	
(b)	Split Line	1	Dot	
(c)	Bit Data	1	Solid	

(3) Color



To set the colors on the graph window, set them on the "Color" section.



1 1 - 1 - 3 - 6 Circular meter

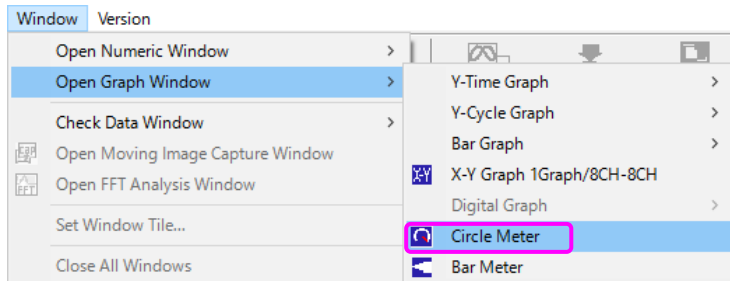
Displays the monitor data by using a circular chart.

The number of channels to be displayed is maximum 1 channel.

■To display the circular meter

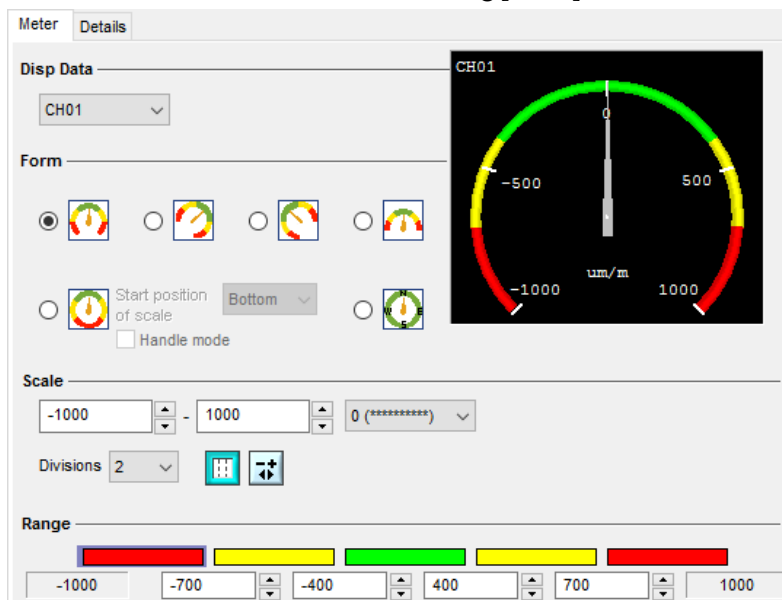
Open the Circular Meter window by any of the following.

- Click the Window - Open Graph Window -Circle Meter
- Click the **Circ. Mtr** icon from the tool bar



■[Meter] tab

This section describes how to set the following [Meter] tab.



(1) Display data

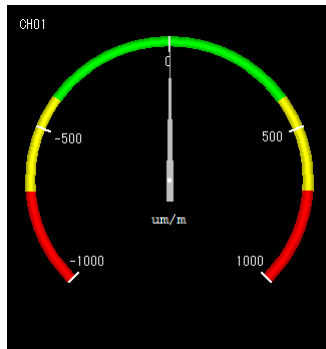
Select the channel to be displayed.

(2) Form

Select the Circular Meter form.

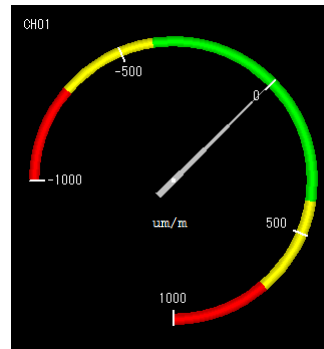
Pattern 1

($-135^{\circ} \sim 135^{\circ}$)



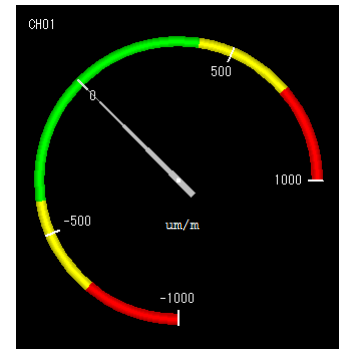
Pattern 2

($-90^{\circ} \sim 180^{\circ}$)



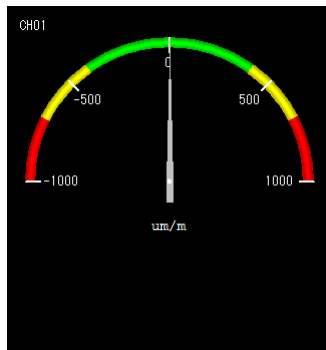
Pattern 3

($-180^{\circ} \sim 90^{\circ}$)



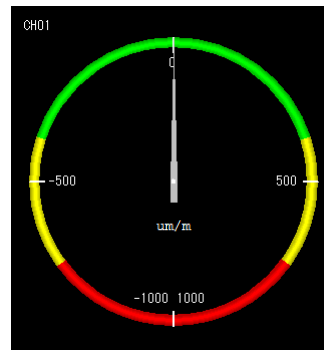
Pattern 4

($-90^{\circ} \sim 90^{\circ}$)

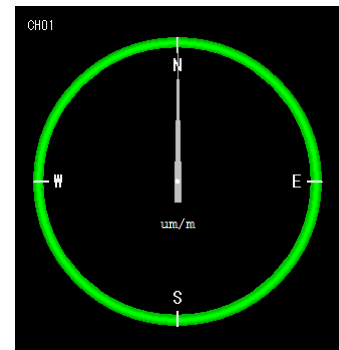


360° mode

($-180^{\circ} \sim 180^{\circ}$)



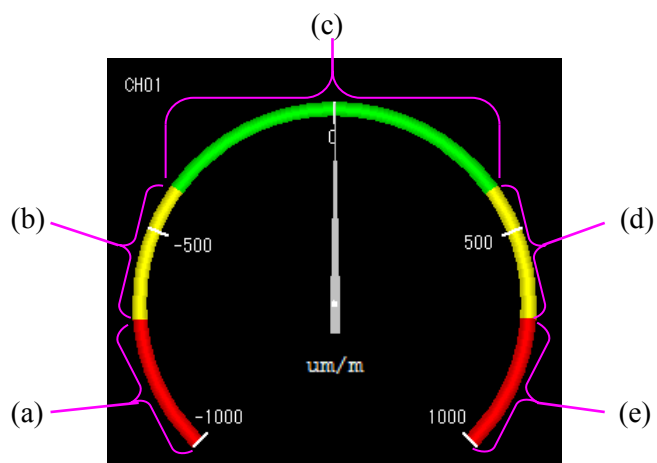
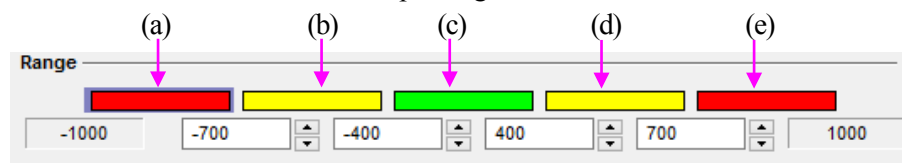
Compass mode



(3) Range

Select the colors and scale values on the Circular Meter.

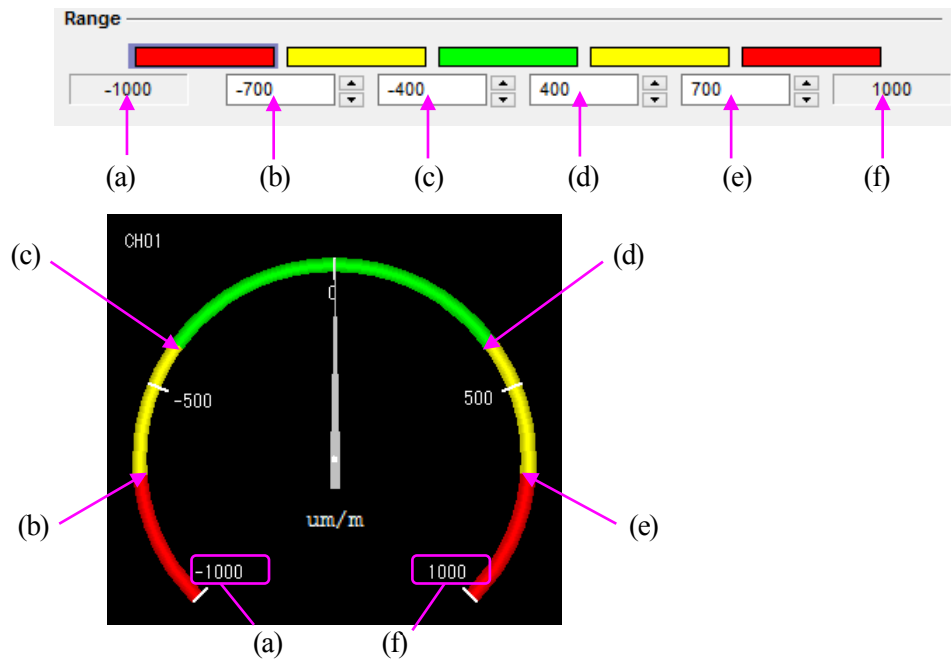
The colors and Circular Meter are corresponding as follows.



Double-click the target box to display the Color window.

Select the target item from the Color window.

The scale values and Circular Meter are corresponding as follows.



To change the scale values, input the numeric values.

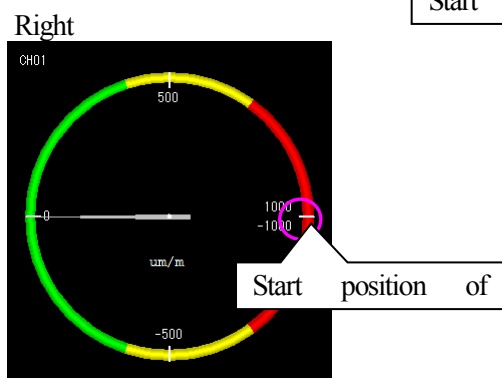
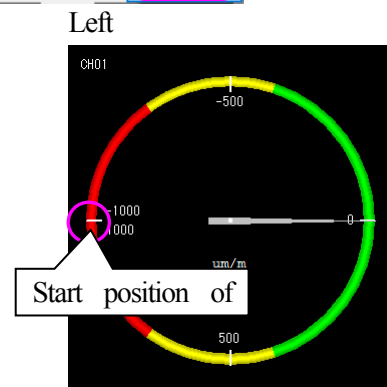
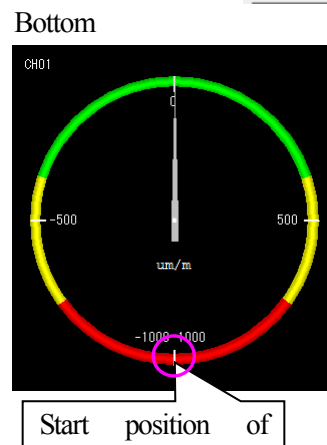
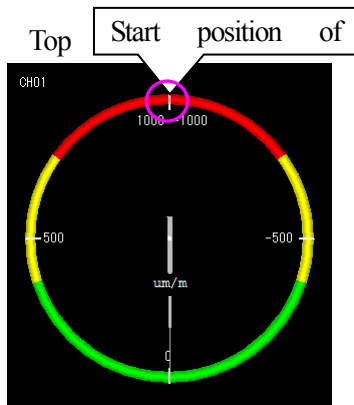
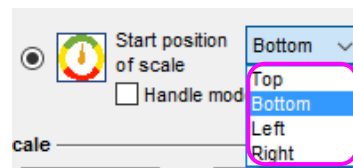
Note that every scale value should be larger than the scale value, located on the left side.

■ To set the 360° mode

This section describes how to set the 360° mode.

(1) Start position of scale

Select the Start position of scale from the right list.
Top/Bottom/Right/Left



(2) Handel mode

The Handel mode is a useful function for displaying the steering angle.

To display the Circular Meter in the handle mode, put a check mark to the check box next to the "Handle mode."

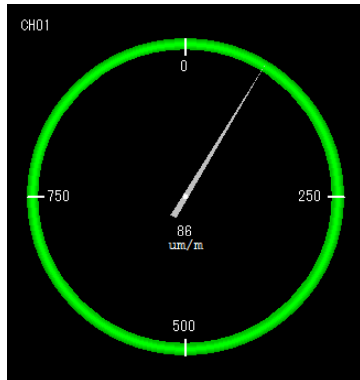
The Handle mode changes the scales automatically after the monitor data exceeds the scale range.

[Example]

Suppose the Circular Meter is as follows.

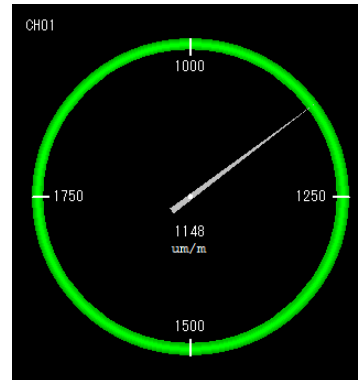
Start position of scale:	Top
Scale values:	0 to 1000
Divisions:	4

0 < Monitor data (86) < 1000



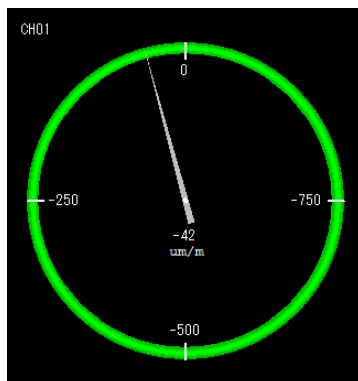
Scale values: "0 to 1000"

1000 < Monitor data (1148) < 2000



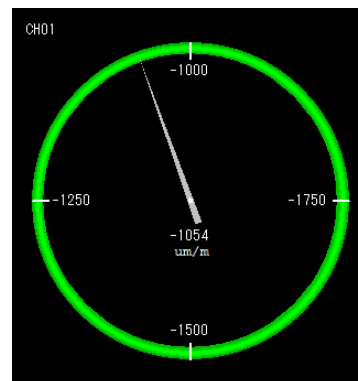
Scale values: "1000 to 2000"

-1000 < Monitor data (-42) < 0



Scale values: "-1000 to 0"

-2000 < Monitor data (-1054) < -1000



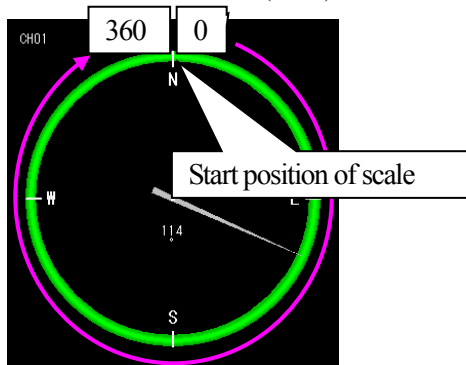
Scale values "-2000 to -1000"

(3) Compass mode

The Compass mode is an useful function for displaying the bearing data.

The Compass mode indicates 0° (North), 90° (East), 180° (South), and 270° (West).

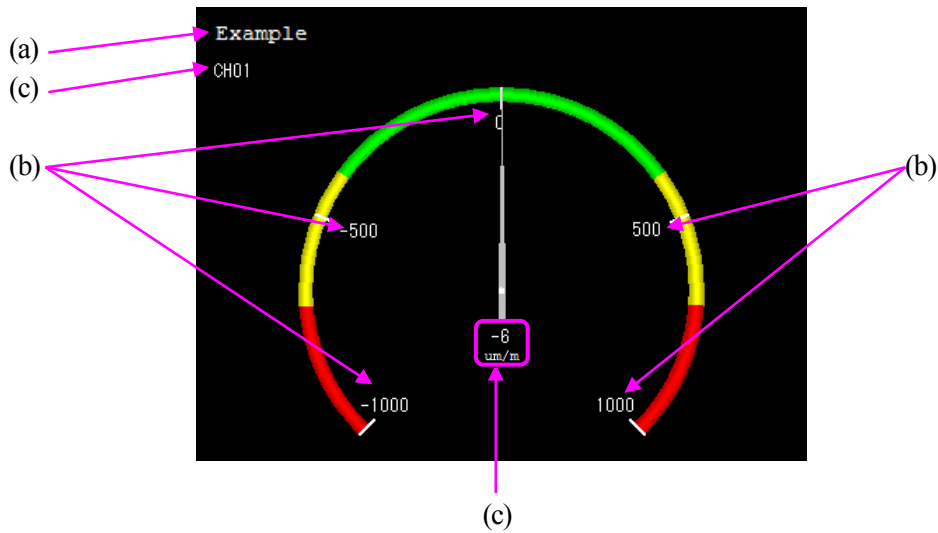
The scale values are 0 to 360 (fixed).



■[Details] tab

This section describes how to set the following [Details] tab.

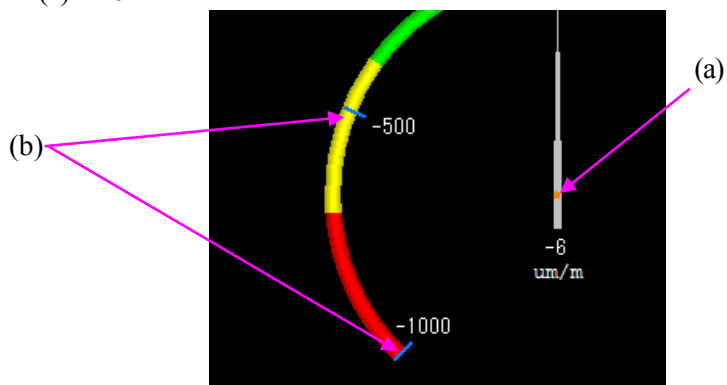
(1) Font



To set the fonts on the graph window, set them on the "Font" section.

Font			
	Font Name	Size	Color
(a) Title	Courier New	10	
(b) Scale	Courier New	10	
(c) Legend	Courier New	10	

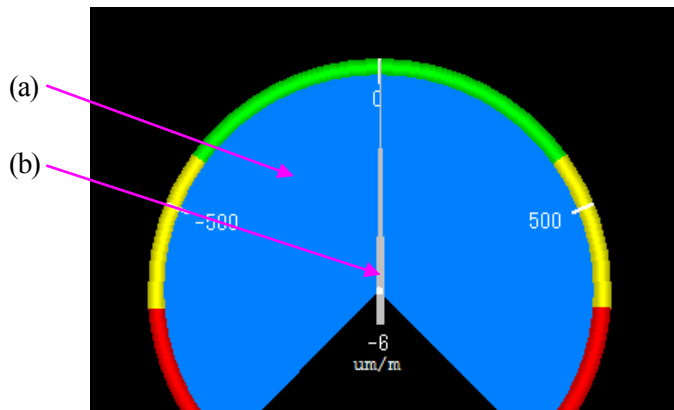
(2) Line



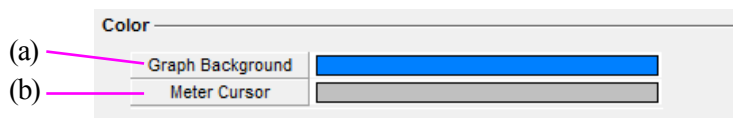
To set the lines on the graph window, set them on the "Line" section.

Line			
	Width	Style	Color
(a) Frame Line	2	Solid	
(b) Split Line	2	Solid	

(3) Color



To set the colors on the graph window, set them on the "Color" section.



1 1 - 1 - 3 - 7 Bar meter

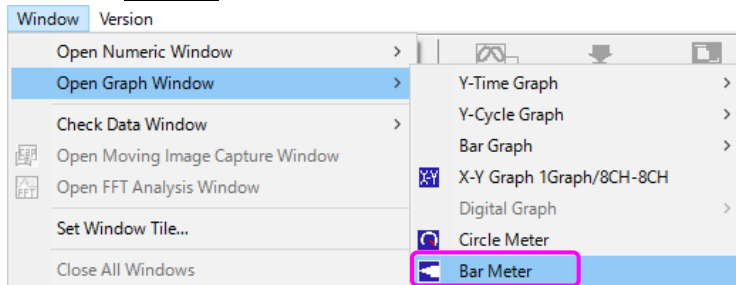
Displays the monitor data by using bar charts.

The number of channels to be displayed is maximum 1 channel.

■To display the Bar Meter

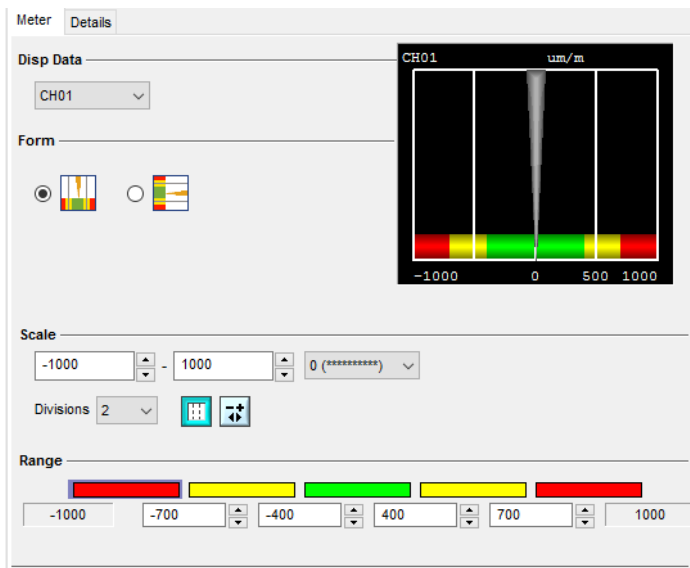
Open the Bar Meter window by any of the following.

- Click the Window - Open Graph Window - Bar Meter.
- Click the **Bar Mtr.** icon from the tool bar.



■[Meter] tab

This section describes how to set the following [Meter] tab.

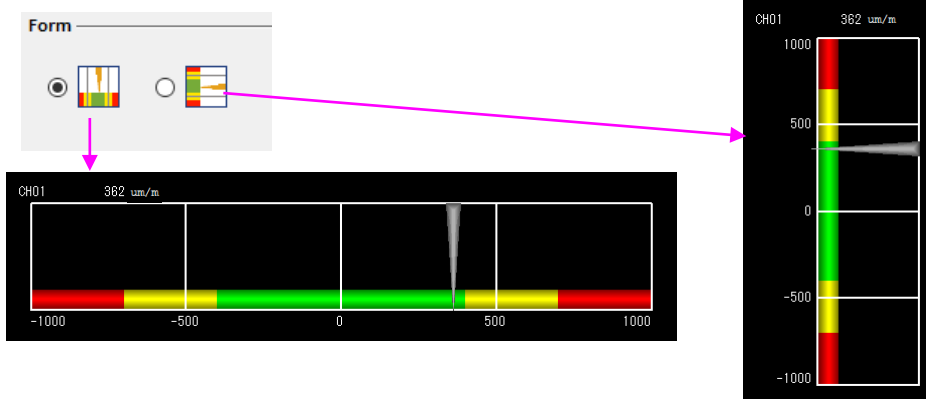


(1) Display data

Select the channel to be displayed.

(2) Form

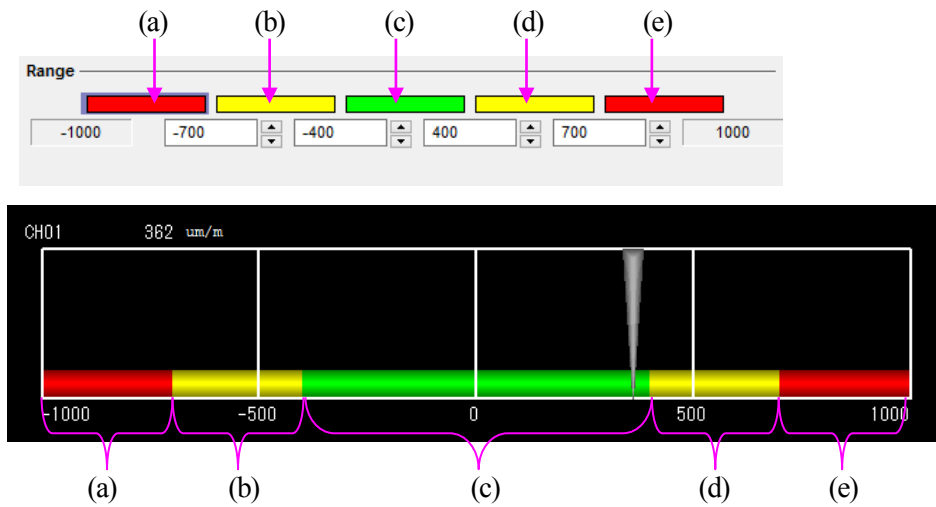
Select the Bar Meter form.



