

INSTRUCTION MANUAL

PCD-400A

SENSOR INTERFACE

(FOR HARDWARE)

Thank you for purchasing KYOWA's product PCD-400A Sensor Interface.
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 PCD-400A.
For the Dynamic Data Acquisition Software DCS-100A, see the DCS-100A INSTRUCTION MANUAL for PCD-400A Operation.
For software operation other than the DCS-100A, see the PCD-400A INSTRUCTION MANUAL for Control command.
For the USB device driver set-up, see the DCS-100A INSTRUCTION MANUAL for Set-up or DCS-100A INSTRUCTION MANUAL for USB driver set-up.

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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 PCD-400A.

STANDARD ACCESSORIES

The following accessories are packed with the PCD-400A.

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

<PCD-400A>

Dynamic Data Acquisition Software (DCS-100A)	1 (DVD)
USB cable (N-38: 1 m)	1
Ground wire (P-72)	1
Test Certificate and Warranty	1 each

OPTIONAL ACCESSORIES

AC adapter (For single unit)	SA-10A-EDS
AC adapter (For stacking multiple units (2 to 4))	UIA345-12
DC power cable	P-76 (2 m)
Input adapter for strain gage transducer	UI-10A (NDIS connector, TEDS supported)
Input adapter for strain gage	UI-11A Clamp type terminal block connector, TEDS supported)
Input adapter for strain gage with operating lever	UI-15A (Clamp type terminal block with operating lever, TEDS not supported)
One-touch lock type input adapter for strain gage	UI-16A (One-touch lock clamp type terminal block, TEDS not supported)
One-touch type input adapter	UI-55A (One-touch type terminal block, TEDS not supported)
Input cable	N-97 (Between the input terminal and NDIS-connector sensor, 0.1 m)
Stacking connector set	ST-1A Set items: ● Gender changer ● Gender changer cover ● Extraction tool ● Flat head screw M3 × 4 (2)
Stacking board	CN-20
USB cable	N-39 (2 m)
Data Analysis Software	DAS-200A

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

The PCD-400A is designed to be used according to "8. Specifications." Do not use the PCD-400A in an environment exceeding the specifications. Or, it may cause trouble.

PRIOR TO USE

For safe use of the PCD-400A, 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 PCD-400A, the following symbol marks are used in the Instruction Manual.

	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 PCD-400A, 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 PCD-400A Instruction Manual (FOR HARDWARE).

● Power supply

To prevent a fire hazard, ensure that the power supply voltage specified for the PCD-400A (11 to 16 VDC) matches the local line voltage before connecting the system to the DC power. When using the optional AC adapter, check the voltage range of the AC power outlet before connecting.

● AC adapter

To prevent an electric shock or fire hazard, always use the optional AC adapter (SA-10A-EDS or UIA345-12).

● Avoid using in environment with inflammable gas, etc.

To prevent the risk of fire hazard or explosion, do not use the PCD-400A in environment with inflammable gas, vapor, or dust.

● If any trouble occurs

To prevent a fire hazard, if smoke is emitted from the PCD-400A, immediately disconnect the AC adapter from the receptacle and stop using the PCD-400A.

● Avoid measuring object applied with high voltage.

Although the PCD-400A is insulated, if it is used for measuring objects with excessive high voltage, it may deteriorate its performance and cause trouble.

● Protective ground

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

● Maximum input voltage range

The PCD-400A is a measuring instruments for a strain gage transducer and strain gage. Do not input high voltage. Or, it may lower the performance and cause troubles.



CAUTION

● CAUTION

Be sure to observe the safety precautions described in the PCD-400A Instruction Manual (FOR HARDWARE).

● Do not use the PCD-400A outdoors.

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

● Do not turn ON the power switch immediately after turning it OFF.

After turning OFF the power switch, wait (5 seconds) until the power supply is shut OFF before turning ON the power switch again. If the power is repeatedly turned ON and OFF within 5 seconds, rush current generated by switching the power ON may damage the PCD-400A.

● Use the PCD-400A 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 PCD-400A in the specified operating humidity range 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 PCD-400A immediately after the change in the environment.

Leave the PCD-400A as it is until it becomes adaptable 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 PCD-400A under dusty environment.

This can lead to performance problems and decreased operating efficiency. Be careful that dust may not enter the PCD-400A not only during operation but also under stored conditions.

● Use the PCD-400A under environment without excessive vibration or high impact.

Vibration resistance: 29.42m/s^2 (3G), 5 to 200Hz (when in operation)

Use the PCD-400A 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 PCD-400A in strong electromagnetic field.

Use the PCD-400A in a magnetic field environment where the PC may be used. 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 PCD-400A under poor conditions.

Use the PCD-400A in the specified voltage range.

DC power 11 to 16 VDC

Optional AC adapter (SA-10A-EDS or UIA345-12) 100 to 240 VAC (50 Hz/60 Hz)

The power supply used for the PCD-400A should not experience an instantaneous power failure and be free from noise.

● The specifications of the optional AC adapter (SA-10A-EDS or UIA345-12) is as follows.

<For single unit>	Model	SA-10A-EDS
	Input voltage	100 to 240 VAC (50 Hz/60 Hz)
	Output voltage	12 V (1.5 A)
	Operating temperature range	0 to 40°C
<For stacking multiple units (2 to 4)>	Model	UIA345-12
	Input voltage	100 to 240 VAC (50 Hz/60 Hz)
	Output voltage	12 V (3.8A)
	Operating temperature range	0 to 40°C

● The optional AC adapter (SA-10A-EDS or UIA345-12) is consumable item. Replace it every five years.



CAUTION

- Do not pull cords and cables.
Lay cords and cables with a certain allowance so that any unreasonable force is applied to the connections.
Pulling or applying unreasonable force may cause trouble or interrupt the measurement.
- Avoid installing sensors and PCD-400A near a welding machine.
Failure to do so will pose the risk of erroneous data, malfunction and failure.
- Do not disassemble or remodel the PCD-400A. Or, it may cause electric shock hazards or damage the PCD-400A. This warranty does not cover any damaged or defective parts that results from disassembling or remodeling.
- Handle the DVD with care.
Do not expose the DVD to direct sun light, high temperature, or high humidity.
Do not apply pressure to the DVD by laying object or bending.
Dust, scratches, and fingerprints on either side of the DVD can cause write errors.
- Preheat the PCD-400A before use.
After the power ON, always preheat the PCD-400A for approximately 1 hour.

LIMITED LIFE PARTS AND PREVENTIVE MAINTENANCE

The PCD-400A 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 PCD-400A, resulting in a malfunction or a failure.

You need to replace parts with a regular preventive maintenance schedule.

Limited life parts used with the PCD-400A are as follows.

○ Relay

A relay's insulation will inevitably degrade or a relay itself will be damaged.

○ 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 PCD-400A.

○ EEPROM

EEPROM will results in malfunctions or degraded performance.

○ AC adapter (optional accessory)

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

To operate the PCD-400A normally, finding a sign of the PCD-400A failure early by daily/periodic inspections and taking the corrective action are required. For inspection, contact KYOWA or our representatives.

*Major limited life parts; Relay, aluminum electrolytic capacitor, EEPROM, AC adapter

* All components do age and will fail.

PCD-400A 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 PCD-400A. Regardless of the replacement parts, the PCD-400A itself gradually deteriorates with age. Before the expected service life is reached, consider replacing the PCD-400A with a new one or the latest series as preventive maintenance.

NOTATIONS USED IN THE INSTRUCTION MANUAL

The following notations are used in the Instruction Manual for convenience.

■ Names described on the panel surface

Names described on the panel surface are expressed in double quotation mark " ".

■ Informational notes

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

Examples of Notations

NOTE

Essential precautions required when handling the PCD-400A.

MEMO

Reference items required when handling the PCD-400A.

IMPORTANT PRECAUTIONS WHEN USING PCD-400A

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. Be sure to use the shielded USB cable for connecting the PCD-400A and PC.
Or, deterioration or malfunction of the instrument may result.
3. Be sure to use an standard accessory USB cable (N-38: 1 m).
When using the other USB cable, make sure the cable length is 5 m or less.
Or, the PCD-400A will not start up correctly, will be unstable, and cause other problems.
4. The number of stacking units is 2 to 4.
When stacking multiple PCD-400A units, do not stack 5 or more PCD-400A units.
Or, deterioration or malfunction of the instrument may result.
5. Do not connect multiple sets of stacking PCD-400A units into one PC.
Be sure to connect single set of stacking PCD-400A units (The number of stacking units: 2 to 4) into one PC.
6. When stacking multiple PCD-400A units, connect the AC adapter to the master unit only.
Or, deterioration or malfunction of the instrument may result.

PRECAUTIONS ON CE MARKING

NOTE

- Use a shielded cable for connecting PCD-400A units.
Wiring should be 30 m or less.
- When using an USB cable other than the standard accessory (N-38), use an USB cable with the ferrite cores or wrap the clamp-on ferrite core around an USB cable.
- Be sure to connect the GND terminal to the ground by using the optional ground wire (P-72).
- Be sure to use the specified AC adapter (SA-10A-EDS or UIA345-12).

1. OUTLINE OF THE PRODUCT

1-1 OUTLINE OF THE PRODUCR

The PCD-400A is a measuring instrument that can be used with no difficulty by connecting to the PC via USB interface.

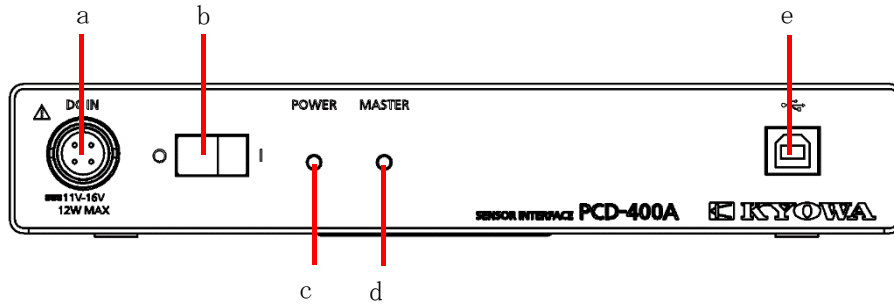
The PCD-400A can execute small-scale measurement of up to 16 channels by stacking 4 PCD-400A units.

1-2 FEATURES

- Connection with the PC is easy with the use of the USB interface.
- Since the PCD-400A has a bridge box built-in, it is capable of conducting a quarter-bridge-system experiment or half-bridge-system experiment for strain gages solely by itself.
- The PCD-400A is provided with input adapters applicable for the sensors.
- Since the PCD-400A is capable of measurement of 4 channels per PCD-400A and maximum 16 channels with 4 PCD-400A units, the PCD-400A is applicable for measurement in a wide range from a simple experiment to advanced measurement.
Sampling frequency: Maximum 10k Hz
- When stacking multiple PCD-400A units, the stacking connector set (ST-1A, optional accessory) enables easy stacking without using synchronous cables.
- Single USB cable and single AC adapter (UIA345-12, optional accessory) enable measurements of maximum 4 PCD-400A units (16 channels).
- Includes low-pass filter as standard equipment.
- When using TEDS compatible sensors, by loading sensor information with TEDS function, the PCD-400A is capable of laborsaving when setting amplifier.
- You can measure and record data easily by using the DCS-100A.
- The DAS-200A is optional software that reproduces and analysis data after recording.

2. CONTROLS AND INDICATORS

2-1 FRONT PANEL



a) "DC.IN" connector

Power connector

The power supply voltage range of the PCD-400A is 11 to 16 VDC.
For details, see "3-5 CONNENT THE POWER SUPPLY."

b) POWER switch

" | " position: Power ON

" o " position: Power OFF

c) "POWER" LED

Lights up while the PCD-400A is ON. For details, see "Table 1-1."

d) "MASTER" LED

During operating the master unit, the "MASTER" LED lights up and during operating the slave unit, the "MASTER" LED lights out.

For details, see "Table 1-1."

Table 1-1 LED status

LED Status		POWER	MASTER
Green	Light up	Power ON	Waiting
	Blink		Measuring
Orange	Light up	Stacking 5 or more PCD-400A units (NOTE 1)	
Red	Blink	The PCD-400A is failure. * Contact KYOWA or our representative.	
Light out		Power OFF	

NOTE 1: You can stack up to 4 PCD-400A units. Do not stack 5 or more PCD-400A units.

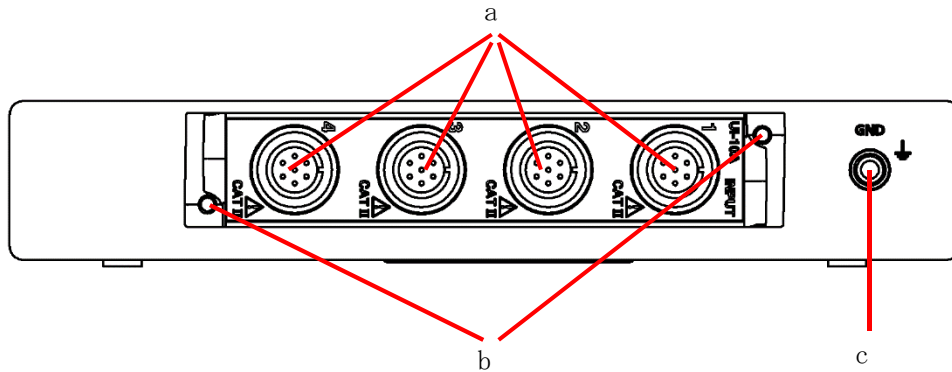
When stacking multiple PCD-400A units, see "3-8-1 LED status when stacking multiple PCD-400A units."

e) "USB" connector

Connects an accessory USB cable.

