

INSTRUCTION MANUAL

EDX-5000A

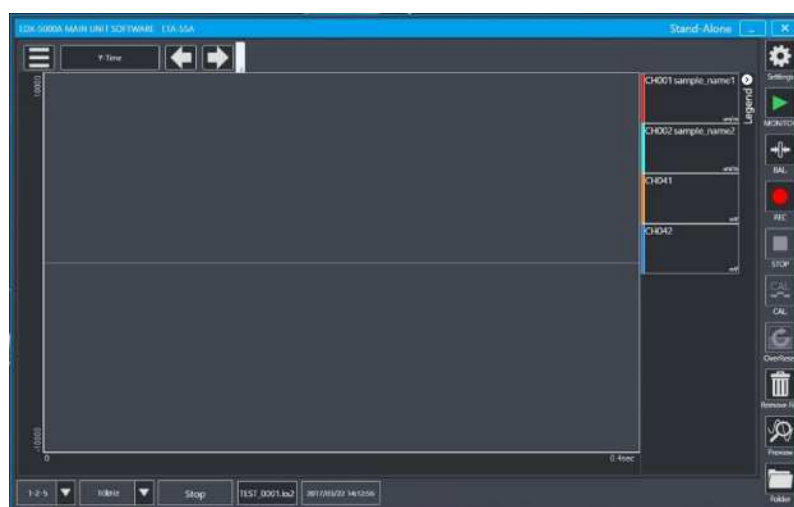
Memory Recorder/Analyzer

[Main Unit Software Manual]

Thank you for purchasing KYOWA's product EDX-5000A
Memory Recorder/Analyzer.

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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About this Instruction Manual

This Manual describes the operation and functions of the ETA-55A software for use with 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.



CAUTION

Describes essential instructions for handling the EDX-5000A.



Describes reference information for handling the EDX-5000A.

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

For details concerning the handling of the ELA-55A (EDX-3000B-compatible application), see the separate volume "INSTRUCTION MANUAL EDX-5000A MEMORY RECORDER/ANALYZER (For EDX-3000B compatible software)".

Restrictions and Safety Precautions for Using this Software

1. Prohibited matters

- This software cannot be started up in conjunction with the ELA-55A on the EDX-5000A.
- Reverse engineering of this software

2. Precautions for use

- This software is intended for use with the EDX-5000A. This software is not guaranteed to function properly on other PCs.
- Response times may slow down depending on the number of graphs displayed. Reduce the number of graphs displayed when response times slow down.
- This software cannot load ELA-55A (EDX-3000B-compatible application) condition files.
- To startup this software from the desktop screen, tap the startup icon for this software on the Start menu.

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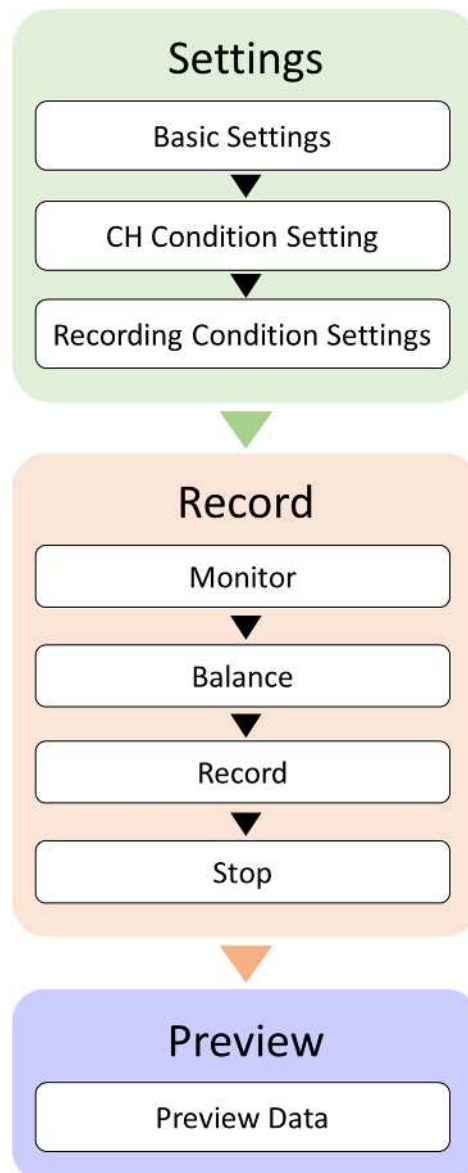
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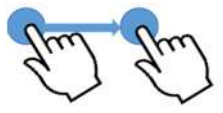
I. Operational Description

1 Setup - Recording - Previewing Flow

Basic data recording follows the process flow outlined below.



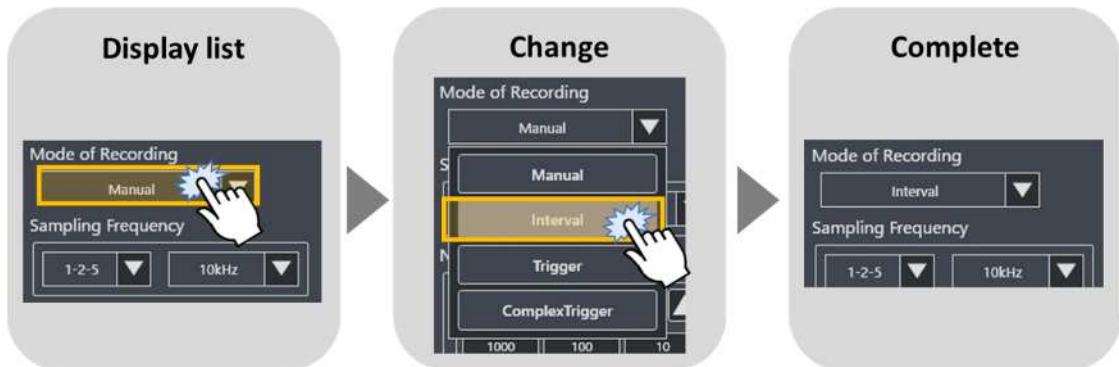
2 Description of Basic Operation Flow

Gestures	Description	
Tap	Tapping lightly once with your finger. (Equivalent to clicking with your mouse)	
Double-tap	Tapping quickly twice. (Equivalent to double-clicking with your mouse)	
Press and hold	Holding down on the screen with your finger for several seconds. (Equivalent to clicking and holding with your mouse)	
Swipe	Pressing your finger on the screen and moving your finger in a fixed direction. (Similar to dragging with your mouse)	
Drag and drop	Selecting an item and releasing your finger when it is over the intended location. (Equivalent to dragging and dropping with your mouse)	

3 Basic Operating Interface

3.1 Drop-down list

Tap to change the list display.



3.2 Character input

Bring up the screen keyboard to input character.



3.3 Spin box

3.3.1 Change values

Tap the  button to change values.

You can also change values by directly inputting them.

Note that emojis cannot be unavailable.



3.3.2 Change magnification

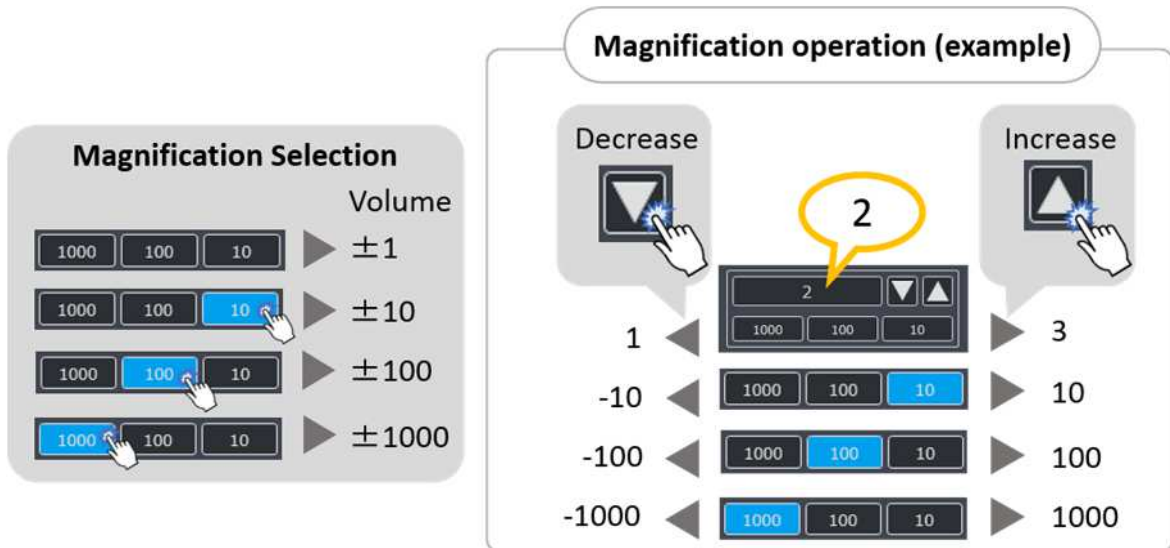
Tap to switch between magnification and mode selection types, and change the magnification amount using the up/down buttons.

Note that the background color will be blue when the button status is ON.

Setting range restrictions will vary depending on the settings configured.

(1) Magnification selection types

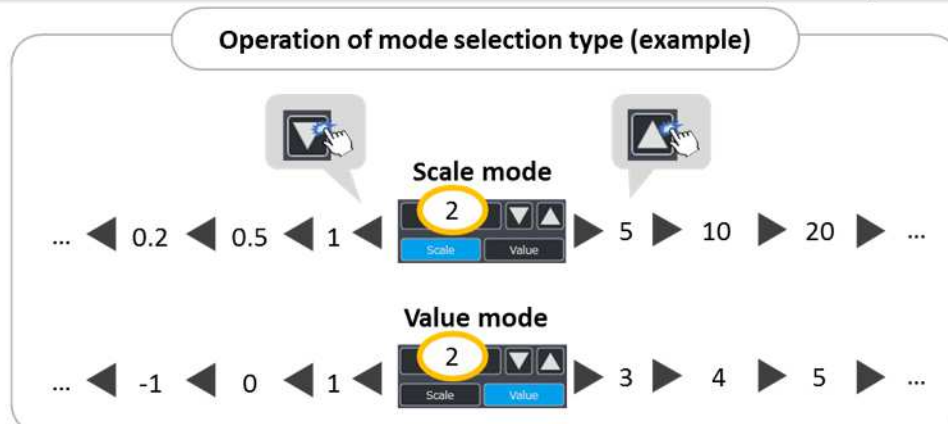
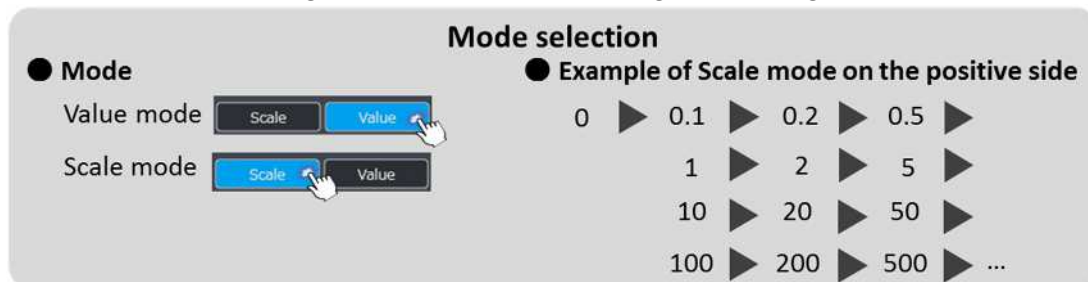
Use the magnification switching button to change the magnification amount in increments of 1, 10, 100, and 1000.



(2) Mode selection types

Value mode : Change amount 1

Scale mode : Change the value so that the high-order digit is 1, 2, or 5



3.4 List

3.4.1 Change settings

Tap to bring up the Settings dialog box to change settings.

For details on inputting characters, see Chap. I Section 3.2.

Bring up the setting dialog

CH	CH Name	Use	Mode
CH001	sample name 1	ON	BV(2.0V)
CH002	sample name 2	ON	BV(2.0V)
CH003	sample name 3	ON	BV(2.0V)

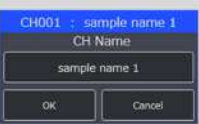
Tap the item you wish to change

Setting dialog operation and Apply changes

- Selection type : tap to select and apply setting.



- input characters type



OK Cancel

Apply changes Cancel

3.4.2 Other actions

3.4.2.1 Select entire column: Tap the item name column.

Tap the list item name to select the entire column.

3.4.2.2 Scroll: Swipe within the list.

Swipe the screen within the list display to scroll through the list.

Scroll operation

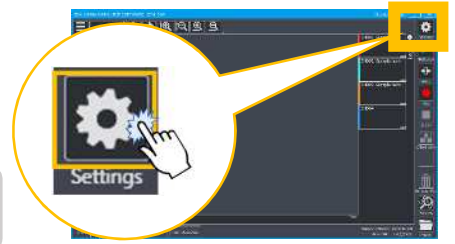


Swipe up: To scroll down
Swipe down: To scroll up

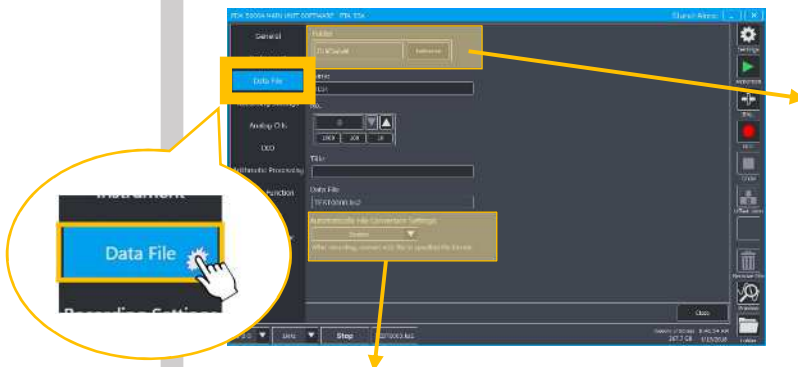
4 Set Recording Conditions

4.1 Recorded data file settings

1. Tap the "Settings" button on the tool bar.



2. Confirm and change settings on the "Data File" page.



Save location settings

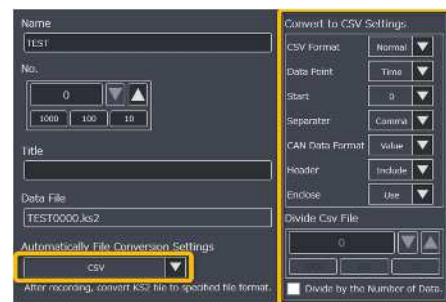
- (1) Tap the "Reference" button
- (2) Select a save location from the Folder Selection window.



Automatically File Conversion Settings

Tap this to select "CSV" or "RPC3" when converting to CSV format or RPC III format and change each conversion settings.

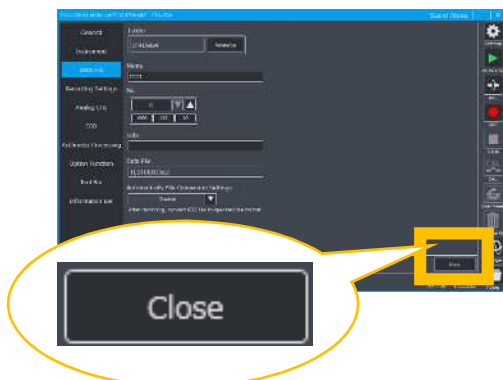
When not converting, select "Disable".
(For details, see Chap. II Section 3.1.2)



CAUTION

- Do not select external storage as the storage location of the recorded data.
- Data cannot be saved in C: drive.

3. Apply settings changes.



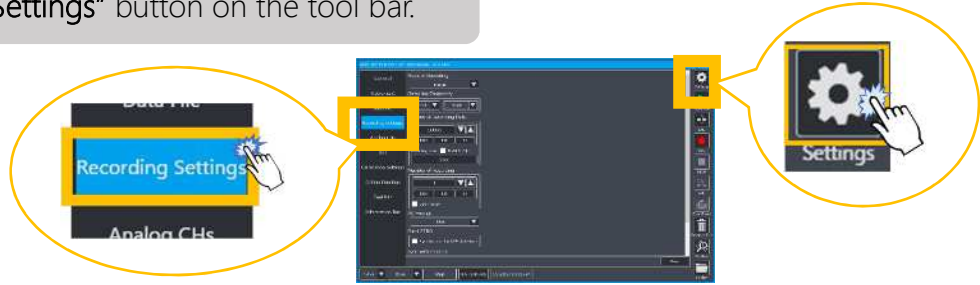
Apply Settings

To apply settings, tap close button in the "Settings" window or switch to another condition settings page.

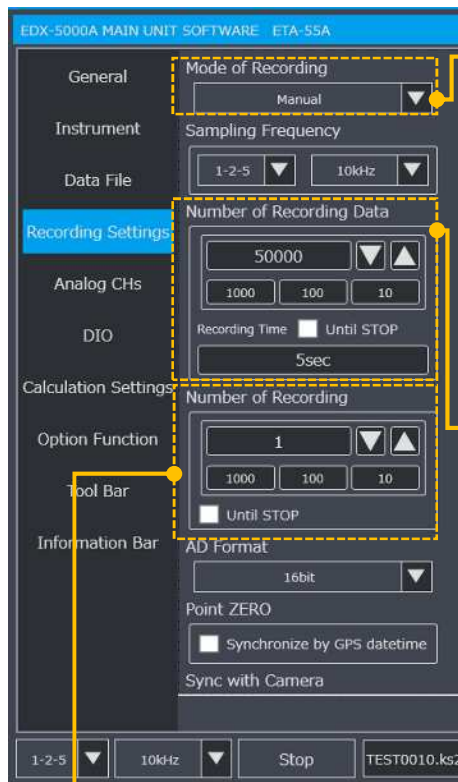
4.2 Recording condition settings

4.2.1 Basic data recording (manual recording) settings

1. Tap the "Settings" button on the tool bar.



2. Confirm and change settings on the "Recording Settings" page.



Recording mode settings

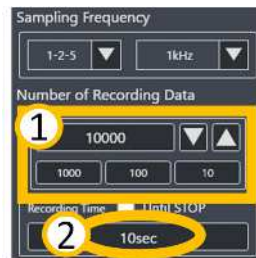
Tap this and select "Manual".



The number of recording data settings

Specify the number of recording data.

- (1) Set the number of data to be recorded.
- (2) Check the recording time displayed.



Recording time can also be set by direct input.

Continue recording until the "STOP" is tapped.

Select the "Until STOP" check box.



Values for the number of data and the recording time will be displayed as "0".

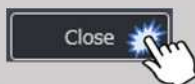
For details, see Chap. II Section 3.2.2

Recording count settings

Continue recording until the "STOP" button is tapped, select the "Until STOP" check box.

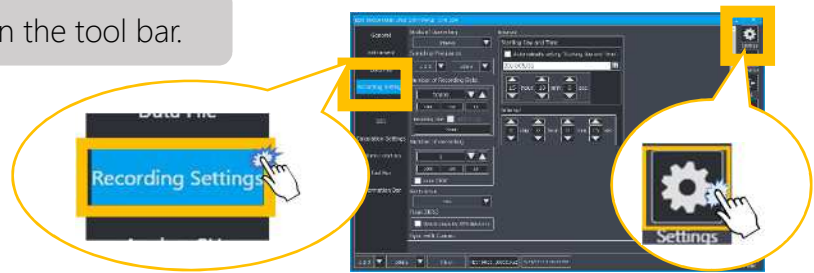


3. Apply settings changes.



4.2.2 Settings to leave a gap between data recording (interval recording)

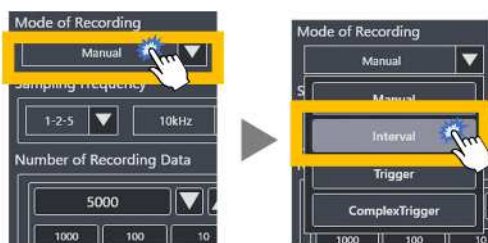
1. Tap the "Settings" button on the tool bar.



2. Confirm and change settings on the "Recording Settings" page.

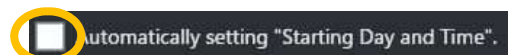
Recording mode settings

Tap this and select "Interval".



Start day and time settings

Designate a recording start time. When not specified, tap this to select the check box.



Recording interval settings

Set the time that added the recording time to the interval time until next recording.

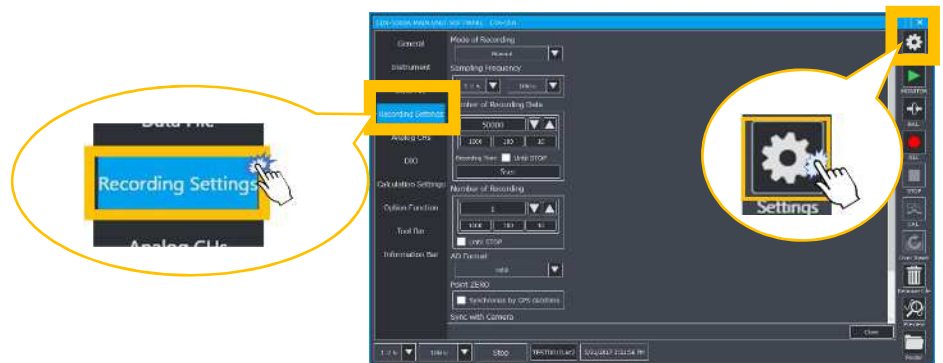
3. Apply settings changes.



4.2.3 Trigger recording settings

The general procedure to configure settings is described below.

1. Tap the **"Settings"** button on the tool bar.



2. Confirm and change settings on the **"Recording Settings"** page.

Recording mode settings

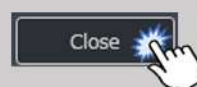
Tap and select either **"Trigger"** or **"Complex Trigger"**

Complex trigger recording

Advanced settings for each trigger mode

See Chap. I Section 4.2.3.1 or Chap. I Section 4.2.3.2

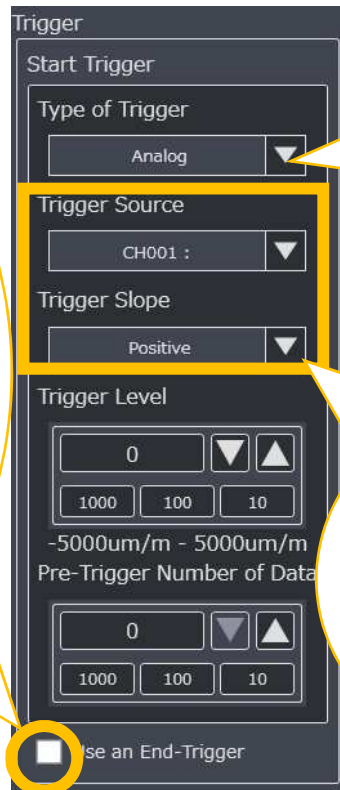
3. Apply settings changes.



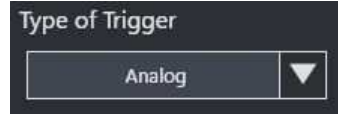
4.2.3.1 Trigger recording advanced settings

- (1) Set an analog CH to a trigger CH.

When setting the end trigger, tap this to select the check box.



Select "Analog"



Trigger Source:

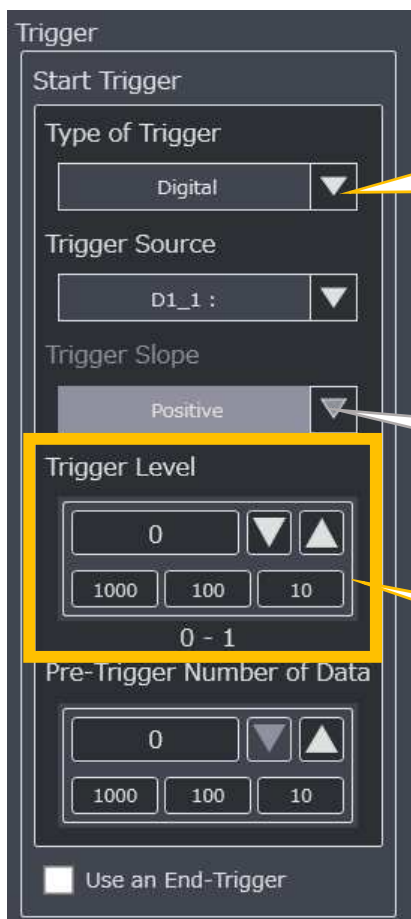
Set the trigger channel.

Trigger Slope:

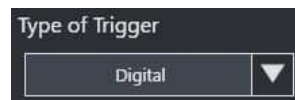
Set how to cross the data on the slope for the trigger level value.

- (2) Set a digital CH to a trigger CH.

The basic operating procedure is the same as that for setting an analog CH.



Select "Digital"

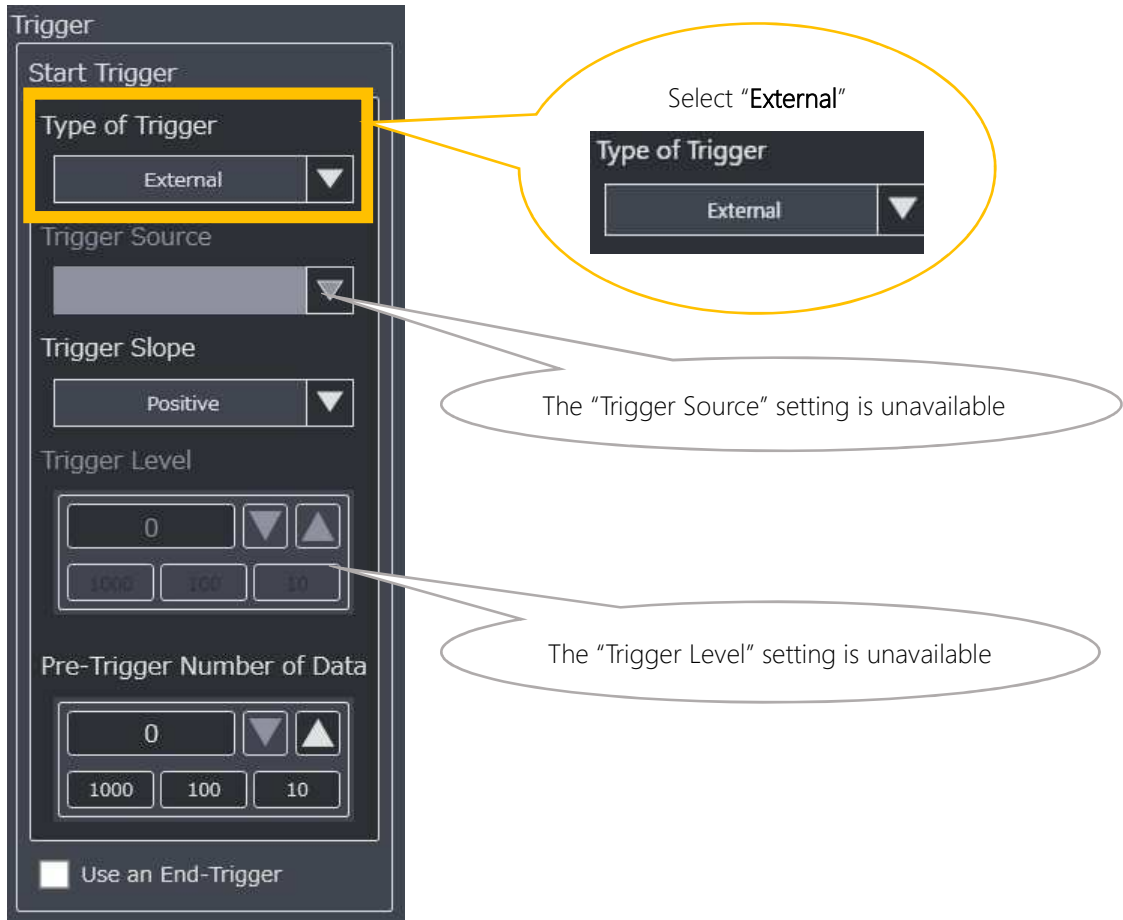


The "Trigger Slope" setting is unavailable.

Set the trigger level to 0 or 1.

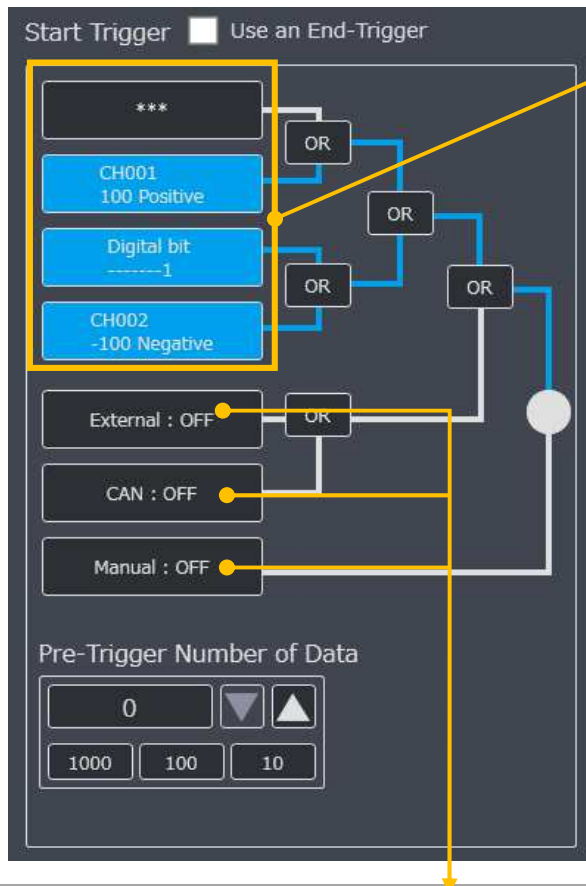
(3) Set an external input signal as the trigger.

The basic operating procedure is the same as that for setting an analog CH.



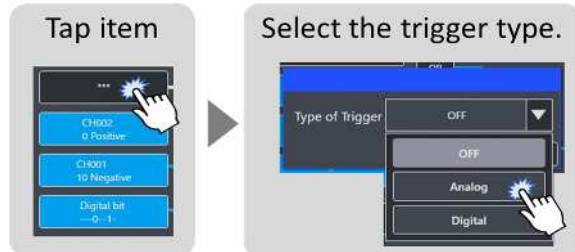
4.2.3.2 Complex trigger recording advanced settings

Complex trigger recordings allow for a combination of analog triggers, digital triggers, external triggers and manual triggers to be set as trigger conditions.



Analog/digital trigger settings (max. 4 channels)

Change settings in the dialog box.



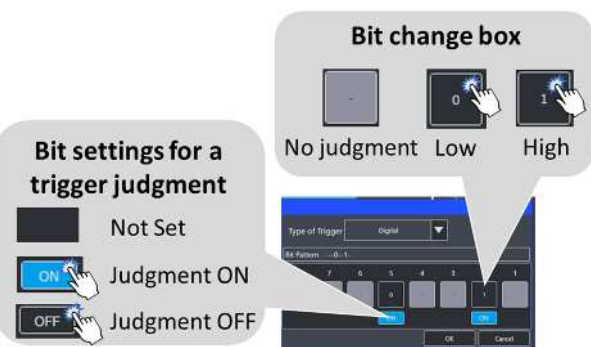
Analog

The same configuration process is used as that for analog trigger settings.

Digital

Set a bit pattern to be used to interpret triggers.

You can turn trigger interpretation ON/OFF with each tap. You can change the bit in the same manner while this setting is ON.



External trigger

ON: Select either **Positive/Negative** of trigger slope.

CAN trigger

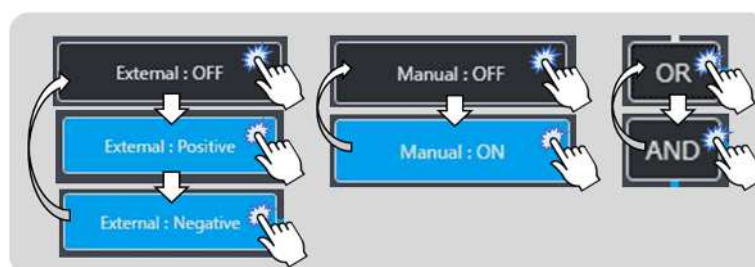
ON: Recording starts when CAN CH settings satisfy trigger conditions.

Manual trigger

ON: **Tapping the "REC" button** when awaiting a trigger will start data recording.

Changing other settings

The settings switch each time the button are tapped.

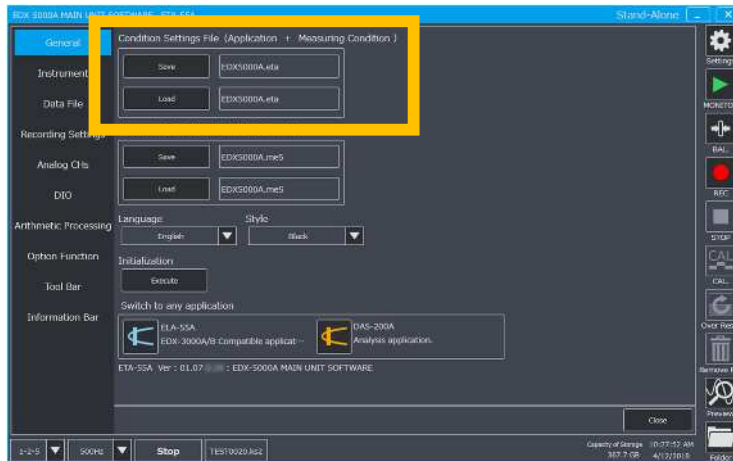
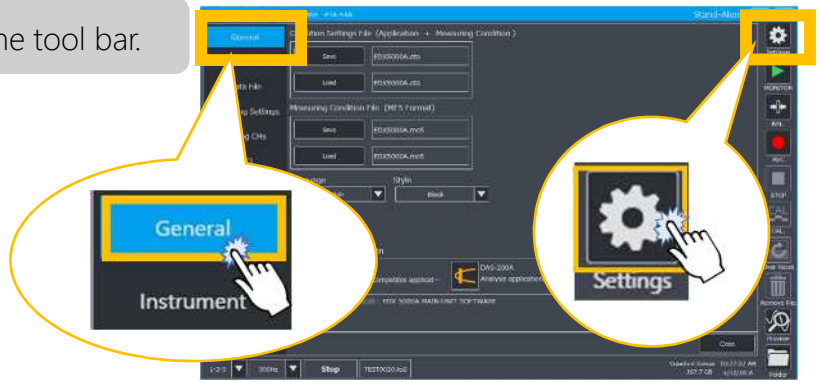


4.3 Condition Settings File

1. Tap the "Settings" button on the tool bar.

2. Open the "General" page.

3. Save/load conditions.



Saving conditions

- (1) Tap the "Save" button.
- (2) Select a save location from the Folder Selection screen and save the current measuring conditions.

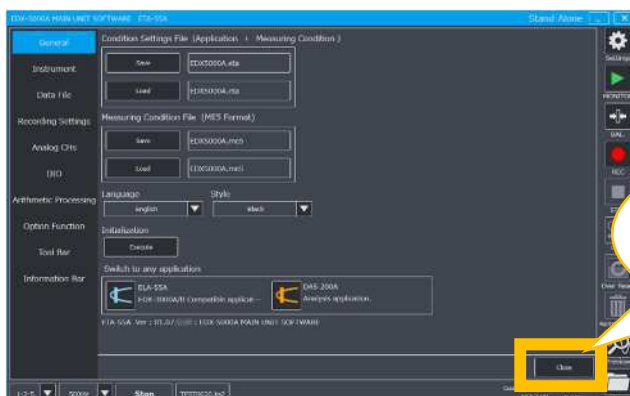


Loading conditions

- (1) Tap the "Load" button.
- (2) Select a condition file from the Folder Selection screen and load the measuring conditions.



4. Close the Settings screen.



5 Setting Measuring Conditions for Each CH

5.1 Configure analog CH settings.

5.1.1 Basic setting method

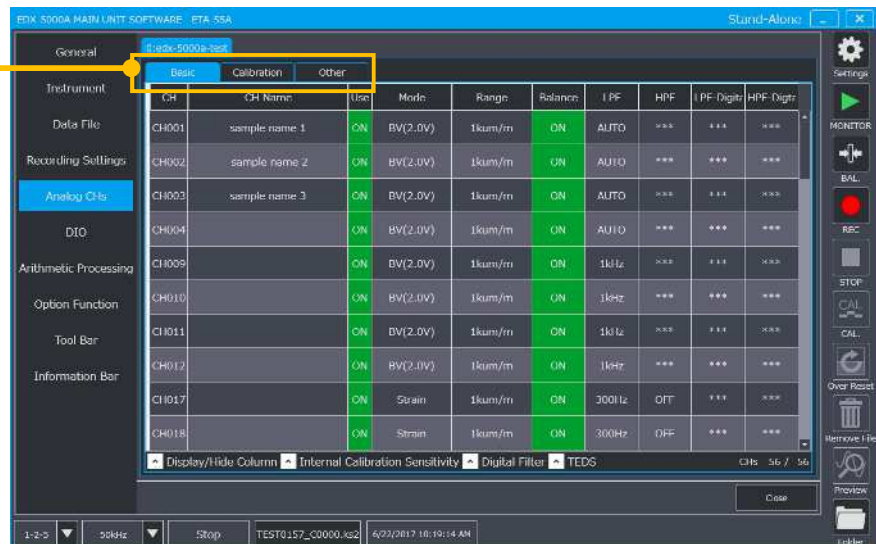
1. Tap the "Settings" button on the tool bar.



2. Open the "Analog CHs" page.



3. Confirm/change settings as required.



Switching settings pages

There are three settings pages,
"Basic, Calibration, Other".

Tap these tabs to switch between the pages.



Changing item settings

See Chap. 1 Item 3.4.1.

4. Apply settings changes.



5.1.2 Perform internal calibration sensitivity. (Necessary when connecting sensors)

When connecting a sensor to the EDX-5000A, perform internal calibration sensitivity prior to performing measurements to compensate for sensitivity changes caused by bridge resistance from the strain gage.

1. Tap the **"Settings"** button on the tool bar and open the **"Analog CHs"** page.

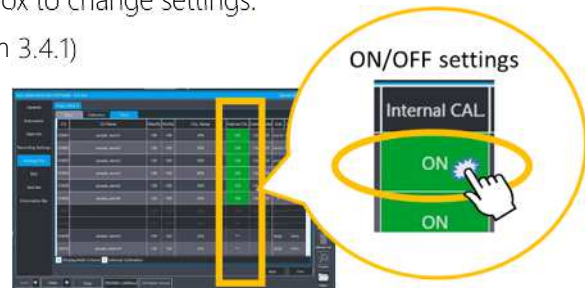
See the previous page.

2. Tap the **"Other"** tab.



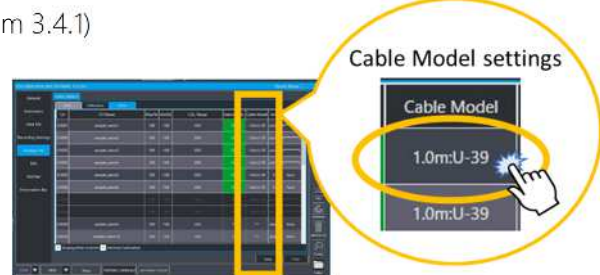
3. Set the **"Internal CAL."** item ON for the target CH performed internal calibration sensitivity.

Tap to bring up the settings dialog box to change settings.
(Operation method: See Chap. I Item 3.4.1)



4. Confirm/set **"Cable Model"**

Tap to bring up the settings dialog box and select the correct cable used.
(Operation method: See Chap. I Item 3.4.1)



5. Perform internal calibration sensitivity

Tap **"Internal Calibration Sensitivity"** at the bottom of the list.



5.2 Load TEDS data.

The EDX-5000A can load TEDS (Transducer Electronic Data Sheet) sensor information and set the range, calibration coefficient, and the unit, etc.

5.2.1 Load and display TEDS information.

1. Open the "Analog CHs" page. (See Chap. I Section 5.1)

2. Load TEDS information.

Tap the "TEDS" button at the bottom of the list.



Tap "Load TEDS" button.



3. When loaded successfully the TEDS information screen will appear.

Load TEDS								
Load TEDS			Write user data			Detail Information		
Use	Card	CH	CH Name	Mode	Range	LPF	Calibr. const.	Unit
ON	CDV-40B-F	CH001		Strain	5kum/m	AUTO	0.24366	mm
								User Data
								KYOWA

OK Cancel

5.2.2 Set TEDS information to an analog CH.

When the "Use" settings is "ON", set TEDS information to an analog CH.

For details, see Chap. II Item 2.1.8.

Set "Use" settings to ON.



Tap "OK"/"Cancel" button.



"OK" : Set
"Cancel" : Not set

5.2.3 Display detailed information.

For details on detailed TEDS data, see Chap. II Item 2.1.8.3.

Choose the CH item you wish to display.



The background color will turn blue when an item is selected

Tap "Detail Information" button.



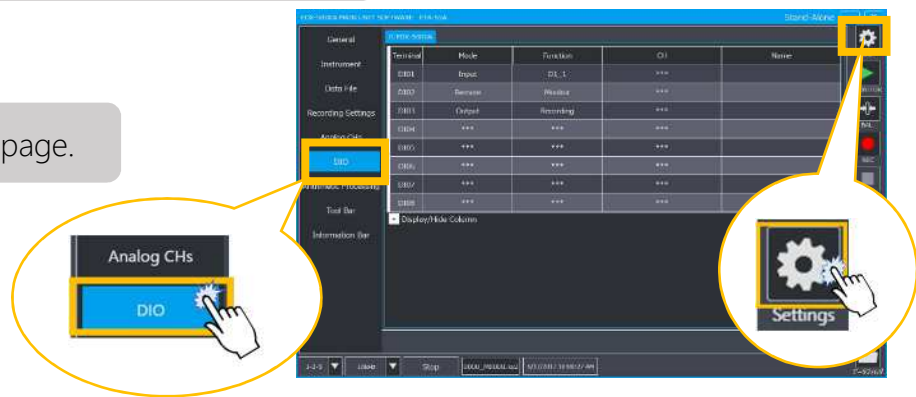
Detail Information screen will be displayed.



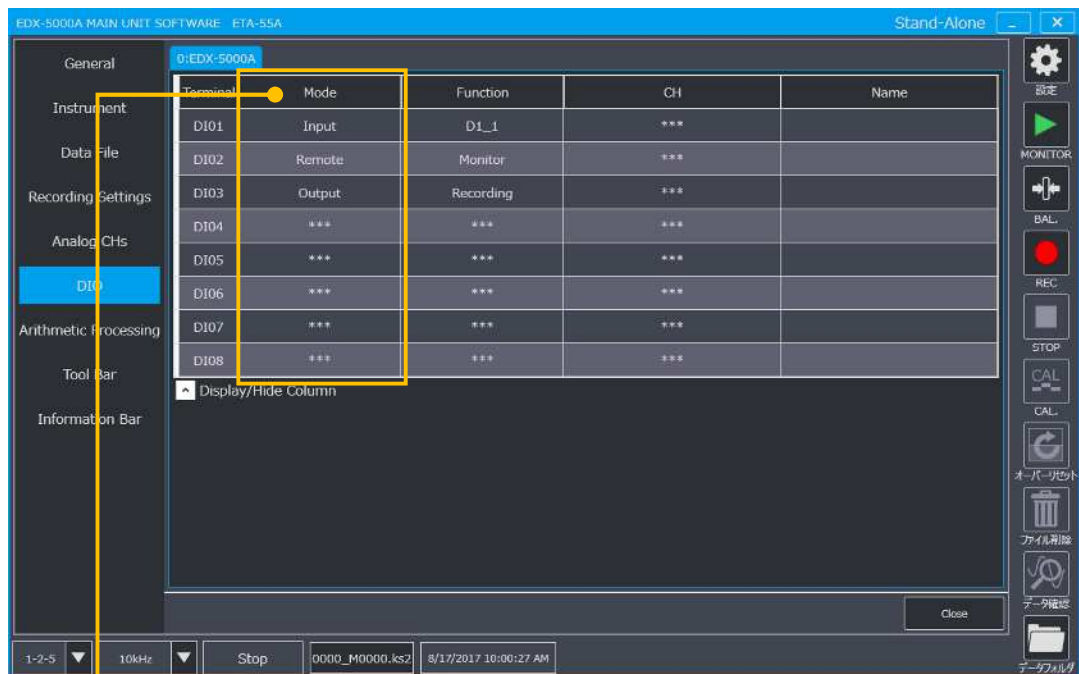
5.3 Configure DIO settings.

1. Tap the "Settings" button on the tool bar.

2. Open the "DIO" page.



3. Confirm and change settings as required.



Mode type

4 mode settings can be configured for every bit, "Input, Output, Remote Control, *** (No Setting)".

For details, see Chap. II Section 2.2

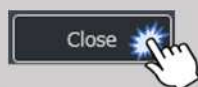
How to change settings

See Chap. I Section 3.4

How to change settings

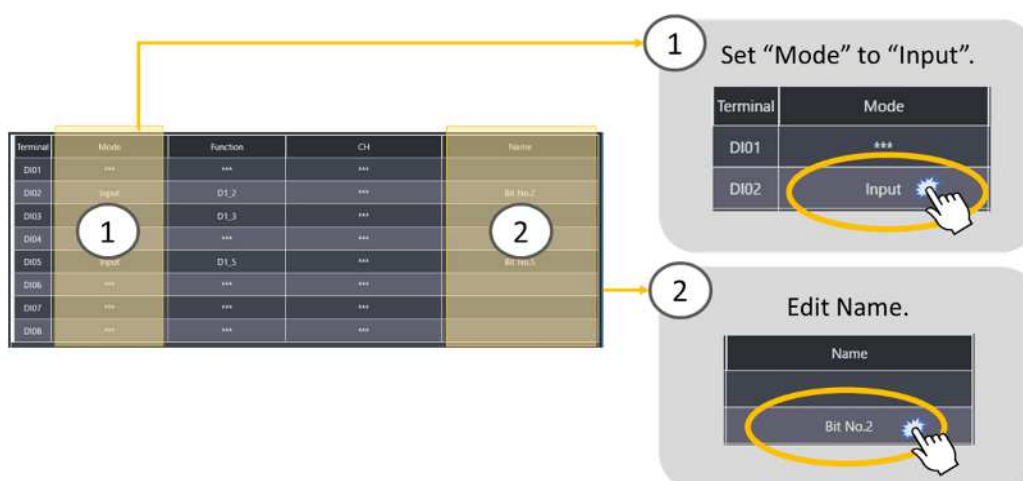
See Chap. I Section 3.4

4. Apply settings changes.



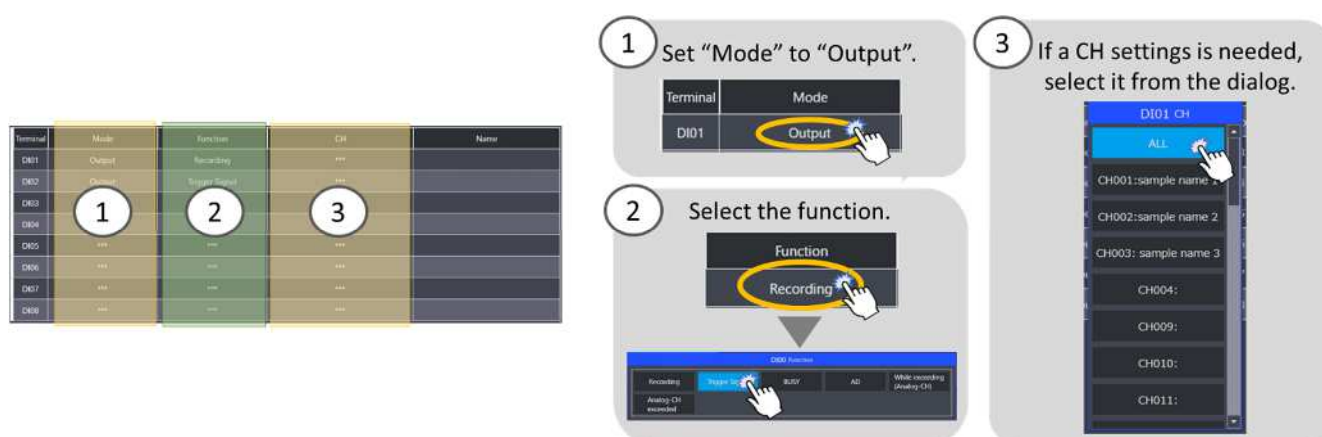
5.3.1 Input mode settings

When digital signals inputs to terminals that has been set "Mode" to "Input", the bits will change.



5.3.2 Output mode settings

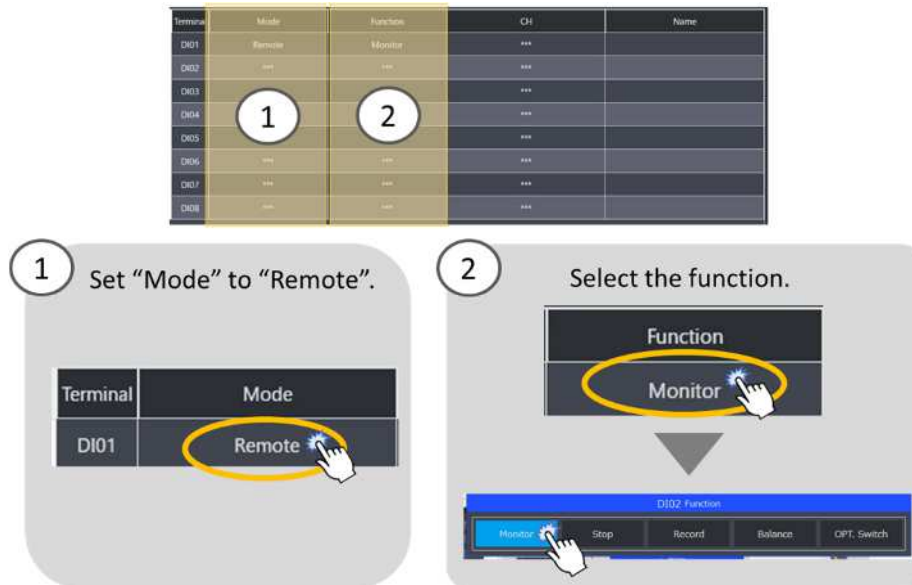
When "Mode" is "Output", digital signals will be output at times set under "Function".



Function	Digital signal output timing
Recording	While recording data.
Trigger Signal	While trigger data recording is being performed.
BUSY	While performing balance adjustment.
AD	While A/D conversion is being performed.
While exceeding Analog-CH	While the analog CH exceeds the pre-set upper/lower limit.
Analog CH exceeded	After the analog CH exceeds the pre-set upper/lower limit once.
While exceeding CAN-CH	While the CAN CH exceeds the pre-set upper/lower limit.
(Available as option only)	[Note] you can set when the sampling frequency settings is 1Hz to 5kHz.
CAN-CH exceeded	After the CAN CH exceeds the pre-set upper/lower limit once.
(Available as option only)	[Note] you can set when the sampling frequency settings is 1Hz to 5kHz.

5.3.3 Remote control mode settings

When "Mode" is "Remote", as you input the digital signal, the EDX-5000A works based on the settings, pre-set on the "Function".