(3) Range

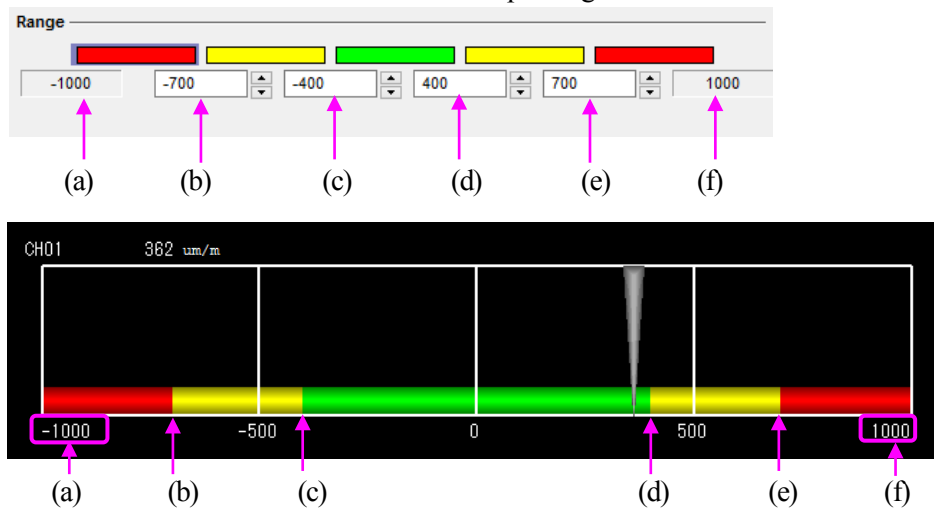
Select the colors and scale values on the Circular Meter.

The colors and Circular Meter are corresponding as follows.



Double-click the target box to display the Color window. Select the target item from the Color window.

The scale values and Circular Meter are corresponding as follows.



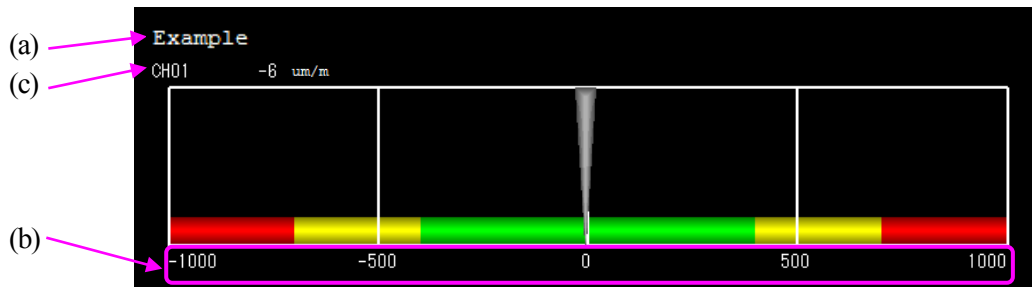
To change the scale values, input the numeric values.

Note that every scale value should be larger than the scale value, located on the left side.

■[Details] tab

This section describes how to set the following [Details] tab.

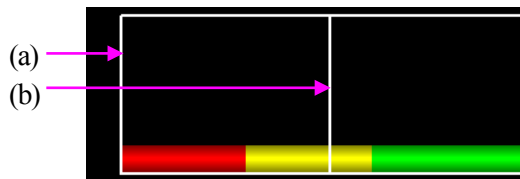
(1) Font



To set the fonts on the graph window, set them on the "Font" section.

Font			
	Font Name	Size	Color
(a) Title	Courier New	10	
(b) Scale	Courier New	10	
(c) Legend	Courier New	10	

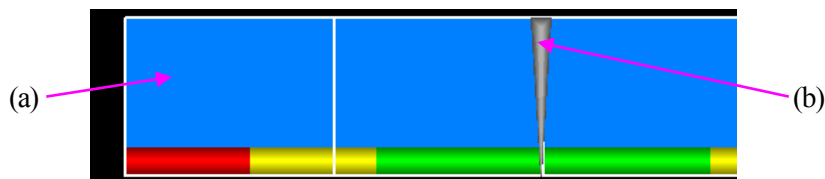
(2) Line



To set the lines on the graph window, set them on the "Line" section.

Line			
	Width	Style	Color
(a) Frame Line	2	Solid	
(b) Split Line	2	Solid	

(3) Color



To set the colors on the graph window, set them on the "Color" section.

Color	
(a) Graph Background	
(b) Meter Cursor	

1 1 - 1 - 4 Numeric windows

1 1 - 1 - 4 - 1 Monitor data

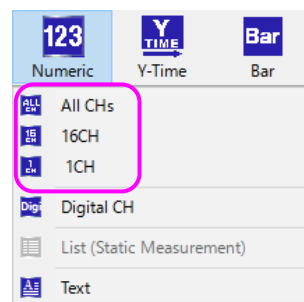
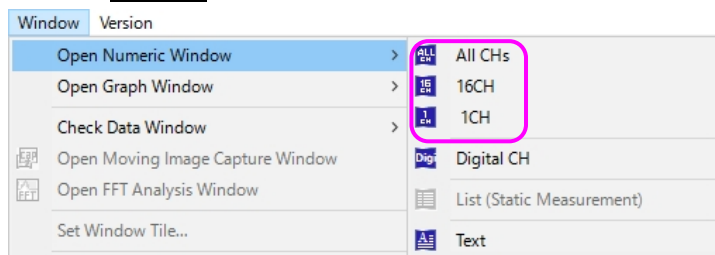
Displays the monitor data in numeric values.

Single numeric window (monitor data) is able to display maximum 100 channels.

■ To display the monitor data

Open the Numeric window (monitor data) by any of the following.

- Click the Window - Open Numeric Window.
- Click the **Numeric** icon from the tool bar and click the target item on the pop-up-menu.



All CHs

Displays the all measuring channels.

CH01	362 $\mu\text{m}/\text{m}$	CH17	362 $\mu\text{m}/\text{m}$
CH02	608 $\mu\text{m}/\text{m}$	CH18	608 $\mu\text{m}/\text{m}$
CH03	797 $\mu\text{m}/\text{m}$	CH19	797 $\mu\text{m}/\text{m}$
CH04	0 $\mu\text{m}/\text{m}$	CH20	123 $\mu\text{m}/\text{m}$
CH05	65 $\mu\text{m}/\text{m}$	CH21	65 $\mu\text{m}/\text{m}$
CH06	-189 $\mu\text{m}/\text{m}$	CH22	-189 $\mu\text{m}/\text{m}$
CH07	49 $\mu\text{m}/\text{m}$	CH23	49 $\mu\text{m}/\text{m}$
CH08	10 $\mu\text{m}/\text{m}$	CH24	10 $\mu\text{m}/\text{m}$
CH09	-882 $\mu\text{m}/\text{m}$	CH25	-882 $\mu\text{m}/\text{m}$
CH10	-688 $\mu\text{m}/\text{m}$	CH26	-688 $\mu\text{m}/\text{m}$
CH11	-422 $\mu\text{m}/\text{m}$	CH27	-422 $\mu\text{m}/\text{m}$
CH12	-39 $\mu\text{m}/\text{m}$	CH28	-39 $\mu\text{m}/\text{m}$
CH13	267 $\mu\text{m}/\text{m}$	CH29	267 $\mu\text{m}/\text{m}$
CH14	53 $\mu\text{m}/\text{m}$	CH30	53 $\mu\text{m}/\text{m}$
CH15	-785 $\mu\text{m}/\text{m}$	CH31	-785 $\mu\text{m}/\text{m}$
CH16	117 $\mu\text{m}/\text{m}$	CH32	117 $\mu\text{m}/\text{m}$

16CH

Displays the 16 channels of the measuring channels.

CH01	362 $\mu\text{m}/\text{m}$
CH02	608 $\mu\text{m}/\text{m}$
CH03	797 $\mu\text{m}/\text{m}$
CH04	0 $\mu\text{m}/\text{m}$
CH05	65 $\mu\text{m}/\text{m}$
CH06	-189 $\mu\text{m}/\text{m}$
CH07	49 $\mu\text{m}/\text{m}$
CH08	10 $\mu\text{m}/\text{m}$
CH09	-882 $\mu\text{m}/\text{m}$
CH10	-688 $\mu\text{m}/\text{m}$
CH11	-422 $\mu\text{m}/\text{m}$
CH12	-39 $\mu\text{m}/\text{m}$
CH13	267 $\mu\text{m}/\text{m}$
CH14	53 $\mu\text{m}/\text{m}$
CH15	-785 $\mu\text{m}/\text{m}$
CH16	117 $\mu\text{m}/\text{m}$

1CH

Displays the 1 channel of the measuring channels.

CH01	362 $\mu\text{m}/\text{m}$
------	----------------------------

■[General] tab

This section describes how to set the following [Numeric] tab.

The screenshot shows the 'Numeric' tab with the 'Details' sub-tab selected. The 'Disp Data' section has a 'Row' dropdown set to 8 and a 'Col' dropdown set to 1. Below these is a table with 8 rows and 1 column. The first row is highlighted, showing '1' in the first column and 'CH01' in the second. The other rows are numbered 2 through 8 and labeled CH02 through CH08. To the right of the table are buttons for 'Set CH' (with a double arrow icon) and 'Clear CH'. Below the table is the 'Display Style' section with three radio buttons: 'Line' (selected), 'Grid', and 'Max/Min'. Each radio button has a small preview icon showing the display style. At the bottom, there are two checkboxes: 'Modify the moving font display size to a window size.' (checked) and 'The measured data is displayed in seven-segment display characters.' (unchecked).

(1) Display data (Row and Col)

Select the number of channels to be displayed and channels to be displayed.

After selecting the number of channel to be displayed on the Row box and Col box, select the channels to be displayed.

This screenshot is similar to the one above, but the 'Row' and 'Col' dropdown menus are highlighted with a pink rectangular box. The 'Row' dropdown is set to 8 and the 'Col' dropdown is set to 1. The table below shows the first row selected, displaying '1' and 'CH01'.

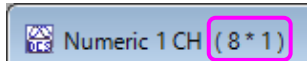
Numeric window (monitor data) Row: 8, Col: 2

CH01	um/m	CH09	um/m
CH02	um/m	CH10	um/m
CH03	um/m	CH11	um/m
CH04	um/m	CH12	um/m
CH05	um/m	CH13	um/m
CH06	um/m	CH14	um/m
CH07	um/m	CH15	um/m
CH08	um/m	CH16	um/m

Numeric window (monitor data) Row: 8, Col: 4

CH01	um/m	CH09	um/m	CH17	um/m	CH25	um/m
CH02	um/m	CH10	um/m	CH18	um/m	CH26	um/m
CH03	um/m	CH11	um/m	CH19	um/m	CH27	um/m
CH04	um/m	CH12	um/m	CH20	um/m	CH28	um/m
CH05	um/m	CH13	um/m	CH21	um/m	CH29	um/m
CH06	um/m	CH14	um/m	CH22	um/m	CH30	um/m
CH07	um/m	CH15	um/m	CH23	um/m	CH31	um/m
CH08	um/m	CH16	um/m	CH24	um/m	CH32	um/m

The Row and Col appear on the title bar.



(2) Display data (Set CH button and Clear CH button)

Set CH button: Sets the channels to be displayed automatically.

You are able to change the vertical/horizontal format by pressing the button, located on the right of the **Set CH** button.



:Vertical format

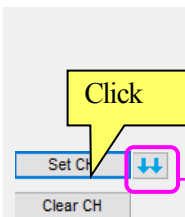


:Horizontal format

[Example 1]

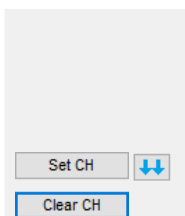
Channels in the vertical format

	1	2	3	4
1	---	---	---	---
2	---	---	---	---
3	---	---	---	---
4	---	---	---	---
5	---	---	---	---
6	---	---	---	---
7	---	---	---	---
8	---	---	---	---



Channels in the vertical format

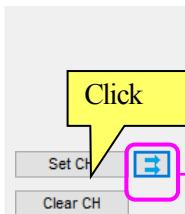
	1	2	3	4
1	CH01	CH09	CH17	CH25
2	CH02	CH10	CH18	CH26
3	CH03	CH11	CH19	CH27
4	CH04	CH12	CH20	CH28
5	CH05	CH13	CH21	CH29
6	CH06	CH14	CH22	CH30
7	CH07	CH15	CH23	CH31
8	CH08	CH16	CH24	CH32



[Example 2]

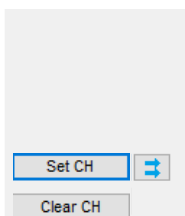
Channels in the horizontal format

	1	2	3	4
1	---	---	---	---
2	---	---	---	---
3	---	---	---	---
4	---	---	---	---
5	---	---	---	---
6	---	---	---	---
7	---	---	---	---
8	---	---	---	---



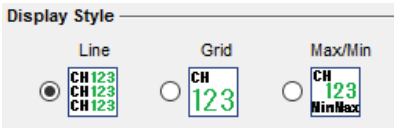
Channels in the horizontal format

	1	2	3	4
1	CH01	CH02	CH03	CH04
2	CH05	CH06	CH07	CH08
3	CH09	CH10	CH11	CH12
4	CH13	CH14	CH15	CH16
5	CH17	CH18	CH19	CH20
6	CH21	CH22	CH23	CH24
7	CH25	CH26	CH27	CH28
8	CH29	CH30	CH31	CH32



Clear CH button: The "---" appears on every CH No.

(3) Display Style
Select the display style.



Line

CH01	-57	um/m	CH09	18	um/m
CH02	102	um/m	CH10	-868	um/m
CH03	179	um/m	CH11	-742	um/m
CH04	8	um/m	CH12	-599	um/m
CH05	76	um/m	CH13	-56	um/m
CH06	18	um/m	CH14	99	um/m
CH07	468	um/m	CH15	161	um/m
CH08	-117	um/m	CH16	187	um/m

Grid

Displays the Legends of every channel in boxes.

CH01	-57	um/m	CH05	76	um/m
CH02	102	um/m	CH06	18	um/m
CH03	179	um/m	CH07	468	um/m
CH04	8	um/m	CH08	-117	um/m

Max/Min

Displays the Legends and peak values (maximum and minimum values) of every channel in boxes.
The ELA-55A clears the peak values (maximum and minimum values) at the following timing.

- When start monitoring data.
- When clicking the View - Clear the peak values (maximum and minimum values).

CH01	-57	um/m	CH05	76	um/m
MIN -57 MAX -57			MIN 76 MAX 76		
CH02	102	um/m	CH06	18	um/m
MIN 102 MAX 102			MIN 18 MAX 18		
CH03	179	um/m	CH07	468	um/m
MIN 179 MAX 179			MIN 468 MAX 468		
CH04	8	um/m	CH08	-117	um/m
MIN 8 MAX 8			MIN -117 MAX -117		

MEMO

The peak values (maximum and minimum values) indicate the maximum value and minimum value, after opening the numeric window.

- (4) Modify the moving font display size to a window size.
- To zoom in/zoom out the Legend font size automatically in accordance with the window size, put a check mark to the check box next to the "Modify the moving font display size to a window size."

With a check mark

CH01	-57 um/m	CH09	18 um/m
CH02	102 um/m	CH10	-868 um/m
CH03	179 um/m	CH11	-742 um/m
CH04	8 um/m	CH12	-599 um/m
CH05	76 um/m	CH13	-56 um/m
CH06	18 um/m	CH14	99 um/m
CH07	468 um/m	CH15	161 um/m
CH08	-117 um/m	CH16	187 um/m

Without a check mark

The Legends appear based on the font size, pre-set on the [Details] tab.

When all of the information in that window cannot be seen at the same time, the scroll bar appears.

Use the scroll bar to see the hidden information.

CH01	-57 um/m
CH02	102 um/m
CH03	179 um/m
CH04	8 um/m
CH05	76 um/m
CH06	18 um/m
CH07	468 um/m

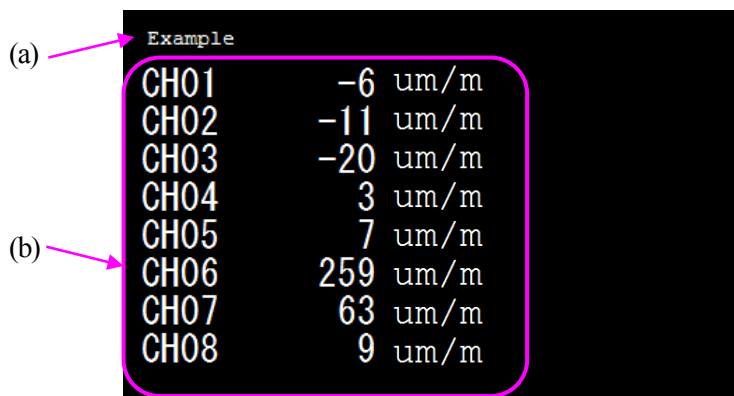
- (5) The measured data is displayed in seven-segment display characters.
- To display the monitor data in digital numeric values, put a check mark to the check box next to the “The measured data is displayed in seven-segment display characters.”
- After putting a check mark, the numerical value (normal) appears green automatically.

CH01	-57 um/m
CH02	102 um/m
CH03	179 um/m
CH04	8 um/m

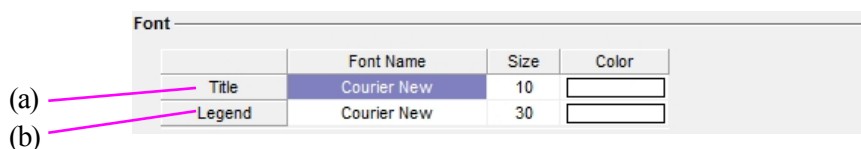
■[Details] tab

This section describes how to set the following [Details] tab.

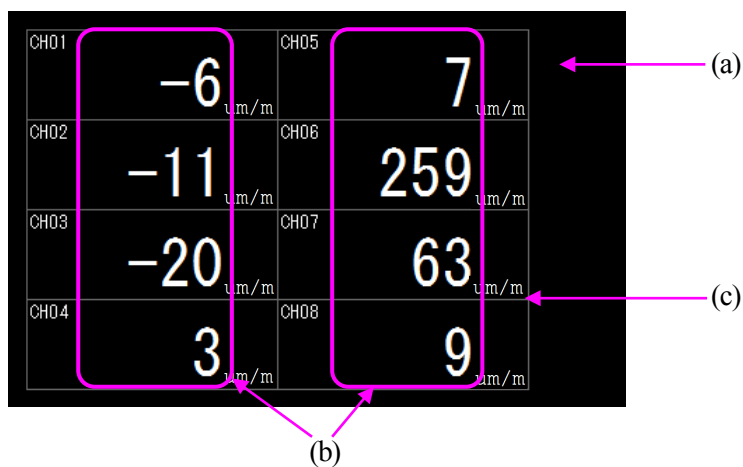
(1) Font



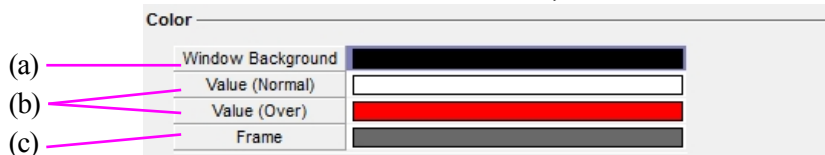
To set the fonts on the numeric window, set them on the "Font" section.



(2) Color



To set the colors on the numeric window, set them on the "Color" section.



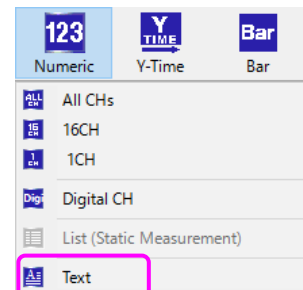
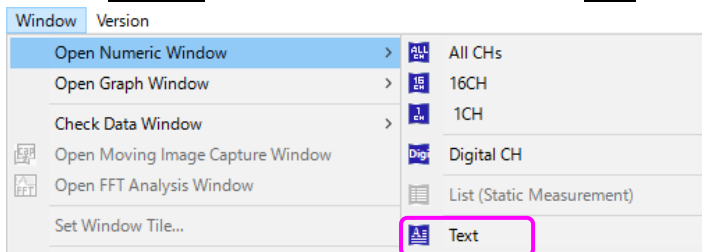
1 1 - 1 - 4 - 2 Text

Displays the arbitrary character string, current time, etc..

■To display the text

Open the Text window by any of the following.

- Click the Window - Open Numeric Window - Text.
- Click the **Numeric** icon from the tool bar and click the **Text** on the pop-up-menu.



Arbitrary character string

Example
13:00~14:00

Data file name

TEST0000.KS2

Date and time

2016/12/08 15:37:15

Measuring status

Monitoring

■[Disp] tab

This section describes how to set the following [Disp] tab.

(1) Display data

Select the target text format from the following.

--:	Hides the character string.
Arbitrary character string	The entered character string (Maximum 100 characters, 6 rows)
Data File Name	Data file name
Data File Title	File title of the data file name
Date	Date (Year/month/day)
Time	Time (Hour: minute: second)
Date and Time	Date and time (Year/month/day hour: minute: second)
Measurement state	Measuring status (Stop, Monitoring, Recording, Pausing) in large characters

(2) Image File

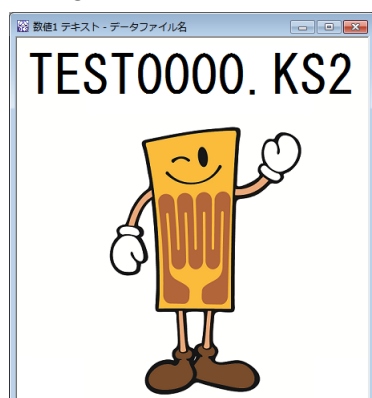
Displays the image file (file format: BMP) on the text window.

To display the image file (file format: BMP) on the text window, put a check mark to the check box next to the "Display a image file." Click the **Browse** button to display the Open File window.

Select the image file (file format: BPM) on the Open File window.

The image file appears below the text.

In the following example, the Disp Data is "Data File Name" with a check mark in the check box next to the "Display a image file."



(3) Modify the moving font display size to a window size.

To zoom in/zoom out the Legend font size automatically in accordance with the window size, put a check mark to the check box next to the "Modify the moving font display size to a window size."

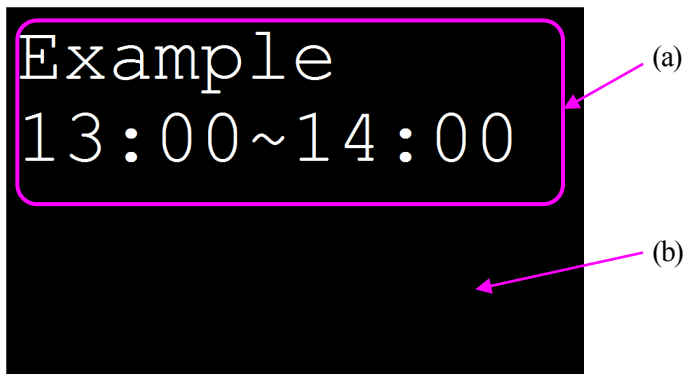
(4) Modify the moving image display size to a window size.

To zoom in/zoom out the image size automatically in accordance with the window size, put a check mark to the check box next to the "Modify the moving image display size to a window size."

■[Details] tab

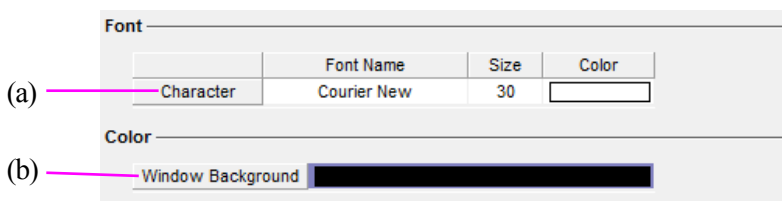
This section describes how to set the following [Details] tab.

(1) Font and Color



To set the fonts on the numeric window, set them on the "Font" section.

To set the colors on the numeric window, set them on the "Color" section.



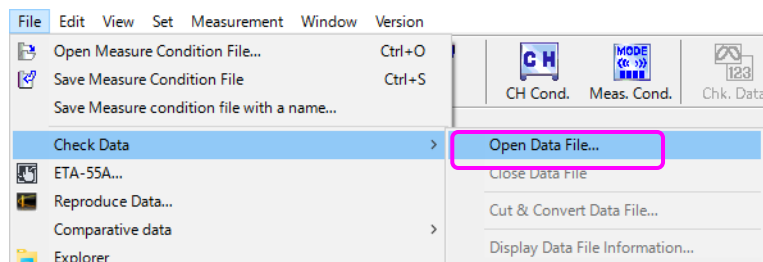
1 1 - 2 Checking data

This section describes how to reproduce the recorded data file (extension: KS2).