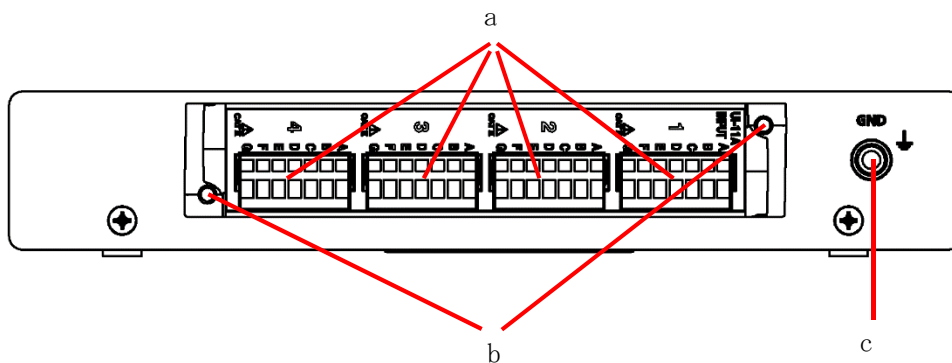
2-2 REAR PANEL

■ With input adapter UI-10A



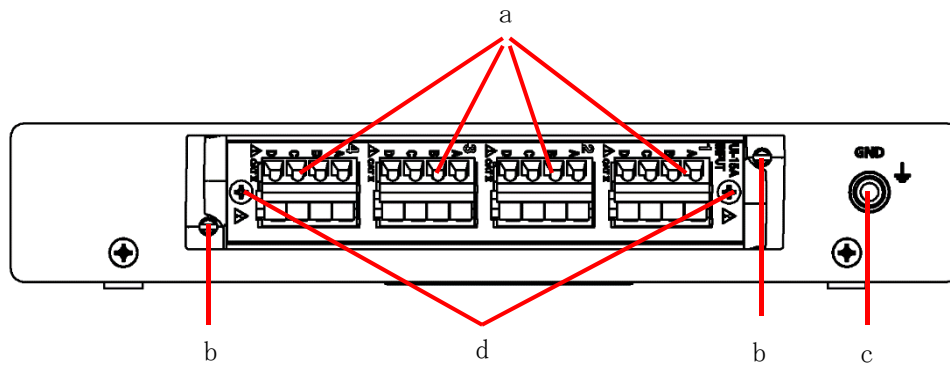
- a) Input connector Connects a strain gage transducer.
- b) Jackscrew Loosen the jackscrews to remove the input adapter.
When mounting the input adapter, fasten the jackscrews.
Tightly fasten the jackscrews with a flat-head screwdriver.
Common to all input adapters.
- c) GND terminal GND terminal
Be sure to connect the GND terminal to the ground.

■ With input adapter UI-11A



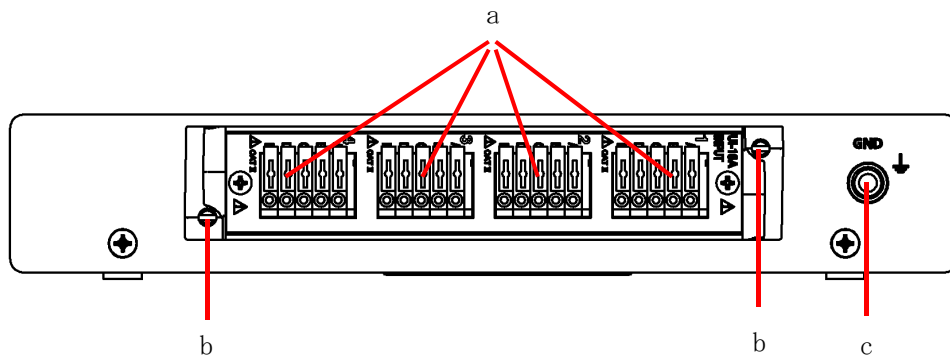
- a) Input terminal block Connects a strain gage or strain gage transducer.
Use a UI-11A accessory small flat-head screwdriver for connection.
When connecting strain gage transducers, use an optional input cable (N-97).

■ With input adapter UI-15A



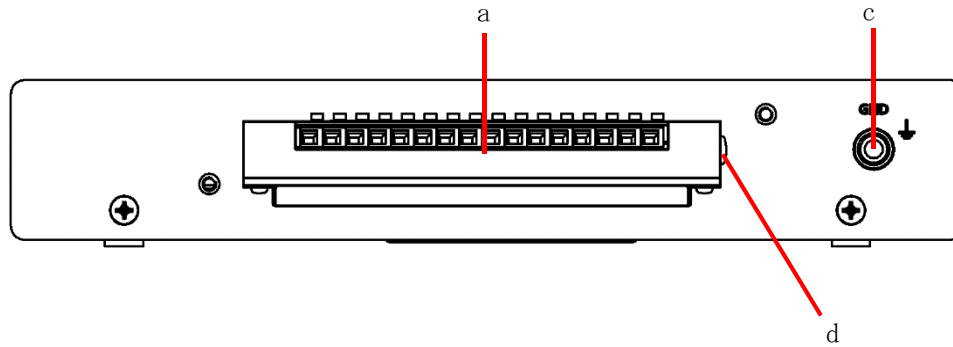
- a) Input terminal block with operating lever Connects a strain gage or strain gage transducer. Press down the operating lever for connection. When connecting strain gage transducers, use an optional input cable (N-97). When a shield wire is attached to the sensor cable, connect the shield wire to the section d) with a screw.

■ With input adapter UI-16A



- a) One-touch lock type input terminal block Connects a strain gage or strain gage transducer. Use a UI-16A accessory small flat-head screwdriver for connection. When connecting strain gage transducers, use an optional input cable (N-97).

■ With input adapter UI-55A



a) One-touch type input terminal block

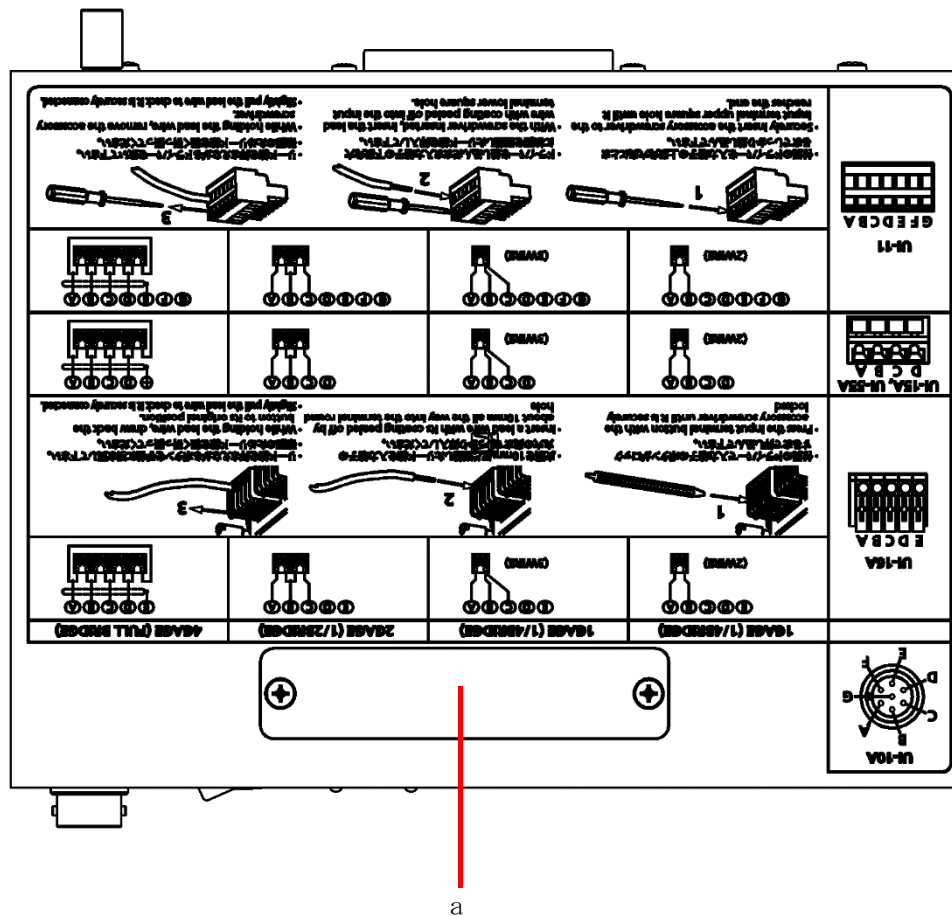
Connects a strain gage or strain gage transducer.

By pressing a button on the terminal block, insert a lead wire for connection.

When connecting strain gage transducers, use an optional input cable (N-97).

When a shield wire is attached to the sensor cable, connect the shield wire to the section d) with a screw.

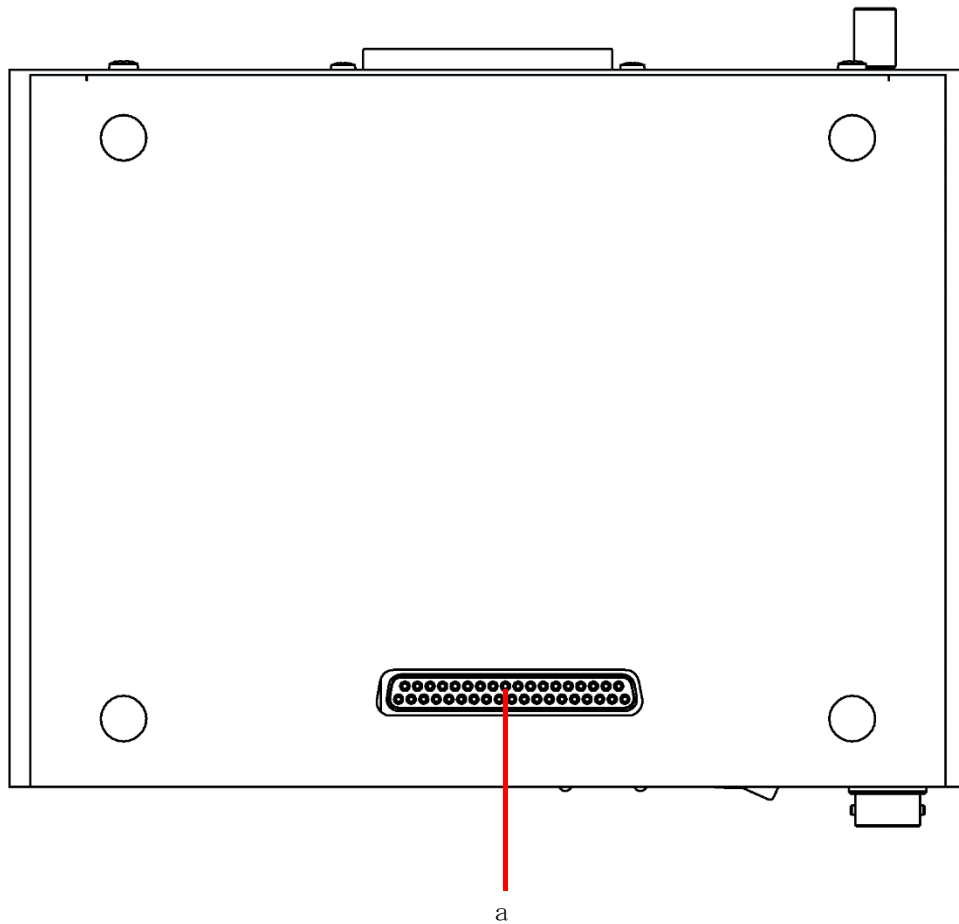
2-3 TOP PANEL



a) Connector cover

When stacking multiple PCD-400A units, remove the slave unit's connector cover and mount the gender changer, included in the stacking connector set (SA-1A).

2-4 BOTTOM PANEL



a) Stacking connector

When stacking multiple PCD-400A units, stack the slave unit via the gender changer, included in the stacking connector set (SA-1A).

