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KYOWA
ELECTRONIC INSTRUMENTS CO., LTD.

MEMORY RECORDER/ANALYZER

EDX-2000B

FOR HARDWARE

INSTRUCTION MANUAL

Thank you for purchasing KYOWA's product EDX-2000B 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 manner other than as described in this Manual.
This manual covers only the hardware operating instructions. For details on software, refer to the “Instruction Manual for Software.”

CONTENTS

This Manual contains operating instructions for the Memory Recorder/Analyzer EDX-2000B (hereinafter referred to as the EDX-2000B), CDV-40B/A and RCU-40A hardware.

STANDARD ACCESSORIES

The following accessories are packed with the EDX-2000B. When unpacking, check the contents to ensure that all accessories are enclosed.

Grounding wire (P-72)····· 1
AC power cable (P-18) ····· 1
DC power cable (P-70) ····· 1
Conversion adapter (CM-33) ····· 1
AC fuse (3.15 A: in AC inlet) ····· 1
DC fuse (30 A)····· 1
Instruction Manual (CD) ····· 1

OPTIONAL ACCESSORIES

- Conditioner cards: See catalog.
- Dummy panel: EDX2000-DUMMY
- Remote control unit: RCU-40A
- Input cable for 8-channel sensor (for CDV-40B/A) U-39 (See "3-3 CONNECTING SENSORS")
- Data analysis software: DAS-100A (Ver. 01.52 or later; compatible with KS2)
- Internal battery (for instantaneous power failure): EDX2000-BAT32CE (for EDX-2000B-32)
  EDX2000-BAT64CE (for EDX-2000B-64)

SAFETY PRECAUTIONS

Do not forget to read the safety precautions prior to use.

The EDX-2000B is designed in accordance with the criteria described in "9. HARDWARE SPECIFICATIONS," and "10. SOFTWARE SPECIFICATIONS." Do not use the EDX-2000B in an environment exceeding the scope of those specifications. Or, the system may be damaged.

PRIOR TO USE

For safe use of the EDX-2000B, be sure to read the safety precautions as described below.
KYOWA ELECTRONIC INSTRUMENTS CO., LTD. assumes no liability for any damage resulting from the user's failure to comply with the safety precautions.

SAFETY SYMBOLS

For safety operation of the EDX-2000B, 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

- **Power supply**
  To prevent fire hazards, ensure that the power supply voltage specified for the EDX-2000B matches the local line voltage before connecting the system to the AC power outlet or DC power supply.
- **Inflammable Environment**
  To prevent the risk of fire and explosion, do not operate the EDX-2000B in area exposed to flammable gases, vapors or dust.
- **Abnormal Condition**
  To prevent fire hazards, if smoke is emerging from the EDX-2000B, immediately shut OFF the power switch and disconnect the power cable from the AC power outlet to terminate the system operation. Likewise, when the DC power supply is used, immediately turn the power switch to OFF and disconnect the DC power cable from the power outlet, thereby halting system operation.
- **Protective Ground**
  Be sure to ground the "GND" terminal. Failure to do so will pose the risk of electric shock, deteriorated performance and system failure.
- **Maximum Input Voltage Range for Measurement**
  Do not apply an input voltage exceeding the range specified for the CDV-40B/A. Failure to do so will pose the risk of electric shock, deteriorated performance and system failure.
  Take the following precautions when measuring the DC voltage of a battery, power supply or the like.
  (1) Use a tester or the like to measure the voltage between negative sides of the DC voltage to be measured in order to ensure that the voltage is approximately 0 V.
  (2) Check that the voltage between the negative side of the DC voltage to be measured and the GND terminal of the EDX-2000B is approximately 0 V.
  (3) When connecting an input, take precautions so that the positive and negative sides are correctly connected.
  (4) Input voltage limits of the CDV-40B/A are ±10 V. Do not apply a voltage exceeding the said range. Failure to comply with the above precautions may result in a short circuit of the signal source (e.g. the DC power supply) to be measured in the CDV-40B/A card, thus causing damage to the EDX-2000B a fire hazard.
- **Environment with excessive vibration**
  Do not set the display portion upright in a vibrating environment. Or, the display portion may move to contact a person or surroundings causing injury to the person or damage to the EDX-2000B.
  Always use in the fixed position in such environment.

⚠ CAUTION

- **Use the EDX-2000B in the specified operating temperature range of 0 to 40°C.**
  Use at temperatures exceeding the specified range may lower the performance and cause troubles.
  If use under direct sunlight or in a cold place is inevitable, prepare a sunscreen or take proper measures to keep it warm.
- **Use the EDX-2000B in the specified operating humidity range of 20% to 80%RH.**
  Use in a humid place exceeding the specified range or where it is exposed to splashing water may lower the performance and cause troubles.
- **Do not use EDX-2000B immediately after the change in the environment.**
  Leave the EDX-2000B as it is to acclimate to the environment.
  Abrupt change in ambient temperature due to transportation, etc. may cause dew condensation, which may result in lower performance and troubles.
- **Do not use the EDX-2000B where it is subject to significant vibration or impact.**
  The vibration resistance of the EDX-2000B is as follows.
  For the EDX-2000B-32-H(E) and EDX-2000B-64-H(E)
  29.42 m/s^2 (3 G) at 5 to 55 Hz (when in operation)
  49.03 m/s^2 (5 G) at 5 to 55 Hz (when not in operation).
  For the EDX-2000B-32-S(E) and EDX-2000B-64 S(E)
  29.42 m/s^2 (3 G) at 5 to 55 Hz (when in operation)
  19.6 m/s^2 (2G) at 10 to 200 Hz (when in operation)
  49.03 m/s^2 (5G) at 5 to 55 Hz (when not in operation).
  The impact resistance of the EDX-2000B is 196.1 m/s^2 (20 G)/11 ms.
  Use the EDX-2000B in an area where vibration and impact can be kept within the scope of specifications.
  Continuous vibration or severe impact may cause deteriorated performance and system failure.
  When mounting the EDX-2000B on the vehicle, always set it on the car seat and securely fix it a band and the like. Do not directly mount it on the vehicle chassis. Or unexpected vibration or impact may be applied to the EDX-2000B. At this time, set it on a vibration isolation table to reduce the applied vibration and impact.
- **Do not use the EDX-2000B in strong electromagnetic fields.**
  Use the EDX-2000B in an environment where magnetic field environment is acceptable to the PC.
  Performance may be lowered and erroneous operation and troubles may result if it is used near a telemetry system, microwave oven, electric furnace or any other equipment generating a strong magnetic field.
- **Do not use the EDX-2000B under poor conditions.**
  Operate the EDX-2000B within the range of 100 to 120 VAC, 190 to 240 VAC or 10 to 30 VDC. The power supply used for the EDX-2000B should not experience an instantaneous power failure and be free from noise.
- **Do not turn ON the power switch immediately after turning it OFF.**
  After turning OFF the power switch, wait until the power supply is shut OFF automatically before turning ON the power switch again. Do not disconnect the power plug from the AC outlet or DC power supply. Or, internal hard disk in the EDX-2000B may be destroyed and the system may not startup again.
- **Do not pull cord and cables.**
  Lay cords and cables with a certain allowance so that any unreasonable force may not be applied to the connections.
  Pulling or unreasonable force may cause troubles or interrupt the measurement.
- **Use a USB memory for collecting the recorded data only.**
  In addition, do not apply vibration to the USB memory when collecting the data, which may cause a system failure or USB memory failure.
- **Do not seal ventilation holes provided for a fan located at the back and two fans located at the front.**
  If there is not enough space to radiate heat, temperature in the EDX-2000B may increase to lower the performance and cause troubles.

NOTATIONS USED IN THE INSTRUCTION MANUAL

Informational Notes
Certain notations are used as necessary to urge attention to information that requires special attention in the handling of the system, and to information provided for reference purposes.

Examples of Notations

WARNING

Prohibited items required when handling the EDX-2000B.

NOTE

Essential precautions required when handling the EDX-2000B.

MEMO

Reference items required when handling the EDX-2000B.

1. OUTLINE OF THE PRODUCT

1-1 OUTLINE

The EDX-2000B is an all-in-one measuring instrument that is capable of measuring, displaying, recording and analyzing data through connections with a variety of sensors, and that features excellent levels of general utility and expandability.
The number of analog input channels has 2 types: Up to 32 channels and up to 64 channels
Built-in data storage device (internal device) has 2 types: HDD (Hard Disk Drive) and SSD (Solid State Drive)
Language has 2 types: Japanese and English
The EDX-2000B has following models.

Model	The number of MAX analog input channels	The number of MAX slots	Internal Disk	Data Recording Capacity	Language
EDX-2000B-32-H	32	4	HDD	100 GB or more	Japanese
EDX-2000B-32-HE	32	4	HDD	100 GB or more	English
EDX-2000B-32-S	32	4	SSD	30 GB or more	Japanese
EDX-2000B-32-SE	32	4	SSD	30 GB or more	English
EDX-2000B-64-H	64	8	HDD	100 GB or more	Japanese
EDX-2000B-64-HE	64	8	HDD	100 GB or more	English
EDX-2000B-64-S	64	8	SSD	30 GB or more	Japanese
EDX-2000B-64-SE	64	8	SSD	30 GB or more	English

The use of a high capacity hard disk provides long term data recording at high sampling rate when measuring multiple channels.
The recorded and processed data can easily be transferred online or offline to the PC.

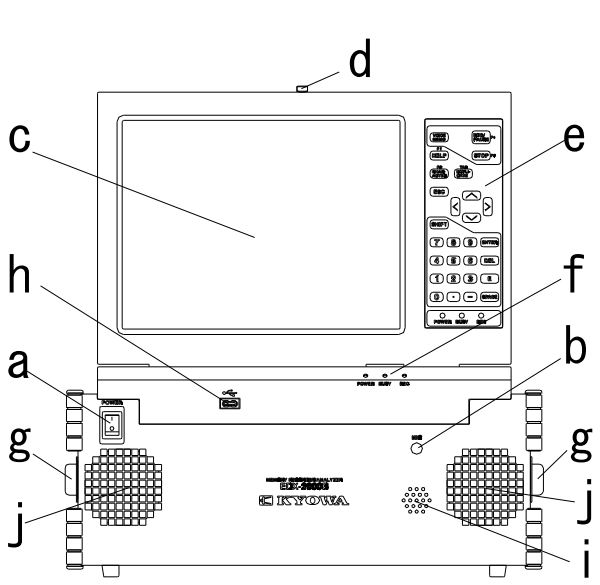
1-2 FEATURES

○Analytical processing tasks (FFT analysis and histogram analysis) can be performed while recording data, so that the input monitored data and processing results can be viewed onscreen.
○An optional conditioner card may be installed in this all-in-one measuring instrument.
○An internal battery maintains operation in the event of a momentary loss of power.
○Long-term data recording is available in the internal disk.
○Voice memo can be recorded simultaneously with data recording.
○CAN data can be recorded by using an optional CAN card.
○Analog output can be reproduced by using an optional DA card.
○The analyses of FFT data, histogram data and arithmetic operations can be conducted.
○Data from 32 channels (simultaneous sampling) can be recorded at a sampling frequency of 100 kHz.
○The EDX-2000B is controlled quickly and easily through interactive operation.
○The handy USB memory is used to transfer data to the PC.
○Data files can be simply transferred by connecting a LAN interface, like wise using the PC.
○An optional data analysis software (DAS-100A: Ver. 01.52 or later) is available.
○Vibration resistance model installing the SSD in the built-in disk is also available.

