



INSTRUCTION MANUAL

EDX-10A

Compact Recording System

(FOR HARDWARE)

Thank you for purchasing KYOWA's product EDX-10A Compact Recording System.

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

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

This Manual only describes hardware operation of the EDX-10A. For the Dynamic Data Recording Software DCS-100A, see the DCS-100A Instruction Manual (For EDX-10A Operation).

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The contents of the Instruction Manual are subjected to change without prior notice.

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This Manual only describes hardware operation of the EDX-10A.

STANDARD ACCESSORIES

The following accessories are packed with the EDX-10A.

When unpacking, check the contents to ensure that all accessories are enclosed.

DYNAMIC DATA RECORDING SOFTWARE DCS-100A:	1 (CD-R)
Ground wire P-72:	1
USB cable N-38:	1
Rubber Foot:	8
Test Certificate and Warranty:	1 each

OPTIONAL ACCESSORIES

AC adapter:	UN310-0515
Strain measuring unit:	EDX-11A
Voltage measuring unit:	EDX-12A
Dynamic Data Acquisition Software:	DAS-200A

SAFETY PRECAUTIONS (Do not forget to read the safety precautions prior to use.)

The EDX-10A is designed to be used according to "7. SPECIFICATIONS."

Do not use the EDX-10A in an environment exceeding the specifications.

Or, system failure may result in.

PRIOR TO USE

For safe use of the EDX-10A, do not forget to read the "Safety Precautions" prior to use.

Kyowa Electronic Instruments Co., Ltd. assumes no liability for any damage resulting from the user's failure to comply with the safety precautions.

For safety operation of the EDX-10A, the following symbol mark is attached to the EDX-10A.

	Indicates "PROTECTIVE GROUND TERMINAL." Be sure to connect the GND terminal to the ground.
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SAFETY SYMBOLS

For safety operation of the EDX-10A, the following symbol marks are used in the Instruction Manual.

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

 WARNING
• WARNING Be sure to observe the warning and precautions described in the EDX-10A Instruction Manual (FOR HARDWARE). • Power Supply To prevent a fire hazard, when using the optional AC adapter, check the voltage range of the AC power outlet before connecting. • Protective Ground Be sure to connect the GND terminal. Or, it may cause electric shock, lower the performance and cause trouble. • Avoid using in environment with inflammable gas, etc. To prevent the risk of fire hazard or explosion, do not use the EDX-10A in environment with inflammable gas, vapor, or dust. • If any trouble occurs To prevent fire hazards, if smoke is emerging from the EDX-10A, immediately disconnect the USB cable or AC adapter to terminate the system operation.

CAUTION

•CAUTION

Be sure to observe the caution and precautions described in the EDX-10A Instruction Manual (FOR HARDWARE).

- Do not use the EDX-10A outdoors.

Or, it may cause electric shock, fire hazard, lower the performance and cause trouble.

- Use the EDX-10A within temperature ranging from 0 to 40°C.

Use at temperatures exceeding the specified range may lower the performance and cause trouble.

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-10A in the specified operating humidity of 20 to 85% RH.

Use in a humid place exceeding the specified range or where it is exposed to splashing water may lower the performance and cause trouble.

- Do not use the EDX-10A immediately after the change in the environment.

Leave the EDX-10A 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-10A where it is subject to significant vibration or impact.

The vibration resistance and impact resistance are as follows.

Vibration resistance: 29.42m/s² (3G), 5 to 200Hz (when operating)

Impact Resistance: 196.1m/s²(20G)/11msec

Use the EDX-10A 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.

- Do not use the EDX-10A in strong electromagnetic field.

Use the EDX-10A in an environment where magnetic field 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, electronic furnace or any other equipment generating a strong magnetic field.

- Do not use the EDX-10A under poor conditions.

Optional AC adapter (UN310-0515): 100 to 240 VAC (50 Hz/60 Hz) The power supply used for the EDX-10A should not experience an instantaneous power failure and be free from noise.

- The specifications of the optional AC adapter (UN310-0515) is as follows.

Input voltage: 100 to 240 VAC (50 Hz/60 Hz)

Output voltage: 5 VDC (1.5 A)

Operating Temperature Range 0 to 40°C

- The optional AC adapter (UN310-0515) is consumable item. Replace it every five years.

- Do not connect the USB cable immediately after disconnecting.

Wait approximately 5 seconds before connecting the USB cable again.

- Do not pull cables.

Lay cords and cables with a certain allowance so that unreasonable force is applied to the connections.

Pulling or unreasonable force may cause troubles or interrupt the measurement.

- Avoid installing sensors and EDX-10A near a welding machine.

Failure to do so will pose the risk of erroneous data, malfunction and failure.

- Do not disassemble or remodel the EDX-10A.

Disassembling or remodeling by user may cause electric shock hazards or damage the EDX-10A.

This warranty does not cover any damaged or defective parts that results from disassembling or remodeling.

- Do not use the EDX-10A under dusty environment.

This can lead to performance problems and decreased operating efficiency.

Be careful that dust may not enter the EDX-10A not only during operation but also under stored conditions.

- Preheat the EDX-10A before use.

After the power ON, always preheat the EDX-10A for approximately 10 minutes.



CAUTION

- Handle the CD-R with care.

Do not expose the CD-R to direct sun light, high temperature, or high humidity.

Do not apply pressure to the CD-R by laying object or bending.

Handle with care to avoid any fingerprint, dirt, scratch on both sides.

LIMITED LIFE PARTS AND PREVENTIVE MAINTENANCE

The EDX-10A consists of various electronic components and those components, if not all, have a useful life. Using them exceeding the years specified according to each part type (useful life) may affect the characteristics of the EDX-10A, resulting in a malfunction or a failure.
You need to replace parts with a regular preventive maintenance schedule.

Limited life parts used with the EDX-10A are as follows.