NOTE

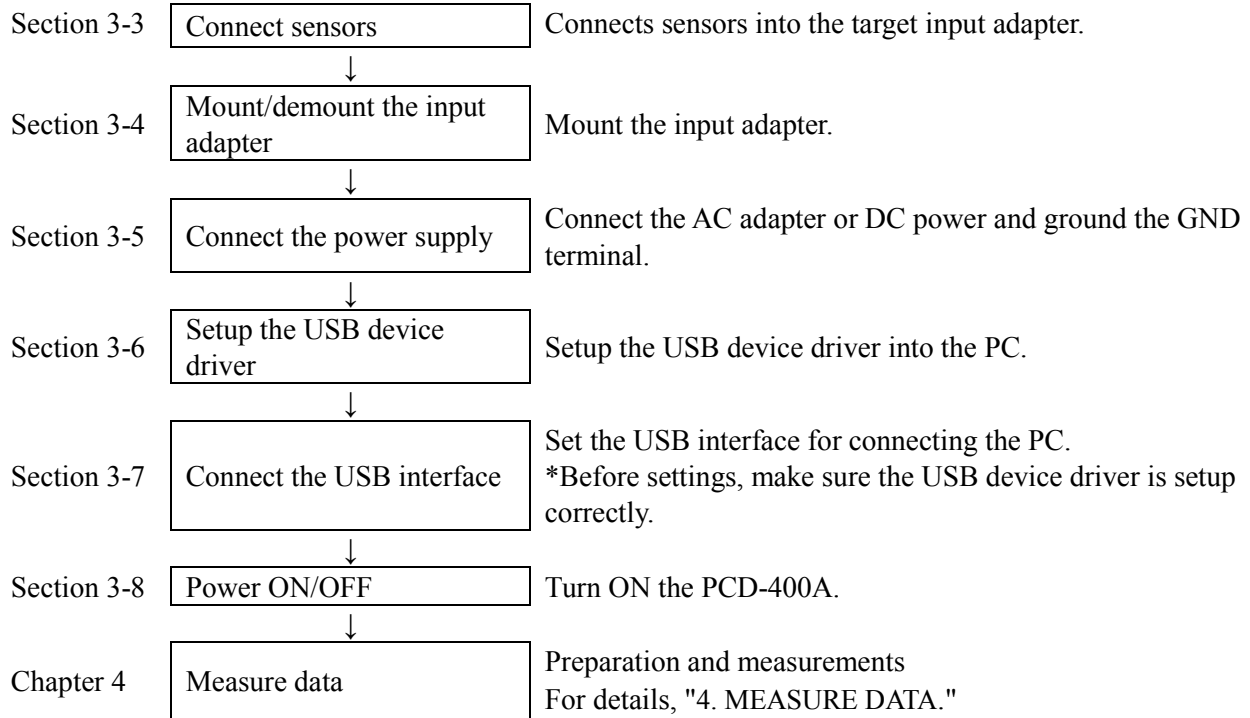
- Never connect the optional input adapter into the stacking connector.
Or, it may cause trouble.

3. CONNECTION AND DEFAULT SETTING

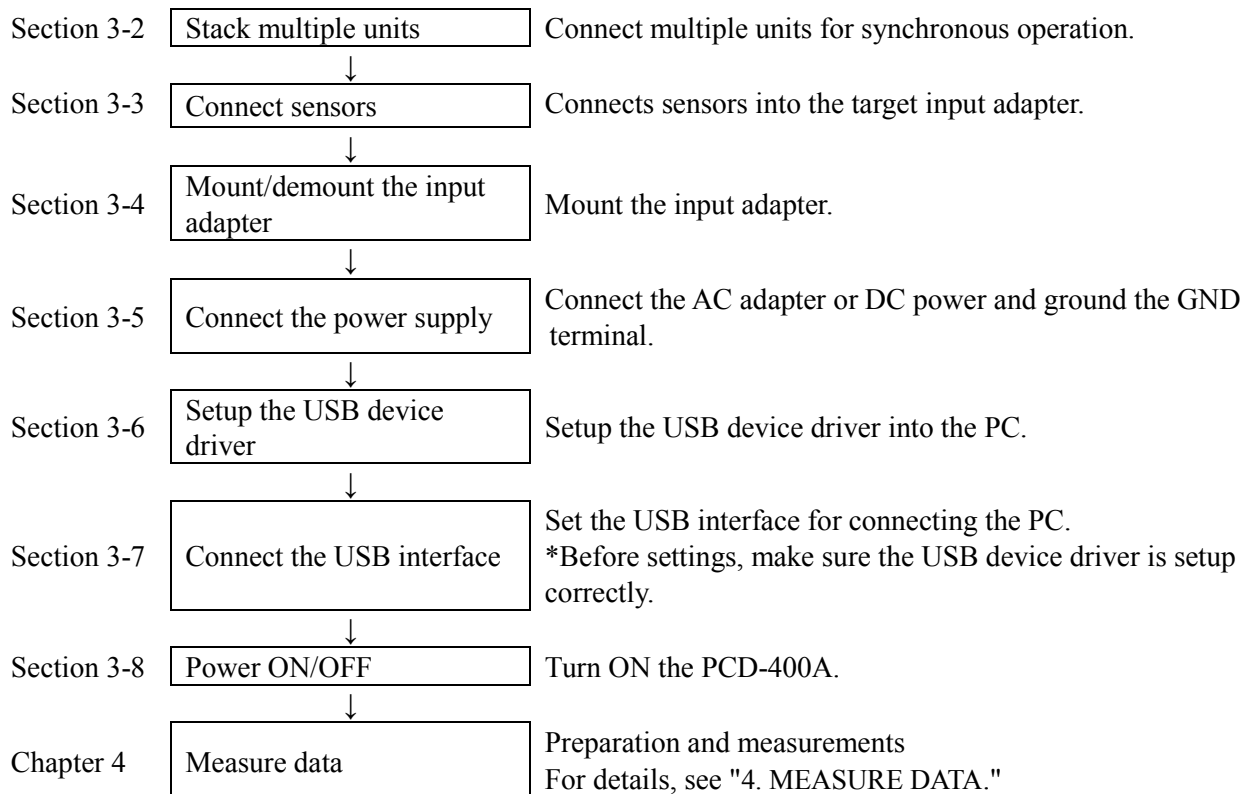
3-1 PRE-PROCEDURES FOR MEASUREMENTS

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

3-1-1 For single unit



3-1-2 For stacking multiple units

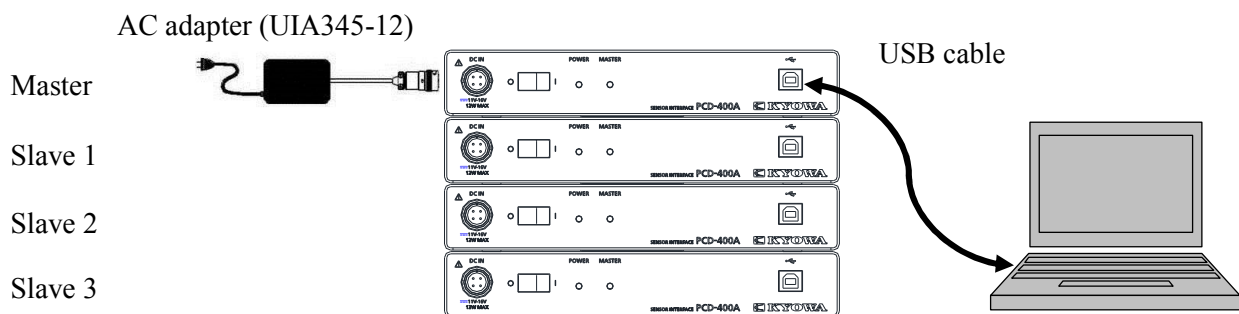


3-2 STACK MULTIPLE UNITS

3-2-1 Parts for stacking multiple units

No.	Parts	Stacking 2 units	Stacking 3 units	Stacking 4 units
1	AC adapter (UIA345-12)	1	1	1
2	USB cable	1	1	1
3	Stacking connector set (ST-1A)	1	2	3
4	Stacking board (CN-20)	2 sets	3 sets	4 sets

Example: Stacking 4 units



MEMO

When stacking multiple PCD-400A units, the unit located on the top is master unit (1CH to 4CH), the second unit from the top is slave 1 (5CH to 8CH), the third unit from the top is slave 2 (9CH to 12CH), and the forth unit from the top is slave 3 (13CH to 16CH).

NOTE

- Connect the AC adapter to the master unit only.
- Connect the USB cable to the master unit only.
- When stacking multiple PCD-400A units, be sure to use the AC adapter (UIA345-12). Do not use the AC adapter (SA-10A-EDS). Or, it may cause trouble.

3-2-2 Procedures for stacking

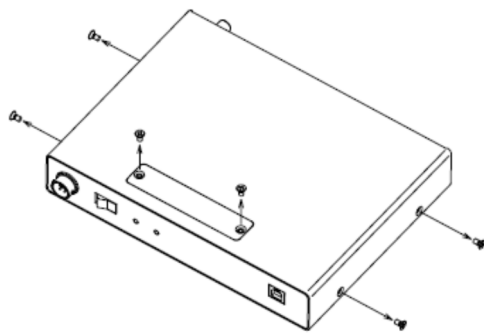
This section describes how to stack multiple PCD-400A units.

NOTE

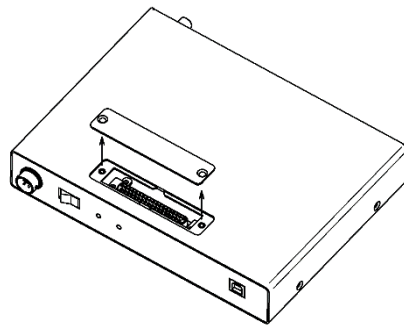
- When stacking multiple PCD-400A units, be sure to remove the AC adapter. Or, it may cause trouble.
- You can stack up to 4 PCD-400A units. Do not stack 5 or more PCD-400A units.

Example: Procedures for stacking 2 PCD-400A units

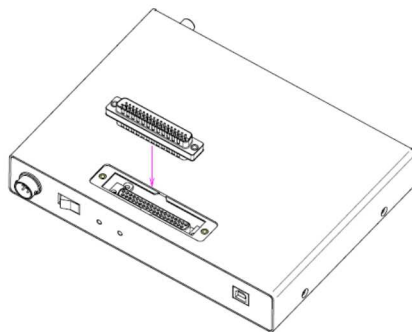
(1) Remove 2 screws on the connector cover on the front panel and remove 4 screws on the side panel.



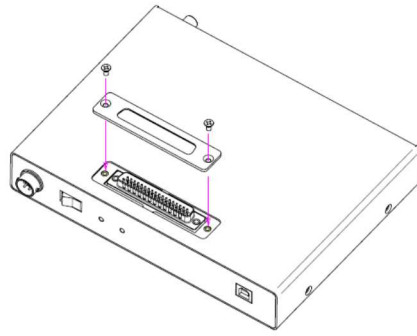
(2) Remove the connector cover.



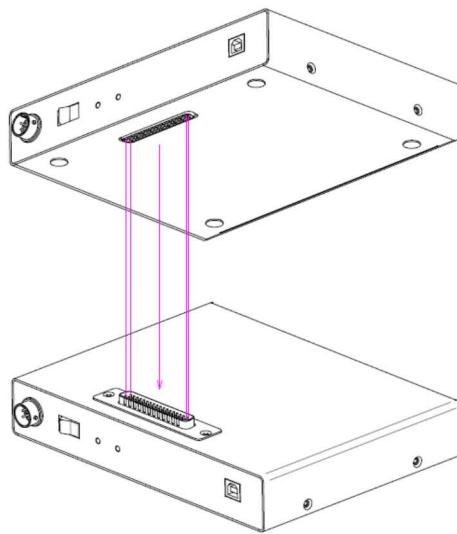
(3) Mount the gender changer included in the stacking connector set (ST-1A, optional accessory).



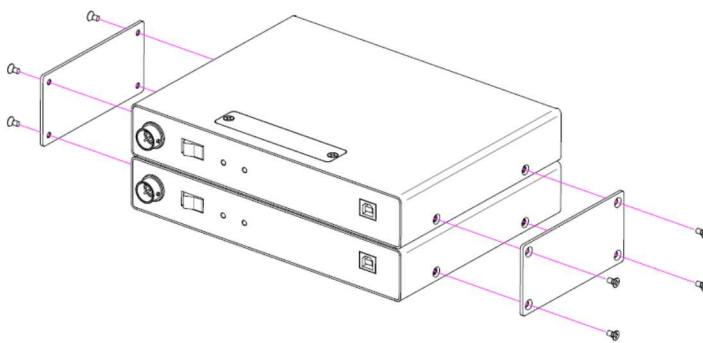
- (4) Mount the gender changer cover included in the stacking connector set (ST-1A, optional accessory) by using accessory screws.



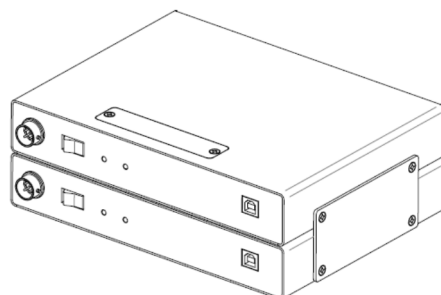
- (5) Stack the PCD-400A units.



- (6) Fix the stacking units and pair of stacking board (CN-20, optional accessory) by using accessory screws.



- (7) The stacking completed.



3-2-3 Procedures for demounting stacking connector set

NOTE

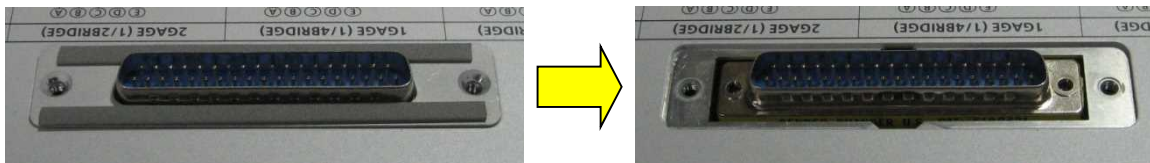
- Before demounting the stacking connector set (ST-1A, optional accessory), be sure to demount the AC adapter. Or, it may cause trouble.

This section describes how to demount the stacking connector set for resetting the PCD-400A to the original status.