1 1 - 2 - 1 To open the data file

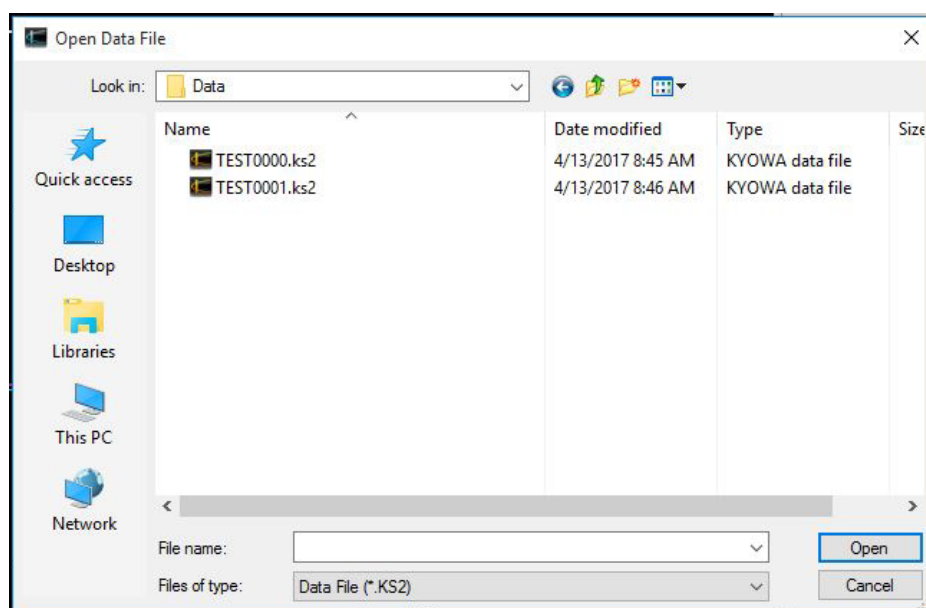
■ To select the data file

(1) Click the File - Check Data - Open Data File....



(2) The Open Data File window appears.

Select the data file and click the **Open** button.

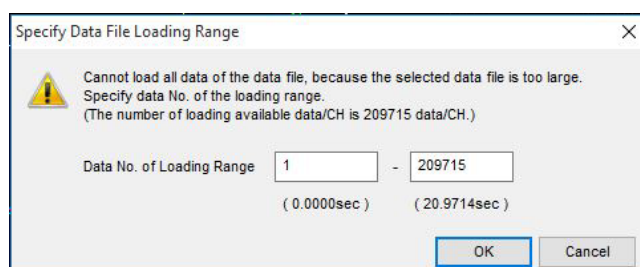


NOTE

When the data file size is larger than 10 MB, since the ELA-55A is not able to load all the data files, the following window

appears.

Specify the data to be loaded on the window.



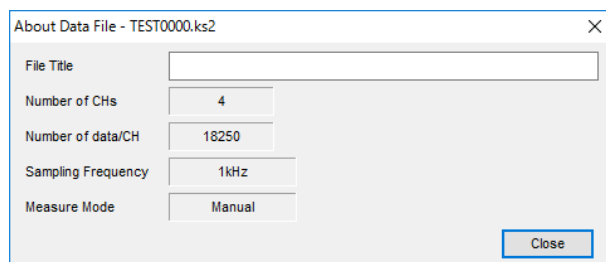
1 1 - 2 - 2 To display the file information

This section describes the file information of the data file.

The file information includes the file title, the number of recording channels, the number of data, sampling frequency, and measuring mode.

■To display the file information

- (1) Click the File - Check Data - Display Data File Information....
- (2) The Data File Information window appears.

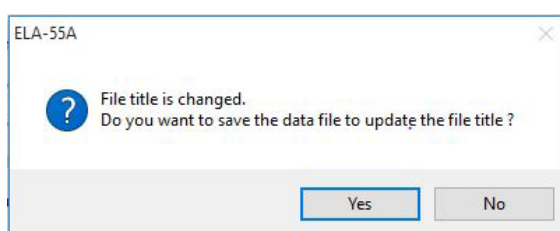


MEM

You are able to edit the file title on the Data File Information window.

After editing the file title, click the **Close** button.

The following message appears. Click the **Yes** button.



1 1 - 2 - 3 Graph windows

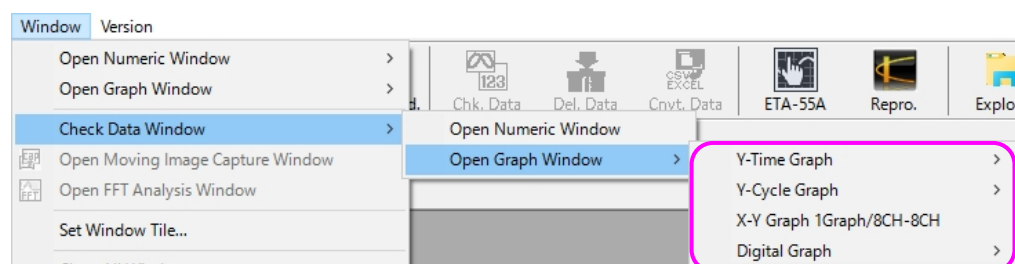
The Graph window displays the recorded data in the data file.

The Checking data operation is able to display the following graph windows.

- Y -Time Graph (1Graph to 4Graph, 1Graph/16DIV)
- X -Y Graph
- Digital Graph

■To display the graph window

After opening the data file, click the Window - Check Data Window - Open Graph Window.



●Maximum value/minimum value/average value

The Y-Time Graph is able to display the maximum value/minimum value/average value within the window.

■To display the Maximum value/Minimum value/Average value

(1) Activate the Graph windows.

(2) Operate the ELA-55A by any of the following.

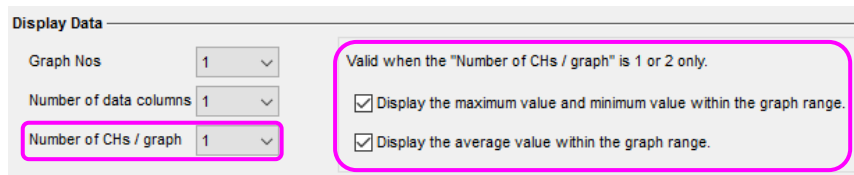
- Click the View - Set Display Condition....
- Right-click the Graph windows to display the pop-up-menu.
Click the **Set Display Condition...** on the pop-up-menu.
- Click the **Disp Cond** icon from the tool bar.
- Double-click the Graph windows.

(3) The Set Display Condition... window appears.

Click the [General] tab.

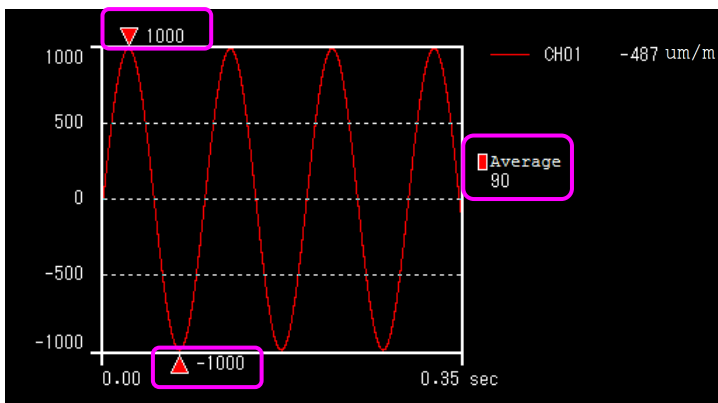
Make sure the Number of CHs/graph is 1 or 2.

Put a check mark to the check box next to the "Display the maximum value and minimum value within the graph range." and "Display the average value within the graph range."



(4) Click the **OK** button to close the Set Display Condition... window.

The maximum value/minimum value/average value appear on the graph window.



NOTE

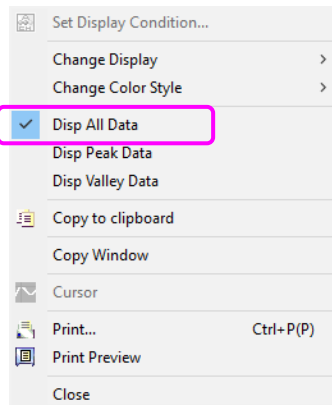
The ELA-55A displays the maximum value/minimum value/average value on the Y-Time Graph only.

●All data mode

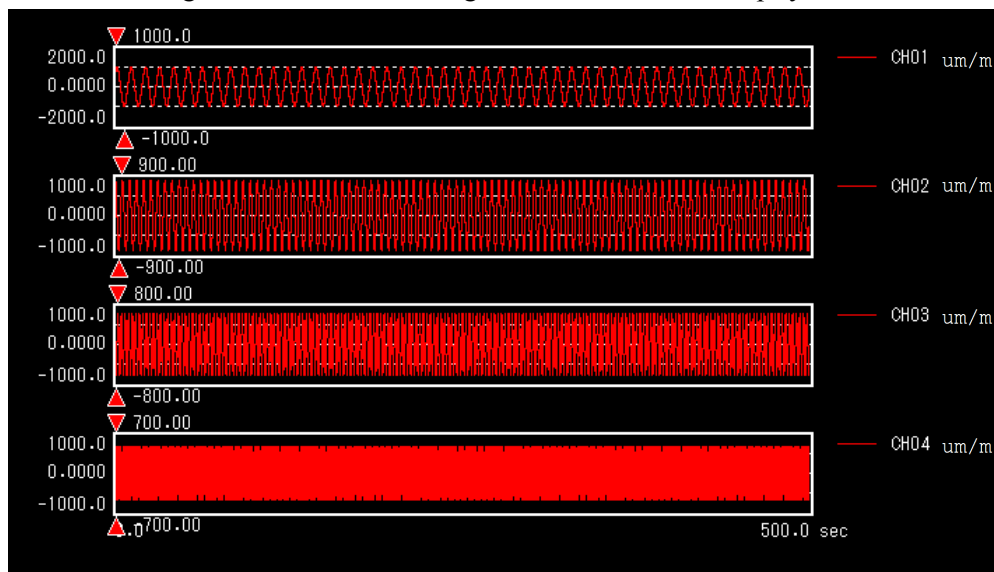
All data in file can be displayed on the Y-Time Graph window.

■Operation method for all data mode

- (1) Set the Graph window to Active.
- (2) Right-click on the Graph window to display the pop-up-menu.
Select the “All Data Mode” menu on the pop-up-menu.



- (3) This will display all data for four fixed graphs.
Select the “Change channel” button to change between the channels displayed.



NOTE

- You cannot display the cursor on the “Set Display Condition...” window.
- You cannot use all data mode for one graph/all channels.

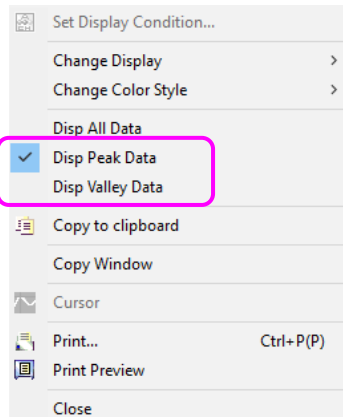
●Disp Peak Data / Disp Valley Data

Peak ata or valley data in data file can be displayed at most 5.

And, the waveform of 400 data before and after the first peak data and valley data can display.

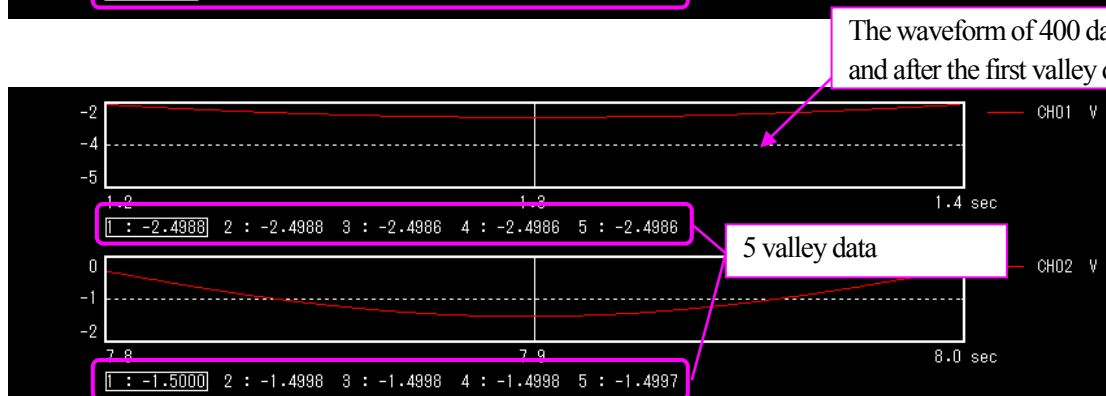
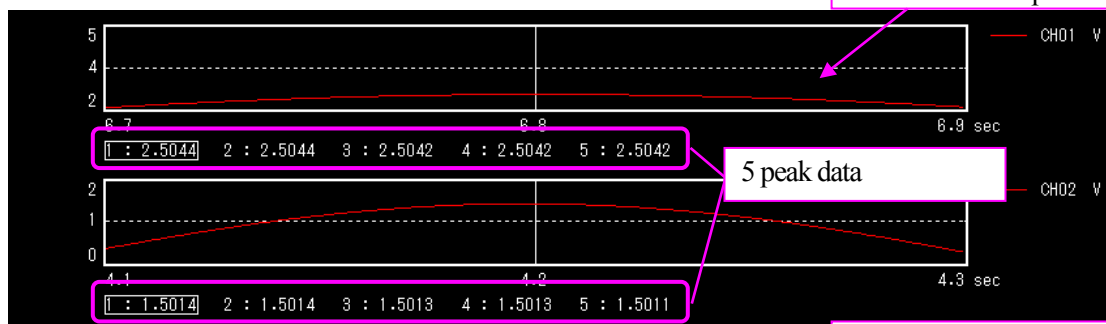
■Operation method for Disp Peak Data / Disp Valley Data

- (1) Set the Graph window Active.
- (2) Right-click on the Graph windows to display the pop-up-menu.
Select the “Disp Peak Data” or “Disp Valley Data” on pop-up-menu.



- (3) The peak data or valley data are displayed 4 graphs.

Click the “Change channel” button to change displayed channels.



NOTE

- “Set display condition” window and cursor can not be displayed.
- When using 1Graph/All CHs and 1Graph/32CH(DIV), the peak data and valley data can not be displayed.
- Data displayed as waveform is 400 data before and after the only first peak data or valley data.

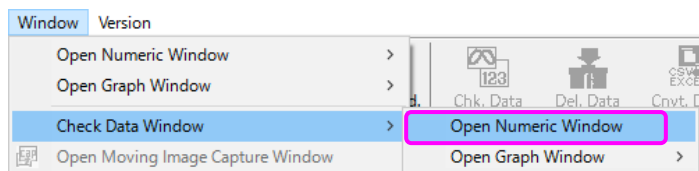
1 1 - 2 - 4 Numeric windows

The Numeric window displays the recorded data in the data file, in numeric values, in the list view.
The Numeric window displays the recorded 500 data on each tab.

1 - 5000					
5001 - 10000					
10001 - 15000					
15001 - 20000					
20001 - 25000					
25001 - 30000					
30001 - 35000					
Data No.	Time(sec)	CH01	CH02	CH03	CH04
		um/m	um/m	um/m	um/m
1	0.0000	0	0	0	1
2	0.0001	6	11	20	1
3	0.0002	13	23	40	1
4	0.0003	19	34	60	1
5	0.0004	25	45	80	1
6	0.0005	31	57	100	1
7	0.0006	38	68	120	1
8	0.0007	44	79	140	1
9	0.0008	50	90	160	1
10	0.0009	57	102	179	1
11	0.0010	63	113	199	1
12	0.0011	69	124	218	1
13	0.0012	75	135	238	1
14	0.0013	82	146	257	1
15	0.0014	88	158	276	1

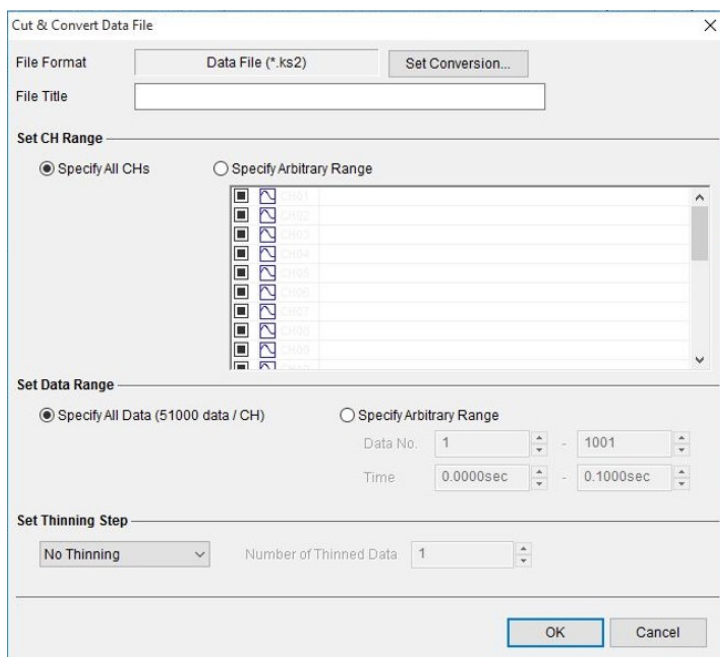
■ To display the numeric window

After opening the data file, click the Window - Check Data Window - Open Numeric Window.



1 1 - 2 - 5 To extract/convert data file

This section describes how to extract data files and convert data files into CSV format files or Microsoft Excel format files.



■ To display the Cut & Convert Data File window

Click the File - Check Data - Cut & Convert Data File....

■Conditions

(1) File Format

Select the file format.

Measured data file (*.KS2)	KYOWA standard format file You are able to load the files with the Kyowa's Data Analysis Software (DAS-200A) or DIAdem.
CSV format file (*.CSV)	Comma-delimited text file You are able to load the files with the text editor or spreadsheet software.
XLS format file (*.XLS)	Microsoft Excel 97-2003 format file
XLSX format file (*.XLSX)	Microsoft Excel format file
RPCIII format file (*.rsp)	MTS RPCIII format file
CAN/analog data conversion format file (*.KS2)	Converts the recorded ECAN data (E4A format file) into the analog data file. The E4A format file is a ECAN data file, recorded on the ECAN-55A.

(2) File Title

Set a file title. The number of character string is maximum 40.

(3) Set CH Range

Set the channel range.

“Specify All CHs”

Cuts/converts all channels.

“Specify Arbitrary Range”

Cuts/converts the specified channels.

(4) Set Data Range

Set the data range.

“Specify All Data”

Cuts/converts all data.

“Specify Arbitrary Range”

Cuts/converts the specified data.

(5) Set Thinning Step

Set the data thinning step.

“No thinning”

No thinning

“Simple Thinning”

Saves data after the specific interval (number of thinned data).

Data No.	Number of Thinned data: 1	Number of Thinned data: 2
1	✓	✓
2		
3	✓	
4		✓
5	✓	
6		
7	✓	✓
8		
9	✓	
10		✓

Data to be saved: ✓

“Average Thinning”

Averages the number of thinned data for saving.

[Example]

Suppose the data has A, B, C, D, E, and F.

Number of Thinned Data: 2 (A+B)/2, (C+D)/2, (E+F)/2

Number of Thinned Data: 3 (A+B+C)/3, (D+E+F)/3

1 1 - 3 Function windows

This section describes the functions that can be performed on the Numeric/Graph window.

1 1 - 3 - 1 To change windows

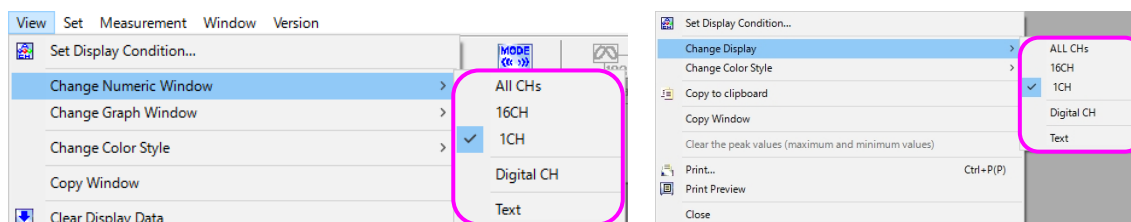
This section describes how to change the active Numeric windows/Graph windows into the other windows.

■ To change windows

- (1) Activate the Numeric windows/Graph windows.
- (2) Operate the ELA-55A by any of the following.

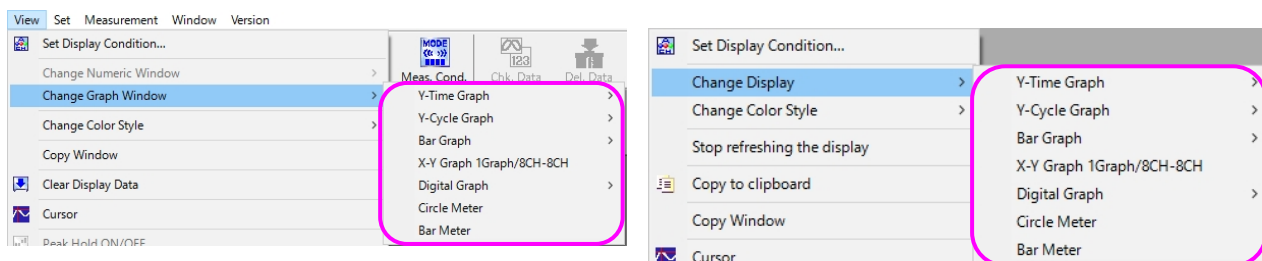
Numeric windows

- Click the View - Change Numeric window - target item.
- Right-click the Numeric windows to display the pop-up-menu.
Click the **Change Display** on the pop-up-menu and click the target item.



Graph windows

- Click the View - Change Graph window - target item.
- Right-click the Graph windows to display the pop-up-menu.
Click the **Change Display** on the pop-up-menu and click the target item.

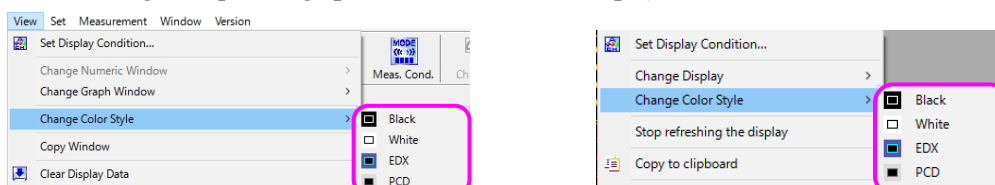


1 1 - 3 - 2 To change color style

This section describes how to change the color style (window background color, graph background color, frame color, scale color, and legend color) of the active Numeric windows/Graph windows.

■ To change color style

- (1) Activate the Numeric windows/Graph windows.
 - (2) Operate the ELA-55A by any of the following.
 - Click the View - Change Color Style.
 - Right-click the Numeric windows/Graph windows to display the pop-up-menu.
Click the **Change Color Style** on the pop-up-menu.
- (In the following example, the graph window is Y-Time Graph.)



1 1 - 3 - 3 To copy windows

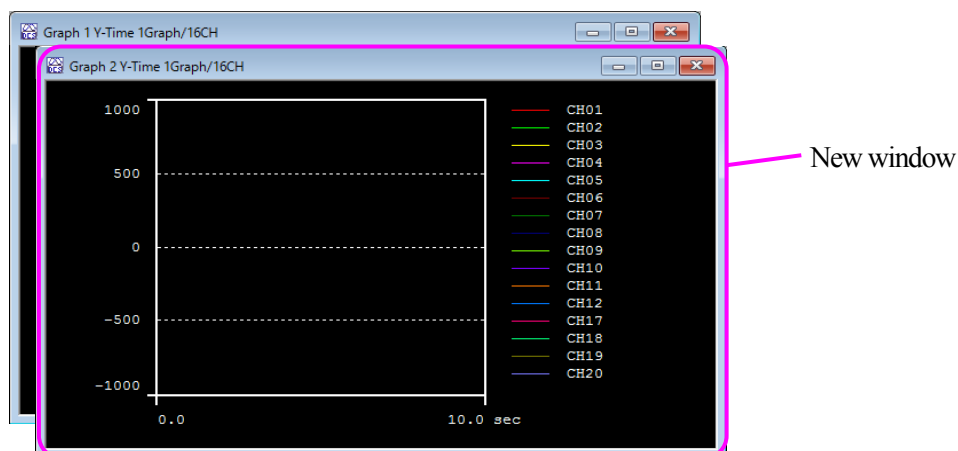
This section describes how to copy the conditions of the active Numeric windows/Graph windows for displaying new windows.