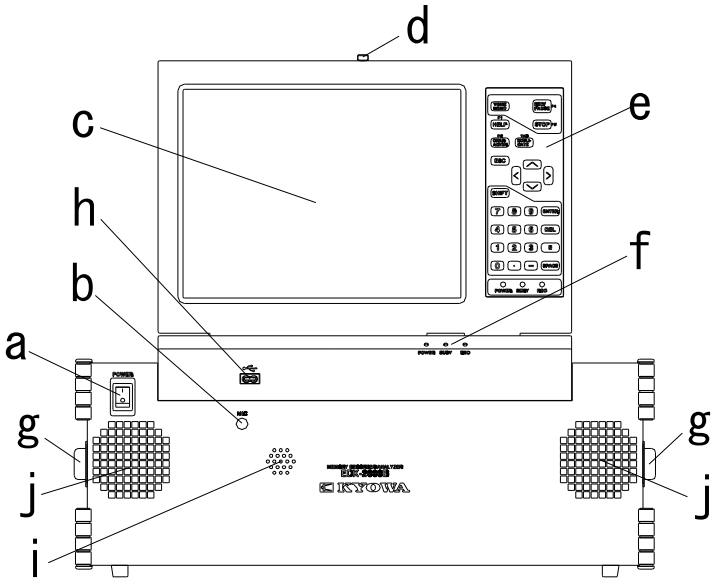
2. CONTROLS AND INDICATORS

2-1 FRONT

The front views of the EDX-2000B models with their displays in the upright position are shown below:



EDX-2000B-32



EDX-2000B-64

a) "POWER" switch — The power is turned ON or OFF when this switch is pressed to the "|" position or "○" position, respectively. When the switch is shut OFF, the internal data is saved and then, the power is automatically shut OFF.

NOTE

Do not disconnect the power plug from the power outlet or DC power supply when the POWER switch is ON. When the POWER switch is turned OFF, wait until the power is shut OFF before disconnecting the power plug. Once you shut OFF the POWER switch, do not operate the POWER switch again until the power is shut OFF. Failure to observe these precautions may destroy the internal hard disk and prevent the EDX-2000B from starting again.

b) "MIC" connector — The MIC connector is used to connect the external microphone. A commercially available microphone should be connected to this connector. It's a 3.5 mm stereo "mini jack" connector with which the condenser type microphone is used for recording voice memos.

c) Display — A 10.4-inch TFT color LCD.

d) Display knob — By sliding the knob to the right, the display can be pulled open and into the upright position. The above figure is the front view of the EDX-2000B with the display set upright. Moving the display to the rear will lock the display in position.

e) Sheet key — Used for controlling the EDX-2000B. LEDs are provided at the bottom to indicate various statuses.

f) Status display LED — LEDs are provided to indicate the status of main unit. These LEDs are the same as those provided at the bottom of the sheet keys. Details of LED status are described in the following table.

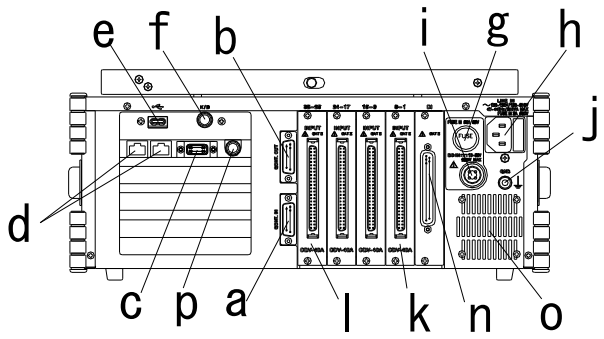
LED / Status	POWER	BUSY	REC
Green LED ON	Power ON state	Accessing the internal hard disk	Recording
Green LED flickers	Getting ready to shut OFF the power (After saving the internal data, the power automatically turns OFF.)		Pausing
Orange LED ON	Charging the internal battery		
Orange LED flickers	Discharging the internal battery		
Red LED ON	Internal battery faulty		Recording voice memo
Red LED flickers	DC power supply voltage dropping (The LED flickers when the voltage is lower than approx. 11 V.)		
Red and Orange LEDs alternately ON	Internal battery operating (AC or DC power supply is lost)		

g) Handles — A pair of handles is provided for easy transportation of the EDX-2000B.
h) USB connector — USB 2.0 connector
For using a USB memory when collecting data, for using a USB mouse or USB keyboard only.
i) Speaker — For reproducing the recorded voice.
j) Ventilation fan — Suction fan for ventilation.

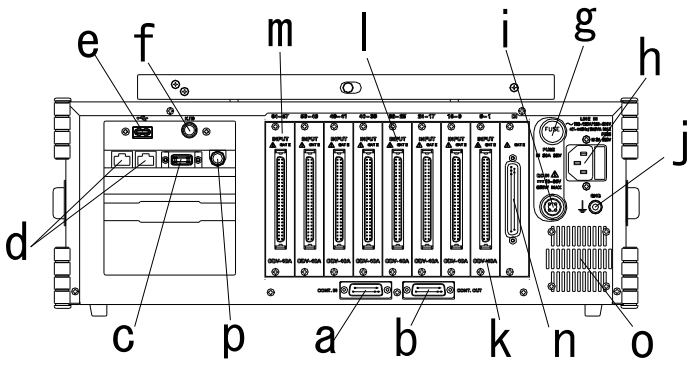
NOTE

Do not seal the ventilation fan.
Or, temperature in the EDX-2000B may increases to lower the performance and force a system shut down.

2-2 REAR



EDX-2000B-32



EDX-2000B-64

a) CONT IN connector — Used for a dedicated remote control unit or for synchronized operation of multiple units.

b) CONT OUT connector — Used for synchronized operation of multiple units.

c) External monitor connector — Used for connecting an external monitor.

NOTE

Be sure to connect the external monitor before turning ON the EDX-2000B when displaying the window of the EDX-2000B to the external monitor that is connecting to the external monitor connector.

d) LAN connector — The LAN connector is used for data transmission.

e) USB connector — USB 2.0 connector
For using a USB memory when collecting data or for using a USB mouse and USB keyboard only.

f) Keyboard connector — Used for connecting the external (PSP) keyboard.

g) DC power supply fuse — This fuse (6.3 in diameter × 32 mm, 30 A) is used for the DC power supply.

h) AC inlet socket — This AC power supply connector should be connected to the AC power outlet by using the AC power cable supplied with the EDX-2000B. The socket is provided with built-in fuse (5 in diameter × 20 mm, 3.15 A).

i) DC power supply connector — Voltage of this DC power supply connector ranges from 10 to 30 VDC. For connector types and pin numbers, see "8. CONNECTOR PIN ASSIGNMENT."

NOTE

Do not disconnect the power plug from the power outlet or DC power supply when the POWER switch is OFF. Once you shut OFF the POWER switch, do not operate the POWER switch again until the power is shut OFF. Failure to observe these precautions may destroy the internal hard disk and prevent the EDX-2000B from starting again.

j) GND terminal — Always ground the GND terminal of the EDX-2000B.

NOTE

Be sure to ground the GND terminal. Failure to do so will pose the risk of electric shock, deteriorated performance and system failure.

MEMO

The GND terminal is connected to the casing and the common of the internal power supply.

k) 1-CH to 8-CH conditioner card Conditioner for channels 1 to 8.
l) 25-CH to 32-CH conditioner card Conditioner for channels 25 to 32.
m) 57-CH to 64-CH conditioner card Conditioner for channels 57 to 64.

MEMO

The channel number is determined by the position where the conditioner card is inserted. The channel numbers are assigned from right to left order as seen from the rear.

n) DI card The DI card is used for digital input.
o) Ventilation fan Discharging fan for ventilation.

NOTE

Do not seal the ventilation fan.
Or, temperature in the EDX-2000B may increases to lower the performance and force a system shut down.

p) Mouse connector Mouse connector
PS2 mouse can be connected.

2-3 FOR CONDITIONER CARDS

One slot of the EDX-2000B has 8 channels.
The number of conditioner cards in the following table can be mounted.
(Excluding the Digital Input Card DIB-40A)

Model	The number of slots	Available cards
EDX-2000B-32	4	4
EDX-2000B-64	8	8

Relation between slot and numbers in rear

Slot	1	2	3	4	5	6	7	8
Numbers in rear	1-8	9-16	17-24	25-32	33-40	41-48	49-56	57-64
	EDX-2000B-32							
	EDX-2000B-64							

Channel numbers of the target slot are displayed in sequence on the slot part of the EDX-2000B rear panel.
Substitute the channel number with the slot number by using the above table.

The EDX-2000B can be used the following conditioner cards.

Name	Model	The number of channels/card	Where to mount
Strain/voltage measuring card	CDV-40B (-F)	8	Arbitrary slots
	CDV-40A (-F)	8	Arbitrary slots
Dynamic strain amplifier card	DPM-42A (-F)	4	Arbitrary slots
Thermocouple card	CTA-40A	8	Arbitrary slots
F/V converter card	CFV-40A	4	Arbitrary slots (The number of mounting cards is limited.)
Charge amplifier card	CCA-40A (-F)	8	Arbitrary slots
DAC card	DAC-40A	8 (output)	Arbitrary slots
CAN card	CAN-40A	1 port (CAN input)	Only one CAN card can be mounted to the last slot.
Digital input card	DIB-40A	16 bit (digital input)	Standard* (dedicated slot only)

*: The Digital Input Card DIB-40A is already installed at the time of purchase.

The DPM-42A (-F) and CFV-40A have 4 channels/card.
Remaining 4 channels (5 to 8) are empty channels.

Example) For the 1st slot: DPM-42A,
2nd slot: CDV-40B
1 to 4 channels: Channels of the DPM-42A
5 to 8 channels: Empty (cannot be used) channels
9 to 16 channels: Channels of the CDV-40B

NOTE

(Restrictions)

・It is necessary to mount the CAN-40A in the last slot.
For the EDX-2000B-32: Mount the CAN-40A in the fourth slot.
For the EDX-2000B-64: Mount the CAN-40A in the eighth slot.
Only one CAN-40A can be mounted.

・The CFV-40A has restrictions as follows.
For the EDX-2000B-32: Up to 2 CFV-40A cards are available.
For the EDX-2000B-64: Up to 2 CFV-40A cards are available.
At this time, you can mount the other cards up to 4 cards.
(Set the remaining 2 slots as empty slots.)
When mounting one CFV-40A, you can mount the other cards up to 6 cards.
(Set the remaining 1 slot as empty slot.)

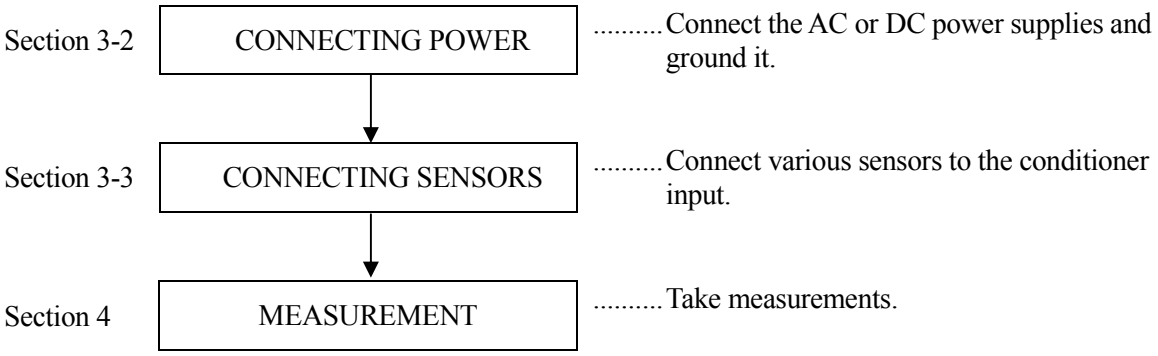
MEMO

- For details of conditioner cards, see Instruction Manuals of conditioner cards.
- It is not necessary to mount the same model cards side-by-side.
  However, we recommend you to mount the same model cards side-by-side due to operations such as setting channel conditions, etc.
- CAN card (with 2 inputs):
  The CAN-41A is for the EDX-100A and EDX-3000A.
  The CAN-41A cannot be used with the EDX-2000B. Use the CAN-40A.

3. INSTALLING EDX-2000B

3-1 INSTALLING PROCEDURE

This section describes required procedures for installing the EDX-2000B and preparing for measurements. Use the following procedures to complete the installation.