○ Aluminum electrolytic capacitor

The signal-noise ratio will lower due to capacity low or smoke will be emitted due to liquid leak, resulting in a malfunction of the EDX-10A.

○ AC adapter (optional accessories)

Heat and smoke will be emitted, resulting in an unstable voltage.

To operate the EDX-10A normally, finding a sign of the EDX-10A failure early by daily/periodic inspections and taking the corrective action are required.
For inspection, contact KYOWA or our representatives.

* All components do age and will fail.

EDX-10A REPLACEMENT BEFORE THE END OF SERVICE LIFE

Preventive maintenance and replacement parts are a cost-effective way of keeping the performance and extending the service life of the EDX-10A.
Regardless of the replacement parts, the EDX-10A itself gradually deteriorates with age.
Before the expected service life is reached, consider replacing the EDX-10A with a new one or the latest series as preventive maintenance.

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 EDX-10A, and to information provided for reference purposes.

Examples of Notations

NOTE

Essential precautions required when handling the EDX-10A.

MEMO

Reference items required when handling the EDX-10A.

IMPORTANT PRECAUTIONS WHEN USING EDX-10A

NOTE

1. Do not disconnect the USB cable and optional AC adapter while recording data.
Or, it will cause data corruption and other problems
2. Do not connect multiple EDX-10A units to one PC.
You can connect one EDX-10A per one PC.
3. When using the USB bus power, be sure to connect one measuring unit to the EDX-10A.
Do not connect multiple measuring units.
We recommend you use the optional AC adapter when connecting one measuring unit.
4. When connecting 2 to 4 measuring units, be sure to use the optional AC adapter.
5. Do not connect 5 or more measuring units.
Or, deterioration or malfunction of the instrument may result.
6. Be sure to use the shielded USB cable for connecting the EDX-10A and PC.
Or, deterioration or malfunction of the instrument may result.
7. Be sure to use the accessory screws (binding head screw, $M3 \times 5$) for coupling measuring units.
Longer screws will damage the inner PCB components.
8. After the power ON, always preheat the EDX-10A for approximately 10 minutes.
9. The USB cable length must be less than 5 m including an USB hub.

CE MARKING

NOTE

1. When using a USB cable other than the standard accessories (N-38), use a USB cable with the ferrite cores or wrap the clamp-on ferrite core two turns around a USB cable.
2. Be sure to use the optional AC adapter (UN310-0515).
3. Be sure to connect the GND terminal to the ground.

SURFACE APPEARANCE

- Some products have a weld line often looks like a scratch or a line on the product appearance. It is called a “weld line” which occurred during parts molding. Weld lines are not a crack or scratch. There are no problems with the quality, performance and strength of the product.

1. OUTLINE OF THE PRODUCT

1-1. OUTLINE OF THE PRODUCT

The EDX-10A is small and lightweight measuring instrument. Measuring units can be connected easily.

The EDX-10A can execute small-scale measurement of up to 16 channels by connecting 4 measuring units in synchronous operation.

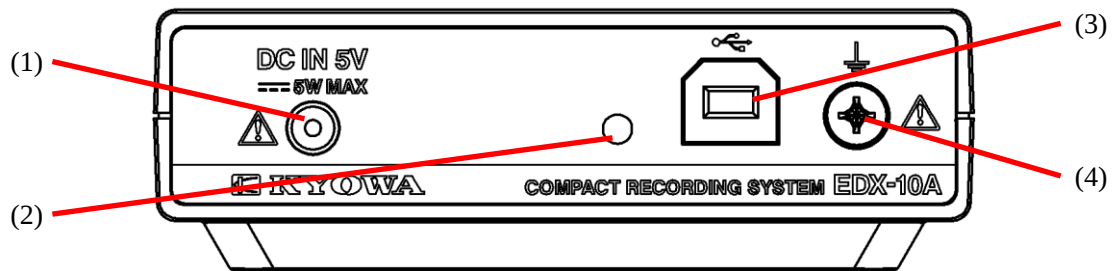
When connecting one measuring unit, the EDX-10A offers additional convenience for measurements because they are powered from the USB interface and do not require a separate power supply.

1-2. FEATURES

- Compact and lightweight
- Stacking connectors enable easy connection and make synchronous cables unnecessary.
- Since one measuring unit is capable of measurement of 4 channels and maximum 16 channels with 4 measuring units, the EDX-10A is applicable for measurement in a wide range from a simple experiment to advanced measurement.
- When connecting one measuring unit, the EDX-10A offers additional convenience for measurements because they are powered from the USB interface and do not require a separate power supply.
When connecting 2 to 4 measuring units, be sure to use the optional AC adapter.
- Applicable for high-speed measurement with the maximum sampling frequency of 20k Hz (up to 4 channels).
When connecting 4 measuring units (16 channels), the maximum sampling frequency is 5k Hz.
- Connection with the PC is easy with the use of the USB interface.
- You can measure and record data easily by using the Dynamic Data Recording Software DCS-100A.
- The Dynamic Data Acquisition Software DAS-200A is optional software that reproduces and analysis data after recording.

