

CHARGE AMPLIFIER CARD
for EDX-2000A

CCA-40A/CCA-40A-F

INSTRUCTION MANUAL

Thank you for purchasing KYOWA's product, CCA-40A/CCA-40A-F Charge Amplifier Card for EDX-2000A Memory Recorder/Analyzer.

Read this manual carefully to ensure the long life and reliability of the product.

The product should not be used in any manners other than as described in this Instruction Manual.

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The contents of this Manual are subject to change without prior notice.

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This Instruction Manual describes details of CCA-40A/CCA-40A-F Charge Amplifier Card (hereinafter referred to as the CCA card, unless otherwise specified) for EDX-2000A Memory Recorder/Analyzer (hereinafter referred to as the EDX-2000A).

Model	Antialiasing Filter Function
CCA-40A	None
CCA-40A-F	Provided

STANDARD ACCESSORIES

The following accessories are packed in the CCA card. When unpacking, check the contents to ensure that all accessories are enclosed.

Term and Conditions of Product Warranty	1
CCA Input Cable U-111	1

SAFETY PRECAUTIONS

Do not forget to read the “Safety Precautions” prior to use.

The CCA card is designed to be used according to the Specifications of the EDX-2000A. Do not use the CCA card in an environment exceeding the range of the above Specifications. Or, system failure may result in.

PRIOR TO USE

For safe use of the CCA card, be sure to read the following precautions.

KYOWA ELECTRONIC INSTRUMENTS CO., LTD. assumes no liability for any damages resulting from the user’s failure to comply with the safety precautions.

SAFETY SYMBOLS

For safety operation of the CCA card, the following “**WARNING**” and “**CAUTION**” symbols are used in “Safety Precautions” of this manual and indicated on the product.

 WARNING	Improper operation of the system may result in severe injury or death of the operator.
 CAUTION	Improper operation of the system may result in injury to the operator and physical damage to the system.

 WARNING
• WARNING ITEMS Take special notice of warning items described in the “EDX-2000A Memory Recorder/Analyzer Instruction Manual for Hardware. • INPUT VOLTAGE RANGE Do not input voltage higher than the specified range (± 5 V or less) in the specifications of this CCA card. Or, electric shock hazard, deterioration in the performance and damage may result in.

 CAUTION
• CAUTION Take special notice of warning items described in the “EDX-2000A Memory Recorder/Analyzer Instruction Manual for Hardware. • When installing or removing the CCA card to/from the EDX-2000A, do not touch any components parts of the CCA card. Or, system failure or damage may result in. • The CCA card is a conditioner card specified for a piezoelectric accelerometer (voltage output type). It cannot be used for strain gage transducers or servo type transducers. If it is connected to other sensors, system failure as well as card failure may result in. • Connect a case insulated (insulated from the ground) piezoelectric accelerometer to the CCA card. If a sensor with non-insulated case is used, separately conduct insulation with other measures or use an insulation stud mount made by sensor manufacturer. • Use a sensor accessory (or sensor manufacture’s made) low noise cable when connecting the card to the sensor. • Always use a shielded cable for input cable of the CCA card and optional output cable.

NOTATIONS USED IN THE INSTRUCTION MANUAL

Informational Notes

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

Examples of Notations

NOTE

Essential precautions required when handling the CCA card.

MEMO

Reference items required when handling the CCA card.

1. OUTLINE OF THE PRODUCT

1-1 OUTLINE OF THE CCA-40A

Features of the CCA-40A are described in the following.

- The CCA-40A card is a charge amplifier card for a piezoelectric accelerometer (voltage output type).
- Capable of 8-CH measurement with 1 card.
- Monitor output of CHs is ± 5 V with $\pm$ full scale of each range.
- The CCA card can load TEDS built-in sensor information. Based on the loaded sensor information, the CCA card automatically sets the most preferable channel conditions. Before using the TEDS built-in sensors, refer to separate volumes of “Instruction Manual for Loading TEDS Sensor Information” and “EDX-2000A Instruction Manual for Hardware and Software.”

1-2 OUTLINE OF THE CCA-40A-F

Features of the CCA-40A-F are described in the following.

- The CCA-40A-F card is a card provided with an antialiasing filter function to the CCA-40A.
Using the antialiasing filter function prevents aliasing caused by sampling.
- The antialiasing filter of the CCA card is composed of 8th butterworth type filter and attenuation obtained by entering $1/2$ of sampling frequency is -48 ± 5 dB.
- Since the antialiasing filter can be switched to ON/OFF, the CCA card can be used without using the antialiasing filter.
In addition, since it can be switched to ON/OFF for every CH, you can select whether the CH is using/ not using the antialiasing filter even in the same card.
- Cutoff frequency of the antialiasing filter automatically changes when setting the sampling frequency of the EDX-2000A. Therefore, it is not required to set the low pass filter. In addition, you can also use it when entering the external clock.

1-3 PRECAUTIONS WHEN USING THE CCA-40A

- Although the CCA card is correctly installed in the slot of the EDX-2000A, if “**DISABLE**” or “**UNKNOWN**” is displayed as the “**Card Type**” on the system menu screen, it is required to update the EDX-2000A hardware.

Contact KYOWA or our representative for updating the EDX-2000A hardware.

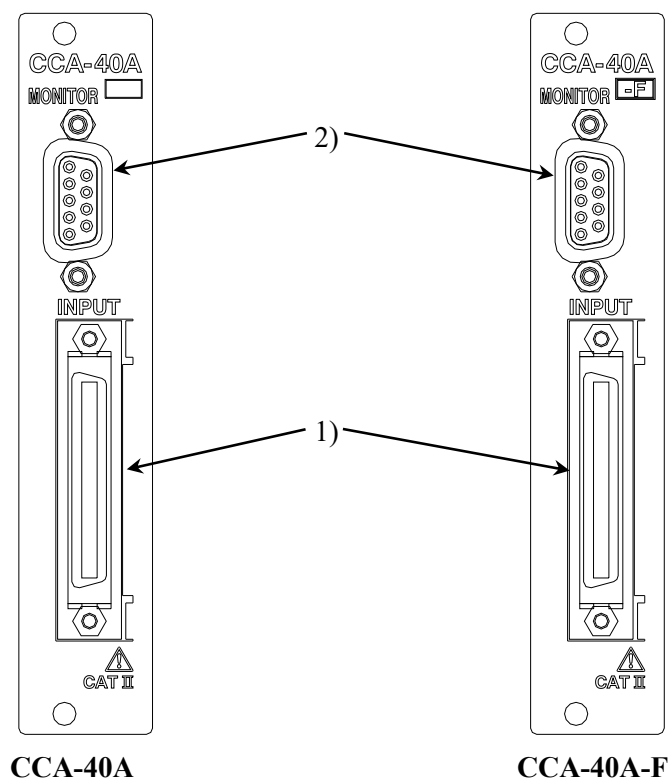
- After the power ON, the CCA card requires a certain time to become stable.

To have the stable measurement, preheat for more than **30 minutes**.

1-4 PRECAUTIONS WHEN USING THE CCA-40A-F

- Cutoff frequency of the antialiasing filter is set to **1/4 of the sampling frequency**. Set the sampling frequency to at least more than 4 times as large as the estimated input frequency.
- Compatible sampling frequency range of the antialiasing filter is **100 Hz or more**.

