IM-A-1438B September 2023

KYOWA

INSTRUCTION MANUAL
PCD-400B/430B
SENSOR INTERFACE
(FOR HARDWARE)

Thank you for purchasing KYOWA's product PCD-400B/430B 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-400B Series.
For the Dynamic Data Acquisition Software DCS-100A, see the DCS-100A INSTRUCTION MANUAL for PCD-400 Series Operation.
For software operation other than the DCS-100A, see the PCD-400 Series 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.

CONTENTS

This Manual only describes hardware operation of the PCD-400B/430B.

STANDARD ACCESSORIES

The following accessories are packed with the PCD-400B/430B.
When unpacking, check the contents to ensure that all accessories are enclosed.

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	UNI360-1540-AC *
USB cable	N-39(2 m)
DC power cable	P-76(2 m)
Connection cable	N-97(10 cm)
Stacking kit	ST-1B
Input adapter for strain gage transducer	UI-10A(TEDS supported)
Input adapter for strain gage	UI-11A(TEDS supported)
Input adapter for strain gage with operating lever	UI-15A
One-touch type input adapter for strain gage	UI-16B
One-touch type input adapter	UI-55A
Input adapter for voltage	UI-30A
Data Analysis Software	DAS-200A

*This AC adapter is common to all countries, including the United States. Please note that you will need to purchase an AC power cable separately if you are using it outside of Japan.

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

This PCD-400B/430B is designed to be used according to "8. SPECIFICATIONS."
Do not use the PCD-400B/430B in an environment exceeding the specifications. Or, it may cause trouble.

- PRIOR TO USE

For safe use of the PCD-400B/430B, 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-400B/430B, the following symbol mark is attached to the PCD-400B/430B.

	Indicates “GROUND TERMINAL.” Be sure to connect the GND terminal to the ground.
	Indicates the operator must refer to an explanation in the INSTRUCTION MANUAL in order to avoid the risk of injury or death of personnel or damage to the instrument.

SAFETY SYMBOLS
For safety operation of the PCD-400B/430B, 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-400B/430B Instruction Manual (FOR HARDWARE).
- Power supply
  To prevent a fire hazard, ensure that the power supply voltage specified for the PCD-400B/430B (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.
- Avoid using in environment with inflammable gas, etc.
  To prevent the risk of fire hazard or explosion, do not use the PCD-400B/430B in environment with inflammable gas, vapor, or dust.
- If any trouble occurs
  To prevent a fire hazard, if smoke is emitted from the PCD-400B/430B, immediately disconnect the AC adapter from the receptacle and stop using the PCD-400B/430B.
- 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.

⚠ CAUTION

- Caution
  Be sure to observe the safety precautions described in the PCD-400B/430B Instruction Manual (FOR HARDWARE).
- Do not use the PCD-400B/430B 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 product.
- Avoid measuring object applied with high voltage in strain measuring mode.
  Although the PCD-400B/430B is insulated, if it is used for measuring objects with excessive high voltage, it may deteriorate its performance and cause trouble.
- Always input voltage within allowable voltage range of ±50 V in voltage measuring mode.
  When measuring object in voltage measuring mode, do not input voltage lower then -50 V or higher than +50 V. The PCD-400B/430B is not insulated in voltage measuring mode. If voltage exceeding the allowable voltage range (+50 V) is input, performance of product may be deteriorated and cause trouble.
- Use the PCD-400B/430B 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 in an environment with a humidity of 20 to 85 % (no condensation).
  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 product immediately after the change in the environment.
  Leave the PCD-400B/430B 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-400B/430B under dusty environment.
  This can lead to performance problems and decreased operating efficiency. Be careful that dust may not enter the PCD-400B/430B not only during operation but also under stored conditions.
- Use the PCD-400B/430B under environment without excessive vibration or high impact.
  Vibration resistance:29.42 m/s^2 (3 G), 5 to 200 Hz (unstacked)
  Use the PCD-400B/430B 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-400B/430B in strong electromagnetic field.
  Use the PCD-400B/430B 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-400B/430B under poor conditions.
  When using a DC power supply, use within the range of 11 to 16 V DC. When using the optional AC adapter (UNI360-1540-AC), use within the range of 100 to 240 V AC (50/60 Hz). Use a power supply that is free from momentary power failures and noise.
- The specifications of the optional AC adapter (UNI360-1540-AC) is as follows.
  Input voltage:AC100 ～ 240 V (50/60 Hz)
  Output voltage:15 V (4.0 A)
  Operating temperature range:0 ～ 40 °C
  *This AC adapter has a limited life. Please purchase a new product after about 5 years.

- 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-400B/430B 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-400B/430B. Or, it may cause electric shock hazards or damage the PCD-400B/430B. 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-400B/430B before use.
  To ensure accurate measurements, allow approximately one hour of warm-up time after turning on the power before starting measurements.

LIMITED LIFE PARTS AND PREVENTIVE MAINTENANCE

This product 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 product, resulting in a malfunction or a failure.
You need to replace parts with a regular preventive maintenance schedule.

Limited life parts used with the product 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 product.
- 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 product normally, finding a sign of the product 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.

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 product. Regardless of the replacement parts, the product itself gradually deteriorates with age. Before the expected service life is reached, consider replacing the product 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 handing the product, and to information provided for reference purposes.

Examples of Notations

NOTE

Essential precautions required when handling the product.

MEMO

Reference items required when handling the product.

IMPORTANT PRECAUTIONS WHEN USING PCD-400B/430B

NOTE

- Do not disconnect the USB cable and the power supply while recording data.
  Or, it will cause data corruption and other problems.
- Be sure to use the shielded USB cable for connecting the PCD-400B/430B and PC.
  Or, deterioration or malfunction of the instrument may result.
- 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-400B/430B will not start up correctly, will be unstable, and cause other problems.
- The number of stacking units is 2 to 4.
  When stacking multiple PCD-400B/430B units, do not stack 5 or more PCD-400B/430B units.
  Or, deterioration or malfunction of the instrument may result.
- Do not connect multiple sets of stacking PCD-400B/430B units into one PC.
  Be sure to connect single set of stacking PCD-400B/430B units (The number of stacking units: 2 to 4) into one PC.
- When stacking multiple PCD-400B/430B units, connect the power supply to the master unit only.
  Or, deterioration or malfunction of the instrument may result.

PRECAUTIONS ON CE MARKING

Product has been confirmed that it complies with EN61326-1:2013 (EMC test requirements for equipment intended to be used in a basic electromagnetic environment, Class A Group 1) under the following conditions. When using this product in EU countries, be sure to meet the following conditions.
Note that the measures required to satisfy the standards may vary depending on the system configuration, wiring, etc. Therefore, it is necessary for the customer to confirm that the entire device complies with the CE marking.

- The DC power cable should be less than 3 m long.
- Be sure to use a shielded cable for connecting to this device. Also, the wiring length should be 30 m or less.
- If you are using a USB cable other than the standard accessory N-38, use one with ferrite cores near the connectors at both ends of the cable, or attach clamp-type ferrite cores separately.
- Use the GND terminal on the back of the device by grounding it using the supplied ground wire.
- use the optional AC adapter.

1. OUTLINE OF THE PRODUCT

1-1 OUTLINE OF THE PRODUCR

The PCD-400B/430B is a measuring instrument that allows easy measurement by simply connecting it to a personal computer via the USB interface.
The PCD-400B is a measuring instrument that can measure strain.
The PCD-430B is a measuring instrument that can measure strain and voltage.
The PCD-400B/430B supports compact measurement of up to 4 units (16 channels) by stack connection.

1-2 FEATURES

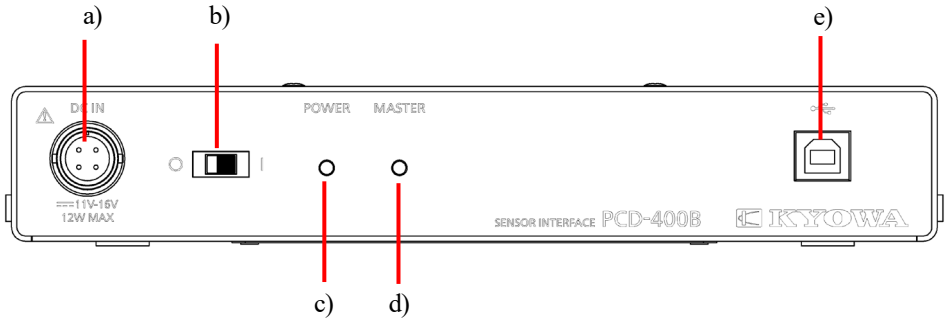
- Connection with the PC is easy with the use of the USB interface.
- When using the PCD-430B, either strain input or voltage input can be selected for every channel.
- Since the PCD-400B/430B has a bridge box built-in, it is capable of conducting a quarter-bridge-system experiment or half-bridge-system experiment for strain gages solely by itself.
- The PCD-400B/430B is provided with input adapters applicable for the sensors.
- Since the PCD-400B/430B is capable of measurement of 4 channels per a unit and maximum 16 channels with 4 units, the PCD-400B/430B is applicable for measurement in a wide range from a simple experiment to advanced measurement. Sampling frequency: Maximum 10 kHz.
- When stacking multiple units, the stacking kit (ST-1B, optional accessory) enables easy stacking without using synchronous cables.
- Single USB cable and single AC adapter (UNI360-1540-AC, optional accessory) enable measurements of maximum 4 units (16 channels).
- Includes low-pass filter as standard equipment.
- When using TEDS compatible sensors, by loading sensor information with TEDS function, the PCD-400B/430B 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.

*Note
- To connect devices on the control software DCS-100A, click the icon labeled PCD-400 Series.
- The model displayed in CH condition setting is the model of PCD-400A and PCD-400B is displayed as PCD-400.The model of PCD-430A and PCD-430B is displayed as PCD-430.

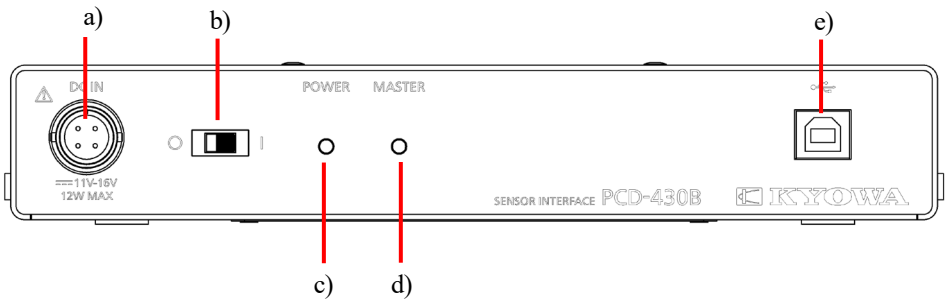
2. CONTROLS AND INDICATORS

2-1 FRONT PANEL

■ PCD-400B



■ PCD-430B



a) "DC.IN" connector — Power connector
The power supply voltage range of the PCD-400B/430B is 11 to 16 VDC.
For details, see "
3-5 CONNECT THE POWER SUPPLY."

b) POWER switch — " | " position: Power ON
" ○ " position: Power OFF

c) "POWER" LED — Lights up while the PCD-400B/430B 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 2-1."

e) "USB" connector — Connects an accessory USB cable.

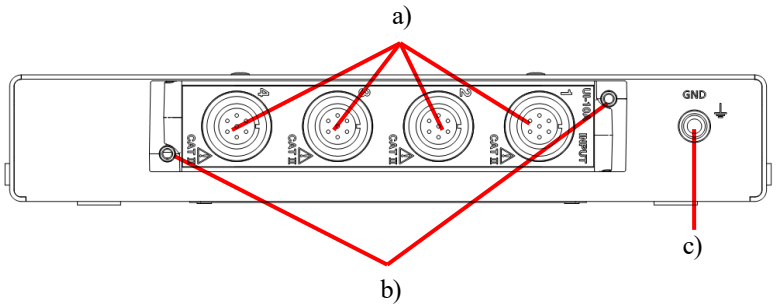
Table 2-1 LED status

LED / Status		POWER	MASTER
Green	Light up	Power ON	Waiting
	Blink		Measuring
Orange	Light up	Stacking 5 or more PCD-400B/430B units (NOTE 1)	
Red	Blink	The PCD-400B/430B is failure. * Contact KYOWA or our representative.	
Light out		Power OFF	

NOTE 1: You can stack up to 4 PCD-400B/430B units. Do not stack 5 or more PCD-400B/430B units.
When stacking multiple PCD-400B/430B units, see "3-8-1 LED status when stacking multiple units."