Function	Action on remote control
Monitor	Starts the monitor.
Stop	Same as the "STOP" switch on the EDX-5000A
Record	Same as the "REC" switch on the EDX-5000A
Balance	Same as the "BAL." switch on the EDX-5000A
OPT. switch	Same as the "OPT." switch on the EDX-5000A

6 Configuring Screen Layout Settings

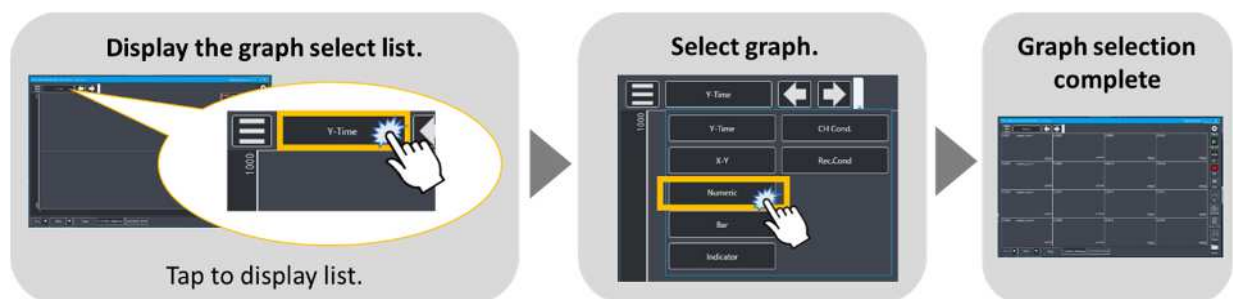
6.1 Setting the graph layout.

6.1.1 Changing the type of graph displayed.

The following 6 graph types are available.

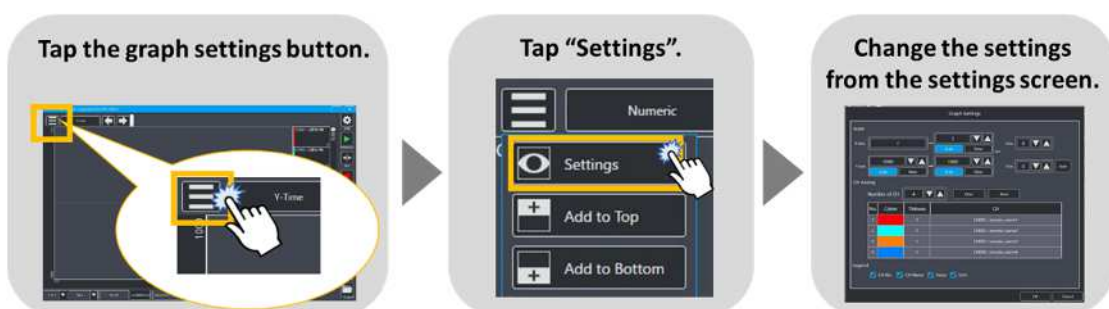
- (1) Y-Time graph
- (2) X-Y graph
- (3) Numeric graph
- (4) Bar graph
- (5) Indicator graph
- (6) FFT graph

You can select the graph displayed from these 6 graph types.



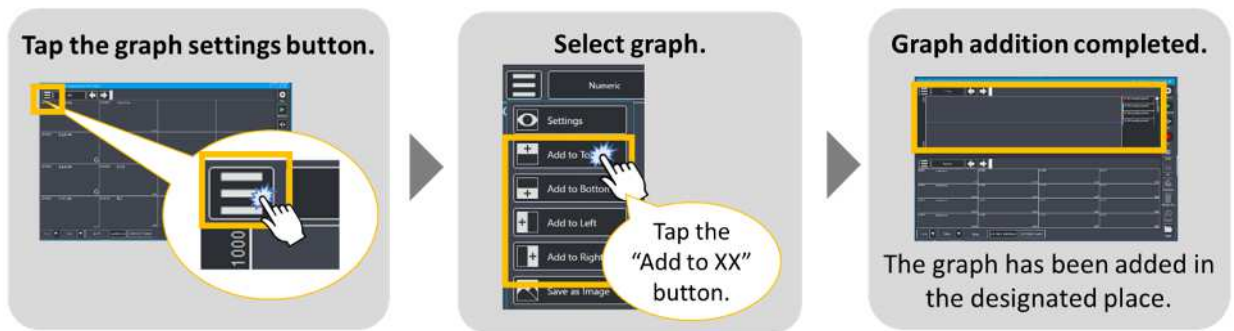
6.1.2 Changing graph display settings.

You can change the CHs displayed, the scale, etc. on the "Settings" screen for each graph. For details on display conditions settings, see Chap. II Section 9.



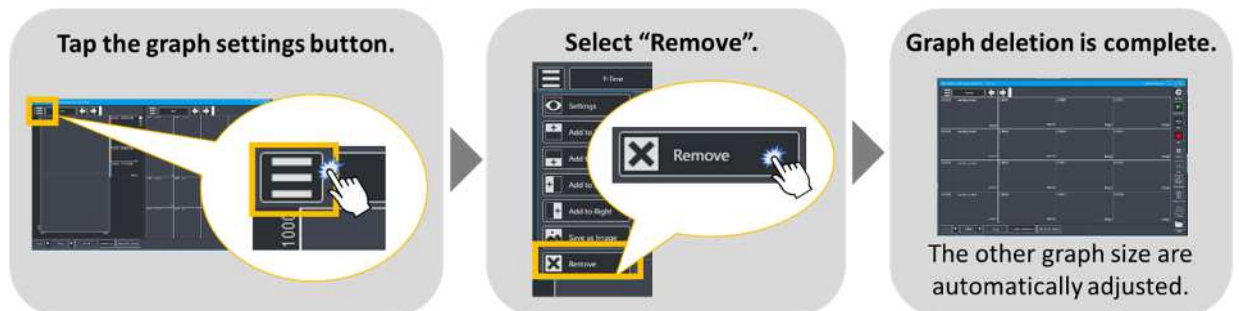
6.1.3 Displaying multiple graphs.

You can display multiple graphs.



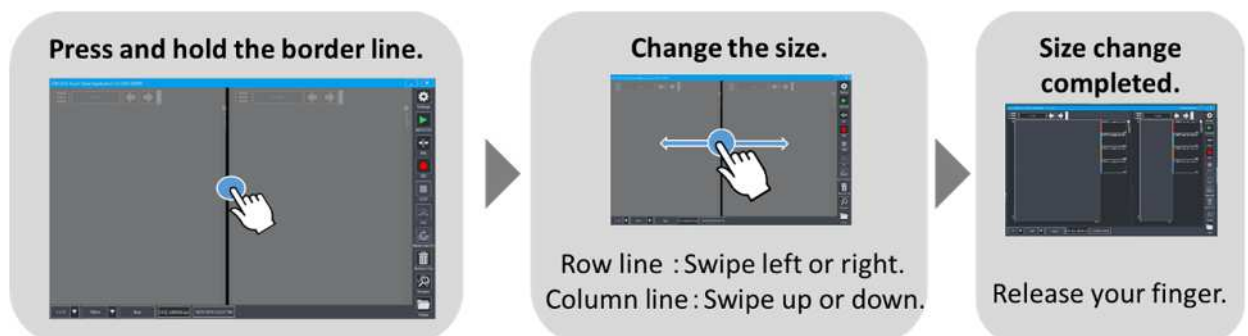
6.1.4 Deleting graphs.

You can delete graphs when one or more graphs are displayed.



6.1.5 Changing the graph size.

Swipe the border between graphs to change their size.

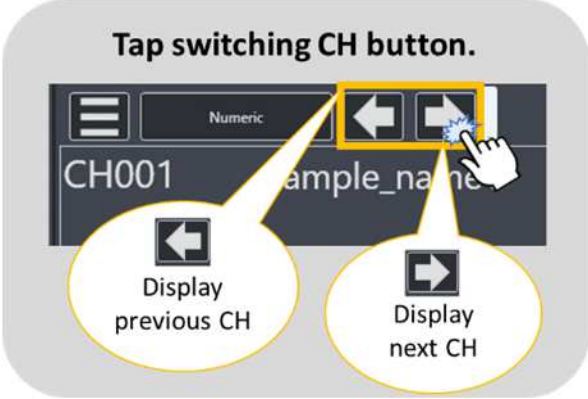


6.2 Other

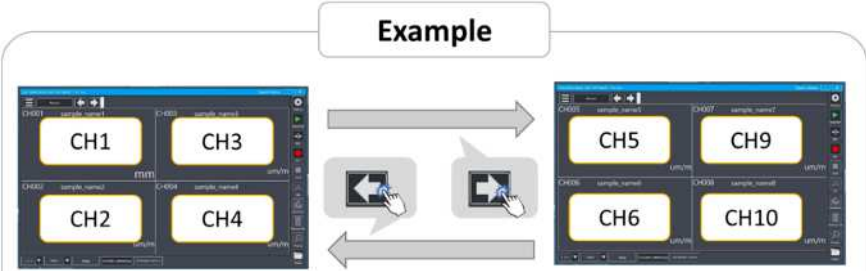
6.2.1 Switching CHs.

Use the   buttons to switch between displayed CHs in order.

Tap switching CH button.



Example

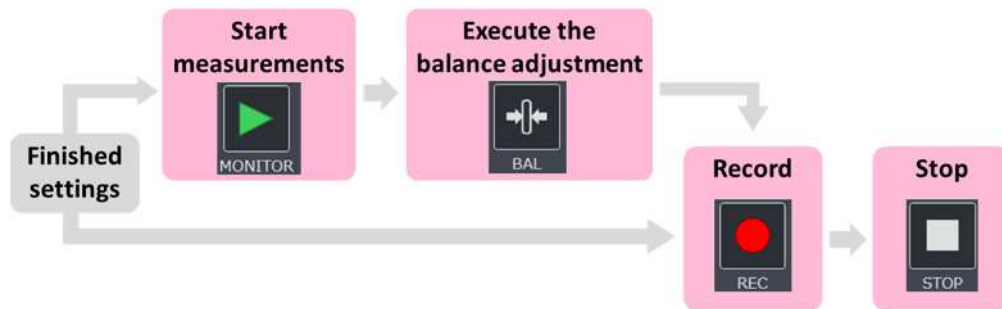


No.	1	2	3	4	5	6	7	8
Recording CH No.	CH1	CH2	CH3	CH4	CH5	CH6	CH9	CH10

7 Performing Data Recording

7.1 Data recording flow

Data recording follows the process flow outlined in the diagram below.



The following items give descriptions on starting measurements (monitor), executing the balance adjustment (balance), recording, and stopping data recording.

For details on toolbar button settings, see Chap. I Item 14.1.

7.2 Starting measurements. (Monitor)

Tap the "MONITOR" button on the toolbar to start the monitor.



7.3 Executing the balance adjustment. (Balance)

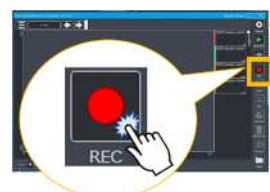
Tap the "BAL." button on the toolbar to perform balance adjustment.

[Note] Balance adjustments cannot be made during data recording.



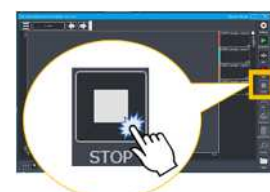
7.4 Data recording.(Recording)

Tap the "REC" button on the toolbar to start data recording based on pre-set recording settings.



7.5 Stopping measurements (monitor) or data recording.

Tap the "STOP" button on the toolbar to stop the monitor or data recording.

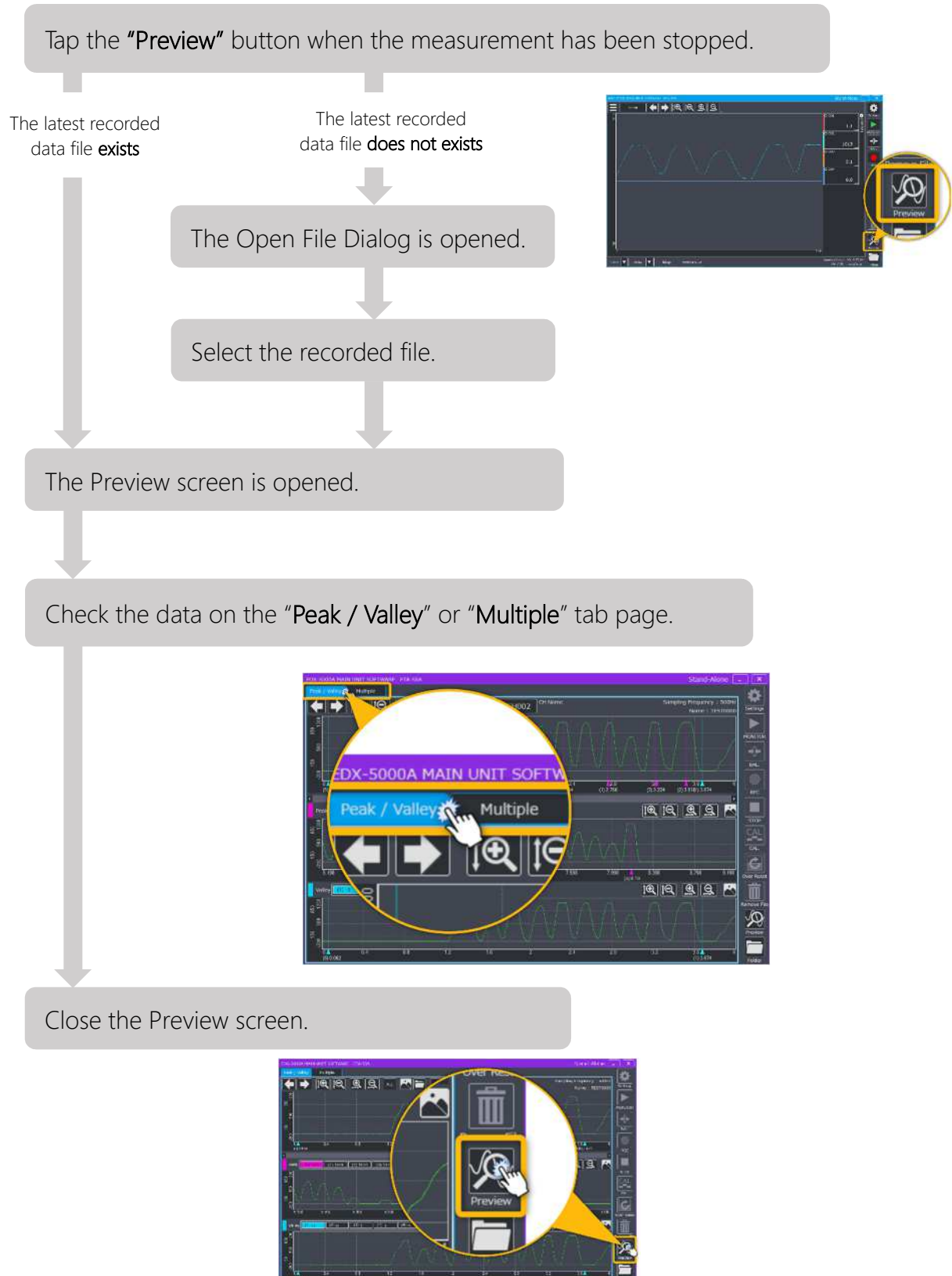


8 Previewing Recording Data.

8.1 Data previewing flow

You can confirm the latest recorded data file*1 or any recorded data file.
For details on toolbar button settings, see Chap. I Section 14.1.

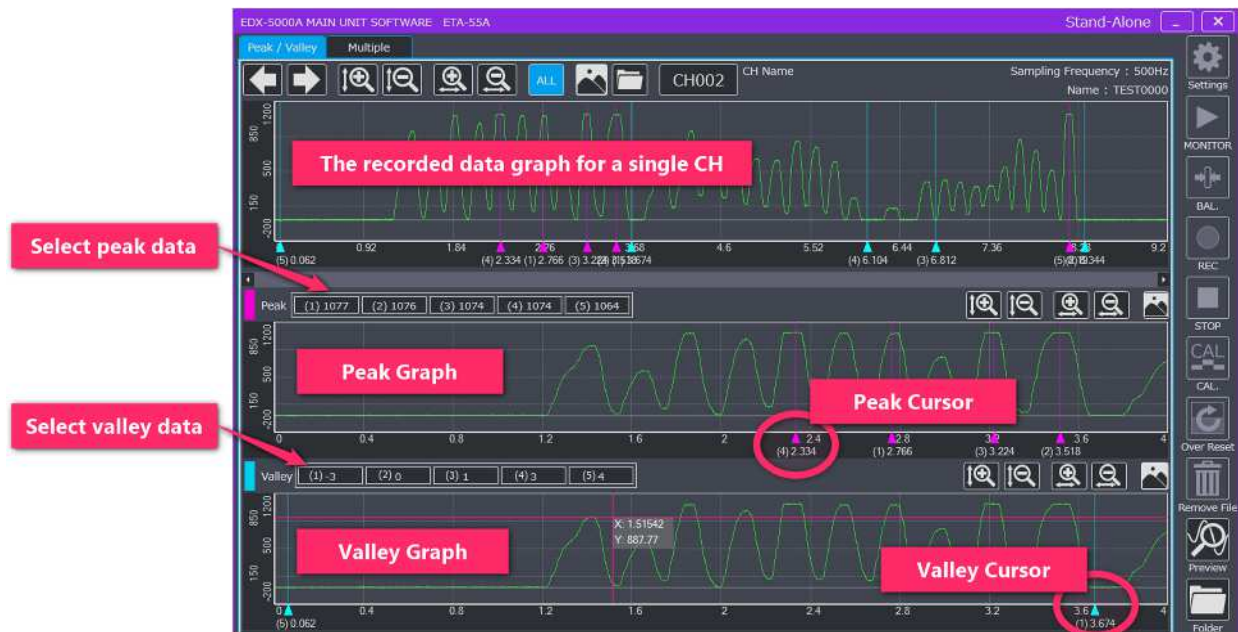
*1) The latest recorded data file: The last recorded data file after turning the EDX-5000A on.



8.2 Previewing max/min values for a single CH.

You can confirm max(Peak)/min(Valley) values for a single CH on the “Peak / Valley” tab page.

8.2.1 Screen configuration



Select peak/valley value displayed

Tap value to change peak/valley value displayed.



Peak data order : (1) > (2) > ... > (5)



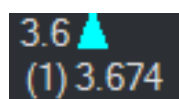
Valley data order : (1) < (2) < ... < (5)

Peak/Valley cursor

This display the position of peak/valley value selected.



Peak : Pink



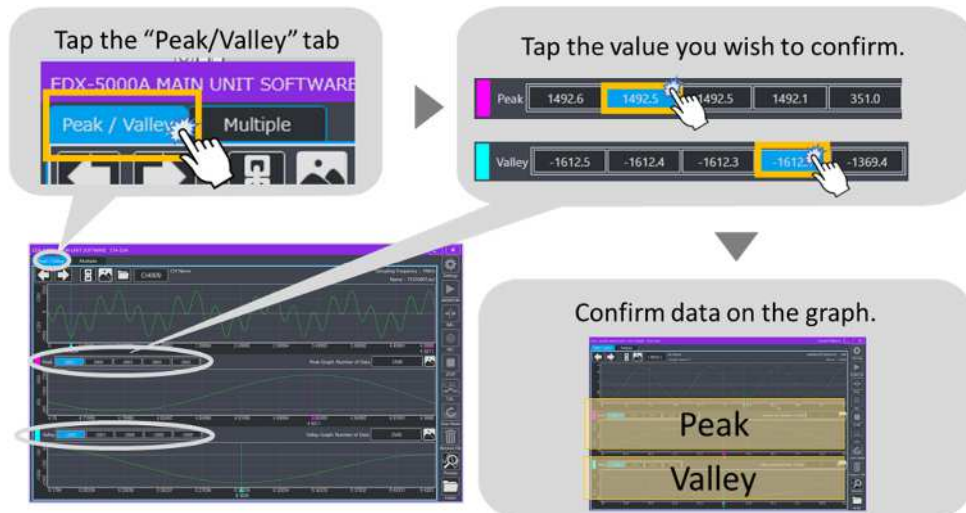
Valley: Blue

Changing CH data displayed

Tap CH No. button to change display CH data.



8.2.2 Previewing peak/valley values.



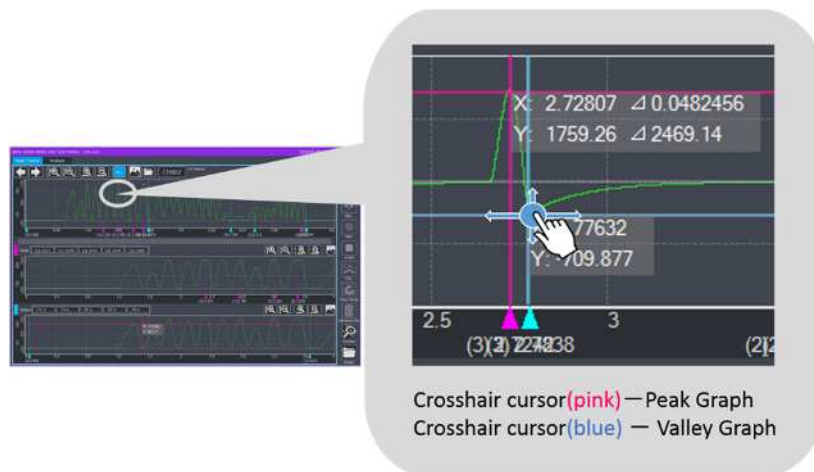
CAUTION

- If the amplitude of the signal input during acquisition is small, the Peak/Valley data may be blank. In that case, the waveform at the beginning of the channel is displayed on the graph.

8.2.3 Showing the data of peak/valley cursor position.

The pink/blue crosshair cursor is moved on the top graph by swipe.

The centered point on the peak/valley graph are linked up with the point that the finger is released from screen.



8.2.4 Zoom in/out the Y/X-axis.

You can zoom in/out the Y/X-axis using zoom in/out button.

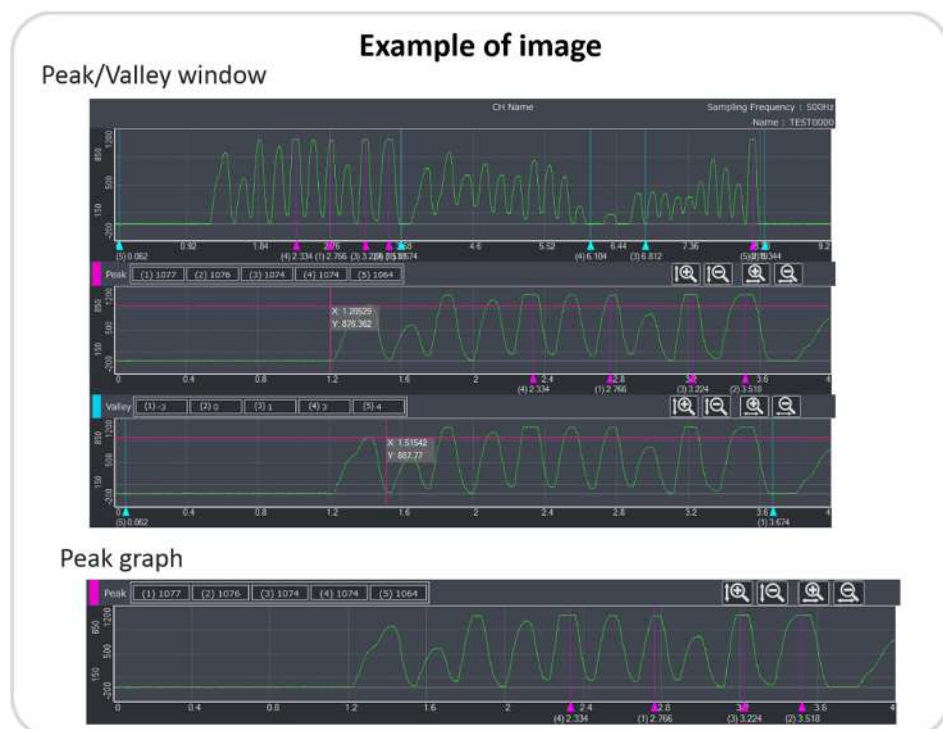
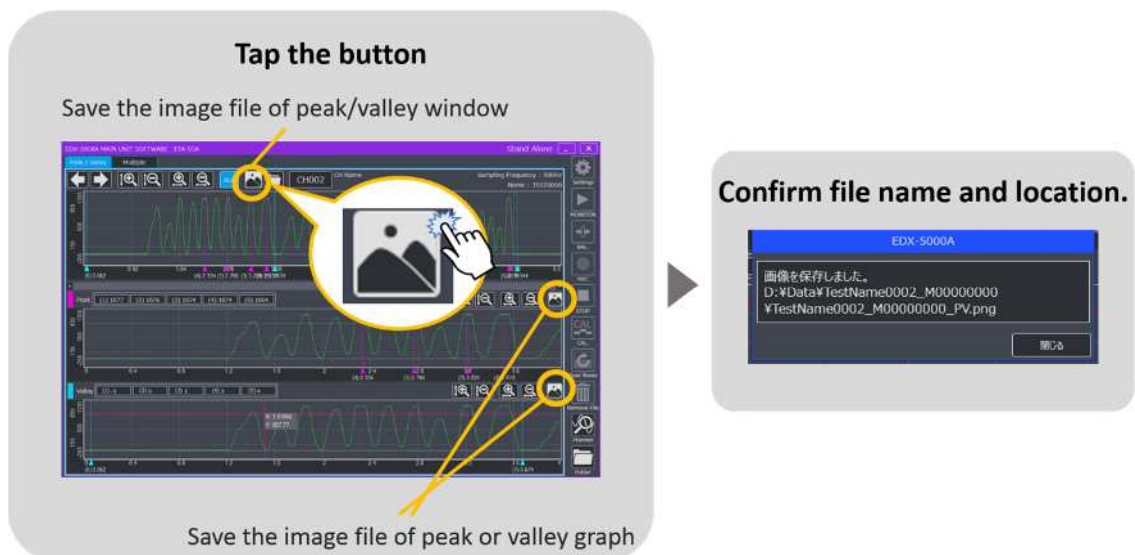


8.2.5 Saving the image of graph.

You can save the image file (PNG format) in the following three type.

- (1) Peak/Valley window
- (2) Only peak graph
- (3) Only valley graph

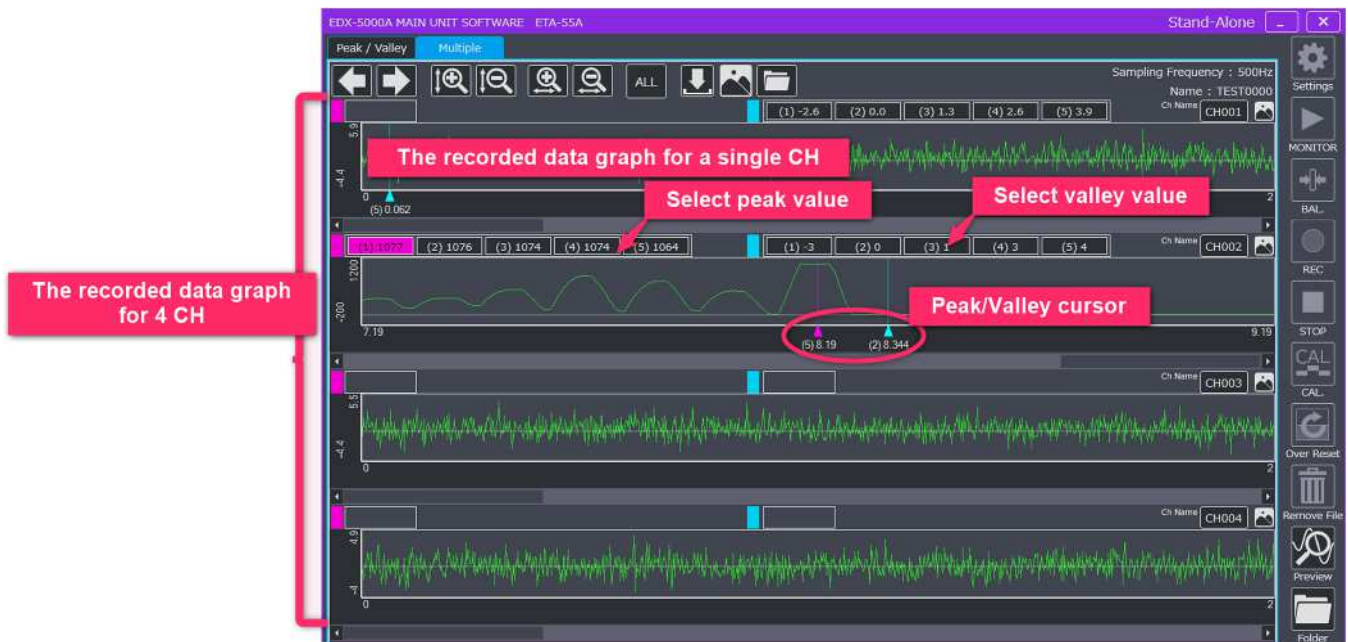
The file name and the save location are automatically assigned.



8.3 Previewing data for multiple CHs.

You can confirm max(peak)/min(valley) values for multiple CHs on the "Multiple" tab page.

8.3.1 Configuration of the multiple CH data previewing screen



Select peak/valley value displayed

Tap value to change peak/valley value displayed.



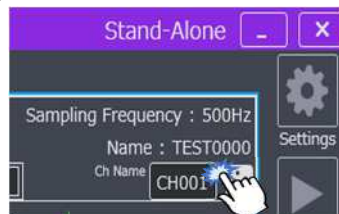
Peak value order : (1) > (2) > ... > (5)



Valley value order : (1) < (2) < ... < (5)

Changing CH data displayed

Tap to CH No. button to change CH data displayed.

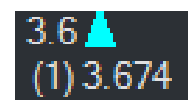


Peak/Valley cursor

This display the position of peak/valley value selected.

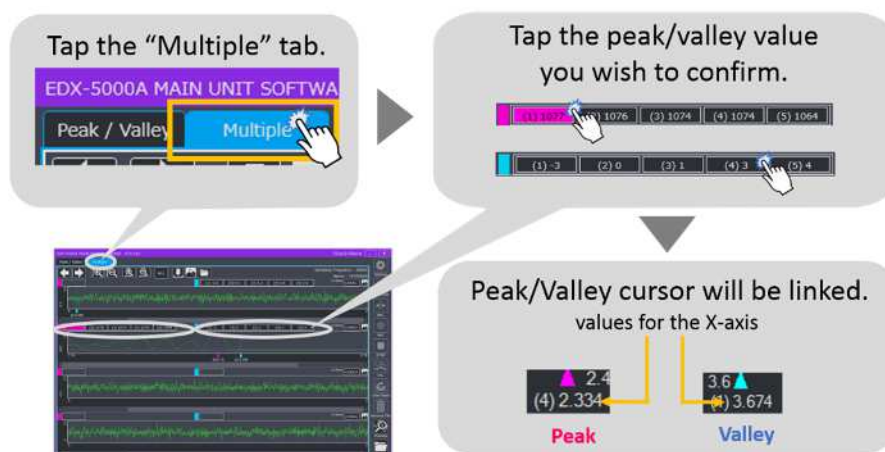


Peak : Pink



Valley : Blue

8.3.2 Previewing max/min values for each CHs



8.3.3 Saving peak/valley value of the recorded CHs

The peak/valley values (up to 5 points) of analog CH and calculation CH can be saved as a file in CSV format.

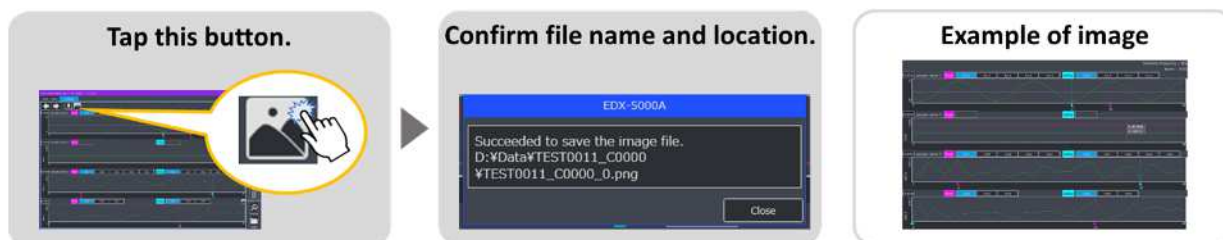
The file name and the save location are automatically assigned.



8.3.4 Saving the image of the graphs

Tap the Save Image button to save the "Multiple" window or each graph as an image file in PNG format.

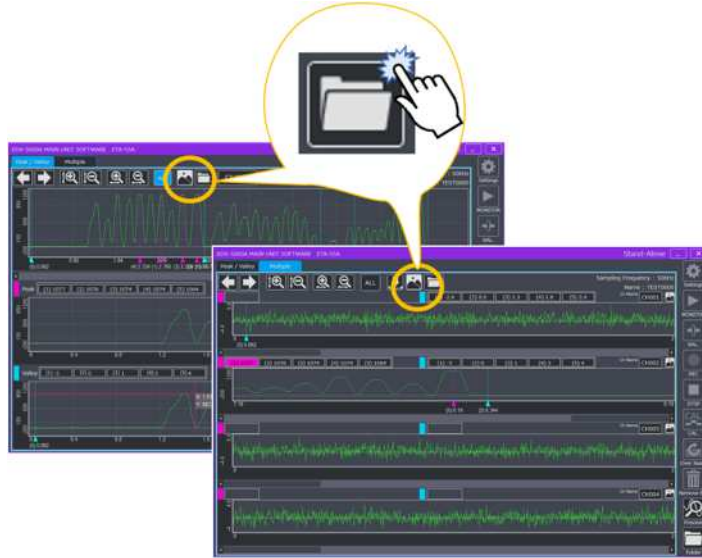
The file name and save location are automatically assigned.



8.4 Confirm any recorded data file.

You can confirm any recorded data file when you tap "File Selection" button.
The general procedure is described below.

1. Tap the "File Selection" button on the "Preview" screen.



2. Open the File Open Dialog

3. Select the recorded file and tap the "Open" button.



CAUTION

- You can select only the file of the KS2 format.
- You can select only the recorded data file that is in the location to save the recorded data file^{*1}

^{*1}) The location to save the recorded data file: For details, Chap. I Item 4.1 or Chap. II Item 3.1

4. The "Preview" screen display the data of the selected file.

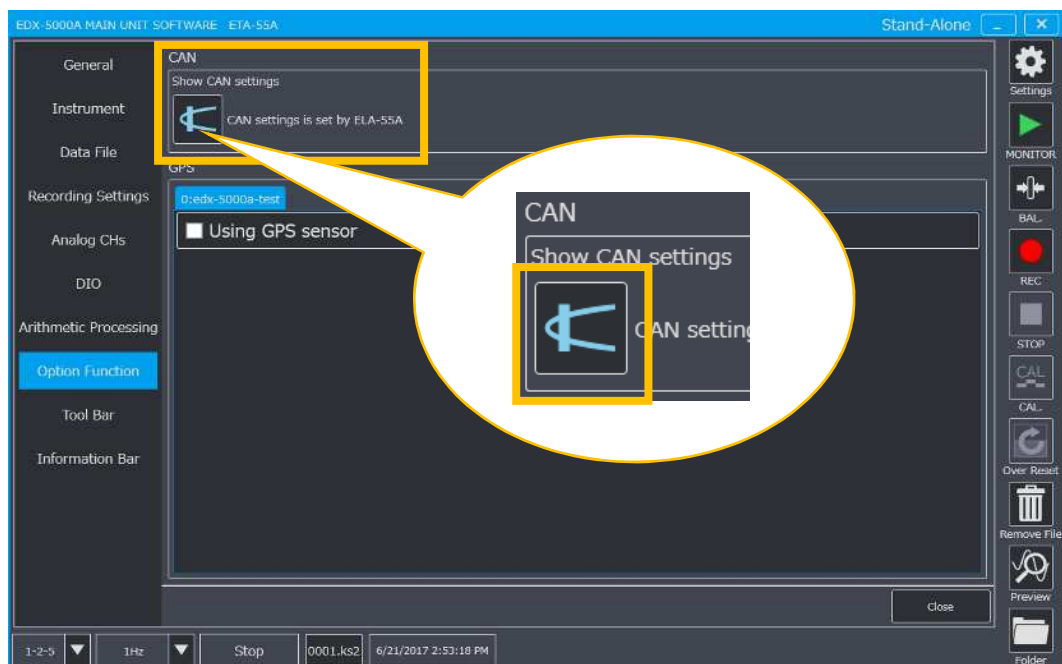
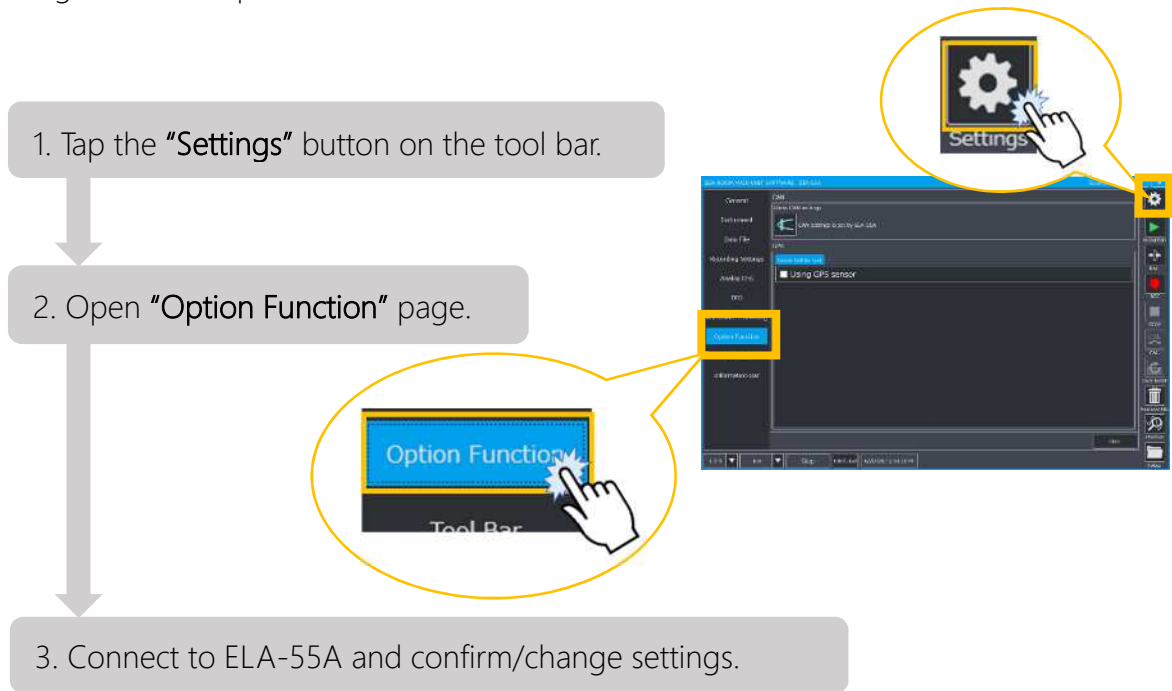
9 Using CAN/GPS data

The EDX-5000A with optional module installed can monitor and record CAN/GPS data. CAN/GPS settings cannot be performed if the optional board is not installed. For details on CAN/GPS, see Chap. II Section 6.

9.1 CAN condition settings

To monitor and record CAN data, perform CAN condition settings in ELA-55A (EDX-3000B compatible software).

CAN settings cannot be performed in this software.



9.2 GPS CH condition settings

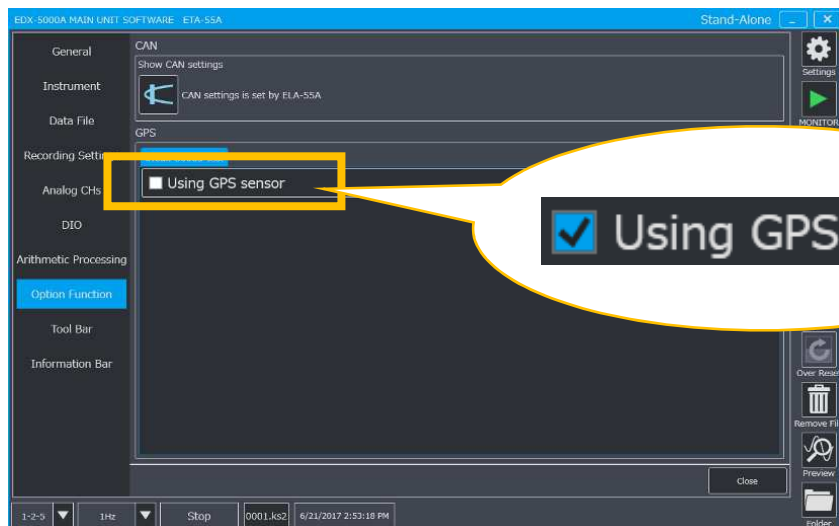
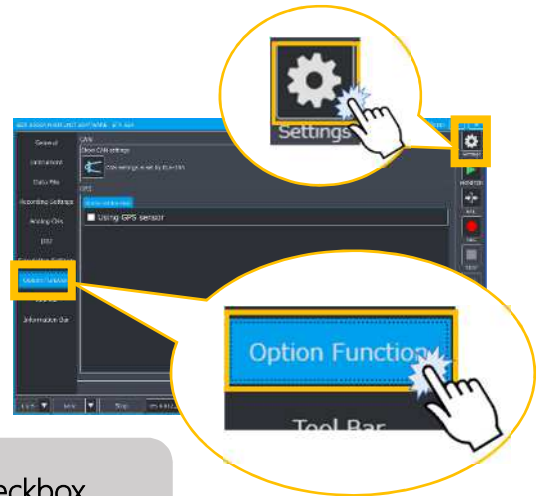
GPS sensors can be used to monitor and record GPS data such as latitude, longitude, and speed. GPS CH data recorded is saved to a separate file (NMEA format) independent from the recorded data file.

For details, see Chap. II Section 6.2.

1. Tap the **"Settings"** button on the tool bar.

2. Open **"Option Function"** page.

3. Put a checkmark in the **"Using GPS sensor"** checkbox to perform GPS-CH settings.



Display ON/OFF

Tap to set ON/OFF for each GPS data display.

CH	CH Name	Display
GPS01	Latitude	ON
GPS02	Longitude	OFF
GPS03	Stellites	ON

Getting GPS data

Put a checkmark in this checkbox to record GPS data.

Recorded data file uses NMEA format.



Other settings

For detail, see Chap. II Item 6.2.4.

4. Apply settings changes.



10 Perform arithmetic operations

Results of arithmetic operations using operators and input signals can be used as calculation CH data. Calculation CH is capable of monitoring and recording the result data and measured data at the same time.

Recorded calculation CHs data are saved to the same file as the recorded data (KS2 file).

For details, see Chap. II Section 7.

10.1 Arithmetic condition settings

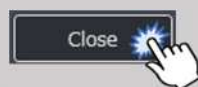
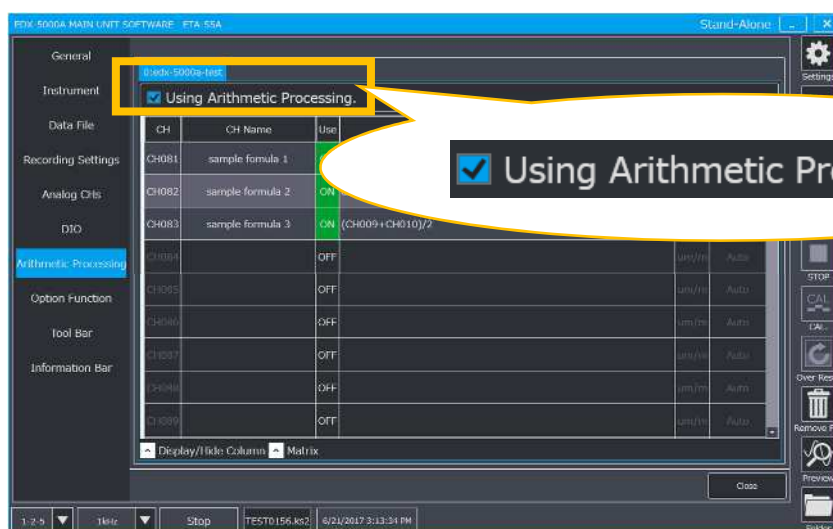
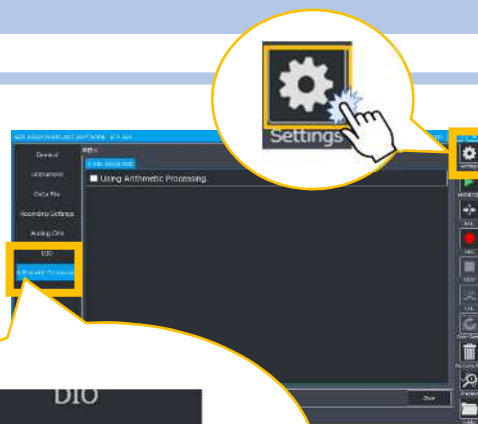
10.1.1 The flow of setting

1. Tap the "Settings" button on the tool bar.

2. Open "Arithmetic Processing" page.

3. Put a check mark in the "Using Arithmetic Processing." checkbox to confirm and change settings.

4. Apply settings changes.



10.1.2 Calculation CH setting items

For details on operational method of list, see Chap. I Section 3.4.

For details on the settings items, see Chap. II Section 7.4.

CH	CH Name	Use	Formula	Unit	Deci Digits
CH081	Sample Name	ON	(CH001+CH002)/2	um/m	0(*****)

➤ Use ON/OFF

Tap to display the setting dialog.

Select ON to perform the arithmetic operation or select OFF to not perform the arithmetic operation.

➤ Formula

Enter formula in less than 200 characters.

Constant, operator, input signal CH No. and operating function can be set for formula.

Input Type	Example	Note
Constant	Circumference: "PI" Value: "100", "1.02"	
Operator	+, -, *, /, ^, ()	For details, see Chap. II Section 7.4 Item (5).
Measurement CH Calculation CH	"CH009", "CH081"	If you set calculation CH, see at Chap. II Section 7.4 Item (5).
Calculation function	"SQR(CH009)"	For details, see Chap. II Section 7.7.

11 Record moving image using webcam.

By using a USB-connected webcam, moving image and measurement data can be monitored and recorded at the same time.

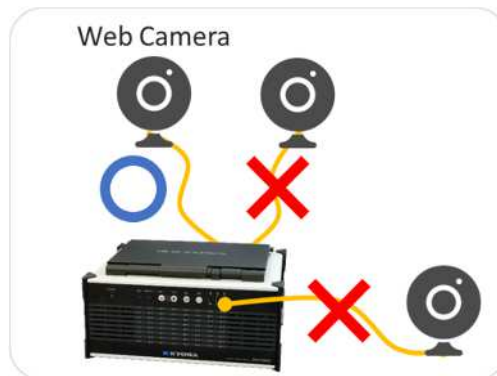
For details on this function, see Chap. II Section 9.9.

11.1 Connecting a webcam

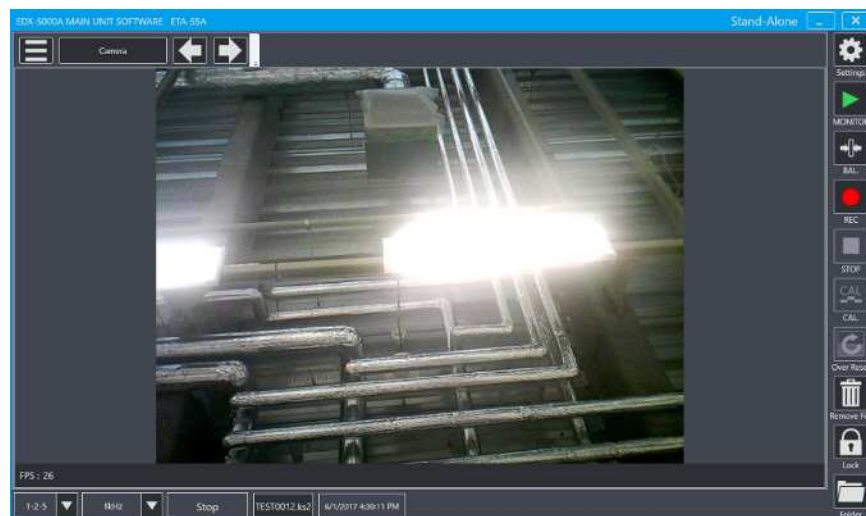
Connect a Direct X Compatible webcam to the USB port on the rear panel of EDX-5000A.

Do not connect the webcam to the USB port on the front panel.

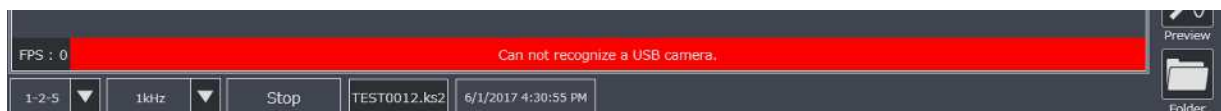
Only a single webcam can be connected at one time.



When the webcam is successfully recognized, the image is displayed.



When the camera is not recognized, the error message shown in the image below is displayed.



11.2 Monitor and Record video.



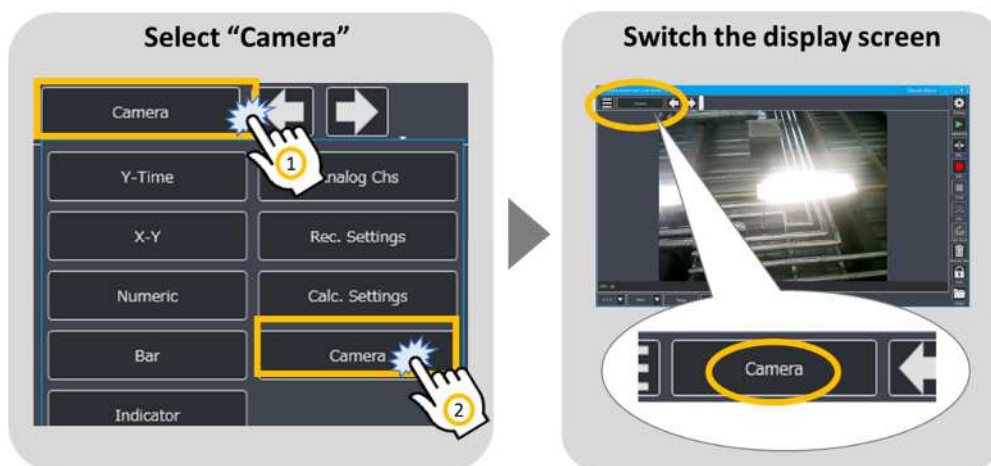
CAUTION:

- When the "Camera" screen is displayed, the recording mode setting automatically switches to "Manual".
- Recording moving image cannot be performed unless the "Camera" screen is displayed.
- Cannot record moving image when EDX-5000A is set to Slave. (See: Chap. II Item 4.2)
- Cannot record moving image when online controlling (see Chap. II Section 5).
- The pause function (see: Chapter II Section 10.11) cannot be used.

Once the webcam connection is successfully recognized, the "Camera" screen can be displayed in a cell to display and record webcam images.

To start recording, tap on the "REC" button in the same way as you would for normal recording. (See: Chap. I Section 7.4)

Recorded moving image is saved as a separate file (AVI format).