NOTE

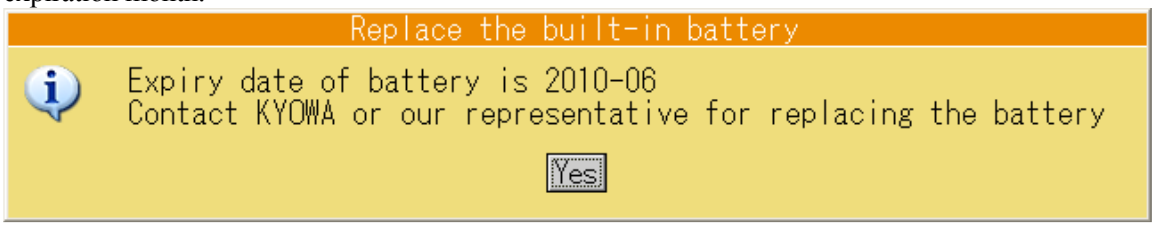
When mounting the EDX-2000B on the vehicle, always mount it on the car seat and securely fix it with a band and the like.
Do not directly mount it on the vehicle chassis. Or, unexpected vibration or impact may be applied to the EDX-2000B. In this case, mount the EDX-2000B on a vibration isolation table to reduce the applied vibration and impact.

3-2 CONNECTING POWER

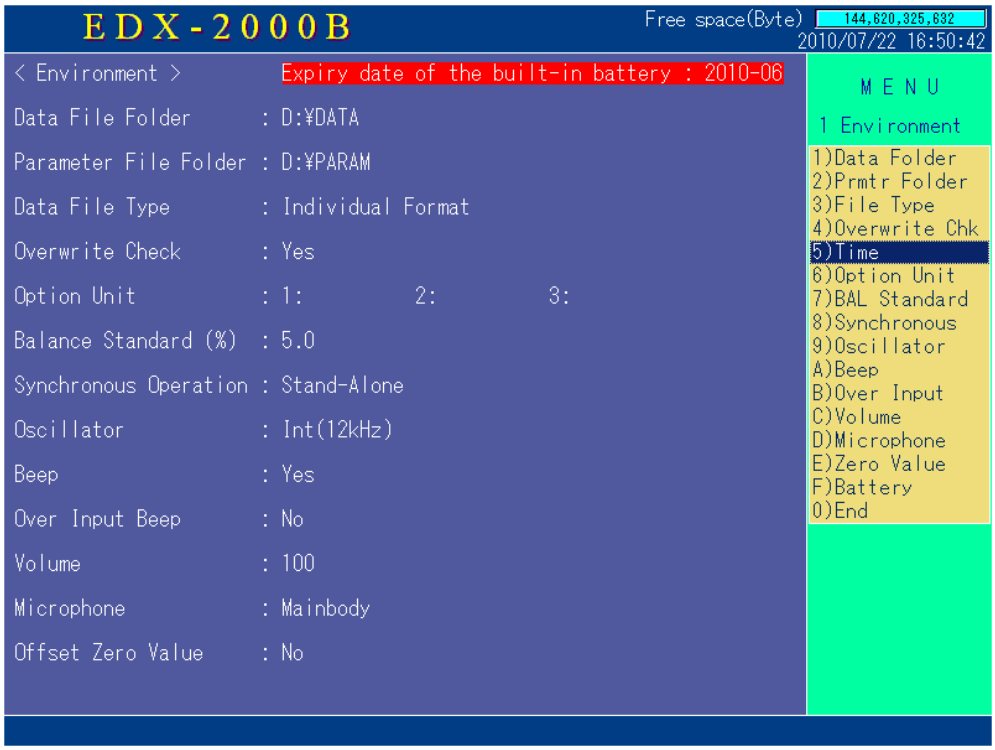
For supplying the AC power, see “3-2-1 Connecting AC Power.”
For supplying the DC power, see “3-2-2 Connecting DC Power.”

NOTE

The validity period of the internal battery is 1 year after replacement.
The following message appears on the window when activating the EDX-2000B after 20th of the expiration month.



After displaying the above message, you can operate the EDX-2000B as usual.
In addition, the expiration date on the upper right of the environment setting window is displayed in red as follows.

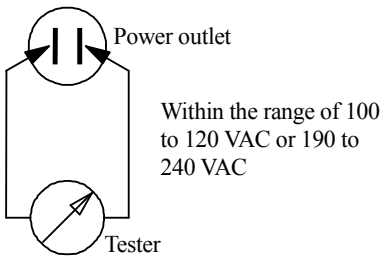


However, replace the internal battery as soon as possible since the battery cannot supply sufficient power if instantaneous power failure occurs.
For details, see “7-2 REPLACING INTERNAL BATTERY.”

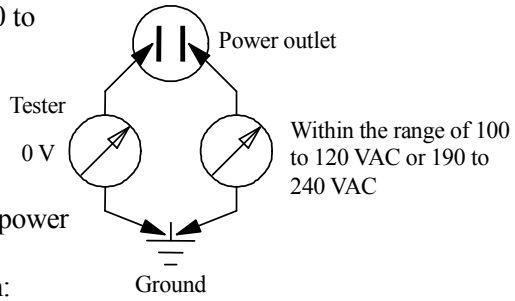
3-2-1 Connecting AC Power

Supply AC power to the EDX-2000B with the attached AC power cable.
Check the power supply voltage before connecting the power cable to the AC power outlet.
The operating power supply voltage range of the EDX-2000B is 100 to 120 VAC or 190 to 240 VAC.
Always operate the EDX-2000B within the specified voltage range.
The EDX-2000B should never be connected to the power supply with voltage outside the above specified voltage range or voltage potentials of the terminals exceed the level of power supply voltage relative to the ground. Doing so will cause system failure and accidents.
The power supply voltage should be checked according to the procedure described below.

1) Use the tester to measure the voltage between the AC power outlet terminals and ensure that the voltage is within the range of 100 to 120 VAC or 190 to 240 VAC.



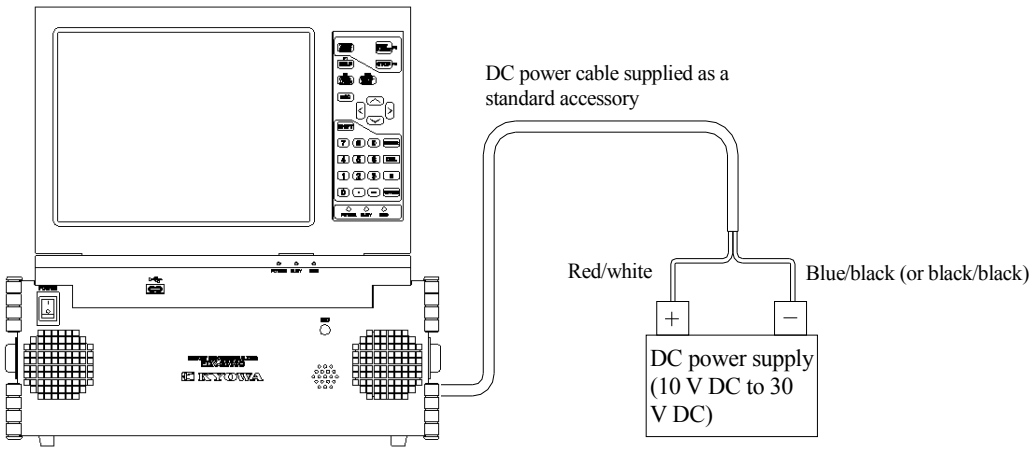
2) Use the testers to measure the voltage between the ground and each of the AC power outlet terminals to ensure that one voltage level is 0 V and the other is within the range of 100 to 120 VAC or 190 to 240 VAC.



3) If the EDX-2000B is used at job site where induction motors, electric welder and other devices that generate noise are used, power supply condition may be insufficient due to noise. It is recommended to use KYOWA's insulation transformer (option: UPT-300B) or noise cut transformer.

3-2-2 Connecting DC Power

Supply DC power to the EDX-2000B with the attached DC power cable.
Check the power supply voltage before connecting the DC power cable.
The operating power supply voltage range of the EDX-2000B is 10 to 30 VDC. Always operate the EDX-2000B within the specified voltage range.
The EDX-2000B should never be connected to the power supply outside the above specified voltage range.
Doing so will cause system failure and accidents.



DC Power Supply Connection Diagram

NOTE

- The negative side of the DC power supply is insulated from the "EDX-2000B housing" and the "GND" terminal. However, when measuring the DC power supply voltage with connecting the EDX-2000B housing (GND terminal) and negative side of the DC power supply, never touch the positive (+) side of the power cable to the casing or never connect the positive (+) side of the power cable to the negative side of the CDV input. Or, the EDX-2000B may be damaged.
- When using an automotive battery whose positive side is connected to the body of the vehicle, insulate the car body from the EDX-2000B.
  In that case, a separate battery should be provided for the EDX-2000B.

MEMO

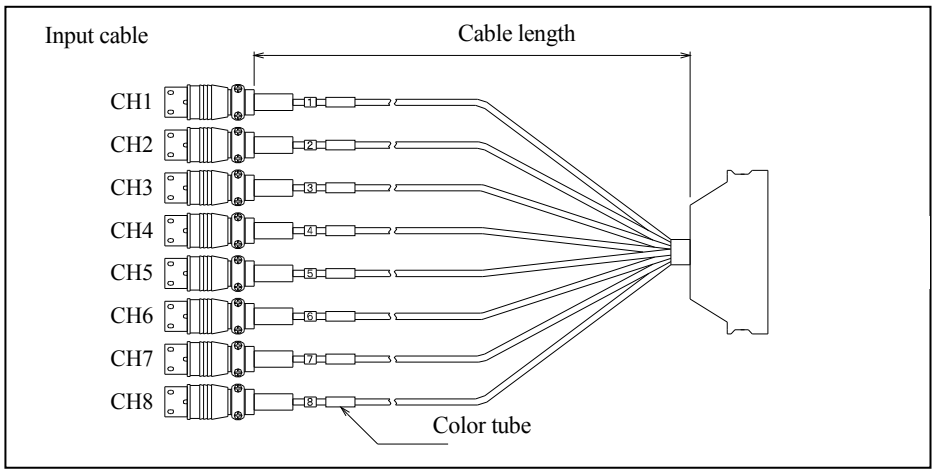
When an automotive battery is used as the DC power supply, even if the power supply voltage temporarily drops due to a starter, etc, the internal battery in the EDX-2000B maintains the power supply voltage, ensuring an uninterrupted supply of power for the system operation.

3-3 CONNECTING SENSORS

This section explains how to connect sensors to the CDV-40B/A strain/voltage measurement card (hereinafter referred to as the CDV-40B/A).

Use dedicated input cables (option) for connecting sensors to the CDV-40B/A. The applicable input cables are shown in the following table.

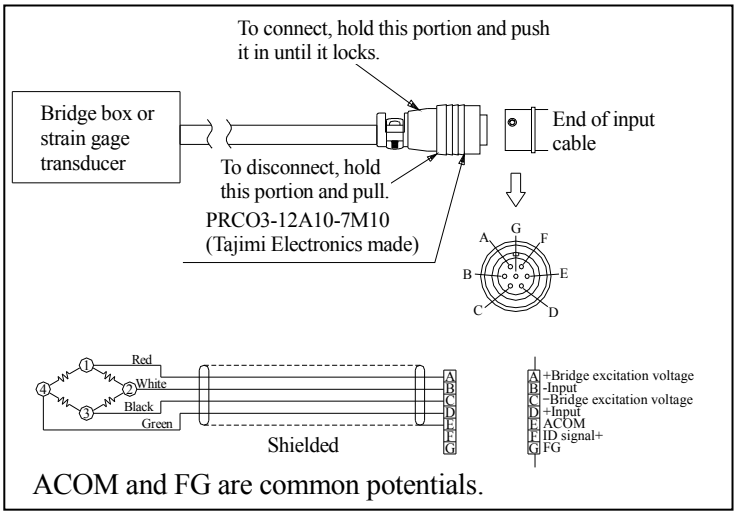
Item	Model	Cable length	Color tube	Item	Model	Cable length	Color tube
Input cable	U-40	50 cm	N/A	Input cable	U-46	50 cm	Blue
	U-41		Brown		U-47		Purple
	U-42		Red		U-48		Gray
	U-43		Orange				
	U-44		Yellow		U-38	1.5 m	N/A
	U-45		Green		U-39	1.0 m	N/A



The CDV-40B is capable of performing strain measurement and voltage measurement. The input cable should be connected as described below.