■To copy windows

- (1) Activate the Numeric windows/Graph windows.
- (2) Copy the window by any of the following.
 - Click the View - Copy Window.
 - Right-click the Numeric windows/Graph windows to display the pop-up-menu.
Click the **Copy Window** on the pop-up-menu.
(In the following example, the graph window is Y-Time Graph.)



- (3) The new window appears.



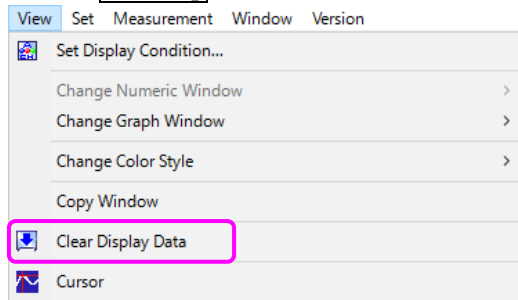
1 1 - 3 - 4 To clear the display data

This section describes how to clear the monitor data on all Numeric windows/Graph windows.

■ To clear the display data

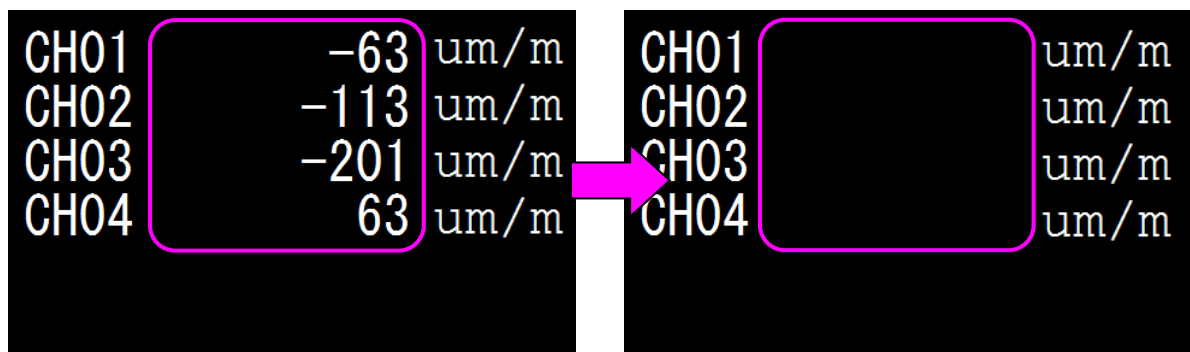
(1) Clear the monitor data by any of the following.

- Click the View - Copy Window.
- Click the **Clr. Disp** icon from the tool bar.

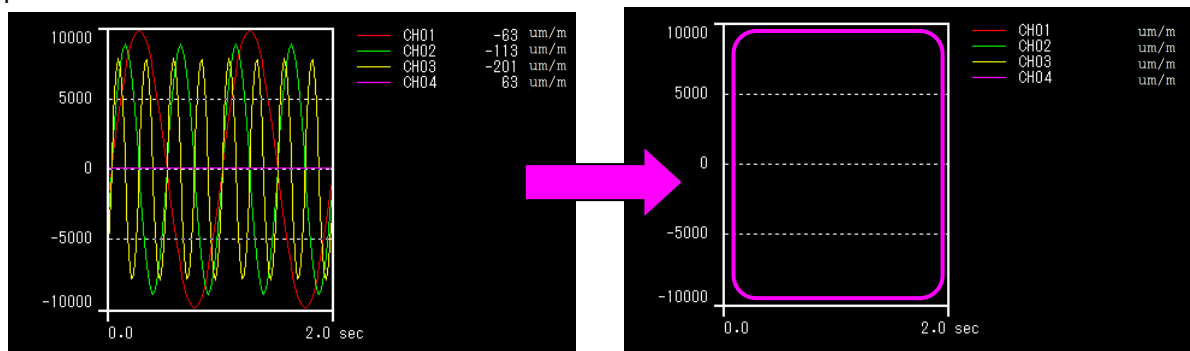


(2) The monitor data on all Numeric windows/Graph windows will be cleared.

- Numeric windows



- Graph windows



1 1 - 3 - 5 To display the cursor

This section describes how to display the cursor on the active graph window.

The cursor enables you to check the display data, on the graph line, in numeric values.

MEMO

The cursor operation is available on the Y-Time Graph and X-Y Graph.

The cursor operation is not available on the Bar Graph, Digital Graph, Circular Meter, and Bar Meter.

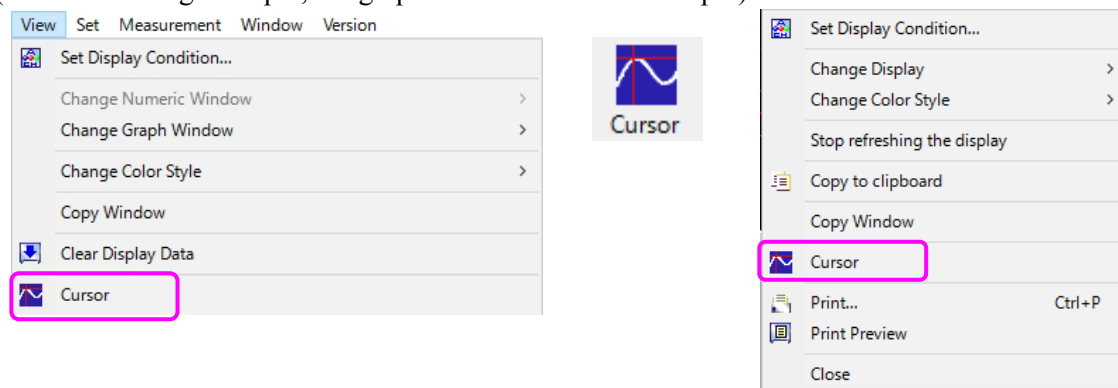
■To display the cursor

(1) Activate the Graph windows.

(2) Display the cursor by any of the following.

- Click the View - Cursor.
- Click the **Cursor** icon from the tool bar.
- Right-click the Graph windows to display the pop-up-menu.
Click the **Cursor** on the pop-up-menu.

(In the following example, the graph window is Y-Time Graph.)



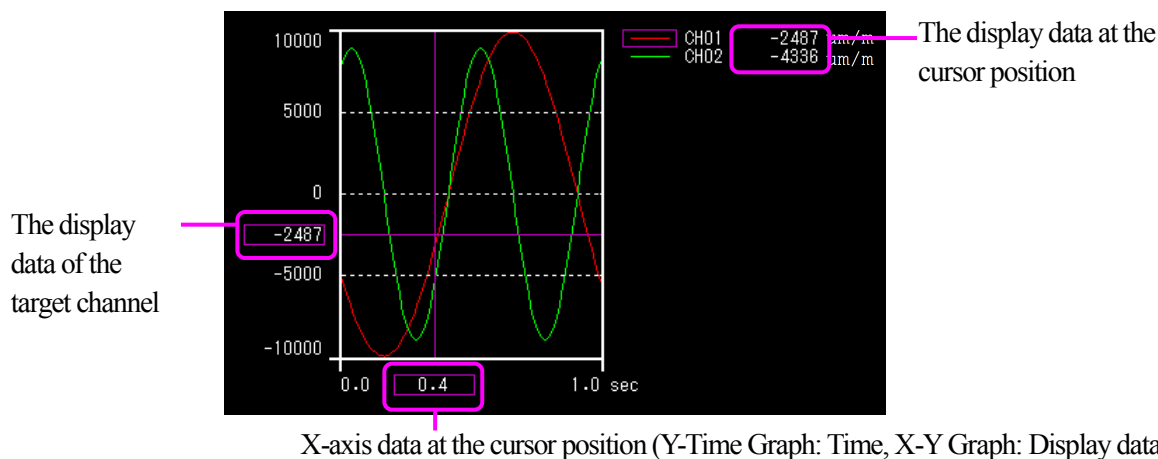
(3) The Cursor enables you to show/hide the cursor.

Make sure the cursor is ON.

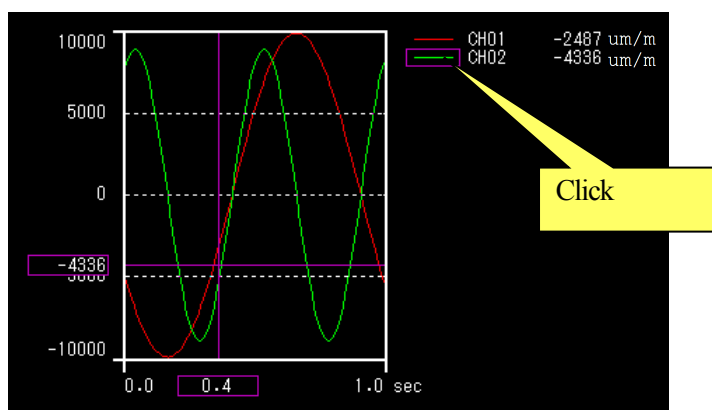
Show :  Hide: 

(4) The cursor appears on the active graph window.

Press the [←] or [→] on your keyboard. The cursor enables you to check the display data, on the graph line, in numeric values. The legend values also enable you to check the display data, at the cursor position.



(5) To change the target channel, press the [↑] or [↓] on your keyboard or click the target channel's legend line.



■ To move the cursor

[←] and [→]:

Moves the cursor, by single data, to the left/right.

[Shift] + [←] and [Shift] + [→]:

Moves the cursor, by 10 data, to the left/right.

[↑] and [↓]:

Changes the target channel.

MEMO

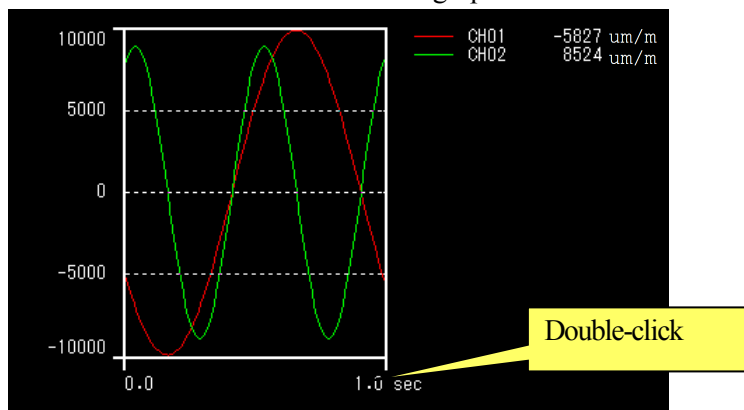
- You are able to move the cursor by dragging mouse.
- You are able to display single cursor on single graph window.

1 1 - 3 - 6 To change scale values on the graph windows

This section describes how to change the x-axis scale value/y-axis scale value on the graph window.

■ To change scale values

(1) Double-click the scale value on the graph window.



(2) The following controller appears.

Set the values by any of the following and press the [ENTER] key.

- Input numerical values directly.
- Click the spin button.

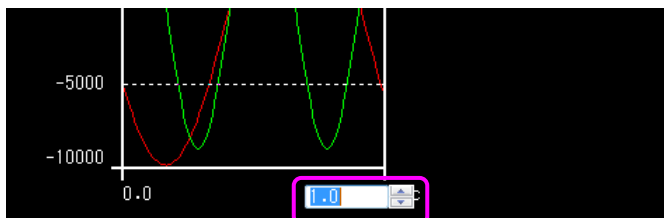
Up arrow: Increases the numerical value in 1/2/5 step.

[Example] 10 → 20 → 50 → 100

Down arrow: Decreases the numerical value in 1/2/5 step.

[Example] 10 → 5 → 2 → 1

To cancel the values, press the [ESC] key.

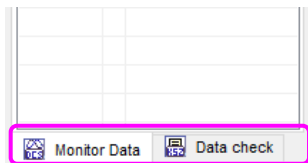


1 1 - 3 - 7 To select channels to be displayed on the CH Disp Bar

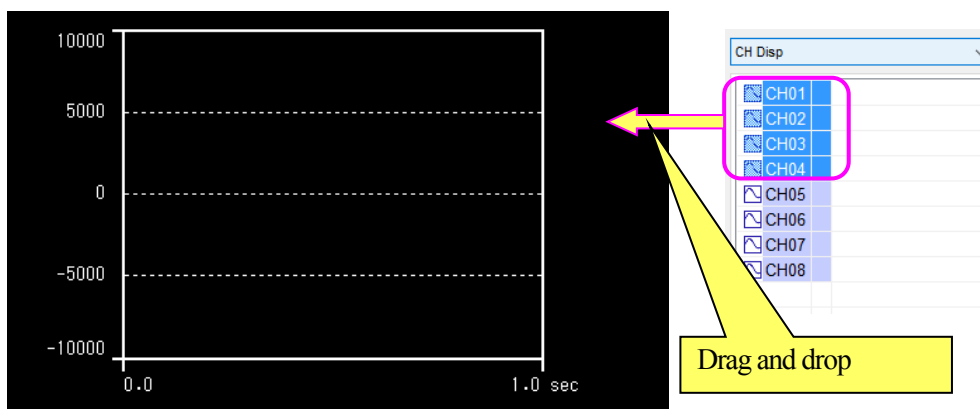
Channels on the CH Disp Bar are able to be set on the Numeric windows/Graph windows by drag-and-drop operations.

■ To select channels to be displayed

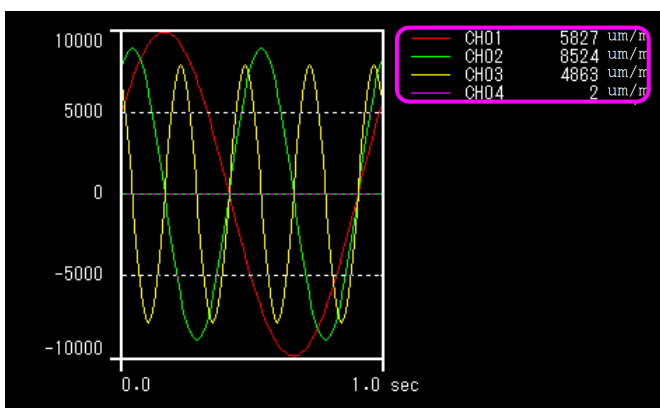
- (1) Select the Monitor Data or Data Check on the [CH] tab on the CH Disp Bar.



- (2) Left-click the target channels on the CH Disp Bar.
Drag and drop them to the target window to display the target channels.



- (3) The target channels appear on the target window.

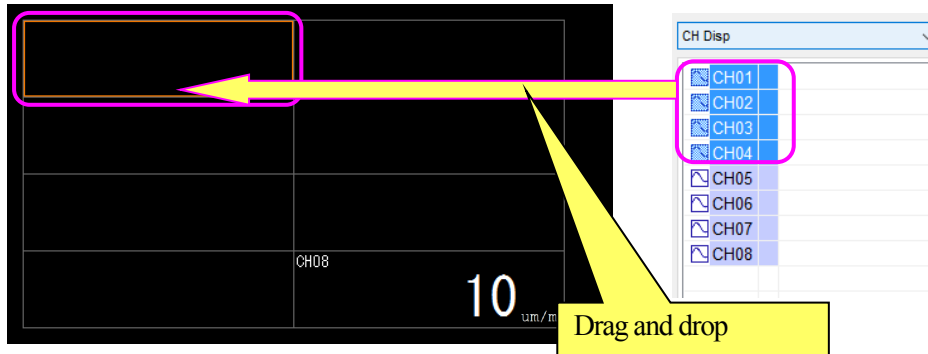


■ **To select channels to be displayed on the Numeric window ("Grid" style or "Max/Min" style)**

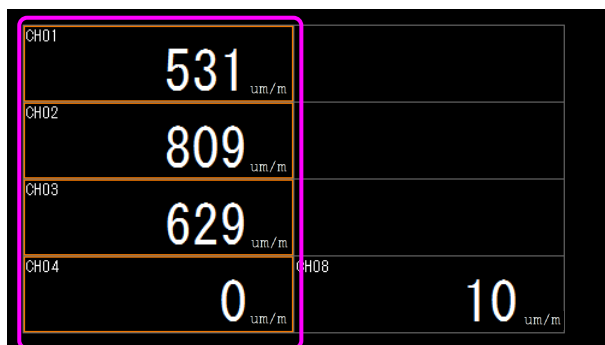
This section describes how to select channels on the CH Disp Bar onto the Numeric windows ("Grid" style or "Max/Min" style) by drag-and-drop operations.

(1) Left-click the target channels on the CH Disp Bar.

Drag and drop them to the target window to display the target channels.



(2) The target channels appear on the target window.

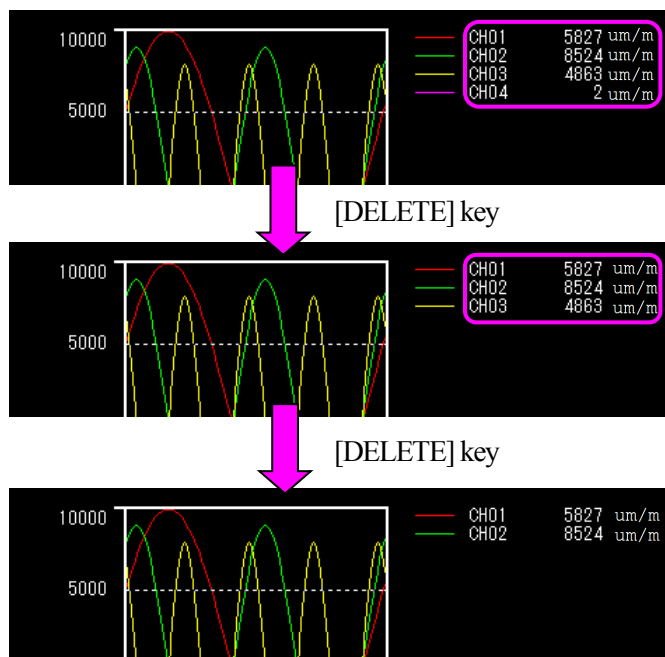


1 1 - 3 - 8 To delete channels on the windows

This section describes how to delete the channels, from the bottom item to the top item, on the active Numeric windows/Graph windows by pressing the [DELETE] key.

■ To delete channels

- (1) Activate the target windows.
- (2) Press the [DELETE] key to delete the channels from the bottom item to the top item.

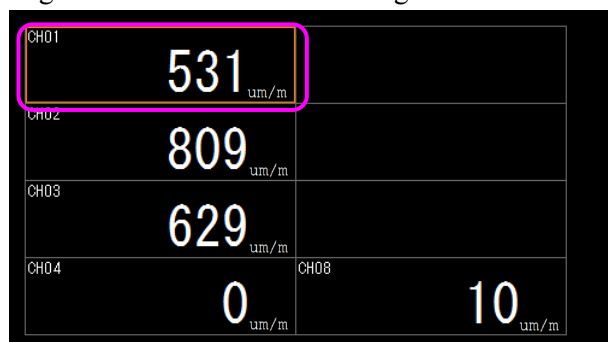


■ To delete channels to be displayed on the Numeric window ("Grid" style or "Max/Min" style)

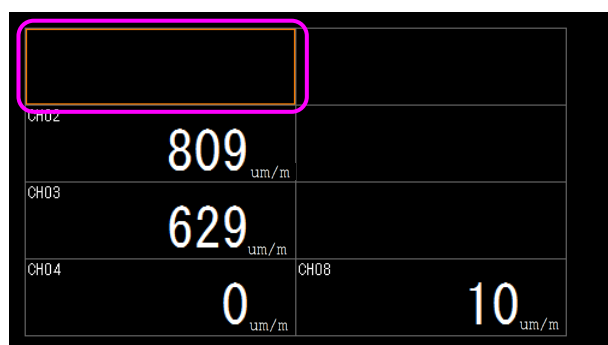
This section describes how to delete channels on the CH Disp Bar onto the Numeric windows ("Grid" style or "Max/Min" style) by pressing the [DELETE] key.

- (1) Click the target channel.

The target channel will be circled in orange.



- (2) Press the [DELETE] key to delete the channel.



1 1 - 3 - 9 Change channel button

The Change channel button appears on the left on the Numeric windows/Graph windows, when you point the mouse cursor on the left (or the Change channel button appears on the right on the Numeric windows/Graph windows, when you point the mouse cursor on the right).

The Change channel button enables you to change the channels to be displayed.

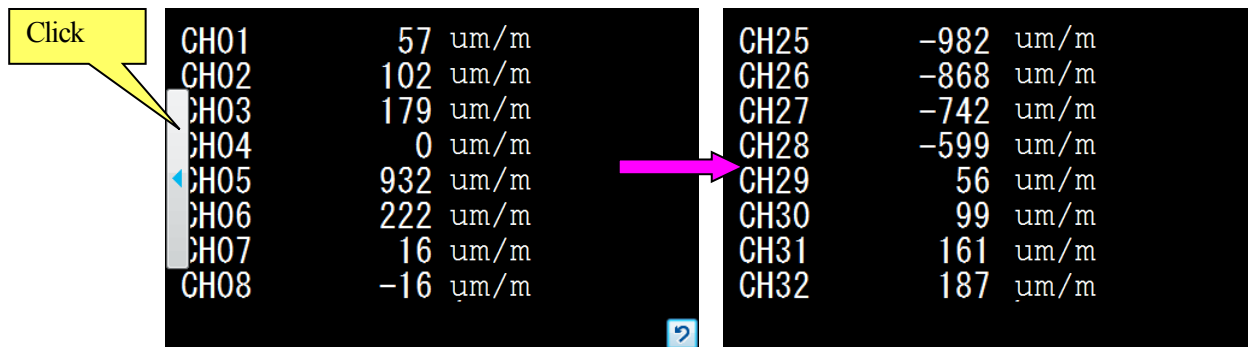
■Left

The Change channel button, on the left: The previous channels appear.

Numeric windows

[Example]

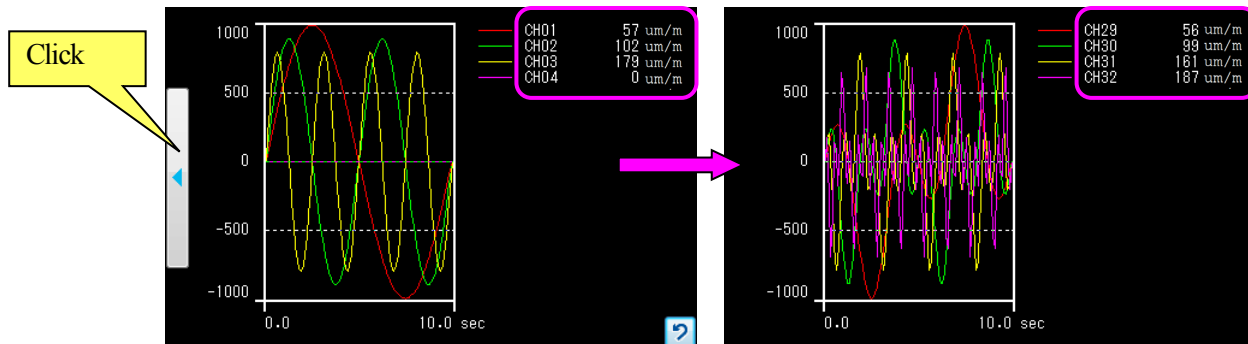
CH01 to CH08 → CH25 to CH32



Graph windows

[Example]

CH01 to CH04 → CH29 to CH32



■Right

The Change channel button, on the right: The next channels appear.

Numeric windows

[Example]

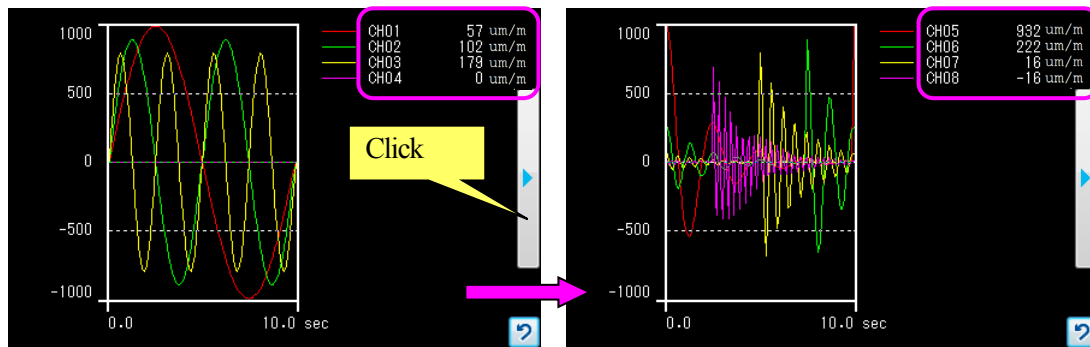
CH01 to CH08 → CH09 to CH16

CH01	57	um/m	 	CH09	-982	um/m
CH02	102	um/m		CH10	-868	um/m
CH03	179	um/m		CH11	-742	um/m
CH04	0	um/m		CH12	-599	um/m
CH05	932	um/m		CH13	56	um/m
CH06	222	um/m		CH14	99	um/m
CH07	16	um/m		CH15	161	um/m
CH08	-16	um/m		CH16	187	um/m

Graph windows

[Example]

CH01 to CH04 → CH05 to CH08



MEMO

To undo your last action, click the 

The same operation is available by clicking the Edit - Undo.