1-5 CONTROLS AND INDICATORS



- | | |
|----------------------------------|--|
| 1) Input connector | Input connector for 8 channels.
Connected to a CCA input cable U-111 (Accessory). |
| 2) Monitor output connector..... | Monitor output connector for 8 channels.
Monitor output voltage is ± 5 V with $\pm$ full scale of each range.
Monitor output cable U-62 (Optional) is connected. |

CH No. With CCA Cards Inserted Into The Respective Slots

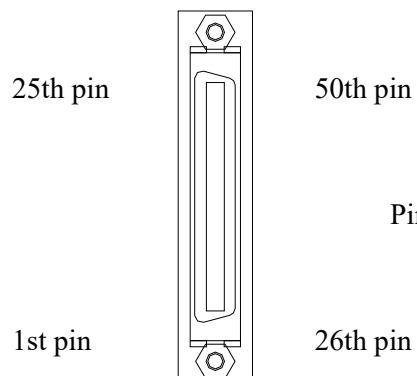
Slot							
1	2	3	4	5	6	7	8
CH1	CH9	CH17	CH25	CH33	CH41	CH49	CH57
CH2	CH10	CH18	CH26	CH34	CH42	CH50	CH58
CH3	CH11	CH19	CH27	CH35	CH43	CH51	CH59
CH4	CH12	CH20	CH28	CH36	CH44	CH52	CH60
CH5	CH13	CH21	CH29	CH37	CH45	CH53	CH61
CH6	CH14	CH22	CH30	CH38	CH46	CH54	CH62
CH7	CH15	CH23	CH31	CH39	CH47	CH55	CH63
CH8	CH16	CH24	CH32	CH40	CH48	CH56	CH64

* Slot No. 1: EDX-2000A power source connector side.

* Slot Nos. 5 to 8: Specified only for the EDX-2000A-64.

1-6 PIN ASSIGNMENT AND CONNECTION OF INPUT CONNECTOR

[Pin Assignment]



Pin assignment of input connectors is described in the following.

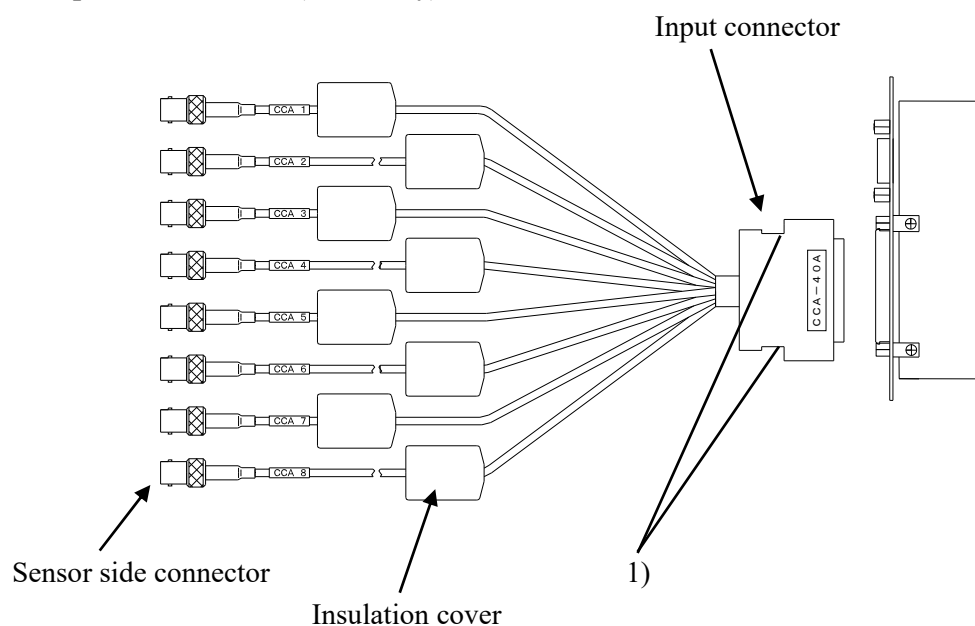
Pin Assignment of Input Connectors

Pin No.	Connection	Pin No.	Connection
25	CH1 A +12V	50	CH1 G Input COM
24	CH1 E GND	49	CH1 C -Input(-12V)
23	CH1 B NC	48	CH1 D +input
22	CH2 A +12V	47	CH2 G Input COM
21	CH2 E GND	46	CH2 C -Input (-12V)
20	CH2 B NC	45	CH2 D +Input
19	CH3 A +12V	44	CH3 G Input COM
18	CH3 E GND	43	CH3 C -Input (-12V)
17	CH3 B NC	42	CH3 D +Input
16	CH4 A +12V	41	CH4 G Input COM
15	CH4 E GND	40	CH4 C -Input (-12V)
14	CH4 B NC	39	CH4 D +Input
13	GND	38	GND
12	CH5 A +12V	37	CH5 G Input COM
11	CH5 E GND	36	CH5 C -Input (-12V)
10	CH5 B NC	35	CH5 D +Input
9	CH6 A +12V	34	CH6 G Input
8	CH6 E GND	33	CH6 C -Input (-12V)
7	CH6 B NC	32	CH6 D +Input
6	CH7 A +12V	31	CH7 G Input COM
5	CH7 E GND	30	CH7 C -Input (-12V)
4	CH7 B NC	29	CH7 D +Input
3	CH8 A +12V	28	CH8 G Input COM
2	CH8 E GND	27	CH8 C -Input (-12V)
1	CH8 B NC	26	CH8 D +Input

* NC: No connection

[Connection Method]

CCA Input Cable: U-111 (Accessory)



To connect, hold the plug case, push it into the slot, and then, tightly fasten with screws.

To disconnect, unfasten the screws, push in the above portions of item 1) and hold the plug case and pull.

Input connector:.....Model PCR-E50LMD-SL (HONDA TSUSHIN KOGYO made)

CCA input cableU-111:.....Model PCR-S50FS (Connector) (HONDA TSUSHIN KOGYO made)
Model PCR-LS50LA (Plug case) (HONDA TSUSHIN KOGYO made)

Sensor side connector:.....Model 050-JZ27C (BNC Jack) (YUETU SEIKI made)

1-7 THE CONNECTION OF THE SENSOR

Sensor installed on the test target should be insulated between output signal and sensor case (or mounting surface). If non-insulated type sensor is used, do not forget to conduct insulation between the sensor and test target.

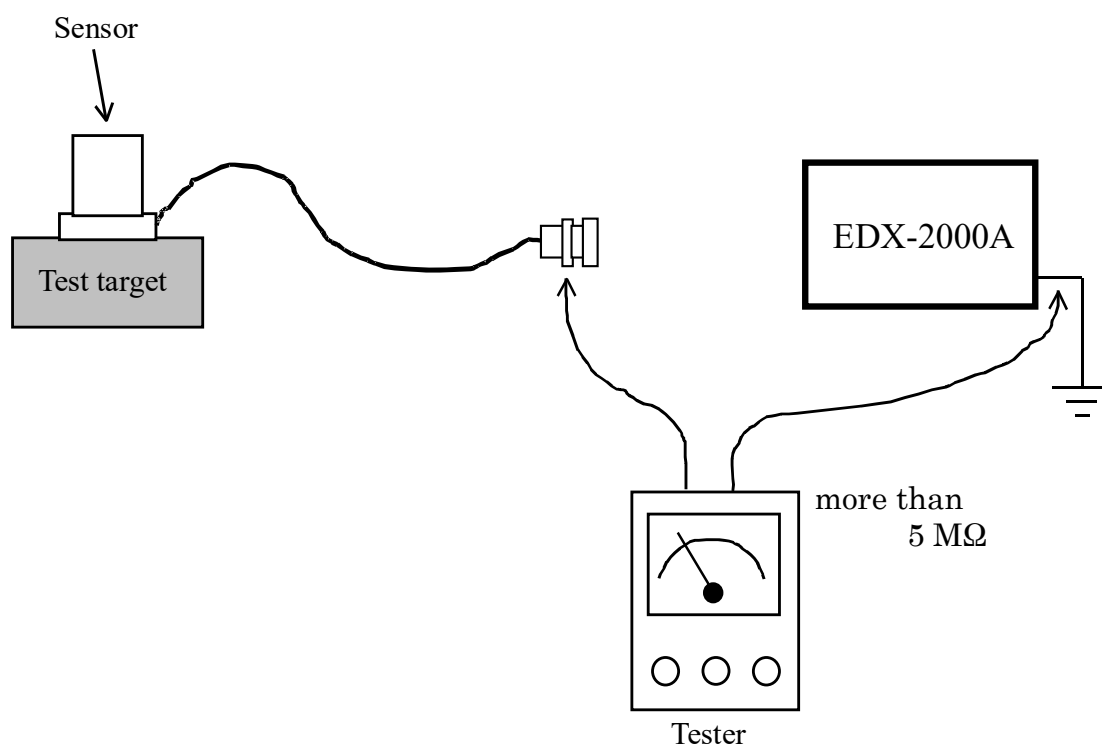
MEMO

Do not forget to connect the GND terminal of the EDX-2000A to ground. Or, interfering noise may become large.