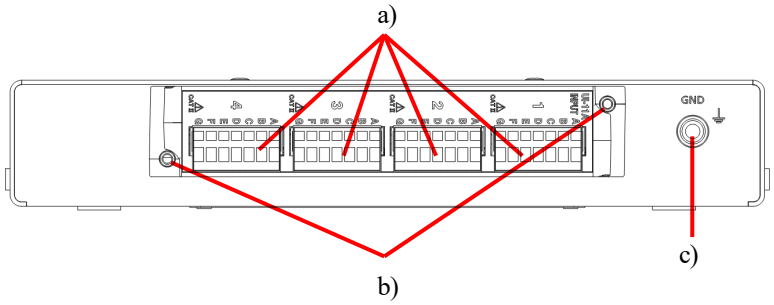
2-2 REAR PANEL

■ With input adapter UI-10A



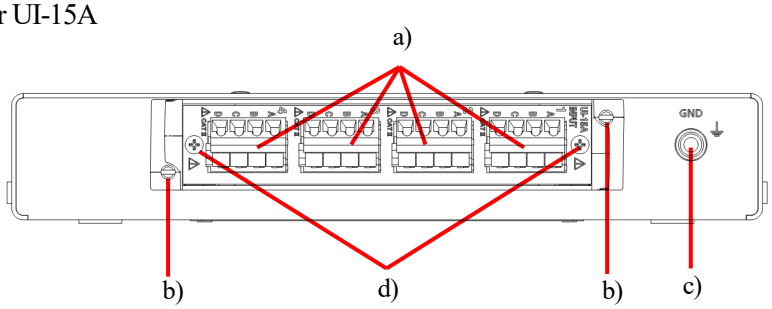
a)	Input connector	Connects a strain gage transducer.
b)	Jackscrew	Loosen the jackscrews to remove the input adapter. When mounting the input adapter, fasten the jackscrews. Tightly fasten the jackscrews with a flat-head screwdriver. Common to all input adapters.
c)	GND terminal (case)	Be sure to connect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

■ With input adapter UI-11A



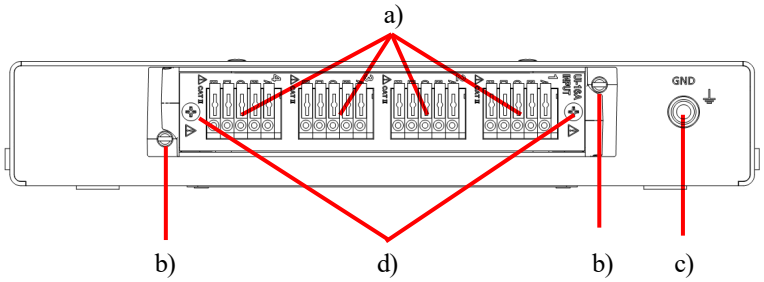
a)	Clamp-type terminals	Connects a strain gage or strain gage transducer. When connecting strain gage transducers, use an optional connection cable (N-97).
b)	Jackscrew	Loosen the jackscrews to remove the input adapter. When mounting the input adapter, fasten the jackscrews. Tightly fasten the jackscrews with a flat-head screwdriver. Common to all input adapters.
c)	GND terminal (case)	Be sure to connect the GND terminal to the ground.

■ With input adapter UI-15A



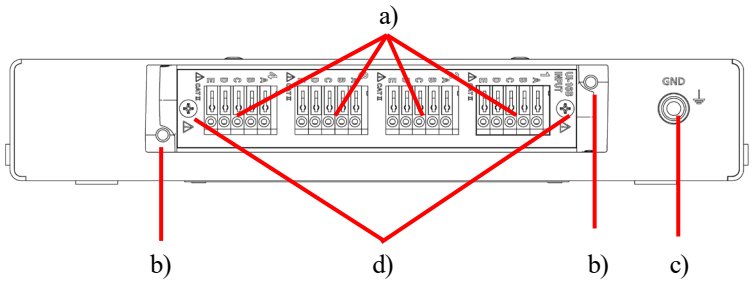
a)	Clamp-type terminals block with operating levers	Connects a strain gage or strain gage transducer. Press down the operating lever for connection. When connecting strain gage transducers, use an optional connection cable (N-97). When a shield wire is attached to the sensor cable, connect the shield wire to the section d) with a screw.
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 (case)	Be sure to connect the GND terminal to the ground.
d)	GND terminal (adapter)	Use for cable shield wiring.

■ With input adapter UI-16A



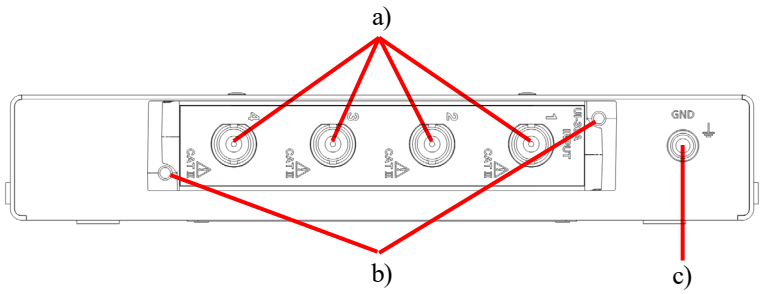
a)	Clamp-type one-touch lock terminals	Connects a strain gage or strain gage transducer. Use a UI-16A accessory small flat-head screwdriver for connection. When connecting strain gage transducers, use an optional connection cable (N-97). When a shield wire is attached to the sensor cable, connect the shield wire to the section d) with a screw.
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 (case)	Be sure to connect the GND terminal to the ground.
d)	GND terminal (adapter)	Use for cable shield wiring.

■ With input adapter UI-16B



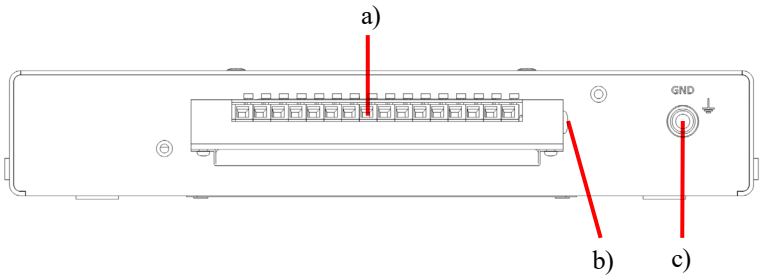
b)	Clamp-type one-touch terminals	Connects a strain gage or strain gage transducer. Use a UI-16B accessory small flat-head screwdriver for connection. When connecting strain gage transducers, use an optional connection cable (N-97). When a shield wire is attached to the sensor cable, connect the shield wire to the section d) with a screw.
e)	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.
f)	GND terminal (case)	Be sure to connect the GND terminal to the ground.
g)	GND terminal (adapter)	Use for cable shield wiring.

■ With input adapter UI-30A



a)	BNC connectors	BNC connector dedicated for inputting voltage. When using the UI-30A, strain gages and strain gage transducer cannot be connected.
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 (case)	Be sure to connect the GND terminal to the ground.

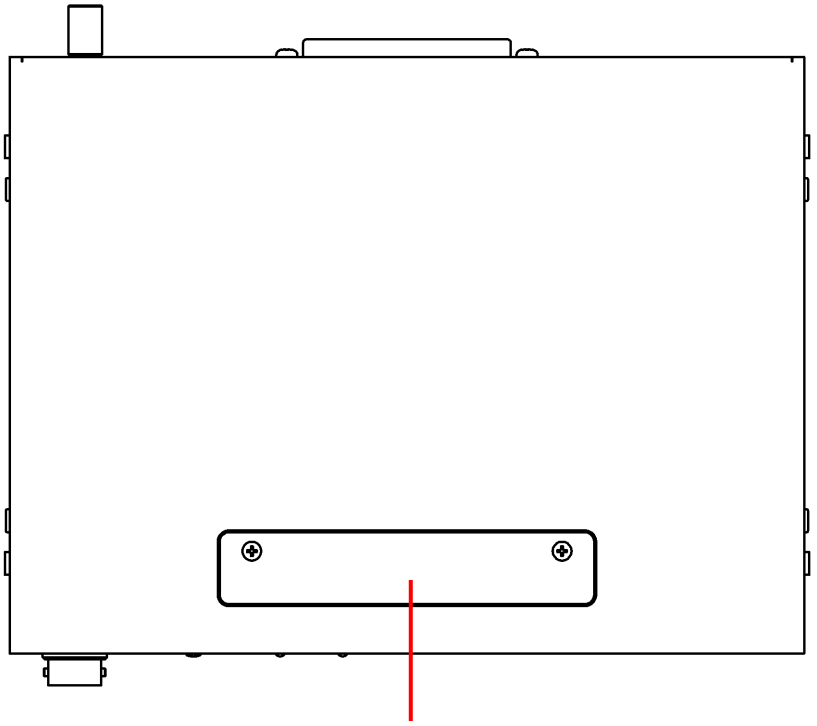
■ With input adapter UI-55A



a)	One-touch type terminals	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 connection cable (N-97). When a shield wire is attached to the sensor cable, connect the shield wire to the section b) with a screw.
b)	GND terminal (case)	Be sure to connect the GND terminal to the ground.
c)	GND terminal (adapter)	Use for cable shield wiring.

2-3 TOP PANEL

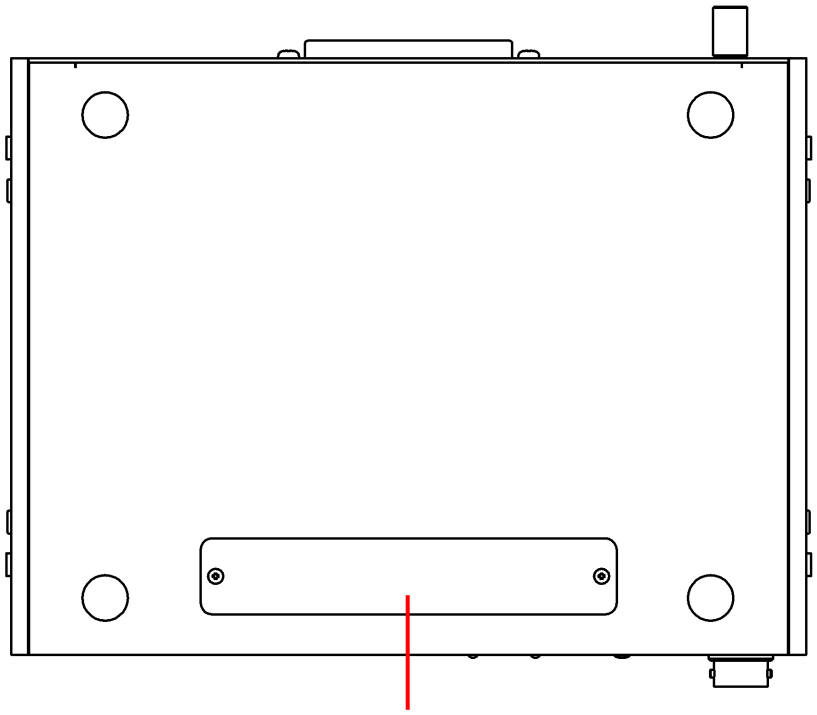
■ PCD-400B, PCD-430B



a)

a) Top connector cover — When stacking the units, remove the connector cover and attach the stacking adapter included in the stacking kit (ST-1B).