1 1 - 3 - 1 0 To check data after recording

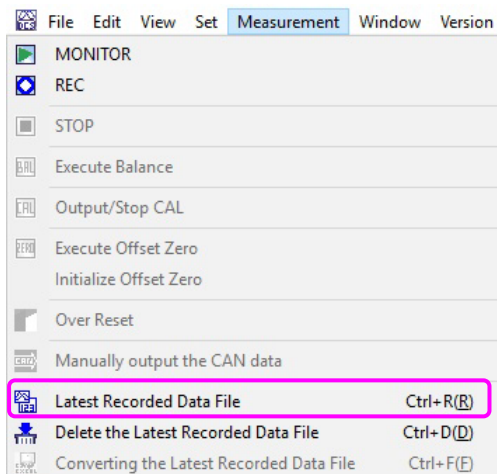
This section describes how to display the confirmation window for checking the recorded data, immediately after recording the data.

NOTE

- The checking operation is available on the Numeric windows (monitor data), Y-Time Graph windows (excluding the 1Graph/All CHs), X-Y Graph widows, and digital graph windows.
- To close the confirmation window automatically, start monitoring data again.

■To check data

- (1) Immediately after recording the data, activate the target window.
- (2) Open the confirmation window by any of the following.
 - Click the Measurement - Latest Recorded Data File.
 - Click the **Chk. Data** icon from the tool bar.

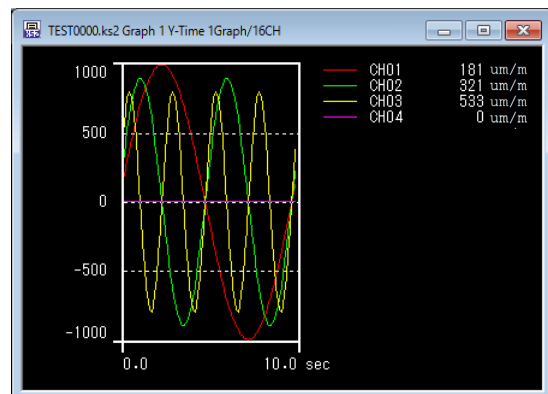


- (3) The confirmation window appears.

Numeric window

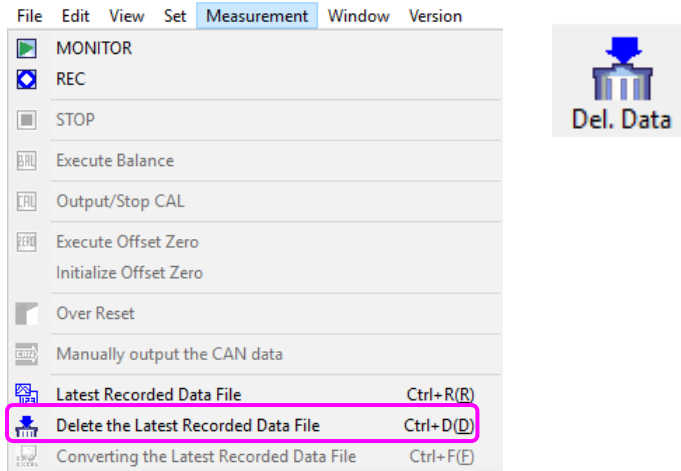
TEST0000.ks2 Numeric 1 List				
1 - 1000				
Data No.	Time(sec)	CH01	CH02	
		um/m	um/m	
1	0.000	187	331	
2	0.010	194	342	
3	0.020	200	352	
4	0.030	206	363	
5	0.040	212	373	
6	0.050	218	383	
7	0.060	224	393	
8	0.070	230	404	
9	0.080	236	414	
10	0.090	243	424	
11	0.100	249	434	
12	0.110	255	443	

Graph window



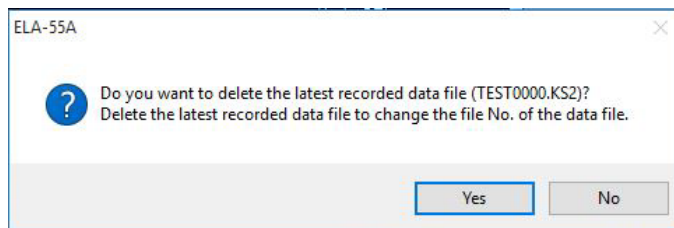
■ To delete data

- (1) After checking the recorded data on the confirmation window, if the data is not necessary, delete the data file by any of the following.
 - Click the Measurement - Delete the Latest Recorded Data File.
 - Click the **Del. Data** icon from the tool bar.



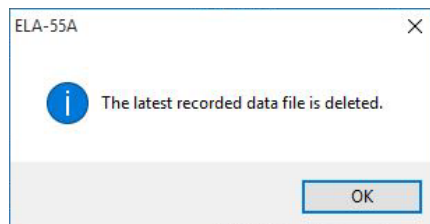
- (2) The following message appears.

Click the **Yes** button.



- (3) The following message appears.

After deleting the data files, the ELA-55A closes all confirmation windows and decrements the file No. of the data files.

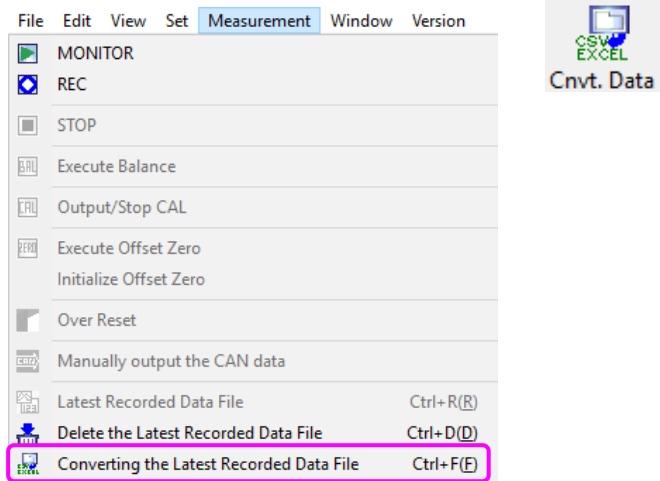


■ To convert data

(1) After checking the recorded data on the confirmation window, you are able to convert the data files into the CSV format file.

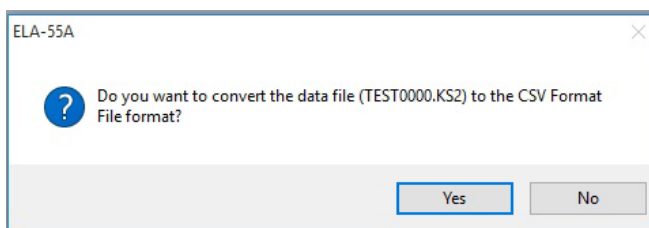
Convert the data files by any of the following.

- Click the Measurement - Converting the Latest Recorded Data File.
- Click the **Cnvt. Data** icon from the tool bar.

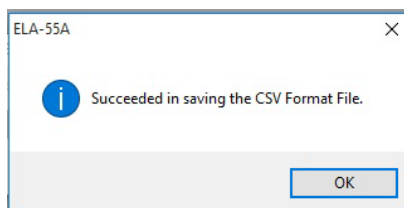


(2) The following message appears.

Click the **Yes** button.

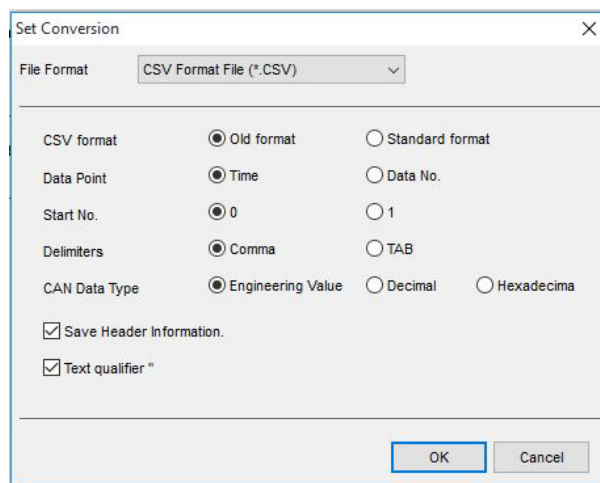
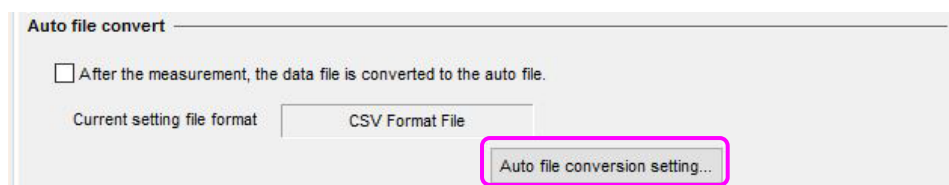


(3) The following message appears.



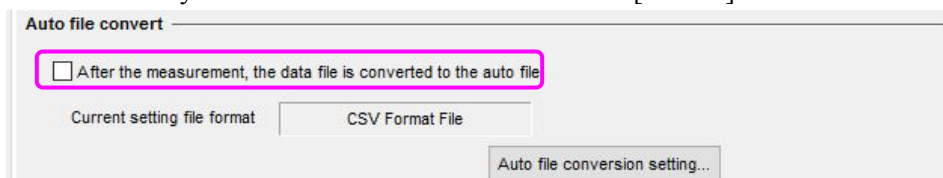
MEMO

To select the file format, click the Set Environment window - [General] tab - **Set Automatic Conversion...** button to open the Set Conversion window.



NOTE

You are not able to convert the data files manually when the ELA-55A converts data files automatically. To convert data files manually, release a check mark from the check box next to the "After the measurement, data is automatically converted into CSV Format File." on the [General] tab on the Set Environment window.



1 1 - 3 - 1 1 To display comparative data

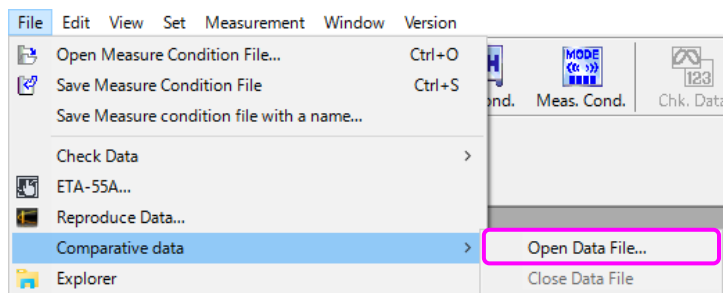
Displays the comparative data (previous KS2 format file) on the Y-Time Graph windows (excluding the 1 Graph/All CHs) and

X-Y Graph window for comparing the monitor data.

The size of data file available on a single screen is up to 10 MB. When the data file size is larger than 10 MB, the ELA-55A displays 10MB data from its head.

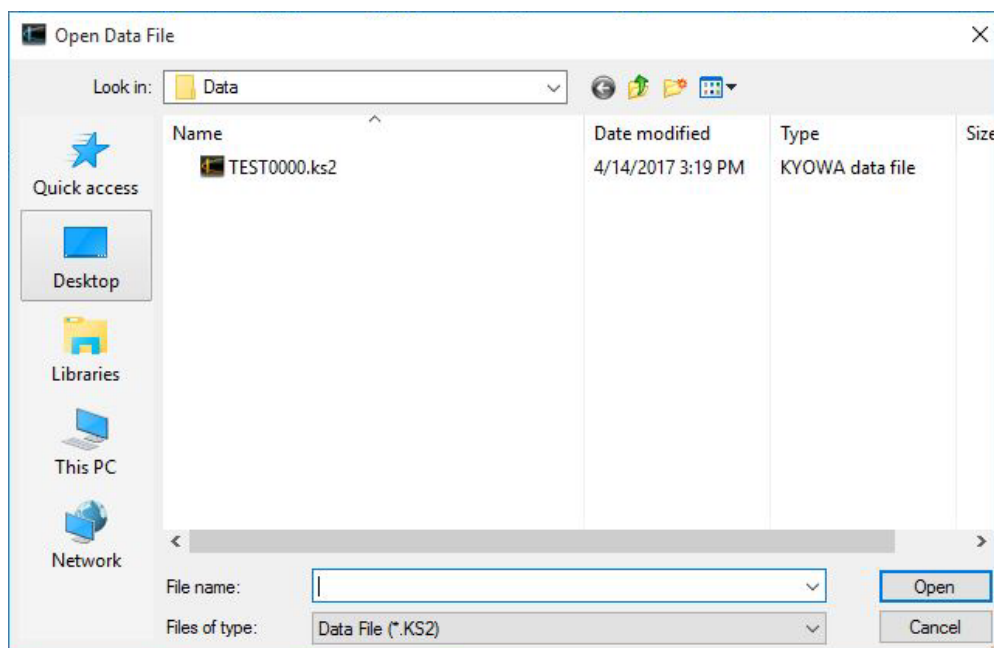
■To display the comparative data.

(1) Click the File - Comparative data - Open Data File....

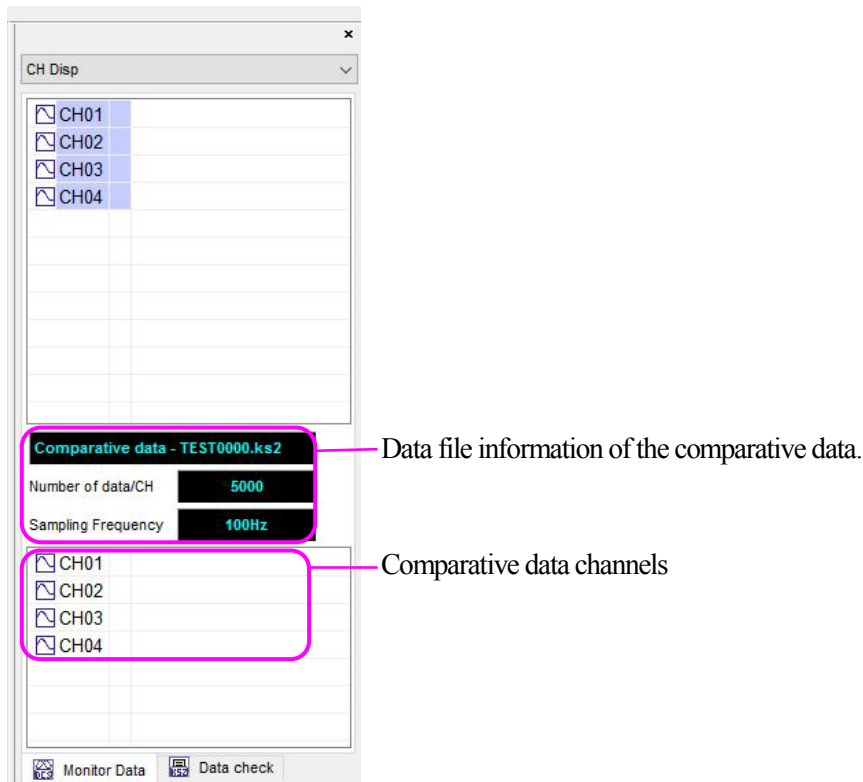


(2) The Open Data File window appears.

Select the data file and click the **Open** button.

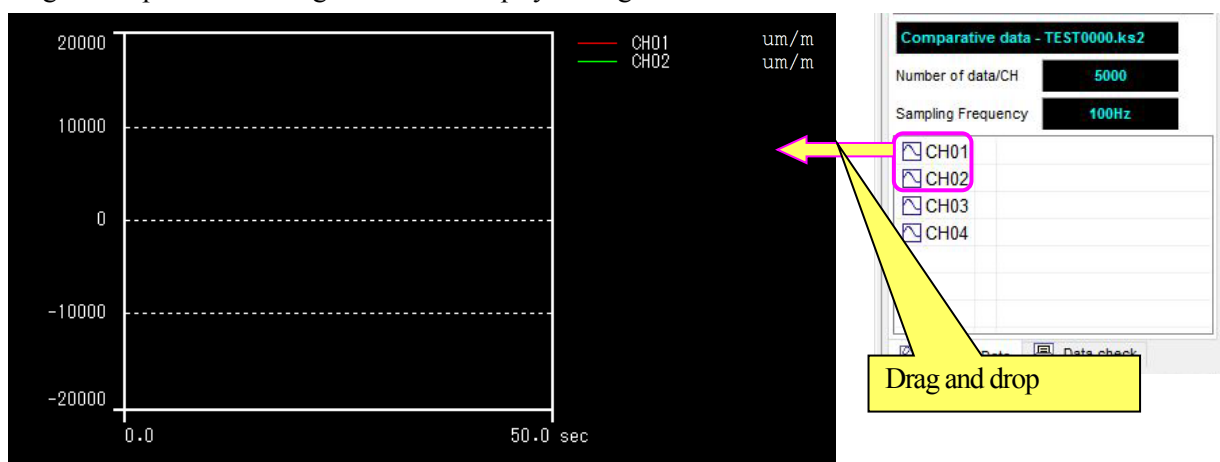


(3) The comparative data channels appear on the CH Disp Bar.

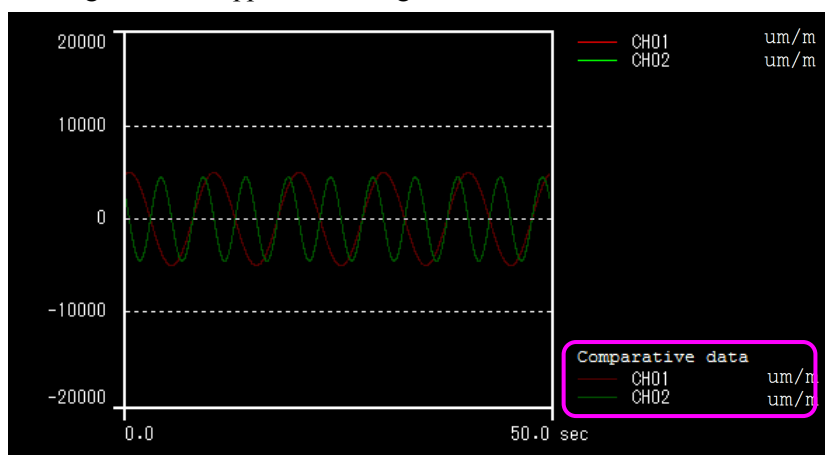


(4) Left-click the target channels on the CH Disp Bar.

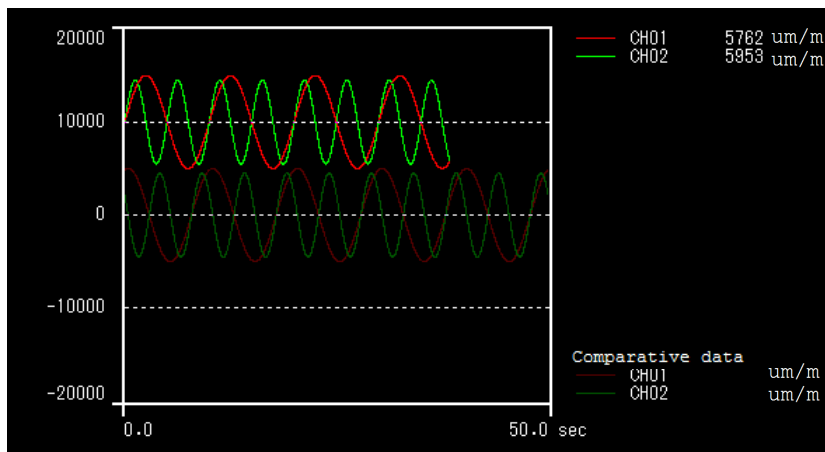
Drag and drop them to the target window to display the target channels.



(5) The target channels appear on the target window.

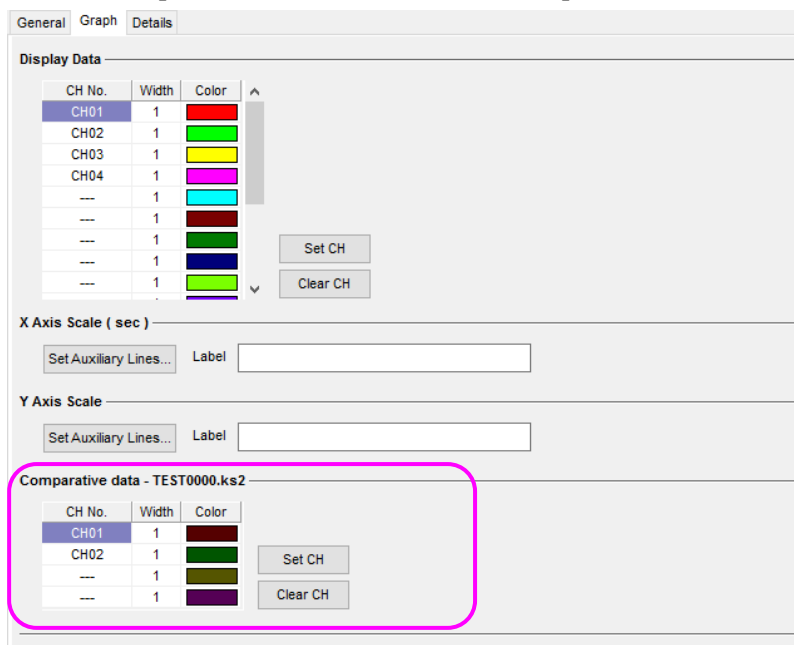


(6) To compare the monitor data to comparative data (previous KS2 format file), start monitoring data.



■[Graph] tab

Sets the comparative data channels on the [Graph] tab on the Set Display Condition... window.



MEMO

- The Y-Time Graph displays up to 4-channel comparative data on a single graph.
- The X-Y Graph displays up to 2 sets of comparative data (x-axis: 2 channels, y-axis: 2 channels) on a single graph.
- To display the Comparative data on the [Graph] tab on the Set Display Condition... window and comparative data channels on the CH Disp Bar, make sure the comparative data files are open.

■To close the comparative data files.

Click the File - Comparative data - Close Data File...

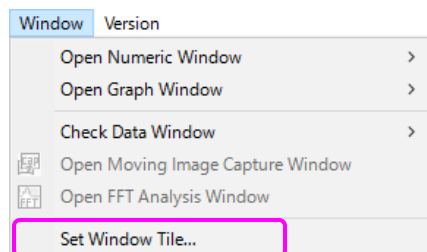
The ELA-55A closes the comparative data files and hides the comparative data on all windows.

1 1 - 3 - 1 2 To tile windows

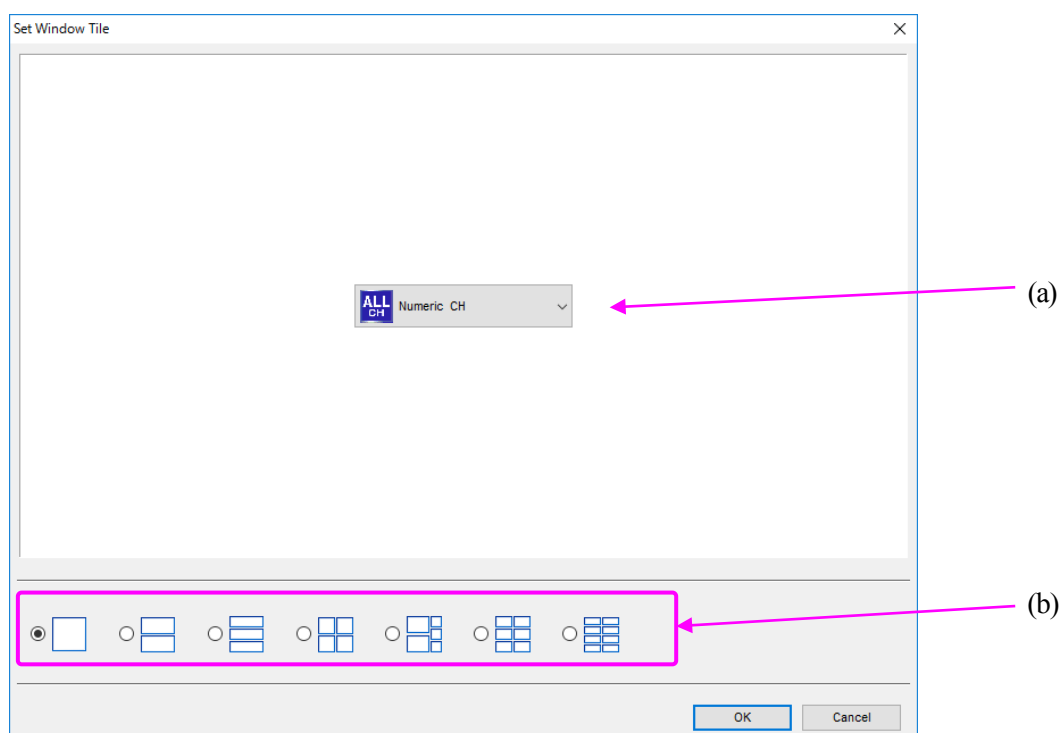
This section describes how to tile Numeric windows/Graph windows on the main window.