1) When using a strain gage or strain gage transducer

When measuring the output of the strain gage or strain gage transducer, connect the bridge box or strain gage transducer as shown in the figure at right.
Before recording data, select the strain mode and monitor the noise. If excessive noise is measured, ground the GND terminal of the bridge box or connect it to the GND terminal of the EDX-2000B, whichever results in less noise.



ACOM and FG are common potentials.

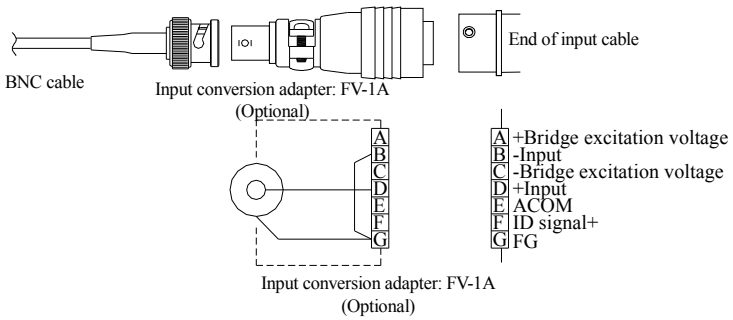
MEMO

In use of other measurement cards, please read the instructions manual of each measurement card.

NOTE

- The F terminal of each channel input for the CDV-40B/A is intended for TEDS + signals. Connecting any other signal to this terminal may prevent the EDX-2000B from recognizing all conditioners installed in the system. If the EDX-2000B does not recognize the conditioners, the startup screen will display "UNKNOWN" when it should display the name of the conditioner (e.g. CDV-40B) in the normal state, resulting to unable the measurement.
- Strain generator: CAB-120D, 350D and WDS-10 are not available because the F and A terminals are short-circuited.
  To connect a remote sensing transducer, use the connection cable (N-81 to N-85).
- To compensate the change in the sensitivity caused by the bridge resistance of the strain gage, perform compensating internal sensitivity prior to measurement.
  For the input cable, use U-39 cable(1-m in cable length).
  For compensating internal sensitivity, the result is multiplied internally by a coefficient factor, assuming a bridge resistance of 350 ohm and the use of the U-39 input cable as reference.

2) When applying an input voltage



ACOM and FG are common potentials.

When measuring the voltage, connect the FV-1A input conversion adapter (optional) to a quick mating connector using the BNC connector. Select the voltage mode for monitoring. For excessive noise, connect the negative side of the voltage signal source to the GND terminal of the EDX-2000B.

WARNING

- **Maximum Input Voltage Range for Measurement**
  Do not apply an input voltage exceeding the range specified for the CDV-40B/A. Doing so will pose a risk of electric shock, degrade performance and cause damage to the EDX-2000B.
  Take the following precautions when measuring the DC voltage of a battery, power supply or the like.
  (1) Use a tester or the like to measure the voltage between negative sides of the DC voltage to be measured in order to ensure that the voltage is approximately 0 V.
  (2) Check that the voltage between the negative side of the DC voltage to be measured and the GND terminal of the EDX-2000B is approximately 0 V.
  (3) When connecting an input, take precautions so that the positive and negative sides are correctly connected.
  (4) Input voltage limits of the CDV-40B/A are ±10 V. Do not apply a voltage exceeding the said range.
  Failure to comply with the above precautions may result in a short circuit of the signal source (e.g. the DC power supply) to be measured in the CDV-40B card, thus causing damage to the EDX-2000B a fire hazard.

NOTE

When using a voltage and strain sensor input signals together in the same CDV-40B/A card, a cross talk may generate and the waveform that is different from the strain sensor input may be displayed in the strain sensor connected CH.

[Worst case]
If the worst comes to the strain sensor input channel with the following conditions, a cross talk of 120 μm/m_{p-p} may generate.

(Conditions) Voltage input channel
- Mode Voltage
- Range 10 V
- LPF FLAT
- Input Square-wave of 20 V_{p-p}

Strain sensor input channel
- Mode Strain
- Range 500 μm/m
- LPF FLAT
- Input Arbitrary

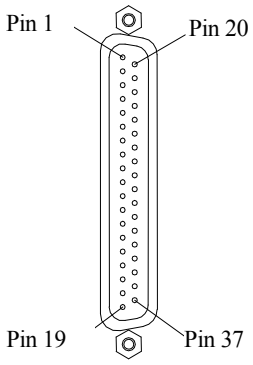
In this case, set the LPF of the strain sensor input channel to less than 10 kHz to eliminate the cross talk.

In addition, if you open the input, the cross talk may generate according to that.
For not using channels, select "**Not measure**" in the "Meas Channel" of the "Channel Cond."

3-4 CONNECTING DIGITAL INPUT CARD

The pin assignment of the digital input card is as shown in the table and figure below:

Pin No.	Name	Pin No.	Name
1	Bit 1	20	Common
2	Bit 2	21	Common
3	Bit 3	22	Common
4	Bit 4	23	Common
5	Bit 5	24	Common
6	Bit 6	25	Common
7	Bit 7	26	Common
8	Bit 8	27	Common
9	Bit 9	28	Common
10	Bit 10	29	Common
11	Bit 11	30	Common
12	Bit 12	31	Common
13	Bit 13	32	Common
14	Bit 14	33	Common
15	Bit 15	34	Common
16	Bit 16	35	Common
17	Not connected	36	Common
18	Common	37	GND
19	GND		

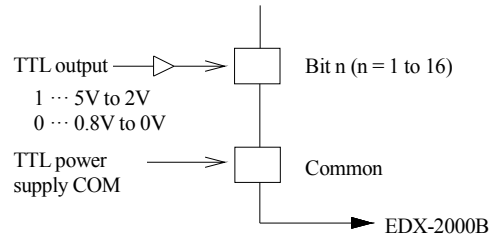


- PCB connector
  Model 17LE-13370-27 (D4BB)
  Manufactured by DDK
- Plug-in connector
  Model 17JE-23370-02 (D8B)
  Manufactured by DDK

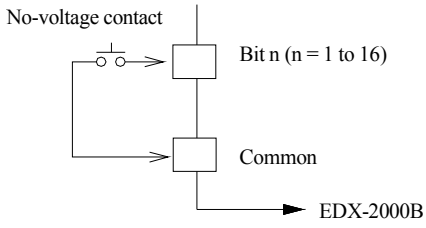
[Note] The signal common is used in common for bits 1 to 16, and is insulated from the casing and the power supply of the main unit.

Connect the TTL signal or no-voltage contact signal, as shown in the figures below

[TTL signal]



[No-voltage contact signal]



NOTE

The input signal between each bit and the common should be within the range of -30 to +30. The digital input card may fail if a voltage exceeding that range is applied.

MEMO

A terminal board type of input printed circuit board is available.
Model: EDX-DIT
Overview: The EDX-DIT consists of the FTP-36H (98) (input terminal printed circuit board) (CONTEC made) and connector cables, and allows the input of signals from the digital input card through the terminal.

4. MEASUREMENT

4-1 MEASUREMENT

After connecting the sensor, turn ON the EDX-2000B power switch. For settings of the conditioner card and measuring conditions, see the Instruction Manual for Software.

4-2 POWER OFF

To shut OFF the power after the measurement is completed, always return to the main menu, and then shut OFF the EDX-2000B power switch. When turning OFF the power switch, take the following precautions.

NOTE

When the POWER switch is turned OFF, do not disconnect the power plug from the power outlet or DC power supply until the system automatically shuts OFF the power. Once you turn OFF the POWER switch, do not operate the POWER switch again until the power is shut OFF. Failure to observe these precautions may destroy the internal hard disk and prevent the EDX-2000B from starting again.

4-3 INTERNAL BATTERY

The EDX-2000B is equipped with an internal battery to cope with the event of a momentary power loss. When the power is shut OFF or the power cable is disconnected from the EDX-2000B while the system is operating via the AC or DC power supply:

1) The buzzer is produced and the status display LEDs alternately light up in red and orange.
2) If the internal battery is fully charged, it will supply power for approximately two minutes. After two minutes, the internal data is saved and the internal program will shut down.
   If the power is recovered within two minutes, items 1) and 2) are automatically cancelled. When the power is not recovered after two minutes, shut OFF the power switch once and ensure that the power supply for the EDX-2000B is shut OFF. Correctly connect the AC or DC power supply to return to normal condition, and turn ON the power switch.

NOTE

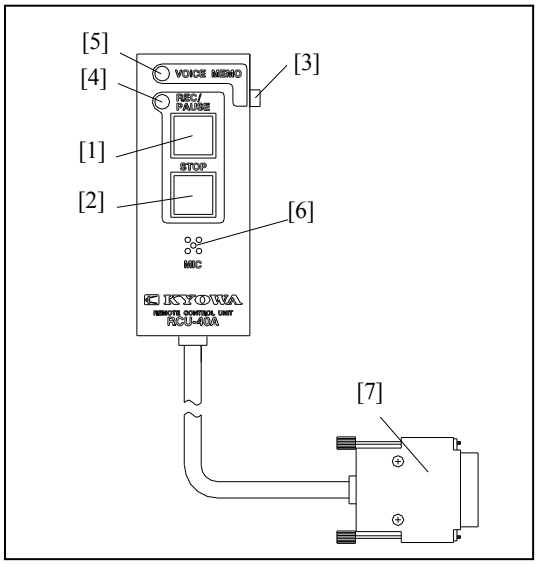
The EDX-2000B has an internal battery that maintains operation in the event of a momentary power loss. However, the internal battery is an auxiliary battery. The power supply to the main unit may be lost in less than two minutes if the internal battery becomes old or is not fully charged. Therefore, avoid using the EDX-2000B under conditions in which the power supply may be lost at any time. Replace the internal battery as soon as it expires (see "7-2 REPLACING INTERNAL BATTERY"). The battery's expiration date is indicated at the rear of the EDX-2000B.

MEMO

It is recommended to refresh the battery about once each month in order to maintain the battery capacity.
The battery can be refreshed by selecting the following:
Select <**Battery**> from <**Environment**> main menu on the initial screen.
For details on how to handle the battery, see the Instruction Manual for Software.
Note that it takes up to 4.5 hours for refreshing the battery.

5. REMOTE CONTROL UNIT

Parts names and functions of the remote control unit RCU-40A (hereinafter referred to as the RCU-40A) are described below.



1) REC/PAUSE switch
   The REC/PAUSE switch has the same functions as those of the sheet key "REC/PAUSE" located on the right side of the EDX-2000B display.
   Pressing this switch while recording pauses the recording, and pressing the switch while the system is paused starts recording data. Data obtained while the system is paused is not saved in memory. To stop recording, press the STOP switch.
2) STOP switch
   The STOP switch has the same functions as those of the sheet key "STOP" located on the right side of the EDX-2000B display.
   Pressing the STOP switch while recording or pausing saves the recorded data and proceeds to the monitoring mode.
3) VOICE MEMO switch
   Pressing this switch lets you record voice memo.
   When the switch is pressed while "measuring," the VOICE MEMO LED 5) lights up in red, and it enables you to record the VOICE MEMO. The system will simultaneously change to the REC mode.
   Voice can be recorded only while the "VOICE MEMO" switch is pressed and the VOICE MEMO LED is lighted up in red.
   This switch can also be used as a voice playback button in data reproduction. To play voice, press down this switch for approximately two seconds.
4) REC/PAUSE LED
   This LED indicates the state of data recording.
   While pausing (PAUSE): The LED flickers in green.
   While recording data (REC): The LED lights up in green.
   Other than the above: The LED is OFF.
5) VOICE MEMO LED
   This LED indicates the state of voice memo recording.
   While recording the voice memo: The LED lights up in red.
   While stopping the voice memo: The LED is OFF.
   Other than the above: The LED is OFF.
6) MIC
   An internal microphone is provided. During voice recording, maintain a distance of approximately 10 cm from the microphone.
7) Connector
   Connect the connector to the remote control connector (CONT IN) located at the rear of the main EDX-2000B unit.