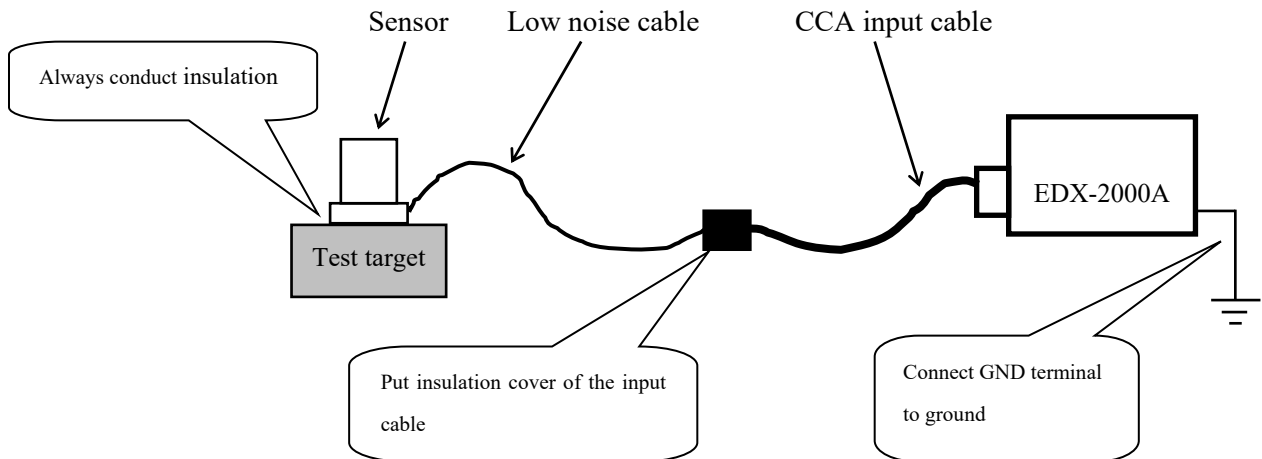
NOTE

Before connecting a sensor, do not forget to check insulation resistance is more than $5\text{ M}\Omega$ between the minus side (shell portion of a coaxial connector) of the sensor output and the EDX-2000A GND terminal with a tester, etc. Then, connect the sensor to the CCA-40A.

If the sensor resistance is less than $5\text{ M}\Omega$, check insulation between the sensor and test target and set it to have more than $5\text{ M}\Omega$. In addition for measuring the insulation resistance, set the applied voltage to less than $\pm 10\text{ V}$.



By connecting the low noise cable from the sensor to a sensor side connector of the CCA input cable (Accessory), measurement is available.



NOTE

Compatible sensor for the CCA card is a voltage type piezoelectric accelerometer.

No measurement is allowed if an electric charge output type piezoelectric accelerometer is directly connected.

In addition, use the sensor with insulated case (insulated from the ground) and insulated output.

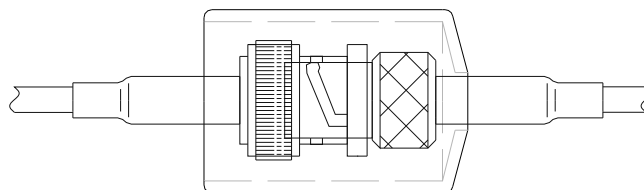
Take care not to connect sensors when the following three conditions are concluded at the same time. Or, the CCA card may be damaged.

- Using non-insulated type sensors.
- No insulation is conducted between non-insulated type sensors and test target.
- GND terminal of the EDX-2000A is not connected to earth ground.

In addition, if no insulation is conducted between the sensors and test target and potential difference between the minus side (shell portion of a coaxial connector) of the sensor output and the ground is more than 15 Vrms (Approx. ± 20 V), the CCA card is damaged.

Therefore, always use the insulated sensors or conduct insulation between the sensors and test target.

The input cable is provided with an insulation cover to cover the connector portion. After the connection, slide aside the insulation cover and cover the connector portion. (Refer to the following figure.)

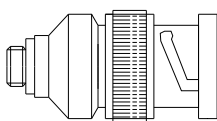


NOTE

The CCA card is equipped with sensor power supply (Constant current source: 4 mA, Applied voltage: Approx. 24 VDC) Take care and always connect appropriate sensors conforming to the specifications or, sensor failure may result in. In addition, take special care that the BNC connector shell of the input cable is applied with voltage of approximately -12 VDC.

If the low noise cable is miniature connector type, use an input adaptor: BNCP-C25J-A. (See the following figure.)

Input adaptor (The change of BNC and miniature connector) : BNCP-C25J-A (Optional)



Connect the low noise cable from the sensor to the miniature connector.

MEMO

Input adaptor BNCP-C25J-A is an optional. See “4. OPTIONALS.”

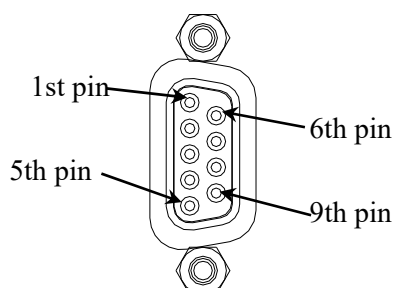
MEMO

The CCA card is equipped with a function that loads TEDS (Transducer Electronic Data Sheet) built-in sensor information. By loading the TEDS sensor information, you can set CAL coefficient, unit, etc. from the EDX-2000A.

For details of the TEDS built-sensor information, refer to separate volume of “Instruction Manual for Loading TEDS Sensor Information,” “EDX-2000A Instruction Manual for Hardware,” and “EDX-2000A Instruction Manual for Software.”

1-8 PIN ASSIGNMENT AND CONNECTION OF MONITOR OUTPUT CONNECTOR

[Pin Assignment]



Pin Assignment Of Monitor Output Connector

Pin	Signal Name
1	CH1 monitor output
2	CH2 monitor output
3	CH3 monitor output
4	CH4 monitor output
5	CH5 monitor output
6	CH6 monitor output
7	CH7 monitor output
8	CH8 monitor output
9	Monitor output COM

Pin Assignment Of Monitor Output When CCA Cards Are Inserted Into The Respective Slots

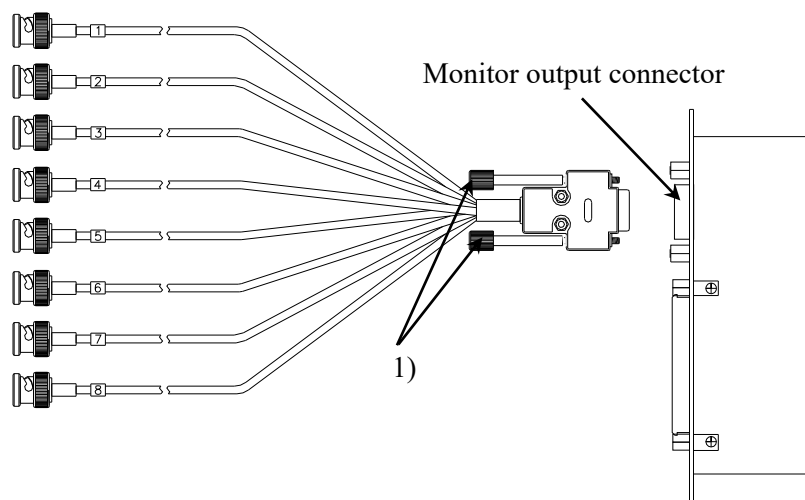
Slot Pin	1	2	3	4	5	6	7	8
1	CH1	CH9	CH17	CH25	CH33	CH41	CH49	CH57
2	CH2	CH10	CH18	CH26	CH34	CH42	CH50	CH58
3	CH3	CH11	CH19	CH27	CH35	CH43	CH51	CH59
4	CH4	CH12	CH20	CH28	CH36	CH44	CH52	CH60
5	CH5	CH13	CH21	CH29	CH37	CH45	CH53	CH61
6	CH6	CH14	CH22	CH30	CH38	CH46	CH54	CH62
7	CH7	CH15	CH23	CH31	CH39	CH47	CH55	CH63
8	CH8	CH16	CH24	CH32	CH40	CH48	CH56	CH64

* Slot 1: EDX-2000A power supply connector side.