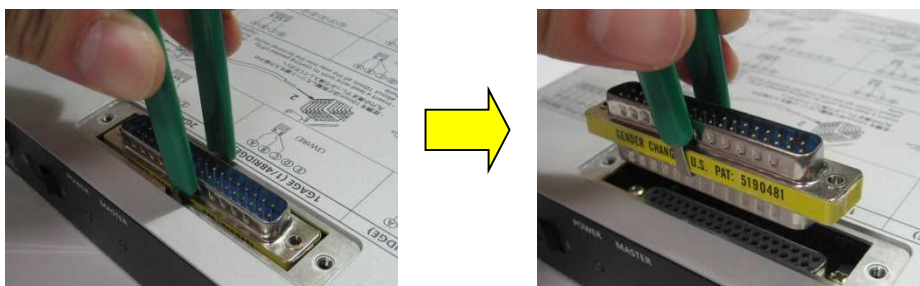
- (1) Remove the 2 flat head screws (M3×4) on the gender changer cover.



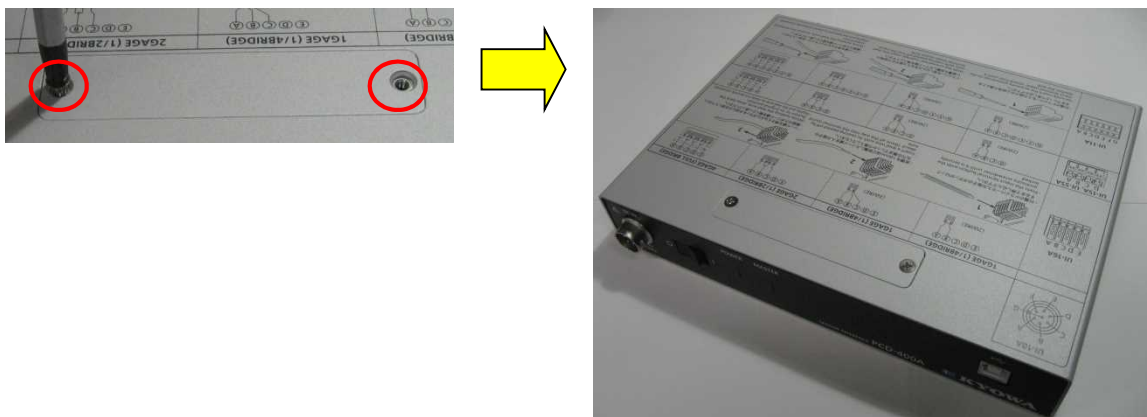
- (2) Demount the gender changer cover.



- (3) Demount the gender changer by using the extraction tool.



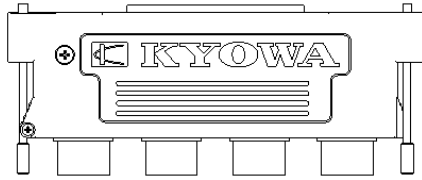
- (4) Mount the connector cover by using the 2 flat head screws (M3×4).



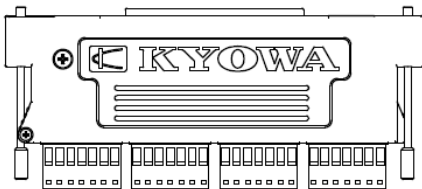
3-3 CONNECT SENSORS

3-3-1 Type and features of the input adapter

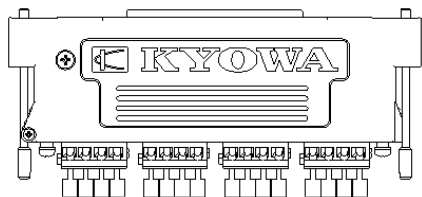
- UI-10A Input adapter with the one-touch NDIS connector
For strain gage transducers. TEDS supported



- UI-11A Input adapter with the clamp-type terminal block
Use the accessory small flat-head screwdriver for connection.
You can mount/demount the terminal block. TEDS supported
For details of the quarter bridge system, half bridge system, and full bridge system, see "3-3-2 Input adapter and connection."



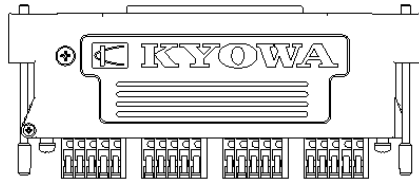
- UI-15A Input adapter with the clamp-type terminal block with operating lever
Since the UI-15A has the operating lever, the UI-15A requires no tool for connection.
Press down the operating lever by your fingers. TEDS not supported
For details of the quarter bridge system, half bridge system, and full bridge system, see "3-3-2 Input adapter and connection."



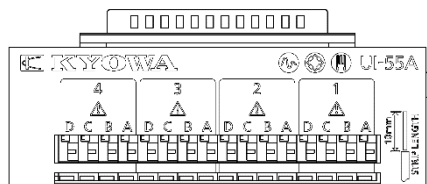
NOTE

Be sure to press down the operating lever of the UI-15A straight. After inserting a lead wire with the operating lever pressed, do not let go of the operating lever abruptly. Or, lead wire damage or operating lever failure may result in. In addition, these operations or degradation over time may break the operating lever. Contact KYOWA or our representative.

- UI-16A Input adapter with the one-touch lock type terminal block
 Press down a lock buttons by using an accessory tool or object with a fine head, insert a lead wire, and set back the lock buttons with your fingers. TEDS not supported
 For details of the quarter bridge system, half bridge system, and full bridge system, see "3-3-2 Input adapter and connection."



- UI-55A Input adapter with the one-touch type terminal block
 By pressing a button on the terminal block, insert a lead wire, and release the button to be locked.
 Be sure to connect and disconnect lead wires by pressing the buttons on the terminal block. TEDS not supported
 For details of the quarter bridge system, half bridge system, and full bridge system, see "3-3-2 Input adapter and connection."

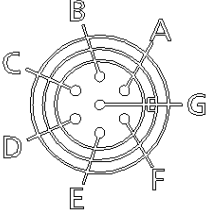
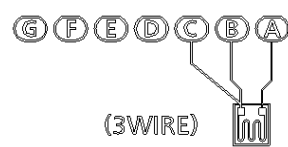
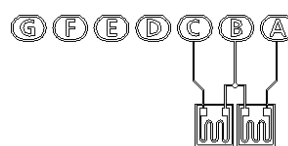
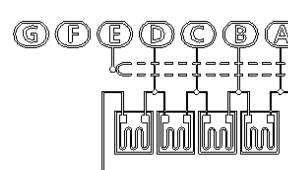


MEMO

- Input adapters and range of electric wires
 - UI-11A Solid wire $\phi 0.5$ mm to $\phi 1.4$ mm (UL AWG16 to 24)
 Stranded wire 0.13 mm^2 to 1.5 mm^2 (UL AWG16 to 26)
 - UI-15A Solid wire $\phi 0.3$ mm to $\phi 1.8$ mm (UL AWG13 to 28)
 Stranded wire 0.08 mm^2 to 1.5 mm^2 (UL AWG16 to 28)
 - UI-16A Solid wire $\phi 0.4$ mm to $\phi 1.2$ mm (UL AWG16 to 26)
 Stranded wire 0.2 mm^2 to 0.75 mm^2 (UL AWG20 to 24)
 - UI-55A Solid wire $\phi 0.3$ mm to $\phi 1.6$ mm (UL AWG14 to 28)
 Stranded wire 0.2 mm^2 to 1.3 mm^2 (UL AWG16 to 24)
- When the wire diameter is small, bend it 2 or 3 times and twist them together for connection.
- When connecting the NDIS-conductor sensor to the UI-11A, UI-15A, UI-16A, or UI-55A, use an optional input cable (N-97).
- For connecting a strain gage, do not connect gage leads (lead wires directly connected from the strain gage) directly. If you connect gage leads directly, gage leads may be broken since they are too thin.
 Use a gage terminal and convert the gage leads to the applicable lead wires or use a strain gage with pre-attached lead cables.

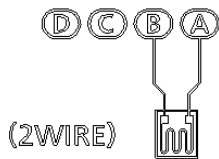
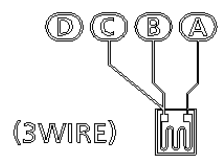
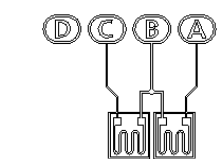
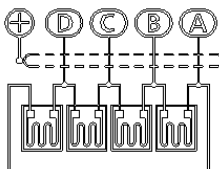
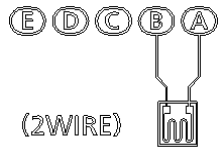
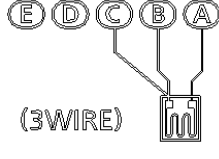
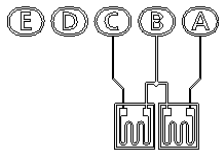
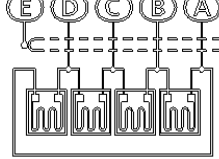
3-3-2 Input adapter and connection

This section describes how to wire a sensor to input adapters as follows.

Input adapter	Applicable gage system	Connection	Remarks
UI-10A	Specified for the full gage system For strain gage transducer Gage resistance: 120 to 1000 ohm		A : +BV B : -SIG C : -BV D : +SIG E : Shield F : +TEDS G : -TEDS TEDS supported
UI-11A	Quarter bridge system (2-wire system connection) Gage resistance: 120 ohm		A : +BV B : -SIG C : -BV D : +SIG E : Shield F : +TEDS G : -TEDS TEDS supported
	Quarter bridge system (3-wire system connection) Gage resistance: 120 ohm		
	Half bridge system Gage resistance: 120 to 1000 ohm		
	Full bridge system Gage resistance: 120 to 1000 ohm		

MEMO

- For quarter bridge system, it is recommended to adopt a "3-wire system connection" that is less affected by temperature on the gage lead wire and that causes little difference including dislocation in initial value, etc.
- For wiring, use Kyowa's low-noise lead wire with shield (L-13, 14, 15, and 16) or 4-conductor shielded cables. In addition, locate the transducer far apart from power lines and wirings interfered with noise.
- When measured values are unstable, connect the GND terminal on the back panel to the ground to make them stable.

Input adapter	Applicable gage system	Connection	Remarks
UI-15A UI-55A	Quarter bridge system (2-wire system connection) Gage resistance: 120 ohm	 (2WIRE)	A : +BV B : -SIG C : -BV D : +SIG ⊕: Shield (S) TEDS not supported
	Quarter bridge system (3-wire system connection) Gage resistance: 120 ohm	 (3WIRE)	
	Half bridge system Gage resistance: 120 to 1000 ohm		
	Full bridge system Gage resistance: 120 to 1000 ohm		
UI-16A	Quarter bridge system (2-wire system connection) Gage resistance: 120 ohm	 (2WIRE)	A : +BV B : -SIG C : -BV D : +SIG E : Shield TEDS not supported
	Quarter bridge system (3-wire system connection) Gage resistance: 120 ohm	 (3WIRE)	
	Half bridge system Gage resistance: 120 to 1000 ohm		
	Full bridge system Gage resistance: 120 to 1000 ohm		

3-3-3 Procedures for connecting lead wires

To connect sensors (not terminated with connector plug on the lead wire head), including strain gages: Peel off the coating from the lead wire head approximately 9 to 1 mm for connection.

To connect sensors (terminated with NDIS connector plug on the lead wire head), including strain gage transducer: Use the following input adapters.

☐ UI-10A

☐ UI-11A, UI-15A, UI-16A, or UI-55A

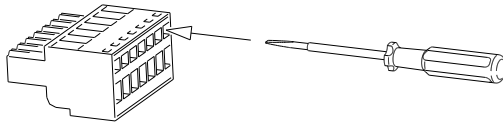
Use an optional input cable (receptacle with lead wire, N-97).

When connecting lead wires into the input terminals on the UI-11A or UI-16A, use the accessory small flat-head screwdriver.

How to connect lead wires is described as follows.

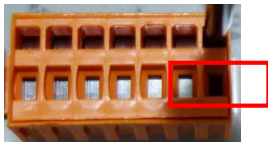
■ UI-11A (You can mount/demount the terminal block.)

(1) Insert the accessory small flat-head screwdriver all the way inside to the square hole, located above the input terminal.

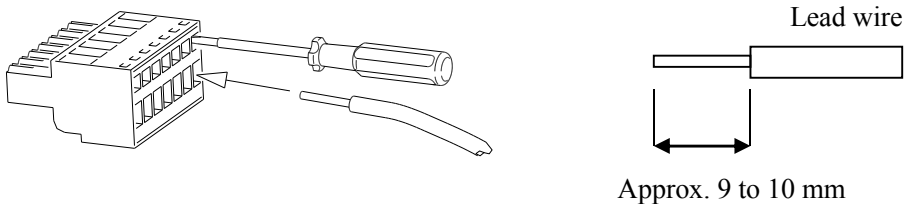


When the accessory small flat-head screwdriver is inserted correctly, it will be left inserted even if your hand is released.

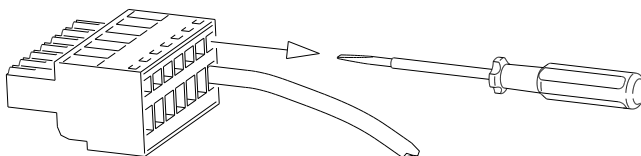
At this time, the clamp (lead wire hole) within the red frame is open.



(2) With the accessory small flat-head screwdriver inserted, insert the lead wire with its coating peeled off approx. 10 mm all the way to its end into the lead wire hole.



(3) By holding the lead wire, pull out the small flat-head screwdriver.