2-4 BOTTOM PANEL



a)

a) Bottom connector cover — When stacking the units, remove the connector cover and attach the stacking adapter included in the stacking kit (ST-1B).

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

Section 3-3	Connect sensors	Connects sensors into the target input adapter.
	↓	
Section 3-4	Mount/demount the input adapter	Mount the input adapter.
	↓	
Section 3-5	Connect the power supply	Connect the AC adapter or DC power and ground the GND terminal.
	↓	
Section 3-6	Setup the USB device driver	Setup the USB device driver into the PC.
	↓	
Section 3-7	Connect the USB interface	Set the USB interface for connecting the PC. *Before settings, make sure the USB device driver is setup correctly.
	↓	
Section 3-8	Power ON/OFF	Turn ON the power.
	↓	
Chapter 4	Measure data	Preparation and measurements For details, "4. MEASURE DATA."

3-1-2 For stacking multiple units

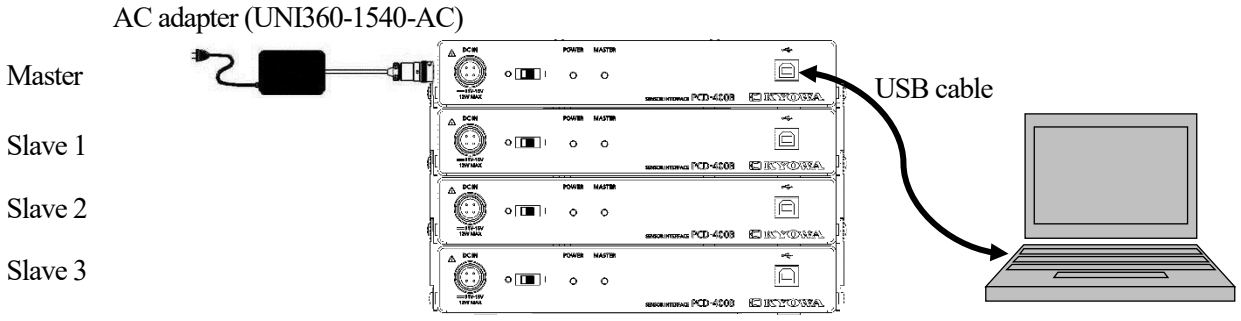
Section 3-2	Stack multiple units	Connect multiple units for synchronous operation.
	↓	
Section 3-3	Connect sensors	Connects sensors into the target input adapter.
	↓	
Section 3-4	Mount/demount the input adapter	Mount the input adapter.
	↓	
Section 3-5	Connect the power supply	Connect the AC adapter or DC power and ground the GND terminal.
	↓	
Section 3-6	Setup the USB device driver	Setup the USB device driver into the PC.
	↓	
Section 3-7	Connect the USB interface	Set the USB interface for connecting the PC. *Before settings, make sure the USB device driver is setup correctly.
	↓	
Section 3-8	Power ON/OFF	Turn ON the power.
	↓	
Chapter 4	Measure data	Preparation and measurements For details, see "4. MEASURE DATA."

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 (UNI360-1540-AC) or DC power	1	1	1
2	USB cable	1	1	1
3	Stacking kit (ST-1B)	1 set	2 sets	3 sets

Example: Stacking 4 units



MEMO

- When stacking multiple PCD-400B/430B 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).

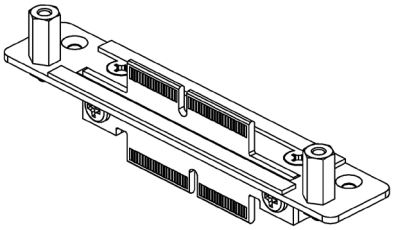
NOTE

- Connect the power to the master unit only.
- Connect the USB cable to the master unit only.
- If vibration is applied during stack connection, normal measurement may not be possible due to cable resonance, etc. In that case, take measures such as fixing the cable.

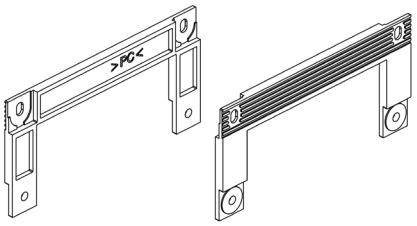
3-2-2 Procedures for stacking

When stacking this instrument, the separately sold "Stacking kit: ST-1B" is required.
The ST-1B includes the following items.

1.	Stack adapter	1
2.	Stack fixture	2
3.	Countersunk screw M2.6*6 mm	2
4.	Binding screw M3*8 mm	8
5.	Spacer washer	4



Stack adapter

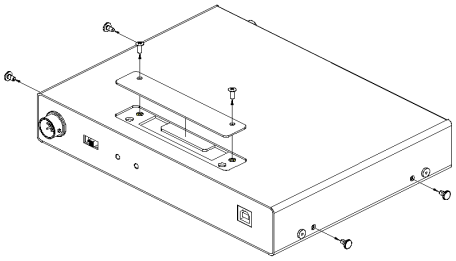


Stack fixture

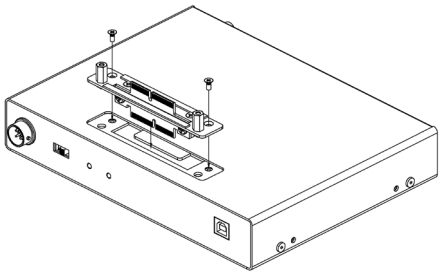
NOTE

- When stacking multiple PCD-400B/430B units, be sure to turn off the power.
  Or, it may cause trouble.
- You can stack up to 4 PCD-400B/430B units. Do not stack 5 or more PCD-400B/430B units.

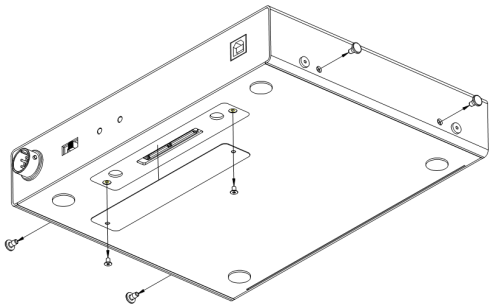
(1) Remove the 2 screws, the top connector cover, and the 4 rubber caps on the sides of the equipment that will be the bottom when stacked.



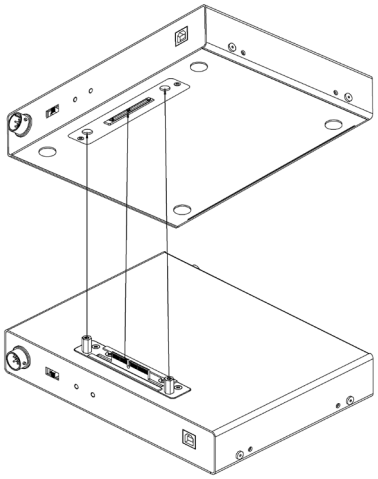
(2) Insert the stack adapter included in the stacking kit (ST-1B: sold separately) into the internal connector, and fix it to the case with the attached 2 countersunk screws. Make sure that the screws and metal parts that secure the stack adapter are facing you.



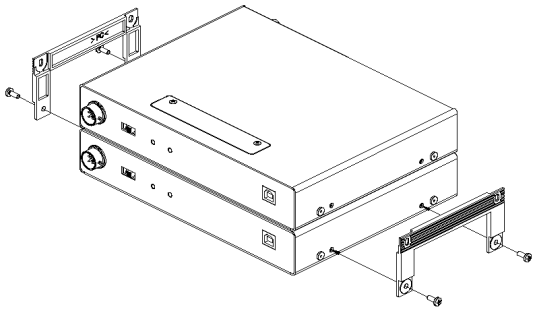
(3) Remove the 2 screws, the bottom connector cover, and the 4 rubber caps on the sides of the equipment to be connected above.



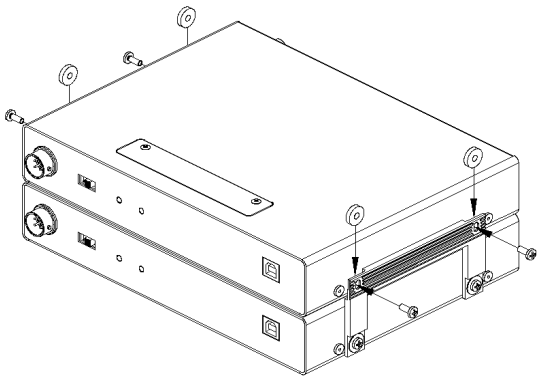
(4) Connect devices.
Stack them so that the hexagonal spacer fits into the hole on the bottom of the housing.



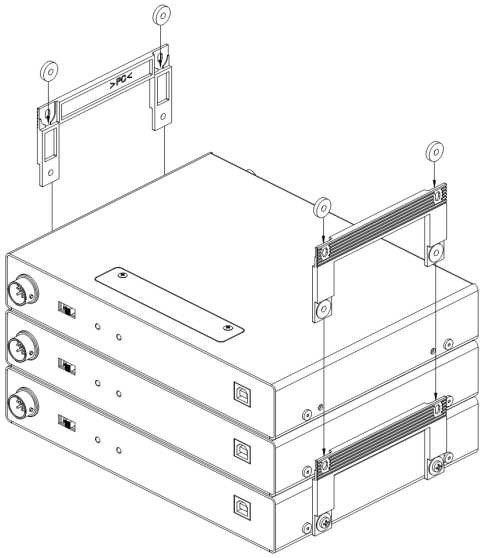
(5) Fix the connecting the stack fixtures with the binding screws.



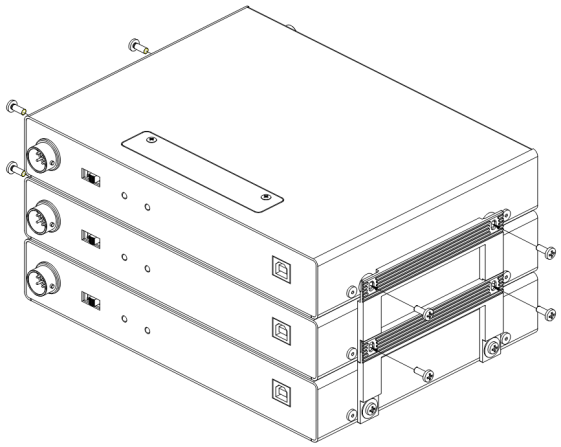
(6) When connecting two units, insert the spacer washers into the connecting the stack fixtures, and then tighten the binding screw.
When connecting 3 or more units, skip this procedure and proceed to step (7).



(7) Perform steps (1) to (4), remove the covers and screws from the devices to be connected, and stack the devices. Insert the connecting the stack fixtures and the spacer washers from above.



(8) Complete by fixing the connecting the stack fixtures and the spacer washers with the binding screws.

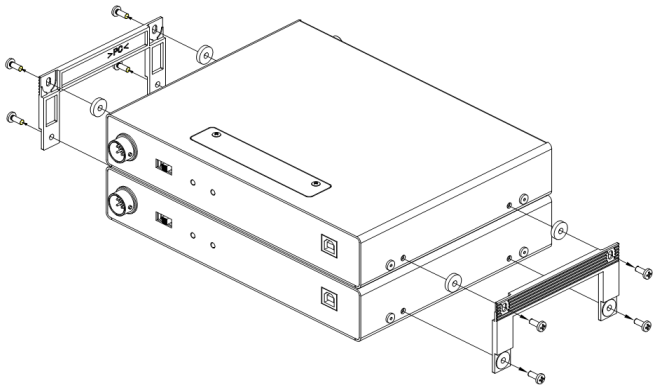


3-2-3 Procedures for demounting stacking kit

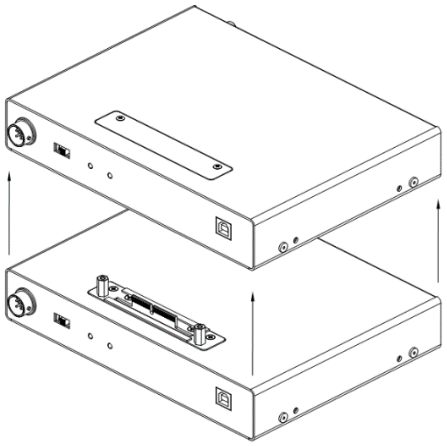
NOTE

● Before demounting the stacking kit (ST-1B, optional accessory), be sure to turn off the power.
Or, it may cause trouble.