NOTE

Always turn OFF the EDX-2000B power switch before connecting the remote control unit RCU-40A.

MEMO

When using the microphone of the remote control unit for "VOICE MEMO," go to Environment Settings and select "Remote Control" in Microphone Selection.
By selecting the above setting, voice can be recorded from the microphone of the remote control unit.

6. TROUBLESHOOTING

If the EDX-2000B does not operate as expected or in a stable manner, examine the facts that may be causing such a condition before concluding that the system has failed. Items to be checked and countermeasures for various symptoms are described below. If the problem still occurs even after corrective action is taken, contact KYOWA or our representative.
If the system is damaged due to a cause other than as specified in this Instruction Manual, or if the user has disassembled or modified the system, KYOWA ELECTRONIC INSTRUMENTS may not be able to offer repair service.

6-1 TROUBLESHOOTING FOR THE EDX-2000B

Symptom	Check item and/or countermeasures
When the AC power supply is used, power is not supplied to the main unit. The POWER LED does not light up.	● Does the AC power outlet have the specified voltage? Check the voltage by using a tester or the like. See "3-2 CONNECTING POWER." ● Is the power cord securely connected? ● Has the fuse blown? A spare fuse is provided in the AC inlet socket. If you find a blown fuse, the problem should be removed before replacing the fuse.
When the DC power supply is used, power is not supplied to the main unit. The POWER LED does not light up.	● Does the DC power supply have the specified voltage? Check the voltage by using a tester or the like. See "3-2 CONNECTING POWER." ● Is the power cord connected securely? ● Has the DC fuse blown? A spare fuse for the DC power supply is included in the standard accessories. If you find a blown fuse, the problem should be removed before replacing the fuse.
The color of the POWER LED is not "green."	● It is normal. See "2-1 FRONT."
After the power supply is turned ON, the POWER LED lights up normally but the initial screen of the EDX-2000B is not displayed.	● If the EDX-2000B interfaces (SCSI, LAN, USB, keyboard and mouse) are connected, shut OFF the power supply, remove all connections, and then turn ON the power supply. If the initial display does not appear even after the power supply is turned on again, an internal hard disk failure is suspected. Contact KYOWA or our representative.
"UNKNOWN" is displayed in Card Type of the initial screen of the EDX-2000B.	● After turning OFF the power supply, remove all connectors from the conditioner card of EDX-2000B, and then turn ON the power. If the normal display appears on the screen, a sensor input error is suspected. See "3-3 CONNECTING SENSORS." If the name of the card installed in the conditioner is not displayed even after the power ON again, contact KYOWA or our representative.
When measuring, no data recording is started, paused or stopped even if the "REC/PAUSE" or "STOP" switch is pressed.	● The "REC/PAUSE" or "STOP" switch signal is accepted at intervals of about two seconds. Do not press the switch too quickly.
The remote control unit was used to record a voice memo, but no voice was recorded.	● Check the microphone that has been selected for voice recording. Environment → Microphone →Remote ● Change the voice volume ("0" is minimum and "127" is maximum). Environment →Volume → Change

Symptom	Check item and/or countermeasures
When playing the recorded VOICE MEMO, the beginning part of the voice memo cannot be heard.	● Voice recording starts after the "REC LED" lights up in red. Confirm that the "REC LED" is lit in red before inputting voice.

6-2 TROUBLESHOOTING FOR STRAIN/VOLTAGE MEASUREMENT CARD CDV-40B

Symptom	Check item and/or countermeasures
"***" is displayed in Card Type of the initial screen even if the card is installed.	● Pull out the conditioner card and check for any bent connector pins located on the other side of the panel. If the connector pins are bent, correct the problem and install the card, then confirm that the card type is displayed. If the same display still appears even after the problem is remedied, please contact KYOWA or our representative for service.
A balance cannot be achieved.	● Is OFF selected for the BAL item in the conditioner settings? If "OK" doesn't appear even if "ON" is selected, it is suspected that a sensor is not connected to the input, a sensor is bad or is unstable.
Excessive noise is present in the waveform display.	● Is the GND terminal of the EDX-2000B grounded? ● When using the strain gage, noise may be reduced by connecting the GND terminal of the EDX-2000B and the test specimen to which the strain gage is attached. See "3-3 CONNECTING SENSORS." ● Is there an inverter motor, machining equipment, welder or AC power supply for power systems placed near the input cable for the EDX-2000B? If so, move the input cable apart from the power source. ● Set low pass filter to reduce noise. Set cutoff frequency of the low pass filter to about 2 to 5 times the frequency of the input signal. (Example: If the input is DC to 100 Hz, select a cutoff frequency of 300 Hz.) If input signals change abruptly, set the parameter to about 10 times the frequency of the input signal.

7. MAINTENANCE

7-1 MAINTENANCE DESCRIPTIONS

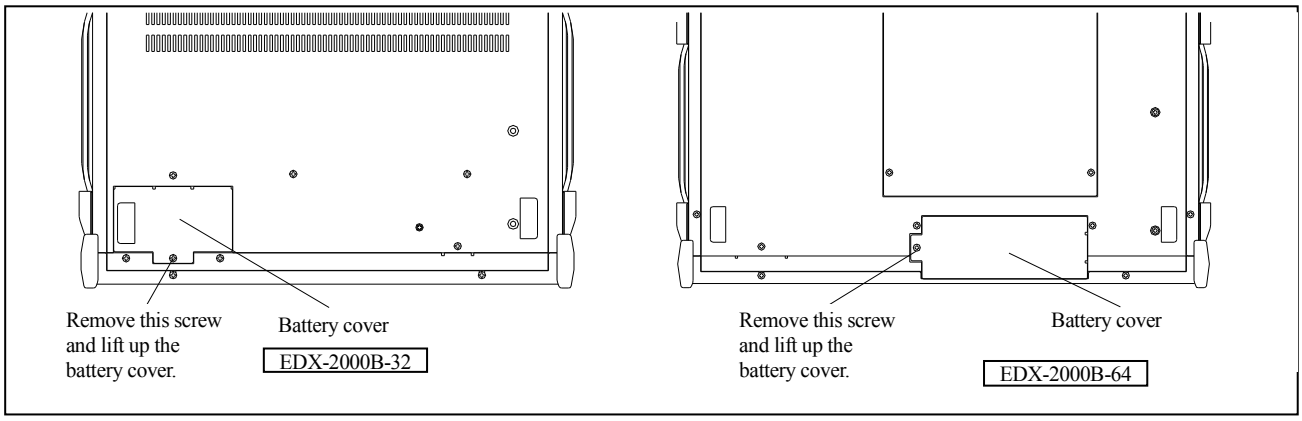
The following items are provided for scheduled maintenance for the EDX-2000B.
Maintenance services are performed at the intervals specified below.

Item	Description	Service intervals
Replacement of internal battery (Ni-MH)	The life of a Ni-MH battery is approximately 1 year. Replace the battery within 1 year, or the battery capacity becomes short. The expiration date is indicated on a label affixed to the rear of the main unit. See "7-2 REPLACING INTERNAL BATTERY," for details on battery replacement.	Once a year
Replacement of internal hard disk	The HDD of the internal disk is a mechanical part that may be deteriorated due to vibration, impact and heat applied during operation. It is recommended to replace the internal hard disk once every 2 years. In addition, for the SSD, it has a limited number of read/write cycles also. It is recommended to replace the internal disk once every 2 years. The EDX-2000B must be returned to KYOWA for replacing the internal disk.	Once every 2 years
Evaluation of accuracy of the internal conditioner card	An annual inspection is recommended to ensure the accuracy of the internal conditioner card. The conditioner card must be returned to KYOWA for the scheduled inspection.	Once a year
Replacement of internal FAN	The fan is a mechanical parts. It is recommended to replace the internal FAN once every 3 years. The EDX-2000B must be returned to KYOWA for replacing the internal FAN.	Once every 3 years
Replacing lithium battery for memory backup	The CPU board incorporates lithium battery for memory back up. The battery lasts about 3 to 5 years at normal temperature (20 to 30℃). Replace the battery within 5 years. The EDX-2000B must be returned to KYOWA for replacing the battery.	Once every 5 years

7-2 REPLACING INTERNAL BATTERY

The internal battery should be replaced with the power supply OFF and the AC or DC power cable disconnected. First, remove the screws from the bottom surface of the EDX-2000B and take out the battery. Remove the terminals connected to the battery and reconnect them to a new battery, insert the new battery, replace the battery cover and screw it securely in place. Contact KYOWA or our representative for information when purchasing a new battery.

<Optional>
Internal battery for the EDX-2000B-32: EDX2000-BAT32CE
Internal battery for the EDX-2000B-64: EDX2000-BAT64CE



NOTE

The EDX-2000B is operated by Ni-MH battery which is recyclable valuable resource.
When disposing the used battery, provide the battery for recycling.

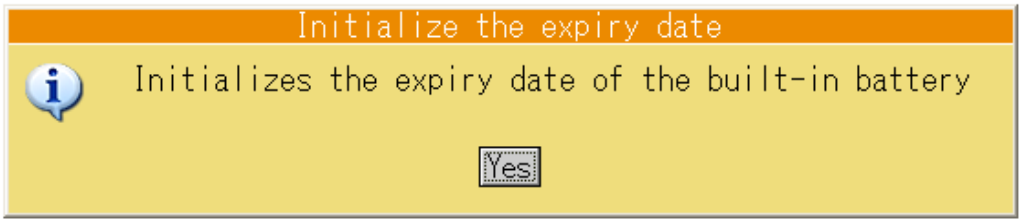
7-2-1 Initializing Expiration Date of Internal Buttery

After replacing the internal battery, initialize the expiration date of the internal battery as follows.

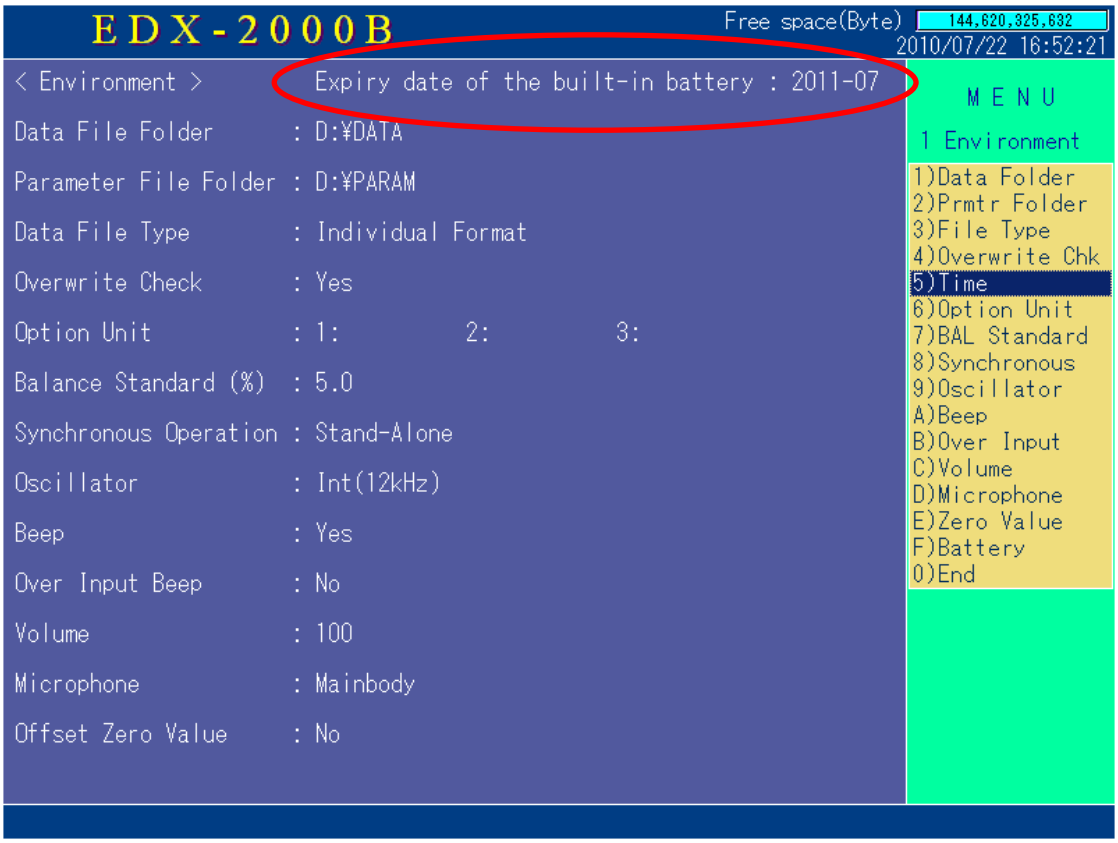
1) Select “Environment” – “Time.”