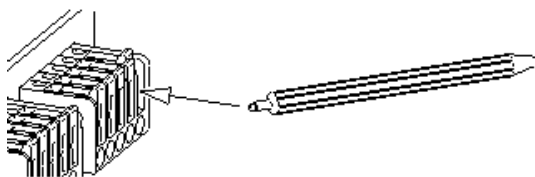
(4) Gently pull the lead wire to check if it is securely inserted.

NOTE

- For connection, always use the accessory small flat-head screwdriver or equivalent.
- When inserting/removing the accessory small flat-head screwdriver, do not swing it up and down more than necessary. Or, it may cause trouble.

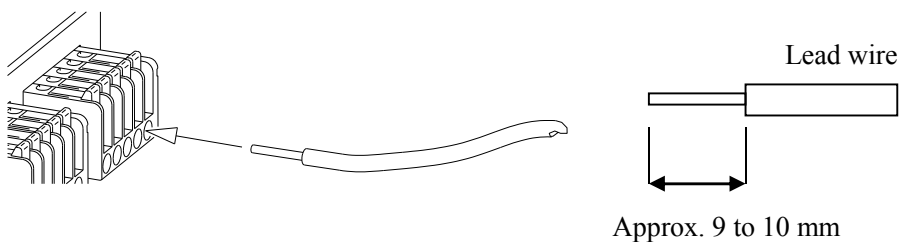
■ UI-16A

(1) Press the lock button until it is locked with the accessory small flat-head screwdriver.

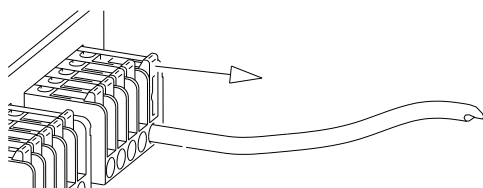


Press the lock button correctly to lock the button.

(2) Insert the lead wire with its coating peeled off approx. 10 mm all the way to its end into the lead wire hole.



(3) While holding the lead wire, pull up the lock button to the original position with your finger.



(4) Gently pull the lead wire to check if it is securely inserted.

NOTE

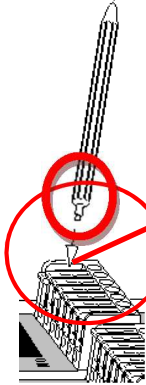
- For connection, always use the accessory small flat-head screwdriver or an object with a fine head.

Read this notes carefully in order to make full use of the high performance capabilities of an one-touch lock type terminal block.

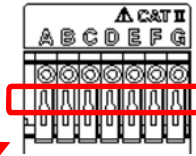


NOTES FOR USING ONE-TOUCH LOCK TYPE TERMINAL BLOCK

● Notes for connecting lead wires



● Press the following position.



Do not press the front edge of the lock buttons. Or, the lock buttons may causes troubles such as unable to be locked or unable to be released.

Be sure to press the position within the red frame with the accessory small flat-head screwdriver.

- For connection, always use the accessory small flat-head screwdriver or an object with a fine head.
- If the lock button does not work, insert the lead wire all the way to its end with pressing the lock button.

- Insert the lead wire with its coating peeled off about 10 mm all the way to its end into the lead wire hole. While holding the lead wire, set back the lock button to the original position with your finger. Be sure to insert the lead wire all the way to its end. Or, it will not fixed firmly.

- For connecting a strain gage, do not connect gage leads (lead wires directly connected from the strain gage) directly.
- Use a gage terminal and convert the gage leads to the applicable lead wires or use a strain gage with pre-attached lead cables.
- If you connect gage leads directly, gage leads may be broken since they are too thin.

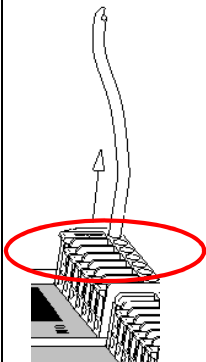
● The available wires are as follows.

Solid wire $\phi 0.4$ mm to $\phi 1.2$ mm (UL AWG16 to 26)

Stranded wire 0.2 mm^2 to 0.75 mm^2 (UL AWG20 to 24)

Be sure to use the above lead wires. Or, a breaking or connection error will happen.

● Notes for setting back lock buttons



- Never set back the lock buttons violently with your fingers or a small screwdriver. Terminals will be deformed and the following troubles will happen.
 - The lock buttons will unable to be locked.
 - The lock buttons will unable to be released.
 - The lock buttons will be deformed.
 - The lead wires will fall out.
- Gently set back the lock buttons to the original position with your fingers.

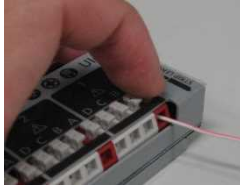
The one-touch lock type terminal block is made of plastic. Through repeated connections/disconnections, the lock function will gradually wear out and may give a poor connection (unable to be locked or unable to be released). The one-touch lock type terminal block is considered to be a consumable item. It is not covered under the terms of the warranty.

■ UI-55A

(1) By pressing a button on the terminal block, insert a lead wire for connection.



(2) Insert the lead wire with its coating peeled off approx. 10 mm all the way to its end into the lead wire hole.



(3) While holding the lead wire, let go of the button.



(4) Gently pull the lead wire to check if it is securely inserted.



NOTES FOR USING ONE-TOUCH TYPE TERMINAL BLOCK

- Do not connect gage leads (lead wires directly connected from the strain gage) directly to the terminal block. Or, gage leads may be broken. Use a gage terminal and convert the gage leads to the applicable lead wires or use a strain gage with pre-attached lead cables.
- Insert the lead wire with its coating peeled off approx. 10 mm all the way to its end into the lead wire hole. The PCD-400A has the "Lead wire sample" at actual size on its front panel. The coating of the sample is peeled off for 10 mm. Use the "Lead wire sample" for peeling the coating off.
- By pressing a button on the terminal block, insert a lead wire, and release the button to be locked. Be sure to connect and disconnect lead wires by pressing the buttons on the terminal block.
- The available wires are as follows.

Solid wire $\phi 0.3$ to $\phi 1.6$ mm (UL AWG28 to 14)

Stranded wire 0.2 mm^2 to 1.3 mm^2 (UL AWG24 to 16)

Be sure to use the above lead wires. Or, a breaking or connection error will happen.

- The replacement frequency of the terminal block is about 1 year, assuming twice a day (connection and disconnection) of use, 20 days a month. Through repeated connections/disconnections, the terminal block will wear out and will give a poor connection. In that case, push up the button with your nail with the lead wires connected.



The middle button is not back correctly



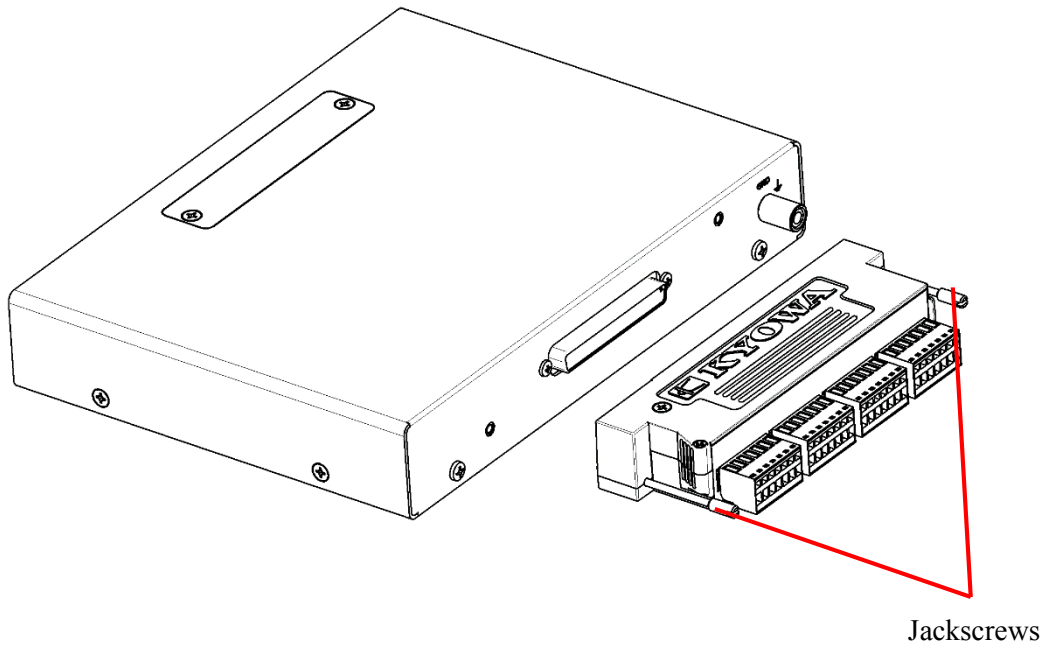
Push up the button with your nail.

- The one-touch type terminal block is made of plastic. Through repeated connections/disconnections, the button will gradually wear out and may give a poor connection unless you push up the button. The one-touch type terminal block is considered to be a consumable item. It is not covered under the terms of the warranty.

3-4 MOUNT/DEMOUNT THE INPUT ADAPTER

To demount the input adapter UI-10A, UI-11A, UI-15A, or UI-16A, remove the jackscrews.

To mount the input adapter UI-10A, UI-11A, UI-15A, or UI-16A, joint the PCD-400A connector and input adapter connector correctly and fasten the jackscrews. Tightly fasten the jackscrews with a flat-head screwdriver.



3-5 CONNECT THE POWER SUPPLY

3-5-1 Connect the AC adapter

Supply power by connecting the optional AC adapter (SA-10A or UIA345-12) to the power connector on the front panel. Before connecting the AC power cable of the AC adapter to the AC power outlet, check the power voltage.

The power supply voltage range of the optional AC adapter is 100 to 240 VAC (50 Hz/60 Hz). Be sure to keep the voltage range.

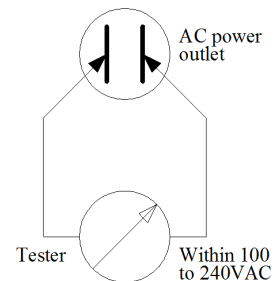
Be sure to connect the GND terminal to the ground.

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.

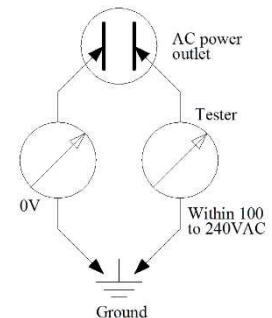
Or, it may cause system failures and accidents.

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

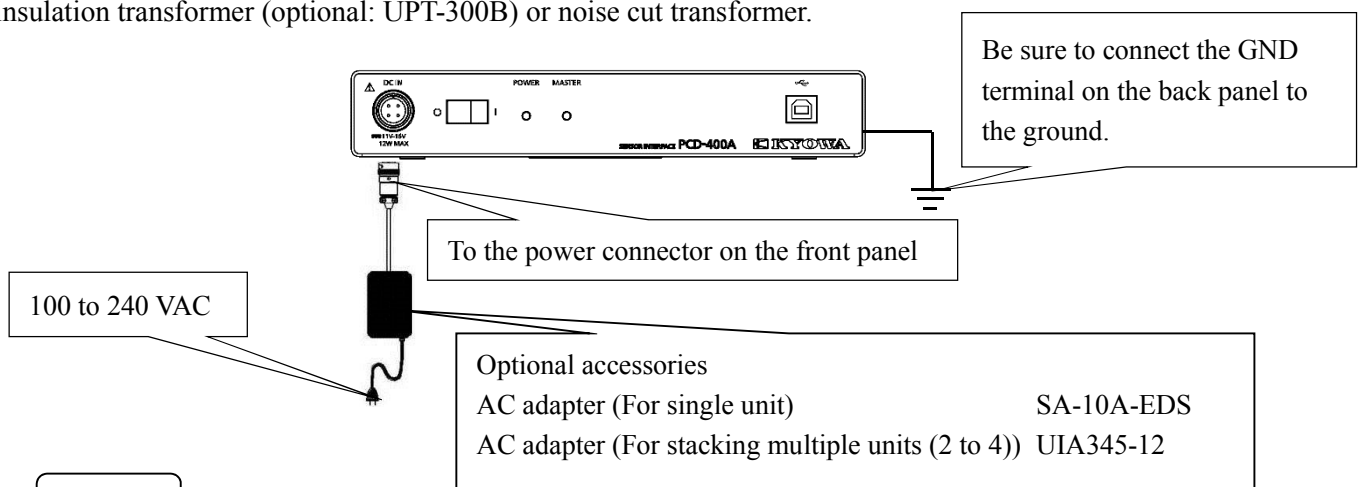
(1) Use the tester to measure the voltage between the AC power outlet terminals and ensure that the voltage is within the range of 100 to 240 VAC.



(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 product 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 (optional: UPT-300B) or noise cut transformer.



NOTE

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

3-5-2 Connect the DC power

Before connecting the DC power, check the power voltage.

The power supply voltage range of the PCD-400A is 11 to 16 VDC. Be sure to keep the voltage range.

Use the DC power 48W or more. (Capable of stacking the 4 PCD-400A units with 48W.)