* Slots 5 to 8: Specified only for the EDX-2000A-64.

[Connection Method]

Centralized Output Cable U-62 (Optional)



To connect, hold the plug case and push it in.
Fasten screws portions of item 1) and fix the cable.

To disconnect, unfasten the screws and pull out front the plug case.

Monitor output connector: Model XM3B-0942-132L (OMRON made)

Centralized output cable U-62: Model HDEB-9P (Connector) (HIROSE ELECTRIC made)
Model HDE-CTH1 (Plug case) (HIROSE ELECTRIC made)

MEMO

Centralized output cable U-62 connected to the monitor output connector is optional.
See “4. OPTIONALS.”

1-9 INSTALLATION OF CCA CARD BOARD

Note that the power switch should be turned OFF before installing the CCA conditioner card.

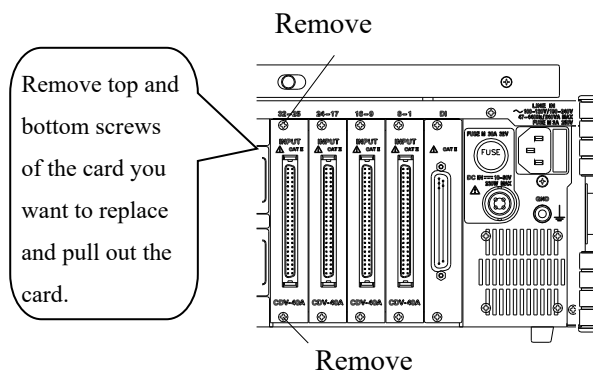
- 1) Remove screws at the top and bottom of the already existing conditioner card or dummy panel.
- 2) Pull out the conditioner card or dummy panel.

- 1) Slowly install the CCA card along the guide rail in the EDX-2000A and then, tighten the screws at the top and bottom of the conditioner card.

- 2) After replacing the conditioner card, power ON the EDX-2000A and check the startup screen. If the “**Card Type**” CCA-40A is displayed on the “**Slot No.**” column, it means that the conditioner card is properly replaced.

If “**DISABLE**” or “**UNKNOWN**” is displayed as the “**Card Type**” on the system menu screen, it is required to update the EDX-2000A hardware.

Contact KYOWA or our representative for updating the EDX-2000A hardware.



CCA-40As are installed in slots 1 and 2.	
Slot No.	Card Type
1	CCA-40A
2	CCA-40A
3	* * *

NOTE

When installing the CCA card in the EDX-2000A, do not touch any component parts of the CCA card. Or, performance failure or damage of the card may result in.

2. HOW TO SET CCA-40A

How to set the CCA card is conducted entirely from the EDX-2000A screen.

Settings and measurement of the CCA card are conducted in due order as described in the following table.

<u>EDX-2000A Initial Screen</u>						
↓						
<u>2) Condition</u>						
↓						
<u>1) Channel Cond</u>						
Item	(1) MEAS Channel	(2) Mode	(3) Range	(4) Lopass Filter	(5) CAL ON/OFF	(6) CAL Range
Selections	Measure Not measure	Voltage Reserve * ¹	5000 mV 2000 mV 1000 mV 500 mV 200 mV 100 mV 50 mV 20 mV OFF	FLAT 10 kHz 3 kHz 1 kHz 300 Hz AUTO * ²	ON OFF	DC 100% DC 50% AC 100% AC 50%
↓						
<u>EDX 2000A Initial Screen</u>						
↓						
<u>1) Measurement</u>						

*1 Reserved mode. Usually not used.

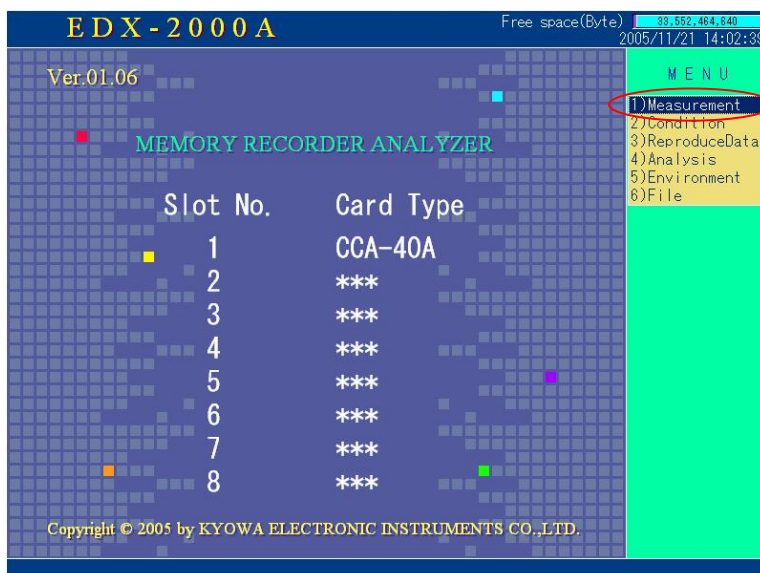
*2 Displayed only for CCA-40A-F.

<CCA-40A Setting Procedures>

EDX 2000A Initial Screen

When the CCA card is properly installed in the EDX-2000A, CCA-40A appears as the “Card Type” in the “Slot No.” column. (The screen at the right shows that ‘1’ CCA-40A is installed in the slot No. 1)

Here, select the item 2) Condition from the main menu and press the **ENTER** key.



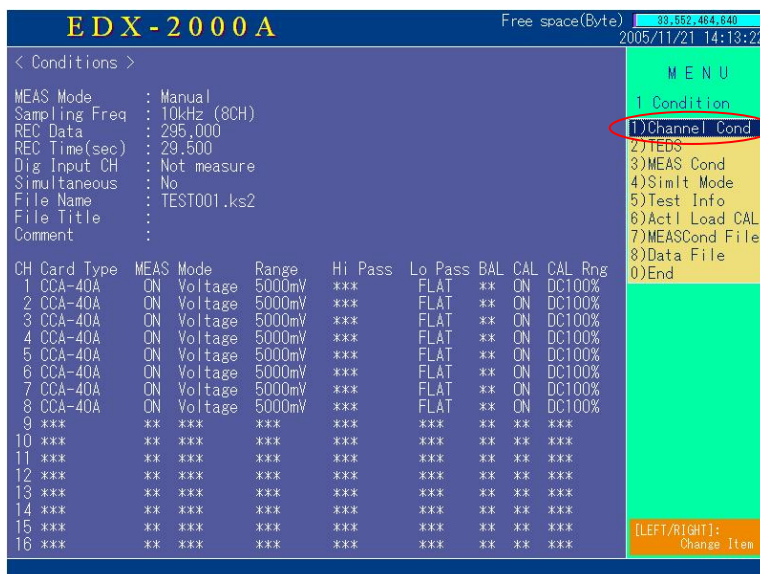
NOTE

If no conditioner card is installed, “Card Type” in the “Slot No.” column is indicated with “***.”

Condition Setting Screen

Select item 2) <Condition> from the main menu on the initial screen to display the screen at the right.

Here, point the cursor to <Channel Cond> on the <Condition> main menu and press the **ENTER** key.