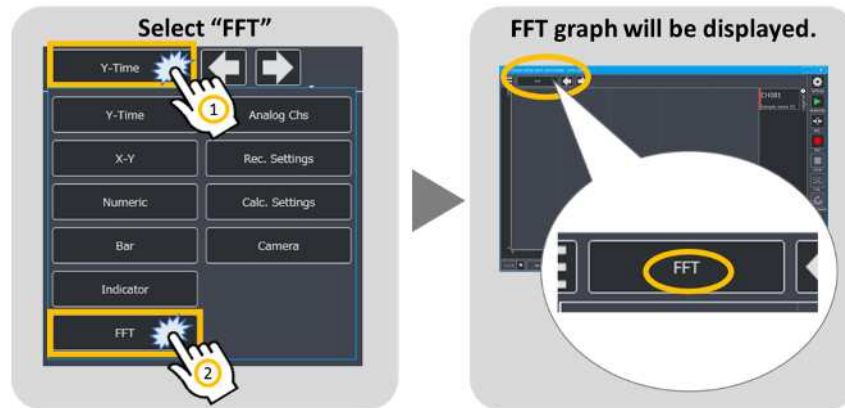
11.3 Playing recorded moving image

To play moving image, use the analysis application DAS-200A or moving image play software. DAS-200A can be launched from the "General Setting" page (see: Chap. II Section 1.2). For how to play moving image on DAS-200A, see the separate volume "Instruction Manual DAS-200A DATA ANALYSIS SOFTWARE".

12 Performing FFT analysis

FFT (Fast Fourier Transform) analysis can be used to perform frequency analysis.

12.1 Display FFT graph



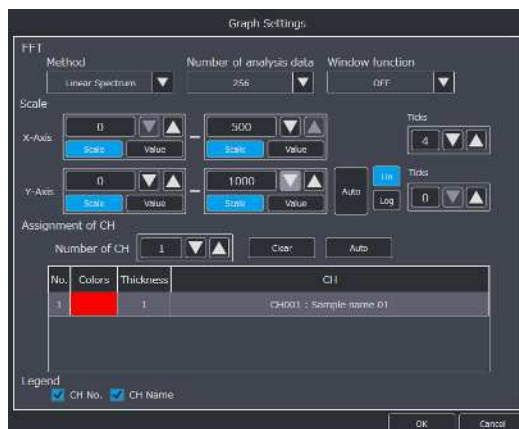
12.2 FFT analysis settings and graph display settings

FFT analysis method and graph display conditions can be set from the setting window. For details, see Chap. II Item 9.8.4.

1. Tap the button at the top left of the window to view the display conditions settings.



2. Confirm and change setting.



FFT

Confirm the FFT analysis method, set the number of data and window function, and define the FFT analysis method.

Scale/Display Data/Legend

Set up the graph display for viewing FFT analysis results.

3. Tap "OK" button to apply settings changes.

13 Synchronous operation using 2 or more units.

Synchronous operation is a feature that measures multiple EDX-5000A units using identical timing (sampling clock sync). Up to 10 units can be synchronized.

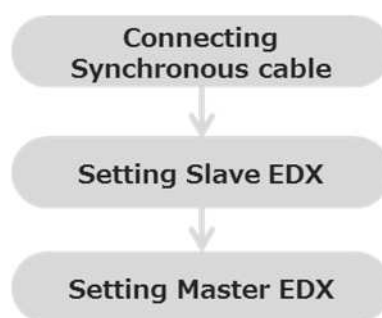
The main unit is called the **Master** and the other unit(s) is called the **Slave**.

13.1 Precautions

- 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 Chap. II Section 4.2 or 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, see Chap. II Section 4.2.
- When performing synchronous operation using different EDX models, supported connection methods are limited.
For details, refer to Chap. II Item 4.4.1 or the precautions in the separate volume entitled "INSTRUCTION MANUAL EDX-5000A MEMORY RECORDER/ANALYZER (FOR HARDWARE) 4-3-2 Precautions when synchronizing different models".

13.2 Settings flow

Synchronous operation settings can be applied by following the procedure shown below:



13.3 Synchronous operation using multiple EDX-5000A units.

13.3.1 Connect synchronous cable

Connect the EDX-5000A using the synchronous cable.

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

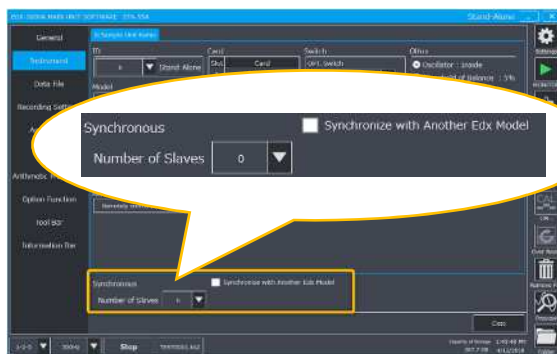
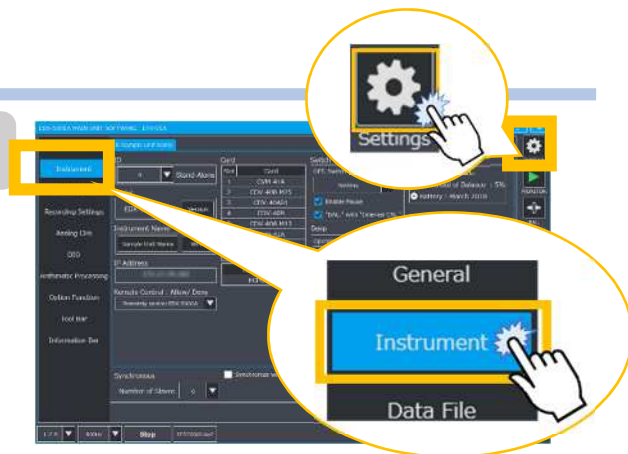


13.3.2 Slave and master Settings

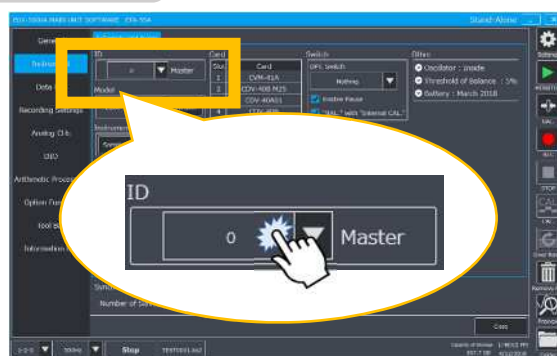
1. Tap the "Settings" button on the tool bar.

2. Open "Instrument" page.

3. Set the "Number of Slaves" in the master unit.



4. Set the "ID"



Synchronous (master only)

Set the total number of EDX units connected as slaves.

Synchronous operation : "1" to "9"

No synchronous operation : "0"

Synchronous

Number of Slaves



ID

Set the ID number of the EDX unit.

Set as master : "0"

Set as slave : "1" to "9"



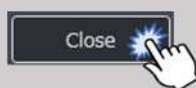
CAUTION

- The ID for slave units must be set in sequential numbers following that of the master unit.



Settings	Master	Slave 1	Slave 2
ID	"0"	"1"	"2"
Synchronous	Number of Slaves : "2"		

5. Apply settings changes.



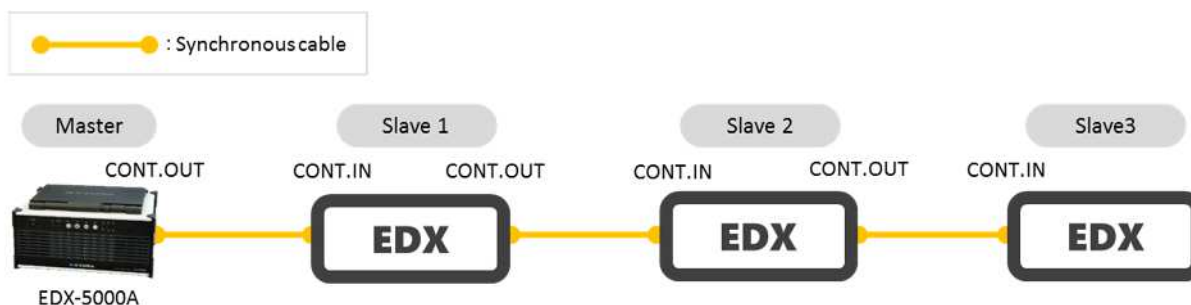
13.4 Synchronous operation using the EDX-5000A and other EDX models.

The EDX-5000A can be combined with other EDX models and operated in synchronization. Applicable models are the EDX-3000B (A) and EDX-200A (excluding EDX-200A-1).

13.4.1 How to Connect

Connect the EDX-5000A and other EDX-5000A and other EDX models using the synchronous cable.

When connecting EDX units, for the precautions refer to Chap. II Item 4.4.1 or the separate volume "INSTRUCTION MANUAL EDX-5000A MEMORY RECORDER/ANALYZER (FOR HARDWARE)".



13.4.2 Slave Settings

Perform "ID", "Synchronous cable setting" settings.

Set up the synchronization using the Dynamic Data Acquisition Software DCS-100A for EDX-5000A.

When using DCS-100A, the synchronization cable length setting is able to be omitted.

Also, EDX-3000A / B is able to be set for synchronization without using DCS-100A.

Refer to the table below to apply settings.

When the Dynamic Data Acquisition Software DCS-100A is not used, the **synchronous cable length must be set** in other EDX models.

Refer to the table below to apply settings.

Model of Slave	ID No. setting	Synchronous cable setting
EDX-5000A	See Chap. I Item 13.3.2	
EDX-3000A/B	See the instruction manual. *1	See Chap. II Item 4.4.2
EDX-200A	Setting up with DCS-100A See the instruction manual. *2	DCS-100A sets it automatically.

*1 "INSTRUCTION MANUAL EDX-3000A MEMORY RECORDER/ANALYZER [FOR HARDWARE]."

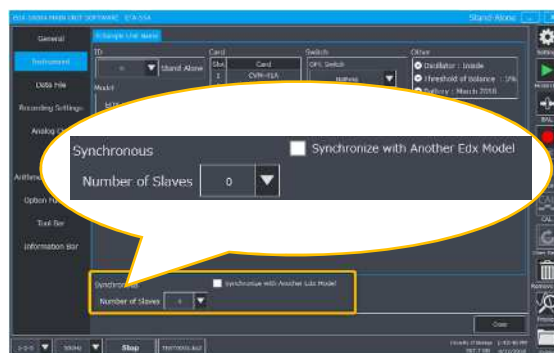
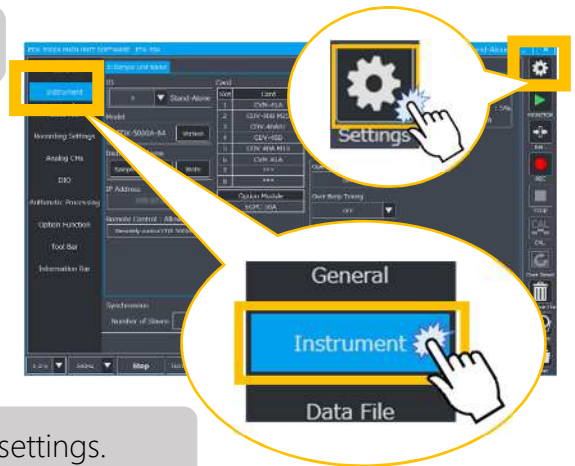
*2 "INSTRUCTION MANUAL EDX-200A UNIVERSAL RECORDER (FOR HARDWARE)"

13.4.3 Master Settings

1. Tap the "Settings" button on the tool bar.

2. Open "Instrument" page.

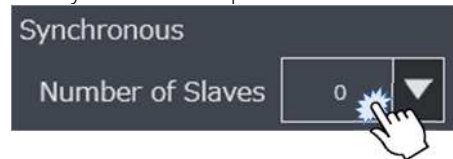
3. Tap to "Synchronous" to display and change settings.



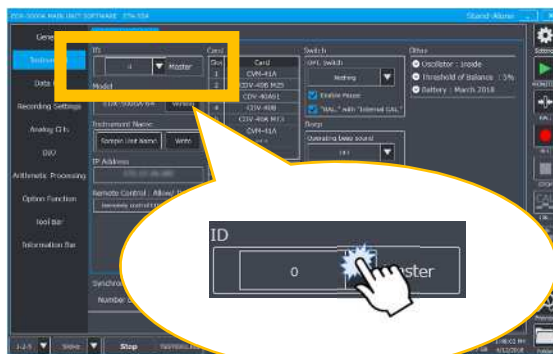
Number of Slaves

Set the total number of EDX units (including other EDX models) connected as slaves.

Synchronous operation : "1" to "9"
No synchronous operation : "0"



4. Set the "ID"



ID

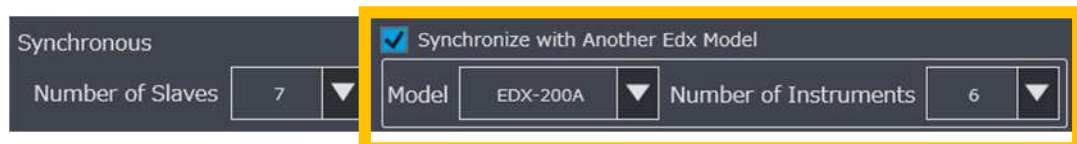
Set the ID number of the EDX unit.

Set as master : "0"
Set as slave : "1" to "9"

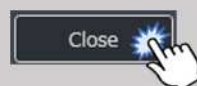


Synchronous with Another Edx model

Set EDX model and the number of Instruments of connected other EDX.



4. Apply settings changes.



13.4.4 Setting example

Shown below is an example of synchronous operation using 8 units consisting of 2 EDX-5000A units and 6 EDX-200A units:

- **Slave Settings**

ID: EDX-5000A is configured on the "Instrument" page.

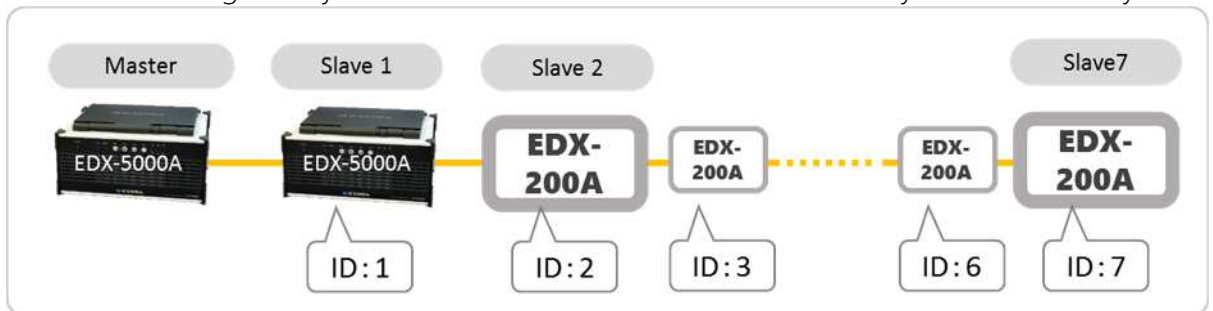
EDX-200A sets the ID with "ID switch" on the front.

For details, refer to "INSTRUCTION MANUAL EDX-200A UNIVERSAL RECORDER (FOR HARDWARE)"

Total length of synchronous cable:

This setting is set automatically by the DCS-100A.

✕ Total length of synchronous cable is not able to set with only EDX-200A body.



- **Master Settings**

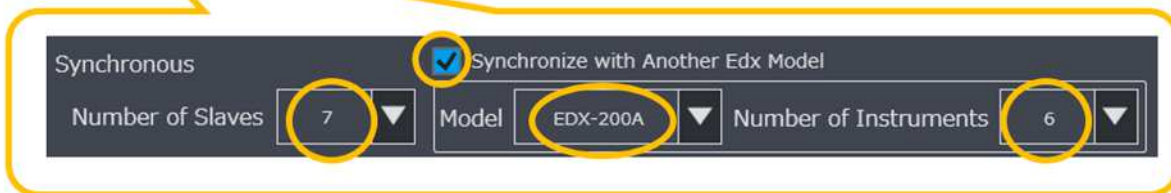
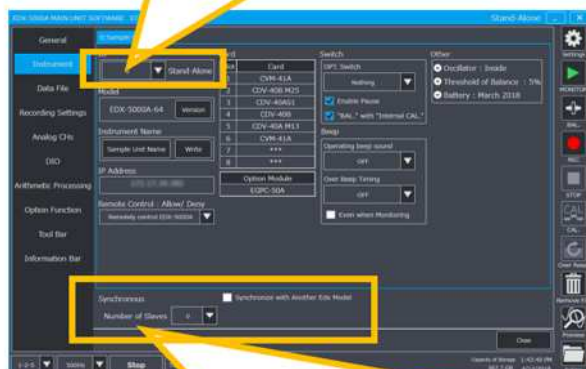
ID: "0"

Number of Slaves: "7"

Synchronize with Another EDX Model: Checkmark ON

EDX Model: "EDX-200A"

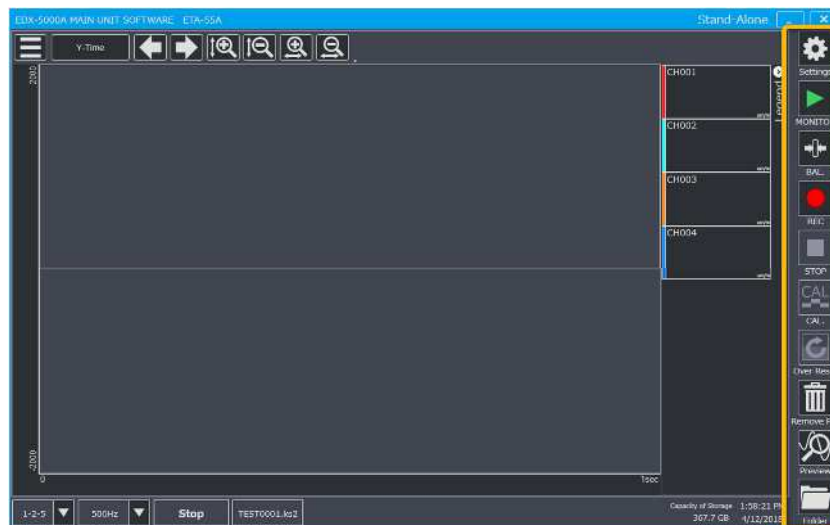
Number of Instruments: "6"



14 Other operations

14.1 Tool bar operations

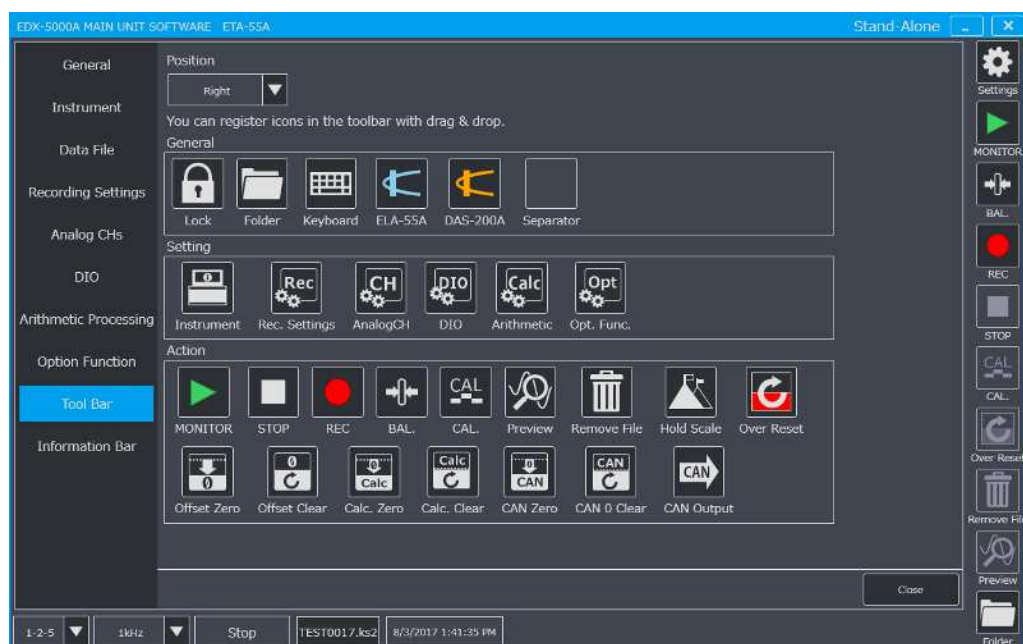
The column/row of operating buttons that always appears on this software screen is referred to as the **tool bar**. You can change the display position and customize operating buttons in "Toll Bar" settings.



1. Tap the "Settings" button on the tool bar.

2. Open the "Tool Bar" page.

3. Confirm and change settings as required.



14.1.1 Changing display position of the tool bar

You can change the display position of the tool bar from the "Position" on the "Tool Bar" screen.

Be aware that the number of displayed buttons will vary depending on the position used.



Example

Display position: Right

Display position: Top

Display position	Right	Left	Top	Bottom
Button display quantity	10	10	18	18

14.1.2 Changing the operating buttons shown on the tool bar

Drag and drop icons on the "Tool Bar" screen to change the operating buttons shown on the tool bar.

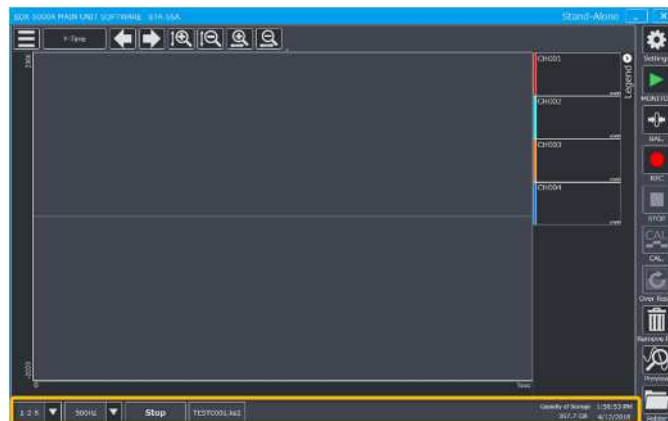
However, with the exception of the "Settings" button, icons can be dropped on only operating buttons in the tool bar.

In addition, with the exception of the "Separator" button, you cannot overlapping register a button with tool bar.



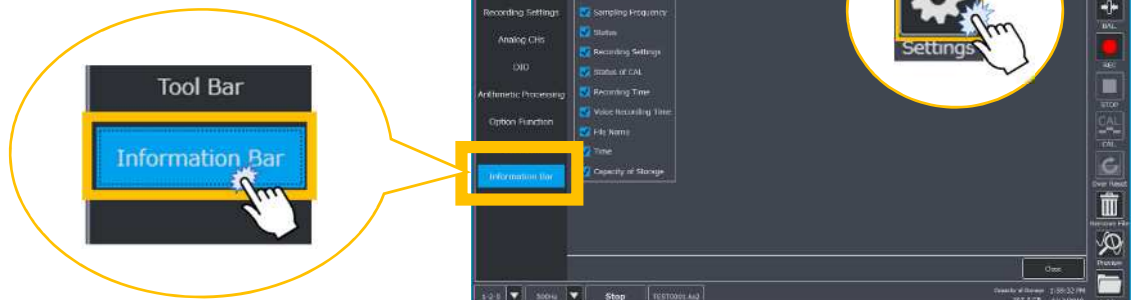
14.2 Information bar operations

The part of the screen showing the sampling frequency and the current time, etc. is referred to as the **information bar**. You can change its display position and the items displayed in information bar settings.

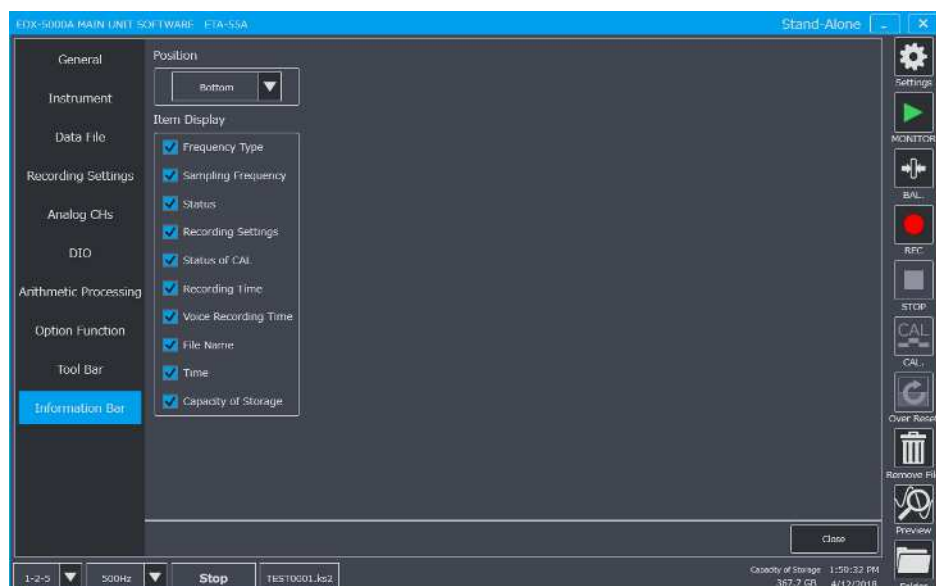


1. Tap the "Settings" button on the tool bar.

2. Open the "Information Bar" page.



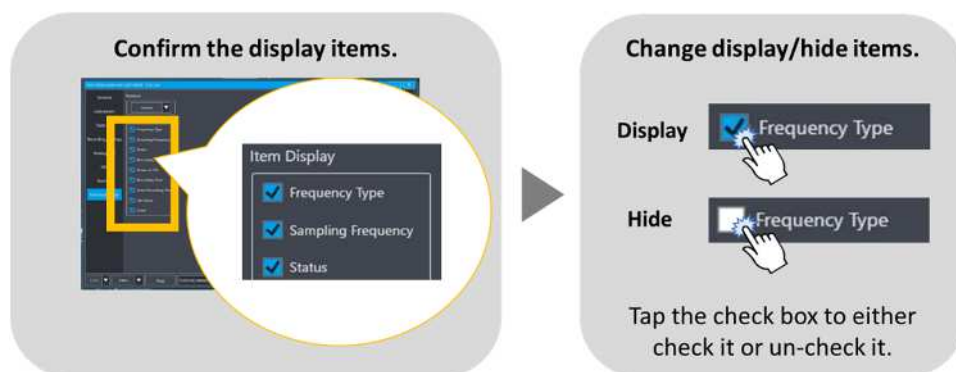
3. Confirm and change settings as required.



14.2.1 Changing the display position of the information bar



14.2.2 Changing display items

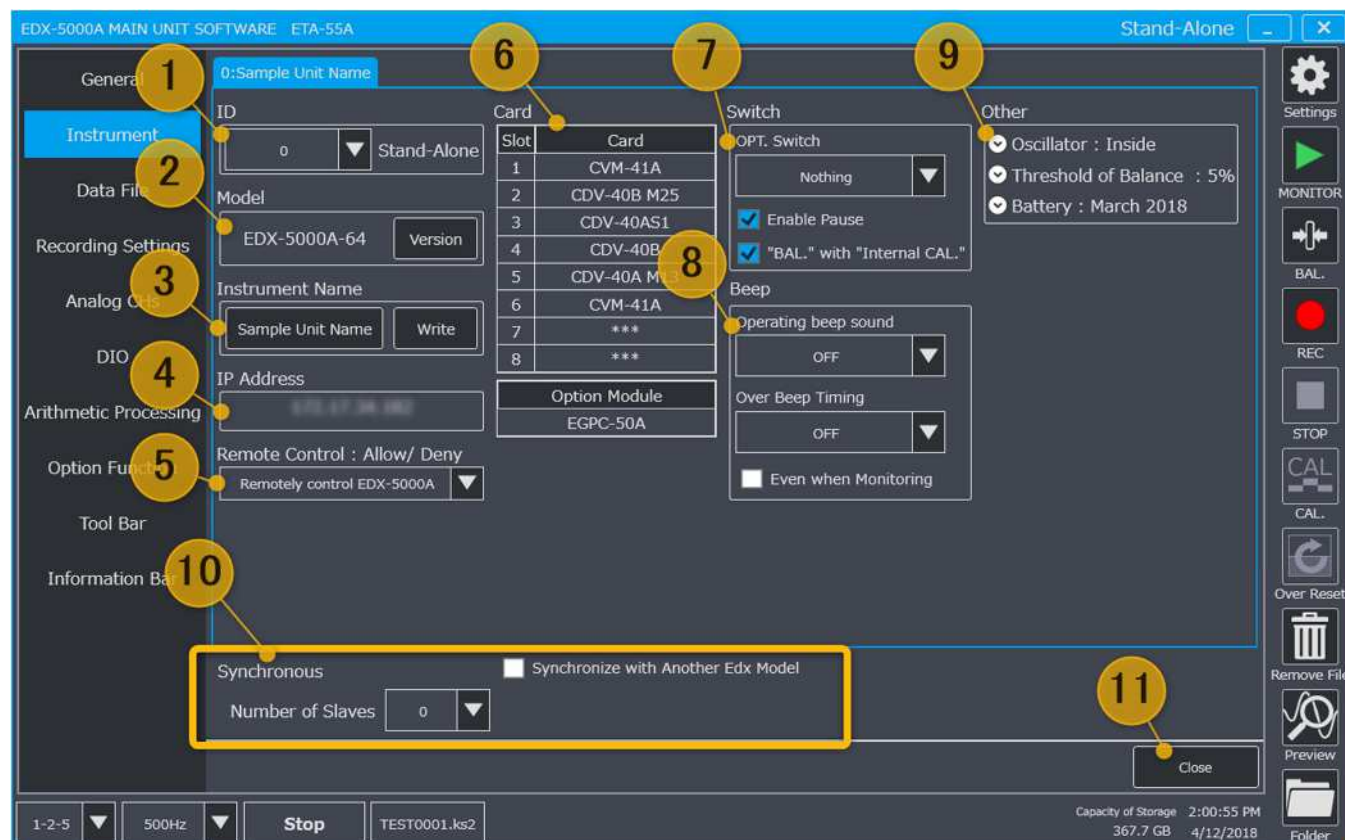


II. Functional Description

1 Basic Settings

1.1 Instrument Settings

Configure EDX-5000A settings and display information on the “Settings” > “Instrument” screen.



No.	Item name	Function
1	ID	Displays the ID No.
2	Model	Displays the EDX-5000A's model and version information.
3	Instrument Name	Displays/set the instrument name.
4	IP Address	Displays the IP address.
5	Remote Control	Allow/deny remote control of EDX-5000A
6	Card	Displays the configuration. Turn on the front panel LED of the EDX-5000A corresponding to each slot.
7	Switch	Displays/set the function assigned to the OPT. switch. Displays/set whether to use the PAUSE function. Displays/set whether to use the function to perform internal calibration sensitivity when making balance adjustments.
8	Beep	Displays/set beep sound settings.

9	Oscillator	Displays/set signal of the active oscillator.
	Threshold of Balance	Displays/set the balance standard value.
	Battery	Displays/set the battery replacement recommendation timing. Perform a battery refresh.
10	Synchronous	Display/set synchronous operation.
11	Close button	Apply settings & Close the “Settings” screen.

(1) ID

Displays the ID.

Measurement using a single EDX-5000A is called “**Stand-Alone**”. In synchronous operation using multiple units, the main unit is called the “**Master**” and the other unit(s) is called a “**Slave**”.

- **Measurement using single a EDX-5000A (Stand-Alone)**

“ID” settings: “0”

“Number of Slaves” settings: “1” (See Chap. II Section 1.1 Item (10))

- **Synchronous operation using multiple units (Master/Slave)**

“ID” settings: Master “0”

Slave Set sequential number using “1” to “9”

“Number of Slaves” settings:

Master Set “2” or more units (see Chap. II Section 1.1 Item (10))

Slave N/A

For detail on synchronous operation, see Chap. II Section 4.

(2) Model

- **Display model**

Use this to confirm the EDX-5000A’s model.

- **Display details information**

Tap “Ver. Information” to confirm detailed information about the EDX-5000A.

- **Save detailed information**

Tap “Save” on the “Ver. Information” screen to save detailed information as a text file.

Save location: (location to save data)¥Ver

File name: version_(year)_(month day)_(hour minute second).txt



(3) Instrument Name

Here you can confirm and set the name of the measuring device.

Input text to change the name. The name set will be saved to the EDX-5000A.

(4) IP Address

Displays the IP address set.

When using a static IP address, see Chap. IV Section 4.

(5) Remote Control

Displays/set whether to deny or allow remote control.



Controlling the EDX-5000A from a PC using a LAN interface is called “**online control**” and using onboard control of the EDX-5000A is called “**offline control**”.

For details on online control, see Chap. II Section 5.

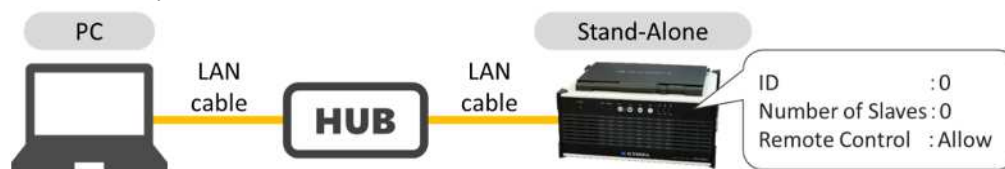
- **Offline control**

Set to “Deny access from the network.”

- **Online control**

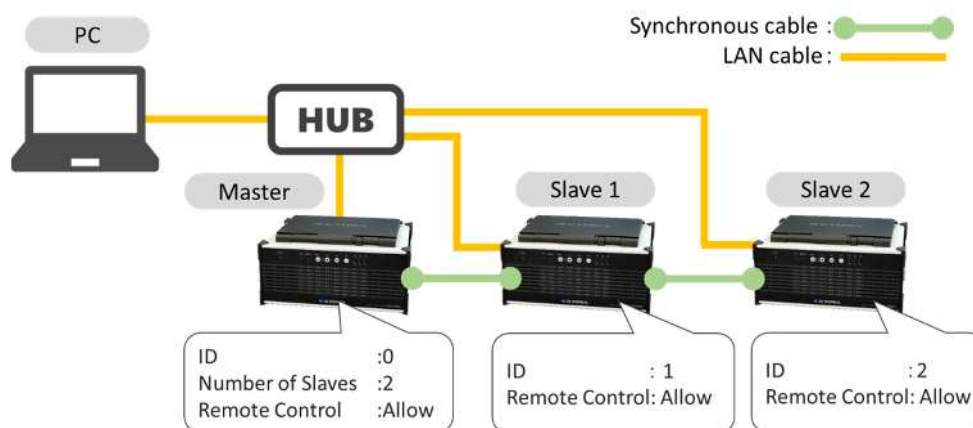
- ✧ **Controlling a single EDX-5000A from a PC**

Set to “Remotely control EDX-5000A”



- ✧ **Controlling multiple EDX-5000A units from a PC**

In all master and slave units to be synchronized, set to “Remotely control EDX-5000A”



(6) Card

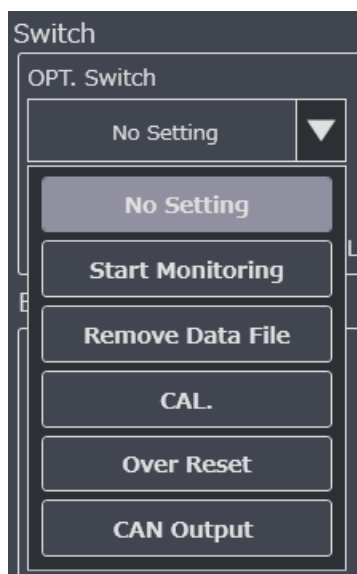
Displays the card configuration/option board configuration for the EDX-5000A.

To check slot positions using the LED on the front panel of the EDX-5000A, double tap the slot or card field while measuring has been stopped.

(7) Switch

● OPT. switch

Set what actions are performed when the “OPT.” switch on the front panel of the EDX-5000A is pressed.



Display	Action
No setting	No action performed
Start Monitoring	Starts the monitoring data.
Remove Data File	Remove the latest recorded data file after measurement is complete.
CAL.	Output/stop the CAL.
Over Reset	Reset the exceeding state to the previous state [before exceeding the check value (up) or check value (down)]
CAN Output (Available as option only.)	Output CAN data. See: Chap. II Item 8.9.1.

● Pause function setting

Configures the use of the pause function.

Check mark ON: You can suspend the recording when tap the “REC” button during recording.

Check mark OFF: The pause function is unavailable for use.

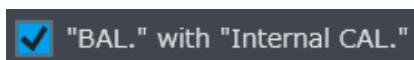


● The internal calibration sensitivity execution timing settings

Sets whether or not to perform internal calibration sensitivity when executing balance adjustments.

Check mark ON: Perform internal calibration sensitivity when executing balance adjustments.

Check mark OFF: Don't perform internal calibration sensitivity when executing balance adjustments.



When not performing internal calibration sensitivity when making balance adjustments, refer to Chap. I Item 5.1.2 to perform internal calibration sensitivity separately.

(8) Beep

● Operating beep sound

Set the beep sound that goes off when performing monitor, data recording and stopping, balance adjustment, and other actions.



Display	Action
OFF	No beep sound used.
High Tone	High tone beep sound used.
Low Tone	Low tone beep sound used.

● Over Beep Timing

Configure beep sound settings when an input of one CH exceeds the over level value during data recording.



Display	Action
OFF	No beep sound used.
During	The beep sound will only play when there are excessive inputs.
Until STOP/PAUSE	The beep sound will continue to play once there are excessive inputs.

Tap this to select the check box if you want to play beep sounds while monitoring and recording data.



(9) Other

● Oscillator

Display/set the active oscillator signal.

This setting field is used when the DPM card is used as a conditioner card.

Inside: Use oscillator signal inside DPM card

Outside: Use external signal for oscillator signal

For details on oscillator, see the separate volume “INSTRUCTION MANUAL EDX-5000A MEMORY RECORDER/ANALYZER (FOR HARDWARE)”

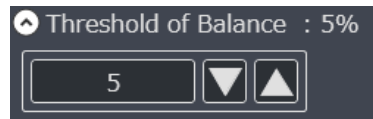
- **Threshold of Balance**

Display the balance standard value and configure settings with value inputs.

Tap the setting item name to show or hide the setting item.

Setting range: 0.1 - 50%

Default value: 5%



Formula for calculating the allowance

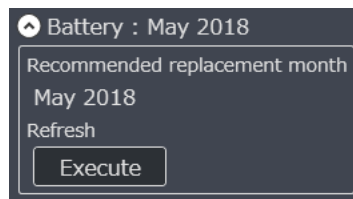
This is calculated using two formulas using the full scale of the range (FS) and the balance standard value (BS).

$$-FS * BS; +FS * BS$$

However, note that the balancing range of the conditioner card takes priority of the balance standard value. Check the specifications of the conditioner card for more information with regard to the balancing range.

- **Battery**

Tap the setting item name to show or hide the setting item.



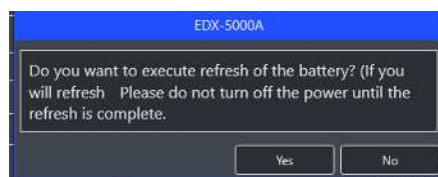
➤ **Recommended replacement month**

Displays the recommended replacement month for the battery.

➤ **Refresh**

Tap the “Execute” button and select “Yes” on the Confirmation dialog box to start a battery refresh.

For details concerning the battery refresh process, see the separate volume "INSTRUCTION MANUAL EDX-5000A MEMORY RECORDER/ANALYZER (FOR HARDWARE)".



Confirmation dialog box

(10) Synchronous

Displays/set synchronous operation settings.

Note: This is only available in stand-alone or master units and not in slave units.

For detail on synchronous operation, see Chap. II Section 4.

- **Number of Slaves**

Display/set the total number of EDX units connected as slaves.

For synchronous operation using other EDX models, set the total number of units including other EDX models.

Number of Slave is 0: Use EDX-5000A as a stand-alone unit

Number of Slave is 1 or more: Synchronous operation using multiple EDX units.

Synchronous ☒ Synchronize with Another Edx Model

Number of Slaves 7 ▼ Model EDX-200A ▼ Number of Instruments 6 ▼

- **Synchronize with Another EDX Model**

For synchronous operation with other EDX models, check "Synchronize with Another EDX Model" and set the model type and number of units.

EDX Model: Display/set the type of EDX model connected.

Number of Instruments: Display/set the number of other EDX models connected.

Synchronous ☒ Synchronize with Another Edx Model

Number of Slaves 7 ▼ Model EDX-200A ▼ Number of Instruments 6 ▼

- **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.

This setting is relevant when synchronous operation or combining files.



➤ Check mark OFF (default settings) :

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

Master: CH1 -
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 (8 slots): CH1 -
Slave 1 (8 slots): **CH65** -
Slave 2 (10 slots): **CH129** -

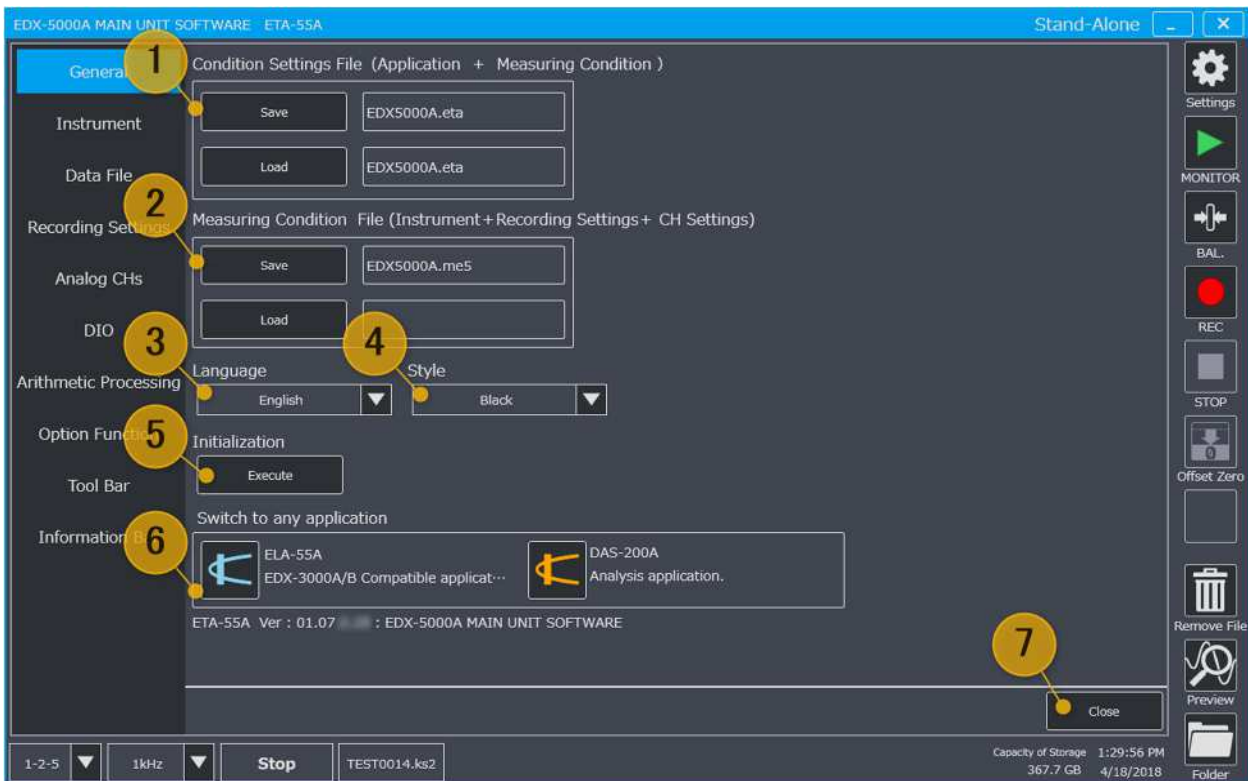


CAUTION

- 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.
- When EDX-5000A is set to standalone, the channel numbers of the arithmetic operations start from 81 CH irrespective of this setting.

1.2 General Settings

Configure condition file, theme color, and other settings, and display information on the “Settings” > “General” screen.



No.	Item name	Function
1	Condition Settings File	Saving/loading the condition settings (window display conditions & measuring conditions) file.
2	Measuring Condition File	Save/loading the measuring condition (instrument information, data recording conditions, and each CH conditions) file.
3	Language	Displays/set the display language
4	Style	Displays/set the theme color
5	Initialization	Format data recording conditions.
6	Switch to any application	Switches the startup application.
7	Close button	Apply settings & Close the “Settings” screen.

(1) Condition Settings File

You can save/load the Condition Settings File.

This condition files use the .eta extension, and contain the measuring conditions and window display conditions.



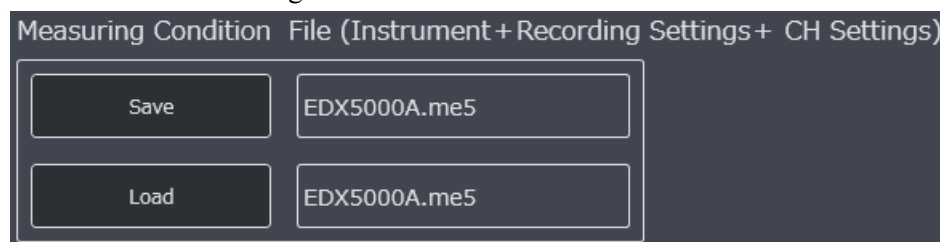
(2) Measuring Condition File

You can save/load the Measuring Condition File.

This condition files use the .me5 extension, and contain the instruments information, the data recording conditions, and each CH conditions.

Note that this condition file not include the window display conditions.

You can also save/load this file using DCS-100A or ELA-55A.



(3) Language

Tap to set the display language of the software to "Japanese" or "English".



(4) Style

You can set the theme colors of this software to "black" or "white".



(5) Initialization

Tap “Execute” to initialize all EDX-5000A settings.



(6) Switch to any application

You can switch to the EDX-3000B compatible software “ELA-55A” and the data analysis software “DAS-200A”.



CAUTION

When switching to the ELA-55A, this software (ETA-55A) will shut down immediately.

Data recording condition settings and display condition settings will be saved automatically upon shut down.

Further, data recording condition settings will be carried over to the ELA-55A.

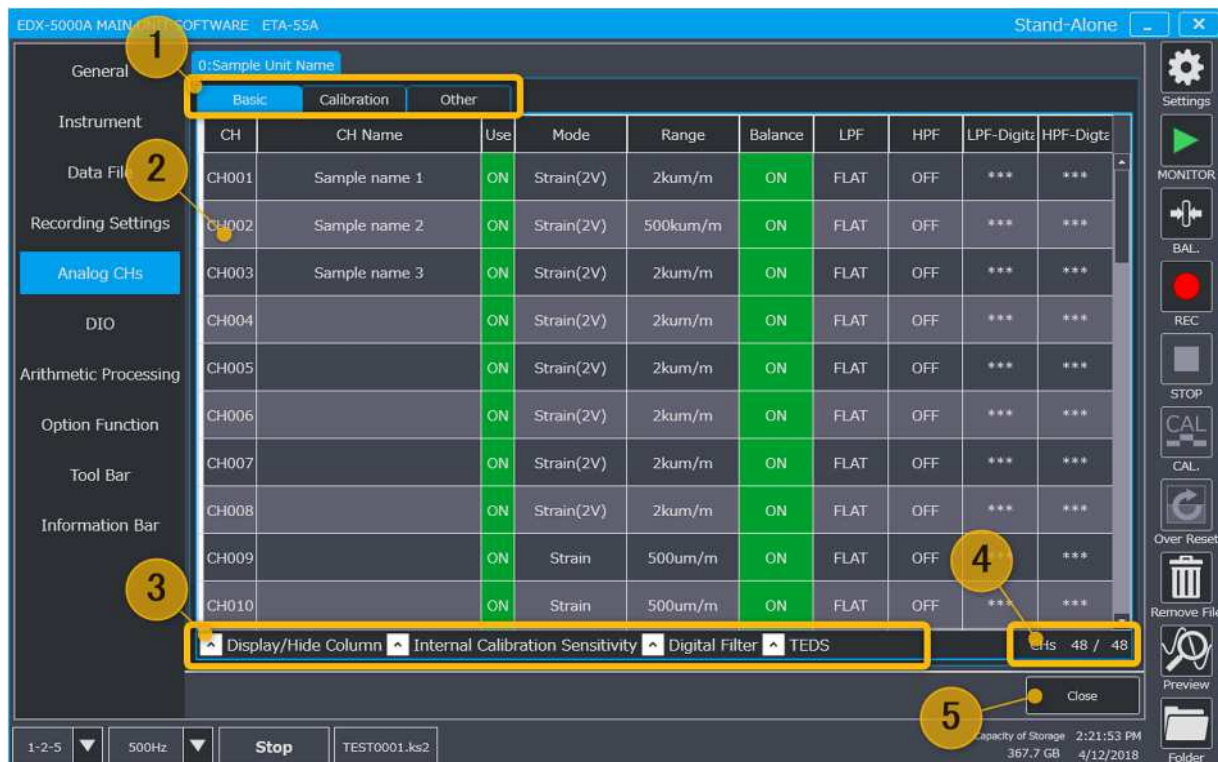
2 CH Conditions Settings

2.1 Analog CH conditions

Set analog CH conditions in the “Settings” > “Analog CHs” screen.

2.1.1 Screen configuration

For details on opening this page, see Chap. I Section 5.1.



No.	Item name	Function	Reference
1	Settings page tabs	Tabs to switch between the three settings pages, “Basics, Calibration value, Others”.	Chap. I Item 5.1.1
2	Setting item list by CH	Displays/set setting items for each CH	Basic : Chap. II Item 2.1.2 Calibration : Chap. II Item 2.1.3 Others : Chap. II Item 2.1.4
3	Advanced setting items	Displays/set advanced setting items	Chap. II Items 2.1.5, 2.1.6, 2.1.7, 2.1.8
4	Number of measuring CHs	Displays the number of measuring CHs and CHs that can be measured	Chap. II Item 2.1.9
5	Close button	Apply settings & Close the Settings screen.	

2.1.2 “Basic” settings tab page

You can display and set the following items on the “Basic” settings tab page.

For details on changing settings, see Chap. I Section 3.4.

Basic		Calibration		Other								
Card	ID-CH	CH	CH Name	Use	Mode	Range	Balance	LPF	HPF	LPF-Digit	HPF-Digit	
CVM-41A	0-01	CH001	sample_name1	ON	Strain(5V)	2kum/m	ON	AUTO	OFF	OFF	OFF	

- **Card**

Displays the model of the currently installed conditioner card.

- **ID-CH**

Displays the EDX-5000A ID No. and CH No.

Ex.) “0-07”: Indicates that the EDX-5000A ID No. is 0, and the CH No. is CH007.

- **CH**

Displays the CH No.

- **CH Name**

Displays the CH name.

You can input text within 40 characters.

- **Use**

Displays/set measurement ON/OFF settings.

Set measuring target CHs to “ON”, and non-measuring target CHs to “OFF”.

Note that settings cannot be changed if the upper limit on the number of CHs that can be recorded is exceeded.

For more information of the upper limit of the number of CHs that can be recorded, see Chap. II Item 3.2.2.

- **Mode**

Displays/set the CH mode.