2. CONTROLS AND INDICATORS

2-1. FRONT

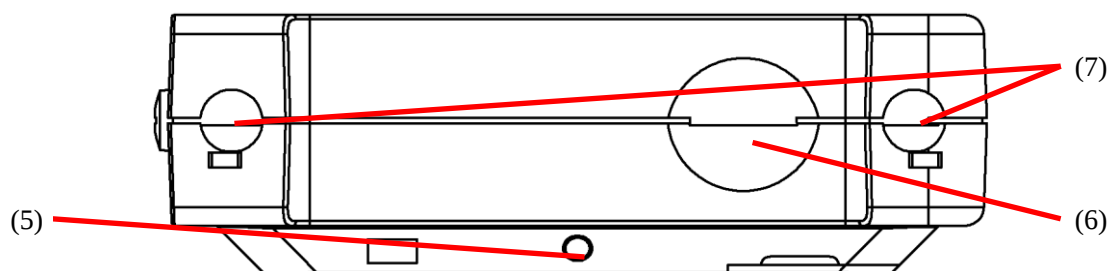


- | | |
|-----------------------|--|
| (1) [DC IN] connector | Used for connecting the optional AC adapter. When connecting 2 to 4 measuring units, be sure to use the optional AC adapter. |
| (2) LED | Lights up or blinks when connecting the PC, when communicating with the PC. For details, see table 2-1. |
| (3) [USB] connector | USB interface connector
Used for connecting the PC. |
| (4) GND terminal | GND terminal
Be sure to connect the GND terminal to the ground. |

Table 2-1 LED and operations

Status		Operation
Green	Light up	After starting up the Dynamic Data Recording Software DCS-100A.
	Blink	When the EDX-10A is communicating with the PC.
	Lights out	The Dynamic Data Recording Software DCS-100A is not working.
Red	Light up	Under the following conditions. When the LED lights up in red, stop using the EDX-10A and disconnect the USB cable after disconnecting the optional AC adapter. • When connecting 2 to 4 measuring units without connecting the optional AC adapter into the [DC IN] connector. • When connecting 5 or more measuring units. • Voltage range of the optional AC adapter exceeds 4.5 to 5.5 V. • Voltage range of the USB bus power exceeds 4.5 to 5.5 V. • When an error occurs in the EDX-10A or in measuring units.

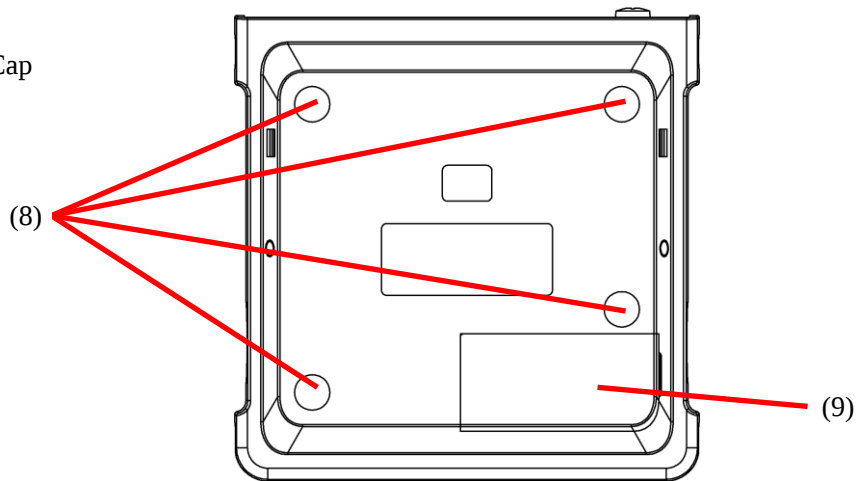
2-2. SIDE



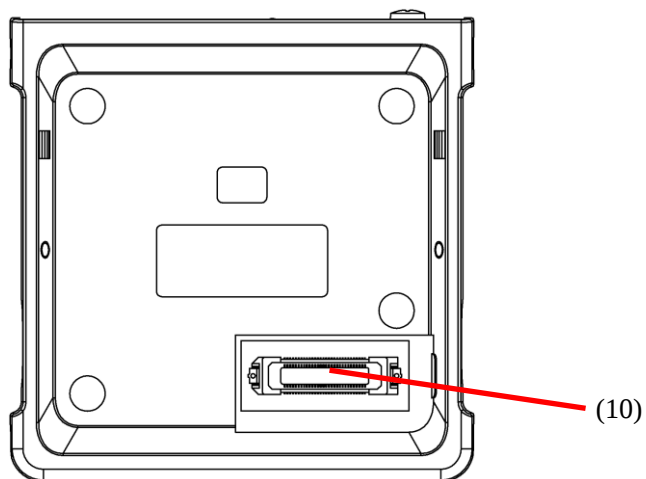
- | | |
|-----------------------|--|
| (5) Fixing screw hole | For fixing the EDX-10A and measuring unit by using a screw. |
| (6) Finger slot | For connecting/disconnecting the EDX-10A and a measuring unit. |
| (7) Rubber foot slot | The EDX-10A has small rubber feet (optional) to keep it from sliding around when placed on a flat surface. |

2-3. BOTTOM

With Cap



With no Cap



(8) Rubber foot slot

The EDX-10A has small rubber feet (optional) to keep it from sliding around when placed on a flat surface.

(9) Cap

Cap for protecting the unit-coupling connector on the EDX-10A bottom. Remove the cap before connecting measuring units.

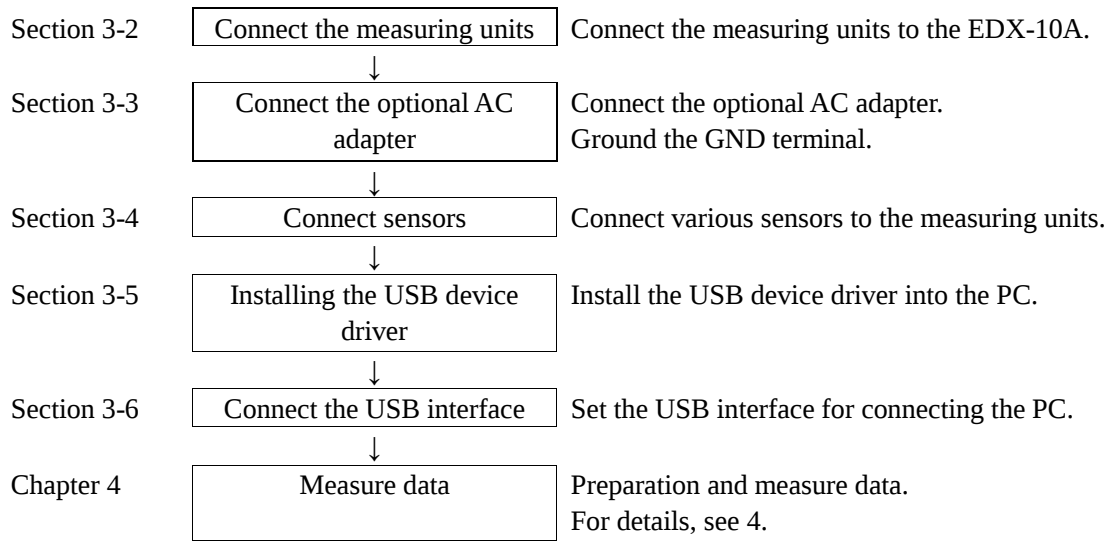
(10) Unit-coupling
Connector

Connector for connecting measuring units.