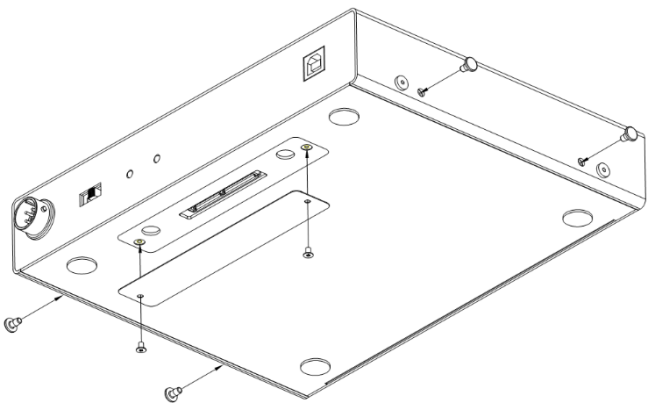
(1) Remove the screws on the side, and remove the stack fixtures and the spacer washers.



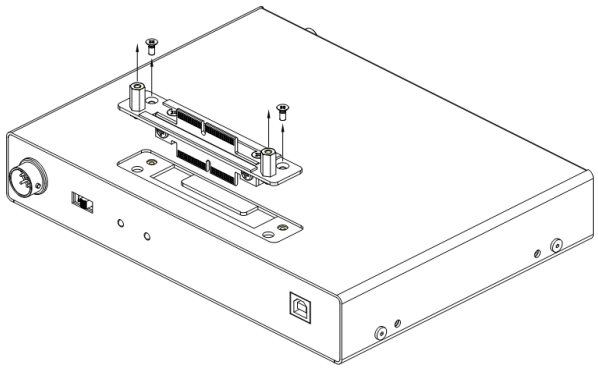
(2) Pull out the device vertically.



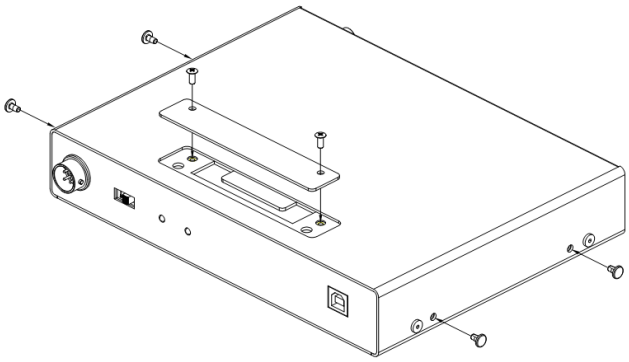
(3) Attach the 2 bottom connector cover screws, the bottom connector cover, and the 4 rubber caps on the sides of the instrument.



(4) Remove the 2 countersunk screws fixing the stack board and the device, and pull out the stack board.
When pulling out, hold the hexagonal spacer and pull it out vertically.



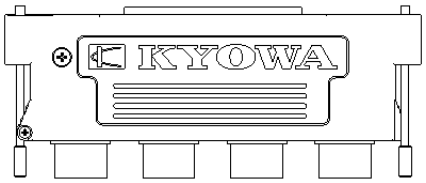
(5) Attach the 2 screws of the top connector cover of the device, the top connector cover, and the 4 rubber caps on the side of the device.



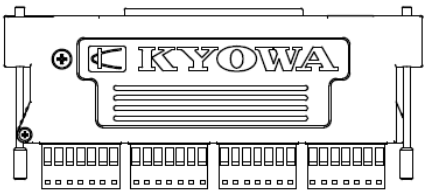
3-3 CONNECT SENSORS

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

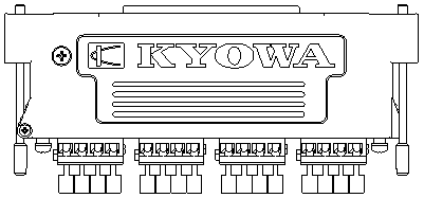
■ UI-10A Input adapter with the one-touch NDIS connector
For strain gage transducers. TEDS supported



■ 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."



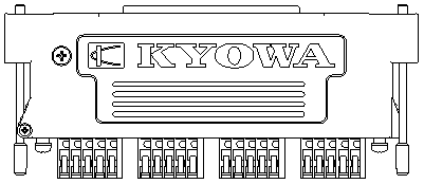
NOTE

- 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

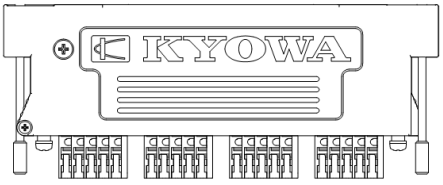
For details of the quarter bridge system, half bridge system, and full bridge system, see "3-3-2 Input adapter and connection."



■ UI-16B Input adapter with the one-touch type terminal block

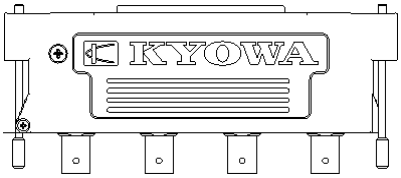
Use the included tool or something with a thin tip to push in the button and perform wiring.
TEDS not supported

For details of the quarter bridge system, half bridge system, and full bridge system, see "3-3-2 Input adapter and connection."



■ UI-30A Voltage input adapter with the BNC connector

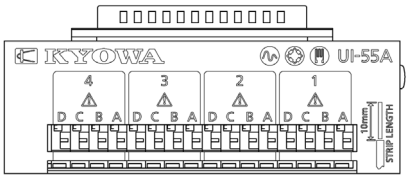
The input adapter is designed to input voltage. TEDS not supported



■ 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

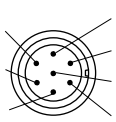
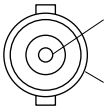
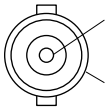
- Input adapters and range of electric wires

UI-11A	Solid wire φ0.5 to 1.4 mm (UL AWG16 to 24)
	Stranded wire 0.13 to 1.5 mm^2 (UL AWG16 to 26)
UI-15A	Solid wire φ0.3 to 1.8 mm (UL AWG13 to 28)
	Stranded wire 0.08 to 1.5 mm^2 (UL AWG16 to 28)
UI-16A, UI-16B	Solid wire φ0.4 to 1.2 mm (UL AWG16 to 26)
	Stranded wire 0.2 to 0.75mm^2 (UL AWG20 to 24)
UI-55A	Solid wire φ0.3 to 1.6 mm (UL AWG14 to 28)
	Stranded wire 0.2 to 1.3mm^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-connector sensor to the UI-11A, UI-15A, UI-16A UI-16B or UI-55A, use an optional connection 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.

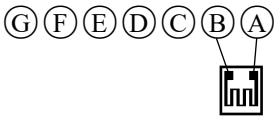
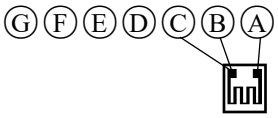
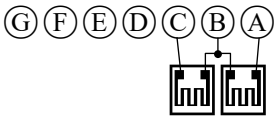
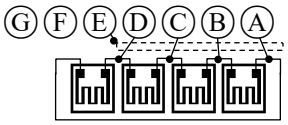
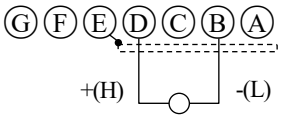
3-3-2 Input adapter and connection

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

Adapter	Applicable gage, Voltage Input	Connection, Terminal name	Remarks
UI-10A	Specified for the full gage system For strain gage transducer Gage resistance: 120 to 1000 Ω	C(-BV) D(+SIG) E(Shield)  B(-SIG) A(+BV) G(-TEDS) F(+TEDS)	TEDS supported Inputting Voltage B: − (L) D: + (H)
	Voltage input FV-1A is used	 +(H) -(L)	-
UI-30A	Dedicated for voltage input	 +(H) -(L)	-

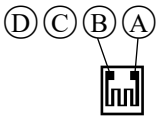
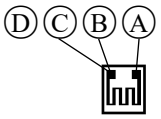
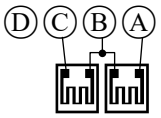
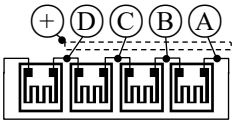
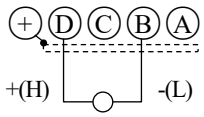
MEMO

- If the measurement is unstable, it may be solved by grounding the [GND] terminal on the rear panel.

Adapter	Applicable gage, Voltage Input	Connection, Terminal name	Remarks
UI-11A	Quarter bridge system (2-wire system connection) Gage resistance: 120 Ω		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 Ω		
	Half bridge system Gage resistance: 120 to 1000 Ω		
	Full bridge system Gage resistance: 120 to 1000 Ω		
	Voltage input		-

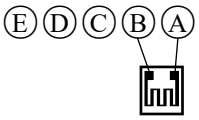
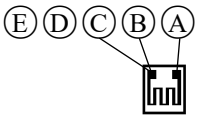
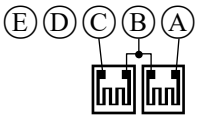
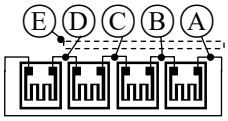
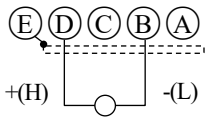
MEMO

- 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.
- Correctly wire a cable for inputting voltage.
  + side input: D terminal
  − side input: B terminal

Adapter	Applicable gage, Voltage Input	Connection, Terminal name	Remarks
UI-15A UI-55A	Quarter bridge system (2-wire system connection) Gage resistance: 120 Ω		A: + BV B: - SIG C: - BV D: + SIG ⏚: Shield TEDS not supported
	Quarter bridge system (3-wire system connection) Gage resistance: 120 Ω		
	Half bridge system Gage resistance: 120 to 1000 Ω		
	Full bridge system Gage resistance: 120 to 1000 Ω		
	Voltage input		B: - (L) D: + (H)

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.
- Correctly wire a cable for inputting voltage.
  + side input: D terminal
  - side input: B terminal

Adapter	Applicable gage, Voltage Input	Connection, Terminal name	Remarks
UI-16A UI-16B	Quarter bridge system (2-wire system connection) Gage resistance: 120 Ω		A: + BV B: - SIG C: - BV D: + SIG E: Shield TEDS not supported
	Quarter bridge system (3-wire system connection) Gage resistance: 120 Ω		
	Half bridge system Gage resistance: 120 to 1000 Ω		
	Full bridge system Gage resistance: 120 to 1000 Ω		
	Voltage input		B: - (L) D: + (H)

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.
- Correctly wire a cable for inputting voltage.
  + side input: D terminal
  - side input: B terminal

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 10 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, UI-16B or UI-55A
  Use an optional connection cable (receptacle with lead wire, N-97).

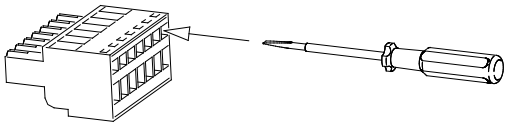
In addition, when inputting voltage, the following 3 methods are available.

- When using the input adapter UI-10A, use an input conversion adapter
  (NDIS-BNC conversion, Optional: FV-1A).
- When using input adapters UI-11A, UI-15A, UI-16A, UI-16B or UI-55A directly connect terminals to Terminal D (+ side) and Terminal B (- side) or use the N-97 and FV-1A for connection.
- Use the input adapter UI-30A.

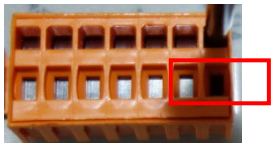
When connecting lead wires into the input terminals on the UI-11A, UI-16A and UI-16B use the accessory small flat-head screwdriver.
How to connect lead wires is described as follows.