Selection options will vary depending on the conditioner card installed.

- **Range**

Displays/set the range.

Selection options will vary depending on the conditioner card installed.

- **Balance**

Here you can display and change balance adjustment settings.

When “ON”, this is the target CH for performing balance adjustment.

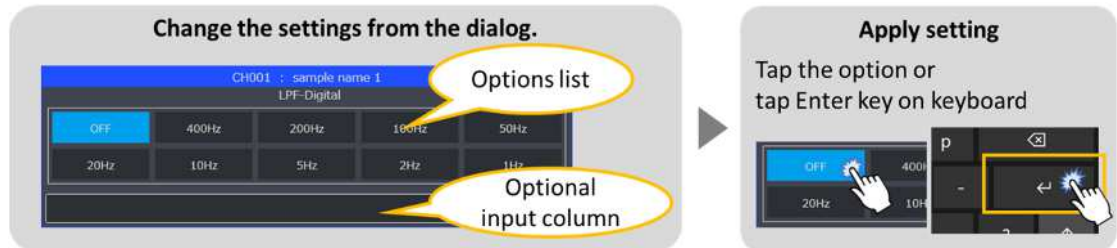
Selection options and settings will vary depending on the conditioner card installed and mode settings.

- **LPF/HPF**

Here you can display and set the cutoff frequency for the low-pass/high-pass filter.
Selection options will vary depending on the conditioner card installed.

- **D-LPF/D-HPF**

Here you can display and set the cutoff frequency when performing digital filtering.
For details on digital filtering, see Chap. II Item 2.1.7.



(1) Settings with input character:

Values within the optional range are set with character input.

Ex.) If the range set is 10 Hz to 4 kHz:

Correct: “150”, “150Hz”, “3kHz”

Wrong: “5”, “20.5”

(2) Settings from the options list:

Select options within the list to set them.



CAUTION

- Be sure to measure at least one analog channel.
- You will not be able to configure D-LPF/D-HPF settings when the order of digital filter settings are set to “0”. For details, see Chap. II Item 2.1.7.
- Digital filtering can only be used when the sampling frequency settings is between 3 Hz and 10 kHz.



Determining the cutoff frequency setting range

Digital filtering can be configured when the sampling frequency (F_s) and the cutoff frequency (F_c) meets the following three conditions:

1. F_s/F_c = between 2.5 to 1000
2. $F_s \geq 3[\text{Hz}]$
3. F_c is an integer.

Ex.) In the case of $F_s = 5[\text{kHz}]$,

$$\text{Max}F_c = 5000[\text{Hz}]/2.5 = 2000[\text{Hz}], \text{ Min}F_c = 5000[\text{Hz}]/1000 = 5[\text{Hz}]$$

Now therefore, the settable F_c range will be between 5Hz to 2000Hz.

2.1.3 "Calibration" settings tab page

You can display and set the following items on the "Calibration" settings tab page.

For details on changing settings, see Chap. I Section 3.4.

Basic		Calibration		Other					
Card	ID-CH	CH	CH Name	Calibr. const.	Offset	Offset Z	Rated Output	Rated Output (mV/	Rated Capacity
CVM-41A	0-01	CH001	sample_name1	1	0	OFF	1000	0.5	1000

- **Card/ID-CH/CH/CH Name**

See Chap. II Item 2.1.2.

- **Calibr. const.**

Displays/set the calibration coefficient that multiplies the measured data.

This is used as a coefficient when using a conversion coefficient for the physical quantity and an extension cable.

Changing the calibration coefficient will automatically change the "Rated Capacity" and "Rated Output" item values.



- **Relationship between the calibration coefficient, the rated capacity and the rated output**

$$\text{calibration coefficient} = \frac{\text{rated output}}{\text{rated capacity} [\times 10^{-6}\text{um/m}] \text{ or } [\text{mV/V}] \text{ or } [\mu\text{V/V}]}$$

Ex.) When the rated capacity of the sensor is 50N, and the rated output is $4000 \times 10^{-6} \text{ um/m}$,

The calibration coefficient would be $50/4000 = 0.0125 [1 \times 10^{-6} \text{ um/m}]$.

- **Formula for measured data (physical quantity)**

Measured data = Measured data (range converted value) $\times$ calibration coefficient + offset

- **Offset**

Displays/set the offset.

Set the offset in physical quantity.

Offset: Used to shift the measured data by a constant amount

- **Offset Zero**

Displays/set the run offset Zero function ON/OFF.

Offset Zero: Sets the monitoring measurement value to the offset value, and the measurement value is set to "0" visibly.

- **Rated Output**

Displays/set the rated output for the input sensor.

Set this with the rated capacity.

The calibration coefficient will be calculated automatically from the rated output and rated capacity.

- **Rated Output (mV/V)**

Displays/set the rated output for the input sensor.

This item is enabled when the “Mode” is set to “Strain”.

Set this with the rated capacity.

The calibration coefficient will be calculated automatically from the rated output and rated capacity.

- **Rated Capacity**

Displays/set the rated capacity for the input sensor.

Set this with the rated output.

The calibration coefficient will be calculated automatically from the rated output and rated capacity.

2.1.4 "Other" settings tab page

You can display and set the following items on the "Other" settings tab page.

For details on changing settings, see Chap. I Section 3.4.

Basic			Calibration		Other					
Card	ID-CH	CH	CH Name	Max(%)	Min(%)	CAL. Range	Internal CAL.	Cable Model	Unit	Deci Digits
CDV-40A	0-01	CH001	Sample CH Name	100	-100	100%	ON	1.0m:U-39	um/m	0(*****)

- **Card/ID-CH/CH/CH Name**

See Chap. II Item 2.1.2.

- **Max (%) / Min (%)**

Set the upper limit and lower limit as a percentage of the range value.

Setting range: -100% to 100%

If measured values exceed the range $\times$ upper limit (%), or drop below the range $\times$ lower limit (%), the measured value display or the background of the display frame will turn red.

For details on displaying out-of-range values on each graph, see Chap. II Section 9.

- **CAL. Range**

Displays/set the setting range ratio during calibration output.

Selection options will vary depending on the conditioner card.

- **Internal CAL.**

Displays/set internal calibration sensitivity compensation ON/OFF settings.

Turn this setting ON when a sensor is connected to the EDX-5000A.

When this setting is ON, internal calibration sensitivity will be performed using the "Cable Model" setting. (For details, see Chap. I Item 5.1.2)

When this setting is OFF, internal calibration sensitivity will not be performed.

Internal calibration sensitivity performs the compensation detailed below by conditioner card.

- **CDV-40B(-F) / CVM-41A**

(1) Strain mode: Checks 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)**

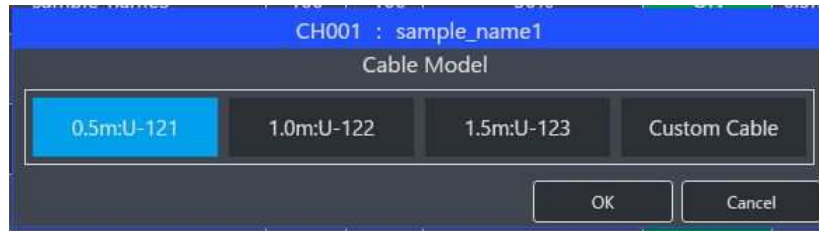
(3) Checks the bridge resistance of the strain gage (full bridge system) or bridge resistance of the strain gage transducer. Compensate the sensitivity.

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

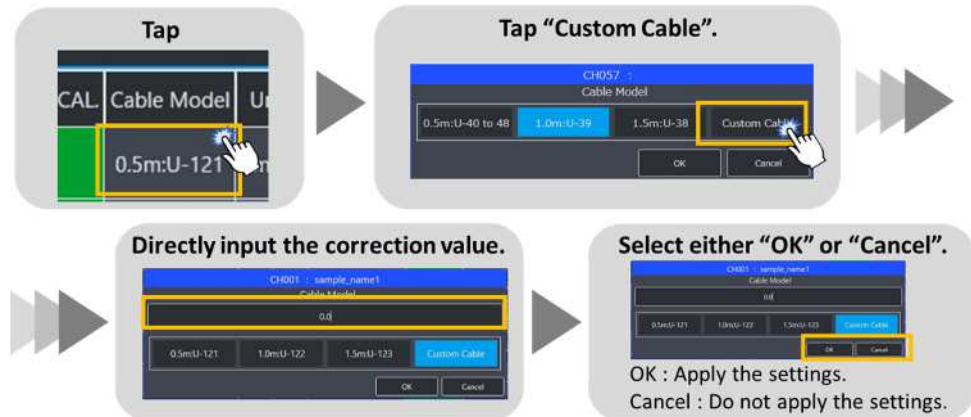
Conduct the item (2) after mounting a new conditioner card or after changing the slot to be mounted.

- **Cable Model**

Displays/set the length of the cable used.



In the case of a custom-made cable, follow the procedure below to set the correction value.



- **Unit**

Displays/set the display unit.

Tap to display the settings dialog, and follow the procedure below to configure settings.



- **Deci digits**

Displays/set the number of digits after the decimal point for values displayed.

Auto : Determine the number of digits to display automatically based on the measured value without setting a fixed number of digits.

0 to 8 : Fixes the number of digits to the value set.

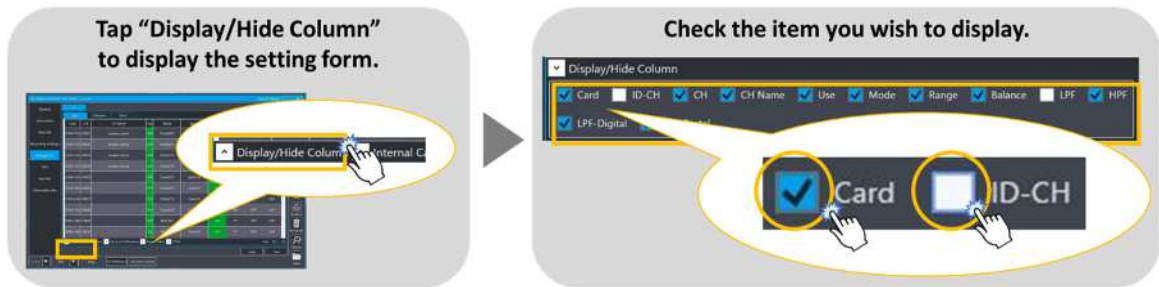
2.1.5 Display/Hide column

This function used to change display items in the setting item list by CH.

Follow the procedure below to make changes.

Check mark inserted : Display setting item column

Check mark not inserted : Hide setting item column



2.1.6 Internal Calibration Sensitivity

2.1.6.1 Perform internal calibration sensitivity

For details on the operation method, see Chap. I Item 5.1.2.



CAUTION

"Cable Model" settings are used to perform internal calibration sensitivity.

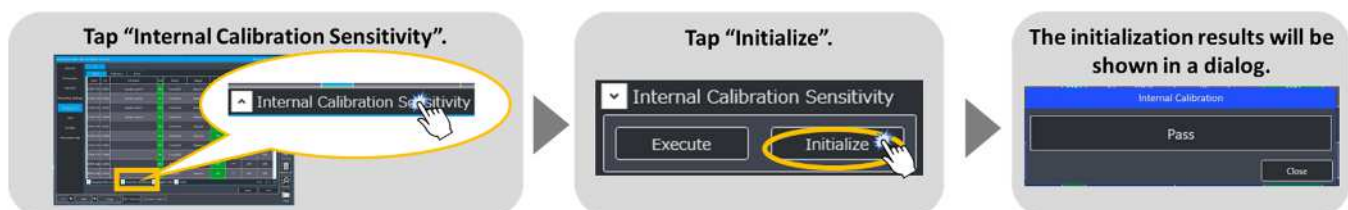
Make sure to check your used "Cable Model" settings prior to performing internal calibration sensitivity.

For details on used cable settings, see Chap. II Item 2.1.4.

2.1.6.2 Formatting internal calibration sensitivity

Format internal calibration sensitivity.

Follow the procedure below.



2.1.7 Digital filter

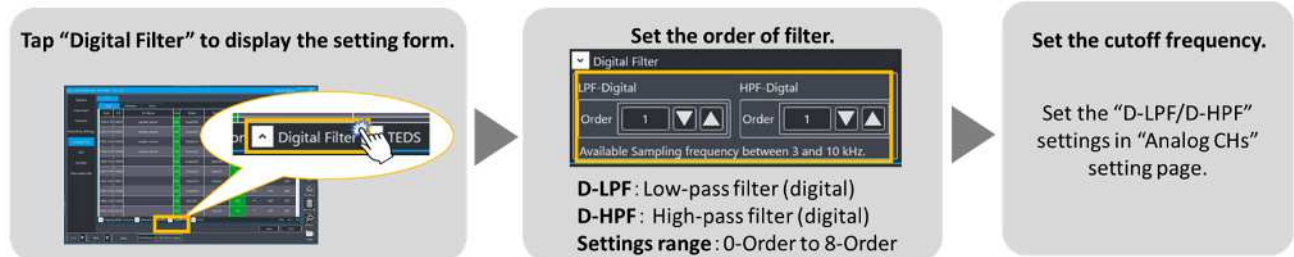
Digital filtering allows you to easily measure a low-noise data.

Setting range: 0-Order to 8-Order

- **Setting method**

Follow the procedure below to configure digital filter settings.

For details on cutoff frequency settings, see Chap. II Item 2.1.2.



The setting range for the two-way D-LPF/D-HPF order is from the 0-Order to the 8-Order.

However, setting this to the 0-Order will prevent you from configuring "D-LPF/D-HPF" settings.

Further, order settings will apply to all CHs collectively.

Order settings cannot be made for each CH individually.

2.1.8 TEDS

2.1.8.1 TEDS information display dialog configuration

Loads TEDS data and displays a list of CHs that have been successfully identified.

(Operation method: See Chap. I Item 5.2.1)

If this does not appear, check whether the wire connection is broken.

Note that unsupported TEDS sensors will not appear.

Use	Card	CH	CH Name	Mode	Range	LPF	Calibr. const.	Unit	User Data
ON	CDV-40B-F	CH001		Strain	Skum/m	AUTO	0.24366	mm	KYOWA



Loadable Template ID

ID 0 / ID 24 / ID 25 / ID 30 / ID 33 / ID 36

- **Use**

Displays/set the apply TEDS data setting ON/OFF.

ON: CHs reflected in analog CH conditions when the “OK” button is tapped.

OFF: Not reflected in analog CH conditions even when the “OK” button is tapped.

- **Card/CH/CH Name/Mode/Range/LPF/Calibr. const./Unit**

See the description on Chap. II Section 2.1.

However, settings cannot be changed in this dialog box.

- **User Data**

Displays TEDS-compatible sensor user data and is used to change settings.

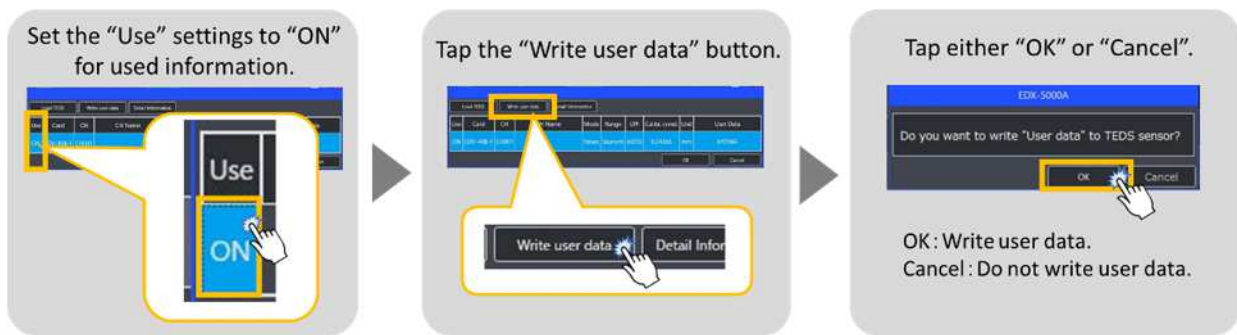
- **OK/Cancel button**

OK button: Reflects TEDS data for CHs where the “Use” item is ON in analog CH conditions.

Cancel button: Does not reflect loaded TEDS data.

2.1.8.2 Writing user data to the TEDS-compatible sensor

Tap the “Write user data” button to write user data for CHs where the “Use” item is ON to the TEDS-compatible sensor.



CAUTION

Note that you may not be able to write user data even if TEDS data can be loaded.

2.1.8.3 Detailed TEDS information display screen

Display the More Info screen to confirm detailed TEDS information. (See Chap. I Item 5.2.3)

Detail InformationCH001

Standard Template ID : 33
Physical Measurand : 17
Transducer Electrical Signal Type : Bridge Sensor
Full-scale Electrical Value Precision : 2
Mapping Method : Linear
Bridge Type : Full
Minimum physical value : 1000
Maximum physical value : 1000
Minimum electrical output [V/V] : 0.002052
Maximum electrical output [V/V] : 0.002052
Bridge element impedance [ohms] : 120
Response Time [sec] : 1E-06
Excitation level,nomal [V] : 2
Excitation level,min [V] : 1
Excitation level,max [V] : 5
Calibration Date : 2008/09/12
Calibration initials : KUR
Calibration Period [days] : 365
Measuerment Location ID : 9

Close

- **Close button**

Tap the “Close” button to return to the TEDS information display dialog.

2.1.8.4 Reload TEDS data

To reload, tap the “Load TEDS” button at the top of the TEDS information display screen.

Load TEDS Write user data Detail Information

Use	Card	CH	CH Name	Mode	Range	LPF	Calibr. const.	Unit	User Data
ON	CDV-40B-F	CH001		Strain	Skum/m	AUTO	0.24366	mm	KYOWA

OK Cancel

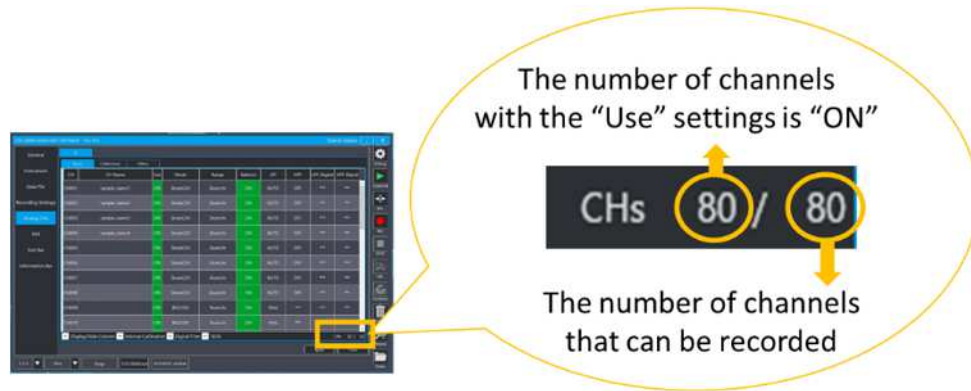
2.1.9 Number of measuring CHs and CHs that can be measured

Number of recording CHs:

Displays the number of CH with the “Use” item turned ON.

Number of CHs that can be recorded:

Displays the maximum number of CHs that can be measured/recorded.



2.2 DIO conditions

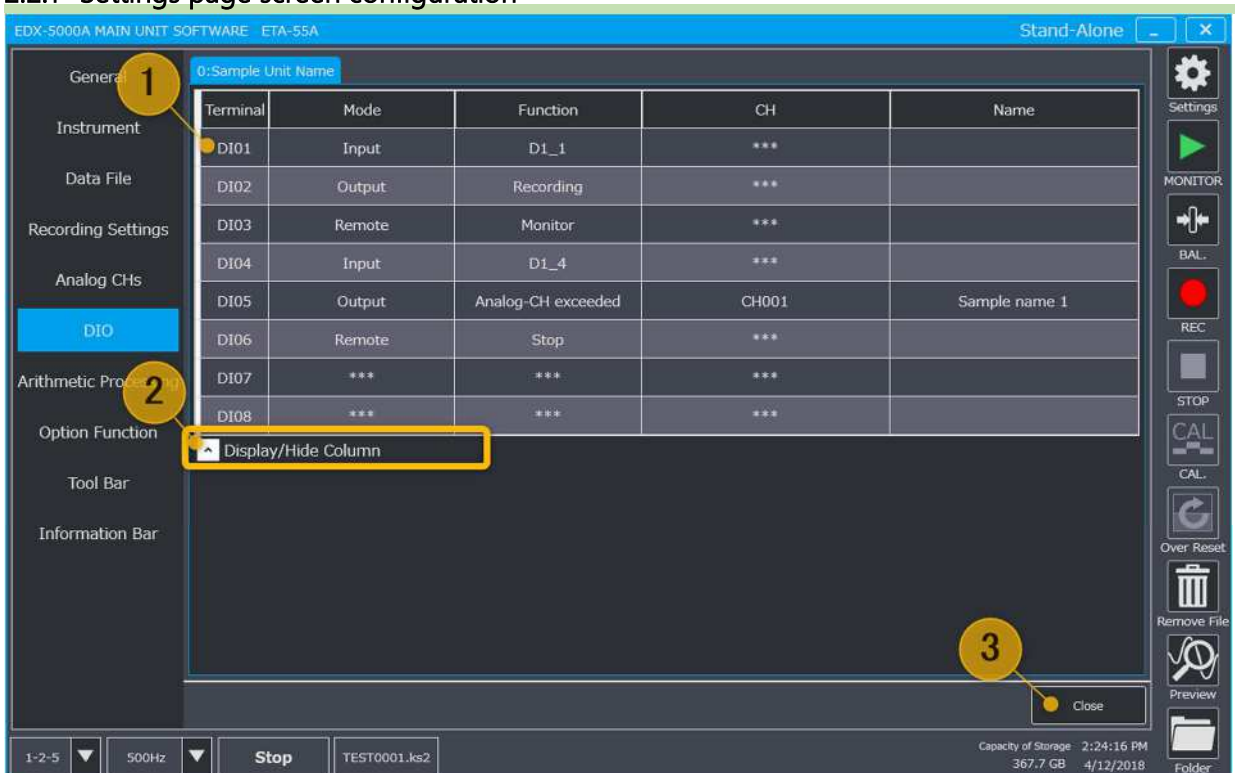
The EDX-5000A comes equipped with a digital input/output (DIO) port, allowing for the input/output of 8-bit digital signals. The input/output of digital signals is also possible when assigning “remote control” functions used to control the EDX-5000A.

You can display and change DIO condition settings in “Settings” > “DIO” screen.

For details on opening “DIO” screen, see Chap. I Section 5.3.

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

2.2.1 Settings page screen configuration



No.	Name	Function
1	Setting item list by DIO terminal	Displays/set setting items for each terminal
2	Advanced settings	Displays/set advanced setting items
3	Close button	Apply settings & Close the Settings screen.

2.2.2 Setting items

(1) Terminal

Displays the terminal name. For details concerning the DIO pin arrangement, see the separate volume "INSTRUCTION MANUAL EDX-5000A MEMORY RECORDER/ANALYZER (FOR HARDWARE)".

(2) Mode

Displays/set the mode for each terminal. The following 3 modes are available.

For details on changing mode settings, see Chap. I Section 5.3.

Mode	Description
Input	Enables digital CHs, and allows for monitoring/recording of digital signals.
Output	Outputs digital signals at times set under the "Function" item. For details concerning output timing, see the separate volume "INSTRUCTION MANUAL EDX-5000A MEMORY RECORDER/ANALYZER (FOR HARDWARE)".
Remote	Performs the action set in the "Function" item when a digital signal is input. When EDX-5000A is set to Slave, the Remote mode cannot be used.

(3) Function

Configures function settings.

Mode	Function name	Description
Input	Displays the bit No.	"D + Digital CH No. + Terminal No." Ex.) "D0_1" Digital CH No.: 0 Terminal No.: 1
Output	See the table on Chap. I Item 5.3.2	
Remote	See the table on Chap. I Item 5.3.3	

(4) CH

When the "While exceeding Analog CH (CAN-CH)" or the "Analog CH (CAN-CH) exceeded" functions are set in "Output" mode, you will be able to display/set CHs the functions are assigned to.



CAUTION

- Setup can be performed using the EDX-3000B compatible software.
- When the sampling frequency settings is set to more than 5kHz, unavailable CAN over.

(5) Name

The names of each terminal can be displayed/set to within 40 characters only when the Mode is set to "Input".

2.2.3 Advanced setting items

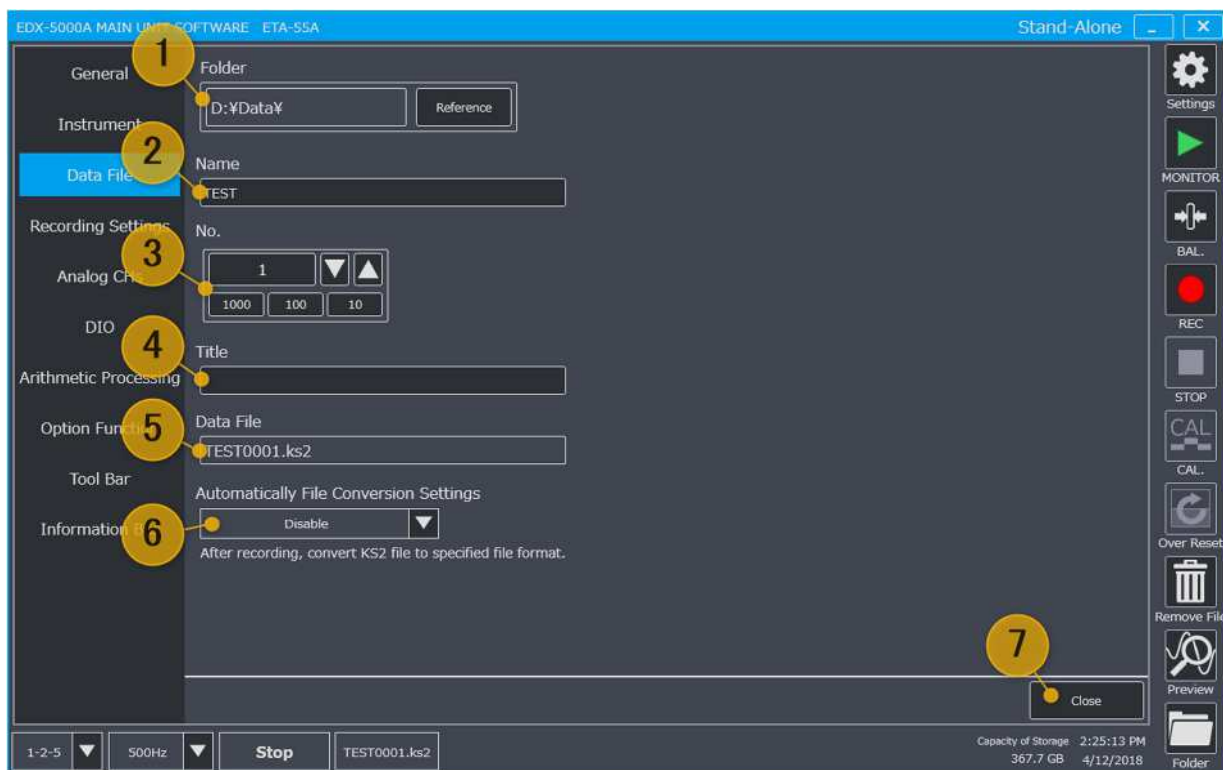
2.2.3.1 Display/hide column

The same operation as that for Chap. II Item 2.1.5.

3 Recording Setting

3.1 Data file

3.1.1 Settings screen



No.	Name	Function
1	Folder	Set the save location for the recorded data file
2	Name	File name settings
3	No.	File No. settings
4	Title	Set the file title for the recorded data file
5	Data File	Displays the title of the recorded data file
6	Automatically File Conversion Settings	Convert file format after data recording
7	Close button	Apply settings & Close the Settings screen.

3.1.2 Display/setting items

(1) Folder

Displays/set the save location of the recorded data file.



CAUTION

- Do not select external storage as the storage location of the recorded data.
- Data cannot be saved in C: drive.

(2) Name

Use character inputs to set a file name of up to 20 characters.

If a file name exceeds this limit, any excessive characters will automatically be deleted when focusing off of the input box.

Title

20 characters

Title

(3) No.

Use number inputs to set the number of the recorded data file.

Setting range: 0 to 9999



CAUTION

- Since the KS2 format data file existing at the save location of the recorded 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 file "TEST0000.ks2" exists: 0001(No change)
- (2) If file "TEST0001.ks2" exists: 0002(Changed)
- (3) If file "TEST1000.ks2" exists: 1001(Changed)
- (4) If 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)

(4) Title

Use character inputs to set a file name of up to 40 characters.

(5) Data File

Data filenames will be generated as follows.

Further, file numbers will be moved up automatically when there are duplicate file names.

“File Name + File No. + Repeat Times + .ks2”

Recording mode		Repeat times part
Manual	One repeat time	None
	One or more repeat times	“_M0000”
Interval		“_I0000”
Trigger	Analog	“_A0000”
	Digital	“_D0000”
	External	“_E0000”
Complex trigger		“_C0000”

Repeat times part:

Expressed as “_(underscore)” + “character string by recording mode” + “the number of repeat times”.

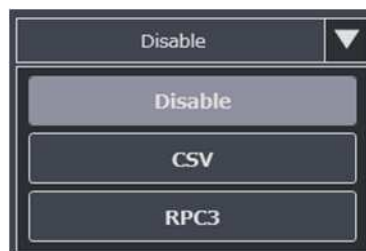
Further, the number of repeat times will increase automatically.

(6) Automatically File Conversion Settings

This function automatically converts the recorded file to another file format after recording.

- **File Format Conversion Setting**

Display/Set the file format.



Selection options	Function
Disable	Not convert.
CSV	Automatically converts the KS2/E4A format data file to the CSV data format (extension: .csv) after recording.
RPC3	Automatically converts the KS2 format data file to the RPC III data format (extension: .rsp) after recording.

- **File Format**

- **CSV**

For details, see Chap. II Item 3.1.3.

- **RPC3**

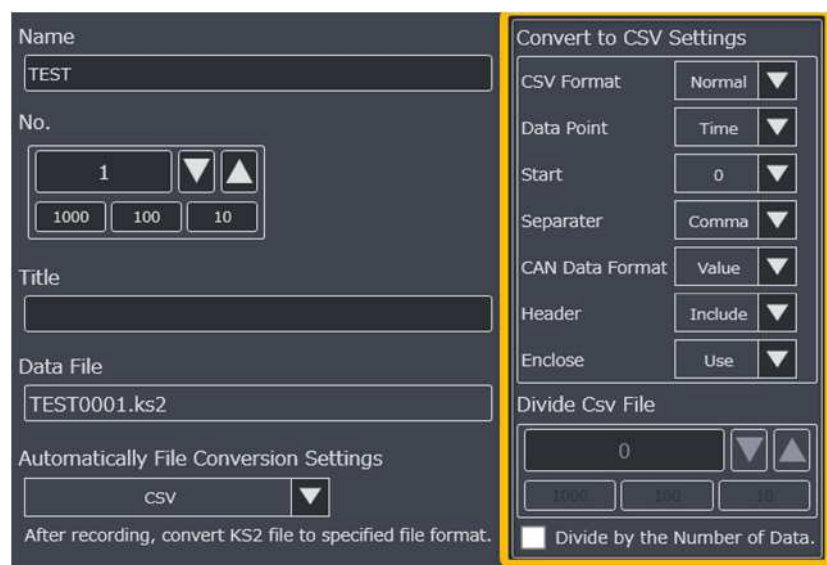
MTS RPC III format

- **Settings item and operation method**

- **CSV**

For details on the settings item, see Chap. II Item 3.1.3.

For details on the operation method used, see Chap. I Item 4.1.



➤ **RPC3**

For details, see Chap. II Item 3.1.4.



● **Converted File**

Converted files will be saved to the same folder as the recorded data file.

The extension of converted file are as follows.

File Format	The recorded file name	The converted file name
CSV (Not divide csv file)	TEST0000.ks2 (TEST0000.e4a)	TEST0000.csv
CSV(Divide csv file)	TEST0000.ks2 (TEST0000.e4a)	TEST0000_i.csv *) i: The divide no.
RPCIII	TEST0000.ks2	TEST0000.rsp

● **Recorded CH data supported.**

The recorded CH data supported are as follows.

Recording CH	CSV Conversion	RPCIII Conversion
Analog CH (KS2 format)	Supported	Supported
Digital CH (KS2 format)	Supported	Not supported
Calculation CH (KS2 format)	Supported	Supported
CAN CH (E4A format)	Supported	Not supported
GPS CH (NMEA format)	Not supported	Not supported

3.1.3 Format and configuration of CSV file

The format of CSV files converted from KS2 or E4A files is shown below.

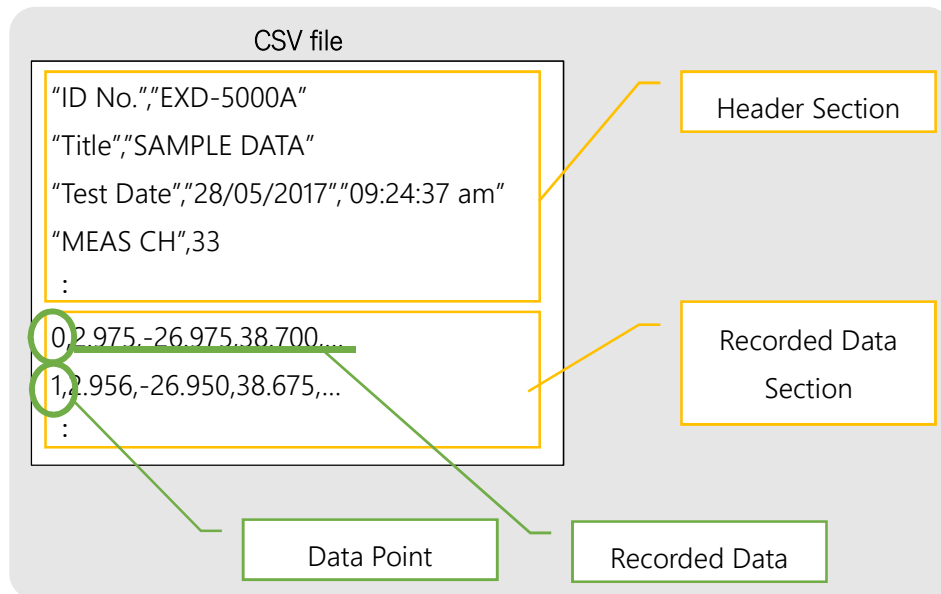
- **CSV file format**

CSV files mainly consist of the header information and recorded data sections.

Data shown in the **header information** section can be changed by setting the “CSV Format”.

In the **recorded data section**, per CH recording data is saved to each row.

Sequential numbers called **Data Point** will be prefixed to each recorded data.



● CSV Format

Header information can be selected as "Old" or "Normal".

Item Name	Description	Old	Normal
ID No.	Data file ID number	Enable	Enable
Title	Data file title	Enable	Enable
Test Date	Date of measurement	Enable	Enable
MEAS CH	Number of recorded CH	Enable	Enable
Digital Input	Digital input ON/OFF status	Enable	Disable
Sampling Rate(Hz)	Sampling frequency	Enable	Enable
Data Nos/CH	Number of data per CH	Enable	Enable
MEAS Time(sec)	Running time of measurement.	Enable	Enable
CH Name	Comment for each CH	Enable	Enable
CH No.	CH No.	Enable	Enable ^(*)
Range	Range for each CH	Enable	Enable
Calibration Coefficient	Calibration coefficient for each CH	Enable	Enable
Offset	Offset value for each CH	Enable	Enable
Unit	Unit for each CH	Enable	Enable
Recorded Data	Recording data	Enable	Enable
High Pass Filter	High pass filter for each CH	Disable	Enable
High Pass Filter (Digital)	Digital high pass filter for each CH	Disable	Enable
Low Pass Filter	Low pass filter for each CH	Disable	Enable
Low Pass Filter (Digital)	Digital low pass filter for each CH	Disable	Enable

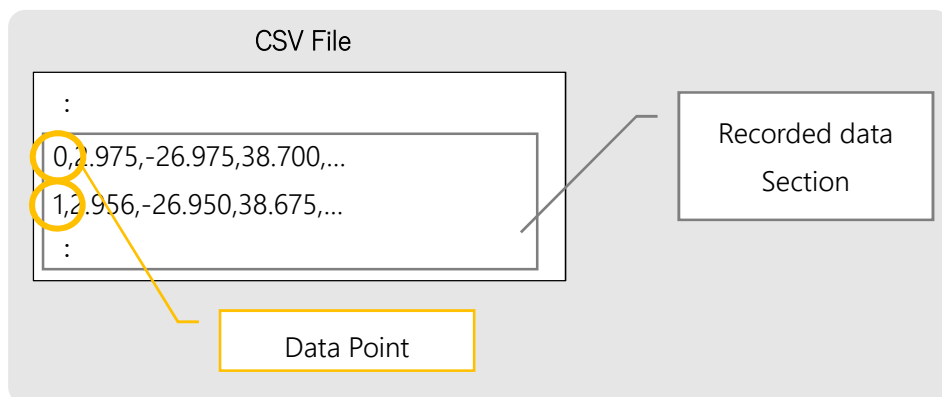
(*1) The "Data Point" setting is "Time". : The item name will be "Time (sec)".

The "Data Point" setting is "Number". : The item name will be "No.".

● Data Point

Select the data point type for sequential numbers prefixed to the recording data.

Selection options: Time, Number



- **Start**

Set the first number of sequential numbers (data points) prefixed to the recording data to either 0 or 1.

- **Separator**

Set the separator type used in files converted to CSV format.

Selection options: Comma, Tab

- **CAN Data Format**

Set CAN data format.

Value: Converts to [CAN data * calibration value + offset] value for each CAN CH

Dec: Converts to CAN data for each CAN CH

- **Header**

Enable/disable header information.

Selection options: None, Include

- **Enclose**

Enable/disable enclosing double quotations for text strings.

Selection options: None, Use

- **Divide CSV File**

Set the number of data per CH in order to divide the recorded data when converting the CSV file. When the file is divided, sequential numbers starting with 0 are automatically suffixed to each file.

Setting range: 0 (no division), 1 to 1,048,500 (divided)

Ex.) When a KS2 format file containing 1,000 recorded data is converted to CSV using the following conditions:

Data Point: Number, **Start:** 0

Header: Include, **Enclose:** Use, **Divide Data Number:** 500

CSV File 1	CSV File 2
"ID No.,""EXD-5000A"	"ID No.,""EXD-5000A"
"Title","SAMPLE DATA"	"Title","SAMPLE DATA"
:	:
0,2.975,-26.975,38.700,...	500,2.975,-26.975,38.700,...
:	:
499,2.945,-26.965,38.600,...	999,2.945,-26.965,38.600,...

3.1.4 File Conversion Settings For RPC III Format

This section describes the settings item of conversion the KS2 format data file to the RPC III data format (extension: .rsp) function.



The screenshot shows a dark-themed dialog box titled "RPC". It contains two settings, each with a text label and a dropdown menu. The first setting is "Frame Length" with a dropdown menu showing the value "256". The second setting is "Group Length" with a dropdown menu also showing the value "256".

- **Settings Item**

- **Frame Length**

You can select the points per frame from the following selections.

Select options: 256, 512, 1024, 2048, 4096, and 8192

- **Group Length**

You can select the points per group from the following selections.

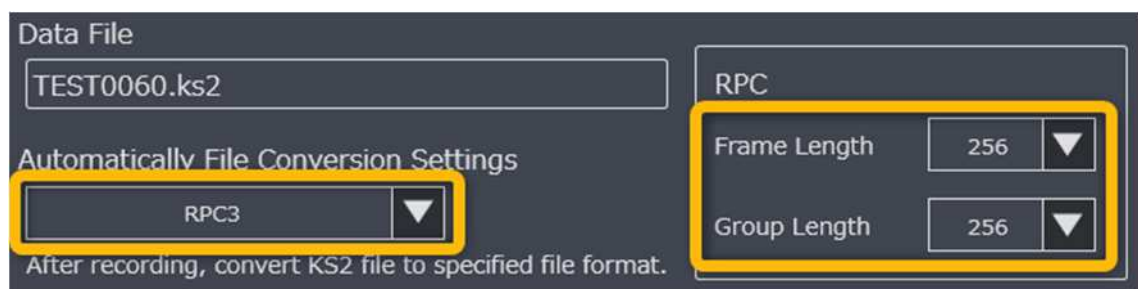
But you can set the points per frame smaller than or equal to the points per group.

Select options: 256, 512, 1024, 2048, 4096, and 8192

Example: When the Frame Length setting is “2048”, the Group Length setting can be set “2048”, “4096” or “8192”.

- **Operation method**

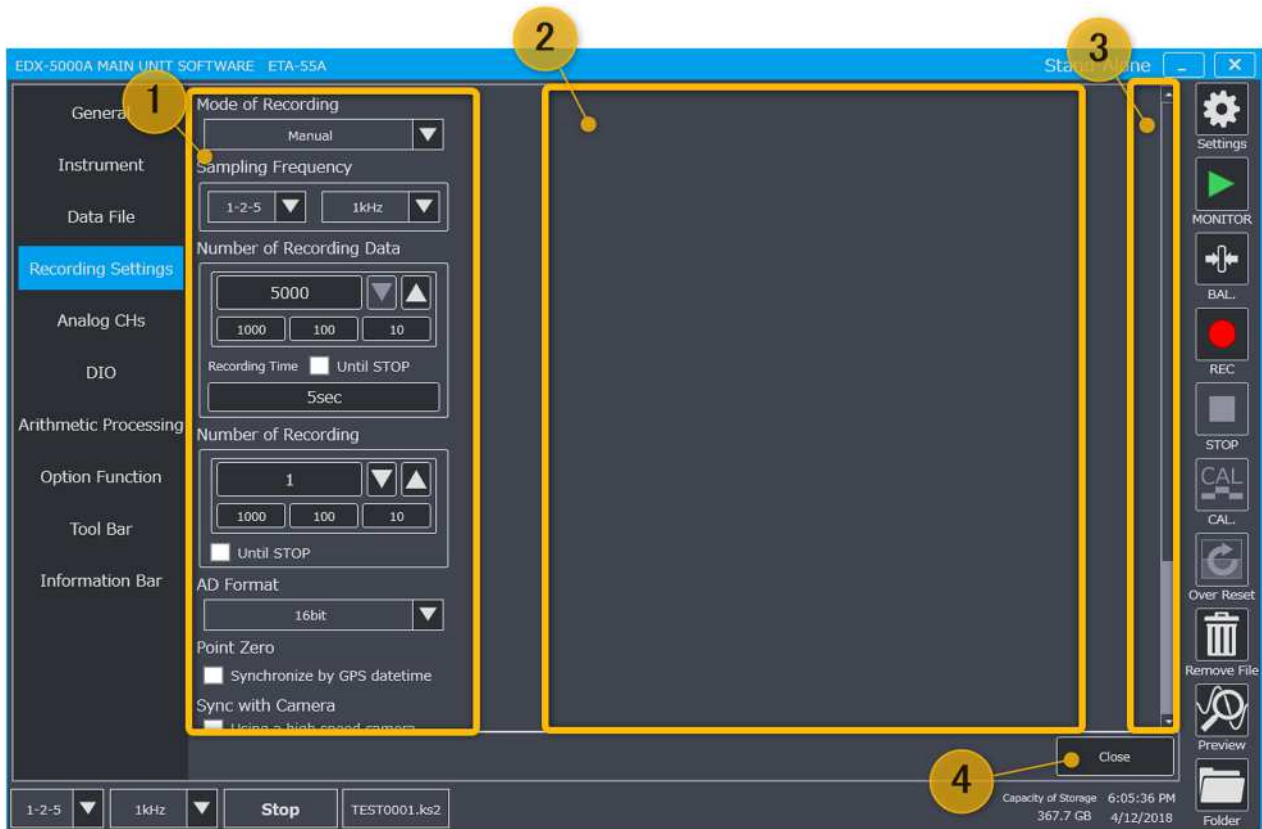
Set File Format Conversion to “RPC3” and select value of points per frame and group in the drop-down list.



The screenshot shows the main software interface. On the left, there is a "Data File" section with a text box containing "TEST0060.ks2". Below it is the "Automatically File Conversion Settings" section, which includes a dropdown menu currently set to "RPC3". At the bottom of this section, it says "After recording, convert KS2 file to specified file format." On the right side of the interface, there is a panel titled "RPC" containing the same "Frame Length" and "Group Length" settings seen in the previous screenshot, both set to "256". Yellow rectangular boxes highlight the "RPC3" dropdown and the "RPC" settings panel.

3.2 Recording conditions

3.2.1 Settings screen configuration



No.	Name	Function	Reference page
1	Common settings	Displays/set common setting items	Chap. II Item 3.2.2
2	Advanced settings	Displays/set advanced setting items	Chap. II Item 3.2.3 Chap. II Item 3.2.4 Chap. II Item 3.2.5
3	Scroll Bar	Display range can be adjusted when displayed	
4	Close button	Apply settings & Close the Settings screen.	

3.2.2 Common setting items

Common setting items are common settings that apply to all recording modes.

The settings items may be hidden by the display area is changed according to the screen size.

You can change display area if the scroll bar is shown on the right side of screen.

- **Mode of Recording**

Displays/set the recording mode.

Tap this to open the drop-down list and change settings.

Mode of Recording	Description	Reference page
Manual	Use the “REC”/”STOP” button to start/stop data recording. You can also perform recordings using a specified number of recorded data.	Chap. I Item 4.2.1 Chap. II Section 10.7
Interval	Leave a gap in starting data recording.	Chap. I Item 4.2.2 Chap. II Section 10.8
Trigger	Starts/stops recording when the specified CH satisfies the trigger conditions.	Chap. I Item 4.2.3 Chap. II Section 10.9
Complex Trigger	Starts/stops recording when multiple CHs satisfies the trigger conditions.	Chap. I Item 4.2.3 Chap. II Section 10.9

- **Sampling Frequency**

Displays/set the sampling frequency.

The sampling frequency applies to all CHs.

You must select the sequence system and the sampling frequency.



System	Sampling frequency
1-2-5 system	1: 1, 10, 100, 1k, 10k, 100k [Hz] 2: 2, 20, 200, 2k, 20k, 200k [Hz] 5: 5, 50, 500, 5k, 50k [Hz]
2n system	2 ⁿ [Hz] (n:2,3,...,17)
External clock	Input the sampling frequency for the external clock.

For basic recordings, select a frequency from the **1-2-5 system**.

The sampling frequencies of 2n system are used when you wish to set the frequency degradation of FFT analysis results to an easily controllable value.

However, there are restrictions on the sampling frequency that can be set based on the number of measuring CHs.



Relationship between the sampling frequency and the number of recording channels

The relationship between the sampling frequency and the upper limit on the number of recording channels is shown in the table below.

Sampling frequency		AD data format	
		16 bit	24 bit
1-2-5 system	1 Hz to 200 kHz	32 CH	16 CH
	1 Hz to 100 kHz	64 CH	32 CH
	1 Hz to 50 kHz	80 CH	64 CH
	1 Hz to 20 kHz	80 CH	80 CH
	1 Hz to 10 kHz	For real-time simultaneous data measurement* ¹	
2n system	4 Hz to 131.072 kHz	32 CH	16 CH
	4 Hz to 65.536 kHz	64 CH	32 CH
	4 Hz to 32.768 kHz	80 CH	64 CH
	4 Hz to 16.384 kHz	80 CH	80 CH
	4 Hz to 8.192 kHz	For real-time simultaneous data measurement* ¹	
External clock	Sampling frequency = $\frac{\text{Reference value}}{\text{The number of analog CH}}$ However, note that the maximum upper limit on the sampling frequency is 200 kHz. Reference value: When the AD format is 16 bit, Reference value = 6,400,000 When the AD format is 24 bit, Reference value = 3,200,000		

*1) Real-time simultaneous data measurement: Using these features that moving image data recording with webcam, digital filter, arithmetic operation and FFT analysis.

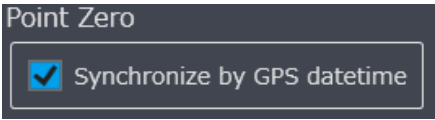
Ex.) When setting the sampling frequency to 200 kHz in the 1-2-5 system when the AD data format is 24 bit data recording is possible for up to 16 CHs.

To record up to 32 CHs, reduce the sampling frequency to 100 kHz or below.



Relationship between the sampling frequency and the recoding operations

The relationship between the sampling frequency and the recording operations shown in the table below.

Settings	The usable range of the sampling frequency
Arithmetic operation function in use (See: Chap. II Section 7.3) 	1 Hz to 10 kHz
Recording moving image using webcam (See, Chap. II Section 9.9)	1 Hz to 10 kHz
Recording moving image using high-speed camera (See, Chap. II Section 10.10)	1 Hz to 200 kHz
FFT analysis processing (See, Chap. II Section 9.8)	3 Hz to 10 kHz
Digital Filter (See, Chap. II Item 2.1.2)	3 Hz to 10 kHz
CAN trigger setting enabled (See, Chap. II Item 3.2.5)	1 Hz to 10 kHz
CAN over setting enabled (See, Chap. II Item 2.2.2(4))	1 Hz to 5 kHz
GPS setting ON (See, Chap. II Item 6.2.4(1))	1 Hz to 200 kHz (Unavailable external clock)
Point Zero setting ON (See, Chap. II Item 3.2.2) 	1 Hz to 200 kHz (Unavailable external clock)

- **Number of Recording Data**

Displays/set the number of recording data and the recording time.

You can set this up to remaining disk space of built-in memory.

However, there is a case of the recording stop because the capacity of built-in memory is full, when you record the CAN data, the GPS data, moving image data or voice data.

The number of recording data and the recording time are linked, and both are calculated using the sampling frequency.

$$\text{Recording Time} = \text{The number of recorded data} * \frac{1}{\text{Sampling frequency}}$$



CAUTION

When “Number of Recording” settings are set to a value other than 1, the “Number of Recording Data” and the “Number of recording” cannot be set to a value less than 5 seconds. (Excluding trigger and complex trigger model)

(1) Setting from the number of recording data:

Use the spin box (Chap. I Section 3.3) or text input (Chap. I Section 3.2) to set the number of data. After applying the settings, the “Number of Recording” will be calculated automatically.

(2) Setting the number of recording data from the recording time:

Use text input (Chap. I Section 3.2) to set the recording time.

Set the recording time in seconds. You can also use a “:” (colon) to set it in time format.

Enter 0 to keep recording until the “STOP” button is tapped.

After applying, the settings the number of recording data will be calculated automatically.

Refer to the input examples in the table below when entering values.

Input example	Display when setting is confirmed
“10sec”	“10sec”
“0.1”	“0.1sec”
“120”	“00:02:00”
“1:02”	“01:02:00”
“1:2:3:4”	“1.02:03:04” (1 day and 2 hours 3 minutes 4 seconds)

(3) To keep recording until the “STOP” button is tapped:

Select the “Until STOP” check box.

This check box will also be selected when the number of recording data is set to 0.

The following screen should appear after settings are applied.

At this time, the “Number of Recording” can only be set to “1” and the recording count is once until you tap “STOP” button.



- **Number of Recording**

Displays/set the number of times a recording repeats.