2) Input the year and month that adds 1000 years to the expiration date.
The expiration date should be one year from the replaced month.
Example)
If you replace the internal battery on July 2010, set the expiration date to July 3011 for initializing.
At that time, you do not need to set day, hour, minute, and second.

3) After inputting the expiration date, press the ENTER key and the following dialog box appears.
Press the ENTER key again.



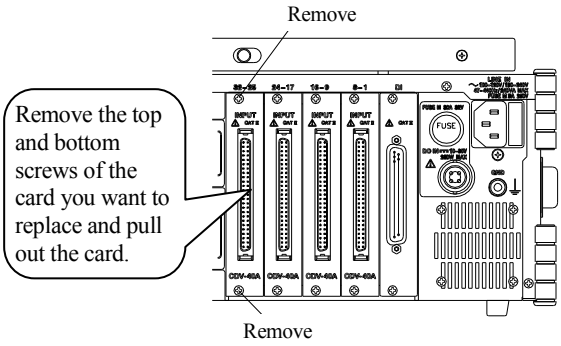
4) A new expiration date of the internal battery appears on the upper right of the “Environment” window.
Check that the expiration date is correct.
Set a new expiration date again from item 1) if the displaying expiration date is wrong.

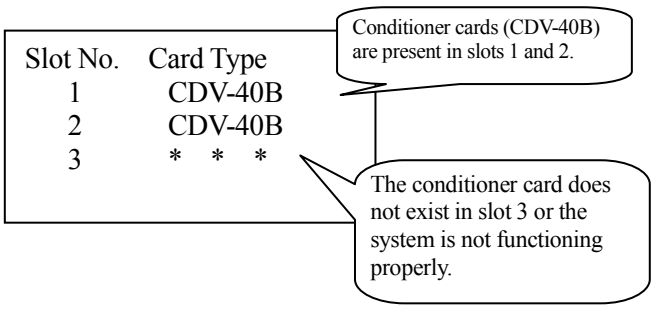


7-3 REPLACING CONDITIONER CARD

To replace the conditioner card, shut OFF the power and take the following steps.

1) The screws located at the top and bottom of the conditioner panel.
2) Pull the conditioner card outward slowly.
3) Insert the new replacement card slowly along the guide rail in the casing, and then tighten the screws at the top and bottom of the conditioner card.
4) After replacing the conditioner card, power ON the EDX-2000B and check the startup screen. If the Card Type is displayed in Slot No. corresponding to the conditioner card that was replaced, it means the conditioner card was replaced properly.
   If the EDX-2000B is not operating properly, "***" is displayed in Card Type as shown in the figure at right. At this time, remove the card and reinsert the conditioner card once again.





Using screws: Binding head screws M3 × 6
(For the DPM-42A and CFV-40A, use dedicated screws already mounted.)

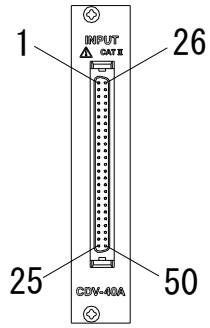
NOTE

・Be sure to turn OFF the power supply of the EDX-2000B before mounting and demounting the conditioner cards.
Or, the it may cause EDX-2000B failure.
・ Do not touch parts on the conditioner cards.
Or, it may cause deterioration of performance and EDX-2000B failure.

8. CONNECTOR PIN ASSIGNMENT

8-1 CDV-40B/A CENTRALIZED CONNECTOR

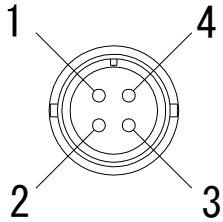
Pin No.	CH	Name	Pin No.	CH	Name
1	1	+BV	26	1	–IN
2		–BV	27		+IN
3		COM	28		ID
4	2	+BV	29	2	–IN
5		–BV	30		+IN
6		COM	31		ID
7	3	+BV	32	3	–IN
8		–BV	33		+IN
9		COM	34		ID
10	4	+BV	35	4	–IN
11		–BV	36		+IN
12		COM	37		ID
13	5	+BV	38	5	–IN
14		–BV	39		+IN
15		COM	40		ID
16	6	+BV	41	6	–IN
17		–BV	42		+IN
18		COM	43		ID
19	7	+BV	44	7	–IN
20		–BV	45		+IN
21		COM	46		ID
22	8	+BV	47	8	–IN
23		–BV	48		+IN
24		COM	49		ID
25	-	Shield	50	-	Shield



Model DN-50S
Manufacturer Hirose

8-2 DC POWER SUPPLY CONNECTOR

Pin No	Name
1	Positive side
2	Positive side
3	Negative side
4	Negative side



Model RM15QRD-4PA
Manufacturer Hirose

NOTE

The “negative side” of the DC power supply connector is insulated with the casing (GND terminal).
See “3-2-2 Connecting DC Power.”

9. HARDWARE SPECIFICATIONS

9-1 OVERALL SPECIFICATIONS

1) Models

Model	The number of MAX. analog input channels	The number of MAX slots	Internal Disk	Language
EDX-2000B-32-H	32	4	HDD	Japanese
EDX-2000B-32-HE	32	4	HDD	English
EDX-2000B-32-S	32	4	SSD	Japanese
EDX-2000B-32-SE	32	4	SSD	English
EDX-2000B-64-H	64	8	HDD	Japanese
EDX-2000B-64-HE	64	8	HDD	English
EDX-2000B-64-S	64	8	SSD	Japanese
EDX-2000B-64-SE	64	8	SSD	English

[Note] Number of slots: Number of slots for conditioners

2) Number of input channels
MAX. 32 channels for EDX-2000B-32 (when four CDV-40B cards are installed)
MAX. 64 channels for EDX-2000B-64 (when eight CDV-40B cards are installed)

3) Analog input
For details, see the specifications for the internal conditioner card.

4) Digital input
16 bits, TTL level, contact input (no-voltage)
CAN data (the CAN-40A is used, Bosch 2.0 B active compatible)

5) Voice input
1 channel (Inputted voice memo during data recording can be recorded with measured data.)

6) Number of output channels
For details, see the specifications for DA card.

7) Sampling frequency
Sampling method
All channels simultaneous
Sampling periods
1 Hz to 200 kHz (1,2,5 system): When recording data up to 16 channels
1 Hz to 100 kHz (1,2,5 system): When recording data up to 32 channels
1 Hz to 50 kHz (1,2,5 system): When recording data up to 64 channels
1 Hz to 10 kHz (1,2,5 system): When realtime simultaneous processing is enabled
2 Hz to 65.536 kHz (2n system): When recording data up to 32 channels
2 Hz to 32.768 kHz (2n system): When recording data up to 64 channels
2 Hz to 8.192 kHz (2n system): When realtime simultaneous processing is enabled.

8) Data recording capacity
HDD (Hard Disk Drive): 100 Gbyte or more
SSD (Solid State Drive): 30 Gbyte or more

9) Display
10.4-inch built-in color LCD or equivalent
(used for parameter settings and graphical/numerical data monitoring, etc.)

10) Control keys — Key panel provided on the main unit and external keyboard

11) External control connectors — CONT IN, CONT OUT (for remote control unit and synchronous operation)

12) External equipment interfaces

[1]	Keyboard interface	For connecting the US 101 keyboard (6-pin mini DIN connector)
[2]	External display interface	VGA connector (15-pin connector for monitor)
[3]	Mouse interface	PS/2 mouse interface (6-pin mini DIN connector)
[4]	USB-interface	USB 2.0, 1 port on front panel and 1 port on rear panel (For connecting data collecting USB memory, USB mouse, and USB keyboard)
[5]	LAN-interface	10/100/1000BASE-TX (for transferring the recorded data)

13) Power supply — 100 to 120 VAC or 190 to 240 VAC, 47 Hz to 440 Hz
10 to 30 VDC
An internal battery is provided to maintain power in the event of a momentary loss of power.

14) Operating temperature and humidity ranges
0 to 40°C, 20 to 80%RH (non-condensing)

15) Storage temperature range — -20 to 60°C

16) Vibration resistance

EDX-2000B-32-H (E) and EDX-2000B-64-H (E)
29.42 m/s^2 (3 G), 5 to 55 Hz (when in operation)
49.03 ms^2 (5 G), 5 to 55 Hz (when not in operation)

EDX-2000B-32-S (E) and EDX-2000B-64-S (E)
29.42 m/s^2 (3 G), 5 to 55 Hz (when in operation)
49.03 ms^2 (5 G), 5 to 55 Hz (when not in operation)
19.6 m/s^2 (2G), 10 to 200 Hz (when in operation)

17) Impact resistance — 196.1 m/s^2 (20 G)/11 ms

18) Outside dimensions

EDX-2000B-32:
350 (W) × 132 (H) × 300 mm (D) (not including protrusions)
Approx. 11 kg (with 2 CDV-40B cards installed)

EDX-2000B-64:
430 (W) × 156 (H) × 300 mm (D) (not including protrusions)
Approx. 12 kg (with 2 CDV-40B cards installed)

9-2 INTERNAL CONDITIONER CARD SPECIFICATIONS

Strain/voltage measurement card: CDV-40B, CDV-40B-F

Item	Strain measurement	Voltage measurement
Number of input channels	8 (centralized connector)	
Input type	Balanced differential input	Unbalance input
Input resistance	Approx. (10 Mohm+10 Mohm)	Approx. 1 Mohm
Coupling	DC/AC (DC cut)	
Applicable gage factor	2.00	–
Bridge Excitation	2.00 VDC ± 2% (120 ohm to 1 Kohm)	–
Balance range	Resistance ± 2.4% (±12000 μm/m)	–
Measuring range	8 steps of 500 μm/m, 1 kμm/m, 2 kμm/m, 5 kμm/m, 10 kμm/m, 20 kμm/m, 50 kμm/m and OFF	8 steps of 0.1 V, 0.2 V, 0.5 V, 1 V, 2 V, 5V, 10 V and OFF
Frequency response range	DC coupling AC coupling (DC cut)	DC to 50 kHz, +1 dB and –3 dB deviations 0.2 or 1 Hz to 50 kHz (see the high-pass filter)
Low pass filter	Transfer characteristics Cutoff frequency: Amplitude ratio at cutoff point Attenuation	2nd order Butterworth 8 steps of 10 Hz, 30 Hz, 100 Hz, 300 Hz, 1 kHz, 3 kHz, 10 kHz and F (Flat) -3 dB ± 1 dB -12 dB/oct. ± 1 dB/oct.
Antialiasing Filter (CDV-40B-F only)	8th order Butterworth Cutoff frequency: Automatically set at sampling frequency × 0.25 Attenuation: -48 dB ± 5 dB (with sampling frequency × 0.5) [Note] Provided that low-pass filter is set to AUTO on EDX-2000B.	
High pass filter (DC cut)	Cutoff frequency 0.2 Hz and 1 Hz Attenuation -6 dB/oct.	
Resousion	16 bits	
TEDS function	Reading information from TEDS-installed sensor	

9-3 REMOTE CONTROL UNIT SPECIFICATIONS

1) Model — RCU-40A

2) Control functions
   - [1] "REC": Start data recording
   - [2] "PAUSE": Pause data recording
   - [3] "STOP": Stop data recording
   - [4] "VOICE MEMO": Used for recording and playing voice (recording starts when the switch signal is recognized)

3) Display — The LED display allows the user to distinguish whether data recording is in progress, data recording is paused, voice is being recorded or data recording has been stopped.