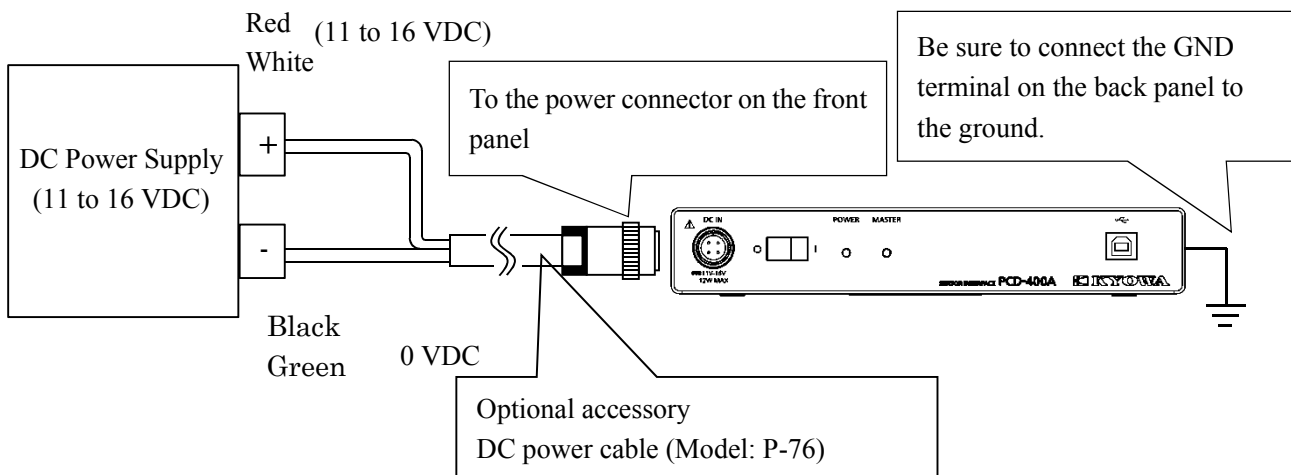
Supply DC power with the optional DC power cable (model: P-76).

Connect a connector side of the DC power cable to the "DC.IN" connector of the PCD-400A.

Connect the black and green wires at the end of the DC power cable to the – side of the DC power.

Connect the red and white wires at the end of the DC power cable to the + side of the DC power.

Connection diagram of the DC power is described as follows.



NOTE

- If the power voltage exceeds the above specified voltage range or if the positive side (+) and negative side (-) are connected adversely, it may cause trouble or damage to the product.
- Be sure to connect the GND terminal to the ground.
Or, it may cause an electric shock, lower the performance and cause trouble.

3-6 SETUP THE USB DEVICE DRIVER

To control the PCD-400A via the USB interface, it is necessary to setup the USB device driver for the PCD-400A in the PC.

NOTE

- When setting up the USB device driver, log in to the Administrator account (e.g. Administrator).
- Before connecting the PCD-400A and PC via the USB cable, be sure to setup the USB device driver.

■ For using the DCS-100A

(1) When setting up the DCS-100A, be sure to setup the USB device driver for the PCD-400A at the same time.

For details, see the DCS-100A INSTRUCTION MANUAL for Set-up.

(2) After turning ON the PCD-400A, connect the PCD-400A and PC via the USB cable.

■ For creating control software

(1) Insert the accessory DVD into the PC.

(2) Execute the "¥UsbDriver¥KYOWA_USB_****.exe" in the DVD.

(Note that *** indicates the version of the setup file for the USB device driver.)

(3) Setup the USB device driver by following the instructions on the window.

For details, see the DCS-100A INSTRUCTION MANUAL for USB driver set-up.

(4) After turning ON the PCD-400A, connect the PCD-400A and PC via the USB cable.

MEMO

After setting up the USB device driver, connect the PCD-400A and PC via an USB cable for installing the USB device driver automatically. You will be able to use the PCD-400A.

Depending on the OS (operating system), the "Wizard" window may appear to help you setup the USB device driver. For details, see the DCS-100A INSTRUCTION MANUAL for USB driver set-up.

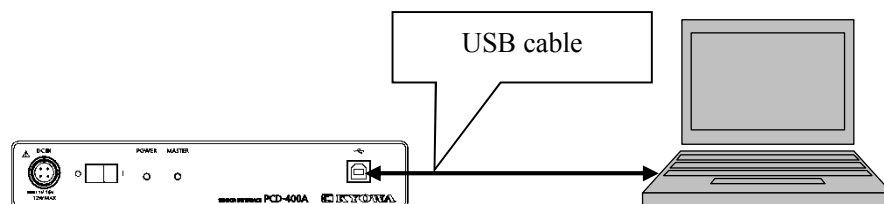
3-7 CONNECT THE USB INTERFACE

Connect the "USB" connector on the front panel and USB connector on the PC via an accessory USB cable. You can also use commercially available USB cables. When using commercially available USB cables, attach the ferrite core at both ends of the USB cable for removing noise. When stacking multiple PCD-400A units, connect the USB cable to the master unit only.

3-7-1 USB interface and connection diagram

(1) When connecting the PC and PCD-400A directly

■ For single unit



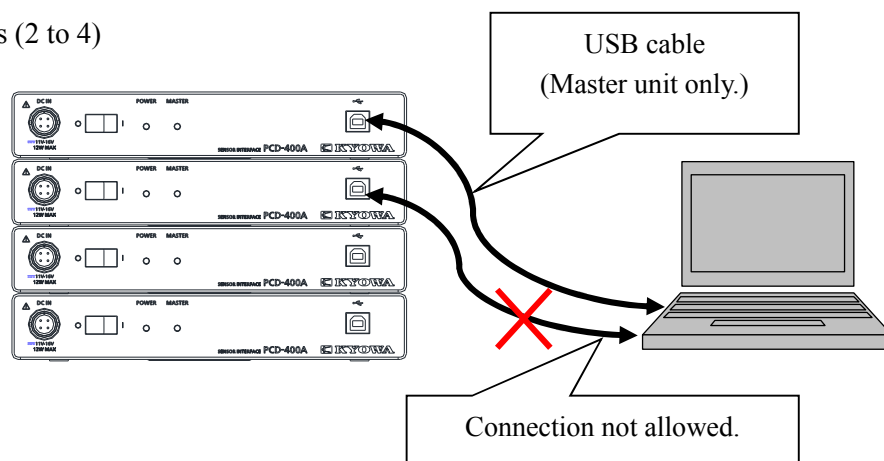
■ For stacking multiple units (2 to 4)

Master

Slave 1

Slave 2

Slave 3

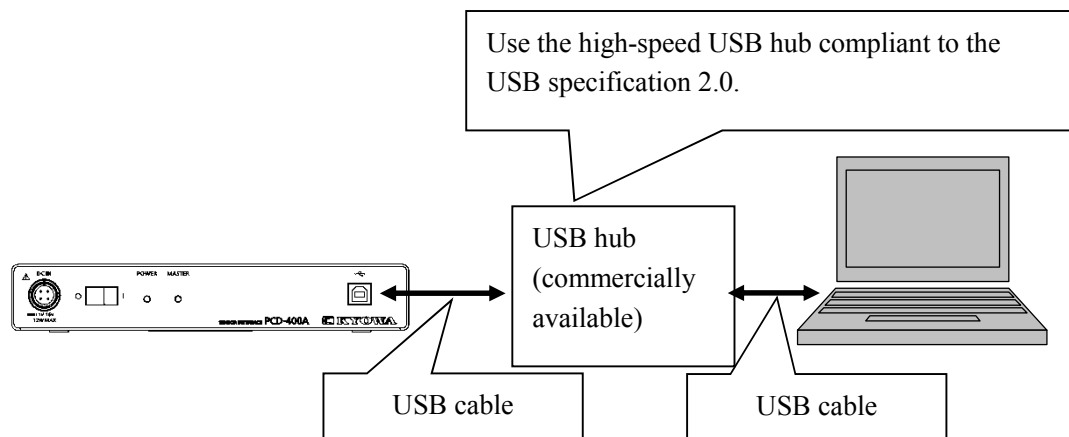


NOTE

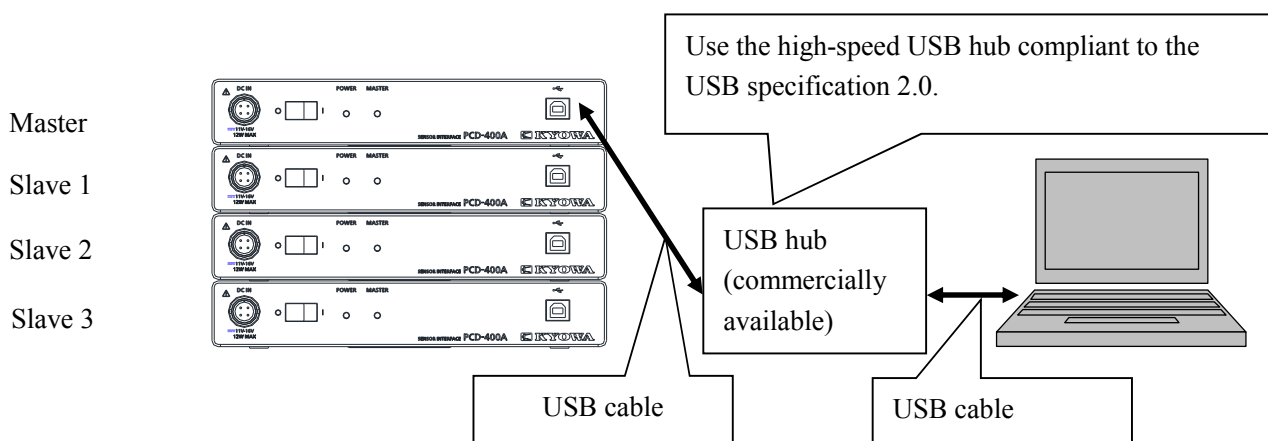
- The number of USB cables is 1.
- When stacking multiple PCD-400A units, connect the USB cable to the master unit only. When connecting the USB cable to a slave unit, the "MASTER" LED lights up in orange. The PC does not communicate with the PCD-400A units.

(2) When connecting the PC and PCD-400A via USB hub

■ For single unit



■ For stacking multiple units (2 to 4)

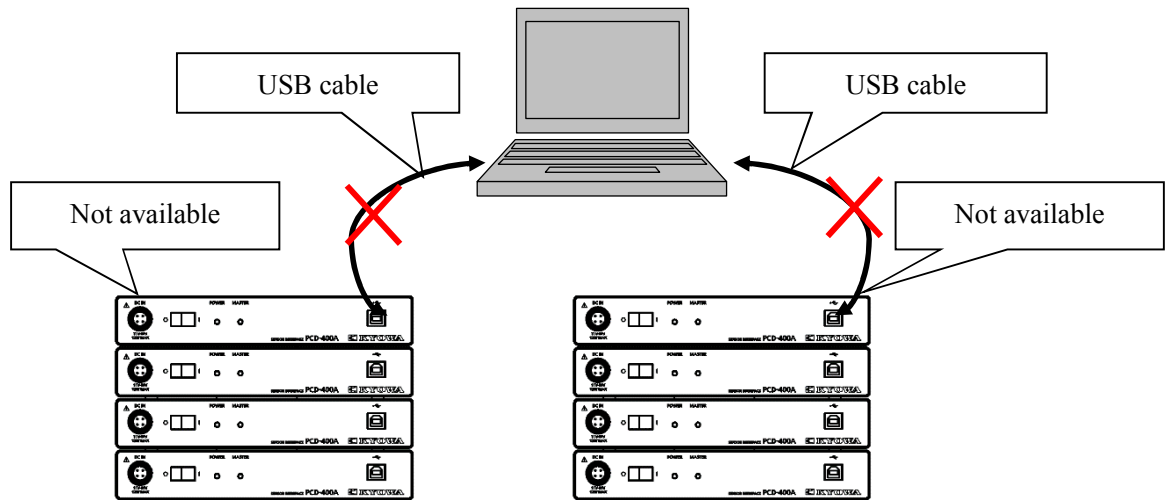


NOTE

- The number of USB cables is 1.
- When stacking multiple PCD-400A units, connect the USB cable to the master unit only.
When connecting the USB cable to a slave unit, the "MASTER" LED lights up in orange. The PC does not communicate with the PCD-400A units.

NOTE

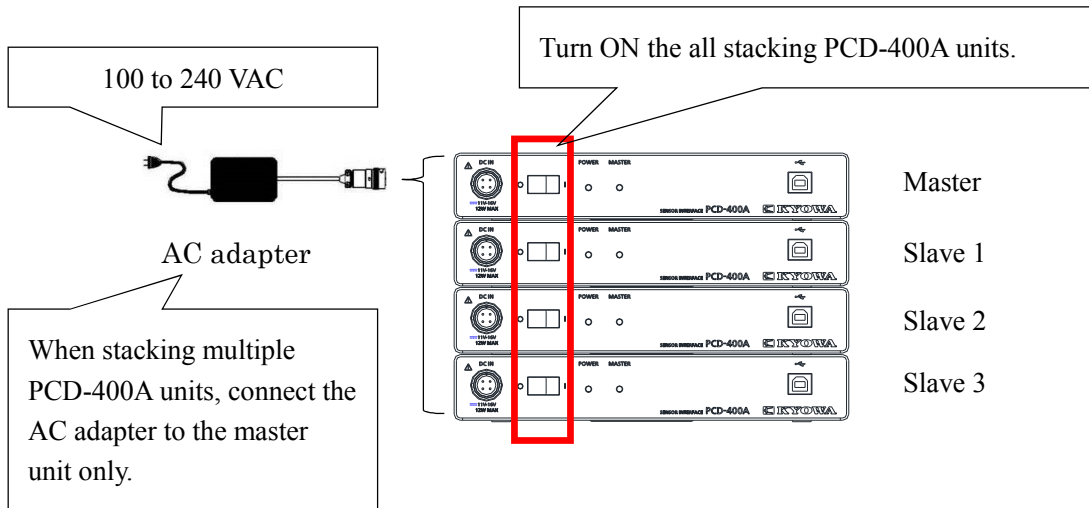
- Do not connect multiple sets of stacking PCD-400A units into one PC.