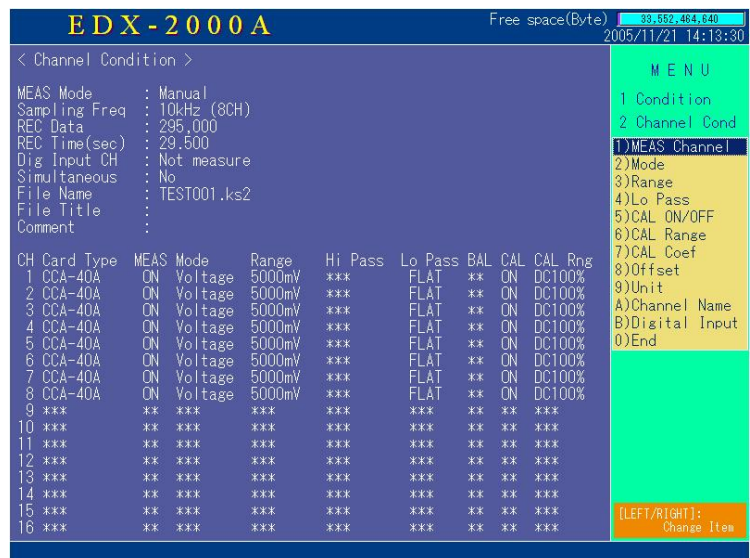
NOTE

If no conditioner card is installed, CH column and items that are not available for setting conditions are indicated with “*.”

Channel Cond

Select item 1) <Channel Cond> from <Condition> main menu to display the screen at the right.

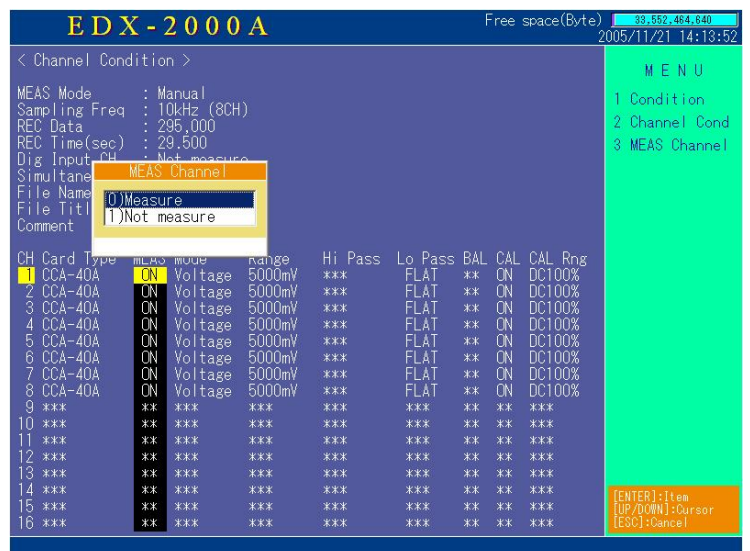
Here, point the cursor to the desired item and press the **ENTER** key.



MEAS Channel

Select 1) <MEAS Channel> from the <Channel Cond> menu to display the screen at the right with a “MEAS Channel” setting window.

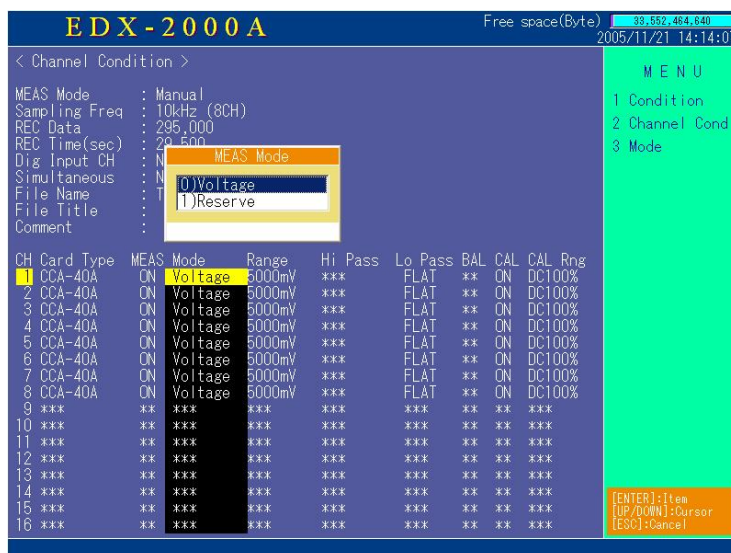
Point the cursor to either 0) Measure or 1) Not measure for every channel and press the **ENTER** key.



Mode

Select 2) <Mode> from the <Channel Cond> menu to display the screen at the right with a “Mode” setting window.

For normal use, select 0) Voltage.



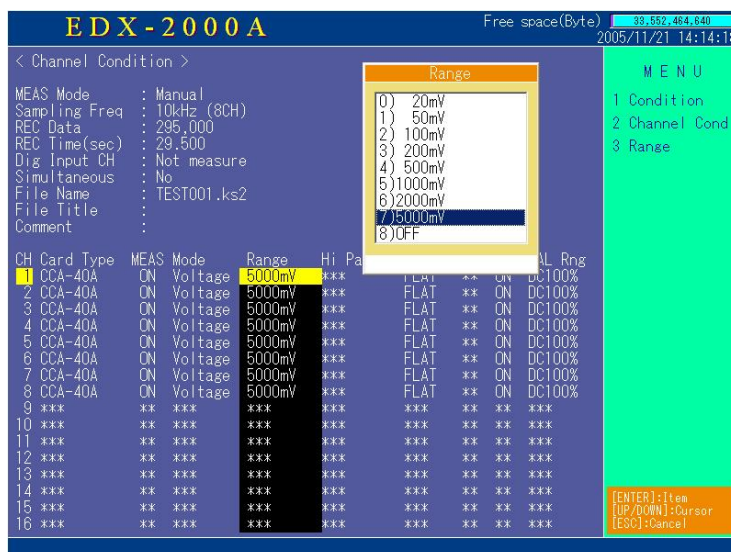
NOTE

Since item 1) “Reserve” is a reserved mode, do not select the “Reserve” mode. Or, no measurement is made for signal output from sensor that is connected to a CH with “Reserve” mode.

Range

Select 3) <Range> from the <Channel Cond> menu to display the screen at the right with a “Range” setting window.

Here, set the desired range appropriate for sensor output signal.



It is required to select an appropriate measuring range according to the magnitude of the input signal. In addition, set the measuring range by considering the following.

- When the input signal is exceedingly smaller than the preset measuring range, measuring accuracy may decrease.
- When the input signal is larger than the preset measuring range, both recording data and monitor output signal become saturated.
- The smaller the measuring range is, the higher becomes the gain of the card. Therefore, the noise tends to become larger.
- Set the “Range” to OFF. Then, output would not change and remain to be approximately 0 V.

Examples of setting range is described in the following:

When the accelerometer sensitivity = 10.20 [mV/m/S²] (100 mV/G, 1 G=9.80665 m/S²) and estimated maximum acceleration = 147.1 [m/S²] (15 G), the estimated maximum input voltage shall be obtained by the following expression.

$$147.1 \text{ [m/S}^2\text{]} \times 10.20 \text{ [mV/m/S}^2\text{]} \approx 1500 \text{ [mV]}$$

Therefore, select '2000 mV' for the setting range.

In addition, when 2000 mV is entered, monitor output voltage is 5 V.

Apply acceleration to the accelerometer. When the recorded data is 1234 [mV] and monitor output is 3.085 [V], acceleration is obtained by calculating the recorded data and monitor output on a pro-rata basis as described in the following expression.

From recording data

$$\text{Acceleration} = 1234 \text{ [mV]} \div 10.20 \text{ [mV/m/S}^2\text{]} \approx 121.0 \text{ [m/S}^2\text{]} (12.34 \text{ G})$$

From monitor output

$$\text{Acceleration} = \frac{3.085 \text{ [V]}}{5 \text{ [V]} (\text{monitor output FS})} \times \frac{2000 \text{ mV (Range)}}{10.20 \text{ [mV/m/S}^2\text{]}} \approx 121.0 \text{ [m/S}^2\text{]} (12.34 \text{ G})$$

In addition, set CAL coefficient to (1/Sensitivity of accelerometer) and set the unit to [m/S²]. Then, the obtained data can be measured in physical quantity.