CAUTION

When “Number of Recording” settings are set to a value other than 1, the “Number of Recording Data” and the “Number of Recording” cannot be set to a value less than 5 seconds. (Excluding trigger and complex trigger model)

(1) When specifying the recording count:

Use the spin box (Chap. I Section 3.3) or text input (Chap. I Section 3.2) to set.

Setting range: 1 to 9999

(2) To keep recording until the “STOP” button is tapped:

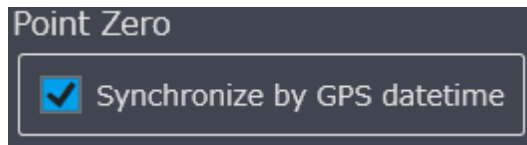
Select the “Until STOP” check box or set the “Number of Recording” to 0.

- **AD Format**

Displays/set the AD data format.

Options: 16 bit or 24 bit

- **Point Zero**



When using the Point Zero function, the time data received from GPS satellites can be used to start recording at the zero-point time (time at msec 0).

Put a checkmark when recording with the Point Zero function.

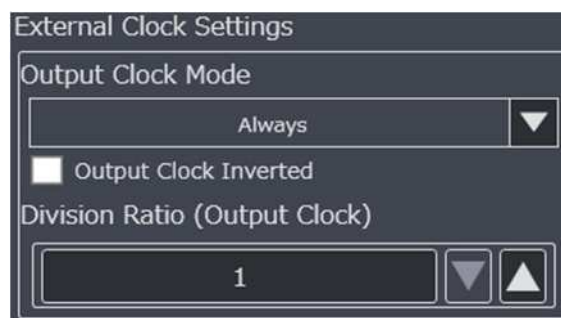
For details on the GPS, see Chap. II Section 6.2.



CAUTION

- When GPS sensor is disconnected, the Point Zero function cannot be enabled.
- If recording using the Point Zero function, only **manual recording (recording count can only be set once) and interval recording** can be used.
- External clock cannot be set for sampling frequency.

- **External Clock Settings**



The EDX-5000A can output a split sampling frequency as a clock (external clock) to make it possible to perform measurements linked to an external device (a logger, high-speed camera, etc. from another company).

Further, the external clock outputs from the CLK.OUT terminal on the rear panel of the EDX-5000A.

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

➤ **Output Clock Mode**



Set/display the output CLK.OUT signal mode.

Selection options: Always, During Recording



CAUTION

“Output Clock Mode” cannot be set “During Recording” when “Mode of Recording” is “Manual” and “Number of Recording” is more than 2.

➤ **Output Clock Inverted**

Set/display whether to invert the CLK.OUT signal.

Check mark ON: Output the CLK.OUT signal is inverted.

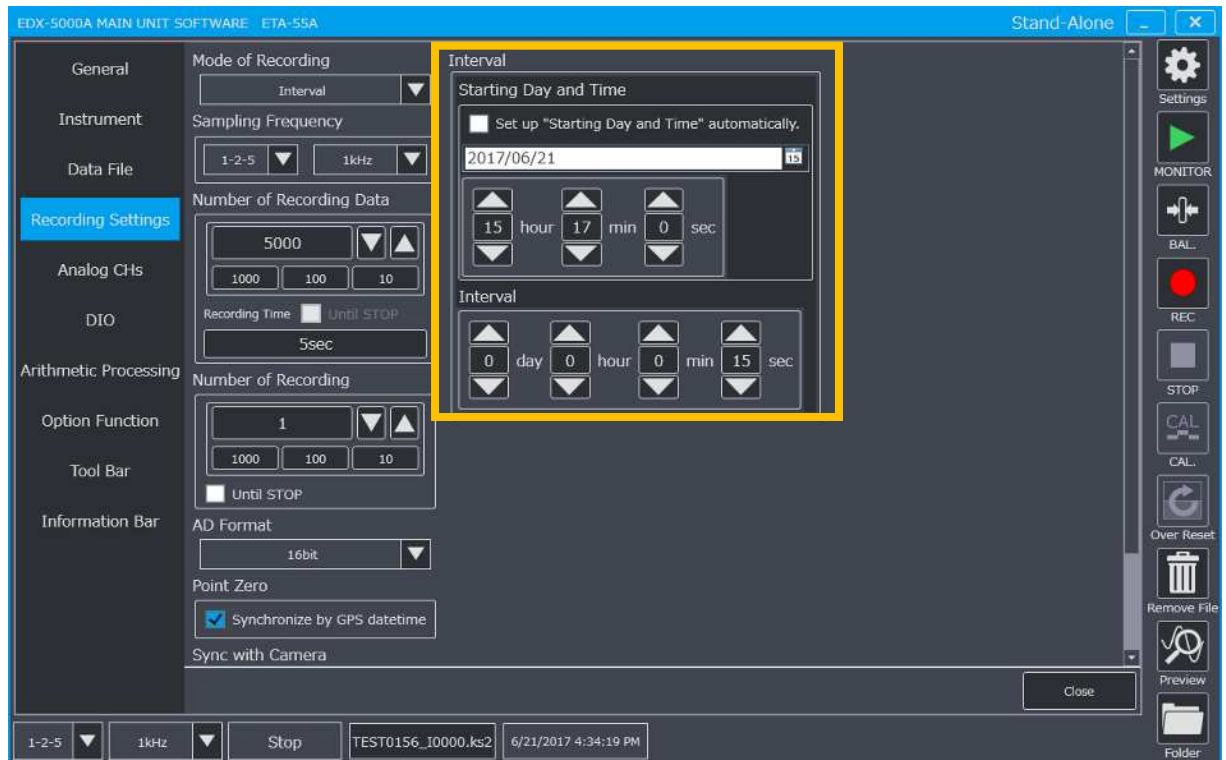
Check mark OFF: Output the CLK.OUT signal is not inverted.

➤ **Division Ratio (Output Clock)**

Set/display division ratio.

Setting range: 1 to 64434

3.2.3 Interval recording advanced settings



- **Starting Day and Time**

Displays/set the start date and time.

Select the “**Setup “Starting Day and Time” automatically.**” check box to set this automatically.

On automatic settings, the start date and time will be several seconds after starting a recording (tapping the “REC” button).

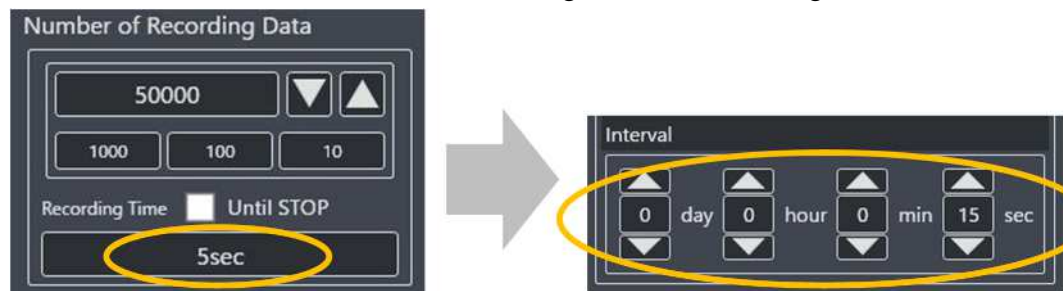
- **Interval**

Displays/set the interval gap.

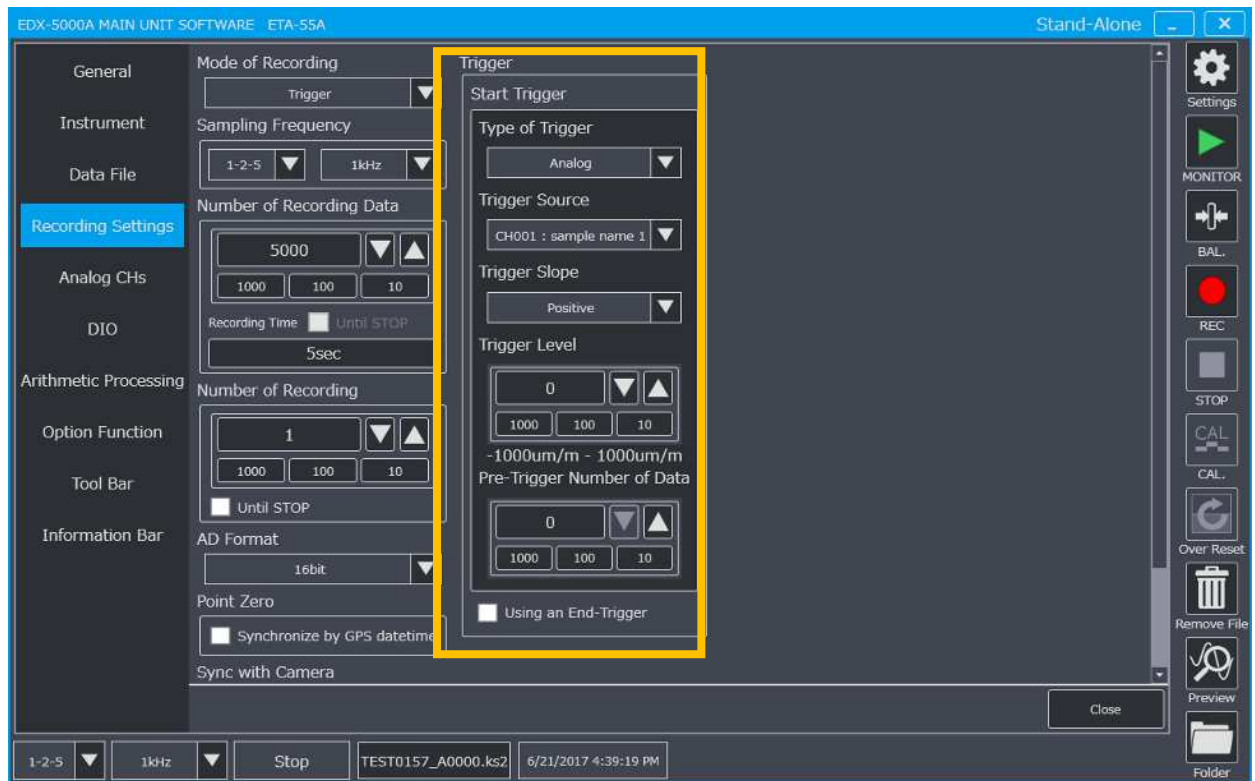


CAUTION

Set “Interval” to a time that is 10 seconds or higher than the recording time.



3.2.4 Trigger recording advanced settings



- **Type of Trigger**

Displays/set the trigger type.

The following three trigger types are available.

- (1) “Analog”:

Set an analog CH as the trigger CH.

- (2) “Digital”:

Set a digital CH in “Input” mode as the trigger CH.

None “Input” mode terminals will not appear as options.

- (3) “External”:

Set the input signal from the external trigger IN (TRIG.IN on the rear panel of the EDX-5000A) as the trigger CH

- **Trigger Source**

Displays/set the trigger CH.

- (1) Analog trigger : Displays/set the analog CH.
- (2) Digital trigger : Displays/set the digital CH input terminal.
- (3) External trigger : Unavailable.

- **Trigger Slope**

Displays/set the horizontal traversal of data against the trigger level value.

- (1) Analog trigger : Set/display the slope (positive)/slope (negative)
- (2) Digital trigger : Unavailable
- (3) External trigger : Set/display the slope (positive)/slope (negative)

Slope (positive):

The trigger is triggered when the measured value of the trigger CH passes over the trigger level value from bottom to top.

Slope (negative):

The trigger is triggered when the measured value of the trigger CH passes over the trigger level value from top to bottom.

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

- **Trigger Level**

Displays/set the reference value for the trigger.

- (1) Analog trigger:

Displays/set the trigger level value in physical quantity.

The setting range can also be the settable range for the equivalent value to physical quantity.



What is the equivalent value to physical quantity?

Setting range × Calibration constant + Offset

- (2) Digital trigger:

Set to 0 or 1.

- (3) External trigger:

Unavailable

- **Pre/Post-Trigger Number of Data**

Start trigger : Pre-Trigger Number of Data (The amount of data to save before the start trigger)

End trigger : Post-Trigger Number of Data (The amount of data to save after the end trigger)

- **Use an End-Trigger**

Displays/set whether or not to use an end-trigger with a check mark.

Check mark ON: Use end-trigger.

Check mark OFF: Do not use end-trigger.

When ON, the end-trigger is set in the same manner as the start-trigger.

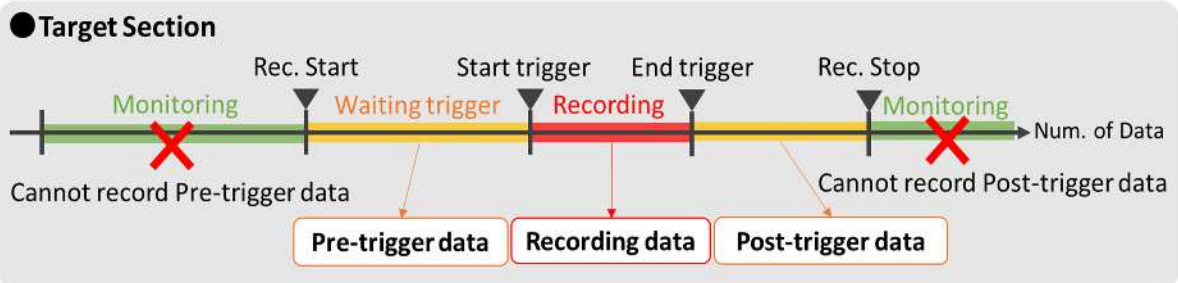
Type of Trigger	Analog	Digital	External
Trigger Source	Set the analog CH	Set the digital CH terminal	Unavailable
Trigger Slope	Positive/Negative	Unavailable	Positive/Negative
Trigger Level	Displays/set the trigger value (physical quantity)	Displays/set either 0 or 1	Unavailable
Pre-trigger Number of Data	If needed, set the number of data/CH.		
Post-trigger Number of Data	If not, set this to "0".		
Use an End-Trigger	If needed, select this check box ON. If not, deselect this check box.		



- **What is the pre/post-trigger data recording section?**

Pre-trigger Data: The section **between trigger wait and start trigger**

Post-trigger Data: The section **between end trigger point and stop**

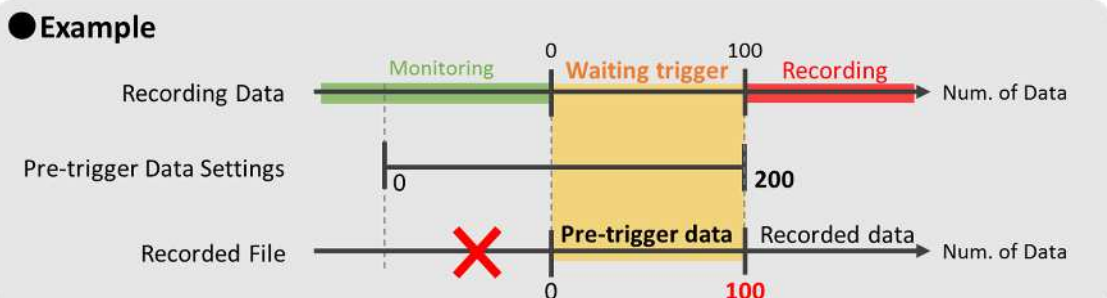


- **Recorded pre/post-trigger data may be smaller than the number of data in the setting.**

If the number of data in the section of recording target is less than the number of data in setting, it will be less than the number of data in setting.

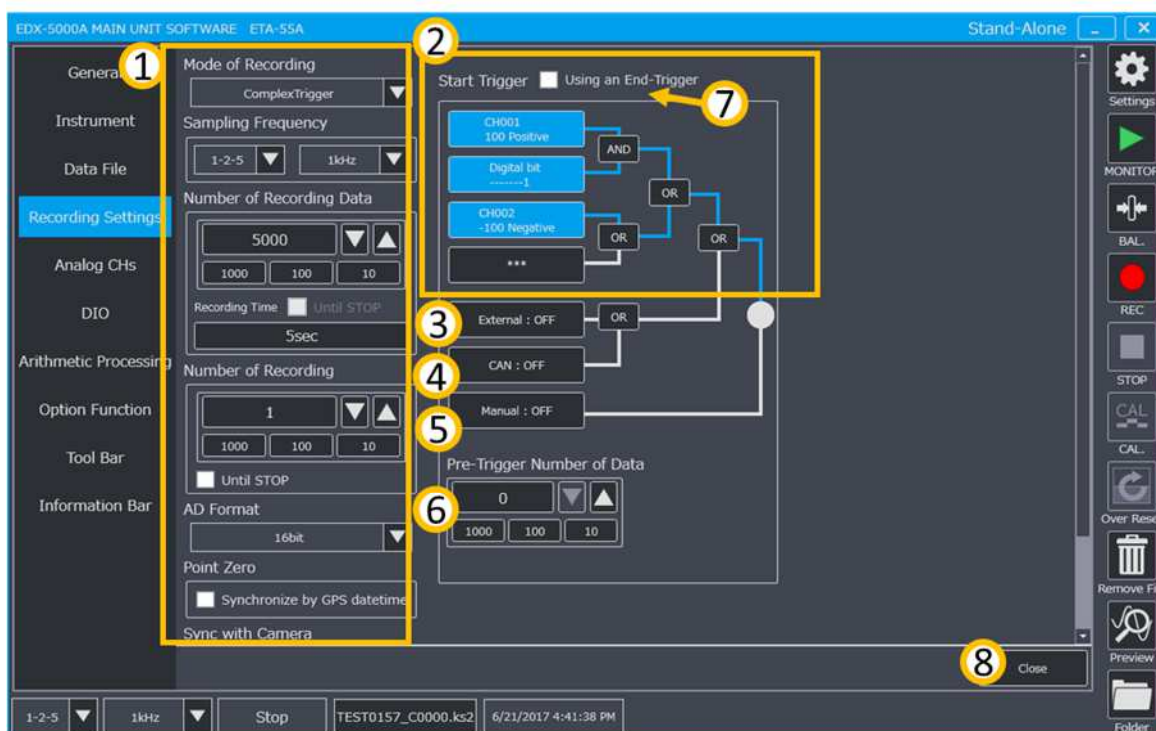
Ex.) Pre-trigger data: When the time between the trigger wait and start trigger is short and the number of data in the target recording section do not fulfill the number of data in the setting

Ex.) Post-trigger data: When the storage capacity runs out before fulfilling the number in the setting. When the recording is stopped by pressing the "STOP" button before fulfilling the number of data in the setting.



3.2.5 Complex trigger recording advanced settings

3.2.5.1 Advanced settings screen



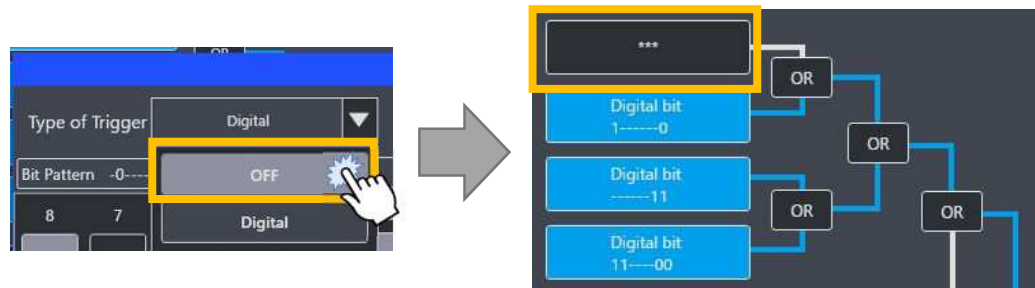
No.	Name	Function	Reference page
1	Common settings	Displays/set setting items	Chap. II Item 3.2.2
2	Analog/Digital trigger	Analog/digital trigger Displays/set up to four CHs	Chap. II Item 3.2.5.2
3	External trigger	Displays/set one external trigger CH	Chap. II Item 3.2.5.3
4	CAN trigger (Available as option only.)	Displays/set CAN trigger	Chap. II Item 3.2.5.4
5	Manual trigger	Displays/set one manual trigger	Chap. II Item 3.2.5.5
6	Pre-trigger data count	Displays/set the pre-trigger data count	Chap. II Section 3.2.4
7	Use end trigger check mark	Displays/set use end trigger	Chap. II Section 3.2.4
8	Close button	Apply settings & Close the Settings screen.	

3.2.5.2 Analog/digital trigger settings screen

Displays/set up to 4 analog trigger and digital trigger CHs.

(1) OFF

Setting this to “OFF” will display “***”, indicating that both analog and digital triggers have not been set.



(2) Analog triggers

Analog triggers use the same setting method as that described on Chap. I Item 4.2.3.1(1).



(3) Digital triggers

A trigger will be triggered when the digital CH value becomes the same value as that set for the bit pattern.

In the example shown in the image below, the trigger will be triggered when the digital CH value is DI08=1, DI07=0, DI04=1 or 0.

For details on the operation method used, see Chap. I Item 4.2.3.2.

Bit No.	8	7	6	5	4	3	2	1
Terminal	DI08	DI07	DI06	DI05	DI04	DI03	DI02	DI01
Mode	Input	Input	Output	Remote	Input	***	***	***

Name	Function
Bit pattern	Displays the bit pattern used for trigger conditions.
Bit No.	Displays the bit No.
Setting of bit	0/1/- (no judgment) display 0/1 setting
Judgment ON/OFF	Displays judgment ON/OFF/setting unavailable Judgment ON/OFF setting

3.2.5.3 External trigger settings

Displays/set the external trigger ON/OFF. The following 3 options are available in the setting:

- (1) “External: OFF” : External trigger OFF
- (2) “External: Positive” : External trigger ON, trigger slope is positive
- (3) “External: Negative” : External trigger ON, trigger slope is negative

3.2.5.4 CAN trigger settings

Displays/sets CAN trigger ON/OFF. (Available as option only.)

The following 2 options are available in the setting:

- (1) “CAN: OFF” : CAN trigger OFF
- (2) “CAN: ON” : CAN trigger ON

CAN trigger conditions must be set in the ELA-55A.

3.2.5.5 Manual trigger settings

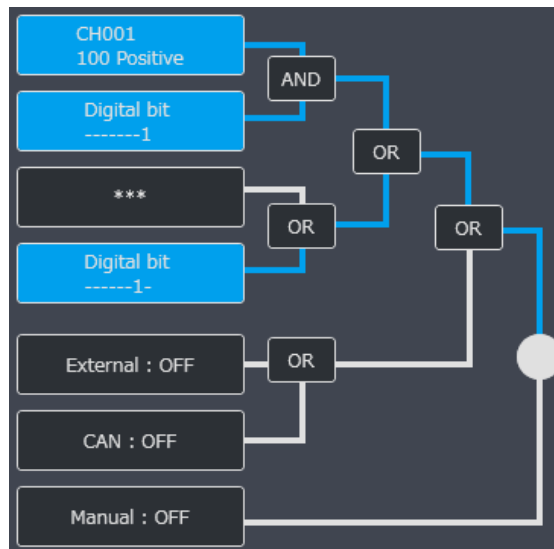
Displays/set the manual trigger ON/OFF. The following 3 options are available in the setting:

- (1) “Manual: OFF”
- (2) “Manual: ON”: Tapping the “REC” button when waiting the trigger will start data recording.

3.2.5.6 AND/OR settings

Displays/set AND/OR settings.

Further, trigger conditions that are available up to the start of a trigger are displayed with a blue line.



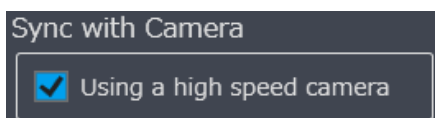
3.2.6 Camera synchronized recording setup

For camera synchronized recording, the moving image recording starts at the same time as the data recording when the trigger condition is satisfied.

For details on camera synchronized recording, see Chap. II Section 10.10.

Follow the procedure below to perform the camera synchronized recording setting.

- (1) **In the Common setting items, put in a checkmark in the “Using a high speed camera” checkbox of the “Sync with Camera” setting.**



- (2) **View and change recording mode setting.**

Only the trigger recording or complex trigger recording are settable.

- (3) **Set trigger conditions.**

Trigger recording setting: See Chap. II Section 3.2.4.

Complex trigger recording setting: See Chap. II Section 3.2.5.

- (4) **Setting is complete**



CAUTION

- **Cannot record moving image during synchronous operation.** (See: Chap. II Item 4.2)
- **Cannot record moving image when online controlling (see Chap. II Section 5) and performing synchronous operation.**
- The high-speed camera to be used must be set in advance so it can be operated by an external clock and external trigger.
- When connecting the EDX-5000A to a high-speed camera, check hardware specifications of both devices prior to making the connection.

For information on the EDX-5000A, see the separate volume “INSTRUCTION MANUAL EDX-5000A MEMORY RECORDER/ANALYZER (FOR HARDWARE)”.



Synchronized data recording

Synchronized recording supports data loggers (third-party products) that can record using an external clock and external trigger. For details, see the separate volume “INSTRUCTION MANUAL EDX-5000A MEMORY RECORDER/ANALYZER (FOR HARDWARE)”.

4 Synchronous operation settings

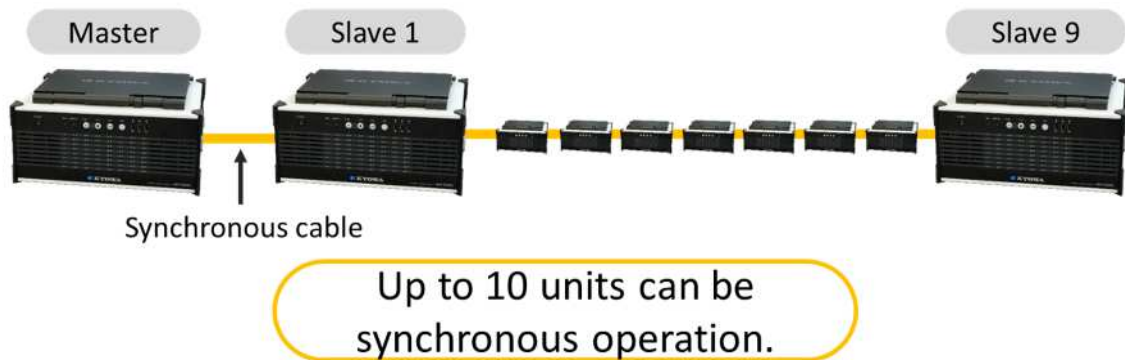
4.1 About synchronous operation

4.1.1 Overview

Synchronous operation is a feature that performs measurement using multiple EDX-5000A units synchronized to operate with identical timing (sampling clock sync).

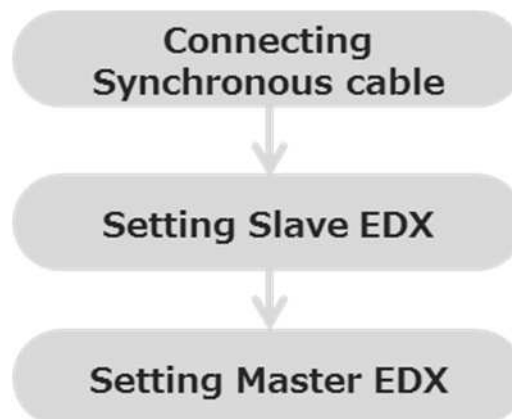
Up to 10 units connected using synchronous cable can be synchronized.

The main unit is called the **Master** and the other unit(s) is called a **Slave**.



4.1.2 Settings flow

Settings can be applied by following the procedure shown below:



4.2 Limitation and precautions

- The settings in this software has the limitations shown in the table below.

Functions			Master	Slave
Conditions settings	Digital Filter (see: Chap. II Item 2.1.7)		N/A	N/A
	Arithmetic Processing (see: Chap. II Section 7)		N/A	N/A
	GPS CH condition (see: Chap. II Section 6.2)		Available	N/A
	Recording Conditions (see: Chap. II Section 3.2)	Point Zero	Available(*1)	N/A
		Sync. With Camera	N/A	N/A
		Other	Available	Available(*2)
Graph	Camera (see: Chap. II Section 9.9)		Available	N/A
Tool bar	MONITOR		Available	N/A
	STOP		Available	N/A
	REC		Available	N/A
	BAL.		Available	N/A
	CAL.		Available	N/A
	Remove File		Available	N/A
	Over Reset		Available	N/A
	Offset Zero		Available	N/A
	Offset Clear		N/A	N/A
	Calc. Zero		Available	N/A
	Calc. Clear		Available	N/A
	CAN Zero		N/A	N/A
	CAN 0 Clear		N/A	N/A
	CAN Output		Available	N/A

(*1) "Point Zero" is not available when synchronizing with other EDX models.

(*2) Setup is possible but the settings will be overwritten by the Master settings at the start of measurement.

- Some recording features has limitations shown in the table below.

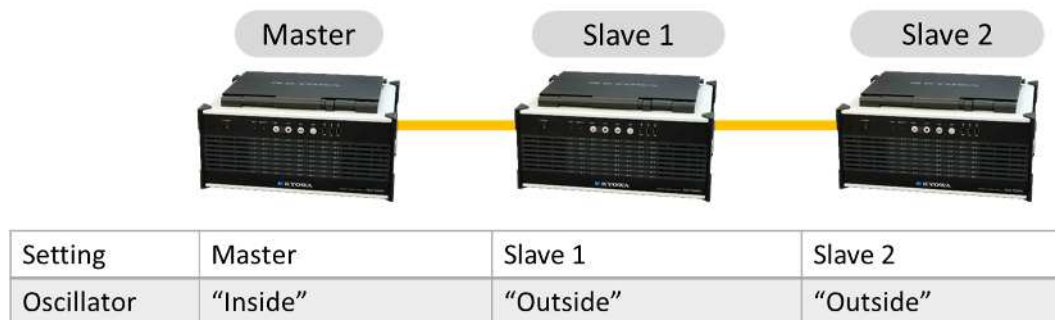
Recording feature	Master	Slave	Slave(other EDX)
Camera synchronized recording	Available	N/A	N/A
Moving image data recording with webcam	N/A	N/A	N/A
Arithmetic operation	N/A	N/A	N/A
FFT analysis	Available	Available	N/A
Automatically file conversion	N/A	N/A	N/A
Digital filter	N/A	N/A	N/A
DI (remote mode)	Available	N/A	N/A
Recording CAN data	Available	Available	N/A
Output CAN data	Available	Available	N/A
Using GPS data	Available	N/A	N/A

- **Oscillator signal synchronization setting may be required.**

In synchronous operation using conditioner card DPM-42B (-F) or DPM-42B-I (-F), synchronization of the oscillator signal may be required.

Refer to the "INSTRUCTION MANUAL EDX-5000A MEMORY RECORDER/ANALYZER (FOR HARDWARE)" and confirm whether synchronization of the oscillator signal is required.

When synchronization of the oscillator signal is required, refer to Chap. II Section 1.1 of this manual and apply oscillator settings as shown in the figure below:



4.3 Synchronous operation using multiple EDX-5000A units

Synchronous operation can be performed by connecting multiple EDX-5000A units using synchronous cables.

4.3.1 How to connect

Plug synchronous cables to the CONT.IN and CONT.OUT connectors on the back of the EDX-5000A as shown in the figure below:



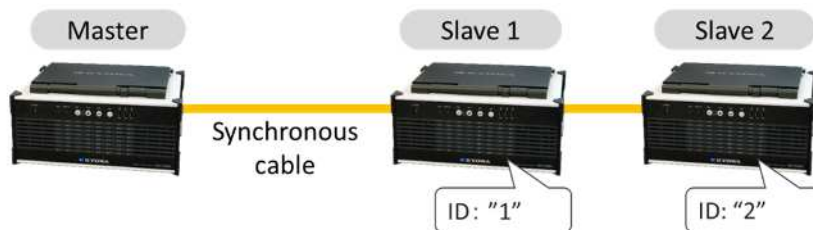
For detail on connecting, see the separate volume “INSTRUCTION MANUAL EDX-5000A MEMORY RECORDER/ANALYZER (FOR HARDWARE)”.

4.3.2 Slave settings

Set the IDs of the slaves. Set the slave ID of the EDX-5000A connected immediately after the Master to "1" and set sequential numbers to all the remaining slaves in order of connection.

Since "0" is always used as the master ID, ensure the sequential numbers start with "1".

For details on setting method, see Chap. I Item 13.3.2.



4.3.3 Master settings

In the master unit, synchronous settings must be performed in addition to setting the ID.

For details on setting method, see Chap. I Item 13.3.2.

- ID settings: "0"

Do not use numbers other than "0" as these are numbers to be assigned to slaves.

- Synchronous settings: Set the number of connected slaves

For the figure below, the number of slaves is 2.



Settings	Master	Slave 1	Slave 2
ID	"0"	"1"	"2"
Synchronous	Number of Slaves : "2"		

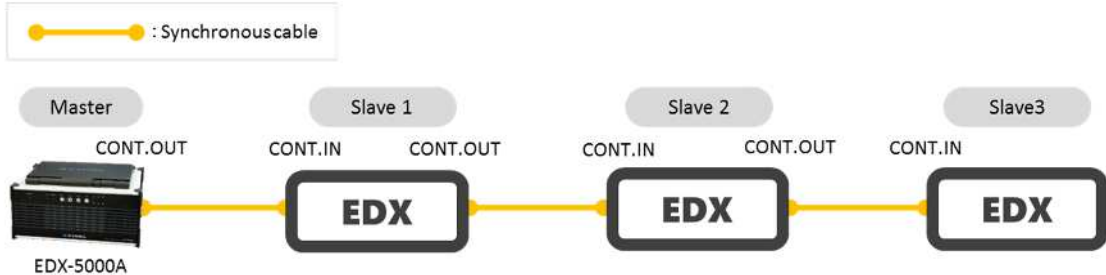
4.4 Synchronous operation using the EDX-5000A and other EDX models

The EDX-5000A can synchronize with other EDX models including an EDX-200A (excluding EDX-200A-1) or EDX-3000B (A) connected using synchronous cables.

4.4.1 Method to connect other EDX models and precautions

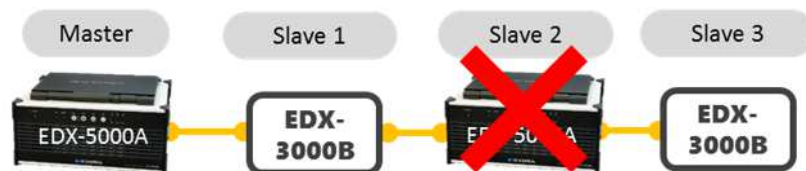
Plug synchronous cables into the CONT.IN and CONT.OUT connectors on the back of EDX as shown in the figure below:

Note that synchronous operation using LAN cable is not supported.



CAUTION

- **Do not connect an EDX-200A and an EDX-3000B (A) together.**
- Depending on the EDX model used, **the total number of units that can be synchronized varies.**
 - EDX-200A: up to 8 units
 - EDX-3000A: up to 10 units
- **Other EDX units must be connected after the EDX-5000A.** Other EDX units cannot be connected in between EDX-5000A units.



- **When using a DCS-100A, the onboard CAN-40A/41A of other EDX models is disabled.**

4.4.2 Slave settings

Set up the synchronization using the Dynamic Data Acquisition Software DCS-100A for EDX-5000A.

- **ID settings**

Set the slave ID of the EDX connected immediately after the Master to "1" and set numbers to all the remaining slaves sequentially in the order of connection.

Since "0" is always used as the master ID, ensure that the sequential numbers start with "1".

EDX-200A sets the ID with "ID switch" on the front.

For details, refer to "INSTRUCTION MANUAL EDX-200A UNIVERSAL RECORDER (FOR HARDWARE)"

- **Synchronous cable length setting**

This setting is automatically determined by the DCS-100A.

*EDX-3000A / B

When the DCS-100A is not use, set "Total length of synchronous cable" to "1000m or less".

4.4.3 Master settings

Set the ID, connected model, and number of units.

For the setting method, see Chap. I Item 13.4.3.

For a setting example, see Chap. I Item 13.4.4.

- **ID settings**

Set to "0"

- **Number of Slaves settings**

Set the total number of other EDX model units and the EDX-5000A connected to slaves.

- **Other EDX Model settings**

EDX Model: Select either EDX-200A or EDX-3000B as the model connected.

Number of Instruments: Set only the number of other connected EDX units.

5 Online control settings

5.1 About online control

Controlling the EDX-5000A from a PC using a LAN interface is called "online control" and using onboard control of the EDX-5000A is called "offline control".

For details about the online control connection method and precautions, see the separate volume "INSTRUCTION MANUAL EDX-5000A MEMORY RECORDER/ANALYZER (FOR HARDWARE)".

5.2 Settings

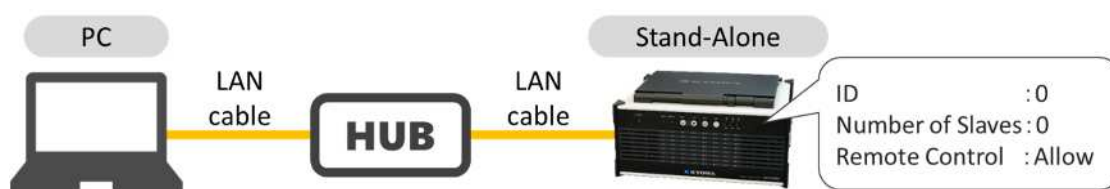
- **Offline control**

See Chap. II Section 1.1 and Set to "Deny access from the network".

- **Online control**

- ✧ **Controlling a single EDX-5000A from a PC**

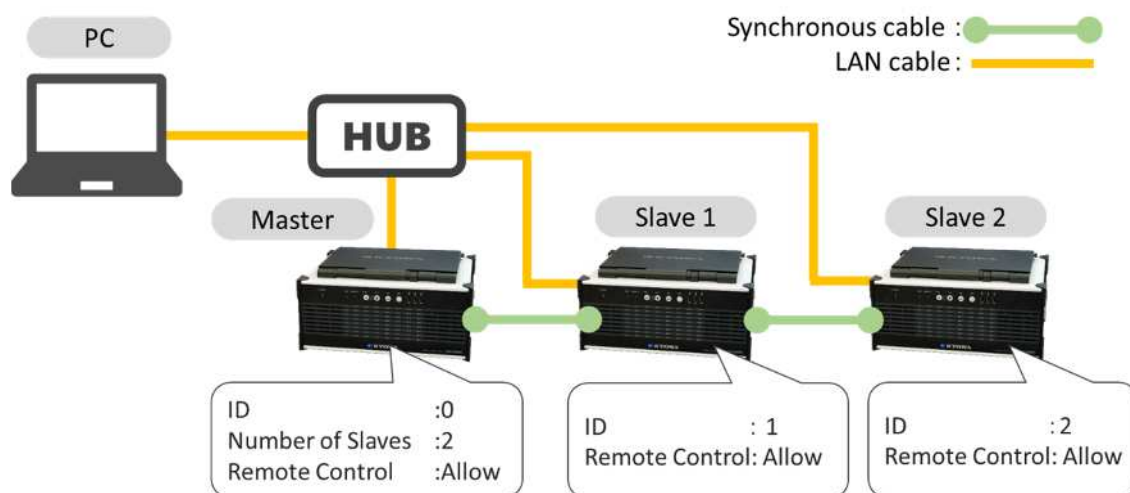
See Chap. II Section 1.1 and Set to "Remotely control EDX-5000A".



- ✧ **Controlling multiple EDX-5000A units from a PC**

See Chap. II Section 1.1 and set to "Remotely control EDX-5000A" in all master and slave units.

For details on synchronous operation, see Chap. II Section 4.



6 Optional function settings

For EDX-5000A models with optional module, an optional functions page is available.

6.1 CAN

For EDX-5000A models with optional module installed, CAN data monitoring and recording can be performed by CAN CH settings.

Recorded CAN CH data is saved in a separate file (E4A format) independent from the recorded data file.

6.1.1 CAN CH settings

Setup can be performed using an EDX-3000B compatible software.

For the operation method, see Chap. I Section 9.1.

For details on CAN CH settings, see the separate volume “INSTRUCTION MANUAL EDX-5000A MEMORY RECORDER/ANALYZER (For EDX-3000B compatible software)”

6.1.2 Monitoring and Recording

When monitoring and recording CAN CH data, see items in Chap. II Item 6.1.1 and use ELA-55A (EDX-3000B compatible software) to perform settings.

6.2 GPS

For EDX-5000A models with optional module installed, monitoring and recording using GPS can be performed.

Also, the GPS CH can be used to monitor and record GPS data such as latitude, longitude, and speed.

Recorded GPS CH data is saved in a separate file (NMEA format) independent from the recorded data file.

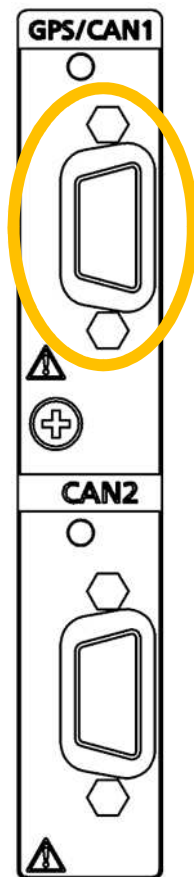
6.2.1 Limitations

- When sampling frequency settings is “External”, recording of GPS data and recording using GPS data (Point Zero function) cannot be used.
- It cannot be used together with camera synchronized recording that uses the high-speed camera.
- Only available in the master unit during synchronous operation.

For synchronous operation, see Chap. II Section 4.

6.2.2 Monitoring and Recording

Connect the GPS sensor (optional product) to the port on the rear panel of the EDX-5000A.



6.2.3 GPS data can be recorded

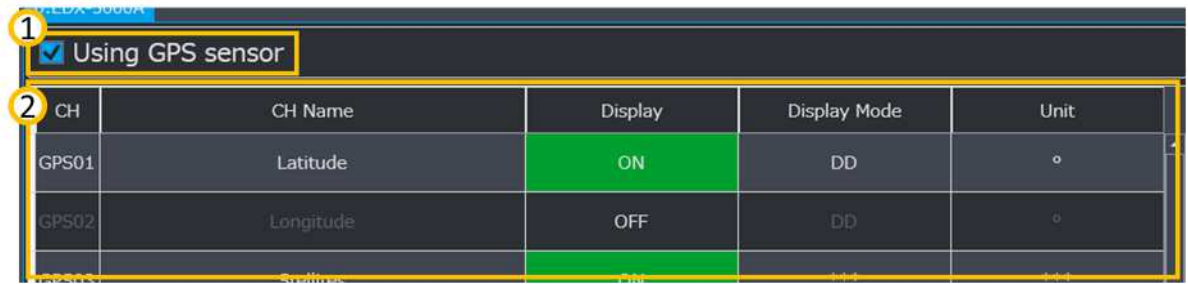
GPS data shown in the table below can be monitored and recorded.

File format and unit of recorded data vary depending on the GPS data.

GPS CH No.	GPS Data (GPS CH Name)	Description
GPS01	Latitude	Latitude(N: North latitude, S: South latitude) Display format: degree or degree/minutes/seconds Saving format: degree
GPS02	Longitude	Longitude(E: East latitude, W: West latitude) Display format: degree or degree/minutes/seconds Saving format: degree
GPS03	Satellites	The number of satellites in use.
GPS04	GPS-Status	Display the status of GPS sensor. Status : “Positioning” Non-differential GPS fix available. “Unreceived” Non-differential GPS fix not available. “Disconnection” GPS sensor disconnected.
GPS05	Time	Display date and time of the GPS sensor. Display format: Local Time or UTC Time Saving format: UTC Time
GPS06	Velocity	Velocity Display unit: knot or km/h Saving unit: knot
GPS07	True Course	Displays traveling direction based on TN (0°)
GPS08	Magnetic Declination	Displays deflection angle between TN (0°) and magnetic north (+:East -:West)
GPS09	Sea Level Altitude	Altitude above sea level (m)
GPS10	Geoid Height	Geoid Height (m)
GPS11	HDOP	Horizontal Dilution Of Precision
GPS12	PDOP	Position Dilution Of Precision
GPS13	VDOP	Vertical Dilution Of Precision

6.2.4 GPS CHs settings

By setting the GPS CH, GPS data described in Chap. II Section 6.2.3 can be monitored and recorded.



(1) Set whether to use the GPS sensor

To record GPS data or monitor and record using GPS data, put a checkmark in the checkbox.



(2) GPS CH setting item list

For method to change a setting item, see Chap. I Section 3.4.

- **CH**

Displays the CH number of GPS CH.

CH number is assigned to each GPS data described in Chap. II Section 6.2.3.

- **CH name**

Displays GPS data name described in Chap. II Section 6.2.3.

The name cannot be changed.

- **Display**

Displays/set the displayed CH on the graph.

ON: Displays GPS CH on the graph.

OFF: Hides GPS CH from the graph.

- **Display Mode**

View and setup GPS data display method.

GPS Data Name	Display Mode	Description
Latitude / Longitude	DD	Display in degrees (bearing shown in S, N, E, W) Ex.) S 35.65766
	DMS	Display in degree/minutes/seconds (bearing shown in S, N, E, W) Ex.) W 35°39'27.92"
Time	Local	Display Local Time.
	UTC	Display UTC Time
Velocity	Knot	Display in units of knot
	km/hour	Display in units of km/h
Other	Unavailable	

- **Unit**

Display and setup using unit.

GPS Data Name	Unit
Velocity	knot or km/h Can be changed in the “Display Mode”.
True Course	°(Fixed unit)
Magnetic Declination	°(Fixed unit)
Sea Level Altitude	m (Fixed unit)
Geoid Height	m (Fixed unit)
Other	Unavailable

6.2.5 Display GPS CHs data

GPS data can be displayed on each graph.

However, received data is not displayed in the Legend display of the FFT graph.

6.2.6 Point Zero

With GPS sensor, it is possible to monitor and record using the Point Zero function.

When using the Point Zero function, the time data received from GPS satellites can be used to start recording at the zero-point time (time in msec 0).

For setting method, see Chapter II Section 3.2.2.

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



CAUTION

- When GPS sensor is disconnected, the Point Zero function cannot be enabled.
- If recording using the Point Zero function, only **manual recording (recording count can only be set once) and interval recording** can be used.
- External clock cannot be set for sampling frequency.

7 Arithmetic Processing Settings

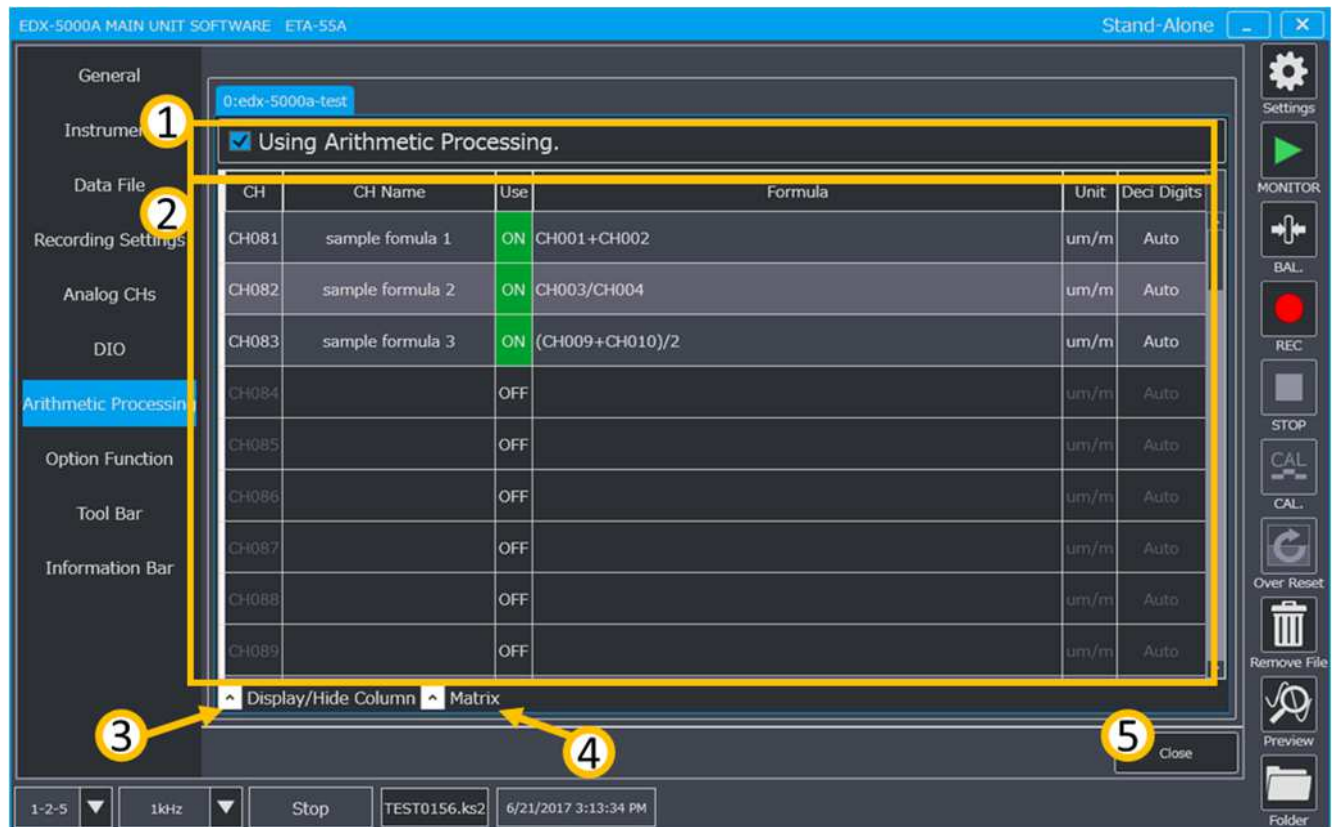
By using an arithmetic expression combining recording CH data, coefficients, and operators, the result data of the expression can be handled as calculation CH data. Up to 64 CHs can be set for the calculation CH.

Recorded calculation CH data is saved to the same file as the recorded data.

7.1 Limitations

- When the sampling frequency setting is between 1 Hz and 10 kHz, the arithmetic operation function can be used. When the sampling frequency is set above 10 kHz, use of the arithmetic operation function is automatically disabled.
- When using the arithmetic operation, the pause operation (see: Chap. II Section 10.11) cannot be used.
- When performing synchronous operation, the arithmetic operation cannot be used.

7.2 Screen configuration



No.	Item Name	Function	Reference
1	Setting whether to use arithmetic operation	Display/set whether to use the arithmetic operation.	Chap. II Section 7.3
2	Setting item list by Calculation CH	Display/set setting items for each calculation CH.	Chap. II Section 7.4
3	Setting display/hide Column	Display/set settings item to be displayed	Chap. II Section 7.5
4	Matrix	Setting for formula using matrix	Chap. II Section 7.6
5	“Close” button	Apply settings & Close the Settings screen.	

7.3 Setting whether to use arithmetic operation

Display/set whether to use the arithmetic operation.

Check mark ON : Using the arithmetic operation.

Check mark OFF : Not using the arithmetic operation.

When using the arithmetic operation function, the sampling frequency setting has limitations.

Available/Not available	Sampling frequency setup	Display
Available	1Hz to 10kHz	 Using Arithmetic Processing.
Not available	Higher than 10kHz	 Using Arithmetic Processing. Setting is grayed out and disabled.

7.4 Setting item list by Calculation CH

For how to change settings, see Chap. I Section 3.4.

(1) ID-CH

Displays the EDX-5000A ID No. and CH No.

Ex.) “0-07”: Indicates that the EDX-5000A ID No. is 0, and the CH No. is CH007.