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

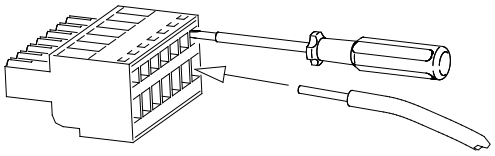
(1) Insert the accessory small flat-head screwdriver all the way inside to the square hole, located above the input terminal.

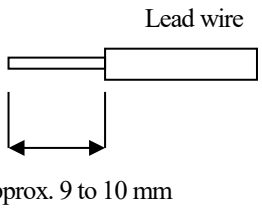


When the accessory small flat-head screwdriver is inserted correctly, it will be left inserted even if your had is released. At this time, the clamp (lead wire hole) within the red frame is open.

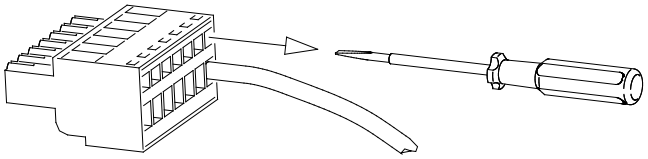


(2) With the accessory small flat-head screwdriver inserted, insert the lead wire with its coating peeled off approx. 10 mm all the way to its end into the lead wire hole.





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



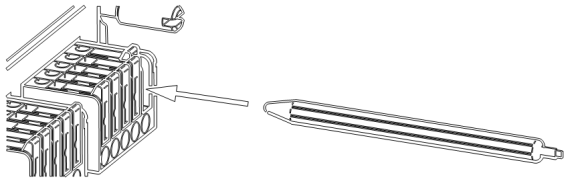
(4) Gently pull the lead wire to check if it is securely inserted.

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.

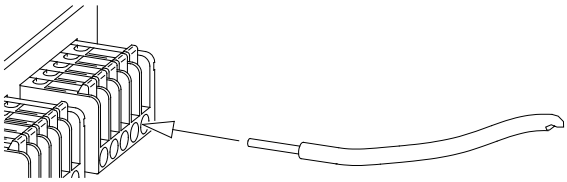
■ UI-16A

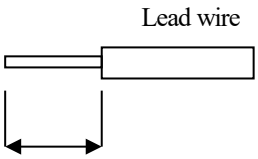
(1) Press the lock button until it is locked with the accessory small flat-head screwdriver.



Press the lock button correctly to lock the button.

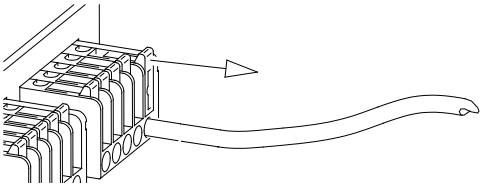
(2) Insert the lead wire with its coating peeled off approx. 10 mm all the way to its end into the hole.





Approx. 9 to 10 mm

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



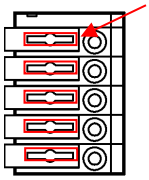
(4) Gently pull the lead wire to check if it is securely inserted.

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 cause troubles such as unable to be locked or unable to be released. Be sure to press the position within the red frame with the 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 be 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 φ0.4 to 1.2 mm (UL AWG16 to 26)

Stranded wire 0.2 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.

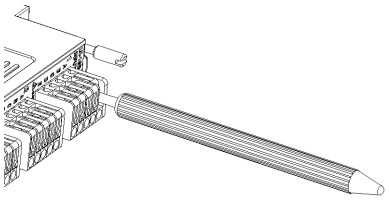
➢ Gently set back the lock buttons to the original position with your fingers.

● The one-touch lock type terminal block is made of plastic.

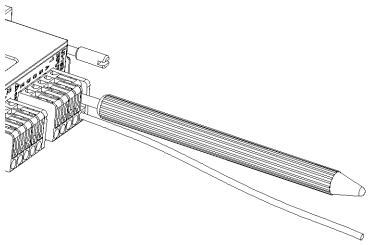
Through repeated connections/disconnections, the lock function will gradually wear out and may give a poor connection (unable to be locked or unable to be released). The one-touch lock type terminal block is considered to be a consumable item. It is not covered under the terms of the warranty. The replacement frequency is about 2 years, assuming twice a day (insertion and removal) of use, 20 days a month.

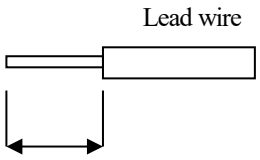
■ UI-16B

(1) Press the button with the accessory small flat-head screwdriver.



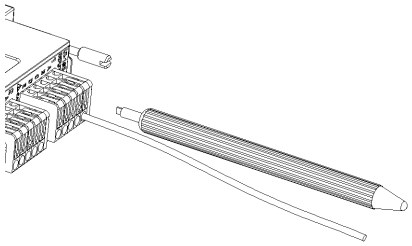
(2) With the button pushed in, insert the lead wire with its coating peeled off approx. 10 mm all the way to its end into the hole.





Approx. 9 to 10 mm

(3) Release the screwdriver from the button.



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

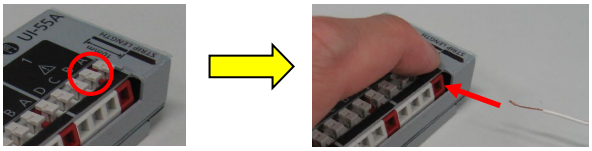
NOTE

- For connection, always use the accessory small flat-head screwdriver or equivalent.
- Insert the lead wire with its coating peeled off about 10 mm all the way to its end into the lead wire hole.
- 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.
- The available wires are as follows.
  Solid wire φ0.4 to 1.2 mm (UL AWG16 to 26)
  Stranded wire 0.2 to 0.75 mm^2 (UL AWG20 to 24)

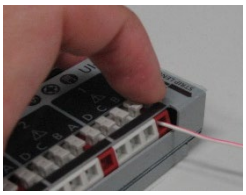
  Be sure to use the above lead wires. Or, a breaking or connection error will happen.

■ UI-55A

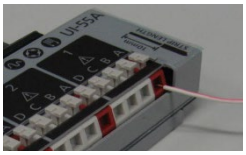
(1) By pressing a button on the terminal block, insert a lead wire for connection.



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



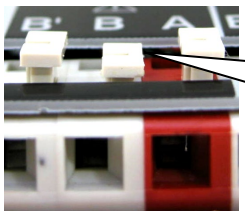
(3) While holding the lead wire, let go of the button.

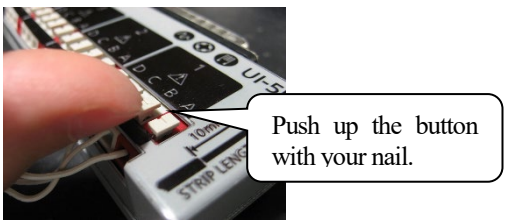


(4) Gently pull the lead wire to check if it is securely inserted.

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-400B/430B 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 φ0.3 to 1.6 mm (UL AWG28 to 14)
  Stranded wire 0.2 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.





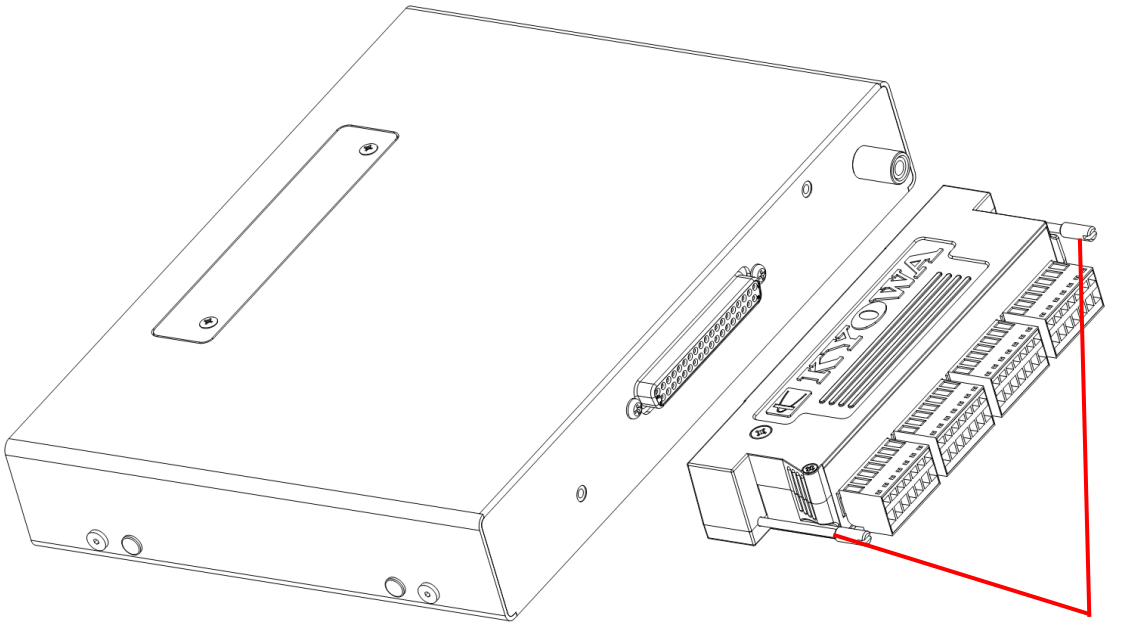
- The one-touch type terminal block is made of plastic. Through repeated connections/disconnections, the button will gradually wear out and may give a poor connection unless you push up the button. The one-touch type terminal block is considered to be a consumable item. It is not covered under the terms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

3-4 MOUNT/DEMOUNT THE INPUT ADAPTER

To demount the input adapter UI-10A, etc., remove the jackscrews.

To mount the input adapter, joint the connector and input adapter connector correctly and fasten the jackscrews.

Tightly fasten the jackscrews with a flat-head screwdriver.

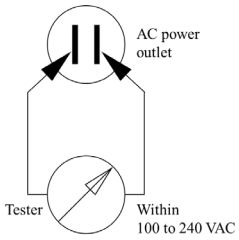


3-5 CONNECT THE POWER SUPPLY

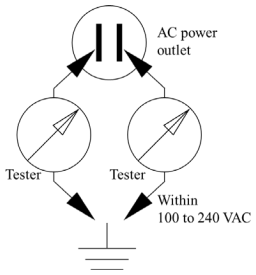
3-5-1 Connect the AC adapter

Supply power by connecting the optional AC adapter (UNI360-1540-AC) to the "DC IN" 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.

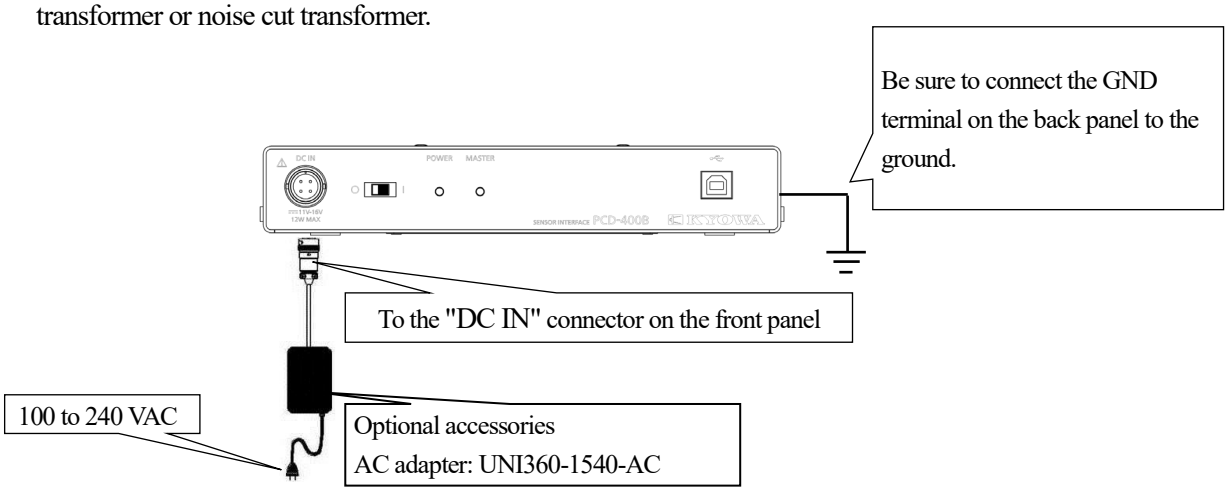
(1) Use the tester to measure the voltage between the AC power outlet terminals and ensure that the voltage is within the range of 100 to 240 VAC.