3. CONNECTION AND DEFAULT SETTING

3-1. PROCEDURES FOR MEASUREMENTS

This section describes necessary operations to be conducted prior to the actual measurements.



3-2. CONNECT THE MEASURING UNITS

This section describes how to connect the measuring unit into the EDX-10A.

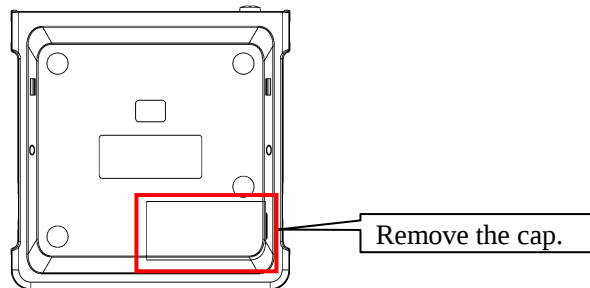
NOTE

- Before connecting the USB cable, mount the cap to the unit-coupling connector of the very-bottom measuring unit.

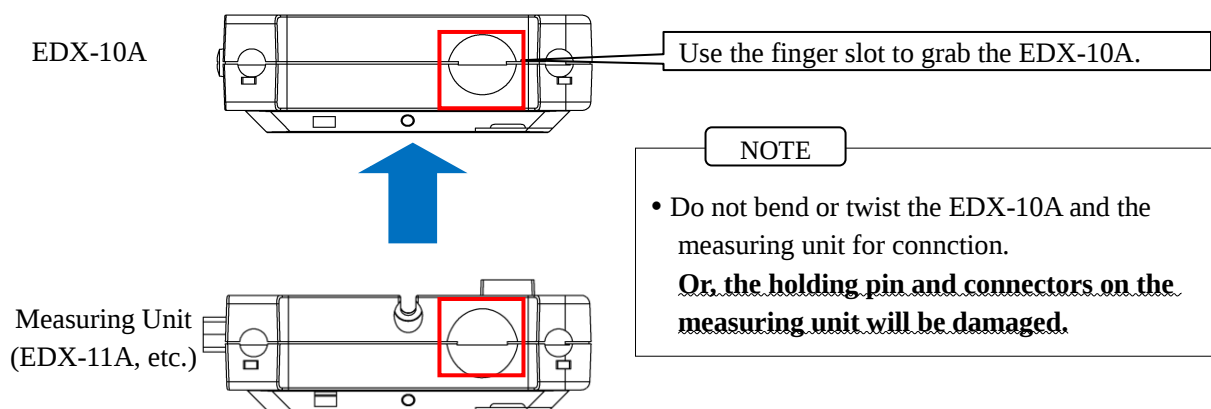
Or, it may cause system failures and accidents.

- You can connect the measuring units up to 4 units. Do not connect 5 or more measuring units.

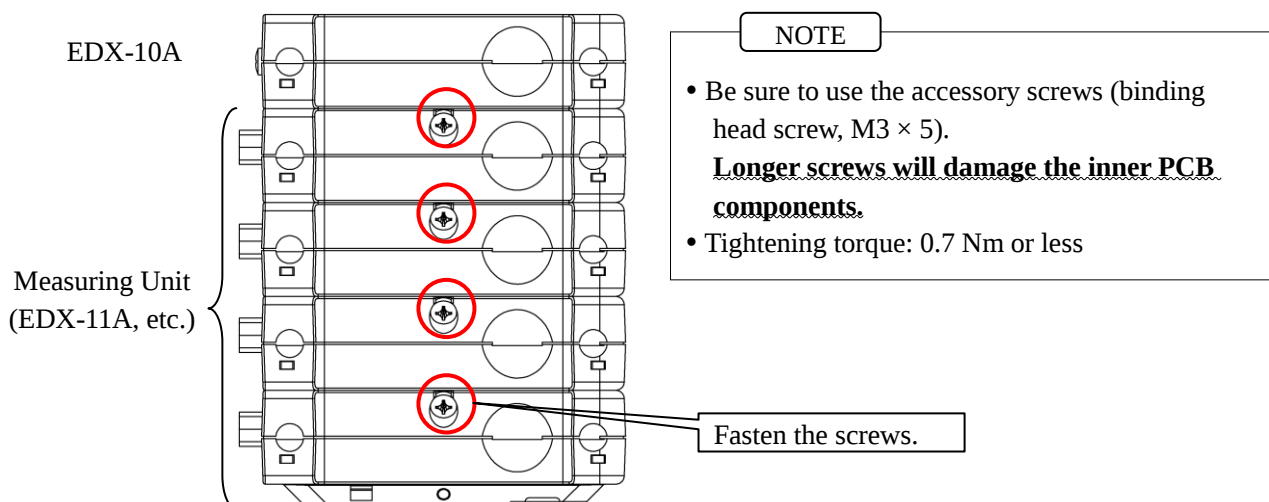
(1) Remove the cap on the EDX-10A bottom.



(2) Connect the unit-coupling connector on the EDX-10A bottom and connector on the measuring unit top.
Use the finger slots to connect the EDX-10A and a measuring unit.