(2) CH

Displays the CH No.

(3) CH Name

Displays the CH name.

You can input text within 40 characters.

(4) Use

Display/set ON/OFF settings of calculation target CH.

ON : Calculation target

OFF: Not Calculation target

Calculation formula must be set for CHs set to ON.

(5) Formula

Display/set formula.

- **The elements that can be set**

The elements that can be set in the arithmetic expression are summarized in the table below.

Input character limit: Up to 200 characters

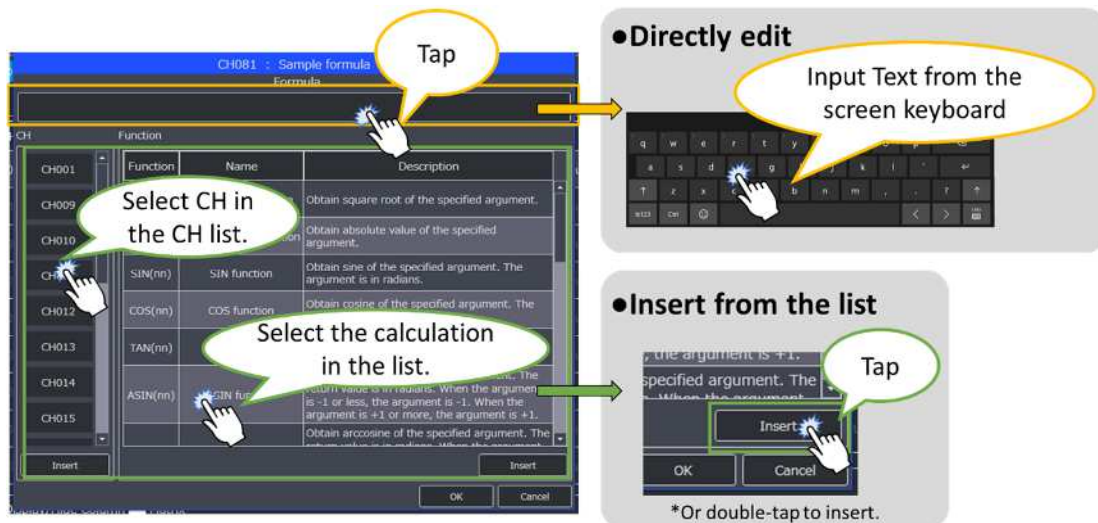
Elements	Description	Input
Measurement CH	Measurement CH data is treated as numerical data.	Enter measurement CH number after "CH". Ex.) "CH001"
Calculation CH	Handles calculation CH data.	Enter calculation CH number after "CH". Ex.) "CH081"
Constant	Numerical value can be set.	Ex.) "100", "2.05"
Operator	The available operator are shown on the right.	Addition: "+" Subtraction: "-" Multiplication: "*" Division: "/" Power: "^" Pi: "PI" Specify calculation priority: "(", ")"
Calculation function	It is possible to make settings using mathematical functions such as trigonometric functions and rosette functions.	For details, see Chap. II Section 7.7.

- **How to setup**

Tap to call up the setup dialog for setting calculation formula.

Tap "OK" to apply the calculation formula.

If not, tap "Cancel".



- **Formula check operation**

It automatically checks whether or not the input expression is correct.

When the formula is invalid, the background of the “Formula” field turns red or the condition setting is not applied.

In such a case, confirm that there are no invalid character strings and the CH entered is the correct measuring CH.

The table below shows examples of errors:

The causes	Example of error.																
The CH entered is not the measuring CH.	CH002 entered is not the measuring CH. <table><tr><th>CH</th><th>CH Name</th><th>Use</th><th>Formula</th></tr><tr><td>CH081</td><td>Sample formula</td><td>ON</td><td>CH001 + CH009</td></tr><tr><td>CH082</td><td>Sample formula2</td><td>ON</td><td>CH002*2</td></tr></table>	CH	CH Name	Use	Formula	CH081	Sample formula	ON	CH001 + CH009	CH082	Sample formula2	ON	CH002*2				
CH	CH Name	Use	Formula														
CH081	Sample formula	ON	CH001 + CH009														
CH082	Sample formula2	ON	CH002*2														
The calculation CH entered is not the CH to be calculated.	CH081 set to “Use” OFF is entered in CH082. <table><tr><th>CH</th><th>CH Name</th><th>Use</th><th>Formula</th></tr><tr><td>CH081</td><td>Sample formula</td><td>OFF</td><td>CH001 + CH009</td></tr><tr><td>CH082</td><td>Sample formula2</td><td>ON</td><td>CH081</td></tr></table>	CH	CH Name	Use	Formula	CH081	Sample formula	OFF	CH001 + CH009	CH082	Sample formula2	ON	CH081				
CH	CH Name	Use	Formula														
CH081	Sample formula	OFF	CH001 + CH009														
CH082	Sample formula2	ON	CH081														
CH No. larger than the calculation CH to be set up has been entered.	Correct : CH081 entered to CH082 Incorrect : CH083 entered to CH082 <table><tr><th>CH</th><th>CH Name</th><th>Use</th><th>Formula</th></tr><tr><td>CH081</td><td>Sample formula</td><td>ON</td><td>CH001 + CH009</td></tr><tr><td>CH082</td><td>Sample formula2</td><td>ON</td><td>CH083</td></tr><tr><td>CH083</td><td>Sample formula3</td><td>ON</td><td>CH001*2</td></tr></table>	CH	CH Name	Use	Formula	CH081	Sample formula	ON	CH001 + CH009	CH082	Sample formula2	ON	CH083	CH083	Sample formula3	ON	CH001*2
CH	CH Name	Use	Formula														
CH081	Sample formula	ON	CH001 + CH009														
CH082	Sample formula2	ON	CH083														
CH083	Sample formula3	ON	CH001*2														
Invalid character string has been entered.	<table><tr><th>CH</th><th>CH Name</th><th>Use</th><th>Formula</th></tr><tr><td>CH081</td><td>Sample formula</td><td>ON</td><td>??*;d</td></tr></table>	CH	CH Name	Use	Formula	CH081	Sample formula	ON	??*;d								
CH	CH Name	Use	Formula														
CH081	Sample formula	ON	??*;d														
Formula of the CH to be calculated is empty.	<table><tr><th>CH</th><th>CH Name</th><th>Use</th><th>Formula</th></tr><tr><td>CH081</td><td>Sample formula</td><td>ON</td><td></td></tr></table>	CH	CH Name	Use	Formula	CH081	Sample formula	ON									
CH	CH Name	Use	Formula														
CH081	Sample formula	ON															

(6) Calculation Zero

Display/set the run Calculation Zero function ON/OFF.

Calculation Zero: Set the monitoring measurement value to the Calculation Zero Value, and the measurement value is set to "0" visibly.

(7) Calculation Zero Value

Display/set the Calculation Zero Value.

Set this in physical quantity.

Calculation Zero Value: Used to shift the measured data by a constant amount.

(8) Unit

Display/set the unit to be displayed.

Tap to display the setting dialog and perform setup.

(9) Decimal digits

Displays/set the number of digits after the decimal point for values displayed.

Auto: Determine the number of digits to display automatically based on the measured value without setting a fixed number of digits.

0 to 8: Fixes the number of digits to the value set.

7.5 Display/Hide column

A function used to change display items in the setting item list by CH.

Check mark inserted: Display setting item column

Check mark not inserted: Hide setting item column

7.6 Matrix

By setting and applying the coefficient matrix and input signal matrix, it is possible to set the expansion formulas that calculates the product of two matrices to any calculation CH.

7.6.1 Settings screen

Matrix

Size: 3 × 3

Apply Load Save

Coefficient

1	2	1.02
4	5	6
7	8	9

Input Signal

CH009
CH010
CH011

No.	Settings Item Name	Function	Reference
1	Matrix setting	Display/set matrix	Chap. II Item 7.6.2
2	“Apply” button	Applies the expansion formulas of the set matrix to the operation channel.	Chap. II Item 7.6.3
3	“Load” button	Loads the CSV file of the coefficient matrix.	Chap. II Item 7.6.4
4	“Save” button	Saves the CSV file of the coefficient matrix.	

7.6.2 Matrix settings

- **Size**

Display/set size of the Coefficient matrix.

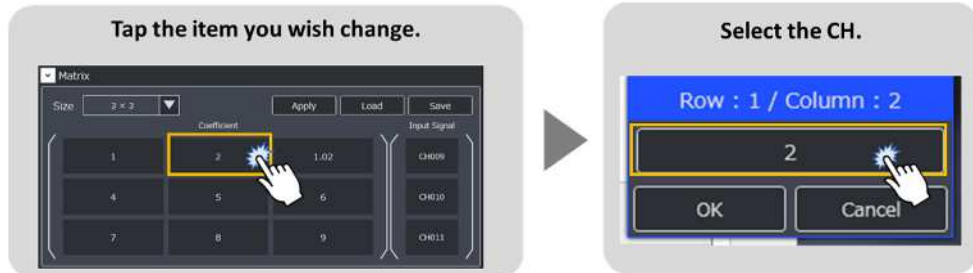
The number of rows in the Input Signal matrix is also changed automatically.

Options: 1×1, 2×2, 3×3, 4×4, 5×5, 6×6

- **Coefficient matrix**

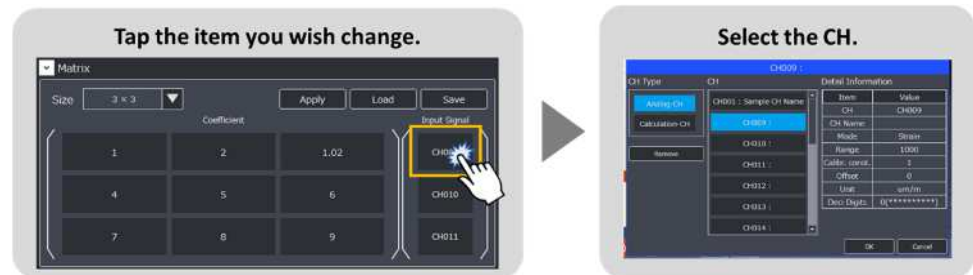
Display/set numerical values for the number of elements of the set size.

You can input text within 20 characters.



- **Input Signal**

Display/set matrix of input signal to the Coefficient matrix.



7.6.3 Apply button

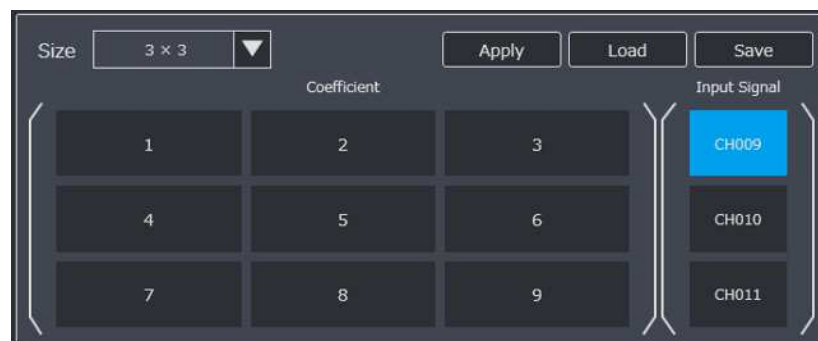
When executed, the set Coefficient and Input Signal matrix are converted to equations.

Expanded formulas are set in order starting from the “Formula” item of the selected calculation CH.

The calculation formula will be overwritten, so proceed with caution when applying the formula.

(Example of expansion expression)

When setting is applied as follows:



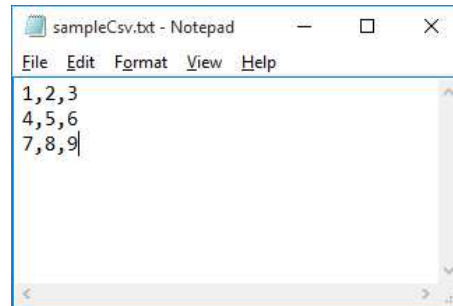
The expansion formula will be as shown below:

$$\begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix} \times \begin{bmatrix} CH009 \\ CH010 \\ CH011 \end{bmatrix} \rightarrow \begin{cases} 1 * CH009 + 2 * CH010 + 3 * CH011 \\ 4 * CH009 + 5 * CH010 + 6 * CH011 \\ 7 * CH009 + 8 * CH010 + 9 * CH011 \end{cases}$$

7.6.4 Load/Save button

- **Load button**

Imports CSV file and applies the numerical value of the CSV file to the setting of the Coefficient matrix. Imported data can be applied if the CSV file has numeric values containing [, (comma)] delimiters as shown below:

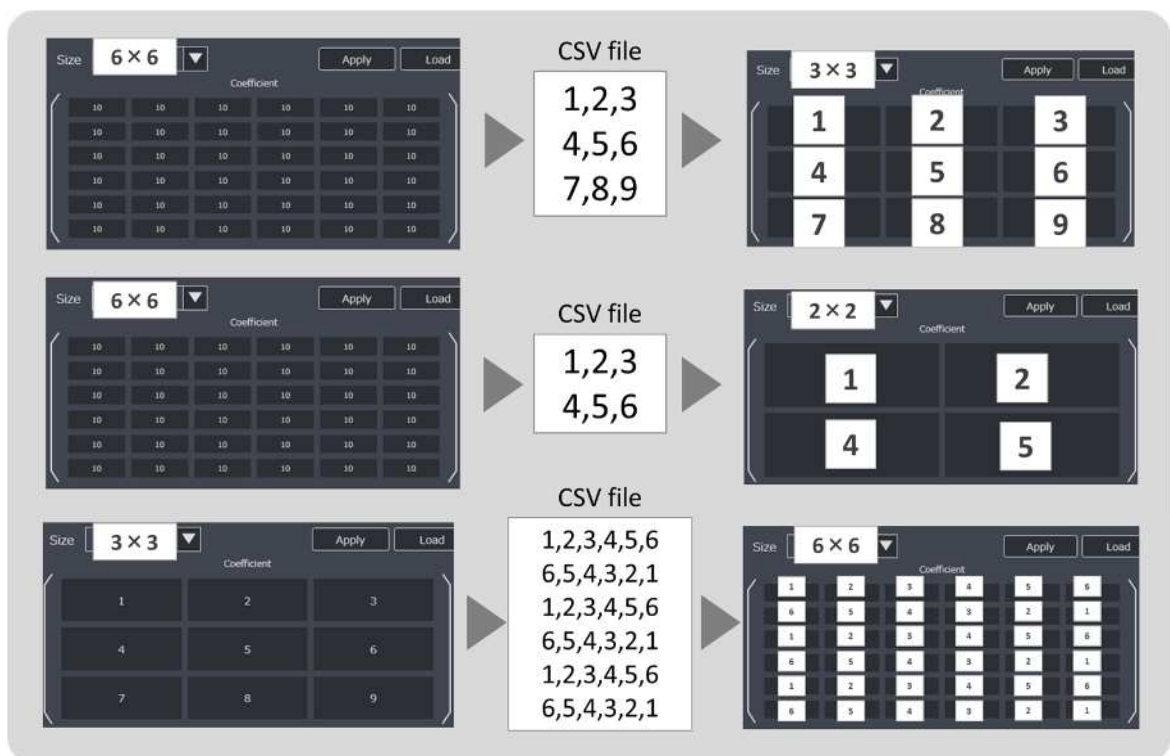


The Coefficient matrix of 3×3 elements

Loading of up to 6×6 elements can be performed.

Note that data import will overwrite any existing the Coefficient matrix.

It first applies the imported data to the Coefficient matrix and then adjusts the size of the matrix automatically, if the CSV file content cannot be converted to a square matrix.



- **Save button**

Saves the numerical value of the set the Coefficient matrix as a CSV file.

7.7 Calculation Function

7.7.1 Mathematical functions

Argument “nn” can be set constant or CH number of using measuring CH data.

- **SQR(nn) Square root function**

Find the square root f_x of the numeric data x of the argument specified as "nn".

$$f_x = \sqrt{x}$$

Ex.) SQR(CH01), SQR(4)

- **ABS(nn) Absolute value function**

Find the absolute value f_x of the numeric data x of the argument specified as "nn".

$$f_x = |x|$$

Ex.) ABS(CH01), ABS(-10)

- **SIN(nn) SIN function**

Let the argument specified as "nn" be the angle θ in radians and find the sine f_θ of θ .

$$f_\theta = \sin \theta$$

Ex.) SIN(CH01), SIN(30)

- **COS(nn) COS function**

Let the argument specified as "nn" be the angle θ in radians and find the cosine f_θ of θ .

$$f_\theta = \cos \theta$$

Ex.) COS(CH01), COS(60)

- **TAN(nn) TAN function**

Let the argument specified as "nn" be the angle θ in radians and find the tangent f_θ of θ .

$$f_\theta = \tan \theta$$

Ex.) TAN(CH01), TAN(60)

- **ASIN(nn) ASIN function**

Let the argument specified as "nn" be the angle x in radians and finds the inverse sine θ of x .

The unit of angle θ is in radians.

Numerical data x can be specified in the range of $-1 \leq x \leq 1$.

x If x is greater than -1 or 1, it is treated as -1 or 1.

$$\theta = \sin^{-1} x$$

Ex.) ASIN(CH01), ASIN(0.5)

- **ACOS(nn) ACOS function**

Let the argument specified as "nn" be the angle x in radians and finds the inverse cosine θ of x .

The unit of angle θ is in radians.

Numerical data x can be specified in the range of $-1 \leq x \leq 1$.

x If x is greater than -1 or 1, it is treated as -1 or 1.

$$\theta = \cos^{-1} x$$

Ex.) ACOS(CH01), ACOS(60)

- **ATAN(nn) ATAN function**

Let the argument specified as "nn" be the angle x in radians and finds the inverse tangent θ of x .

The unit of angle θ is in radians.

$$\theta = \tan^{-1} x$$

Ex.) ATAN(CH01), ATAN(60)

- **DSIN(nn) DSIN function**

Let the argument specified as "nn" be the angle x in radians and finds the inverse sine θ of x .

The unit of angle θ is in degrees.

Numerical data x can be specified in the range of $-1 \leq x \leq 1$.

x If x is greater than -1 or 1, it is treated as -1 or 1.

$$\theta = \sin^{-1} x$$

Ex.) DSIN(CH01), DSIN(0.5)

- **DCOS(nn) DCOS function**

Let the argument specified as "nn" be the angle x in radians and finds the inverse cosine θ of x .

The unit of angle θ is in degrees.

Numerical data x can be specified in the range of $-1 \leq x \leq 1$.

x If x is greater than -1 or 1, it is treated as -1 or 1.

$$\theta = \cos^{-1} x$$

Ex.) DCOS(CH01), DCOS(60)

- **DTAN(nn) DTAN function**

Let the argument specified as "nn" be the angle x in radians and finds the inverse tangent θ of x .

The unit of angle θ is in degrees.

$$\theta = \tan^{-1} x$$

Ex.) DTAN(CH01), DTAN(60)

- **LOG(nn) LOG function (Common logarithm)**

Let x be the numeric data of the argument specified as "nn" and find the common logarithm f_x of x . The relational expression of f_x and x is as follows.

$$f_x = \log_{10} x \leftrightarrow 10^{f_x} = x$$

Ex.) LOG(CH01), LOG(60)

- **LN(nn) LN function (Natural Logarithm)**

Let x be the numeric data of the argument specified as "nn" and find the natural logarithm f_x of x . The relational expression of f_x and x is as follows.

$$f_x = \log_e x \leftrightarrow e^{f_x} = x$$

Ex.) LN(CH01), LN(60)

- **EXP(nn) EXP function (Exponent)**

Let the numerical data of the argument specified as "nn" be the exponent x and find the value f_x obtained by multiplying the Napier e by x . The relational expression of f_x and x is as follows.

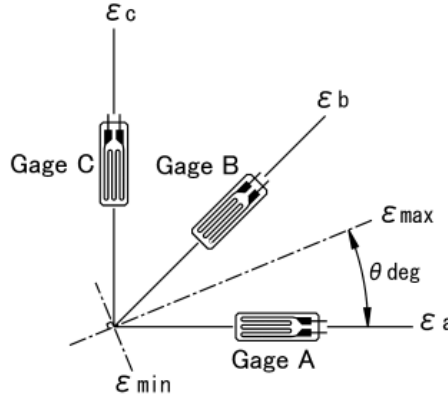
$$f_x = e^x$$

Ex.) LN(CH01), LN(60)

7.7.2 Rosette function

Rosette function is an analytical function using 3-axis rosette gage.

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



For the argument "ch", you can set the CH number of the measurement CH data to be used.

E is the modulus of longitudinal elasticity and ν is the poisson's ratio.

Convert units as follows: E to $\times 10^{12}$ Pa, ε to $\times 10^{-6}$, and output stress to MPa

- **HMX(ch,ch,ch) Maximum Principal Strain Function**

Let $\varepsilon_a, \varepsilon_b, \varepsilon_c$ be the numerical data of the argument specified for "ch" and find the maximum principal strain ε_{max} using the following formula:

$$\varepsilon_{max} = \frac{1}{2} \left[\varepsilon_a + \varepsilon_c + \sqrt{2\{(\varepsilon_a - \varepsilon_b)^2 + (\varepsilon_b - \varepsilon_c)^2\}} \right]$$

Ex.) HMX(CH01,CH02,CH03)

- **HMN(ch,ch,ch) Minimum Principal Strain Function**

Let $\varepsilon_a, \varepsilon_b, \varepsilon_c$ be the numerical data of the argument specified for "ch" and find the minimum principal strain ε_{min} using the following formula:

$$\varepsilon_{min} = \frac{1}{2} \left[\varepsilon_a + \varepsilon_c - \sqrt{2\{(\varepsilon_a - \varepsilon_b)^2 + (\varepsilon_b - \varepsilon_c)^2\}} \right]$$

Ex.) HMN(CH01,CH02,CH03)

- **HSM(ch,ch,ch) Maximum Sheering Strain Function**

Let $\varepsilon_a, \varepsilon_b, \varepsilon_c$ be the numerical data of the argument specified for "ch" and find the maximum sheering strain γ_{max} using the following formula:

$$\gamma_{max} = \sqrt{2\{(\varepsilon_a - \varepsilon_b)^2 + (\varepsilon_b - \varepsilon_c)^2\}}$$

Ex.) HSM(CH01,CH02,CH03)

- **SMX(ch,ch,ch,E,ν) Maximum Principal Stress Function**

Let $\varepsilon_a, \varepsilon_b, \varepsilon_c$ be the numerical data of the argument specified for "ch" and find the maximum principal stress σ_{max} using the following formula:

$$\sigma_{max} = \frac{E}{2(1-\nu^2)} \left[(1+\nu)(\varepsilon_a + \varepsilon_c) + (1-\nu) \times \sqrt{2\{(\varepsilon_a - \varepsilon_b)^2 + (\varepsilon_b - \varepsilon_c)^2\}} \right]$$

Ex.) When the longitudinal elastic modulus is 205 GPa and the poisson's ratio is 0.3.

Input example: SMX (CH01, CH02, CH03, 0.205, 0.3)

Note: Since the unit of input E of longitudinal elastic modulus is converted to $\times 10^{12}$ Pa, enter 0.205.

- **SMN(ch,ch,ch,E,ν) Minimum Principal Stress Function**

Let $\varepsilon_a, \varepsilon_b, \varepsilon_c$ be the numerical data of the argument specified for "ch" and find the minimum principal stress σ_{min} using the following formula:

$$\sigma_{min} = \frac{E}{2(1-\nu^2)} \left[(1+\nu)(\varepsilon_a + \varepsilon_c) - (1-\nu) \times \sqrt{2\{(\varepsilon_a - \varepsilon_b)^2 + (\varepsilon_b - \varepsilon_c)^2\}} \right]$$

Ex.) When the longitudinal elastic modulus is 205 GPa and the poisson's ratio is 0.3.

Input example: SMN(CH01, CH02, CH03, 0.205, 0.3)

Note: Since the unit of input E of longitudinal elastic modulus is converted to $\times 10^{12}$ Pa, enter 0.205.

- **SSM(ch,ch,ch,E,ν) Maximum Sheering Stress Function**

Let $\varepsilon_a, \varepsilon_b, \varepsilon_c$ be the numerical data of the argument specified for "ch" and find the maximum sheering stress τ_{max} using the following formula:

$$\tau_{max} = \frac{E}{2(1+\nu)} \times \sqrt{2\{(\varepsilon_a - \varepsilon_b)^2 + (\varepsilon_b - \varepsilon_c)^2\}}$$

Ex.) When the longitudinal elastic modulus is 205 GPa and the poisson's ratio is 0.3.

Input example: SSM(CH001, CH002, CH003, 0.205, 0.3)

Note: Since the unit of input E of longitudinal elastic modulus is converted to $\times 10^{12}$ Pa, enter 0.205.

- **DEG(ch,ch,ch) Principal Strain Direction Function**

Let $\varepsilon_a, \varepsilon_b, \varepsilon_c$ be the numerical data of the argument specified for "ch" and find the direction of principal strain θ using the following formula:

$$\theta = \frac{1}{2} \tan^{-1} \left(\frac{2\varepsilon_b - \varepsilon_a - \varepsilon_c}{\varepsilon_a - \varepsilon_c} \right)$$

The direction of the principal strain θ is expressed in units of degrees.

Also, the following are expressed when the direction of gauge A is set to 0 degrees: ε_{max}

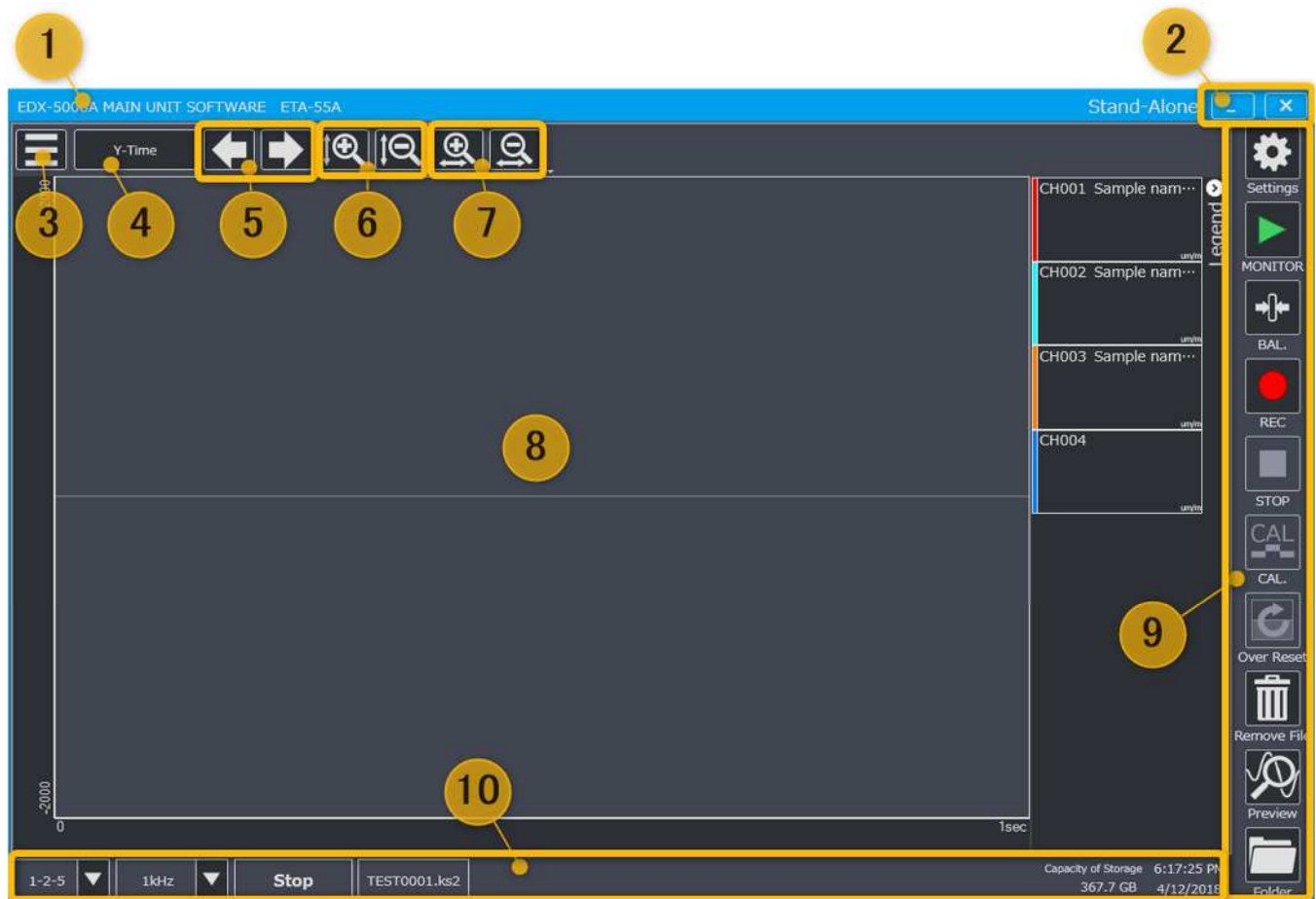
becomes the angle to the maximum principal strain when $\varepsilon_a > \varepsilon_c$, and ε_{min} becomes the angle to the minimum principal strain when $\varepsilon_a < \varepsilon_c$.

Ex.) DEG (CH01, CH02, CH03)

8 Window Operations

8.1 Main window

The main window shown below will display when starting up this software.



No.	Name	Function
1	Title bar	Displays the software title and measuring status
2	Minimize button	Minimizes the software.
	Close button	Closes the software.
3	Cell display settings button	Cell display settings
4	Select cell content button	Displays/set the graph/settings screen displayed
5	Change CH button	Go forward/back in order of graph display CHs.
6	Zoom in/out the Y-axis button	Zoom in/out the Y-axis.
7	Zoom in/out the X-axis button	Zoom in/out the X-axis.
8	Cell	Displays the graph /settings screen.
9	Toolbar	Displays function buttons.
10	Information bar	Displays/set(partial) recording information.

8.2 Title bar

Displays the model of this software and the software name.

The title bar color will change depending on the measuring status.

- **Title bar color**

Stop : Blue

Monitoring : Green

Recording : Red

Pausing : Gray

Waiting : Varies depending on the mode of recording.

Further, each status color is shared with the background color of the recording mode on the information bar. (Excluding the inactive status.)

- **Display during a battery refresh**

The icon shown below will appear during a battery refresh.

For details on performing a battery refresh, see Chap. II Section 1.1 Item

For details concerning the battery refresh process, see "INSTRUCTION MANUAL EDX-5000A MEMORY RECORDER/ANALYZER (FOR HARDWARE)".



- **Battery error notification**

The icon shown below will appear when a battery error occurs.



- **Display during online control**

During online control, the display will be as shown in the figure below:

For online control, see Chap. II Section 5.



8.3 Minimize/Close button

8.3.1 Minimize button

Tap this button to minimize the software.

8.3.2 Close button

Use this to exit the software.

8.4 Cell display settings button

There is a display settings button for each cell open. Tap to display a drop-down list to control the cell.



8.4.1 Settings

If a graph is open in a cell, use this “Settings” button to open the display conditions settings screen for the graph. If the settings screen is already displayed, this option will be unavailable.

For details on display conditions settings for each graph, see Chap. II Section 9.

8.4.2 Add to Top/Bottom/Left/Right

Adds a cell to the direction selected.

Up to 12 cells can be displayed.

For details on the operation method used, see Chap. I Item 6.1.3.

8.4.3 Save as Image

Saves the current screen as an image.

When carrying this out, screens will be saved as PNG format files.

8.4.4 Remove

Remove the cell.

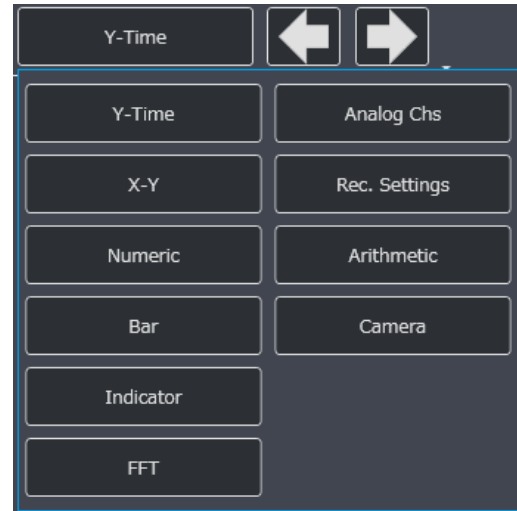
For details on the operation method used, see Chap. I Item 6.1.4.

8.5 Select cell content button

Select the graph/settings screen to display in the cell.

For details on changing settings, see Chap. I Section 6.1.1.

- **Graph** (see: Chap. II Section 9)
 - (1) Y-Time graph
 - (2) X-Y graph
 - (3) Numeric graph
 - (4) Bar graph
 - (5) Indicator graph
 - (6) FFT graph
- **Condition settings screen**
 - (1) Analog CHs (see: Chap. II Section 2.1)
 - (2) Recording Settings (see: Chap. II Section 3.2)
 - (3) Arithmetic (see: Chap. II Section 7)
- **Other**
 - (1) Camera (see: Chap. II Section 9.9)



8.6 Change CH button

Switch between displayed CHs in order when the graph window is displayed.

8.7 Zoom in/out the Y-axis

You can zoom in/out the Y-axis as a threshold at the center of the graph.

Note that you cannot use this button in Numeric Graph.

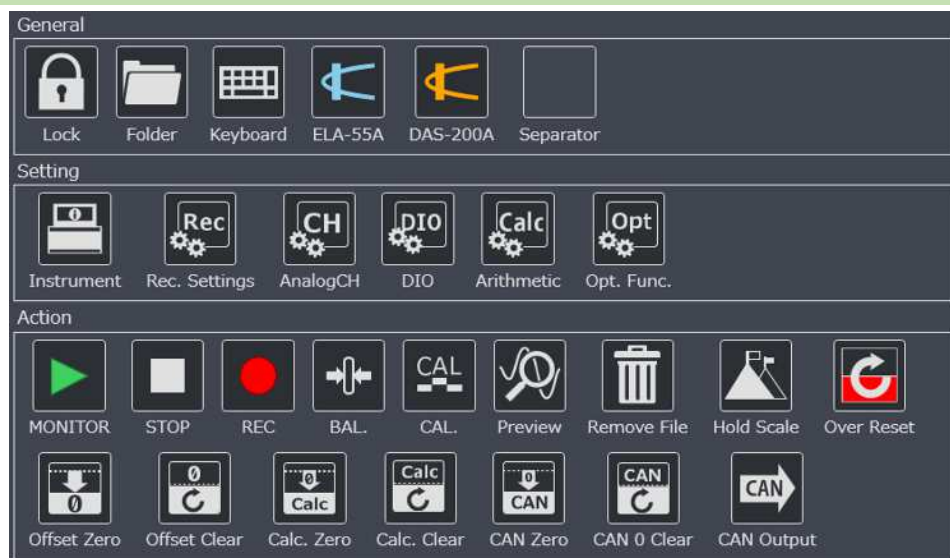
8.8 Zoom in/out the X-axis

You can zoom in/out the X-axis as a threshold at the center of the graph.

Note that you can use this button in Y-time, X-Y and FFT Graph.

8.9 Toolbar

8.9.1 Function buttons



Item	Name	Function
General	Lock	Locks the EDX-5000A switch and operating buttons for this software.
	Folder	Opens the save location for the recorded data file.
	Keyboard	Brings up the screen keyboard.
	ELA-55A	Opens the EDX-3000B compatible application software.
	DAS-200A	Opens the analysis application software.
	Separator	The separator icon.
Settings	Settings	Opens the Settings screen. This icon is always displayed.
	Instrument	Opens the “Instrument” page on the Settings screen.
	Rec. Settings	Opens the “Recording Settings” page on the Settings screen.
	AnalogCH	Opens the “Analog CHs” page on the Settings screen.
	DIO	Opens the “DIO” page on the Settings screen.
	Arithmetic	Opens the “Arithmetic Processing” page on the Settings screen.
Action	MONITOR	Starts measurement (monitor).
	STOP	Stops measurement (monitor) and recordings.
	REC	Starts recording.
	BAL	Executes the balance adjustment.
	CAL	Outputs/stops the calibration switch (CAL).
	Preview	Confirm data for the latest recorded data file.
	Remove File	Deletes the latest recorded data file.
	Hold Scale	Automatically sets the display scale range according to the peak value.
	Over Reset	Clears the overload status.
	Offset Zero	Executes Offset Zero.
	Offset Clear	All “Offset” value of the analog CH conditions is set Zero.

	Calc. Zero	Executes Offset Zero for calculation CHs.
	Calc. Clear	All “Calculation Zero Value” of the calculation CH conditions is set Zero.
	CAN Zero*	Executes Offset Zero for CAN CHs.
	CAN 0 Clear*	All “Offset” value of the CAN CH conditions set Zero.
	CAN Output*	Output CAN data.

(*) It is optional function. It are only available in EDX-5000A with optional module installed.

- **Lock**

Tap this to make the switch operation on the EDX-5000A main frame unavailable.

Tap this to unlock again.

Further, the availability of operation buttons in this software when locked is described below.

Lock button : Available for use

Settings button : Available for use. However, settings cannot be changed while locked.

Other operation buttons : Unavailable

- **Folder**

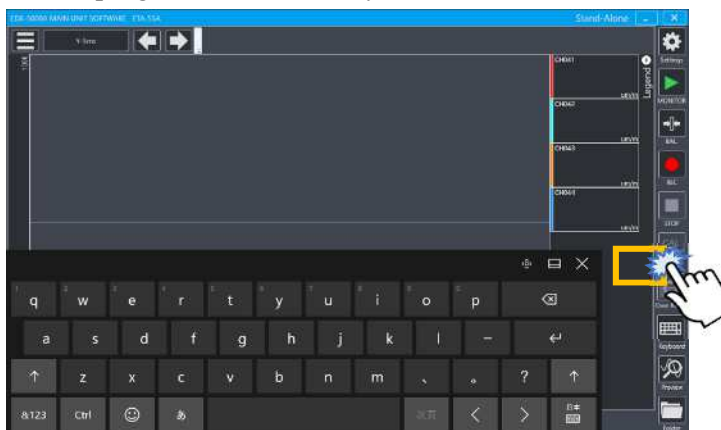
Open folders specified in the save location for the recorded data file in Explorer.

For details on changing the save location for recorded data files, see Chap. I Section 4.1.

- **Keyboard**

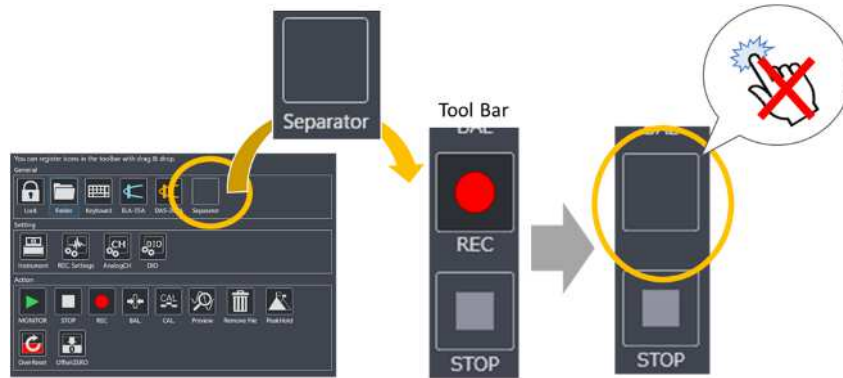
Tap this to display the screen keyboard.

Tap the  button on the top right of the screen keyboard screen to close the screen keyboard.



- **Separator**

Adds a blank space icon to the toolbar. Nothing will occur when tapped.



- **Remove File**

Deletes the latest recorded data file when found.

Tap this to display a Confirmation dialog box.

To delete the file, tap “Yes”. To cancel, tap “No”.

Note that the recorded file will also be deleted.

Files to be deleted:

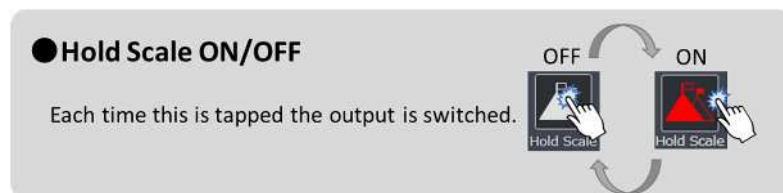
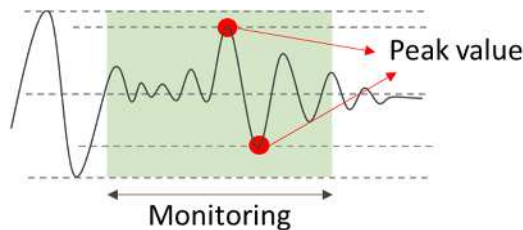
Recorded data files, CSV files, E4A files (CAN),
NMEA files (GPS), and AVI files (movie)

- **Hold Scale**

When the status of this button is ON, this automatically sets the display axis range according to the peak value.

However, this function is only available when auto-scaling is set on a Y-time graph or an X-Y graph.

Peak value: The maximum/minimalize measured value when starting measurements.



- **Opt. Function (Available as option only)**

In the settings window, open the "Optional function" page (see: Chap. II Section 6).

- **Offset Zero/Offset Clear**

Offset Zero: Sets the current measurement value as the offset value of the analog CH condition (see: Chap. II Item 2.1.3) to convert the output value to 0.

Offset Clear: Initializes all analog CH condition offset values to "0".

- **Calc. Zero/Calc. Clear**

Calc. Zero: Sets the current measurement value as the Calculation Zero Value of the calculation CH condition (see: Chap. II Item 7.4) to convert the output value to 0.

Calc. Clear: Initializes all calculation CH condition Calculation Zero Values to "0".

- **CAN Zero/CAN 0 Clear (Available as option only)**

CAN Zero: Sets the current measurement value as the offset value of the ECAN condition to convert the output value to 0.

CAN 0 Clear: Initializes all CAN CH condition offset values to "0".

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

- **CAN Output (Available as option only)**

Outputs the data frame configured in "ECAN Cond." window of ELA-55A (EDX-3000B compatible software) at an arbitrary timing.

For details on Switching ELA-55A, see Chap. I Section 9.1.

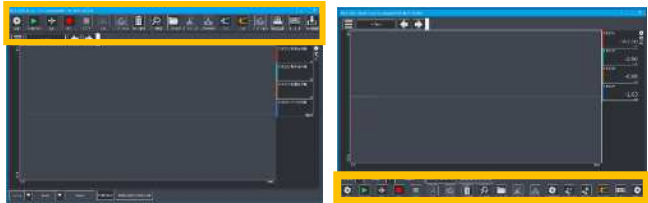
For details on ECAN conditions settings, see the separate volume "INSTRUCTION MANUAL EDX-5000A MEMORY RECORDER/ANALYZER (FOR HARDWARE)".

8.9.2 Customizing the toolbar

You can change the function buttons displayed.
For details on changing this, see Chap. I Item 14.1.2.
Note that the Settings icon cannot be changed.

8.9.3 Display position

You can change the display position of the toolbar to top, bottom, left, or right.
For details on changing this, see Chap. I Item 14.1.1.

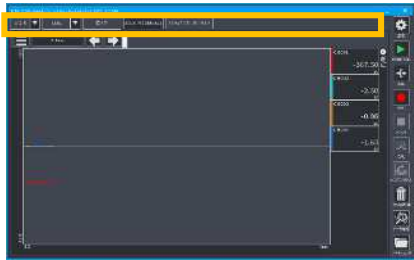
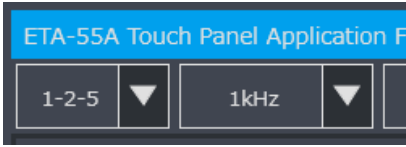
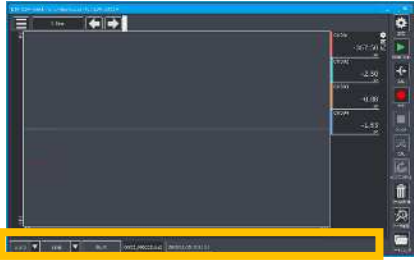
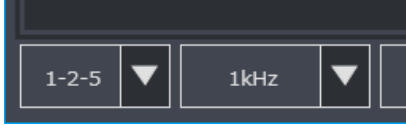
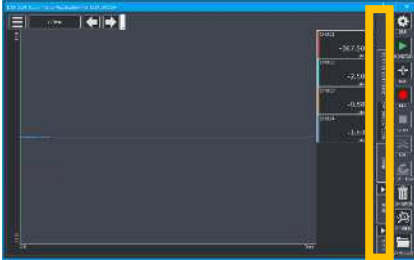
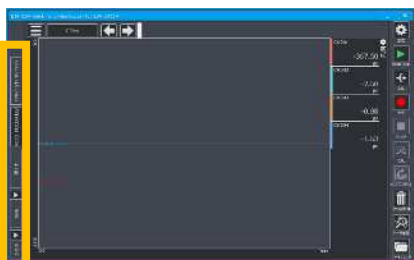
Position	Screen example	Number of buttons
Top/Bottom		18
Right/Left		10

8.10 Information bar

8.10.1 Display position

You can change the display position of the toolbar to top, bottom, left, or right.

For details on changing settings, see Chap. I Item 14.2.1.

position	Screen example	Enlarged screen
Top		
Bottom		
Right		
Left		

8.10.2 Display items

Display items on the information bar are as follows.

For details on show/hide item settings, see Chap. I Item 14.2.2.

Item Name	Function
Frequency Type	Displays/set the sampling frequency order.
Sampling Frequency	Displays/set the sampling frequency.
Status	Displays the measurement and recording status.
Recording Settings	Displays the measurement and additional recording information.
Status of CAL.	Displays the CAL output status.
Recording Time	Displays the recording time.
Voice Recording Time	Displays the audio recording time.
File Name	Displays the recorded file name.
Time	Displays the current date and time.
Capacity of Storage	Displays the current available storage capacity.

- **Frequency Type/Sampling Frequency**

Displays/set the sampling frequency order and the frequency.

To change these settings, tap this to open the drop-down list and select an option from the list.

Any settings changes made will be applied when starting measurement/recording, or when applying settings.



- **Status**

Displays the measurement and recording status.

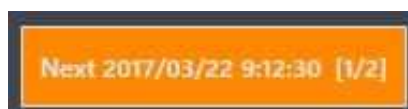
The Pausing display may also appear depending on the recording mode.



- **Recording Settings**

Displays additional information on the acquisition conditions.

Setting items will vary depending on the recording mode used.



- **Stats of CAL.**

“+CAL” or “-CAL” is shown during CAL output.

These statuses will not appear when CAL output has been stopped.



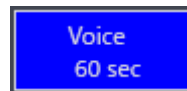
- **Recording Time**

Displays the recording time in text format and as a progress bar.



- **Voice Recording Time**

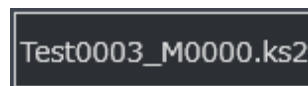
Displays the audio recording available time when recording/measuring.



- **File Name**

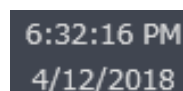
Displays the recorded file name.

For details on file name naming conventions, see Chap. II Item 3.1.2.



- **Time**

Displays the current date and time.



- **Capacity of Storage**

Displays the current available storage capacity.



9 Graphs

9.1 Basic display functions

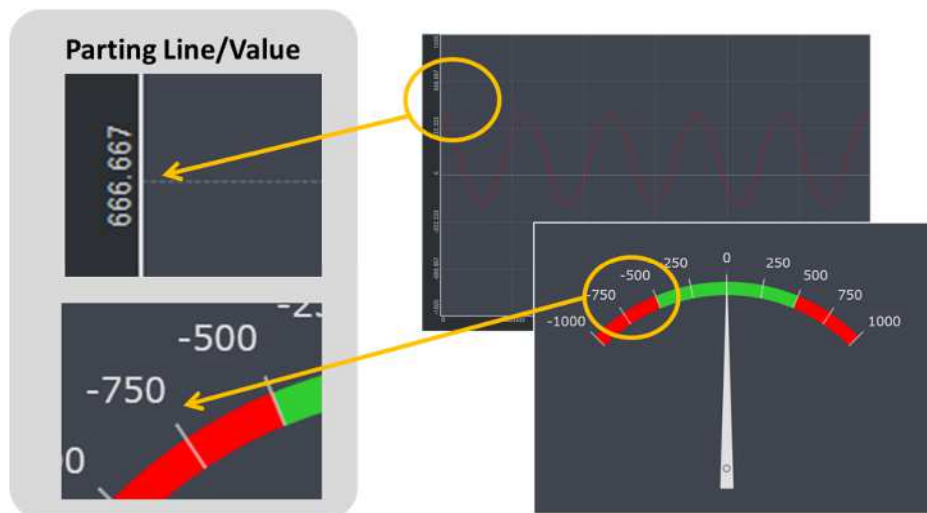
● Crosshair cursor

- Can be used in Y-time graphs, X-Y graphs, FET graphs, and the data confirm window.
- Can show/hide up to 2 crosshair cursors.
- Can display the difference between X-axis/Y-axis coordinates.
- Cursor can be moved by switching operation cursor.



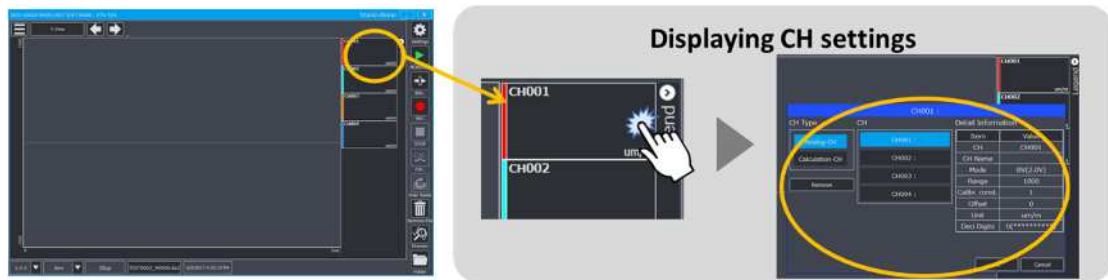
● Parting line and Parting value

- Can display/set graph be dividing lines (except for numeric graphs).
- Dividing line can be displayed as dashed line when you set more than 1 dividing line (solid lines for circle meter).



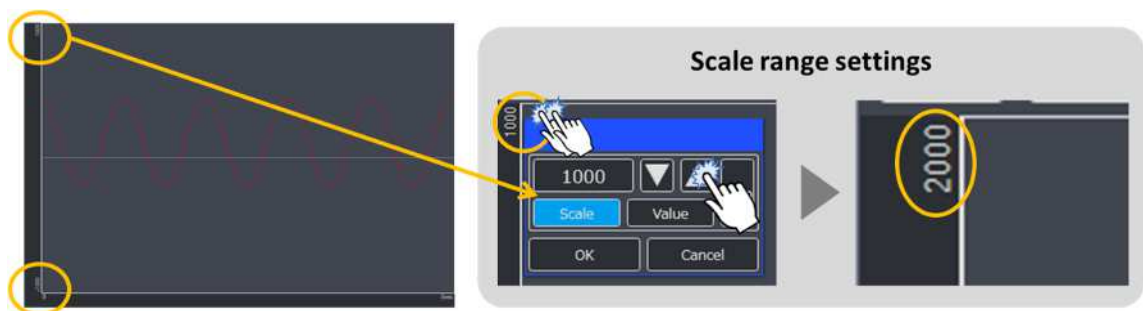
- **Display CH settings**

- This is a part of the function that displays legends. Tap to show dialog where display CH can be configured directly.