(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 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.

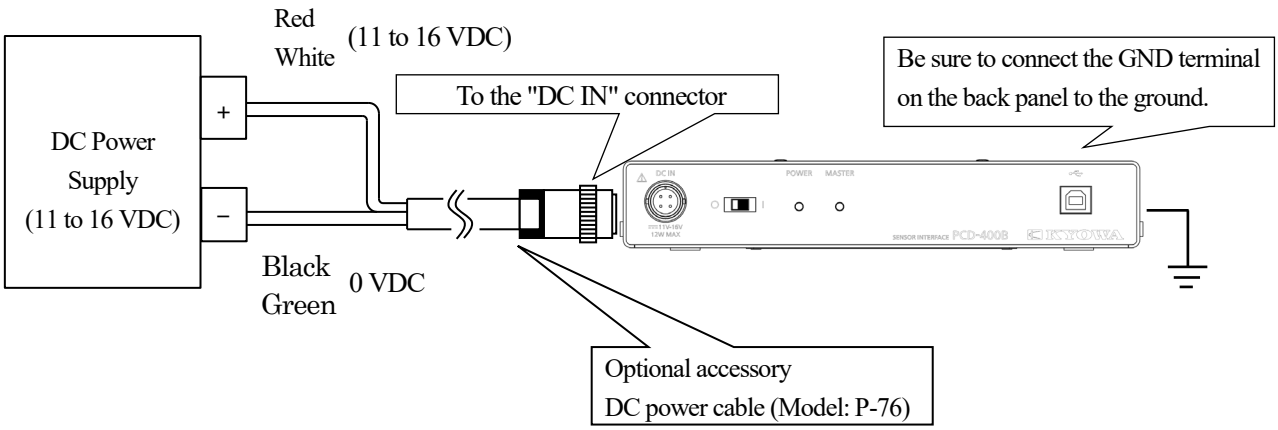
3-5-2 Connect the DC power

Before connecting the DC power, check the power voltage.
The power supply voltage range of the PCD-400B/430B 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-400B/430B 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-400B/430B.
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-400B/430B via the USB interface, it is necessary to setup the USB device driver for the PCD-400B/430B in the PC.

NOTE

- When setting up the USB device driver, log in to the Administrator account (e.g. Administrator).
- Before connecting the PCD-400B/430B and PC via the USB cable, be sure to setup the USB device driver.

■ For using the dynamic data acquisition software DCS-100A

(1) When setting up the DCS-100A, be sure to setup the USB device driver for the PCD-400B/430B at the same time. For details, see the DCS-100A INSTRUCTION MANUAL for Set-up.

(2) After turning ON the PCD-400B/430B, connect the PCD-400B/430B 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-400B/430B, connect the PCD-400B/430B and PC via the USB cable.

MEMO

- After setting up the USB device driver, connect the PCD-400B/430B and PC via an USB cable for installing the USB device driver automatically. You will be able to use the PCD-400B/430B. Depending on the OS (operating system), the "Wizard" window may appear to help your setup the USB device driver. For details, see the DCS-100A INSTRUCTION MANUAL for USB driver set-up.

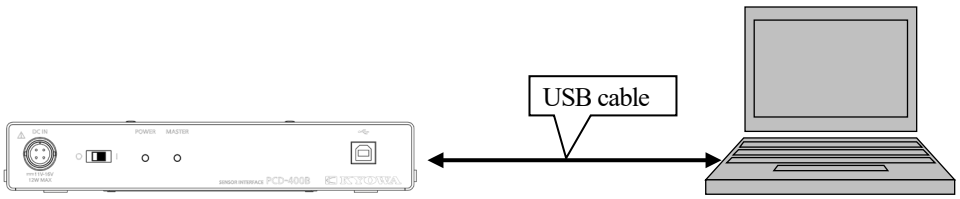
3-7 CONNECT THE USB INTERFACE

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-400B/430B units, connect the USB cable to the master unit only.

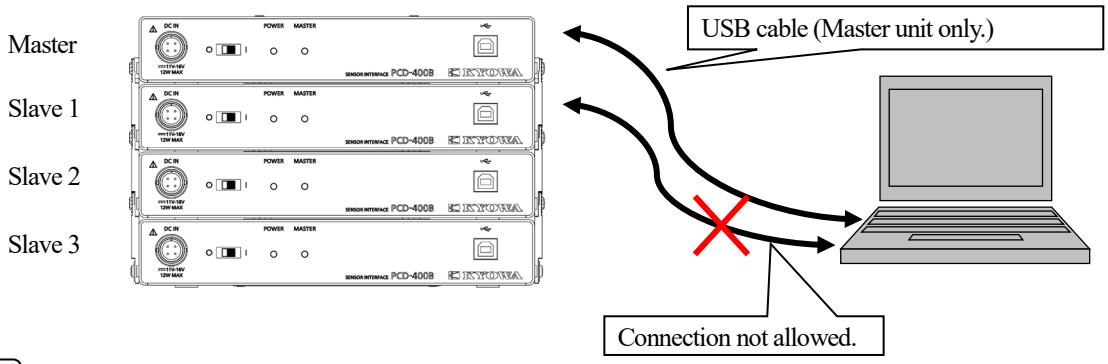
3-7-1 USB interface and connection diagram

(1) When connecting the PC and PCD-400B/430B directly

■ For single unit



■ For stacking multiple units (2 to 4)

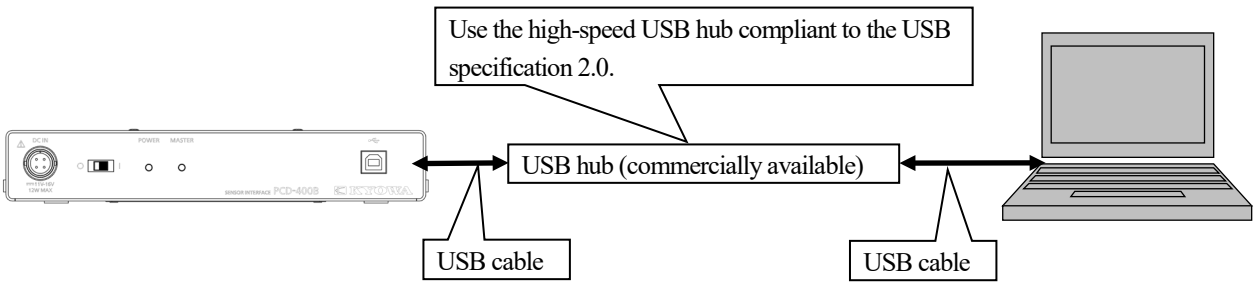


NOTE

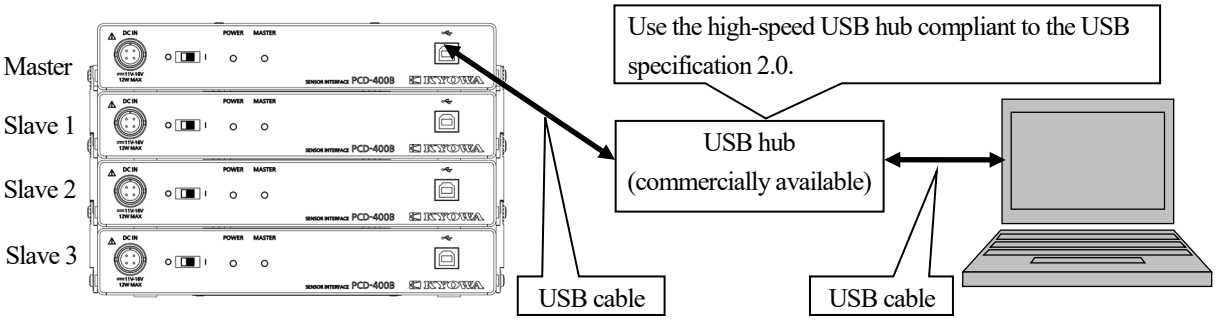
- The number of USB cables is 1
- When stacking multiple units, connect the USB cable to the master unit only.
  When connecting the USB cable to a slave unit, the "MASTER" LED lights up in orange. The PC does not communicate with the PCD-400B/430B units.

(2) When connecting the PC and PCD-400B/430B via USB hub

■ For single unit

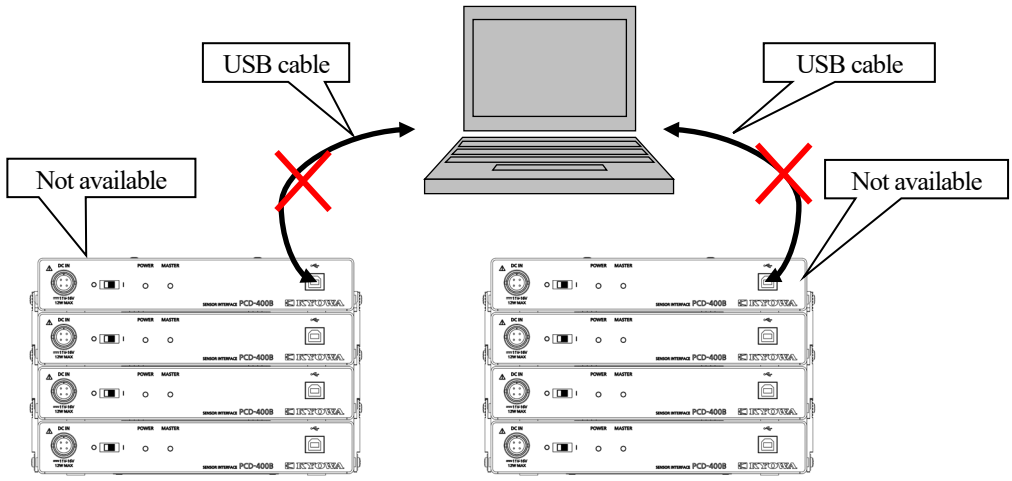


■ For stacking multiple units (2 to 4)



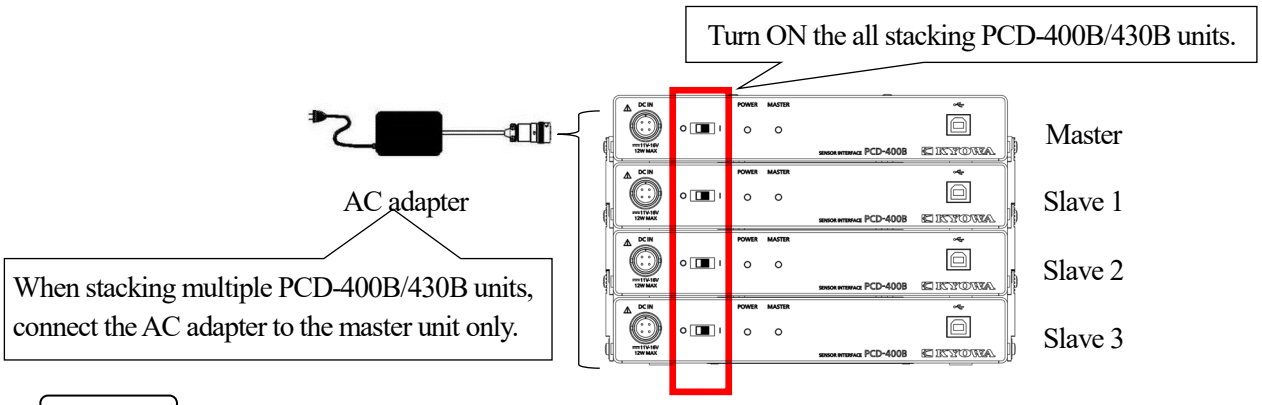
NOTE

- The number of USB cables is 1.
- When stacking multiple PCD-400B/430B 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-400B/430B units.
- Do not connect multiple sets of stacking PCD-400B/430B units into one PC.