(3) Fasten the accessory screws on both side of the measuring units.



3-3. CONNECT SENSORS

Before connecting the USB cable and optional AC adapter, connect sensors to measuring units.

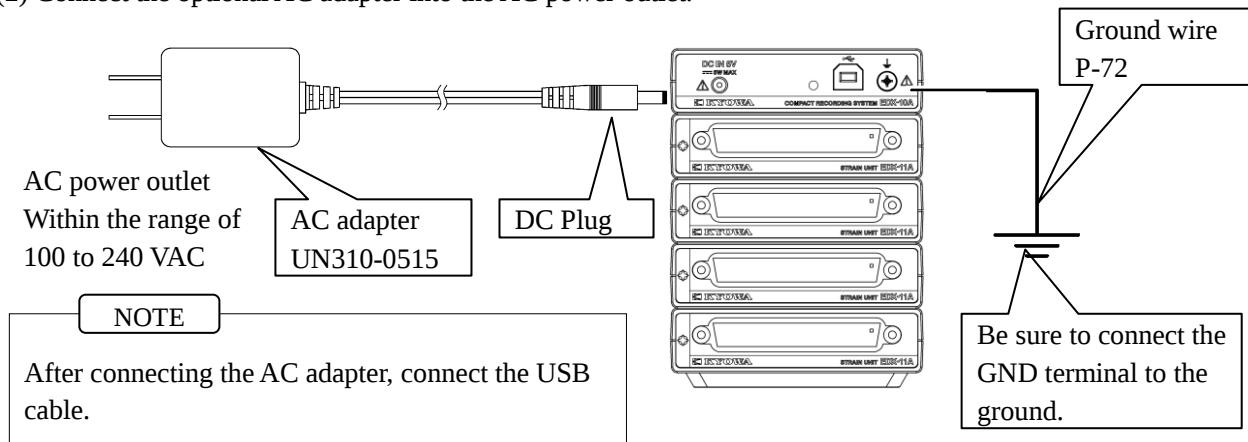
Connect sensors by referring to instruction manuals of the measuring units.

3-4. CONNECT THE OPTIONAL AC ADAPTER

When connecting 2 to 4 measuring units, be sure to use the optional AC adapter.

(1) Connect the DC plug of the optional AC adapter into the [DC IN] connector of the EDX-10A.

(2) Connect the optional AC adapter into the AC power outlet.



NOTE

When using the optional AC adapter, check the voltage range of the AC power outlet before connecting.
Voltage range of the optional AC adapter is 100 to 240 VAC (50 Hz/60 Hz). Be sure to keep the voltage range.
Be sure to connect the GND terminal to the ground.
 If the power supply voltage exceeds the above range or if a voltage between each terminal and the grounding has a potential exceeding power supply voltage, do not connect the AC power cable to the AC power outlet.
 Or, it may cause system failures and accidents.

The power supply voltage should be checked according to the procedure described below.

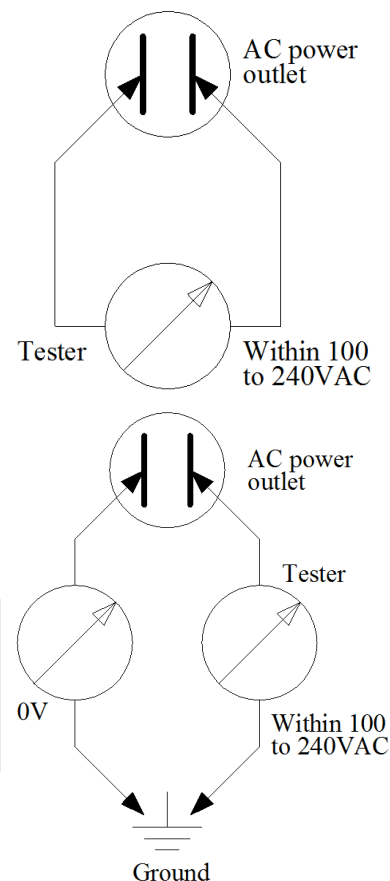
(1) Use the tester to measure the voltage between the AC power outlet terminals and ensure that the voltage is within the range of 100 to 240 VAC.

(2) Use the testers to measure the voltage levels 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 V to 240 VAC.

(3) If the EDX-10A 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 or noise cut transformer.

NOTE

Be sure to connect the GND terminal to the ground.
 Or, it may cause electric shock, lower the performance and cause trouble.



3-5. INSTALLING THE USB DEVICE DRIVER

Install the USB device driver into the PC before using the USB interface.

This section describes how to install the USB device driver.

NOTE

When installing the USB device driver, log in with an administrator account.
Enter the Administrator password.

- (1) Insert the CD-R into the PC.
- (2) Double-click the "¥EDX-10¥Driver¥SETUP_EDX10A_USB.exe" in the CD-R.
- (3) Follow the instruction on screen.
- (4) Finish button appears when the installation completes.

NOTE

Supported OS: Windows XP, Windows Vista (note), Windows 7 (note)
Note: Applicable to both 32-bit version and 64-bit version.