- **Display/set maximum/minimum scale range**

- This setting is only available for Y-time graphs, X-Y graphs, FET graphs and bar graphs.
- Here you can view and set the maximum/minimum display scale range for the X-axis and Y-axis.



9.2 Basic setting items

● Scale

Displays/set the graph scale when there is a settings field open.

X-Axis / Y-Axis : Set the display scale range for the X-axis/Y-axis.

Ticks : Set the number of divisions for the X-axis/Y-axis scale.

“Auto” button : When ON, the scale will be set automatically based on measured values for the displayed CH.

Note that, while this is ON you will not be able to set the scale yourself.

● Assignment of CH

Displays/change display settings for the number of CHs displayed and measured values.

Configurable settings will change depending on the graph.

When changing, tap to bring up the dialog box to change display settings.

For details, see descriptions for the Display Settings screen for each graph described from Chap. II Section 9.3 to Section 9.8 onwards.

Number of CH : Set the number of CHs displayed in a graph.

List : Change the CHs displayed and the line color settings, etc.

“Clear” button : Clears settings for display CHs.

“Auto” button : Sets display CHs automatically.

No.	Colors	Thickness	CH
1	Red	1	
2	Cyan	1	
3	Orange	1	
4	Blue	1	

● Special settings

These settings fields will appear when configuring settings by graph.

Indicator : “Shape” settings and “Colors” settings (see: Chap. II Item 9.7.2)

● Legend

Displays/set settings to show/hide CH numbers, names, etc.

Check mark ON : Display

Check mark OFF : Hide

● OK/Cancel button

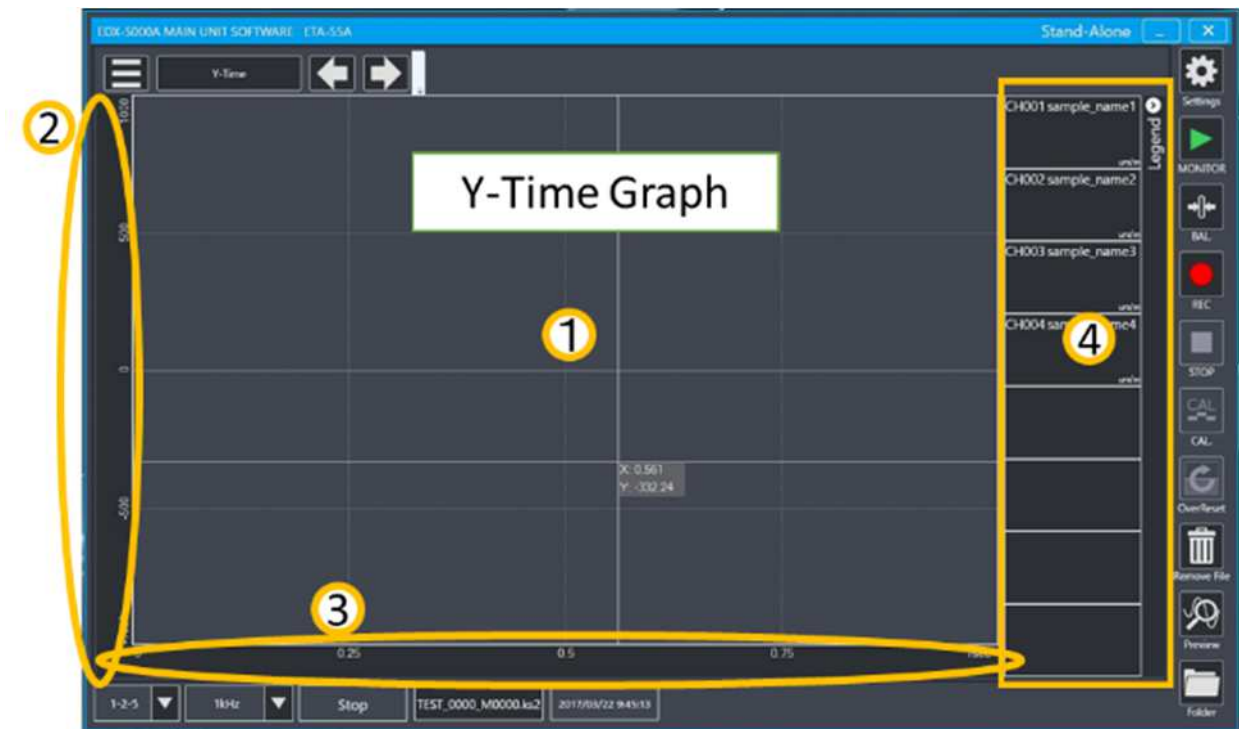
“OK” button : Apply settings.

“Cancel” button : Do not apply settings.

9.3 Y-Time graph

9.3.1 Graph window

Y-Time graphs are graphs that show CH data on the Y-axis, and use the X-axis as a time axis (seconds). Up to 8 CHs can be displayed.



No.	Name	Function
1	Graph	Measured value graph
2	Y-axis scale	Displays/set scale values
3	X-axis scale	Displays/set scale values
4	Legend	Displays/set displayed CH information

- **Graph functions**

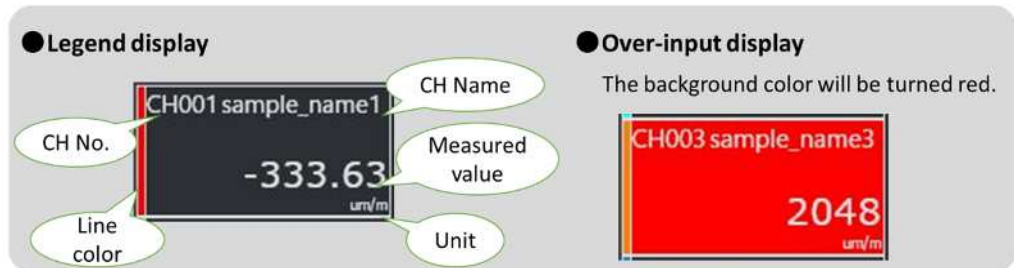
- (1) Waveform line : Displays the measured value as a waveform.
- (2) Y-axis zero line : Displays the zero line when the scale range includes a 0.
- (3) Parting line : Displays parting lines as a dotted line when one or more parting lines are set.
(See Chap. II Section 9.1)
- (4) Crosshair cursor : For details, see Chap. II Section 9.1.

- **X-axis/Y-axis scale functions**

- (1) Displays/set the max/min display scale range : See Chap. II Section 9.1.
- (2) Partition value : Displays the partition value when one or more parting lines are set.
(See Chap. II Section 9.1)

- **Legend functions**

- (1) Legend display : Displays the CH No., measured values, and other information of each CH.
- (2) Display CH settings : For details, see Chap. II Section 9.1.
- (3) Show/hide legend : Switch either showing or hiding the Legend each time you tap this bar.



9.3.2 Display settings screen

Graph Settings

1 Scale

X-Axis: Minimum: 0, Maximum: 1, Parting line: 0, Auto: [X], Ticks: 0

Y-Axis: Minimum: -1000, Maximum: 1000, Parting line: 0, Auto: [X], Ticks: 0

2 Assignment of CH

Number of CH: 4, Clear, Auto

No.	Colors	Thickness	CH
1	Red	1	CH001 : Sample Name 1
2	Cyan	1	CH002 : Sample Name 2
3	Orange	1	CH003 : Sample Name 3
4	Blue	1	CH004 : Sample Name 4

3 Legend

☒ CH No. ☒ CH Name ☒ Value ☒ Unit

OK Cancel

- **Scale**

X-axis	Minimum value	Unavailable. Fixed to 0 sec.
	Maximum value	Upper limit: Varies depending on the sampling frequency. (sec = 20,000/sampling frequency)
	Parting line	Setting range: 0 to 6
Y-axis	Minimum value	Lower limit: -1×10^8
	Maximum value	Upper limit: $+1 \times 10^8$
	Parting line	Setting range: 0 to 6
	Auto scale	Displays/set ON/OFF

- **Assignment of CH**

Number of CHs	Setting range: 0 to 8
No.	Displays the display data No. in serial form starting from 1
Colors	Displays/set the color of waveform lines
Thickness	Displays/set the thickness of lines Setting range: 1 to 3
CH	Displays/set the CH displayed in a graph

- **Legend**

Configured settings will be shown/hidden in the position shown in the diagram on the right.



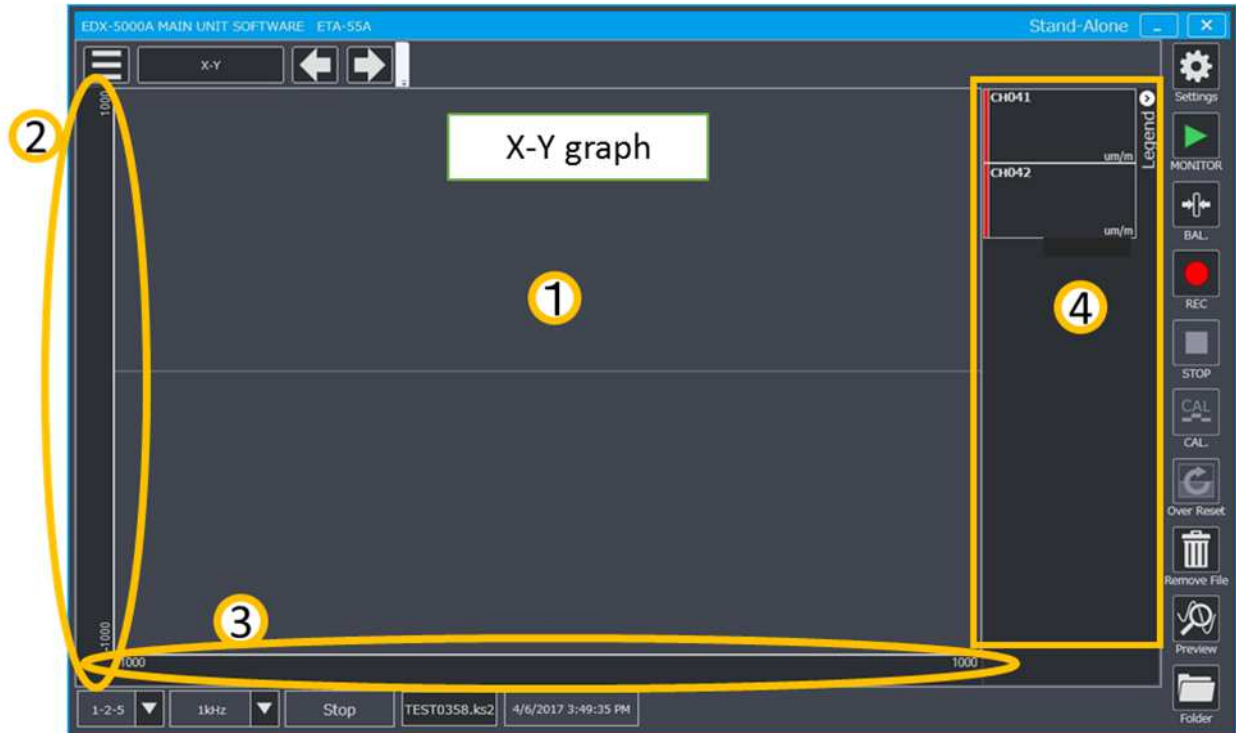
9.4 X-Y graph

9.4.1 Graph window

X-Y graph is a relative graph displaying X and Y-axis with the CH data.

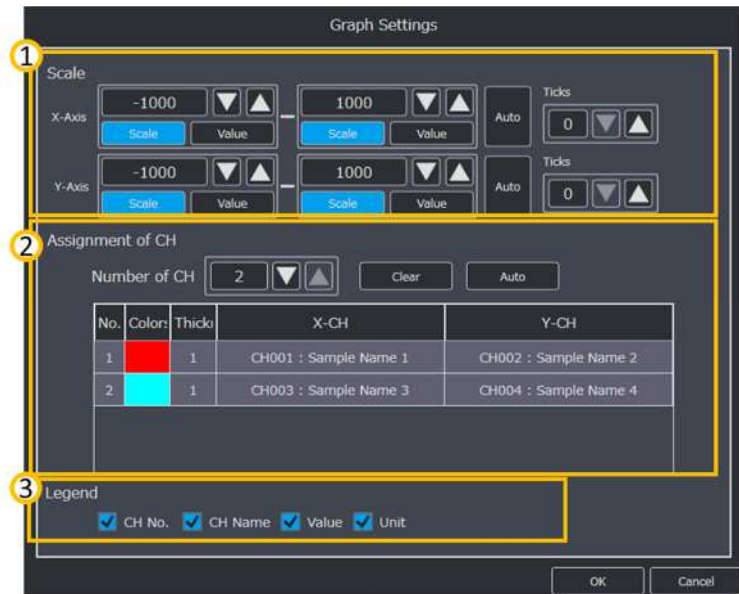
Suppose the 1 CH of X-axis and CH of Y-axis consist 1 unit, the X-Y graph can superimpose maximum 2 graph.

The description for each function used is the same as that described in Chap. II Item 9.3.1.



No.	Name	Function
1	Graph	Measured value graph
2	Y-axis scale	Displays/set scale values
3	X-axis scale	Displays/set scale values
4	Legend	Displays/set displayed CH information

9.4.2 Display settings screen



● Scale

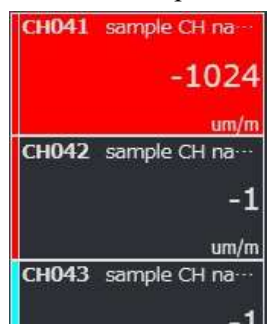
X-Axis/Y-Axis	Minimum value	Lower limit: -1×10^8
	Maximum value	Upper limit: $+1 \times 10^8$
	“Ticks”	Set number of parting line. Setting range: 0 to 6
	“Auto” scale	Displays/set ON/OFF.

● Assignment of CH

“Number of CH”	Displays/set the number of CHs. Setting range: 0 to 2 sets
“No.”	Displays the display data No. in serial number.
“Colors”	Displays/set the colors of waveform lines.
“Thickness”	Displays/set the thickness of waveform lines. Setting range: 1 to 3
“X-CH”	Displays/set the X-axis CH displayed in the graph.
“Y-CH”	Displays/set the Y-axis CH displayed in the graph.

● Legend

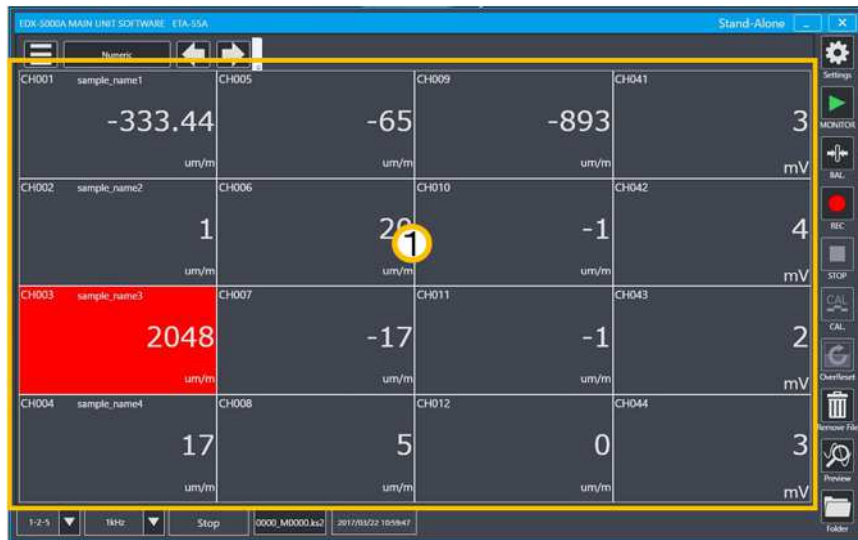
This settings will be shown/hidden in the position shown in the diagram below.



9.5 Numeric graph

9.5.1 Graph window

Up to 80 CHs (8 rows by 10 columns) can be displayed.



No.	Name	Function
1	Number graph	Displays/set measured values, CH numbers, etc.

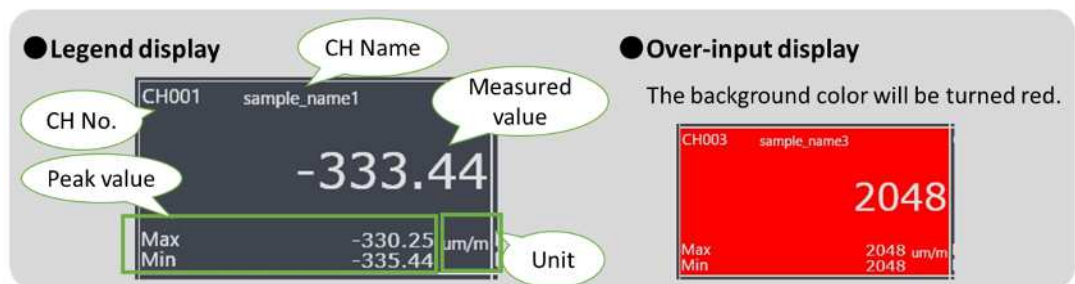
- **Numeric graph**

(1) Legend display:

Displays the CH No., etc., and displays measured values/peak value as a numeric value.

However, note that the sampling frequency must be 10 kHz or less when using the peak hold function, and, the peak hold function cannot be displayed when using CAN function.

(2) Display CH settings: For details, see Chap. II Section 9.1.



9.5.2 Display settings screen

The image shows the 'Graph Settings' screen. It has two main sections highlighted with yellow boxes and numbered 1 and 2.

Section 1: Assignment of CH

Row: 4 (with up/down arrows) Column: 4 (with up/down arrows) [Clear] [Auto]

CH001	D1_1	D1_5	
CH002	D1_2	D1_6	
CH003	D1_3	D1_7	
CH004	D1_4	D1_8	

Section 2: Legend Display/Hide

☒ CH No. ☒ CH Name ☒ Unit ☐ Max-Min

[OK] [Cancel]

- **Assignment of CH**

Row	Setting range: 1 to 8
Column	Setting range: 1 to 10
Display CH table	Displays/set CHs according to the number of rows × the number of data columns (display CH No. range: 1 to 80CH). Tap to change display CH settings.

- **Legend**

This settings will be shown/hidden in the position shown in the diagram below.

The peak value setting can be displayed when the sampling frequency is below 10 kHz.

The diagram shows a screen with a legend box highlighted by a yellow border. The legend box contains the following information:

CH025 Sample Ch Name

490

Max	491	μE
Min	462	

9.6 Bar graph

9.6.1 Graph window

A bar graph is a graph that displays measured values as bars. Up to 80 CHs can be displayed.



No.	Name	Function
1	Graph	Displays measured values in bar form
2	Y-axis scale	Displays/set scale values
3	Legend	Displays/set displayed CH information
4	Peak hold value	Displays the peak value

- **Graph**

- (1) Bar : Displays measured values in bar form.
- (2) Over-input display : When excessive input is detected the background color will turn red.
- (3) Y-axis zero line : Displays this when the scale range includes a 0.
- (4) Parting line : Displays this as a dotted line. For details, see Chap II Section 9.1.

- **Y-axis scale**

- (1) Displays/set the max/min display scale range: See Chap. II Section 9.1.
- (2) Partition value: See Chap II Section 9.1

- **Legend**

- (1) Legend display :
Displays the CH No., measured values, and other information of each CH.
However, note that the sampling frequency must be 10 kHz or less when using the peak hold function, and, the peak hold function cannot be displayed when using CAN function.

- (2) Display CH settings : See Chap. II Section 9.1.

- **Legend display**

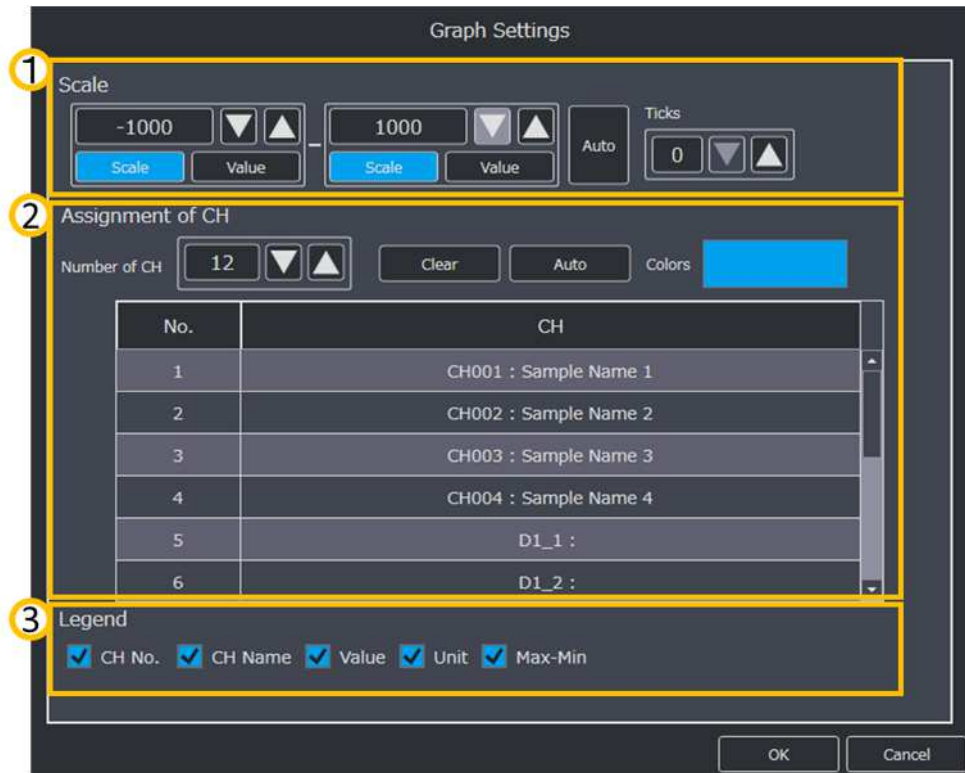


- **Over-input display**

The background color will be turned red.



9.6.2 Display settings screen



● Scale

Y-axis	Minimum value	Lower limit: -1×10^8
	Maximum value	Upper limit: $+1 \times 10^8$
	Ticks	Display/set the number of parting line. Setting range: 0 to 10
	Auto scale	Displays/set ON/OFF

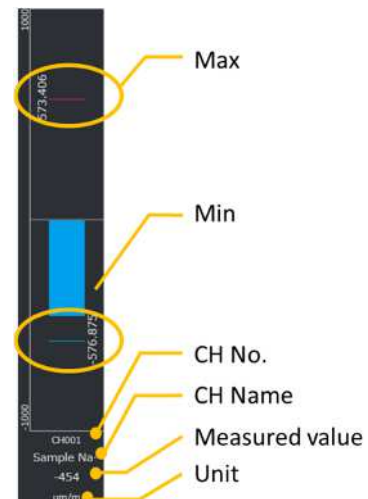
● Assignment of CH

Number of CH	Setting range: 0 to 80
Colors	Displays/set the color of graph bars.
CH	Displays/set the display CH in a graph.

● Legend

This settings will be shown/hidden in the position shown in the diagram on the right.

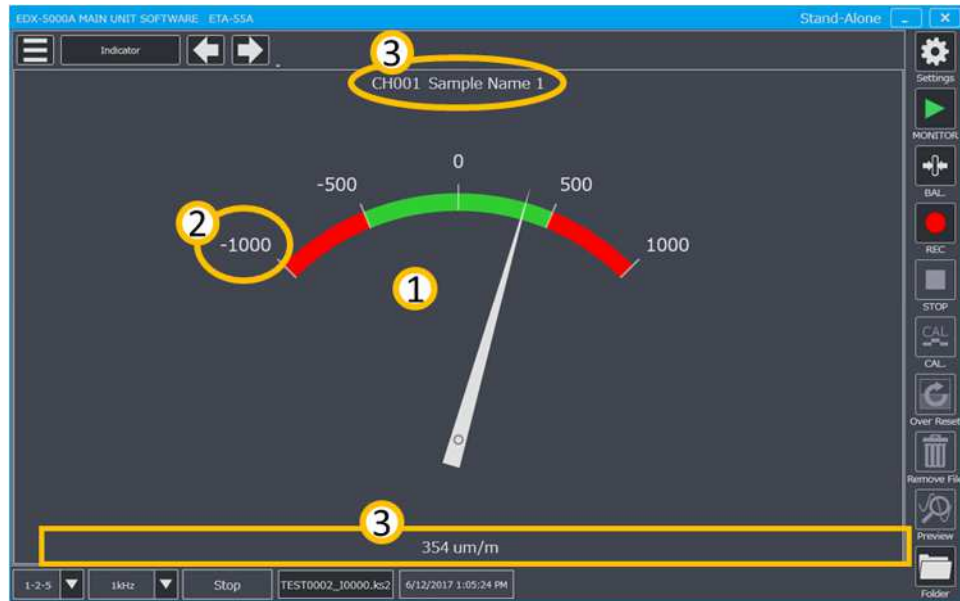
The peak value setting can be displayed when the sampling frequency is below 10 kHz.



9.7 Indicator graph

9.7.1 Graph window

Displays measured values in the form of a circle meter indicator. Up to one CH can be displayed.



No.	Name	Function
1	Circle meter	Displays measured values in the form of a circle meter indicator.
2	Scale	Displays/set scale values
3 (top part)	Legend	Displays the CH No. and the CH name. Display CH settings
3 (bottom part)	Legend	Displays measured values and the unit used

- **Circle meter**

Expresses measured values in the form of an indicator.

You can change the color, shape and other settings concerning the circular arc.

- **Scale**

Displays the max/min display scale range.

Also displays the partition value when one or more parting lines are set.

- **Legend (top part)**

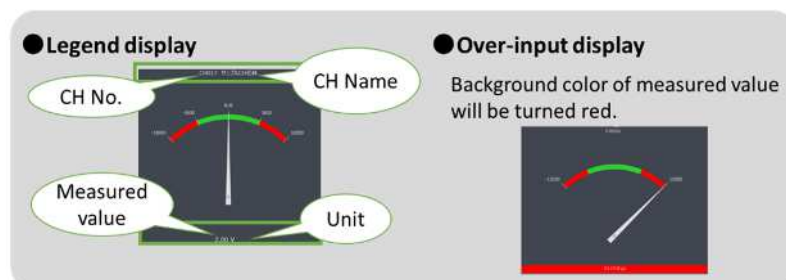
(1) Legend display : Displays the CH No. and the CH name.

(2) Display CH settings : For details, see Chap. II Section 9.1.

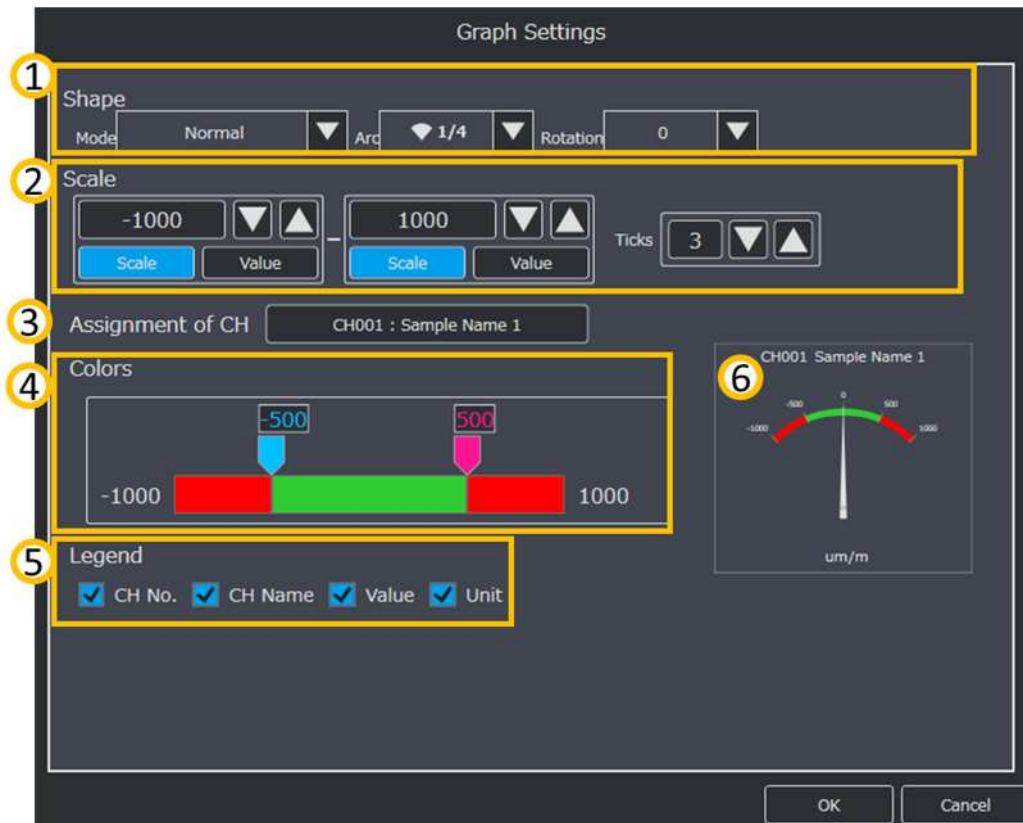
- **Legend (bottom part)**

(1) Legend display : Displays measured values and the unit used.

(2) Over-input display : When measured value is input over status, the background color will be turned red.



9.7.2 Display settings screen



- **Shape**

Mode:

Normal : Shows the measured value as an indicator.

The movable range of the indicator is the range of the circular arc.

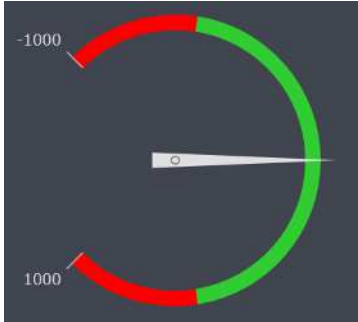
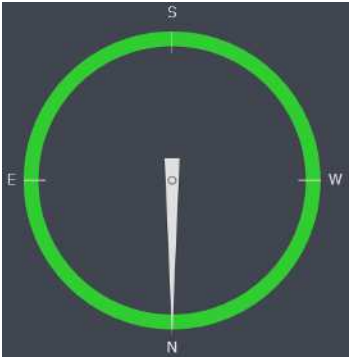
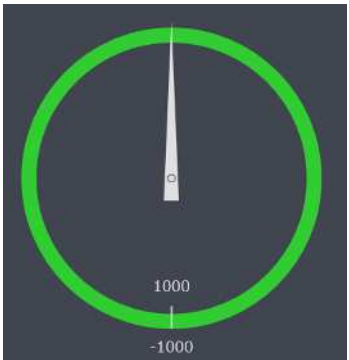
Compass : This is a circle meter that expresses direction.

Handle : This is a circle meter that shifts in scale to match the scale width when the upper/lower limits of the scale are exceeded.

The setting items made available will vary between each mode as shown in the table below.

Mode	Normal	Compass	Handle
Arc	1/4 (90 degrees) 1/2 (180 degrees) 3/4 (270 degrees) 1/1 (360 degrees)	1/1 (360 degrees)	1/1 (360 degrees)
Rotation	0 degrees 90 degrees 180 degrees 270 degrees	0 degrees 90 degrees 180 degrees 270 degrees	0 degrees 90 degrees 180 degrees 270 degrees
Scale	-10^8 to $+10^8$	0 to 360 (fixed)	-10^8 to $+10^8$
Ticks	0 to 11	Not available	0 to 11
Division of colors	Available	Not available	Not available

Several setting examples are described below.

Conditions	Example
Mode: Normal Arc: 1/4 (90 degrees) Rotation: 0 degrees	
Mode: Normal Arc: 3/4 (270 degrees) Rotation: 90 degrees	
Mode: Compass Rotation: 180 degrees	
Mode: Handle Rotation: 0 degrees	

- **Scale**

Displays/set the meter range.

Be aware that the setting range will vary depending on the mode in use.

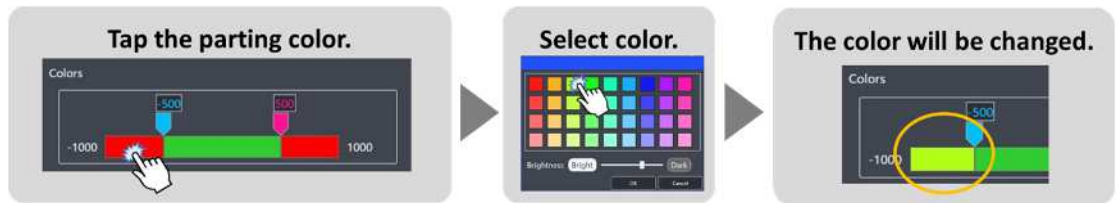
- **Assignment of CH**

One CH can be displayed.

- **Colors**

Configure circular arc colors settings and split circular arc colors.

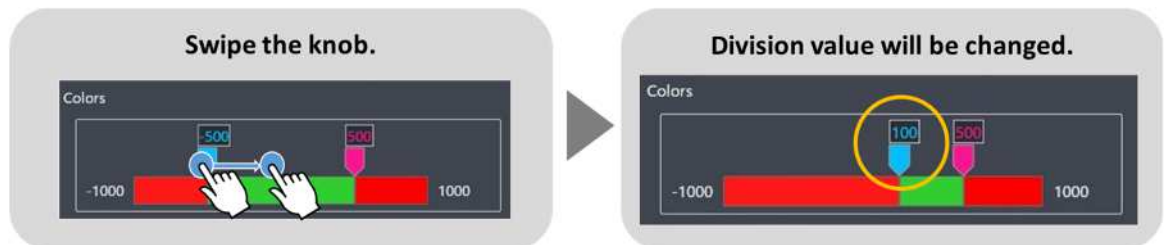
- ◆ **Change appearance**



- ◆ **Change partition values**

Swipe the slider to change partition values as follows.

The amount of change is based on a 1/20 scale.



To fine tune value settings, tap the partition value and set from setting dialog.

- **Legend**

Show/Hide settings will be applied to the Legend in the graph.

- **Preview**

Shows a preview of the circle meter with settings applied.

9.8 FFT graph

9.8.1 About FFT analysis

By displaying the FFT graph, FFT (Fast Fourier Transform) analysis processing can be performed simultaneously while monitoring and recording.

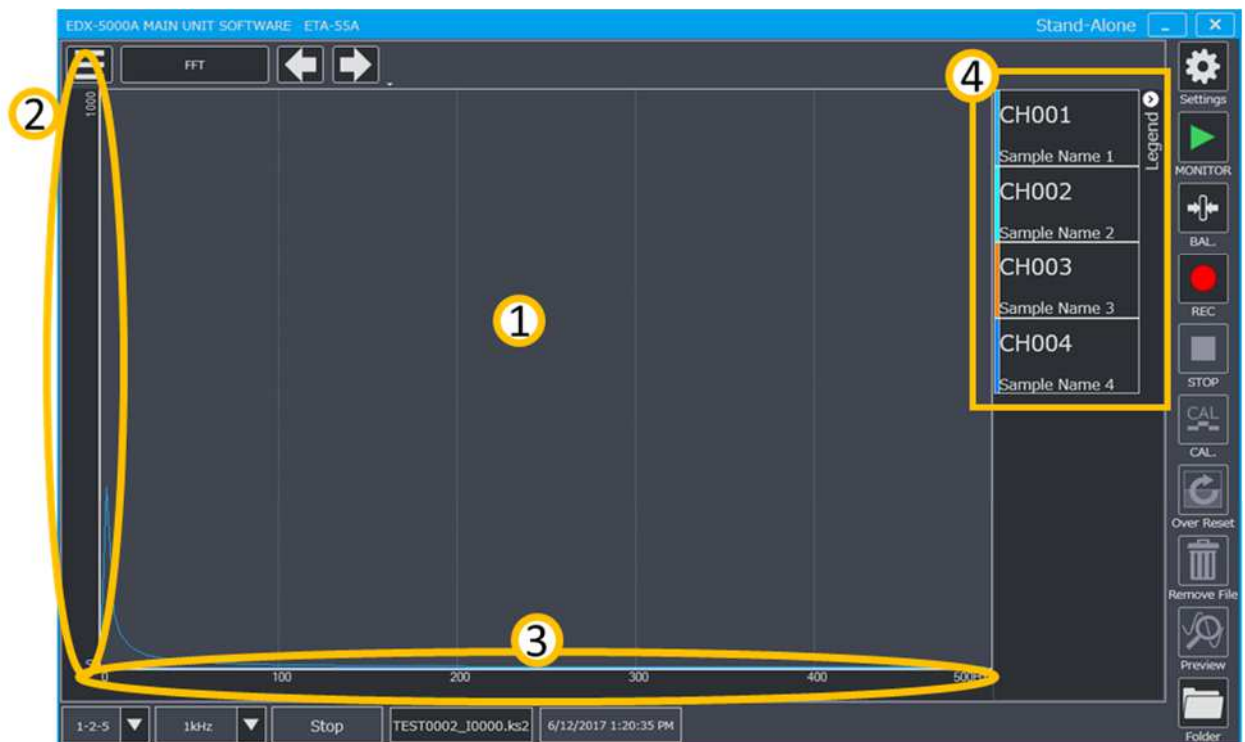
It can be used for frequency analysis, etc.

9.8.2 Limitations and Safety Precautions

When performing FFT analysis function, set the sampling frequency within the range of 3 Hz to 10 kHz. When a frequency outside of the range is set, FFT analysis cannot be performed.

9.8.3 Graph Window

Displays results of FFT analysis of the measurement CH data.



No.	Name	Function
1	Graph	Displays the result of measured value performed FFT analysis.
2	Y-axis scale	Displays/set scale values
3	X-axis scale	Displays/set scale values
4	Legend	Displays/set displayed CH information

- **Graph**

- (1) Waveform line: Displays the measured value as a waveform.
- (2) Parting line: Displays it parting line a dotted line when one or more parting lines are set.
(See Chap. II Section 9.1)
- (3) Crosshair cursor: For details, see Chap. II Section 9.1.
- (4) Error message: When the sampling frequency setting is outside the range, this is displayed.

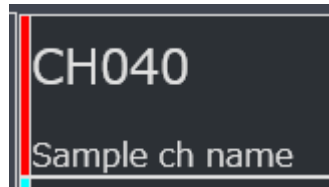
Available Sampling frequency between 1Hz and 10 kHz.

- **X-axis/Y-axis scale functions**

- (1) Displays/set the max/min display scale range: For details, see Chap. II Section 9.1.
- (2) Partition value: Displays the partition value when one or more parting lines are set.
(See Chap. II Section 9.1)

- **Legend**

- (1) Legend display: Displays the CH No. and CH name of each CH.



- (2) Display CH settings: See Chap. II Section 9.1.
- (3) Show/Hide Legend: Switch either showing or hiding each time you tap this bar.

9.8.4 Display settings screen

Graph Settings

1 FFT

Method: Linear Spectrum | Number of analysis data: 256 | Window function: OFF

2 Scale

X-Axis: 0 to 500 | Ticks: 4

Y-Axis: 0 to 1000 | Ticks: 0 | Auto | Lin | Log

3 Assignment of CH

Number of CH: 2 | Clear | Auto

No.	Colors	Thickness	CH
1	Red	1	
2	Cyan	1	

4 Legend

☒ CH No. ☒ CH Name

OK Cancel

- **FFT**

(1) Method:

Options: Linear Spectrum, Power Spectrum, Cross Spectrum*,
Auto Correlation, Cross Correlation*
(*: This is a method to perform analysis using 2 CHs.)

(2) Number of analysis data:

Options: 256, 512, 1024, 2048, 4096, 8192

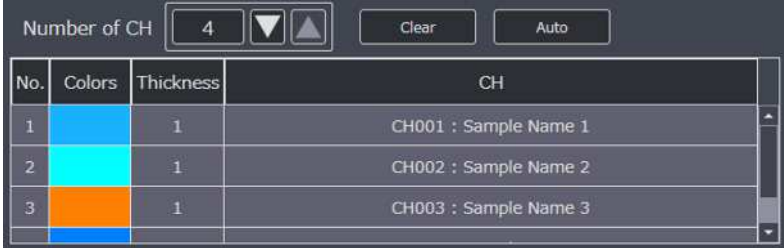
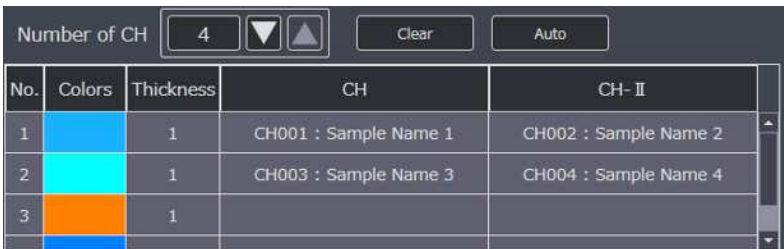
(3) Window function

Options: OFF, Hamming, Hanning, Fejér, Blackman, Gaussian

- **Scale**

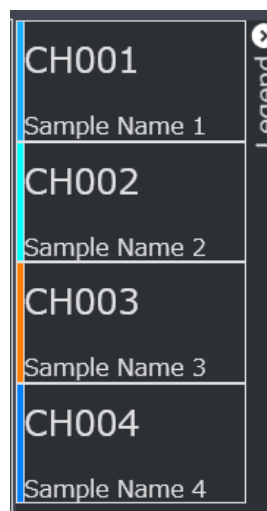
X-axis	Minimum value	Unavailable. Fixed to 0 Hz.
	Maximum value	Upper limit: Varies depending on the sampling frequency.
	Parting line	Setting range: 0 to 6
Y-axis	Minimum value	Lower limit: -1×10^8
	Maximum value	Upper limit: $+1 \times 10^8$
	Parting line	Setting range: 0 to 6
	Auto scale	Displays/set ON/OFF
	Lin/Log	Switches between Linear and Log.

- **Assignment of CH**

Number of CHs	Setting range: 0 to 4
No.	Displays the display data No. in serial form starting from 1.
Colors	Displays/set the color of waveform lines.
Thickness	Displays/set the thickness of lines. Setting range: 1 to 3
CH	Displays/set the CH displayed in a graph. Linear/Power/Cross Spectrum: Can display/set up to 4 CHs  Auto/Cross Correlation: Can display/set up to 4 combinations requires setting of “CH-II”. 

- **Legend**

This settings will be shown/hidden in the position shown in the diagram below.



9.8.5 Definition of Various Spectrums

ETA-55A 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 ETA-55A 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 ETA-55A.

● Linear Spectrum

ETA-55A 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 (Ex.: V, μE , 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 CH No. "****" of "Measuring CH****".

$$\text{Amplitude} \quad |X_a|: \sqrt{R_a^2 + I_a^2}$$

$$\text{Logarithm} \quad (dB): 20 \log \frac{|X_a|}{|X_a|_{\max}}, \quad |X_a|_{\max} : \text{Maximum amplitude}$$

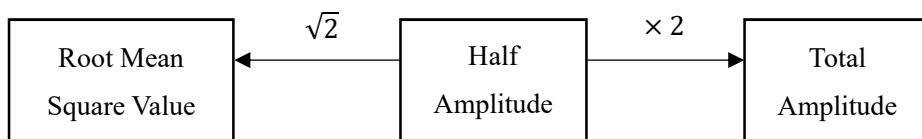
$$\text{Phase} \quad \theta_a: \tan^{-1} \frac{I_a}{R_a}$$

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.

$$|C_a| = \sqrt{C_a \cdot C_a^*} = \sqrt{\left(\frac{a_a - jb_a}{2}\right) \cdot \left(\frac{a_a + jb_a}{2}\right)} = \frac{1}{2} |X_a|$$

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. The power spectrum is expressed in the unit of square value of signal waveform (Ex.: V^2 etc.).

Logarithmic display of the power spectrum is a relative display with maximum amplitude of frequency components set to '0' dB.

Subscript α in the following equation denotes CH No. "****" of "Measuring CH****".

Amplitude	$ X_a :$	$R_a^2 + I_a^2$
Logarithm	(dB):	$10\log \frac{ X_a ^2}{ X_a ^2_{max}}$

Suppose $|X_a|^2$ is compared with power spectrum $|C_a|^2$ that is based on the 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.

$$|C_a|^2 = C_a \cdot C_a^* = \left(\frac{a_a - jb_a}{2} \right) \cdot \left(\frac{a_a + jb_a}{2} \right) = \frac{1}{4} (a_a^2 + b_a^2) = \frac{1}{4} |X_a|^2$$

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 α and β in the following equations denote CH No. "****" of "Measuring CH****", respectively.

Logarithmic display of the amplitude spectrum becomes a relative display with maximum amplitude of frequency components set to '0' dB. The phase spectrum is expressed by - 180 to 180 (Degree).

Amplitude	$X_{ab}:$	$X_b \cdot X_a^* = \sqrt{R_{ab}^2 + I_{ab}^2}$, X_a^* : Complex conjugate number of X_a
-----------	-----------	--

Logarithm	(dB):	$20\log \frac{X_{ab}}{X_{abmax}}$, X_{abmax} : Maximum amplitude
-----------	-------	---

Phase	$\theta_{ab}:$	$\tan^{-1} \frac{I_{ab}}{R_{ab}}$
-------	----------------	-----------------------------------

(Note)	$X_{ab} = X_b \cdot X_a^* = R_{ab} + jI_{ab}$
--------	---

- **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.'

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 CH No. "****" of "Measuring CH****".

$$\frac{F^{-1}|X_a|^2}{F^{-1}|X_a(0)|^2}$$

- **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'. 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 equations denote CH No. "****" of "Measuring CH****", respectively.

$$\frac{F^{-1}|H_{ab}|}{F^{-1}|H_{ab}(0)|}$$

(Supplementary Description)

When analysis object time series data is sampling rate $\Delta t \times \text{Number of data } N = \text{Cycle(Analysis interval)}T$, 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 abovementioned 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 ETA-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 frequency 10 kHz (Sampling rate $\Delta t = 10^{-4}$ 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.

9.9 Camera

By connecting a webcam to the USB port at the rear panel of EDX-5000A, it is possible to monitor and record moving images from the webcam while monitoring and recording the data.

Recorded moving images is saved as a separate file (AVI format) independent from the recorded data file.

The “Camera” window can display the moving image data from this web camera.

Note that this is different from the moving image recording using the high-speed camera.

For details about video recording using the high-speed camera, see Chap. II Section 10.10.

9.9.1 Limitations and Safety Precautions

- **About webcam**
 - (1) Use a **DirectX compatible webcam** (webcam that Windows 10 OS can recognize as an imaging device).
 - (2) **Only a single webcam can be connected at a time.** Do not connect more than two cameras.
 - (3) **Make sure the webcam is connected to the USB port at the rear panel of EDX-5000A.**
- **About recording conditions settings**
 - (1) **Sampling frequency setting must be set below 10 kHz.**
When set higher than 10 kHz, recording moving image is not available.
 - (2) When video recording, **only the manual recording mode can be set.** Opening the “Camera” screen **automatically switches the recording mode to manual recording.**
 - (3) Available “Number of Recording” is once only.
- **About recording**
 - (1) **To perform recording moving image, make sure the “Camera” screen is open.**
Video recording cannot be performed unless the “Camera” screen is opened.
 - (2) It is not possible to start recording data and moving image data at the exact same time.
 - (3) When recording moving images, the pause function (see: Chapter II Section 10.11) cannot be used.
 - (4) Only available in the master unit during synchronous operation.
For synchronous operation, see Chap. II Section 4.
 - (5) **When online controlling EDX-5000A, video recording cannot be performed.**
For online control, see Chap. II Section 5.
- **About video recording file**
 - (1) The frame rate (fps) of the moving image data captured with a webcam may not be consistent.
Therefore, **the video file may not match the recorded time of the recorded data file.**

9.9.2 Connecting webcam

Connect the webcam to the USB port at the rear panel of EDX-5000A.

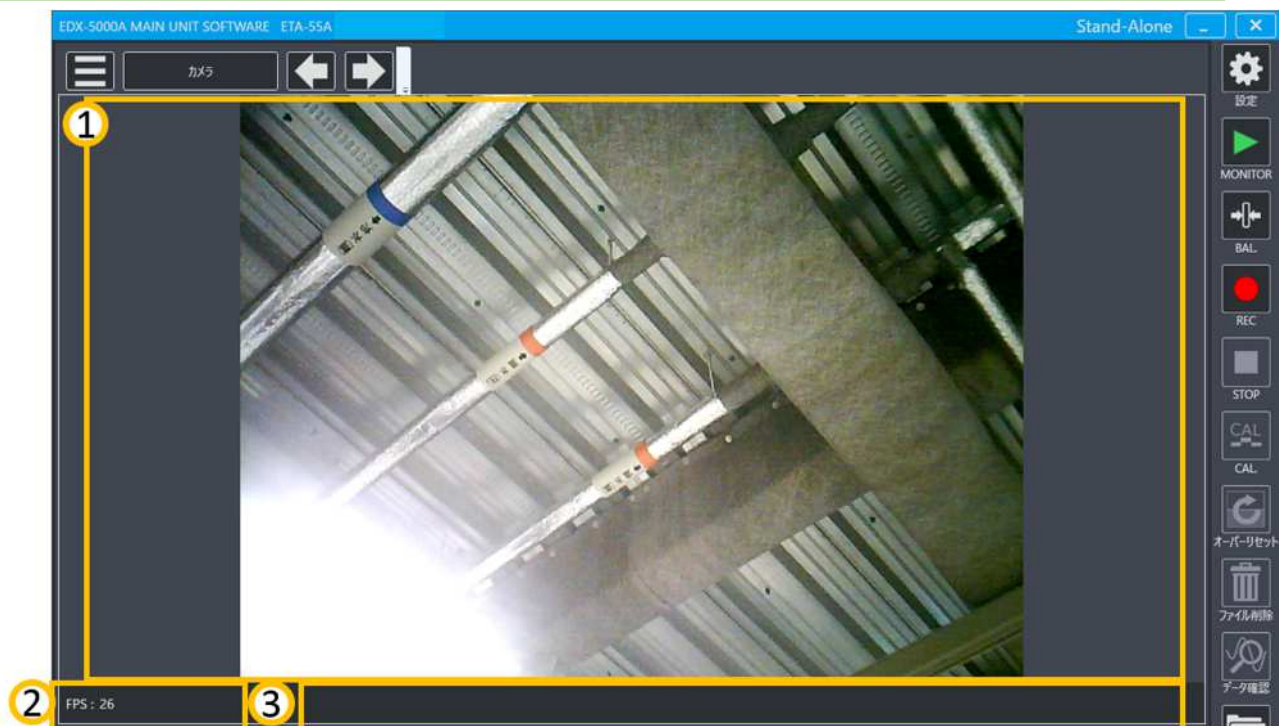
For details, Chap. I Section 11.1.

9.9.3 Video data monitor/record/playback

For monitor and record, see Chap. I Section 11.2.

For playback, see Chap. I Section 11.3.

9.9.4 Display screen



No.	Name	Function
1	Moving image data display	Webcam moving image data display
2	FPS	Frame rate display
3	Message display	Error contents and status display

- Moving image data display

Displays webcam video data.