NOTE

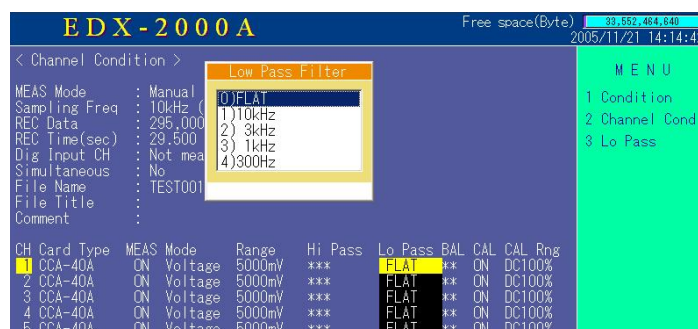
For how to set the CAL coefficient and unit, refer to “4-1-9 Setting CAL Coefficient” and “4-1-11 Setting Unit” in EDX-2000A Memory Recorder/Analyzer Instruction Manual for Software.

For the TEDS built-in sensor, you can set the CAL coefficient and units from the separate volume of “Instruction Manual for Loading TEDS Sensor Information.”

Lo Pass

Select item 4) <Lo Pass> from the <Channel Cond> menu to display the right screen with “Low Pass Filter” setting window.

Here, set an appropriate low pass filter according to the CCA card type.



CCA-40A: FLAT, 10 kHz, 3 kHz, 1 kHz, and 300 Hz

CCA-40A-F: FLAT, 10 kHz, 3 kHz, 1 kHz, 300 Hz, and AUTO

When AUTO is selected, antialiasing filter becomes “ON” and cutoff frequency is set to 1/4 of the sampling frequency. (See “1-4.”)

Using the low pass filter enables to remove high frequency component in the sensor output signal. It is especially effective for output signal with exceeding noise. When the input signal sinusoidally (sin functionally) varies, set the low pass filter to around 2 to 5 times as large as the input signal frequency. If the input signal rapidly changes, set the low pass filter to approximately 10 times as large as the signal frequency.

NOTE

Sampling frequency range usable for the antialiasing filter is 100 Hz or more.

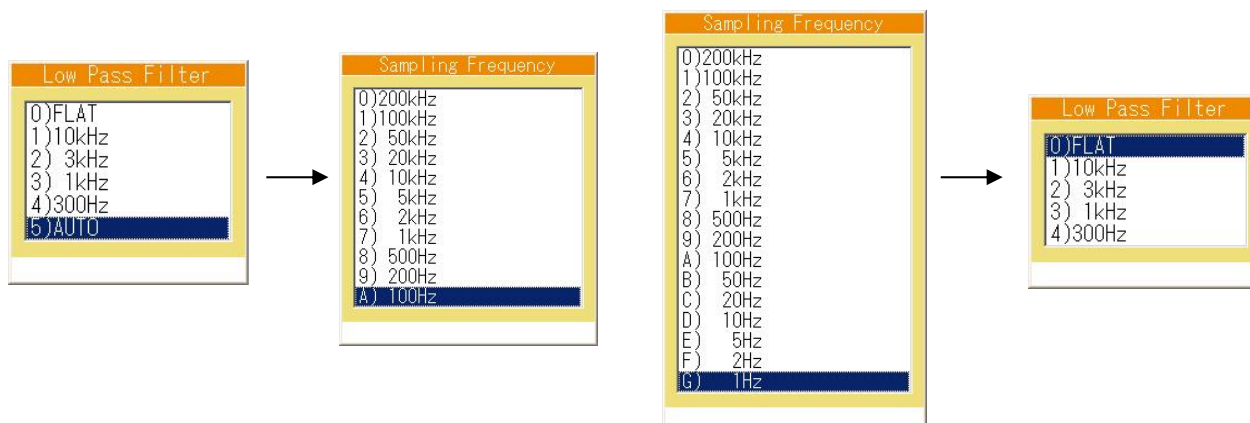
Although the card type is CCA-40A-F, if “AUTO” is not displayed on the “Low Pass Filter” setting window, check whether or not the sampling frequency is set to less than 100 Hz.

(“Conditions” → “Meas Cond” → “Sampling”)

In addition, if “Low Pass Filter” of even 1 measuring CH is set to “AUTO,” sampling frequency of less than 100 Hz would not appear on the “Sampling Frequency” setting window. (See the following left figure.)

When setting the sampling frequency of less than 100 Hz, set the low pass filter of all the channels to other than “AUTO.”

On the contrary, if the sampling frequency is set to less than 100 Hz, “AUTO” would not appear on the “Low Pass Filter” setting window. (See the following right figure.)



When it is set to “AUTO”.

Sampling frequency of less than 100 Hz is not displayed.

When sampling frequency is set to less than 100 Hz.

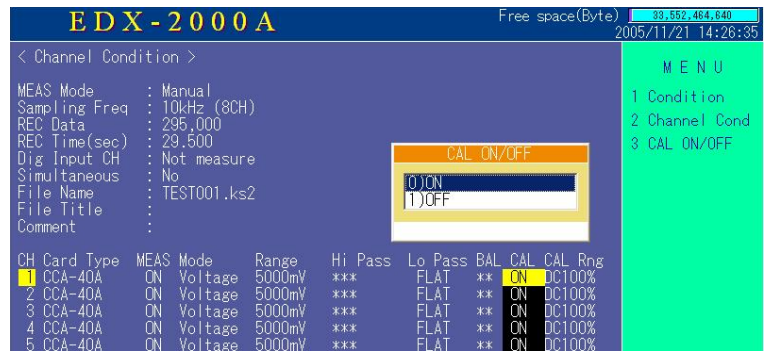
“AUTO” is not displayed.

CAL ON/OFF

Select 5) <CAL ON/OFF> from the <Channel Cond> menu to display the screen at the right with “CAL ON/OFF” setting window.

Here, set the cursor to “ON” or “OFF” and press the **ENTER** key.

Only CHs that are set to “ON” are allowed for entering CAL value when conducting the measurement..

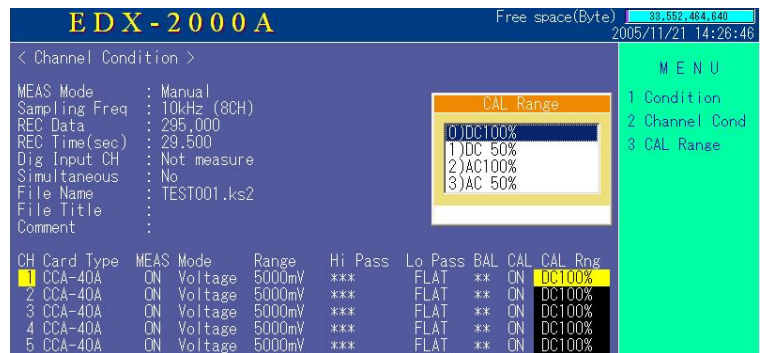


CAL Range

Select 6) <CAL Range> from the <Channel Cond> menu to display the screen at the right with “CAL Range” setting window.

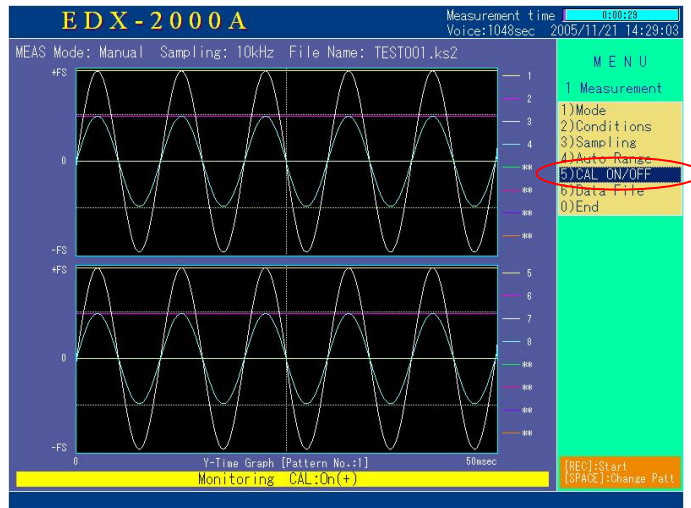
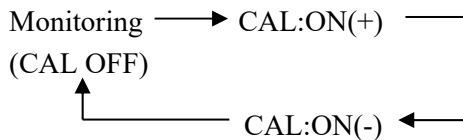
Point the cursor to any of “DC100 %,” “DC 50%,” “AC 100%,” or “AC 50%” and press the **ENTER** key.