■To tile windows

(1) Click the Window - Set Window Tile....



(2) The following window appears.



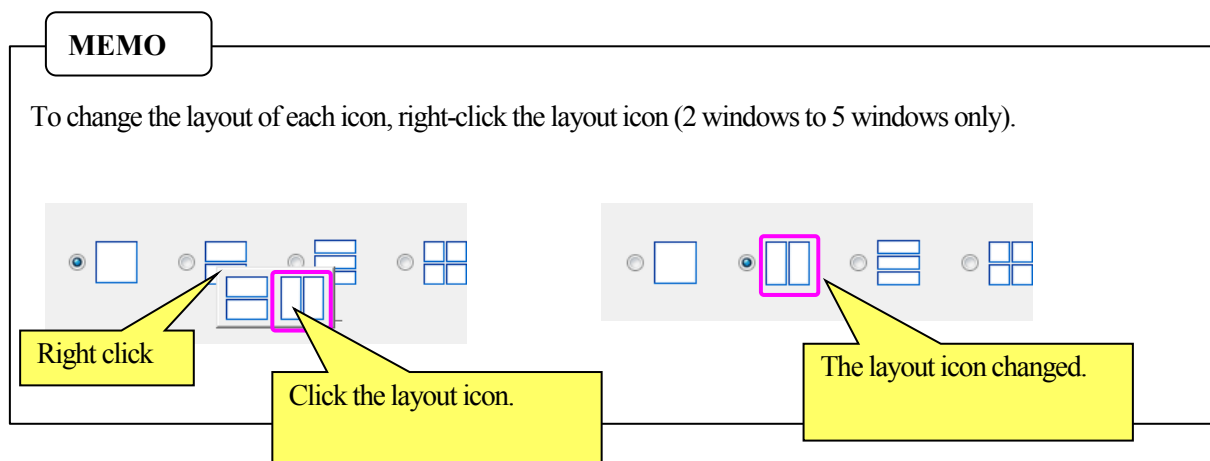
(a)List

Select the target Numeric windows/Graph windows.

(b)Layout

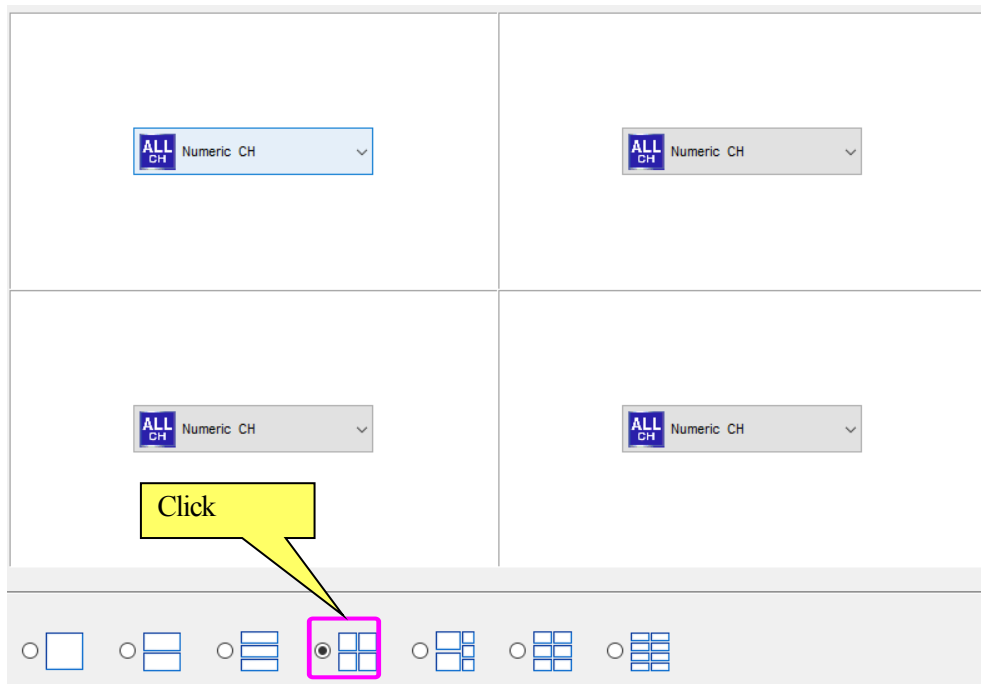
Select the target layout.

1 window/2 windows/3 windows/4 windows/5 windows/6 windows/8 windows

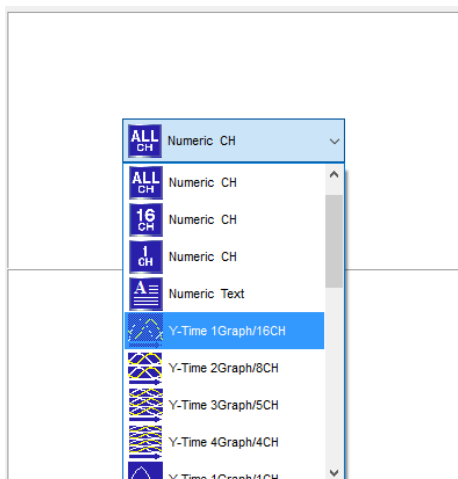


(3) Select the layout.

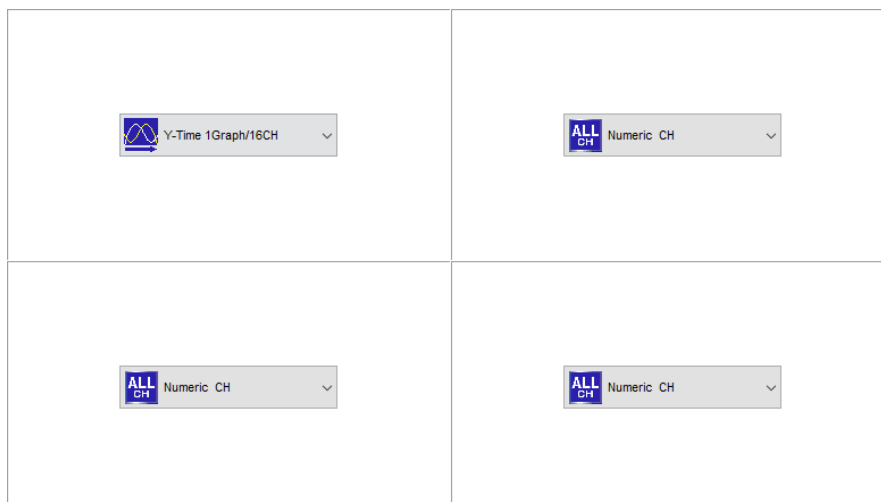
(In the following example, the layout icon is 4 graphs.)



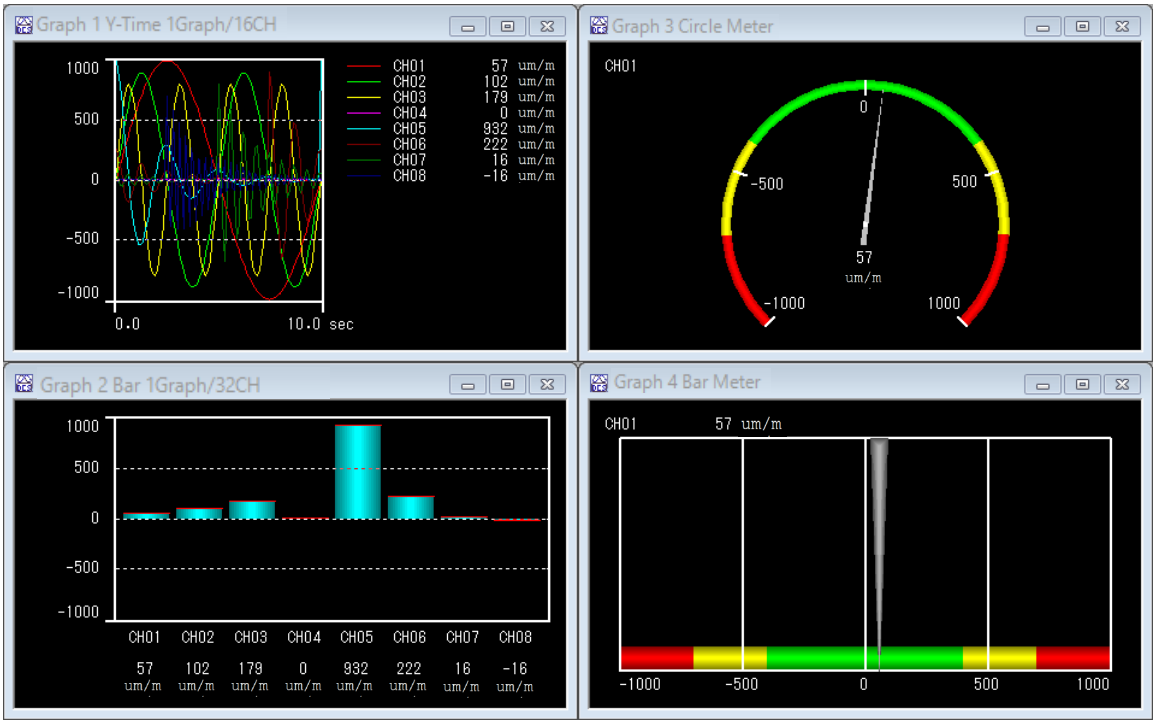
(4) Select the target Numeric windows/Graph windows.



(5) Click the **OK** button.



(6)The pre-set windows, on the Set Window Tile window, appear on the main window.

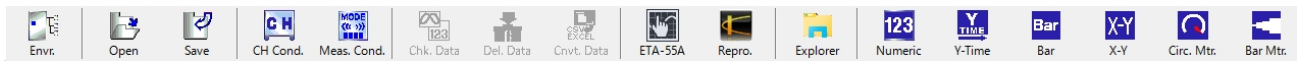


1 2 Control bar

1 2 - 1 Tool bar

Displays the icon menu (tool bar button).

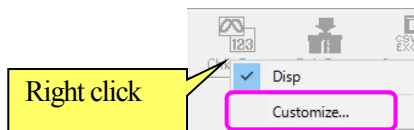
The icon menus (tool bar buttons) are able to be added, deleted, and sorted.



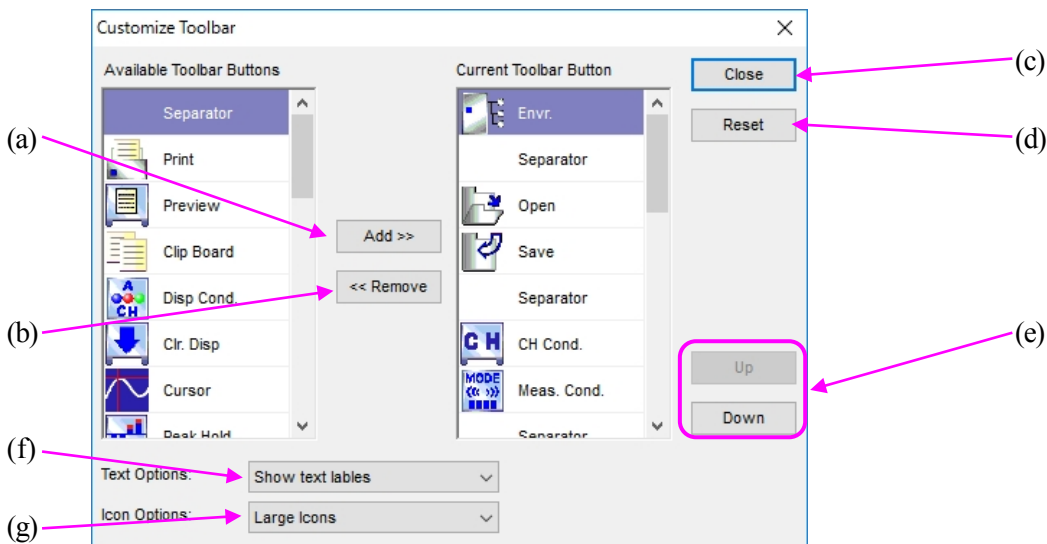
■ To add, delete, and sort the icon menus (tool bar buttons)

(1) Open the Customize Toolbar window by any of the following.

- Click the View - Control Bar - Tool Bar - Customize....
- Right-click the Tool Bar and click the **Customize...** on the pop-up-menu.



(2) The following window appears.



- | | |
|---------------------------|---|
| (a) Add button | Adds the current selecting icon menus (tool bar buttons) on the Tool Bar. |
| (b) Remove button | Removes the current selecting icon menus (tool bar buttons) from the Tool Bar. |
| (c) Close button | Determines the pre-set contents and closes the window. |
| (d) Reset button | Resets the icon menus (tool bar buttons) on the Tool Bar to the default status. |
| (e) Up/Down button | Sorts the current selecting icon menus (tool bar buttons). |
| (f) Text Options | Show or hide the the text labels on the icon menus (tool bar buttons). |
| | Show text labels/Not show text labels |
| (g) Icon Options | Size of the icon menus (tool bar buttons). |
| | Small Icons/Large Icons |

(3) Click the **Add** button/**Remove** button to display the icon menus (tool bar buttons) on the Tool Bar.

■To show or hide the tool bar

(1) Operate the ELA-55A by any of the following.

- Click the View - Control Bar - Tool Bar - Disp.
- Right-click the Tool Bar and click the Disp on the pop-up-menu.

(2) To show : Put a check mark to the check box next to the “Disp.”
To hide : Release a check mark from the check box next to the “Disp.”

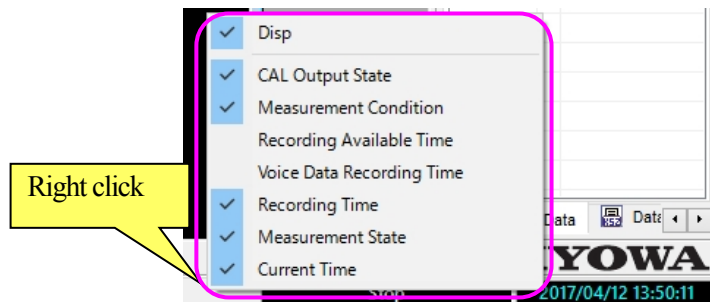
1 2 - 2 Status bar

Displays the measuring status, recording status, current time, etc.

■To show or hide the items

(1) Operate the ELA-55A by any of the following.

- Click the View - Control Bar - Status Bar.
- Right-click the Status Bar and click the target item on the pop-up-menu.



(2) To show : Put a check mark to the check box next to the item.
To hide : Release a check mark from the check box next to the item.

■To show or hide the status bar

(1) Operate the ELA-55A by any of the following.

- Click the View - Control Bar - Status Bar - Disp.
- Right-click the Status Bar and click the Disp on the pop-up-menu.

(2) To show : Put a check mark to the check box next to the “Disp.”
To hide : Release a check mark from the check box next to the “Disp.”

1 2 - 3 Meas mode bar

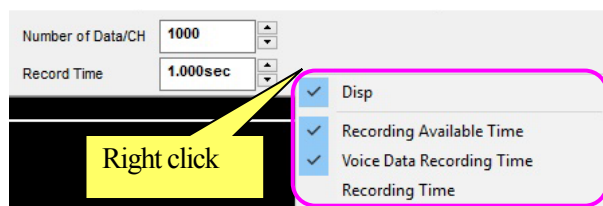
Displays the current Meas Mode, Sampling frequency, The number of recording data, Recording time, etc.

Measure Mode	Manual (Set Record Data)	Number of Data/CH	1000
Sampling Frequency	1,2,5 1kHz	Record Time	1.000sec

■ To show or hide the items

(1) Operate the ELA-55A by any of the following.

- Click the View - Control Bar - Meas Mode Bar.
- Right-click the Meas Mode Bar and click the target item on the pop-up-menu.



- (2) To show : Put a check mark to the check box next to the item.
To hide : Release a check mark from the check box next to the item.

■ To show or hide the meas mode bar

(1) Operate the ELA-55A by any of the following.

- Click the View - Control Bar - Meas Mode Bar - Disp.
- Right-click the Tool Bar and click the Disp on the pop-up-menu.

- (2) To show: Put a check mark to the check box next to the “Disp.”
To hide: Release a check mark from the check box next to the “Disp.”

1 2 - 4 Measure operation panel

You can easily measure data by using buttons on the Measure Operation Panel with a feeling like using a remote controller.

■To show or hide the measure operation panel

(1) Operate the ELA-55A by any of the following.

- Click the View - Control Bar - Measure Operation Panel - Disp.
- Right-click the Measure Operation Panel and click the **Disp** on the pop-up-menu.



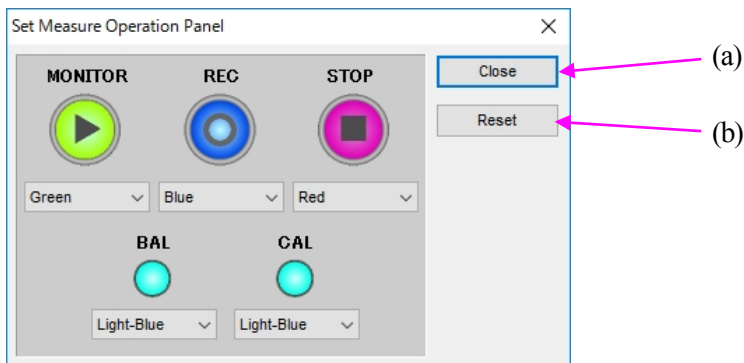
- (2) To show : Put a check mark to the check box next to the "Disp."
To hide : Release a check mark from the check box next to the "Disp."

■To change the button color

(1) Operate the ELA-55A by any of the following.

- Click the View - Control Bar - Measure Operation Panel - Customize....
- Right-click the Measure Operation Panel and click the **Customize...** on the pop-up-menu.
- Double-click the Meas Operation Panel.

(2) The following window appears.



- (a) **Close** button Determines the pre-set contents and closes the window.
(b) **Reset** button Resets the button colors to the default status.

MONITOR button/**REC** button/**STOP** button: Green, blue, or red
BAL button/**CAL** button: Light-blue, orange, or purple

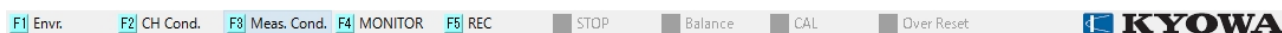
(3) Set the color of each button. Then, click the **Close** button to close the window.

1 2 - 5 Function key bar

Displays the icon menus (tool bar buttons), registered on the function keys (F1 to F12).

The same operation is available by pressing the function keys (F1 to F12) on your keyboard.

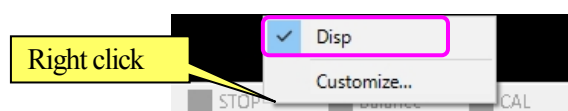
The icon menus (tool bar buttons) are able to be registered or deleted on the function keys (F1 to F12).



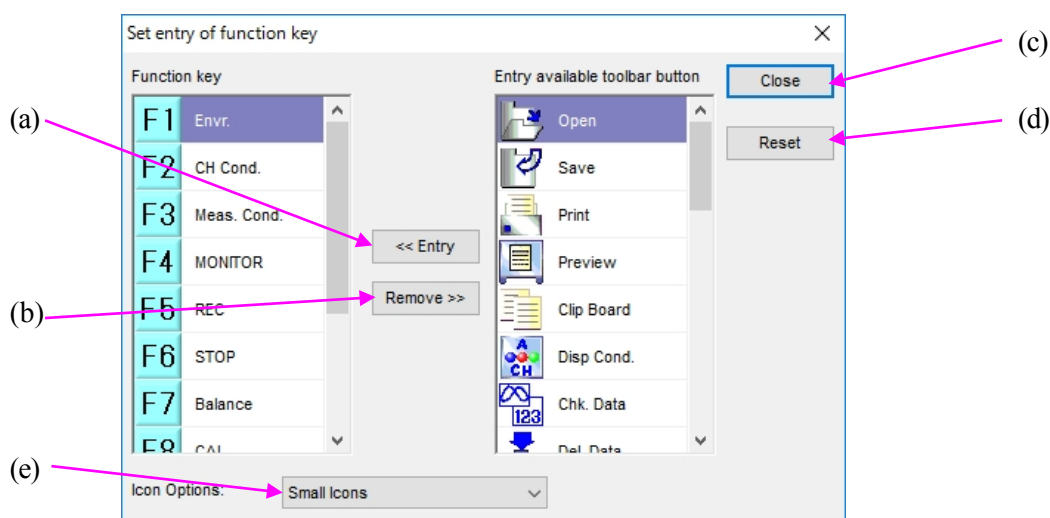
■ To register or delete the icon menus (tool bar buttons) on the function keys (F1 to F12)

(1) Operate the ELA-55A by any of the following.

- Click the View - Control Bar - Function Key Bar -Customize....
- Right -click the Function Key Bar and click the **Customize...** on the pop-up-menu.



(2) The following window appears.



- (a) **Entry** button Adds the current selecting icon menus (tool bar buttons) on the function keys (F1 to F12).
- (b) **Remove** button Removes the current selecting icon menus (tool bar buttons) from the function keys (F1 to F12).
- (c) **Close** button Determines the pre-set contents and closes the window.
- (d) **Reset** button Resets the icon menus (tool bar buttons) on the Function Key Bar to the default status.
- (e) **Icon Options** Size of the icon menus (tool bar buttons).
Small Icons/Large Icons

(3) Click the **Entry** button/**Remove** button to register the icon menus (tool bar buttons) on the function keys (F1 to F12).

■ To show or hide the function key bar

(1) Operate the ELA-55A by any of the following.

- Click the View - Control Bar - Function Key Bar -Disp.
- Right-click the Function Key Bar and click the Disp on the pop-up-menu.

(2) To show : Put a check mark to the check box next to the “Disp.”

To hide : Release a check mark from the check box next to the “Disp.”

1 2 - 6 Window disp bar

Displays buttons to sort the Numeric windows/Graph windows and buttons to show/hide the title bar.
The buttons are able to be added, deleted, and sorted.

 (1) Sorts the windows based on the pre-set template layout.

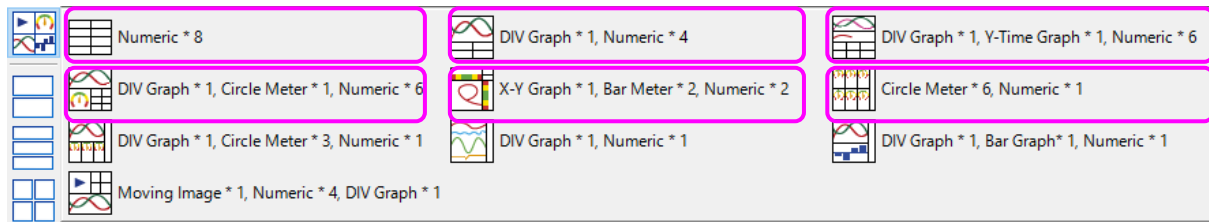
 (2) Sorts the windows based on the button layout.

 (3) Moves the active window.

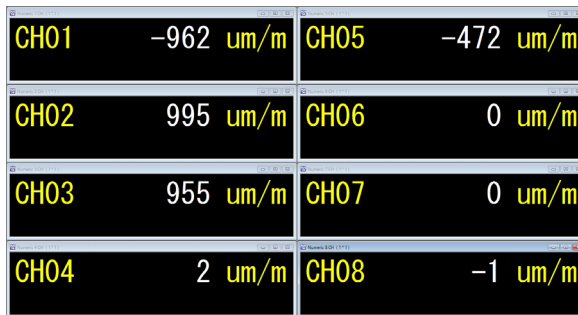
 (4) Shows/hides the title bar of all windows.

■Template layout

Sorts the windows based on the pre-set template layout.