3-6. CONNECTING THE USB INTERFACE

3-6-1. Connect the USB cable

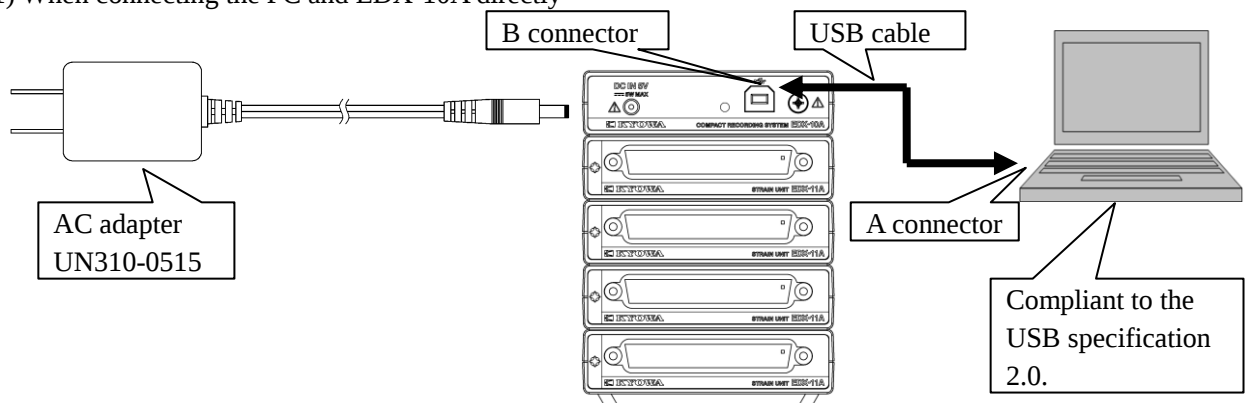
- (1) Connect the B connector of the USB cable into the [USB] connector of the EDX-10A.
- (2) Connect the A connector into the USB port of the PC.
- (3) Make sure the LED lights up in green after starting up the Dynamic Data Recording Software DCS-100A.

NOTE

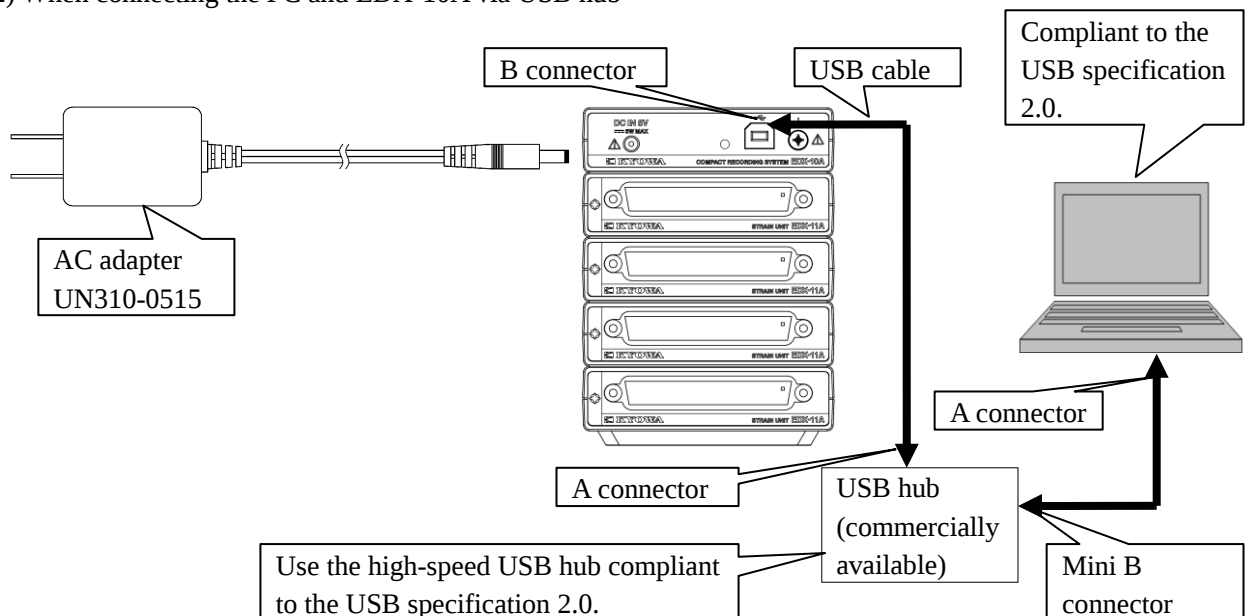
After connecting the USB cable and starting up the DCS-100A, when the LED lights up in red, you cannot control the EDX-10A from the PC.
Solve the cause by checking the "Checked Items and Countermeasures" in 5 TROUBLE SHOOTING.

3-6-2. Wiring diagram of the USB interface

- (1) When connecting the PC and EDX-10A directly

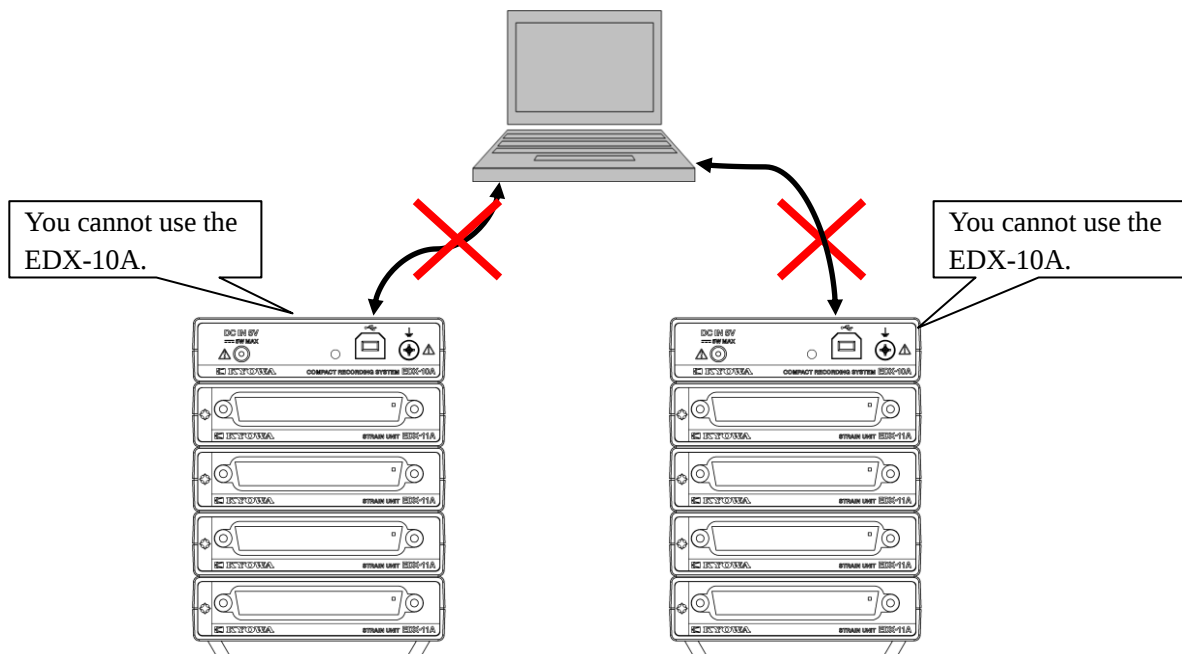


- (2) When connecting the PC and EDX-10A via USB hub



NOTE

When connecting multiple EDX-10A units to one PC, you cannot use them.