All the CAL of this CCA card shall be absolute value output.



- When “DC 100% (50%)” is selected:
When +CAL is conducted, DC volt of 100% (50%) of range value, and when -CAL is conducted, DC volt of -100% (-50%) of range value is output.
- When “AC 100% (50%)” is selected
When +CAL is conducted, AC volt (sinusoidal wave 100 Hz) of 100% (50%) of range value, and when – CAL is conducted AC volt is output in the same manner as the +CAL.

To conduct CAL on the “Measurement” screen (see the right figure), point the cursor to 5) CAL ON/OFF and press the **ENTER** key. The following operation is repeated every time the **ENTER** key is pressed.



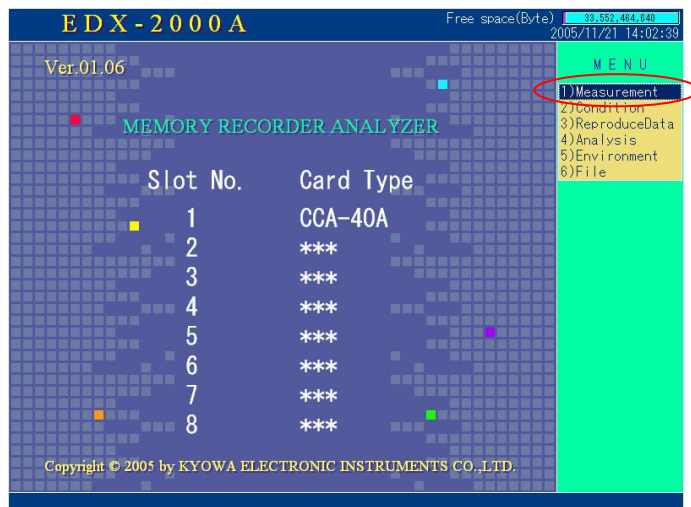
Other Settings

For how to set “CAL Coef,” “Unit,” and “Channel Name, refer to “4-1-9 Setting CAL Coefficient,” “4-1-10 Setting Offset,” “4-1-11 Setting Unit,” and “Setting Channel Name” in EDX-2000A Memory Recorder Analyzer Instruction Manual for Software.

Measurement

After the entire settings are complete, select 0) Exit on the <Channel Cond> menu to return to the EDX-2000A initial screen shown at the right.

Here, select 1) <Measurement> to start the measurement with determined channel conditions.



NOTE

For detailed description of recording or reproduction of data, etc., see EDX-2000A Instruction Manual.

NOTE

If channel of 20 mV range and that of 5000 mV range are mixedly used in the same card, crosstalk may occur resulting to display a waveform that is different from the input waveform of the channel of 20 mV range.

[Reference]

<The most affected example>

With the following conditions, the most unpreferable crosstalk of approximately 0.2 mV may occur to the channel of 20 mV range.

Crosstalk hardly occurs when a usual sensor is connected.

(Condition)	Arbitrary 1 CH	• Range 20 mV • LPF FLAT • When entering 1 kΩ resistor between D/C input.
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	All the other CHs	• Range 5000 mV • LPF FLAT • 10 V_{p-p}, 20 kHz, sine wave
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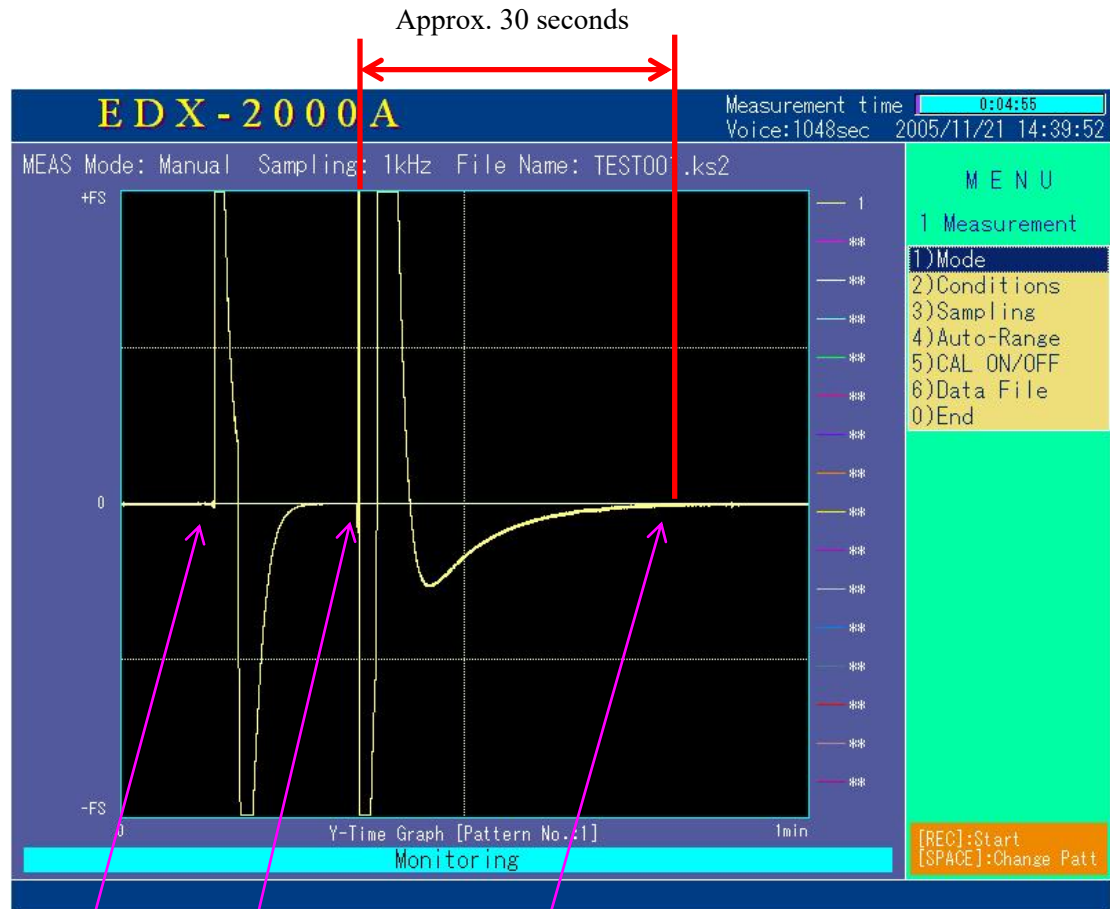
In the above case, set LPF of the channel of 20 mV range to 3 kHz. Then, crosstalk rarely occurs.

NOTE

When the CCA card power is ON, when the input connector is disconnected, when the sensor is removed, measuring range is changed, or when excess signal is entered, the output voltage may largely varies. But it is not faulty.

Although the time required until the output voltage becomes stable varies according to sensors in use or CCA card measuring range, the output voltage becomes stable in approximately 20 to 40 seconds. Wait for a while until it becomes stable before starting the measurement.

Example: When removing sensors.



Remove the sensor

Output voltage becomes stable.