3-8 POWER ON/OFF

Press the POWER switch on the PCD-400B/430B front panel to the '|' side to turn ON and, to the '○' side to turn OFF the PCD-400B/430B.
The "POWER" LED on the front panel lights up green while the PCD-400B/430B is ON and the PCD-400B/430B is working successfully.



NOTE

- Be sure to use the optional AC adapter AC adapter UNI360-1540-AC.
- When stacking multiple PCD-400B/430B units, be sure to turn ON the slave units first and turn ON the master unit.
- 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-400B/430B 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-400B/430B units, be sure to turn ON the all stacking PCD-400B/430B units. It will not work properly if the machine with power off is connected in stack.

MEMO

- After turning ON the power, the LEDs on the front panel light up as follows.
  - "POWER" LED Lights up green while the PCD-400B/430B 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 units

Table 3-1 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-400B/430B 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-400B/430B is failure. (NOTE 2)		The PCD-400B/430B is failure. (NOTE 2)	
Light out		Power OFF		Power OFF	

NOTE 1: You can stack up to 4 PCD-400B/430B units. Do not stack 5 or more PCD-400B/430B units.
NOTE 2: Contact KYOWA or our representative.
NOTE 3: When stacking multiple PCD-400B/430B units, be sure to turn ON the all stacking PCD-400B/430B units. Or, the PCD-400B/430B 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-400B/430B
Mount the PCD-400B/430B by referring "
3. CONNECTION AND DEFAULT SETTING."

(3) Turn ON the PC.
Turn ON the PC to start up Windows.
Connect the PC and PCD-400B/430B by referring "3-7 CONNECT THE USB INTERFACE."

(4) Turn ON the PCD-400B/430B
Turn ON the PCD-400B/430B 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-400 Series Operation.

NOTE

- To connect devices on the control software DCS-100A, click the icon labeled PCD-400 Series.
- The model displayed in CH condition setting is the model of PCD-400A and PCD-400B is displayed as PCD-400.The model of PCD-430A and PCD-430B is displayed as PCD-430.

(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-400B/430B
Turn OFF the PCD-400B/430B 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. ● Make sure the input/output of the AC adapter are securely connected. ● Make sure the "POWER" switch turned ON. ⇒For details, see " 3-5 CONNECT THE POWER SUPPLY."
The "POWER" LED blinks in red	● The PCD-400B/430B is failure. Stop using the PCD-400B/430B. ⇒ Contact KYOWA or our representative.
The "POWER" LED lights up orange	● Make sure 5 or more PCD-400B/430B units are not stacked. ⇒ You can stack up to 4 PCD-400B/430B 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-400B/430B units are all ON. ⇒ When stacking multiple PCD-400B/430B units, be sure to turn ON the all stacking PCD-400B/430B 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. ● Is connection method for inputting voltage correctly set? ⇒ Correctly set the connection method. ● Are measuring mode of channels correctly set? ⇒ Correctly set the strain or voltage measuring modes of CHs to the input voltage.

Trouble	Checked items and countermeasures
The balance is incorrect	● Make sure the balance item checked in the CH conditions on the dynamic data acquisition software DCS-100A. ● Make sure the wiring and strain mode settings of the dynamic data acquisition software DCS-100A are correct. ● Make sure the input value does not exceed ±10000×10^{-6} strain. ⇒the balance adjustment range is within ±10000×10^{-6} strain. ● If there is a lot of noise in the input, try the next item " 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 30 Hz. 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 is 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 cab tire cable, 0.5 mm^2, 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.)

Table 7-1 Calibration coefficient

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

8. SPECIFICATIONS

8-1 PCD-400B

(1)	Name	Sensor Interface
(2)	Model	PCD-400B
(3)	Measuring Target	Strain gage and strain-gage transducers
(4)	Number of Channel	4
(5)	Input Form	Balanced differential input
(6)	Synchronous Measurement	Up to 4 units by 16 channels
(7)	Compatible Gage Resistance	Quarter bridge system 2-wire, 3-wire:120 Ω Half bridge system, full bridge system:120 to 1000 Ω
(8)	Input Connector	D-sub 37-pin connector
(9)	Bridge Excitation	AC2 Vrms
(10)	Gage Factor	2.00 fixed
(11)	Balance Adjustment	Resistance: Within ±2 % (±10 k × 10^{-6} strain) Capacitance: Within 5000 pF
(12)	Balance Adjustment Method	Resistance: Auto balance Capacity: CST method (capacitance self-tracking)
(13)	Nonlinearity	Within ±0.1 %FS
(14)	Range	200, 500, 1 k, 2 k, 5 k, 10 k, and 20 k×10^{-6} strain -7 steps Accuracy: Within ±0.5% FS
(15)	Frequency Response	DC to 200 Hz Deviation: Within ±10 %
(16)	Sampling Frequencies	Max. 10 kHz (Synchronous 4-unit sampling for 16 channels at 10 kHz)
(17)	LPF	Transfer characteristic:2nd order Butterworth Cutoff frequencies:10, 30, 100 Hz, and FLAT (4 steps) Amplitude ratio at cutoff point: -3 ±1 dB Attenuation: -12 ±1 dB/oct.
(18)	AD Converter	24 bits
(19)	Setting Value Storage	The range and balance adjustment value etc. are written to nonvolatile memory.
(20)	TEDS	Reads information from TEDS-installed sensors. (Input adapters: UI-10A and UI-11A only) Channel name writing (If the manufacturer's ID is Kyowa)
(21)	Interface	USB2.0 (Conforms to High-speed USB standards. USB3.0 supported)
(22)	Stability	Temperature Zero point: Within ±0.2 ×10^{-6} strain per ºC Sensitivity: Within ±0.05%/ºC Time Zero point: Within ±0.5 ×10^{-6} strain per 8h Sensitivity: Within ±0.15 %/8h
(23)	Withstand Voltage	250 VAC for 1 minute between input and case 250 VAC for 1 minute between input channels
(24)	Operating Temperature & Humidity Range	0 to 40°C, 20 to 85% (Noncondensing)
(25)	Vibration Resistance	±29.42 m/s^2 (3 G), 5 to 200 Hz(12 cycles for each axis, 10 minutes/cycle) *unstacked
(26)	Power Supply	11 to 16 VDC Connector type: RM12BRD-4PH (Hirose)
(27)	Current Consumption	0.7 A or less (12 VDC) 0.6 A or less (15 VDC)
(28)	Dimensions	210 W x 35 H x 157.5 D mm (Excluding protrusions)

(29)	Weight	Approximately 650 g	
(30)	Compliance	Directive 2011/65/EU, (EU)2015/863 (10 restricted substances) (RoHS) Directive 2014/30/EU (EMC)	
(31)	Degree of protection	IP30 (JIS C 0920 / IEC 60529) *Except when the one-touch type input adapter UI-55A is connected and when the adapter is not connected.	
(32)	Standard Accessories	USB cable N-38 (1 m) Ground wire P-72 (5 m) Dynamic data acquisition software DCS-100A (DVD)	
(33)	Optional Accessories	AC adapter	UNI360-1540-AC
		USB cable	N-39 (2 m)
		DC power cable	P-76 (2 m)
		Connection cable	N-97 (10 cm)
		Stacking kit	ST-1B
		Input adapter for strain gage transducer	UI-10A (TEDS compatible)
		Input adapter for strain gage	UI-11A (TEDS compatible)
		Input adapter for strain gage with operating lever	UI-15A
		One-touch type input adapter for strain gage	UI-16B
		One-touch type input adapter	UI-55A
		Data analysis software	DAS-200A

* The specifications apply to the state in which the temperature has stabilized after a preheating time of 1 hour.

8-2 PCD-430B

(1)	Name	Sensor Interface	
(2)	Model	PCD-430B	
(3)	Measuring Mode	Strain measurement mode	Voltage measurement mode
(4)	Measuring Target	Strain gage and strain-gage transducers	Voltage
(5)	Number of Channel	4	
(6)	Input Form	Balanced differential input	Unbalanced
(7)	Synchronous Measurement	Up to 4 units by 16 channels	
(8)	Compatible Gage Resistance	Quarter bridge system 2-wire, 3-wire: 120 Ω Half bridge system, full bridge system: 120 to 1000 Ω	
(9)	Input Connector	D-sub 37-pin connector	
(10)	Bridge Excitation	AC2 Vrms	
(11)	Gage Factor	2.00 fixed	
(12)	Balance Adjustment	Resistance: Within ±2 % (±10 k × 10^{-6} strain) Capacitance: Within 5000 pF	
(13)	Balance Adjustment Method	Resistance: Auto balance Capacitance: CST method (capacitance self-tracking)	
(14)	Nonlinearity	Within ±0/1 %FS	
(15)	Range	200, 500, 1 k, 2 k, 5 k, 10 k, and 20 k ×10^{-6} strain -7 steps Accuracy: Within ±0.5 %FS	1, 2, 5, 10, 20, and 50 V -6 steps Accuracy: Within ±0.2 %FS
(16)	Frequency Response	DC to 200 Hz Deviation: Within ±10 %	DC to 1 kHz, Deviation: Within -3 to 1 dB
(17)	Sampling Frequencies	Max. 10 kHz (Synchronous 4-unit sampling for 16 channels at 10 kHz)	
(18)	HPF		0.2 Hz or OFF (2 steps)
(19)	LPF	Transfer characteristic: 2nd order Butterworth Cutoff frequencies: 10, 30, 100 Hz, and FLAT (4 steps) Amplitude ratio at cutoff point: -3 ±1 dB Attenuation: -12 ±1 dB/oct.	2nd order Butterworth Cutoff frequency: 10, 30, 100, 300 Hz, and FLAT (5 steps) Amplitude ratio at cutoff point: -3 ±1 dB Attenuation characteristics -12 ±1 dB/oct.