4. MEASURE DATA

4-1. PROCEDURE

- (1) Install the Dynamic Data Recording Software DCS-100A (for the first time only).
Install the Dynamic Data Recording Software DCS-100A into the PC.
For details, see the DCS-100A Instruction Manual (For Common Operation).
- (2) Mount the EDX-10A.
Mount the EDX-10A.
For details, see 3.
- (3) Turn ON the PC.
Turn ON the PC to start up Windows.
Connect the PC and EDX-10A by referring to 3-6.
- (4) Set the measuring conditions.
Start up the Dynamic Data Recording Software DCS-100A. Set the channel conditions, measuring conditions, and sampling frequency.
The LED will light up in green after starting up the Dynamic Data Recording Software DCS-100A.
For details, see the DCS-100A Instruction Manual (For EDX-10A Operation).
- (5) Monitor the data on the PC for checking the input signal.
Conduct the balancing operation if required.
If noisy, set the low-pass filter on the channel condition setting window and check the grounding.
- (6) Start recording data.
Start recording data by using the Dynamic Data Recording Software DCS-100A.
The recorded data is saved in the specified folder in the PC.
- (7) Stop recording data
Stop recording data by using the Dynamic Data Recording Software DCS-100A.
- (8) Check the recorded data waveform
Check the recorded data waveforms by using the Dynamic Data Recording Software DCS-100A.
After retrieving data, you can check and analyze the recorded data by using the Dynamic Data Acquisition Software DAS-200A.

4-2. EDX-10A POWER ON/OFF

The EDX-10A power ON when the USB cable is connected and power OFF when the USB cable is disconnected. To turn OFF the EDX-10A after measurements, disconnect the USB cable after disconnecting the optional AC adapter.

5. TROUBLE SHOOTING

When the EDX-10A does not operate as expected or when it operates unstably, trace the cause before concluding a defect of EDX-10A.

Items to be checked and countermeasure against various phenomena are described in the following table.

If troubles are not solved despite countermeasures, contact KYOWA or our representative.

If the EDX-10A is damaged due to disassembling or remodeling by the user, KYOWA may refuse the repair.

Trouble	Checked Items and Countermeasures
The LED lights up in red after starting up the Dynamic Data Recording Software DCS-100A.	• When connecting 2 to 4 measuring units, connect the optional AC adapter into the [DC IN] connector. • Do not connect 5 or more measuring units. → Be sure to connect up to 4 measuring units. • When using the optional AC adapter, check the voltage range of the AC power outlet before connecting. For details, see 3-3. • Voltage range of the optional AC adapter exceeds 4.5 to 5.5 V. Replace the optional AC adapter with a new one. • Voltage range of the optional USB bus power exceeds 4.5 to 5.5 V. 1) The power supply voltage dropped and the EDX-10A might not work properly, because of a smaller-diameter USB cable or too long USB cable. Replace the USB cable with a new one. 2) The power supply voltage exceeded the specified range, because of the USB port error of the PC. Replace the PC with a new one. • An error occurs in the EDX-10A or in measuring units. Contact KYOWA or our representative.
The LED does not light up in green after starting up the Dynamic Data Recording Software DCS-100A.	• Did you install the USB device driver? → For details, see 3-5. • The USB cable is failure (wire breakage or connector breakage). → Replace the USB cable with a new one. • If the LED does not light up in green despite countermeasures, contact KYOWA or our representative.

MEMO

Inductive interference

Using the EDX-10A, near equipment generating strong magnetic field, generates induction noise.

The equipment includes large motors, transformer, and ferro-resonant constant voltage transformer.

Locating the EDX-10A, far away from measuring points, also generates induction noise.

Take the following measures to protect against induction noise.

- Separately locate the EDX-10A from the power source.
- Use a shielded cable for sensor connection. Connect the shield to the E terminal of the [INPUT] connector.

Potential interference

Potential interference occurs when the target to be measured has a DC/AC potential.

At this time, grounding the EDX-10A is not necessarily a good thing.

It may be appropriate to connect the target to be measured and EDX-10A.

If there is induction noise or if the target to be measured has potential, it is rare to be solved by a simple method.

Especially nowadays, the number of electrical devices that are used together in the measuring environment are increasing resulting to affect with each other as the noise cause.

The above mentioned countermeasures are mere examples.

Fully consider the operational environment and take appropriate measures to obtain the most preferable results.

6. MAINTENANCE

For the EDX-10A, the following items should be serviced for scheduled maintenance. Maintenance service should be performed at the intervals specified below.

Table 6-1 Calibration of apparatus

Item	Content	Service intervals
Evaluation of operation of the EDX-10A	An annual maintenance inspection is recommended to ensure the operation of the EDX-10A. Must be returned to KYOWA for the scheduled maintenance inspection.	Once in a year
Evaluation of accuracy of measuring units	An annual maintenance inspection is recommended to ensure the accuracy of measuring units. Must be returned to KYOWA for the scheduled maintenance inspection.	Once in a year

Table 6-2 Replacement of limited life parts

Item	Content	Service intervals
AC adapter (OPTIONAL ACCESSORIES)	The optional AC adapter (UN310-0515) is a limited part. Service life, depends on the frequency of use and ambient temperature, is approximately 5 years. We recommend you purchase a new AC adapter every 5 years.	Once in every 5 years

The replacement frequency of limited-life parts is about five years, assuming eight hours of use, 365 days a year. The above figure is only a rough indication.