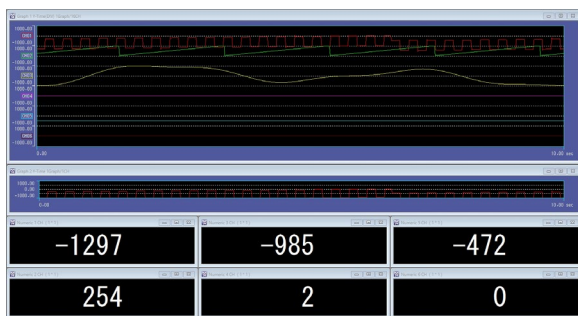
“Numeric Graph×8”



“DIV Graph×1 and Numeric Graph×4”



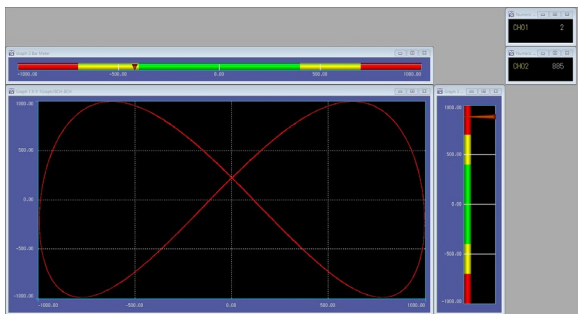
“DIV Graph×1, Y-Time Graph×1, Numeric Graph×6”



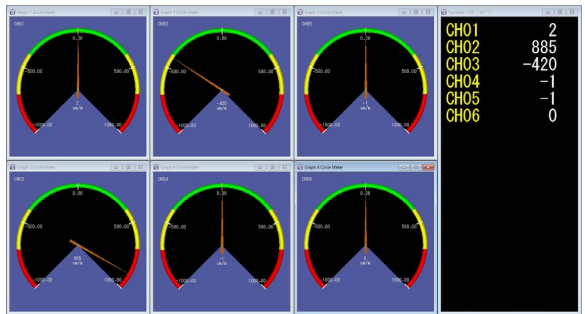
“DIV graph×1, Circle Graph×1, Numeric Graph×6”



“X-Y Graph×1, Bar Graph×2, Numeric Graph×2”



“Circle Graph×6, Numeric Graph×1”

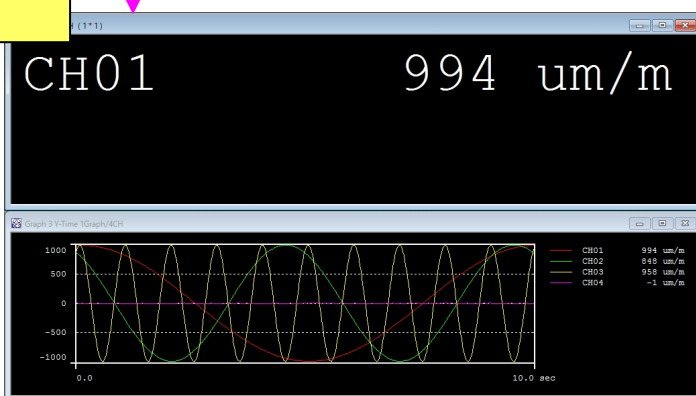


■Button layout

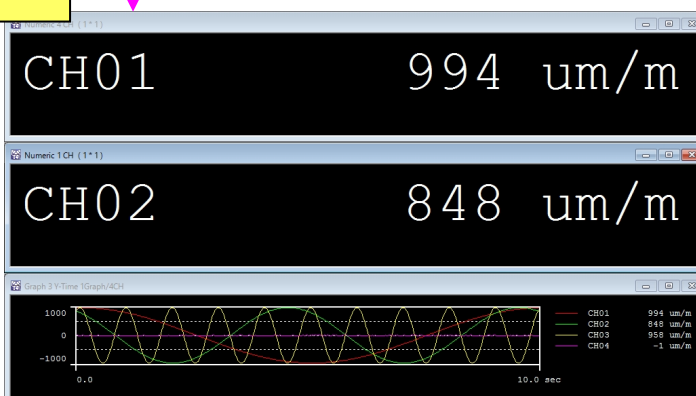
Sorts the windows based on the button layout.

Windows will appear in active window → Numeric window → Graph window.

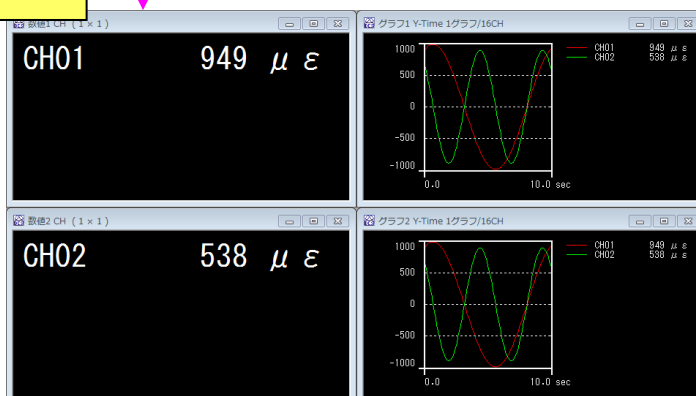
2 windows

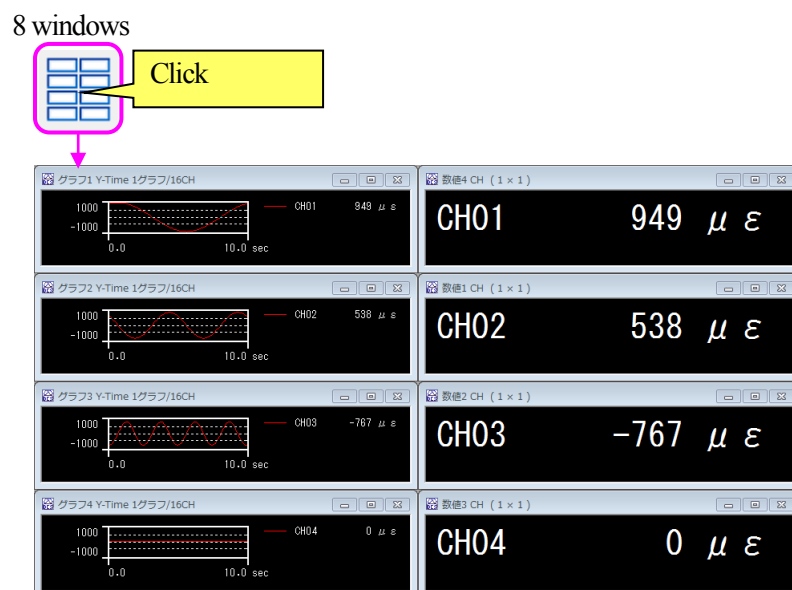
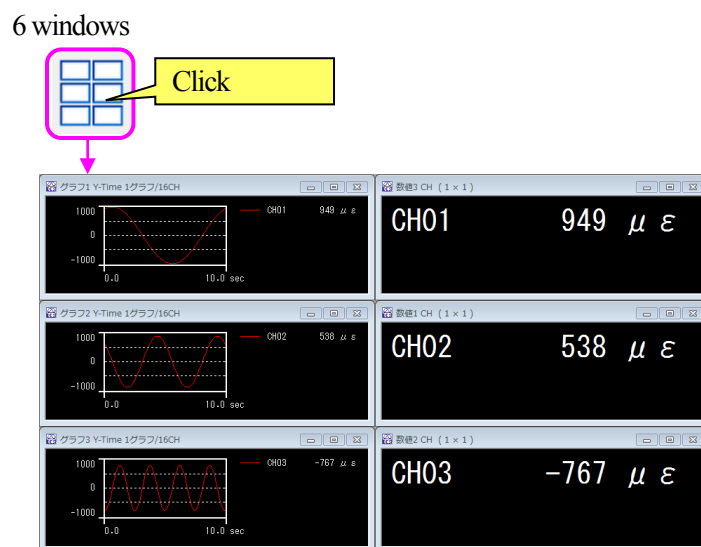
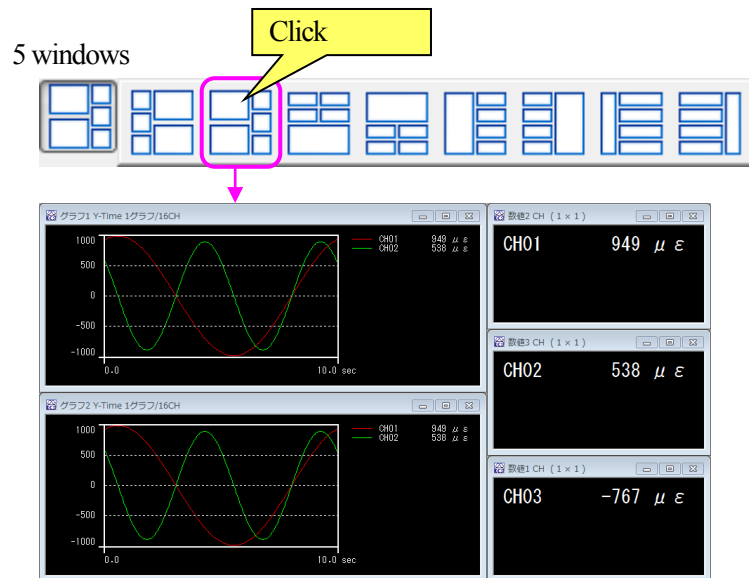


3 windows



4 windows

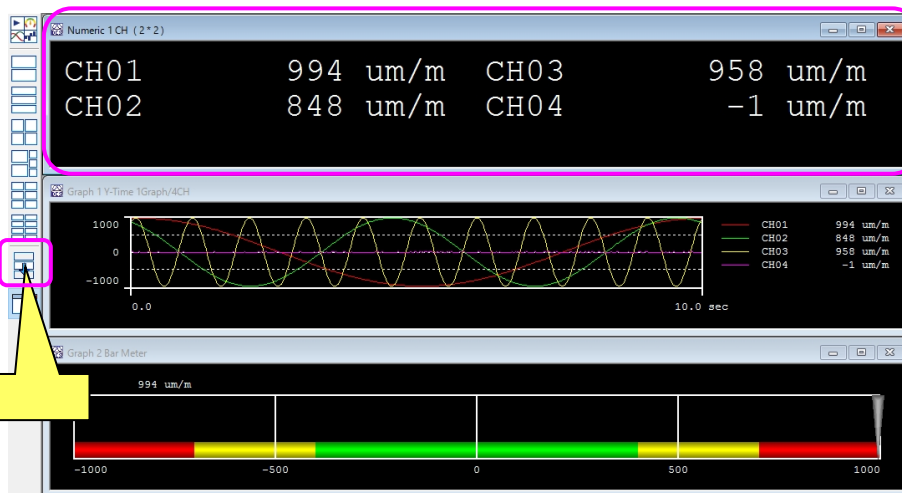




■ To move the active window

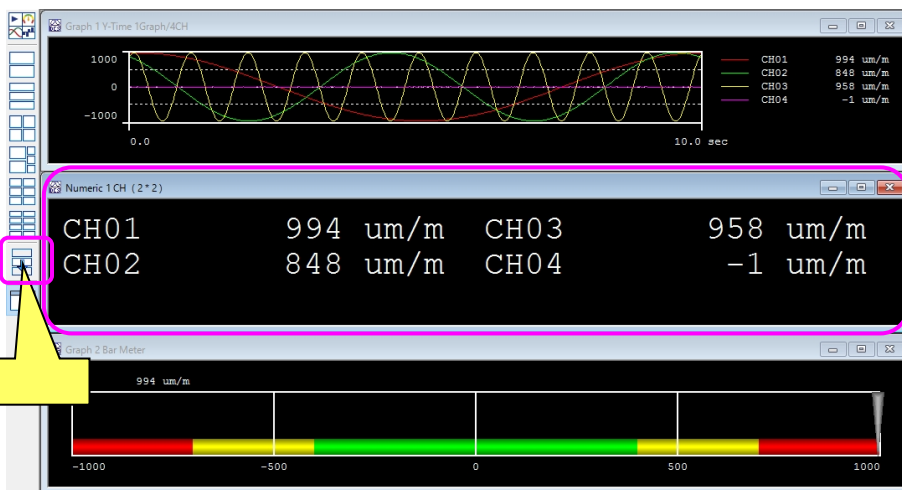
To move the active window, click the button.

(1)

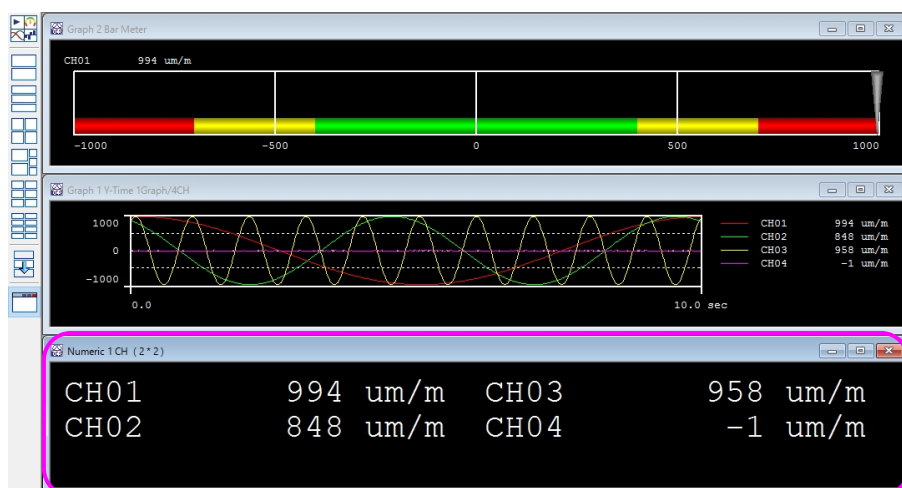


Active window

(2)



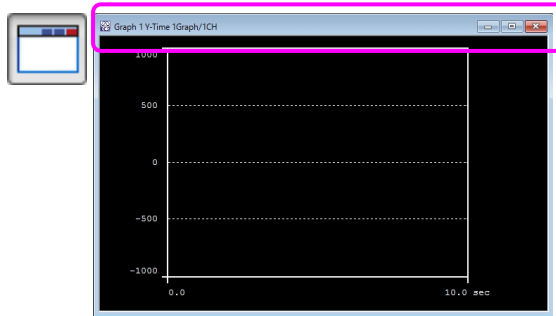
(3)



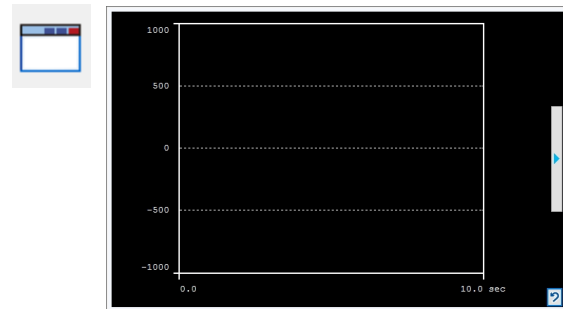
■To show or hide the title bar

To show/hide the title bar of all windows, turn ON/OFF the button.

Show the title bar: Button ON



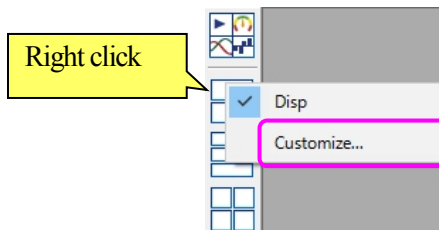
Hide the title bar: Button OFF



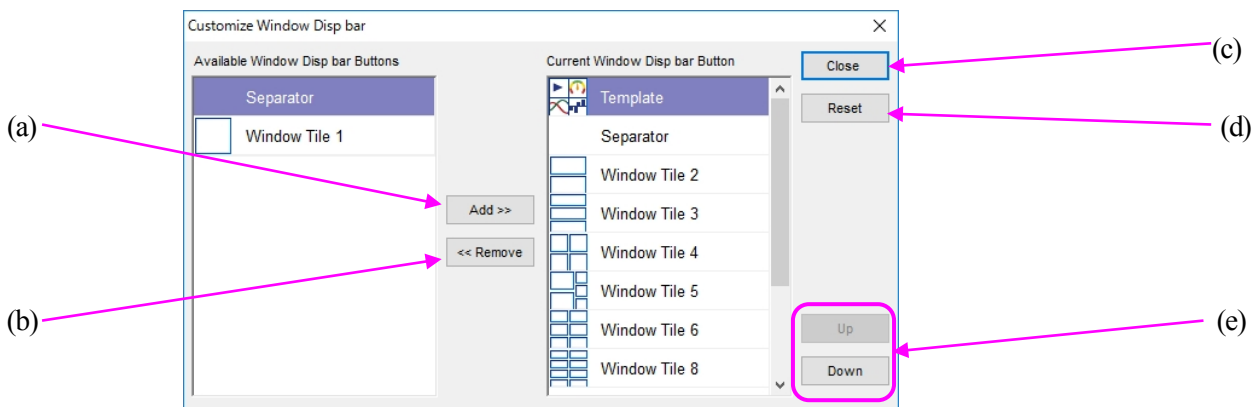
■To add, delete, and sort the buttons

(1) Open the Customize Window Disp Bar window by any of the following.

- Click the View - Control Bar - Window Disp Bar - Customize....
- Right-click the Window Disp Bar and click the **Customize...** on the pop-up-menu.



(2) The following window appears.



- | | |
|--|--|
| (a) Add button | Adds the current selecting buttons on the Window Disp Bar. |
| (b) Remove button | Removes the current selecting buttons from the Window Disp Bar. |
| (c) Close button | Determines the pre-set contents and closes the window. |
| (d) Reset button | Resets the buttons on the Window Disp Bar to the default status. |
| (e) Up button/ Down button | Sorts the current selection buttons. |

(3) Click the **Add** button/**Remove** button to display the buttons on the Window Disp Bar.

■To show or hide the Window Disp Bar

(1) Operate the ELA-55A by any of the following.

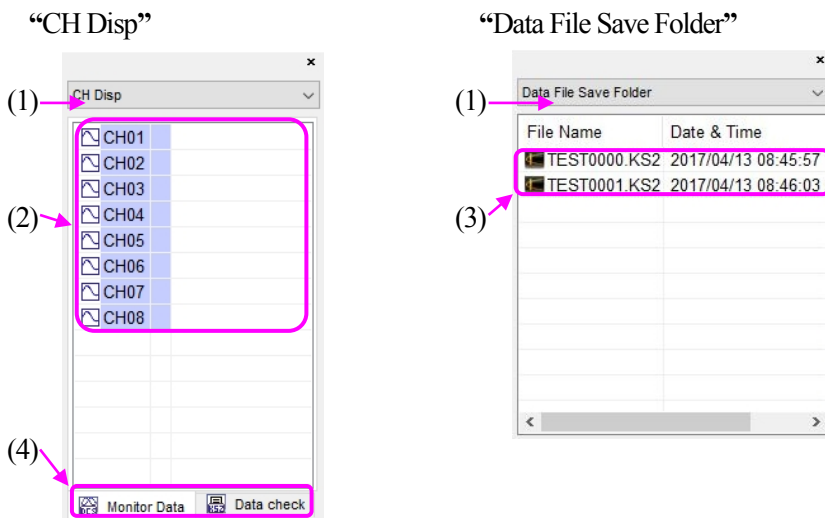
- Click the View - Control Bar - Window Disp Bar - Disp.
- Right-click the Window Disp Bar and click the **Disp** on the pop-up-menu.

- (2) To show : Put a check mark to the check box next to the “Disp.”
 To hide : Release a check mark from the check box next to the “Disp.”

1 2 - 7 CH disp bar

Displays the current measuring channels and recording channels, while checking data.

Channels on the CH Disp Bar are able to be set on the Numeric windows/Graph windows by drag-and-drop operations.

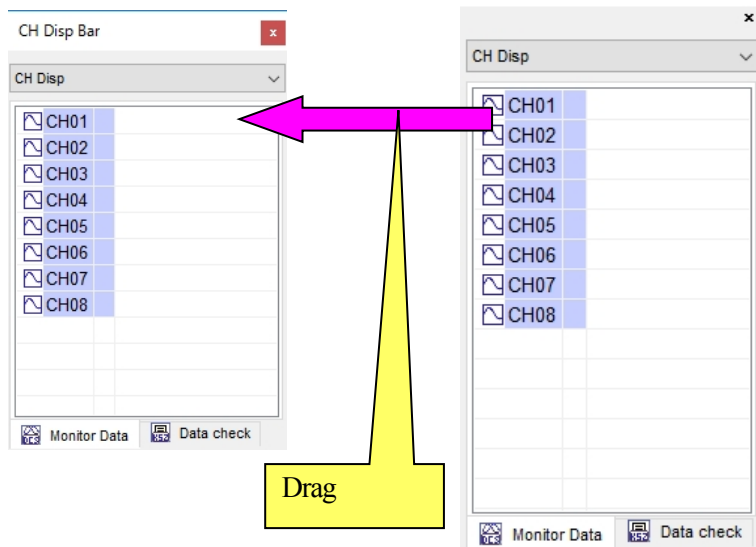


- (1) CH/Data list CH Disp or Data File Save Folder.
 (2) Channels Displays the channels based on the [CH] tab.
 (3) Data files Displays the data files, saved in the data file save folder.
 To check data on the graph window, double-click the data file.
 (4) [CH] tab Monitor Data or Data Check
 Monitor Data: Displays the current measuring channels on the (2) Channels.
 Data Check: Displays the recording channels, while checking data, on the (2) Channels.

■To detach the CH Disp Bar

To detach the CH Disp Bar, drag it from the main window frame.

To attach the CH Disp Bar, drag it to the main window frame.

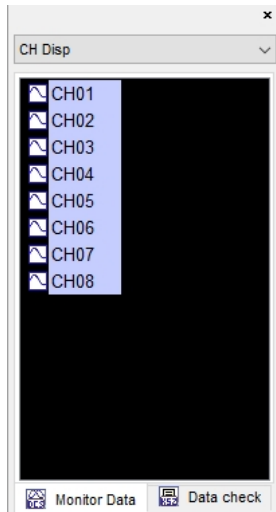


■To change the color on the CH Disp Bar

(1) Operate the ELA-55A by any of the following.

- Click the View - Control Bar - CH Disp Bar - Change Color Style.
- Right-click the CH Disp Bar to display the pop-up-menu.
- Click the Change Color Style on the pop-up-menu.

(2) The color on the CH Disp Bar changes. (In the following example, the color is black.)



■To show or hide the CH Disp Bar

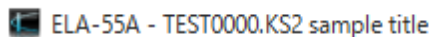
(1) Operate the ELA-55A by any of the following.

- Click the View - Control Bar - CH Disp Bar - Disp.
- Right-click the CH Disp Bar to display the pop-up-menu.
- Click the Disp on the pop-up-menu.

(2) To show : Put a check mark to the check box next to the “Disp.”
To hide : Release a check mark from the check box next to the “Disp.”

1 2 - 8 Main title bar

Displays the ELA-55A model, current device to be controlled, data file name, and file title.

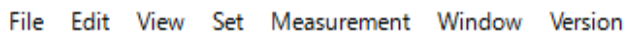


■ To show or hide the main title bar

- (1) Operate the ELA-55A by any of the following.
 - Click the View - Control Bar - Main Title Bar.
 - Right-click the empty area on the MAIN window, where no Numeric windows/Graph windows exists, to display the pop-up-menu.
 - Click the Main Title Bar on the pop-up-menu.
- (2) To show : Put a check mark to the check box next to the Main Title Bar.
- To hide : Release a check mark from the check box next to the Main Title Bar.

1 2 - 9 Menu bar

Provides pull-down menu.



■ To show or hide the Menu Bar

- (1) Operate the ELA-55A by any of the following.
 - Click the View - Control Bar - Menu Bar.
 - Right-click the empty area on the MAIN window, where no Numeric windows/Graph windows exists, to display the pop-up-menu.
 - Click the Menu Bar on the pop-up-menu.
- (2) To show: Put a check mark to the check box next to the “Menu Bar.”
- To hide: Release a check mark from the check box next to the “Menu Bar.”

1 3 Editing

1 3 - 1 To zooming the scale

This section describes how to zoom in the x-axis scale/y-axis scale on the graph window by dragging mouse.

■To zoom in the scale

- (1) Activate the Graph windows.
- (2) Enable the zoom in function by any of the following.

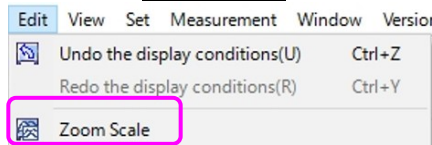
Enabled state



Disabled state



- Click the Edit - Zoom Scale.
- Click the **Zoom Scale** icon from the tool bar.