4) Cable length — Approx. 1.5 m

10. SOFTWARE SPECIFICATIONS

10-1 SETTING MEASURING CONDITIONS

1)	Measuring channel conditions	Parameters are set for the channels to be used, as well as the range, high pass filter (DC cut), low pass filter, calibration coefficient, offset, unit and channel name.
2)	Measuring mode	
	[1] Manual measurement	Data recording using panel keys or the remote control unit.
	[2] Interval measurement	Automatic data recording is performed at specified intervals.
	[3] Trigger measurement	Automatic data recording is performed according to the trigger channel(s) and trigger conditions.
3)	Sampling frequency	The sampling frequency is set.
4)	Recorded data	Free space on internal hard disk: Sampling rate ranges from 1 Hz to 10 kHz. 2 to 2 Gbyte data sets (data recording channels × recorded data): When sampling rate exceeds 10 kHz.
5)	Test information	Test title, comment and item/description
6)	Saving and loading measurement conditions	

10-2 MEASUREMENT/DATA RECORDING

10-2-1 Monitoring

1)	Monitoring types	Numerical display, time axis graph, bar graph and relative (X-Y) graph
	[1] Numerical monitoring	Measured data is numerically displayed.
	[2] Time axis (Y-T) graph	1 graph per screen, 2 graphs per screen, 3 graphs per screen or 4 graphs per screen
	[3] Bar graph	For all channels (MAX. 64 channels)
	[4] Relative (X-Y) graph	One graph per screen or two graphs per screen Four pairs (channels) of relative plots can be drawn in each graph.
2)	Data check	
	[1] Raw data check	Acquired data is checked (time axis graph).
	[2] MAX/MIN data	Data (±200 data items) near the maximum and minimum of the recorded data is viewed in graphical format.
	[3] Histogram graph	The results of simultaneous histogram processing are viewed in the histogram.

10-2-2 Simultaneous Processing

1)	Types of simultaneous processing	Histogram processing Only one type can be selected for each measurement channel during monitoring or data recording.
2)	Histogram analysis	
	[1] Types of histogram analysis	5 types: Max/Min + Rain1D, P/V, Max/Min, Rain1D and Rain2D (Max/Min = Maximum/minimum value method, Rain1D = 1-dimension rainflow method, Rain2D = 2-dimension rainflow method, and P/V = Peak/Valley method)
	[2] Number of slices	1-dimension: 16 (±8), 32 (±16), 64 (±32), 128 (±64) and 256 (±128) 2-dimension: 16 (±8) and 32 (±16)
	[3] Hysteresis	2 to the preset number of slices

10-3 DATA REPRODUCTION

10-3-1 Graph Display

1) Graph types

[1]	Time axis (T-Y) graph	1 graph per screen, 2 graphs per screen, 3 graphs per screen or 4 graphs per screen
[2]	Relative (X-Y) graph	1 graph is provided per screen, and 8 pairs (channels) of relative plots can be drawn.

2)	Graph display conditions	Display channel, graph scale, number of displayed data items, additional line, etc.
3)	Graph controls	Scroll, Cursor Movement and Display Value, Zoom In/Zoom Out, Display All Data/Zoom, Play VOICE MEMO, etc.

4) Saving and loading of display conditions

10-3-2 Editing Data File

1)	Edit data	Change and/or edit recorded data. (The number of data items that can be edited at once is limited.)
2)	Edit header	Change header information for recorded data (data recording time, calibration coefficient, offset, unit, file comment and channel name).
3)	Save file	Save the edited data in a different file.
4)	Cut and save	Save arbitrary data area of the recorded data file in a different file.
5)	Convert to ASCII	Convert the recorded data to the ASCII (CSV) format and save it.

10-3-3 Statistical Processing

Display and save the maximum value, minimum value, average value and standard deviation of the recorded data.

10-4 ANALYSIS PROCESSING

10-4-1 Arithmetic Operations

Arithmetic operations are performed between the arbitrary channels in maximum 2 recorded data files, and the operation results are saved in a specified file.

1) Setting items

[1]	Calculation target file name	1 (A) or 2 (A and B) recorded data files should be specified. If 2 files are specified, those recorded data files should have the same sampling frequency.
[2]	Calculation results file name	Specify the file name for saving the results of the arithmetic operations. The results of the arithmetic operations should have the same format (KS2) as that of the recorded data file.
[3]	Calculation target channel	Analog channels only (A01 to A64 and B01 to B64). Example of channel display "A06": Represents channel No. 6 of file A. "B28": Represents channel No. 28 of file B.
[4]	Calculation result channel	Channels of arithmetic operations result: Maximum 32 channels (C01 to C32) (C**: ** shows the channel that describes the calculating formula.) Example of channel: "C06" Expression f ( ) is specified by C** = f (A**, B**) used for saving calculated results obtained from C06 = (expression).
[5]	Expression	Specify the expression of C**= f (A**, B**) Expression should be within 60 digits. Up to 32 expressions (calculation result channels) can be set.
[6]	Unit	Engineering units can be specified for the calculation result.
[7]	Channel name	Comment for the calculation result channel.

2) Operators and expressions

[1]	Addition, subtraction, multiplication and division operators	+, -, *, /, SQR, ABS, SIN, COS, TAN, ASIN, ACOS, ATAN, LOG, LN, EXP and rosette function
[2]	Others	No variables is be used. + and – can also be used as signs (e.g. -5.7, -A15). The calculation result (channel) cannot be used for the expression in another calculation result channel. Recursive processing cannot be performed. (Example: C10 = C01 + C02 , C12 = C12 + 3.1415 etc. cannot be used.)

3) Saving and loading the calculation operations conditions

10-4-2 FFT Analysis

FFT analysis is conducted for arbitrary channel data of the recorded data and the results are saved in a specified file. The results can be viewed in graphical format.

1) Types of FFT analysis — Linear spectrum, power spectrum, cross spectrum, auto correlation and cross correlation
2) Analysis conditions
   - [1] Analysis types — Linear spectrum, power spectrum, cross spectrum, auto correlation and cross correlation
   - [2] Analysis target channel — One or two channels (depending on the type of analysis)
   - [3] Filter — Low pass filter may be used for the pre-processing of FFT analysis.
   - [4] Integration — Data integration may be performed for the pre-processing of FFT analysis (once or twice).
   - [5] Analysis data — 256, 512, 1024, 2048, 4096, 8192, 16354 and 32768 items
   - [6] Window function — Off (square window), Hanning, Hamming, Fejer, Blackman and Gaussian
   - [7] Average times and shift data — Average of FFT results and number of shift data
   - [8] Analysis start point — The analysis start point for the target data is specified.
   - [9] Analysis result file — The analysis results are saved with the target time series data.
3) Analysis results graph — Display a graphical presentation of target time series data and FFT analysis results
   Display the cursor, zoom in/out the X axis/Y axis.
4) Saving and loading of analysis conditions

10-4-3 Histogram Analysis

Histogram processing is performed for recorded data, and then the processing results are saved in a specified file. The processing results can be viewed as a list or in graphical format.

1) Setting items
   - [1] Target channel — Channel(s) are specified to perform histogram processing.
   - [2] Types of histogram processing
     - A) Peak/valley method (P/V)
     - B) Maximum/minimum value method (MAX/MIN)
     - C) One-dimension rainflow method (Rain[1D])
     - D) Two-dimension rainflow method (Rain[2D])
     - E) Amplitude method (AMPLITUDE)
     - F) One-dimensional time at level (TIME[1D])
     - G) Complex: One-dimension rainflow method + Peak/valley method (RAIN&P/V)
     - H) Complex: One-dimension rainflow method + Maximum/minimum value method (RAIN&M/M)
   - [3] Number of slices — 1-dimension (A, B, C, E, F, G and H of the above)
     10 (±5) to 256 (±128)
     2-dimension (D of the above)
     Even numbers of 10 to 50
   - [4] Slice width — A physical value is specified for the width of one slice.
   - [5] Hysteresis — The number of slices subject to masking is specified within the range of 0 to the preset number of slices.
   - [6] Offset — A physical value is set when the maximum/minimum value method is used.
   - [7] Target file for processing — Recorded data file or arithmetic operations result file
   - [8] Processing result file — Histogram processing result file