3-8 POWER ON/OFF

Press the POWER switch on the PCD-400A front panel to the 'I' side to turn ON and, to the 'O' side to turn OFF the PCD-400A.

The "POWER" LED on the front panel lights up green while the PCD-400A is ON and the PCD-400A is working successfully.



NOTE

- Be sure to use the optional AC adapter SA-10A-EDS (For single unit) or AC adapter UIA345-12 (For stacking multiple units (2 to 4)).
- After turning OFF the power switch, wait more than 5 seconds to turn ON the power once again. After turning ON the power, the PCD-400A will be in operation. However, inner electrical parts are not yet in thermally stabilized state right after the power ON. It is required to have approximately 1 hour preheating time to stable the operation of the above internal parts.
- When stacking multiple PCD-400A units, be sure to turn ON the all stacking PCD-400A units. Or, the PCD-400A units will not work successfully. Disconnect the PCD-400A which is turned OFF.

MEMO

After turning ON the power, the LEDs on the front panel light up as follows.

- "POWER" LED Lights up green while the PCD-400A is ON.
- "MASTER" LED Master unit: Lights up green
Slave unit: Lights out

During measurements, the "MASTER" LED of the master unit blinks in green.

3-8-1 LED status when stacking multiple PCD-400A units

Table 1-2 LED Status

LED Status		POWER		MASTER	
		Master	Slave 1 to 3	Master	Slave 1 to 3
Green	Light up	Power ON		Waiting	
	Blink			Measuring	
Orange	Light up	Stacking 5 or more PCD-400A units (NOTE 1)		Some slave unit is OFF. (NOTE 3)	The USB cable is connecting to the slave unit. (NOTE 4)
Red	Blink	The PCD-400A is failure. (NOTE 2)		The PCD-400A is failure. (NOTE 2)	
Light out		Power OFF		Power OFF	

NOTE 1: You can stack up to 4 PCD-400A units. Do not stack 5 or more PCD-400A units.

NOTE 2: Contact KYOWA or our representative.

NOTE 3: When stacking multiple PCD-400A units, be sure to turn ON the all stacking PCD-400A units.
Or, the PCD-400A units will not work successfully.

NOTE 4: Connect the USB cable to the master unit only.

4. MEASURE DATA

4-1 PROCEDURES FOR MEASUREMENTS

- 1) Install the DCS-100A (for the first time only).
Install the DCS-100A into the PC.
For details, see the DCS-100A INSTRUCTION MANUAL for Set-up.
- 2) Mount the PCD-400A.
Mount the PCD-400A.
For details, see "3. CONNECTION AND DEFAULT SETTING."
- 3) Turn ON the PC.
Turn ON the PC to start up Windows.
Connect the PC and PCD-400A by referring "3-7 CONNECT THE USB INTERFACE."
- 4) Turn ON the PCD-400A
Turn ON the PCD-400A by referring "3-8 POWER ON/OFF."
- 5) Set the measuring conditions.
Start up the DCS-100A. Set the channel conditions, measuring conditions, and sampling frequency.
For the Dynamic Data Acquisition Software DCS-100A, see the DCS-100A INSTRUCTION MANUAL for PCD-400A Operation.
- 6) Monitor the data on the PC for checking the input signal.
Conduct the balance adjustment on the DCS-100A if required.
If noisy, set the low-pass filter on the channel condition setting window and check the grounding.
- 7) Start recording data.
Start recording data by using the DCS-100A.
The recorded data is saved in the specified folder in the PC.
- 8) Stop recording data
Stop recording data by using the DCS-100A.
- 9) Check the recorded data waveform
Check and analyze the recorded data waveforms by using the DCS-100A.
After retrieving data, you can check and analyze the recorded data by using the DAS-200A.
- 10) Turn OFF the PCD-400A.
Turn OFF the PCD-400A by referring "3-8 POWER ON/OFF."

5. TROUBLE SHOOTING

In the event that the product would not operate as expected or in a stable manner, you should trace the factor(s) that may be causing such a condition before concluding that the system has failed.

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 product is damaged due to any causes other than as written in the Instruction Manual or if the user has disassembled or remodeled the product, Kyowa Electronic Instruments Co., Ltd. may not be able to offer repair service.

Trouble	Checked items and countermeasures
The power is not turned ON. (The "POWER" LED does not light up green.)	● Make sure the AC power outlet has the specified voltage. ⇒ Check the voltage with a tester. For details, see "3-5 CONNECT THE POWER SUPPLY." ● Make sure the input/output of the AC adapter are securely connected. ● Make sure the "POWER" switch turned ON. ● Make sure the AC adapter is the optional AC adapter SA-10A-EDS (For single unit) and multiple PCD-400A units are not stacked. When stacking multiple PCD-400A units, be sure to use the optional AC adapter UIA345-12 (For stacking multiple units (2 to 4)).
The "POWER" LED blinks in red.	● The PCD-400A is failure. Stop using the PCD-400A. Contact KYOWA or our representative.
The "POWER" LED lights up orange.	● Make sure 5 or more PCD-400A units are not stacked. ⇒ You can stack up to 4 PCD-400A units.
The "MASTER" LED lights up orange.	● Make sure the USB cable is not connecting to the slave unit. ⇒ Connect the USB cable to the master unit only. ● Make sure the stacking PCD-400A units are all ON. ⇒ When stacking multiple PCD-400A units, be sure to turn ON the all stacking PCD-400A units.
Operation stops and accepts no instruction at all.	● The operation failed due to noise. ⇒ Turn OFF and ON the power. If the same phenomenon still generates due to noise, take appropriate countermeasures for removing the noise from operating environment, power supply, etc. For details, see the following "Noisy" part.
The measured value varies.	● The operation failed due to noise. ⇒ Take appropriate countermeasures for removing the noise. For details, see the following "Noisy" part. ● Make sure the input adapter and input cables are connected correctly. ⇒ Connect them correctly and keep them from moving.
The measured value is incorrect.	● Make sure the bridge system and connections are correct. ⇒ Correctly set and connect the sensors.

The balance adjustment cannot be conducted.	● Make sure the "Balance adjustment" is checked on the channel conditions. ● Make sure a sensor is connected to the input. ● Make sure the input is within the balancing range. ⇒ Balancing range Within $\pm 10000 \mu\text{m/m}$ ● Make sure the input does not have excessive noise. ⇒ For details, see the following "Noisy" part.
Noisy	● Make sure the GND terminal is connected to the ground. When using a strain gage, connect the measuring target, on which the strain gage is mounted, and GND terminal of the product to decrease noise. ● Do not locate the input cable near the inverter motor, machine tool, welding machine, or AC motor power supply. Separately locate the input cable from the power source. ● Set the low-pass filter to reduce noise. Set the cutoff frequency of the low-pass filter 2 to 5 times as large as the input signal frequency. (Example: Suppose the input is DC to 30Hz. Set the cutoff frequency 100 Hz.)
Cannot measure data with the stacking multiple units.	● Make sure the stacking connector are correctly used. ⇒ For details, see "3-2 STACK MULTIPLE UNITS." ● Make sure the USB cable is not connecting to the slave unit. ⇒ Connect the USB cable to the master unit only.

6. MAINTENANCE

For the product, 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	Contents	Service intervals
Evaluation of operation and measuring accuracy	An annual maintenance inspection is recommended to ensure the operation and measuring accuracy of the product Must be returned to KYOWA for the scheduled maintenance inspection.	Once in a year

Table 6-2 Replacement of limited life parts

Item	Contents	Service intervals
AC adapter (optional accessory)	The accessory AC adapter 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 product 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 product is error-free or will be repaired at no additional cost in the above period.

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

Particularly if the product is used continuously for long periods of time, early replacement of parts is required for the purposes of safety and stable operation.

The product is not designed for continuous operation of 24 hours.

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

7. TECHNICAL INFORMATION

7-1 CORRECTION REQUIRED WHEN AN EXTENSION CABLE WAS USED

When distance from the sensor to a measuring instrument is considerably long, an extension cable may be used and connected for the measurement.

It should be noted that the measured value includes the error due to the use of the extension cable. To compensate the above error, multiply the measured value by the compensation coefficient (calibration coefficient). The following table describes the compensation coefficient obtained by using Kyowa's extension cable (4-conductor shielded cable, 0.5 mm², Model: N81 to N85).

In addition, the above compensation method corresponds to errors due to types of extension cable, ambient temperature, etc.

(Use the connection cable 30 m or less.)

Extension cable Bridge resistance	5 m	25 m
120 ohm	1.003	1.015
350 ohm	1.001	1.005

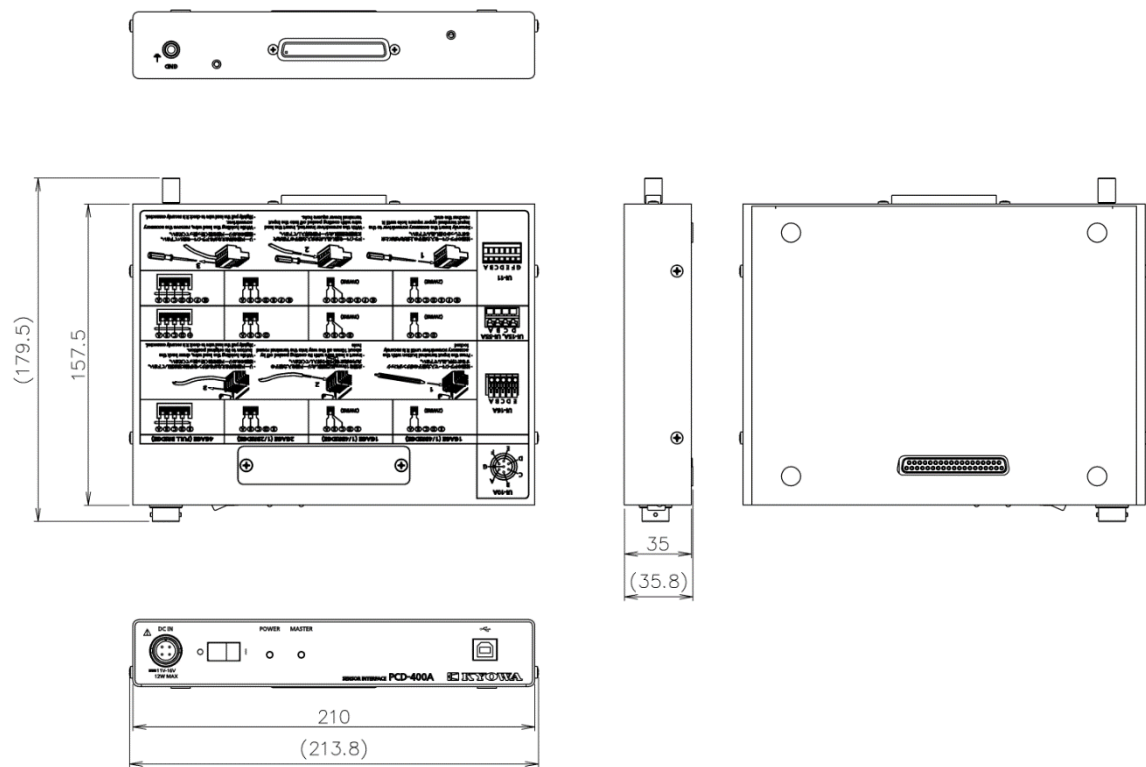
8. SPECIFICATIONS

(1) Name	Sensor Interface		
(2) Model	PCD-400A		
(3) Applicable Sensor	Strain gage, strain gage transducer		
(4) Number of Channel	4		
(5) Synchronous Measurement	Up to 4 units by 16 channels		
(6) Applicable Gage Resistance	Quarter bridge system (2-wire and 3-wire)	120 ohm	
	Half bridge system	120 to 1000 ohm	
	Full bridge system	120 to 1000 ohm	
(7) Input Connector	37-pin D-sub connector		
(8) Bridge Excitation	2VACrms		
(9) Gage Factor	2.00 fixed		
(10) Balance adjustment range	Resistance:	Within $\pm 2\%$ ($\pm 10000 \mu\text{m/m}$)	
	Capacity:	Within 5000 pF	
(11) Balance adjustment method	Resistance:	Auto balance	
	Capacity:	CST method (automatic tracking)	
(12) Nonlinearity	Within $\pm 0.1\%$ FS		
(13) Range	200,500,1 k, 2 k, 5 k, 10 k, and 20 k $\mu\text{m/m}$ - 7 steps		
	Accuracy:	Within $\pm 0.5\%$ FS	
(14) Frequency Response range	DC to 200 Hz, deviation within $\pm 10\%$		
(15) Sampling Frequency	Maximum 10 kHz (simultaneous sampling of 4 units 16 channels)		
(16) Low Pass Filter	Secondary Butterworth type		
	Cutoff frequency	: 10, 30, 100 Hz, and FLAT - 4 steps	
	Amplitude ratio at cutoff point	: $-(3 \pm 1)$ dB	
	Attenuation characteristics	: $-(12 \pm 1)$ dB/oct.	
(17) A-D Converter	24 bit		
(18) Holding Setting Condition	Range, Balance adjustment are stored in internal nonvolatile memory.		