Resolution/Size: 640x480

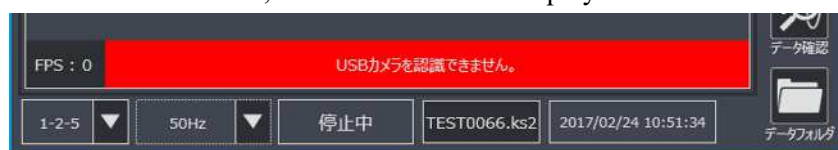
Frame rate: 30fps Max.

- FPS

Display Frame rate.

- Message display

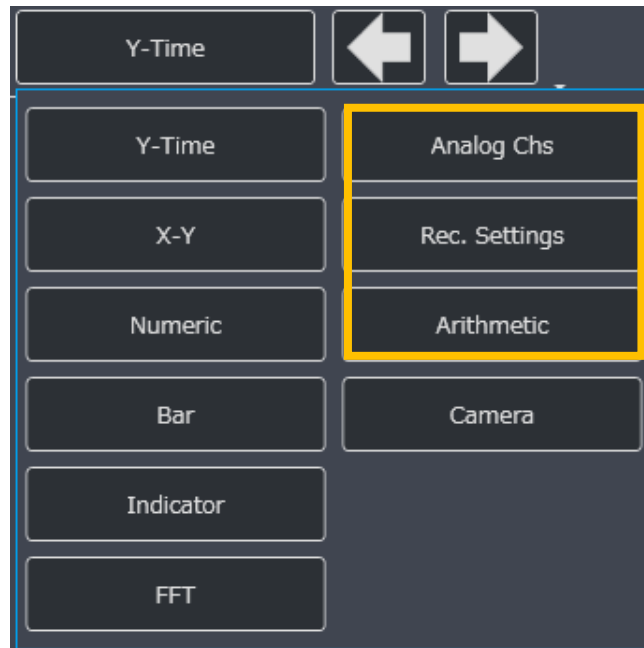
When an error occurs, the error details are displayed.



Also, “REC” is displayed during recording.

9.10 Other

You can also display the “Analog CHs”, “Recording Settings” and “Arithmetic Processing” settings screens, and change these settings.



CAUTION

Changes can only be made on conditions settings screens when measurement is stopping.

10 Measurement and Data Recording

This section describes actions that can be performed during measurement and data recording.

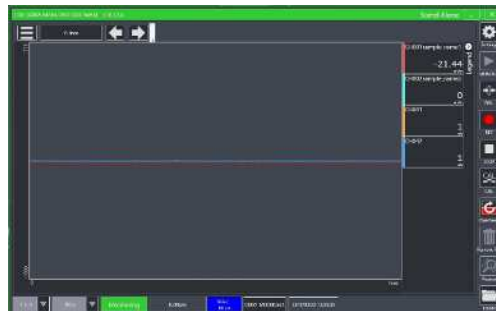
10.1 Start/Stop measurement

This manual refers to measurement as “monitoring”.

You can confirm measured values without recording data when monitoring data.

Further, the color of title bar will turn green when monitoring.

For details on starting/stopping measurements, see Chap. I Item 7.2.



10.2 Balance

Balance refers to balance adjustments.

This can be used to cancel the initial bridge unbalance in the amplifier and bring the current measured value closer to zero.

10.2.1 Preliminary settings

When executing the balance adjustment, turn the “BAL” item in “Analog CHs” settings “ON”.

(See Chap. II Item 2.1.2)

10.2.2 Execute the balance adjustment

Balance adjustments can be performed when the “BAL” button is located on the toolbar as shown in the image below.

If you cannot find this button, see Chap. I Item 14.1.2 for details on adding the “BAL” button.



CAUTION

Balance adjustments cannot be made during data recording.

10.3 CAL

“CAL” is a function for outputting the physical value equivalent to the range ratio set for the “CAL Range” item in the setting range to each analog CH input.

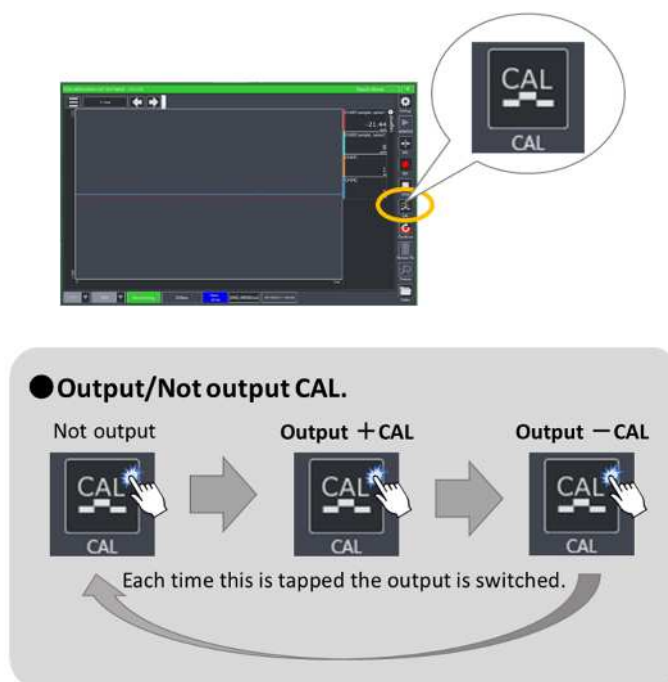
10.3.1 Preliminary settings

See the “CAL. Range” item described in Chap. II Item 2.1.4 to configure settings using list actions (see Chap. I Section 3.4).

10.3.2 Output/stop the CAL

Outputting/stopping the calibration can be performed when the “CAL” button is located on the toolbar as shown in the image below.

If you cannot find this button, see Chap. I Item 14.1.2 for details on adding the “CAL” button.



10.3.3 Output/stop the CAL condition display

The calibration value output status is displayed on the information bar.

However, the “Status of CAL” item will not appear on the information bar when set to Hide.

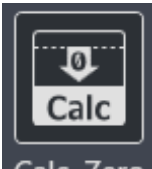
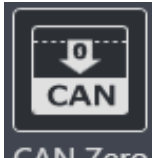
For details on show/hide item settings for the information bar, see Chap. I Item 14.2.2.

10.4 Offset Zero

This function substitutes the current measured value to the “Offset” value in the CHs settings and forcibly sets the current value to 0.

You can execute this function for the analog CHs, calculation CHs, CAN CHs.

There is a function button corresponding to each.

Analog CHs	Calculation CHs	CAN CHs
Offset Zero  Offset Zero	Calc. Zero  Calc. Zero	CAN Zero  CAN Zero

10.4.1 Preliminary settings

Offset Zero function ON/OFF settings:

Analog CHs: To set this to “ON”, see the “Offset Zero” item described on Chap. II Section 2.1.3.

Calculation CHs: To set this to “ON”, see the “Calculation Zero” item described on Chap. II Section 7.4.

CAN CHs: For details, see the separate volume "INSTRUCTION MANUAL EDX-5000A MEMORY RECORDER/ANALYZER (For EDX-3000B compatible software)".

10.4.2 Execute offset Zero

Offset Zero can be performed when the “Offset Zero”, “Calc. Zero” or “CAN Zero” button is located on the toolbar as shown in the image below.

If you cannot find this button, see Chap. I Item 14.1.2 for details on adding each button.

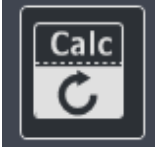


10.5 Offset Zero Clear

This function initializes all CH condition offset values to "0".

You can execute this function for the analog CHs, calculation CHs, CAN CHs.

There is a function button corresponding to each.

Analog CHs	Calculation CHs	CAN CHs
Offset Clear  Offset Clear	Calc. Clear  Calc. Clear	CAN 0 Clear  CAN 0 Clear

10.5.1 Preliminary settings

When you use this function, you set the Offset Zero function ON/OFF settings to "ON".

For details setting Offset Zero function ON/OFF, see Chap. II Item 10.4.1.

10.5.2 Execute offset Zero Clear

Offset Zero Clear can be performed when the "Offset Clear", "Calc. Clear" or "CAN 0 Clear" button is located on the toolbar.

If you cannot find these buttons, see Chap. I Item 14.1.2 for details on adding each button.

10.6 Over Reset

Performing over reset will reset the excessive input over status.

The status of the CH LED on the EDX-5000A will be also changed.

Over reset can be performed when the "Over Reset" button is located on the toolbar as shown in the image below.

If you cannot find this button, see Chap. I Item 14.1.2 for details on adding the "Over Reset" button.



10.7 Manual recording

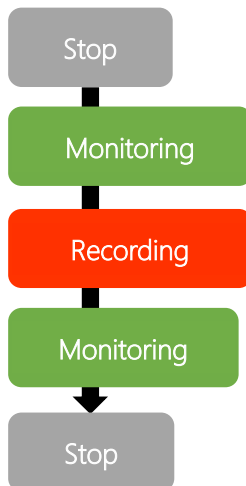
With manual recording you can use the “REC”/“STOP” button to start/stop data recording.

You can also perform recordings using the specified number of recorded data.

10.7.1 Settings

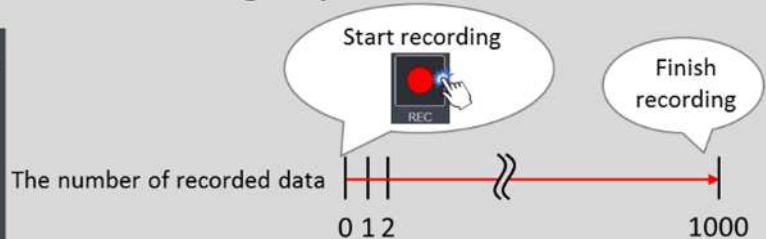
See Chap. I Item 4.2.1, Chap. II Item 3.2.2.

10.7.2 Recording procedure flow

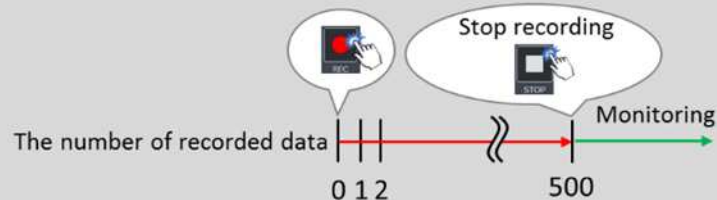


● Start/Finish of one recording

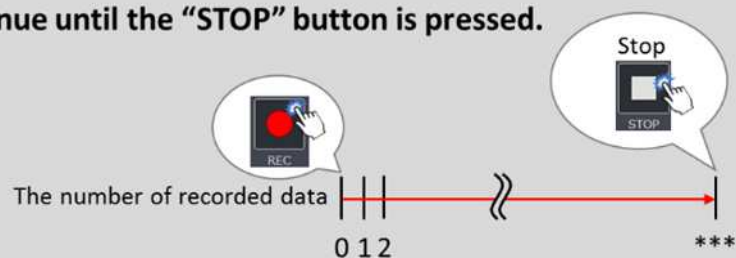
1. Recording will be finished after recording the pre-set number of recorded data.



◆ Tap “STOP” button if you want to stop recording midway.



2. The recording will continue until the “STOP” button is pressed.



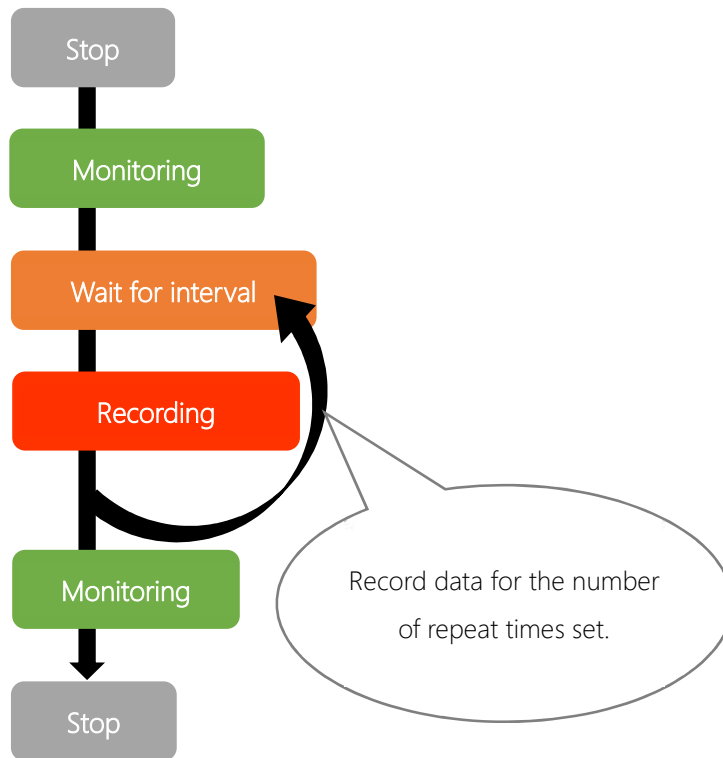
10.8 Interval recording

With interval recording you can record data in pre-set time intervals.

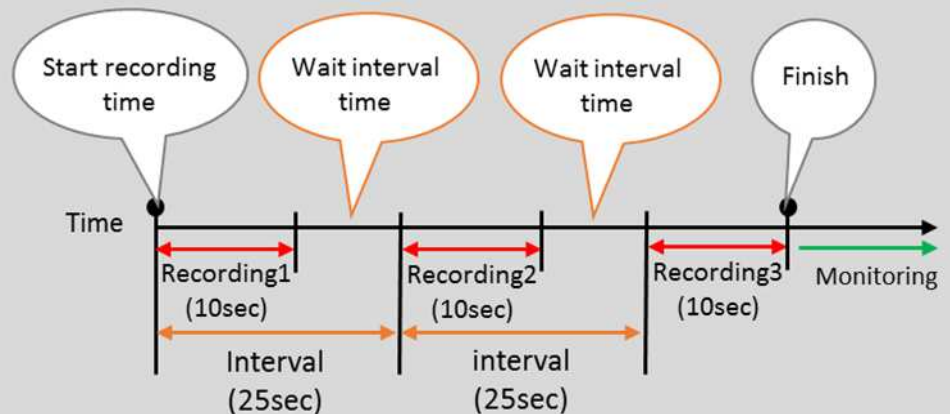
10.8.1 Settings

See Chap. I Item 4.2.2, Chap. II Item 3.2.3.

10.8.2 Recording procedure flow



● Ex.) : Recording flow when the “Number of Recording” is set to 2.



10.9 Trigger recording/Complex trigger recording

Analog trigger: Starts/stops recording when the measured value of the specified analog CH as the trigger source satisfied the trigger conditions.

Digital trigger: Starts/stops recording when the bit of the specified digital CH as the trigger source satisfied the trigger conditions.

External trigger: Starts/stops recording when the external trigger signal is received.

Complex trigger: Starts recording when trigger conditions are satisfied according to logical AND/OR conditions for analog trigger/digital trigger 4CH, external trigger 1CH, and manual trigger.

10.9.1 Settings

Operation method: See Chap. I Item 4.2.3

Functional description See Chap. II Item 3.2.4, Chap. II Item 3.2.5.

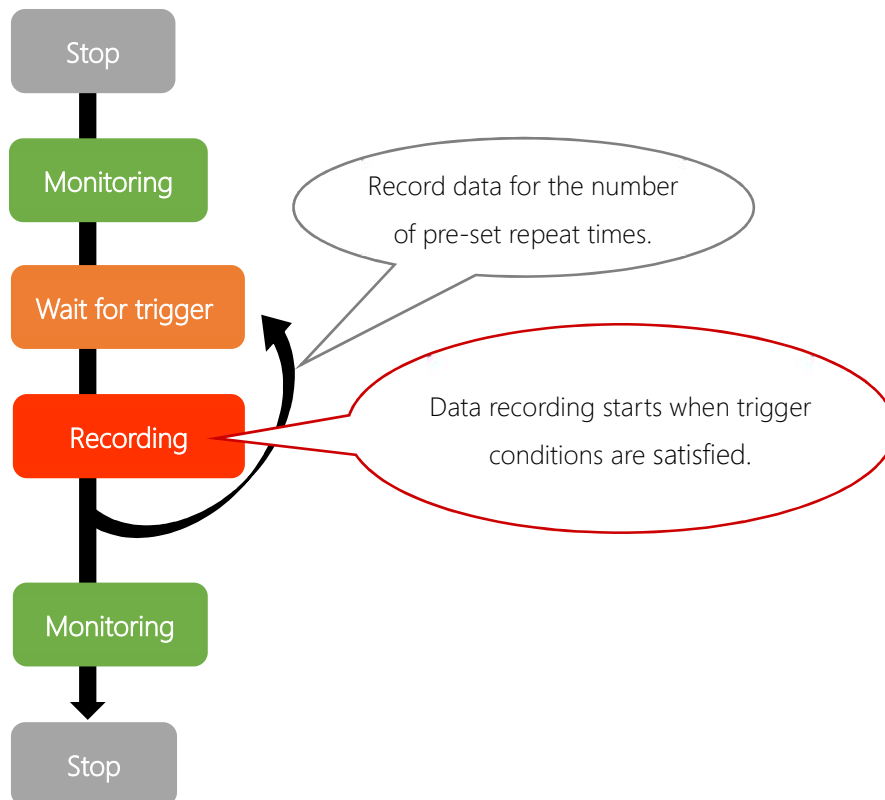
10.9.2 Recording procedure flow

Data recording starts when set start trigger conditions are satisfied.

Data recordings can be ended in the following two ways.

- (1) Stop data recording by specifying the number of recording data
- (2) Stop data recording by using the end trigger

However, you can also forcibly end a recording by tapping the “STOP” button during data recording.



10.10 Camera synchronized recording

When trigger condition is satisfied, it starts the video recording at the same time as the data recording.

Note that synchronized GPS time recording is disabled in this mode.

10.10.1 Preparation

When performing synchronized camera recording, connect the output from the TRG. OUT connector located at the rear of EDX-5000A to the external trigger input of the high-speed camera.

Also, if the high-speed camera has an external clock input feature, connecting to the CLK.OUT connector at the rear of the EDX-5000A allows recording to be performed in synchronization with the frequency output sent from the CLK.OUT.

For details about the setting division ratio of the external clock, see Chap. II Item 3.2.2.

10.10.2 Settings

For details, see Chap. II Item 3.2.6.

10.10.3 Recording flow

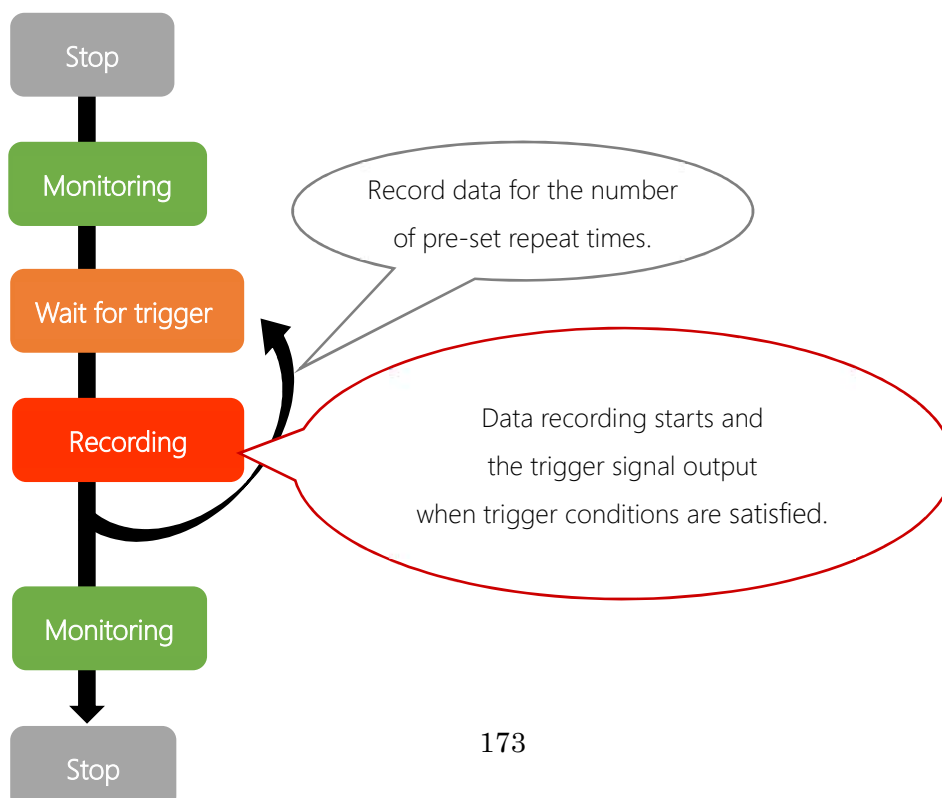
Data recording starts when set start trigger conditions are satisfied.

When the start trigger condition is satisfied, the trigger signal output is sent from the TRG. OUT connector of EDX-5000A.

There are two types of settings to stop recording.

- (1) Stop recording by specifying the number of acquired data
- (2) Stopping recording according to the end trigger

However, it is also possible to force stop the recording by pressing the “STOP” button during recording.



10.11 Pause

Tap the “REC” button during data recording to suspend the recording.

Recording settings that pause is available:

- In manual recording, when the “Until STOP” check box is marked for “Number of Recording Data” settings.
- In manual recording, when the “Number of Recording Data” settings is two or more, and the “Number of Recording” settings is once.



CAUTION

The pause function cannot be used when displaying the “Camera” screen (see: Chap. II Section 9.9).

10.11.1 Setting

For details, see Chap. II Section 1.1(7).

11 Previewing Data File

You can confirm the recorded data file on the Data Previewing screen.

The Data Previewing screen display the latest recorded data file*¹.

If the latest recorded data file does not exists, you can select any recorded data file on the File Open dialog.

Further, the Data Previewing screen can only be used when measurement has been stopped.

For details on the main process flow for data previewing and the operation method, see Chap. I Section 8.

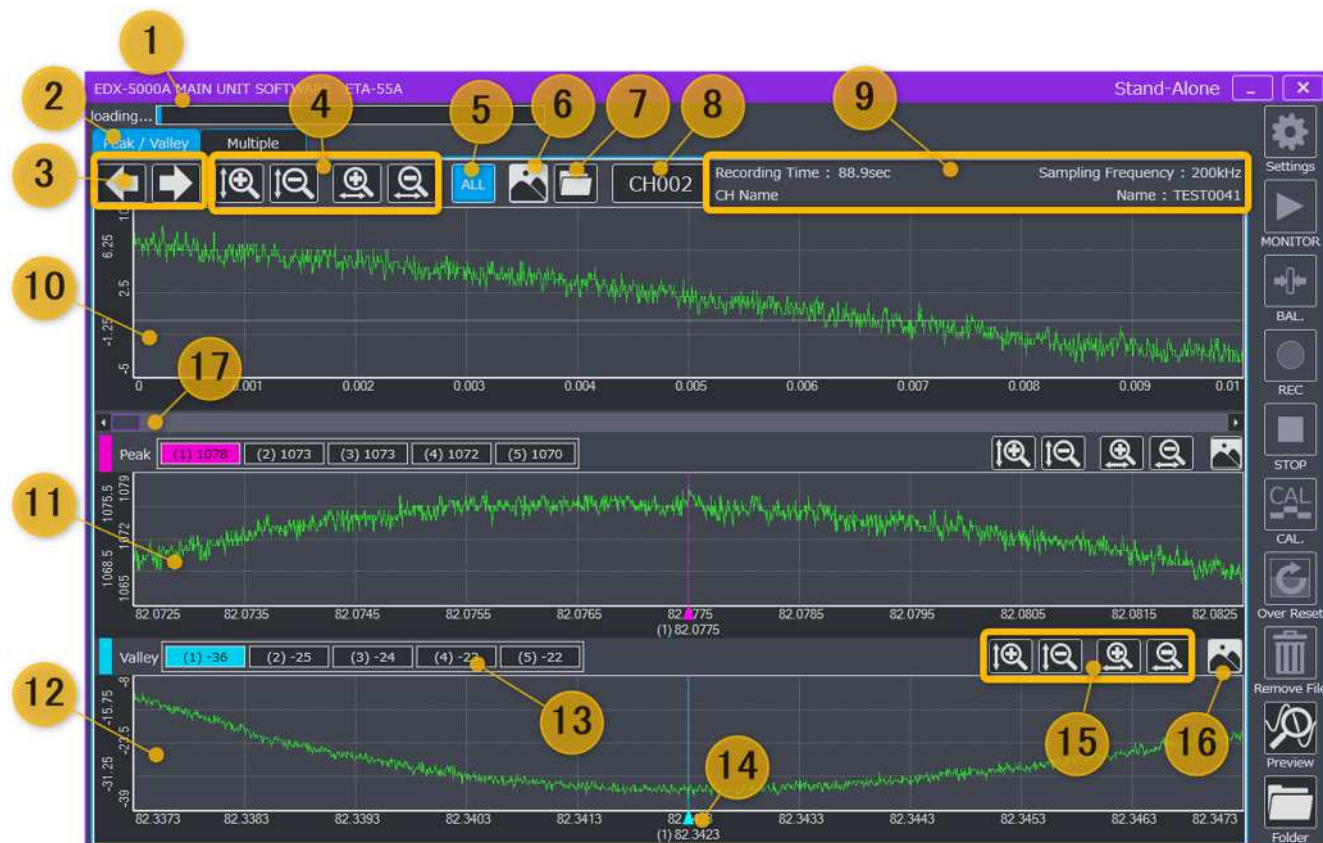
*1) The latest recorded data file: The last recorded data file after turning the EDX-5000A on.

11.1 Peak/Valley page

11.1.1 Overview

You can confirm the max/min values for each CH (up to 5 points) on the “Peak/Valley” tab page.

11.1.2 Screen configuration



No.	Setting item name	Function
1	Progress bar	Displays the progress of the recorded file loading process.
2	Tabs	Switches between the “Peak/Valley” page and the “Multiple” page.
3	Change CH button	Tap this button to go to the next CH in the order of CHs displayed.
4	Zoom in/out Y/X-axis	Zoom in/out the Y/X-axis in the recorded data display graph.
5	Display all data button	When this button is ON, display all data in the recorded data display graph.
6	Save image button	Saving an image of this screen.

7	File selection button	Opening File Open dialog and select the recorded data file.
8	CH button	Display/set the CH No. of displayed data.
9	CH & file information	Displays the file name, the recorded time, the sampling frequency and the selected CH name of the loaded recorded data file.
10	Recorded data display graph	Displays the recorded data for a CH.
11	Peak graph	Displays an expanded view of data near the maximum value.
12	Valley graph	Displays an expanded view of data near the minimum value.
13	Peak/Valley values	Displays Peak/Valley values for up to 5 points. Select data to expand.
14	Peak/Valley cursor	Peak/Valley value time axis line.
15	Zoom in/out the Y/X-axis in the Peak/Valley	Zoom in/out the Y/X-axis in the Peak/Valley Graph.
16	Save image button in the Peak/Valley	Saving an image of the peak or valley graph.
17	Scroll bar	Move display area in the recorded data display graph.

- **Progress bar**

Displays the progress of loading recorded files.

This displays while the recorded file loading process and not display after the file loading is finished.

You cannot use the display all data button (ALL button) while the file loading.

- **Tabs**

Tap “Peak/Valley” or “Multiple” to switch between the pages displayed.

- **Change CH button**

Switch to the next or previous CH one CH at a time.

- **Zoom in/out the Y/X-axis button**

Zoom in/out the Y-axis or X-axis as a threshold at the center of the recorded data display graph.

Zoom in the Y-axis:



Zoom in the X-axis:



Zoom out the Y-axis:



Zoom out the X-axis:



- **Display all data button**

When this button is ON, display the all recorded data in the recorded data display graph.

Note that you cannot use this while loading the recorded files.

Switch either ON or OFF each time you tap this button.



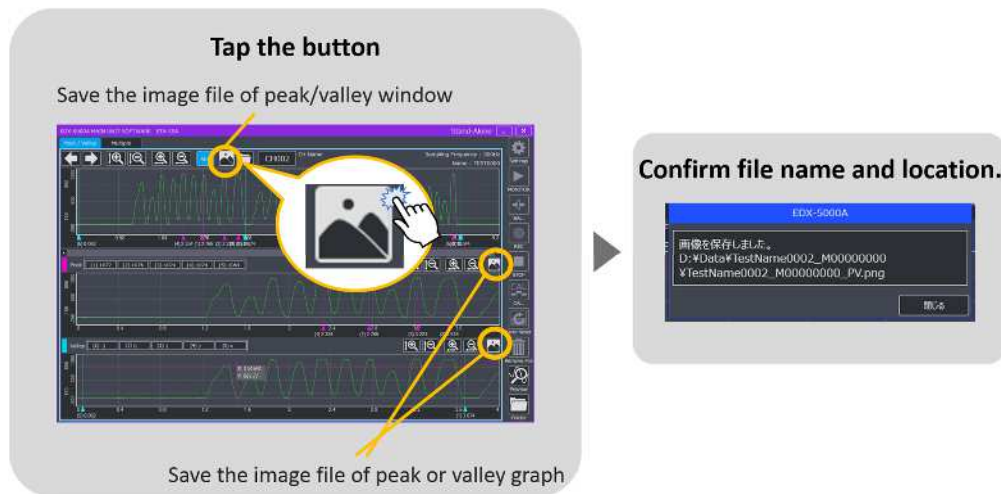
- **Save image button**

Tap this to save an image of peak/valley screen.

Format: PNG format

File name: Automatically determined.

Location: Automatically determined.



- **File selection button**

When you tap this, you can select any recorded file on the File Open dialog.

For details, Chap. I Item 8.4.



CAUTION

- You can select only the file of the KS2 format.
 - You can select only the recorded data file that is in the location to save the recorded data file*1.
- *1) The location to save the recorded data file: For details, Chap. I Item 4.1 or Chap. II Item 3.1

- **CH button**

Display/set the CH No. of displayed data.

If you change the displayed CH, tap this to open the settings dialog and set CH No..

- **All data display graph**

Displays recorded data for a single CH.

- **Peak/Valley graph**

Displays an expanded view of data near the peak/valley value for a single CH.

- **Peak/Valley values**

Displays up to 5 recorded peak/valley values.

- **The order of peak/valley data**



Peak: data1 > data2 > ... > data5



Valley: data1 < data2 < ... < data5

- **Switch the display peak/valley value**

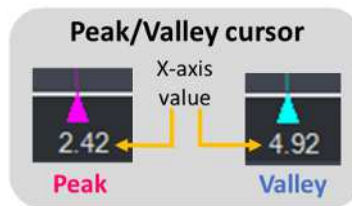
1. Tap the switched value



2. Peak/valley cursor and graph will be changed.

- **Peak/Valley cursor**

Display the position of peak/valley value selected in the “Peak/Valley values” field with a cursor.



- **Zoom in/out Y/X-axis in the Peak/Valley**

Zoom in/out the Y-axis or X-axis as a threshold at the center of the Peak/Valley graph.

- **Save image of Peak/Valley graph**

Tap this to save an image of peak/valley graph.

Format: PNG format

File name: Automatically determined.

Location: Automatically determined.

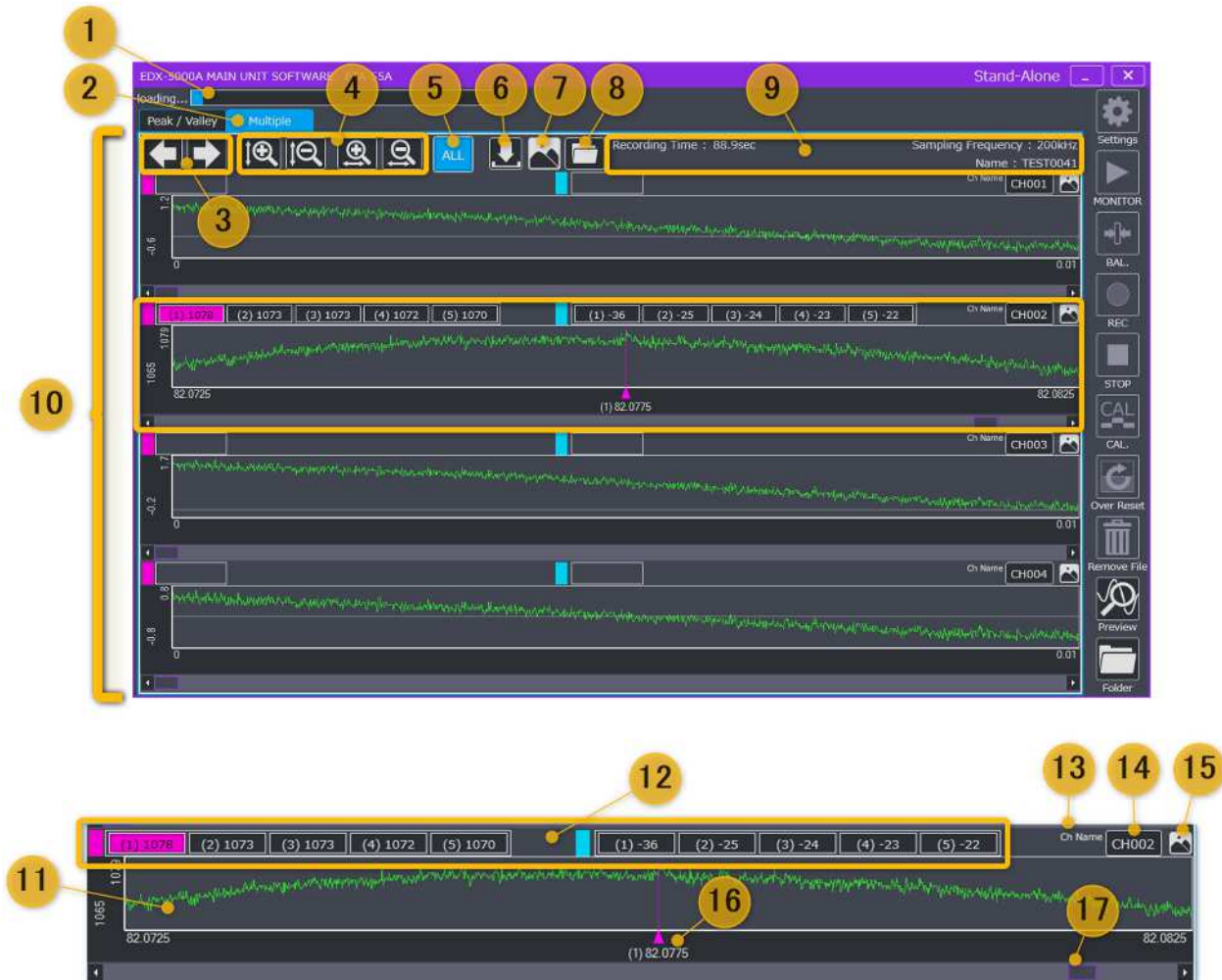


11.2 Multiple page

11.2.1 Overview

You can confirm the max/min values for four CHs (up to 5 points) on the “Multiple” page.
In addition, it can also be used for data comparison for arbitrarily 4 CH.

11.2.2 Screen configuration



No.	Name	Function
1	Progress bar	Displays the progress of the recorded file loading process.
2	Tabs	Switch between the “Peak/Valley” page and the “Multiple” page.
3	Change CH button	Tap this button to go to the next CH in the order of CHs displayed.
4	Zoom in/out Y/X-axis	Zoom in/out the Y/X-axis in the all graph.
5	Display all data button	When this button is ON, display the all data in the all graph.
6	Save Peak/Valley values button	Save peak/valley values of analog CH and calculation CH.
7	Save the image button	Save the image of “Multiple” screen.
8	File selection button	Opening File Open dialog and select the recorded data file.
9	Recorded file information	Displays the file name, the recorded time and the sampling frequency of the loaded recorded data file.

10	Display 4 graphs area	Display the recorded data display graphs for 4 CHs.
11	Recorded data display graph	Display the recorded data display graph for a single CH.
12	Peak/Valley values	Display max/min values for up to 5 points Select the max/min values to display
13	CH Name	Display the selected CH name.
14	CH button	Display/set the CH No. of displayed data.
15	Save the image of each graph	Save the image of each graph.
16	Peak/Valley cursor	Display the position of max/min values.
17	Scroll bar	Move display area in each graph.

- **Save peak/valley values button**

Tap this to save Peak/Valley values of analog CH and calculation CH in another file.

Format: CSV format

File name: Automatically determined.

Location: Automatically determined.



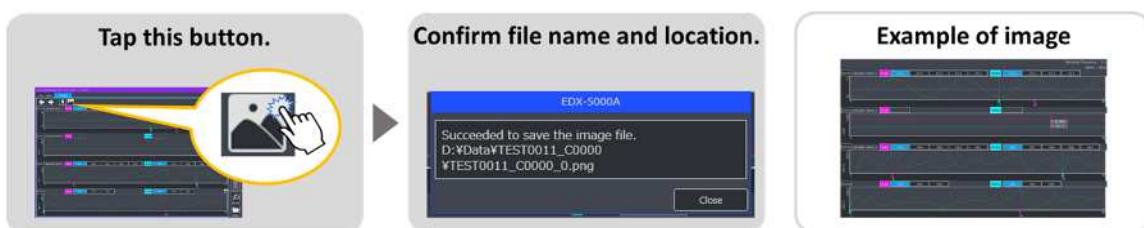
- **Save the image button / Save the image of each graph button**

Save the image of “Multiple” screen or the each displayed CH data graph.

Format: PNG format

File name: Automatically determined.

Location: Automatically determined.



- **Other**

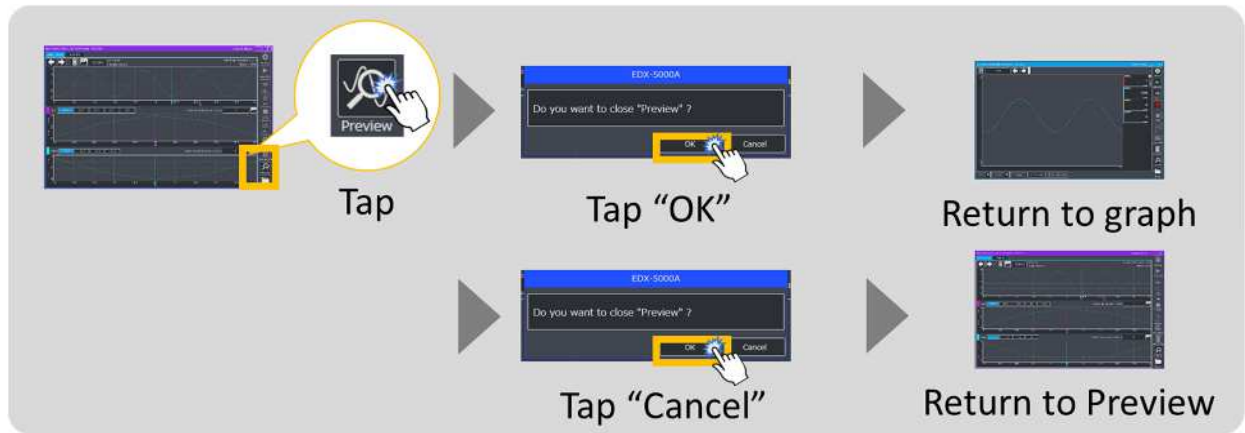
See Chap. II Item 11.1.2.

11.3 Close the Preview screen.

Tap the “Preview” button again and follow the dialog message to close the Preview screen.

When closing the Preview screen, you will be returned to the graph window.

Tap “Cancel” to return to the Preview screen.



III. Main Unit Software Specification Sheet

1 Measuring Conditions

(1) CH conditions Number of recordable data items

Measurement ON/OFF, measuring mode, range, high-pass filter, low-pass filter, digital high-pass filter, digital low-pass filter, balance ON/OFF, CAL range, calibration coefficient, offset, offset zero ON/OFF, unit, CH name, measurement range, rated capacity, rated output, Upper limit value, lower limit value, decimal digits (any display items can be selected), internal calibration sensitivity ON/OFF, input cable, cable correction value

(2) Number of recordable data items

Up to remaining disk space of built-in memory

(3) Manual measurement

Recording from REC to STOP, or pre-set number of data from REC

(4) Interval measurement

Automatic recording according to the pre-set starting time and recording interval

(5) Trigger measurement

Recording starts/stops according to pre-set trigger conditions.

• Common trigger conditions

End trigger:	Settable
Pre-trigger data:	When in 16-bit mode: Up to 4,194,304 data/CH When in 24-bit mode: Up to 2,097,152 data/CH
Post-trigger data:	When in 16-bit mode: Up to 4,194,304 data/CH When in 24-bit mode: Up to 2,097,152 data/CH

Trigger data correlates to the number of measuring CHs and the AD format

• Analog trigger conditions

Trigger CH:	Any CH selected from analog CHs
Trigger level:	Set in physical quantity
Trigger slope:	Positive/Negative

• Digital trigger conditions

Trigger bit:	Any 1 bit from a digital CH
Trigger level:	0,1

• External trigger conditions

Trigger slope:	Positive/Negative
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• Complex trigger conditions

Trigger source:	Select any 4 analog/digital CHs, any 1 external trigger CH, and any 1 manual trigger CH
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AND/OR:	AND/OR can be used for analog trigger, digital trigger and external trigger.
Trigger level:	Analog CHs : Set in physical quantity Digital CHs : Set to 0,1
Trigger slope:	Positive/Negative
(6) Load TEDS information	
Load TEDS information and configure settings automatically according to loaded conditions.	
(7) Load/Save measurement conditions 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 ELA-55A.	

2 Measuring Operation

Monitor measurement, recording start, pause, stop, balancing, and CAL output, etc.

2.1 Real-Time Processing

Monitoring and recording of data can be done simultaneously.

The sampling frequency up to 10 kHz is available.

(1) Moving image data recording with webcam.

Camera :	DirectX compatible webcam (recognized by the OS as an image device)	
Number of cameras :	1	
Resolutions :	MAX. 640×480	
Frame rate :	MAX. 30fps	
Saving file format :	AVI format *Resolution and frame rate depend on the camera. The webcam is optional.	
Measuring conditions :	Measuring Mode :	Manual, Manual (Set Record Data)

(2) Arithmetic Processing

Digital Filter :	Characteristics :	Butterworth filter (IIR)
	Type :	Low-pass filter, high-pass filter
	Order :	1 to 8
	Amplitude ratio of cutoff point :	-3dB
	Attenuation characteristics :	-6dB×N dB/oct. (N: Order of filter)
	*The digital filter can be used with the built-in low pass filter of conditioner cards.	

Arithmetic operation :	Number of calculation CH :	Up to 64 CHs	
	Calculation CH conditions :	Calculation ON/OFF, arithmetic expressions (up to 200 characters), unit, decimal digits, CH name (up to 40 characters), calculation zero, calculation zero value	
	Operator, constant :	Addition: "+" Subtraction: "-" Multiplication: "*" Division: "/" Power: "^" Pi: "PI" Specify calculation priority: "(", ")"	
	Arithmetic operations :	SQR Square Root ABS Absolute value SIN Sine COS Cosine TAN Tangent ASIN Arcsine (return value: radian) ACOS Arccosine (return value: radian) ATAN Arctangent (return value: radian) DSIN Arcsine (return value: degree) DCOS Arccosine (return value: degree) DTAN Arctangent (return value: degree) LOG Common Logarithm LN Natural Logarithm EXP Exponent HMX Max Principal Strain HMN Min Principal Strain HSM Max Shearing Strain SMX Max Principal Stress SMN Min Principal Stress SSM Max Shearing Stress DEG Direction of Principal Strain	

(3) FFT analysis

Analysis Type :	Linear spectrum, power spectrum, cross spectrum, auto correlation, cross correlation		
Window function :	OFF, Hanning, Hamming, Fejer, Blackman, Gaussian		
Number of analysis data :	256, 512, 1024, 2048, 4096, 8192		
Number of analysis windows :	Up to 4 CHs		

2.2 Saving file formats

Kyowa standard file format (KS2).

KS2 file version: 01.06

3 Monitor Screen

(1) Y-Time graph	X-axis: Time; Y-axis: Measured value (physical quantity) graph. Displays up to 8 CHs.
(2) X-Y graph	X-axis: Measured value; Y-axis: Measured value graph. Displays any combination of 4 CHs can be plotted on X- and Y-axis.
(3) Bar graph	Displays up to 80 CHs. Can display the maximum/minimum values for each CH.
(4) Circle meter	Displays any one CH in a circle meter.
(5) Numeric graph	Displays up to 80 CHs. Can display the maximum/minimum values for each CH.
(6) FFT graph	Displays the result of FFT analysis. Displays up to 4 CHs.
(7) Webcam	Displays the moving image captured by webcam.
(8) Input over display	Displays the value color, the background color, etc. of input over CHs in red.
(9) Graph scale	Can auto-scale the Y-axis in the Y-Time graph, the X- and Y-axis in the X-Y graph, and the Y-axis in the bar graph.
(10) Cursor display	Displays the cursor in the Y-Time graph and the X-Y graph.
(11) Number of simultaneously displayed windows	Up to 12 windows can be displayed based on the graphs open.
(12) Save image	Each graph can be saved as an image file.

4 Configuration

(1) Synchronous operation setting	Standalone, synchronous master, synchronism slave
(2) Other	Oscillator switching (internal/external), operation beep, balance standard value, AD data format switching (16/24 bits), option switch settings

5 GPS/Multi-channel CAN Optional Functions

(1) Recording CAN data Up to 512 CHs of CAN data can be recorded for each unit. (CAN data is saved in E4A file format.) [Note] CAN condition settings are configured in EDX-3000B compatible software.
(2) CAN trigger Starts/stops recording using analog triggers, digital triggers, and complex triggers. [Note] CAN condition settings are configured in EDX-3000B compatible software.
(3) Graph display Graph displays simultaneously showing numerical displays and analog data.
(4) Point Zero (Manual) Users can start manual measurements at the zero seconds mark (time at which msec is 0) using time data received from GPS satellites.
(5) Point Zero (Interval) Users can start interval measurements at the zero seconds mark (time at which msec is 0) using time data received from GPS satellites.
(6) Recording GPS data Users can monitor and record GPS data (latitude, longitude, speed, bearing, etc.). GPS data is saved in NMEA file format.

IV. Supplementary Document

1 How to show/hide the task bar (Windows 10)

- **To hide automatically**

- (1) Place the cursor at the bottom of the screen and display the task bar.
- (2) Right-click to open the menu and click "Properties"
- (3) In the "Taskbar" tab, put a checkmark in the "Auto-hide the taskbar" checkbox.
- (4) Click "OK" and apply the setting.

- **To fix task bar**

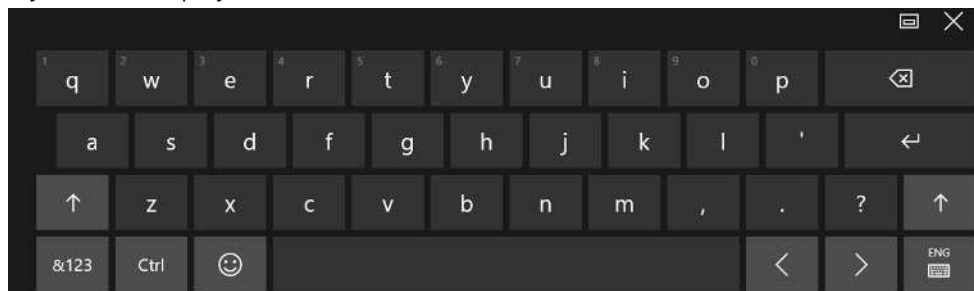
- (1) Place the cursor at the bottom of the screen and display the task bar.
- (2) Right-click to open the menu and click "Properties"
- (3) In the "Task bar" tab, put a checkmark in the "Lock the taskbar" checkbox.
- (4) Remove a checkmark from the "Auto-hide the taskbar" checkbox.
- (5) Click "OK" and apply the setting.

2 How to call up the onscreen keyboard in desktop mode (Windows 10)

- (1) Tap (click) the keyboard icon at the bottom right of the task bar



- (2) Onscreen keyboard is displayed.

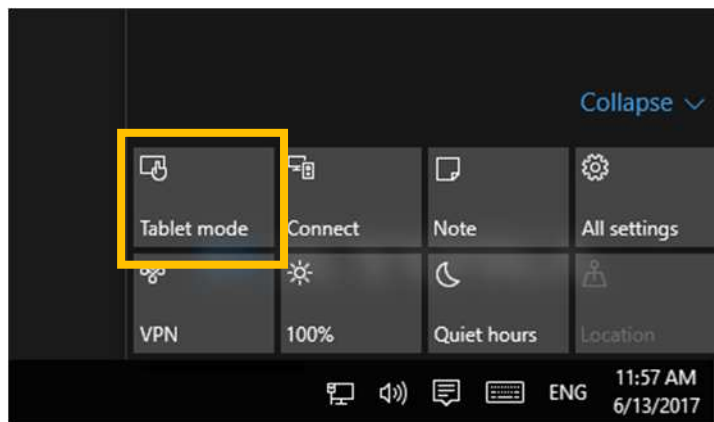


3 How to switch tablet mode (Windows 10)

- (1) Tap (click) the Action Center button at the bottom right of the task bar or swipe in from the right side of the screen to open the Action Center.



- (2) Enabling the Action Center Tablet Mode.

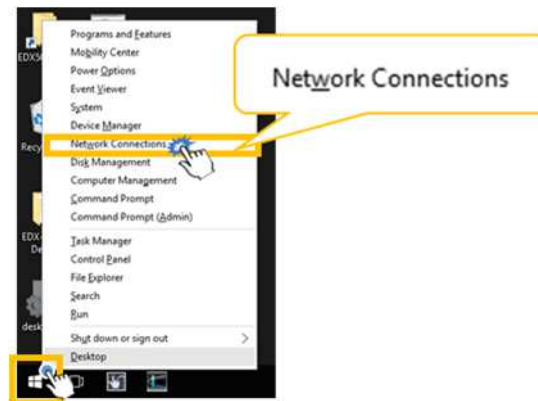


What is "Tablet mode"?

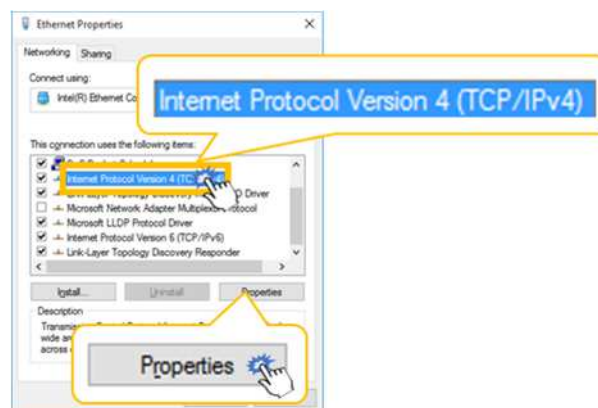
In Windows 10, you can choose either "Desktop mode" or "Tablet mode" display. The EDX-5000A uses "Desktop mode" as the default display mode. When set to "Tablet Mode", the display is optimized for touchscreen operations.

4 How to set a fixed IP address (Windows 10)

- (1) Long tap(right click) the start button
- (2) Select [Network Connections]



- (3) "Ethernet" is displayed.
- (4) Long Tap (right click) and hold "Ethernet" to open "Properties".
- (5) Tap (click) to select "Internet Protocol Version 4 (TCP / IPv4)".
- (6) Tap (click) "Properties" while selecting the option.



- (7) Select "Use the following IP address" and enter settings.
- (8) Click "OK". Fixed IP address setting is complete.