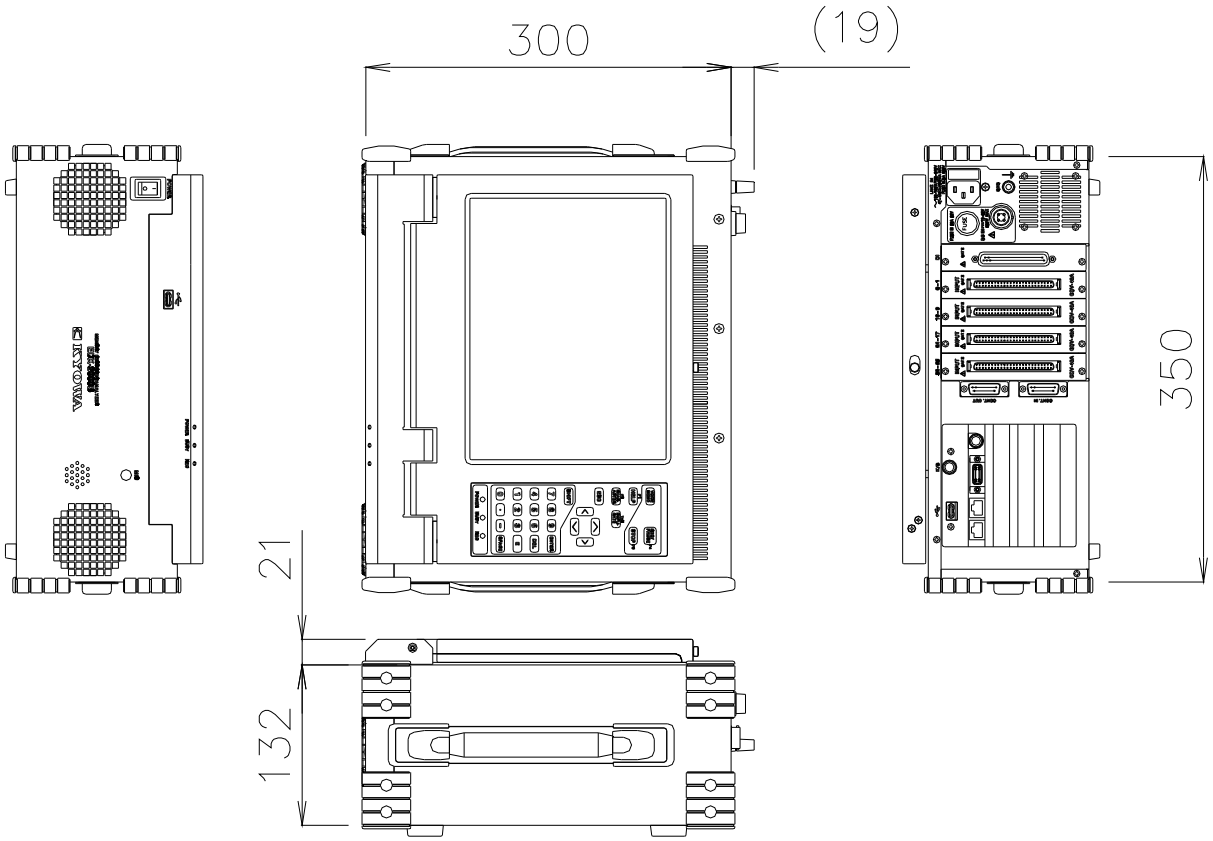
2) Result presentations

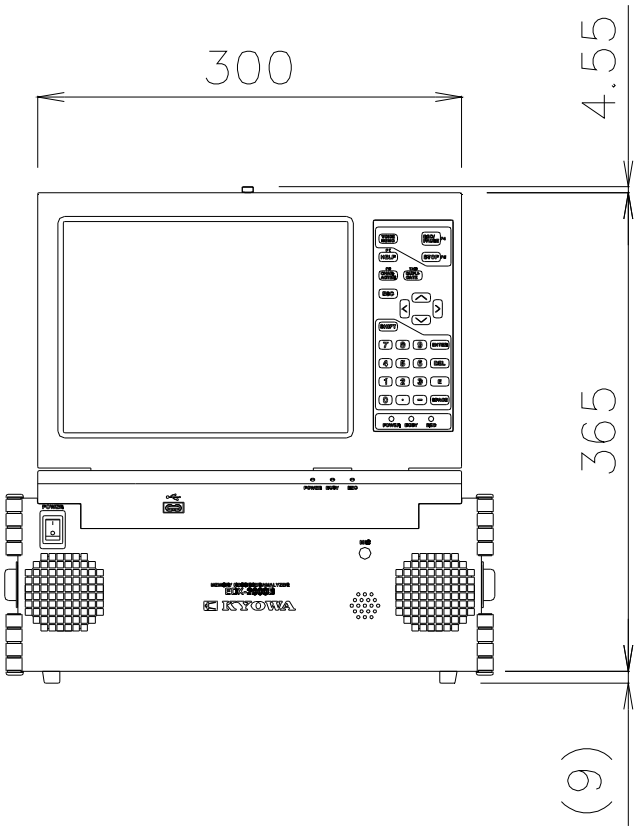
[1] Chart	A list of results is displayed for each processing channel.
[2] Plots	A histogram graph is displayed for each channel (3-dimensional graph is presented for the 2-dimensional type).

11. EXTERNAL VIEWS

11-1 MEMORY RECORDER/ANALYZER EDX-2000B-32

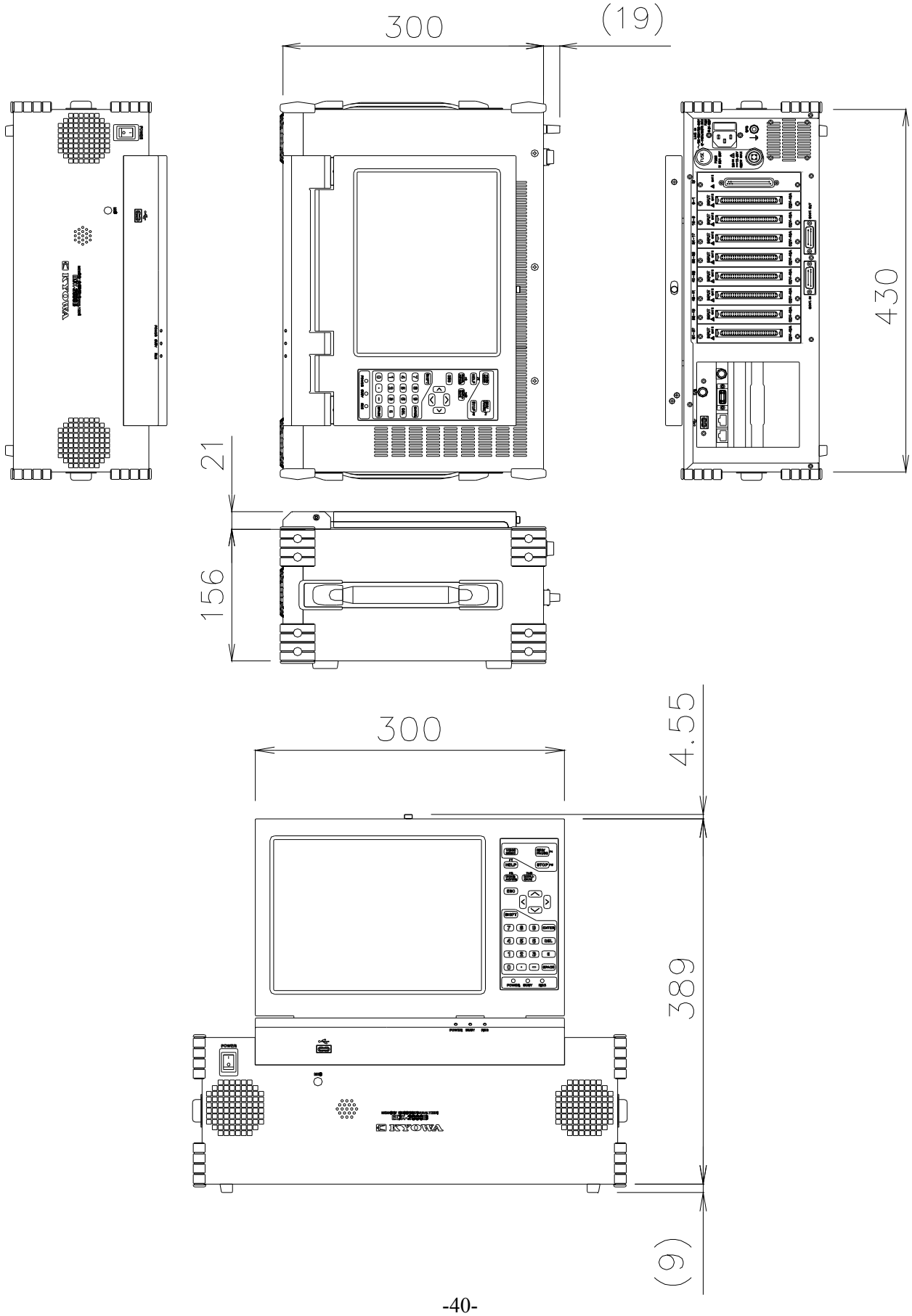
(Unit mm)





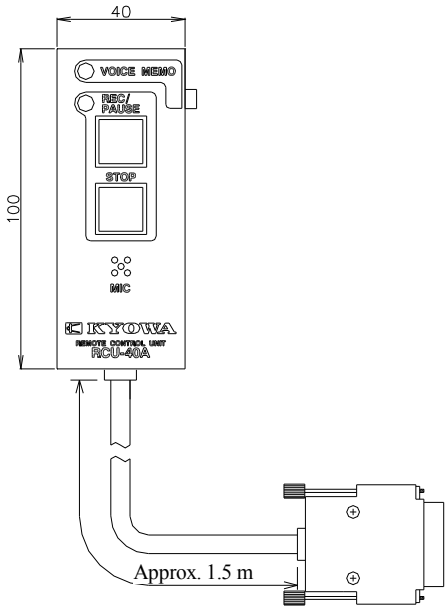
11-2 MEMORY RECORDER/ANALYZER EDX-2000B-64

(Unit mm)



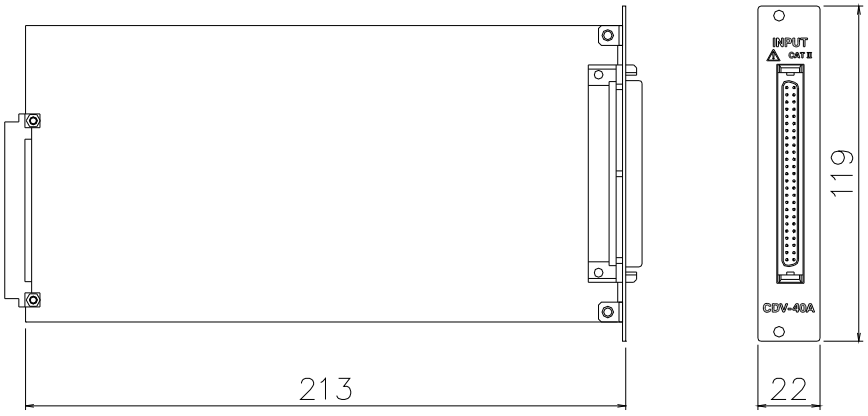
11-3 REMOTE CONTROL UNIT RCU-40A

(Unit mm)



11-4 STRAIN/VOLTAGE MEASUREMENT CARD CDV-40B/A

(Unit mm)



12. APPENDIXES

12-1 HOW TO RESET SETTINGS TO THE FACTORY DEFAULT

The settings of the EDX-2000B can be reset to the factory default with the following operations.

1) Turn ON the EDX-2000B.
2) Windows logo appears on the window.
"・・・3, 2, 1" appears on the down right side of the window just before starting the application of the EDX-2000B.
Press the **DEL** key during displaying the numbers.
⇒ The settings are reset to the factory default.
3) After disappearing the numbers, the software of the EDX-2000B starts up with the factory default state.

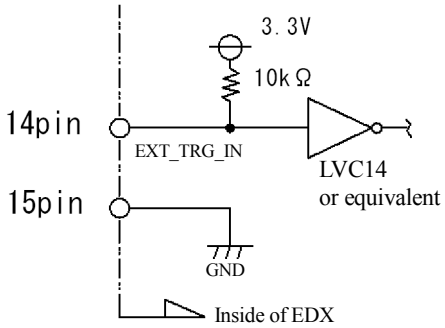
Settings are the only items that can be reset to the factory default.
The recorded data and parameter files with the saved conditions are not deleted.

12-2 EXTERNAL TRIGGER FUNCTION

This section describes how to start recording by inputting the external trigger signal to the EDX-2000B.

1) For the pin assignment of the external trigger signal and connector

The CONT IN connector on the rear panel of the EDX-2000B incorporates an external trigger pins.
These are 14-pin and 15-pin. Do not use pins other than above.

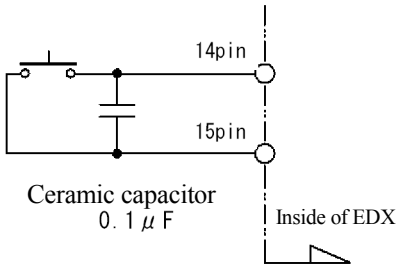


Applicable connector (cable side): D15-403N-190 (Technical electron co. Ltd)
D-sub15pin (female) Connector + hood equipped.

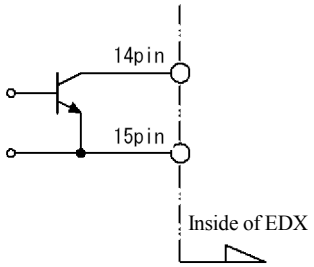
2) For input signal

Input non-voltage contact signal or open collector signal.
The "slope (Positive)" or "slope (Negative)" of the input trigger depends on the setting of the software of the EDX-2000B.

(For a contact)



(For an open collector)



*The above is an outline circuit.

NOTE

- Avoid noise such as chattering, etc. from happening in the trigger input signal.
- It is recommended to use the open collector signal as the trigger input to prevent noise from external device and recommended to use an insulation element such as photocoupler, etc.
- The trigger works by width of the time of one time or more of the set sampling frequency.
- Input threshold value: 2.4 V or more for open circuit
  0.4 V or less for closed circuit
- MAX. input voltage range is 0 to +5 V. Or, the input circuit may cause system failure.
- Do not use other than 14-pin and 15-pin of the [CONT IN] D-Sub connector. Or, malfunction or failure may occur.
- The remote control unit RCU-40A cannot be used together with the external trigger function.
- The external trigger function can be used with the master EDX-2000B only when synchronously operating the units.
  The slave EDX-2000B units cannot be connected.
- Pre-test and check if the EDX-2000B is correctly triggered before the main-test.