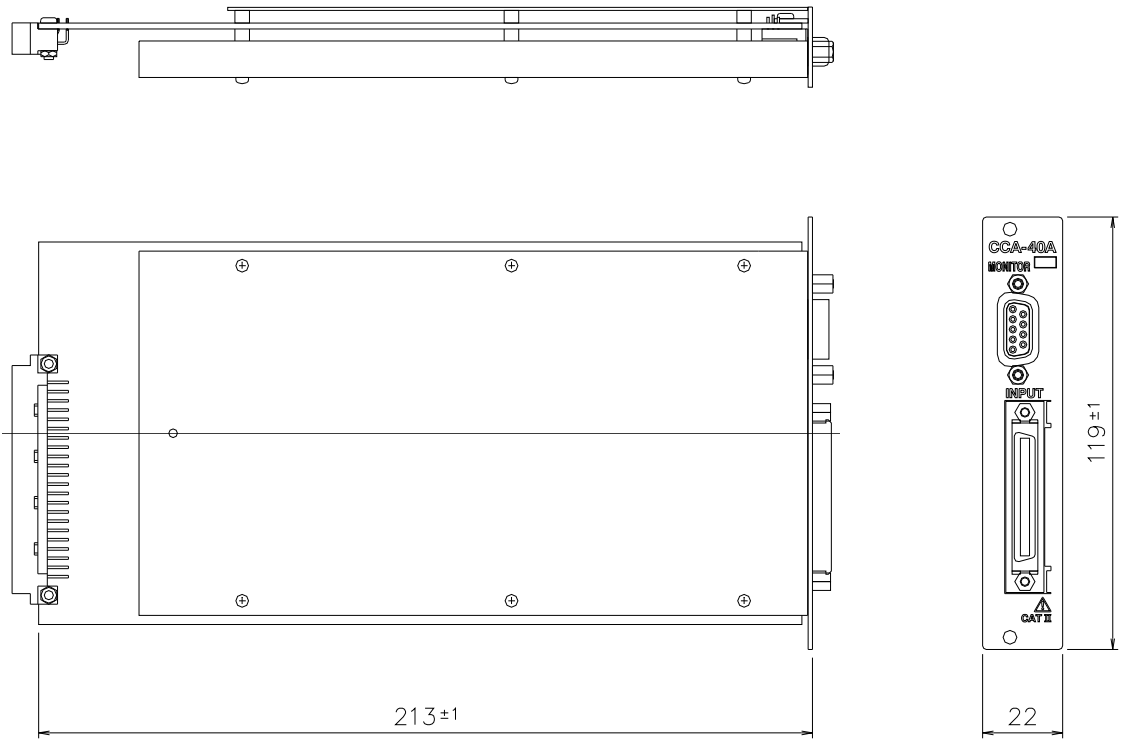
Connect the sensor once again.

3. SPECIFICATIONS

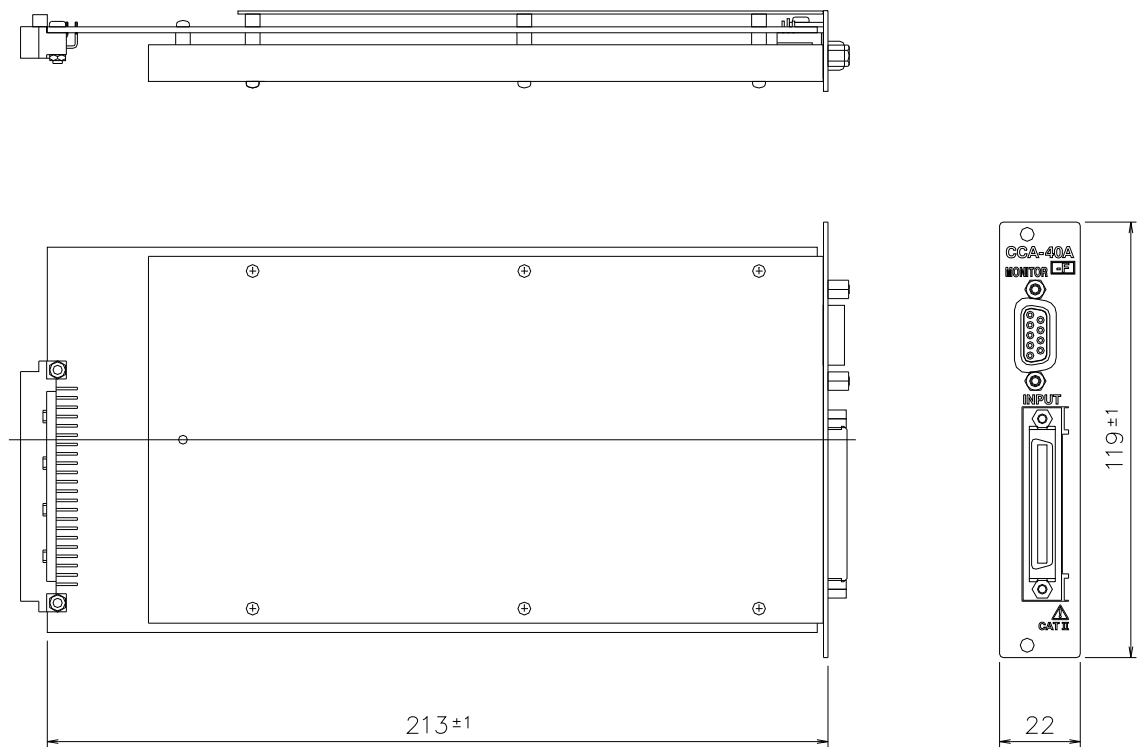
3-1 HARDWARE SPECIFICATIONS

Name	CCA-40A/CCA-40A-F Charge Amplifier Card		
Compatible Sensors	Piezoelectric Accelerometer (Voltage output type: Insulated case ^(Note))		
	(Note) Output and case(or mounting surface) should be insulated with each other.		
Number of Measuring CHs	8 CHs/card		
Sensor Power Supply.....	Constant current power supply: 4 mA, Approx. 24 VDC, Load: 1 k Ω or less		
Frequency Response Range.....	1 to 20 kHz (Deviation: +1 dB, -3 dB)		
Range.....	9 steps : 20, 50, 100, 200, 500, 1000, 2000, 5000 mV and OFF		
	Accuracy: Within $\pm 1\%$ FS		
CAL Value	DC CAL	$\pm 100\%$ and $\pm 50\%$ of each range is absolute output	
		Accuracy:	Within $\pm 0.2\%$ FS
	AC CAL	$\pm 100\%$ and $\pm 50\%$ of each range is absolute output	
		Accuracy:	Within $\pm 1\%$ FS
		Frequency accuracy:	Within 100 Hz $\pm 5\%$
Low Pass Filter	2nd Butterworth type		
	Cutoff frequency		
	5 steps: 300 Hz, 1 kHz, 3 kHz, 10 kHz, and FLAT		
	Amplitude ratio at cutoff point: -3dB ± 1 dB		
	Attenuation: -12 dB ± 1 dB/oct		
SN Ratio	50 dB _{p-p} or more (Range: 20 mV, Low pass filter: FLAT)		
Distortion.....	1% or less		
Resolution.....	16 bits		
Monitor Output.....	Accuracy: Within ± 5 V $\pm 1\%$ (Load: 5 k Ω or more)		
Additional Function.....	Loading TEDS built-in sensor information		
Antialiasing Filter [Applied only to CCA-40A-F]	8th Butterworth type		
	Cutoff frequency: Automatically set to [Sampling frequency $\times 0.25$].		
	Cutoff characteristics: -48 dB ± 5 dB (When sampling frequency $\times 0.5$)		
	Note) This setting is activated when low pass filter is set to [AUTO] in EDX-2000A.		
Compliance.....	Directive 2014/30/EU (EMC)		
	Directive 2011/65/EU,(EU)2015/863(10 restricted substances) (RoHS)		

3-2 OUTSIDE DRAWING



<CCA-40A>

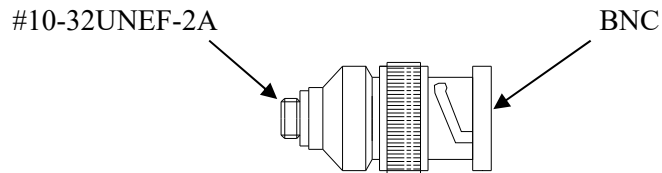


<CCA-40A-F>

4. OPTIONALS

Input Adaptor: BNCP-C25J-A (The change of BNC and miniature connector)

By connecting an input adaptor BNCP-C25J-A to a CCA input cable (U-111), measurement is available with a sensor having miniature connector type cable.



Centralized Output Cable: U-62

By connecting a centralized output cable U-62 (Length: Approx. 1.0 m) to a monitor output connector, monitoring data is allowed for every channel.

BNC connector for monitor devices.

For how to connect the centralized output cable, see “1-6 PIN ASSIGNMENT AND CONNECTION OF CONNECTORS.”