We do not promise or guarantee that the EDX-10A is error-free or will be repaired at no additional cost in the above period.

To operate the EDX-10A normally, finding a sign of the EDX-10A failure early by daily/periodic inspections and taking the corrective action are required.

Particularly if the EDX-10A is used continuously for long periods of time, early replacement of parts is required for the purposes of safety and stable operation. The EDX-10A is not designed for continuous operation of 24 hours.

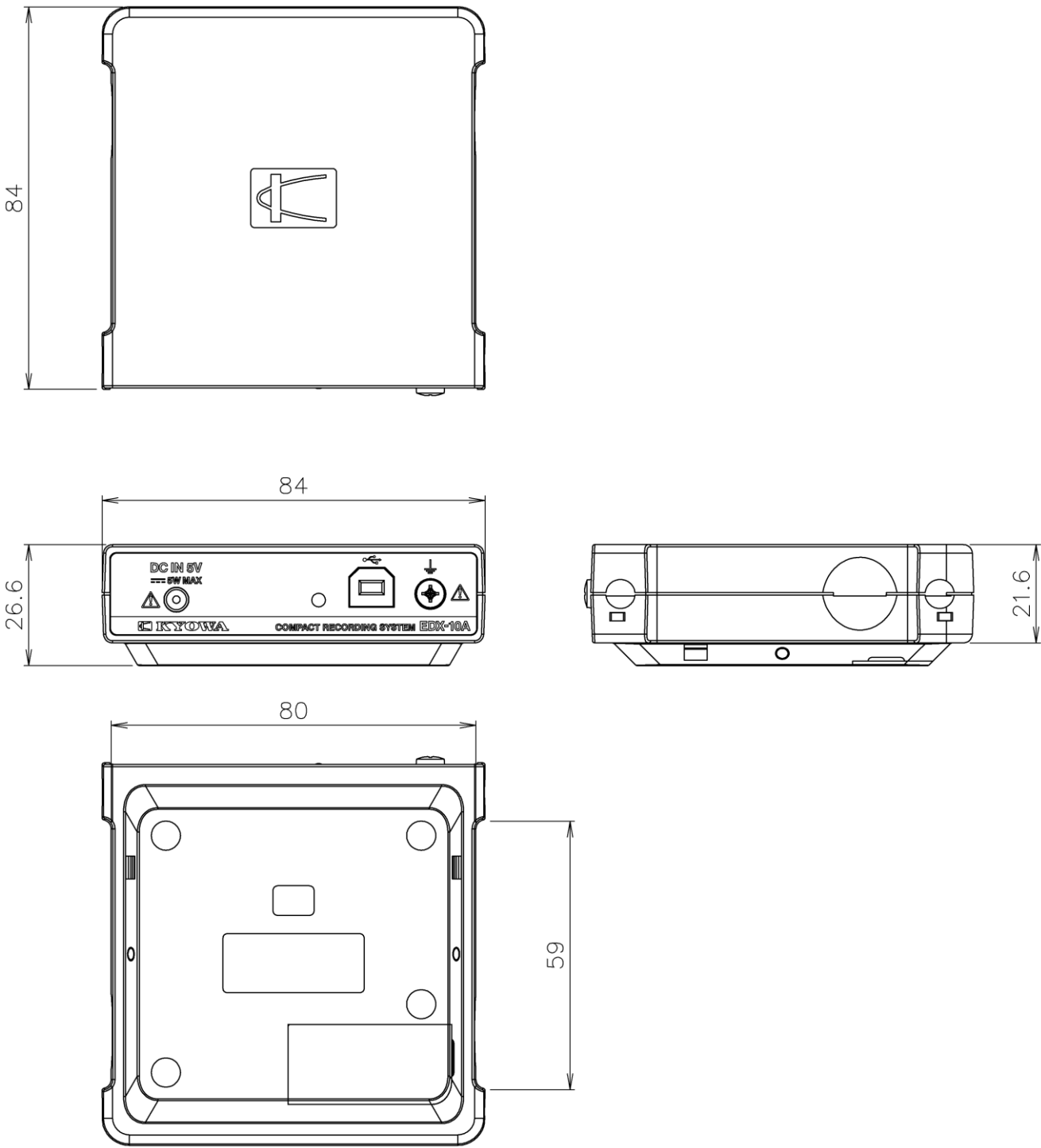
We do not guarantee the continuous operation of the EDX-10A and shall not be responsible for any failure of the EDX-10A to perform within the warranty period.

7. SPECIFICATIONS

1) Interface	Compliant to the USB specification 2.0 Connector: USB standard-B receptacle		
2) The number of measuring units	Maximum 4 measuring units (maximum 16 channels)		
3) Sampling frequency	1Hz to 20kHz:	The number of channels 1 to 4	
	1Hz to 10kHz:	The number of channels 5 to 8	
	1Hz to 5kHz:	The number of channels 9 to 16	
	1/2/5 system	Simultaneous sampling of all channels	
4) Operating temperature range	0 to +40°C		
5) Power supply	5 VDC	For 1 measuring unit:	USB bus power
		For multiple measuring units:	Optional AC adapter
6) Current consumption	140 mA or less (at 5 VDC)		
7) Weight	Approx. 170g		
8) Dimensions	84.0 (W) × 26.6 (H) ×84.0 (D) mm (excluding protrusions)		
9) EMC standard	EN61326-1		

8. OUTSIDE DRAWING

8-1. EDX-10A



8-2. WHEN CONNECTING FOUR EDX-11A UNITS