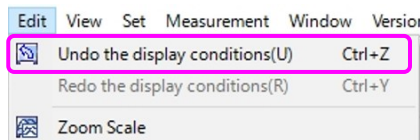
- (3) With the zoom in function in the enabled state, drag the mouse within the graph to zoom in the x-axis scale/y-axis scale.

1 3 - 2 To undo the display conditions

Every Numeric window/Graph window has the latest 5-step conditions.
To undo your last action, click the Undo the display conditions.

■To undo

- (1) Activate the Numeric windows/Graph windows.
- (2) Undo the display conditions by any of the following.
 - Click the Edit - Undo the display conditions (U).
 - Click the **Undo** icon from the tool bar.

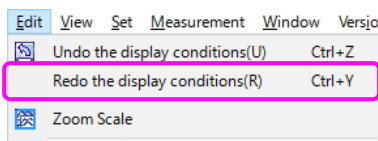


1 3 - 3 To redo the display conditions

To redo your last action, click the Redo the display conditions.

■To redo

- (1) Activate the Numeric windows/Graph windows.
- (2) Click the Edit - Redo the display conditions.



1 4 Appendix

1 4 - 1 Restrictions on each measurement

Measure Mode	Manual	Manual (Set Record Data)	Interval	Analog Trigger, Digital Trigger, External Trigger, and Complex Trigger
Sampling Frequency	Limited by the number of channels. (For details, see 1 4 - 2) *1			
The number of channels	Limited by the sampling frequency. (For details, see 1 4 - 2)			
The number of repeat times	1 fixed	Setting range: 1 to 9999. If you set "0," the actual number of the repeat times is 65535.		
Repeated recording	Not available	Available (Record time : 5 seconds or longer)	Not available	
Digital filtering	Sampling frequency 3 to 10 kHz			
Recording CAN data	Available			Available *2
Recording GPS data	Available			
DIO	Available (You can set the sampling frequency less than 5kHz when “DIO” mode is “Output”, and the function is “While exceeding (ECAN-CH)” or “ECAN-CH exceeded”).)			
Maximum data file size	Up to remaining disk space of built-in memory			
PAUSE function	Available *3		Not available	
Balance adjustment	Available while monitoring data and while pausing. (Not available while stopping/recording data.)		Available while monitoring data only (Not available while stopping / recording data.)	
Offset Zero	Available while monitoring data only (Not available while stopping/recording data.)			
Real-Time Processing Recording moving Image (with a Webcam)	Available (Sampling frequency: 10k Hz or less, The number of repeat times : 1 fixed)		Not available	
Real-Time Processing Recording moving Image (with a High speed camera)	Not available			Available
Real-Time Processing Arithmetic operations	Available (Sampling frequency: 10k Hz or less)			
Real-Time Processing FFT analysis	Available (Sampling frequency : 10k Hz or less. Available while monitor mode is “Continuous monitor mode”. For details, see “ 1 4 - 3 ”.)			

*1 You cannot set the sampling frequency less than 100 Hz when using conditioner cards with antialiasing filter and when low pass filter is set to **AUTO**.

*2 You cannot set the sampling frequency less than 10 kHz when measure mode is "Complex Trigger", and set "ECAN Trigger : ON".

*3 Not available when the number of repeat times is not 1.
Not available when recording moving image and using calculation processing.

Measure mode	Point ZERO measurement	Interval (GPS synchronization) measurement
	Point ZERO (manual) Point ZERO (manual n. of data)	Interval (GPS synchronization)
Sampling Frequency	Limited by the number of channels. (For details, see 1 4 - 2), External clock : Not available *1	
The number of channels	Limited by the sampling frequency. (For details, see 1 4 - 2)	
The number of repeat times	1 fixed	Setting range: 1 to 9999. If you set "0," the actual number of the repeat times is 65535.
Repeated recording	Not available	
Digital filtering	Sampling frequency 3 to 10 kHz	
Recording CAN data	Available	
Recording GPS data	Available	
DIO	Available (You can set the sampling frequency less than 5kHz when “DIO” mode is “Output”, and the function is “While exceeding (ECAN-CH)” or “ECAN-CH exceeded”).	
Maximum data file size	Up to remaining disk space of built-in memory	
PAUSE function	Not available	
Balance adjustment	Available while monitoring data only (Not available while stopping/recording data.)	
Offset Zero	Available while monitoring data only (Not available while stopping/recording data.)	
Real-Time Processing Recording moving Image (with a Webcam)	Available (Sampling frequency: 10k Hz or less, The number of repeat times : 1 fixed)	Not available
Real-Time Processing Recording moving Image (with a High speed camera)	Not available	
Real-Time Processing Arithmetic operations	Available (Sampling frequency: 10k Hz or less)	
Real-Time Processing FFT analysis	Available (Sampling frequency : 10k Hz or less. Available while monitor mode is “Continuous monitor mode”. For details, see “1 4 - 3 ”.)	

*1 You cannot set the sampling frequency less than 100 Hz when using conditioner cards with antialiasing filter and when low pass filter is set to **AUTO**.

Measure mode	Static measurement *1	
	Manual	Interval
Sampling Frequency	1kHz fixed	
The number of channels	Maximum 80	
The number of repeat times	1 fixed	Setting range: 1 to 9999. If you set "0," the actual number of the repeat times is 65535.
Repeated recording	Not available	
Digital filtering	Available	
Recording CAN data	Not available	
Recording GPS data	Not available	
DIO	Available	
Maximum data file size	Up to remaining disk space of built-in memory	
PAUSE function	Not available	
Balance adjustment	Available while monitoring data only (Not available while stopping/recording data.)	
Offset Zero	Available while monitoring data only (Not available while stopping/recording data.)	
Real-Time Processing Recording moving Image (with a Webcam)	Not available	
Real-Time Processing Recording moving Image (with a High speed camera)	Not available	
Real-Time Processing Arithmetic operations	Available	
Real-Time Processing FFT analysis	Not available	

*1 The Synchronous operation is “Standalone.”
The Control mode is “Offline.”

1 4 - 2 The sampling frequency and the number of channels

The sampling frequency and the maximum number of channels to be measured (per one EDX-5000A) are as follows.

Sampling frequency (1/2/5 system)	The maximum number of channels to be measured (AD data format: 16 Bits)	The maximum number of channels to be measured (AD data format: 24 Bits)
200k	32	16
100k	64	32
50k	80	64
20k or less	80	80

Sampling frequency (2n system)	The maximum number of channels to be measured (AD data format: 16 Bits)	The maximum number of channels to be measured (AD data format: 24 Bits)
131,072	32	16
65,536	64	32
32,768	80	64
16,384 or less	80	80

* The maximum number of channels to be measured do not include the number of digital channels, the number of arithmetic channels, and the number of CAN channels.

1 4 - 3 The maximum number of data

If the number of data bytes is $\leq 640,000$, the maximum number of data per one graph will be 50,000 and continuous monitor mode will be used.

If the number of data bytes is $> 640,000$, the maximum number of data per one graph will equal the sampling frequency $\times 0.1$ and intermittent monitor mode will be used.

The number of data bytes can be calculated using the following formulas.

- When the AD data format is 16 bits :
The number of data bytes = (the number of measuring channels $\times 2$) $\times$ the sampling frequency
 - When the AD data format is 24 bits :
The number of data bytes = (the number of measuring channels $\times 4$) $\times$ the sampling frequency
 - When performing arithmetic processing in real time :
The number of data bytes = (the number of measuring channels $\times 8$) $\times$ the sampling frequency
- *The number of measuring channels is the total of the number of analog channels and digital channels, and the number of arithmetic channels.

●Monitor mode

The monitor mode varies with the maximum number of data per one graph.

The maximum number of data per one graph: 50,000 Continuous monitor mode

The maximum number of data per one graph: Sampling frequency $\times 0.1$ Intermittent monitor mode

Continuous monitor mode: Records data continuously from the EDX-5000A.

Intermittent monitor mode: Records data intermittently from the EDX-5000A.

Note that the intermittent monitor mode records data for the maximum number of data per one graph continuously, stops recording data, and records data for the maximum number of data per one graph continuously.

[Example]

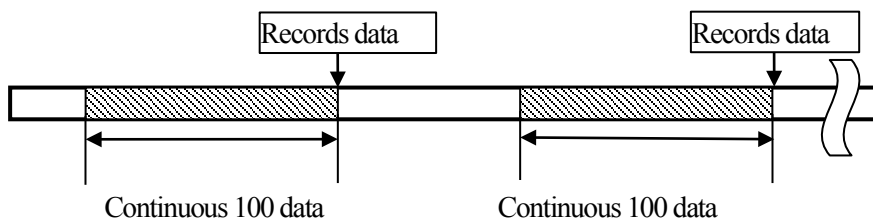
Intermittent monitor mode and recorded data

(The maximum number of data per one graph: 100)

□: Data buffer of the EDX-5000A

The data buffer saves data to the right direction.

▨ : Recorded data

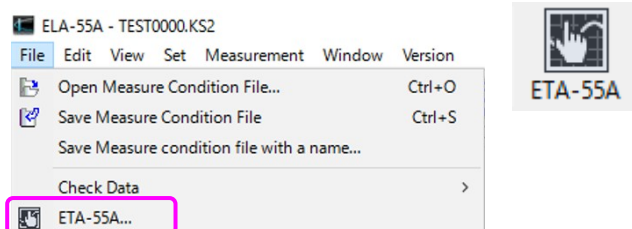


1 4 - 4 Switching to the ETA-55A

You can switch the software used to control the EDX-5000A from the ELA-55A to the ETA-55A.

(1) Perform either of the following operations.

- Select “File” - “ETA-55A” menu.
- Select the “ETA-55A” toolbar button on the toolbar.



(2) Close the ELA-55A and start the ETA-55A.

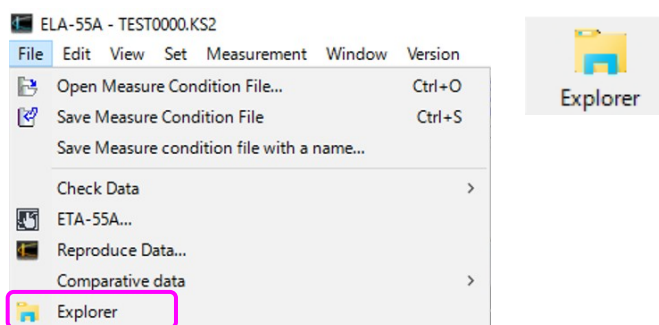
1 4 - 5 Launch Explorer

You can launch Explorer when the data file save folder is open in the ELA-55A.

You can use Explorer to delete acquired data files and copy them to external media.

Perform either of the following operations.

- Select “File” - “Explorer” menu.
- Select the “Explorer” toolbar button on the toolbar.



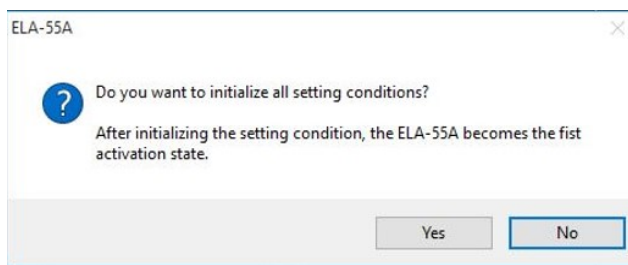
1 4 - 6 Initialize setting conditions

This section describes how to initialize setting conditions (environment setting, channel condition, measurement condition, real-time condition, CAN condition and display condition) from the ELA-55A.

(1) Click the File – Initialization of the condition...

(2) The following message appears.

Click the **Yes** button.



(3) All setting conditions of ELA-55A are initialized.

1 5 Specifications

1 5 - 1 Measuring conditions

- | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|--|--------------|----------|-----------------------------|--|------------------|----------------------|---------------|---------------------------|---------------|----------|-------------|-----------|---------------|------|---------------|----------|----------------|--|----------|--|---------------|---|---------------|----------|
| (1) Channel conditions | Measurement, Mode, Range, High-pass filter, Low-pass filter, Balance, CAL Range, CAL, Calibr. const., Offset, Unit, CH Name, Meas Range, the number of digits below the decimal point, Rated Capacity, Rated Output, Digital Filter, Sampling Frequency (High, Low, High + Low)
(Display items can freely be selected.) | | | | | | | | | | | | | | | | | | | | | | | | | |
| (2) Recordable data | Up to remaining disk space of built-in memory | | | | | | | | | | | | | | | | | | | | | | | | | |
| (3) Manual measurement | Recording from REC to STOP, or preset data starts from REC | | | | | | | | | | | | | | | | | | | | | | | | | |
| (4) Interval measurement | Automatic recording according to designated starting time and recording interval | | | | | | | | | | | | | | | | | | | | | | | | | |
| (5) Trigger measurement | <p>Common trigger conditions</p> <table border="0"> <tr> <td>End trigger</td> <td>Settable</td> </tr> <tr> <td>Pre-trigger or post trigger</td> <td>Max. 4194304 points per channel when A / D is set to 16-bit.
Max. 2097152 points per channel when A / D is set to 24-bit.</td> </tr> </table> <p>Trigger data correlates with the number of channels and AD data.</p> <p>Analog trigger conditions</p> <table border="0"> <tr> <td>Trigger channels</td> <td>Any 1 analog channel</td> </tr> <tr> <td>Trigger level</td> <td>Sets in physical quantity</td> </tr> <tr> <td>Trigger slope</td> <td>Up, down</td> </tr> </table> <p>Digital trigger conditions</p> <table border="0"> <tr> <td>Trigger bit</td> <td>Any 1 bit</td> </tr> <tr> <td>Trigger level</td> <td>0, 1</td> </tr> </table> <p>External trigger conditions</p> <table border="0"> <tr> <td>Trigger slope</td> <td>Up, down</td> </tr> </table> <p>Complex trigger conditions</p> <table border="0"> <tr> <td>Trigger source</td> <td>Selection of any 4 analog / digital channels, an external trigger channel, or a manual trigger channel</td> </tr> <tr> <td>AND / OR</td> <td>be used for analog trigger, digital trigger and external trigger</td> </tr> <tr> <td>Trigger level</td> <td>A physical quantity is set for the analog channel, and 0 or 1 for the digital channel</td> </tr> <tr> <td>Trigger slope</td> <td>Up, down</td> </tr> </table> | | End trigger | Settable | Pre-trigger or post trigger | Max. 4194304 points per channel when A / D is set to 16-bit.
Max. 2097152 points per channel when A / D is set to 24-bit. | Trigger channels | Any 1 analog channel | Trigger level | Sets in physical quantity | Trigger slope | Up, down | Trigger bit | Any 1 bit | Trigger level | 0, 1 | Trigger slope | Up, down | Trigger source | Selection of any 4 analog / digital channels, an external trigger channel, or a manual trigger channel | AND / OR | be used for analog trigger, digital trigger and external trigger | Trigger level | A physical quantity is set for the analog channel, and 0 or 1 for the digital channel | Trigger slope | Up, down |
| End trigger | Settable | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pre-trigger or post trigger | Max. 4194304 points per channel when A / D is set to 16-bit.
Max. 2097152 points per channel when A / D is set to 24-bit. | | | | | | | | | | | | | | | | | | | | | | | | | |
| Trigger channels | Any 1 analog channel | | | | | | | | | | | | | | | | | | | | | | | | | |
| Trigger level | Sets in physical quantity | | | | | | | | | | | | | | | | | | | | | | | | | |
| Trigger slope | Up, down | | | | | | | | | | | | | | | | | | | | | | | | | |
| Trigger bit | Any 1 bit | | | | | | | | | | | | | | | | | | | | | | | | | |
| Trigger level | 0, 1 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Trigger slope | Up, down | | | | | | | | | | | | | | | | | | | | | | | | | |
| Trigger source | Selection of any 4 analog / digital channels, an external trigger channel, or a manual trigger channel | | | | | | | | | | | | | | | | | | | | | | | | | |
| AND / OR | be used for analog trigger, digital trigger and external trigger | | | | | | | | | | | | | | | | | | | | | | | | | |
| Trigger level | A physical quantity is set for the analog channel, and 0 or 1 for the digital channel | | | | | | | | | | | | | | | | | | | | | | | | | |
| Trigger slope | Up, down | | | | | | | | | | | | | | | | | | | | | | | | | |
| (6) Static measurement | <p>Every time you start a recording, the static measurement applies a moving-average function to measured data (averaging value data) and saves it to one CSV format file.</p> <p>*Measure Mode: Manual and Interval only.</p> | | | | | | | | | | | | | | | | | | | | | | | | | |
| (7) Reading / Saving measuring condition files | Capable of reading / saving measuring condition files | | | | | | | | | | | | | | | | | | | | | | | | | |
| (8) Reading / Saving sensor's files | Capable of reading / saving sensor's CSV files by CH condition | | | | | | | | | | | | | | | | | | | | | | | | | |
| (9) Digital I / O settings | <table border="0"> <tr> <td>I / O points</td> <td>Max. 8</td> </tr> <tr> <td>I / O settings</td> <td>Sets every bit to digital input, digital output, remote-control</td> </tr> </table> | | I / O points | Max. 8 | I / O settings | Sets every bit to digital input, digital output, remote-control | | | | | | | | | | | | | | | | | | | | |
| I / O points | Max. 8 | | | | | | | | | | | | | | | | | | | | | | | | | |
| I / O settings | Sets every bit to digital input, digital output, remote-control | | | | | | | | | | | | | | | | | | | | | | | | | |
| (10) TEDS | Reads sensor's information and sets to channel condition automatically | | | | | | | | | | | | | | | | | | | | | | | | | |

(11) Load/Save ME5 file

Load ME5 file and configure settings according to loaded measurement conditions.

Save the measurement conditions in ME5 file.

*You can also load/save ME5 file using DCS-100A and ETA-55A.

1 5 - 2 Measuring operation

Monitor measurement, recording start, pause, stop, balancing, and CAL output, etc.

1 5 - 2 - 1 Real-Time operation

Simultaneous monitoring and recording of data.

(1) Video data acquisition with a web camera

Using camera	DirectX compatible webcam (Webcam that the OS recognizes it as the imaging device.)
The number of using camera	1
Resolution	Maximum 640×480
Frame rate	Maximum 30 fps
Save file format	AVI file
The resolution and frame rate are determined according to the using webcam.	
Measuring conditions when recording moving image	
Sampling frequency	Maximum 10 kHz
MEAS mode	Manual, Manual(Set Record Data)

(2) Calculating procession

▪ Digital filter

Butterworth filter (IIR)

Filter type	Low-pass filter, high-pass filter
Order of filter	1 to 8
Amplitude Ratio at the cutoff point	-3dB
Attenuation characteristic	$-6 \times N$ dB/oct. (N : Order of filter)

*The digital filter can be used with the built-in low pass filter of conditioner cards.

The measurement condition when using "Digital filter"

Sampling frequency	3 to 10 kHz
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▪ Arithmetic operations

The number of the calculation CHs	Maximum 64 CHs
Calculation CH conditions	Calculation ON/OFF, arithmetic expression (within 200 characters), unit, deci digits, CH name (within 40 characters), calculation zero, and calculation zero value
Operators and constants	addition : +, subtraction : -, multiplication : *, division : /, power : ^, circle ratio : PI, and bracket : ()
Calculation function	SQR Square Root Function ABS Absolute Function SIN SIN Function COS COS Function TAN TAN Function ASIN ASIN Function ACOS ACOS Function ATAN ATAN Function DSIN DSIN Function DCOS DCOS Function DTAN DTAN Function

LOG	LOG Function (Common Logarithm)
LN	LN Function (Natural Logarithm)
EXP	EXP Function (Exponent)
HMX	Maximum Principal Strain Function
HMN	Minimum Principle Strain Function
HSM	Maximum Sheering Strain Function
SMX	Maximum Principle Stress Function
SMN	Minimum Principle Stress Function
SSM	Maximum Sheering Stress Function
DEG	Principle Strain Direction Function

The measurement condition when using “Arithmetic operations”

Sampling frequency Maximum 10 kHz

(3) FFT analysis

Analysis types Linear spectrum, power spectrum, cross spectrum, auto-correlation, and cross-correlation

Window functions Rectangle, Hamming, Hannig, Fejer, Blackman, and Gaussian

Analyzed data points 256, 512, 1024, 2048, 4096, and 8192

Analysis channels 4 channels / window, max. 8 windows

Saving file format Analyzed results are saved in CSV files

The measurement condition when using “FFT analysis”

Sampling frequency Maximum 10 kHz

1 5 - 2 - 2 Saving format

Saving format KYOWA standard file format KS2

KS2 file version 01.06

1 5 - 3 Monitor

(1) Y-Time graph X-axis indicates the time, and Y-axis the physical amount of measurement for a maximum of 16 channels.

10 graphs per window is possible.

(2) Y-Time (all channels) graph X axis indicates the time, and Y axis the physical amount of measurement. The line color is the same for all channels.

(3) Y-Time (DIV) graph X axis indicates the time, and Y axis the physical amount of measurement for a maximum of 16 channels possible. Allow channel's zero position to be set on the Y axis.

(4) X-Y graph Any combination of 8 channels I plotted on X and Y axis.

(5) Bar graph Up to 32 channels are contained in a graph. 1 to 4 graphs are indicated on a window. Peak hold ON / OFF.

(6) Digital graph X axis indicates the time, and Y axis bit data of a digital channel (Up to 16 bits). 1 to 4 graphss are displaye on a window.

(7) Circle meter Any one channel is displayed in a circle meter.

(8) Bar meter Any one channel is displayed in a horizontal or vertical bar meter.

(9) Numeric window	Any one channel, 16 channels or all channels are listed. The max. and min. values of each channel are possible.
(10) FFT graph	Up to 4 channels of analyzed results are displayed.
(11) Web camera	Displays captured images.
(12) Over-input	Capable of displaying the excessive channel values in red, except FFT graphs.
(13) Graph scale	Capable of displaying auto-scale and full scale values on the Y-time graph (Y axis), X-Y graph (X, Y axes) and bar graph (Y axis). Y axis of Y-time graph are swichable among 1-axis, 2-axis, and channel-by-channel.
(14) Display color	Any color is selectable
(15)Title, labels	Any title or X and Y axis labels are specified.
(16) No. of windows	8 numeric windowss, 8 graph windows (Including an FFT window).
(17) Auxiliary lines	Capable of displaying the desired auxiliary lines on the Y-time graphs (X axis and Y axis), X-Y graph (X axis and Y axis), and Bar graph (X axis and Y axis). (Up to 4 auxiliary lines each for both X axis and Y axis).
(18) Comparative data	Displays the comparative data (Previous KS2 format file) on the Y-time graphs, neigher Y-time (All channels) graphs nor Y-time (DIV) graphs, and X-Y graphs for comparing the monitor data. The size of the data file is maximum 10MB. If the file size exceeds 10MB, displays the 10MB data from its head.

1 5 -4 Setting environment

(1) Operation modes	Standalone, sync host, sync guest setting
(2) Control modes	Off-line, Online switching
(3) Automatic file conversion	Automatic file conversion upon measurement(CSV, XLS, XLSX, or RPC III format)
(4) Real-time processing	Recording moving image (web camera) ON/OFF, Recording moving image (high speed camera) ON/OFF, Calculating procession (arithmetic operations) ON/OFF, FFT analysis ON/OFF
(5) Others	Oscillator switching (internal, external), operation beep, balance reference values front speaker ON / OFF A / D bits switching : 16 or 24 bits Optional switch setting

1 5 - 5 GPS / Multi channel CAN option function

(1) Recording CAN data	Capable of recording up to 512-channel CAN data per one unit. (In the EDX-5000A data drive, as the E4A file).	
(3) CAN trigger	Trigger channel	Any 1 CAN channel
	Trigger level	Set in CAN data
	Trigger slope	Up, down
(3) Communications conditions	Sample points, sampling frequency, resynchronization jump width selection	
(4) Measureing channel conditions	Start bit, bit length, data type, Calibration coefficient (Conditions for conversion of extracting CAN data to physical quantity)	
(5) Graph display	Simultaneous display of graph, numerical value, frame, and analog data	
(6) Read CANdb files	File	DBC format
	The number of "Network Node"	Maximum 1024
	The number of "Message"	Maximum 2048
	The number of "Signal"	Maximum 4096
(7) Point ZERO (manual) measurement	Starts the manual measurement at 0 msec by using the time data, received from the GPS satellite.	
(8) Interval (GPS synchronization) measurement	Starts the interval measurement at 0 msec by using the time data, received from the GPS satellite.	
(9) Recording GPS data	Monitors/records the GPS data (latitude, longitude, speed, azimuth, etc.). The ELA-55A saves the GPS data in the EDX-5000A data drive (in the NMEA format).	