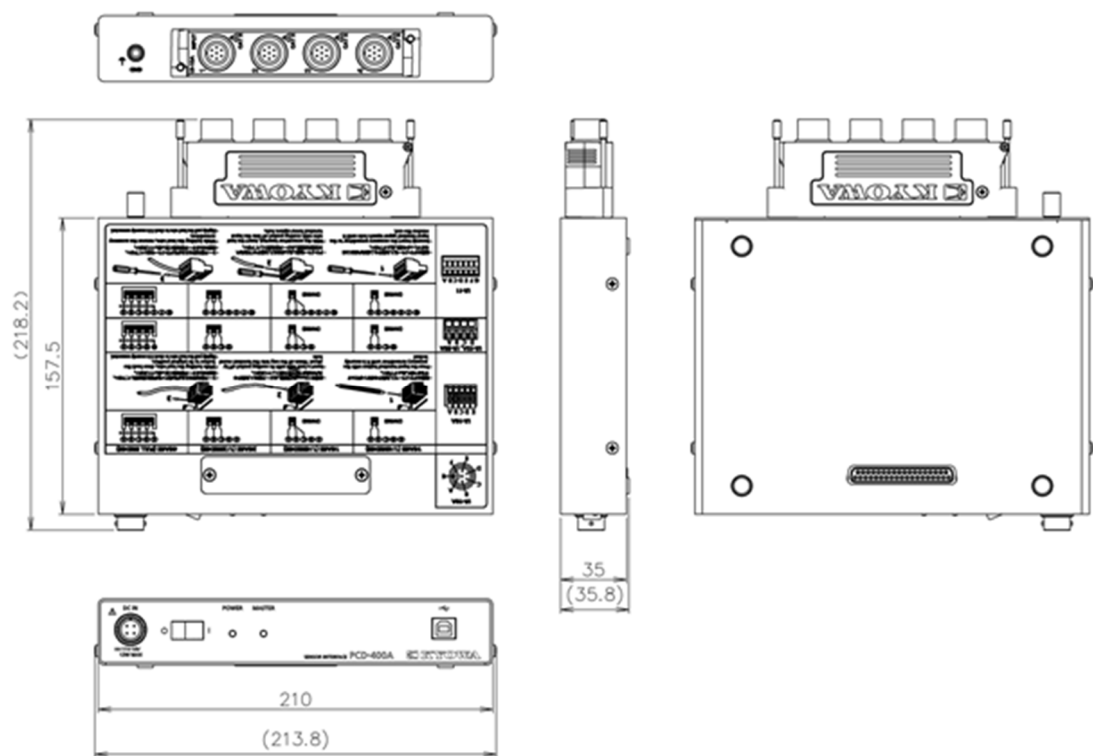
(19) TEDS Function	Loading function from the TEDS sensor CH name writing function (For the manufacture ID: KYOWA only)
(20) Interface	USB 2.0(Compliant to the High-Speed, USB3.0 port supported)
(21) Stability	Zero point - temperature within $\pm 0.2 \mu\text{m/m}/^{\circ}\text{C}$ Sensitivity - temperature within $\pm 0.05\%/^{\circ}\text{C}$ Zero point - time within $\pm 1.0 \mu\text{m/m}/8\text{h}$ Sensitivity - time within $\pm 0.3\%/8\text{h}$
(22) Withstand Voltage	Input-case, 250 VAC, 1 min.
(23) Operating Temperature & Humidity Range	0 to 40°C, 20 to 80%RH (Noncondensing)
(24) Vibration Resistance	$\pm 29.42\text{m/s}^2$ (3G), 5 to 200 Hz (12 cycles for each axis, 10minutes/cycle)
(25) Power Supply	11 to 16 VDC (AC adapter: Optional accessory, SA-10A-EDS or UIA345-12) Connector: RM12BRD-4PH (Hirose)
(26) Current Consumption	0.7 A or less (12 VDC)
(27) Dimensions	210(W) × 35(H) × 157.5(D) mm (not including Protrusions)
(28) Weight	Approximately 700 g
(29) EMC standards	EN61326-1
(30) Standard Accessories	USB cable N-38 (1m) Ground wire P-72 (5m) DVD (Dynamic data acquisition software DCS-100A)
(31) Optional Accessories	AC adapter SA-10A-EDS (For single unit) AC adapter UIA345-12 (For multiple units (2 to 4)) USB cable N-39 (2m) DC power cable P-76 (11 to 16 VDC, 2m) Input cable N-97 (10cm) Stacking connector set (ST-1A) Stacking board Input Adapter NDIS connector UI-10A (TEDS supported) Clamp type terminal block UI-11A (TEDS supported) Clamp type terminal block UI-15A One-touch lock clamp type terminal block UI-16A One-touch type terminal block UI-55A

9. OUTSIDE DRAWING

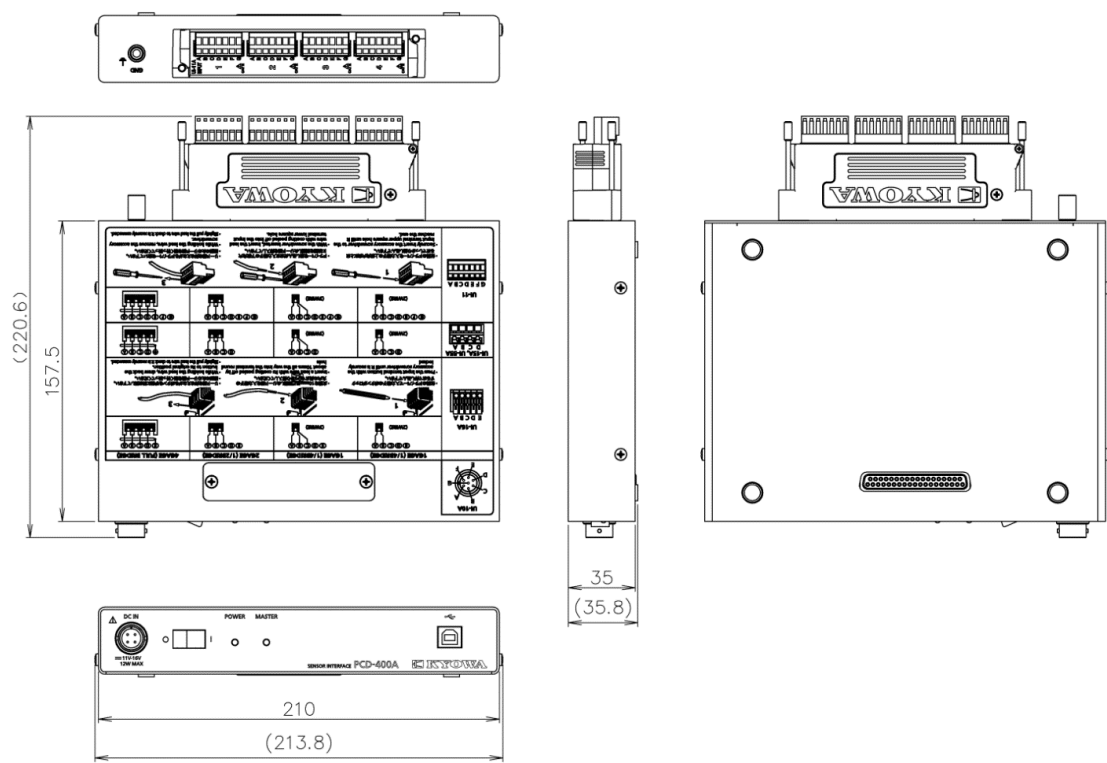
9-1 PCD-400A (WITHOUT INPUT ADAPTER)



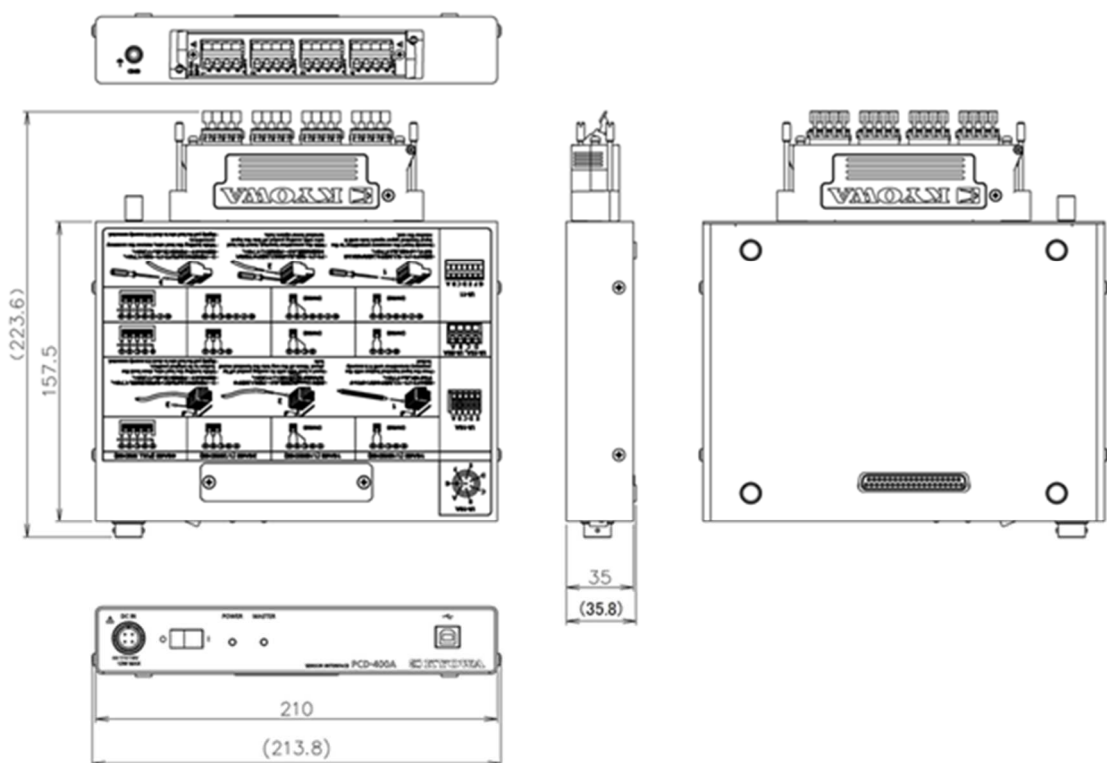
9-2 WITH INPUT ADAPTER UI-10A



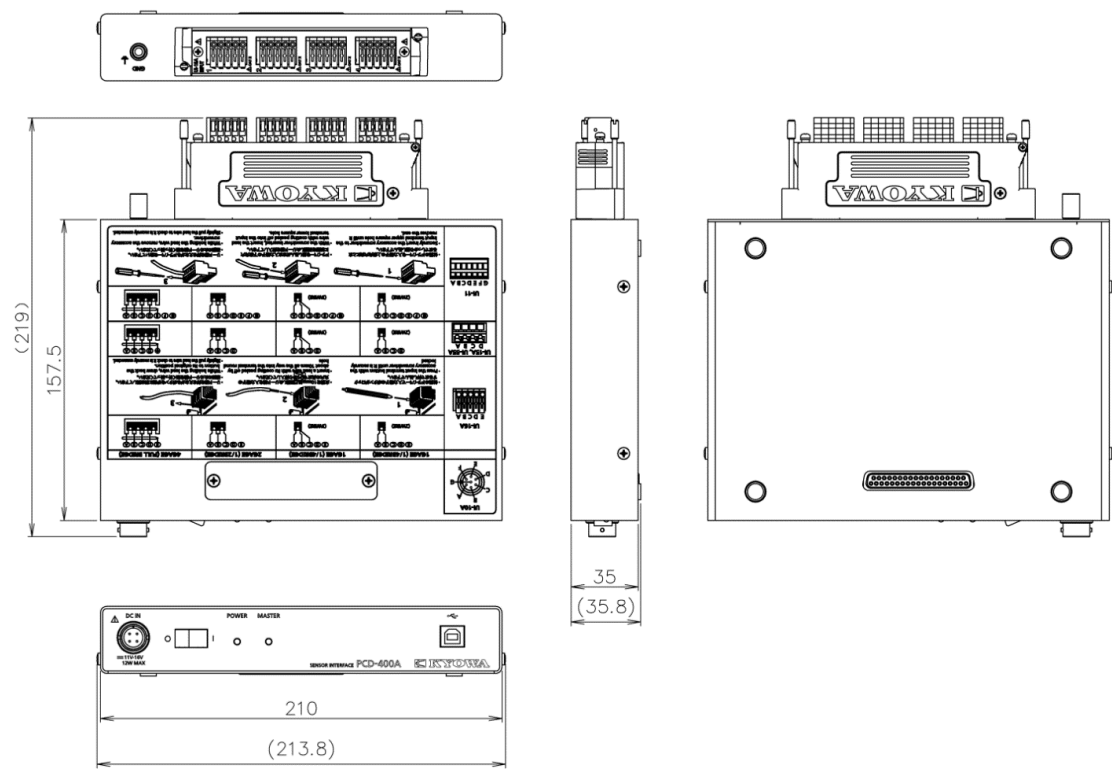
9-3 WITH INPUT ADAPTER UI-11A



9-4 WITH INPUT ADAPTER UI-15A



9-5 WITH INPUT ADAPTER UI-16A



9-6 WITH INPUT ADAPTER UI-55A