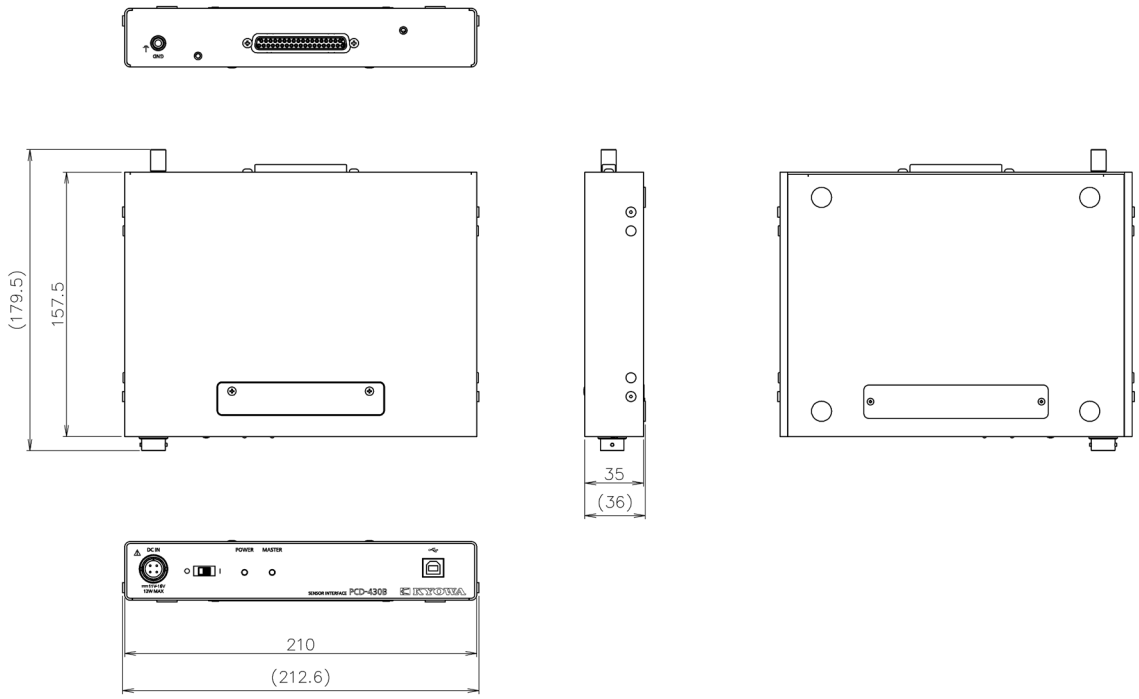
(20)	AD Converter	24 bits	
(21)	Setting Value Storage	The range and balance adjustment value etc. are written to nonvolatile memory.	
(22)	TEDS	Reads information from TEDS-installed sensors. (Input adapters: UI-10A and UI-11A only) Channel name writing (If the manufacturer's ID is Kyowa)	
(23)	Interface	USB2.0 (Conforms to High-speed USB standards. USB3.0 supported)	
(24)	Stability	Temperature Zero point: Within ±0.2 ×10^{-6} strain per ºC Sensitivity: Within ±0.05%/ºC Time Zero point: Within ±0.5 ×10^{-6} strain per 8h Sensitivity: Within ±0.15%/8h	Temperature Zero point: Within ±0.008 %FS/ºC Sensitivity: Within ±0.02 %/ºC Time Zero point: Within ±0.03 %FS/8h Sensitivity: Within ±0.1 %/8h
(25)	Withstand Voltage	250 VAC for 1 minute between input and case 250 VAC for 1 minute between input channels	None
(26)	Operating Temperature & Humidity Range	0 to 40 ºC, 20 to 85 % (Noncondensing)	
(27)	Vibration Resistance	±29.42 m/s^2 (3 G), 5 to 200 Hz(12 cycles for each axis, 10 minutes/cycle) *unstacked	
(28)	Power Supply	11 to 16 VDC Connector type: RM12BRD-4PH (Hirose)	
(29)	Current Consumption	0.9 A or less (12 VDC) 0.7 A or less (15 VDC)	
(30)	Dimensions	210 W x 35 H x 157.5 D mm (Excluding protrusions)	
(31)	Weight	Approximately 670 g	
(32)	Compliance	Directive 2011/65/EU, (EU)2015/863 (10 restricted substances) (RoHS) Directive 2014/30/EU (EMC)	
(33)	Degree of protection	IP30 (JIS C 0920 / IEC 60529) *Except when the one-touch type input adapter UI-55A is connected and when the adapter is not connected.	
(34)	Standard Accessories	USB cable N-38 (1 m) Ground wire P-72 (5 m) Dynamic data acquisition software DCS-100A (DVD)	
(35)	Optional Accessories	AC adapter: UNI360-1540-AC USB cable: N-39(2 m) DC power cable: P-76(2 m) Connection cable: N-97(10 cm) Stacking kit: ST-1B NDIS-BNC Conversion adapter: FV-1A Input adapter for strain gage transducer: UI-10A(TEDS compatible) Input adapter for strain gage: UI-11A(TEDS compatible) Input adapter for strain gage with operating lever: UI-15A One-touch type input adapter for strain gage: UI-16B One-touch type input adapter: UI-55A Voltage input adapter: UI-30A Data analysis software: DAS-200A	

* The specifications apply to the state in which the temperature has stabilized after a preheating time of 1 hour.

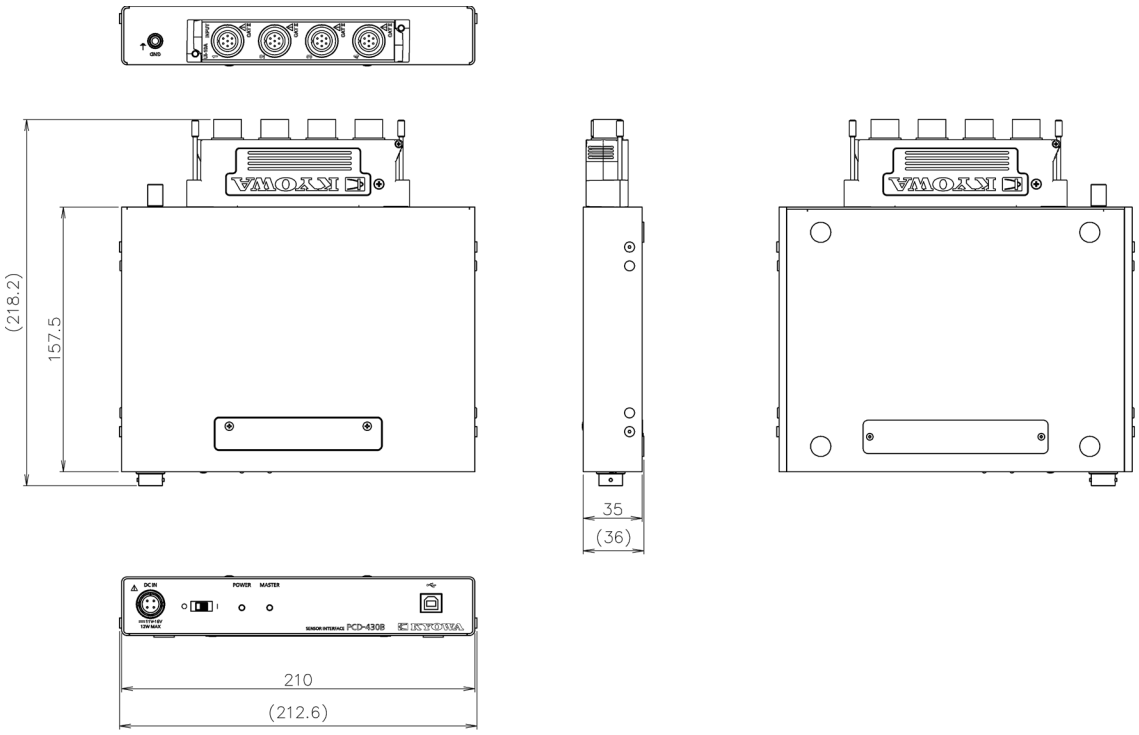
9. OUTSIDE DRAWING

The appearance of PCD-400B/430B differs only in the type part of the front silk. Below are various external views of the PCD-430B.

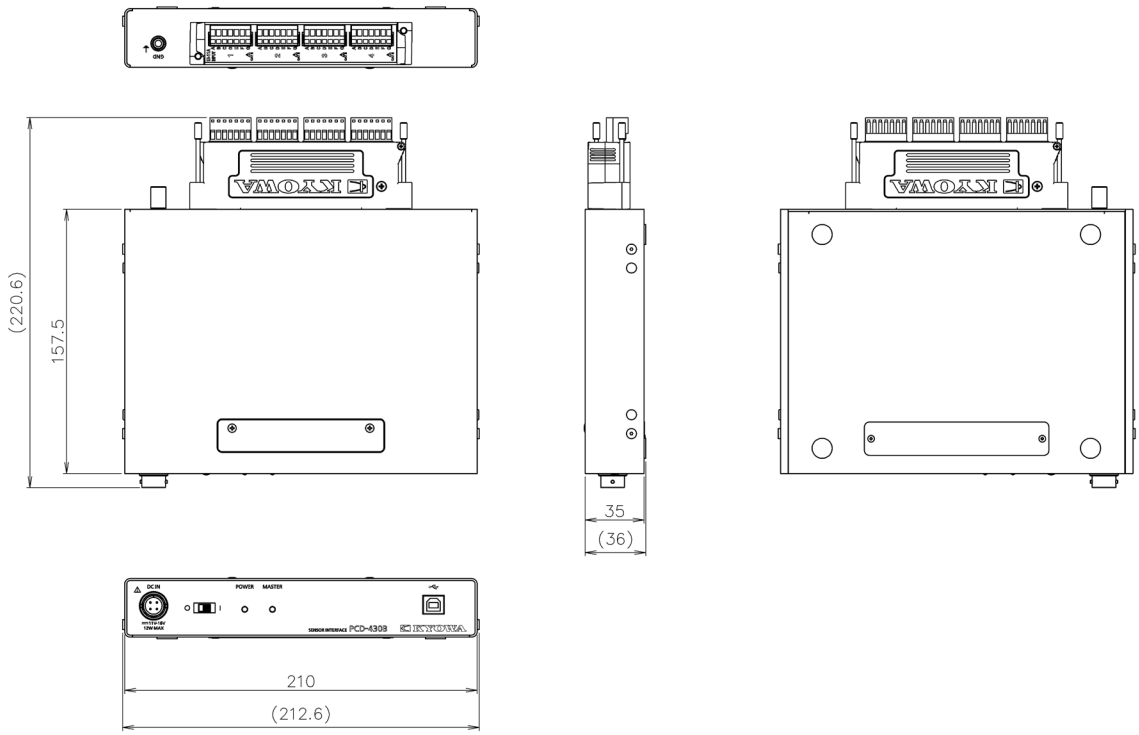
9-1 PCD-430B



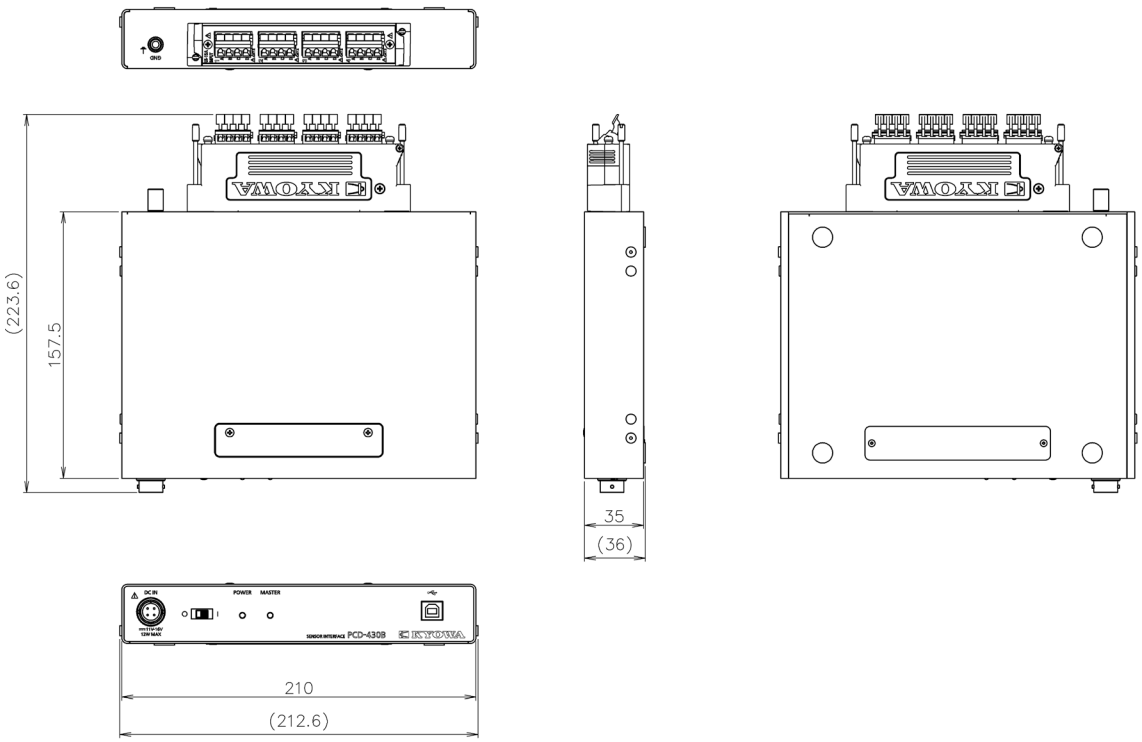
9-2 WITH INPUT ADAPTER UI-10A



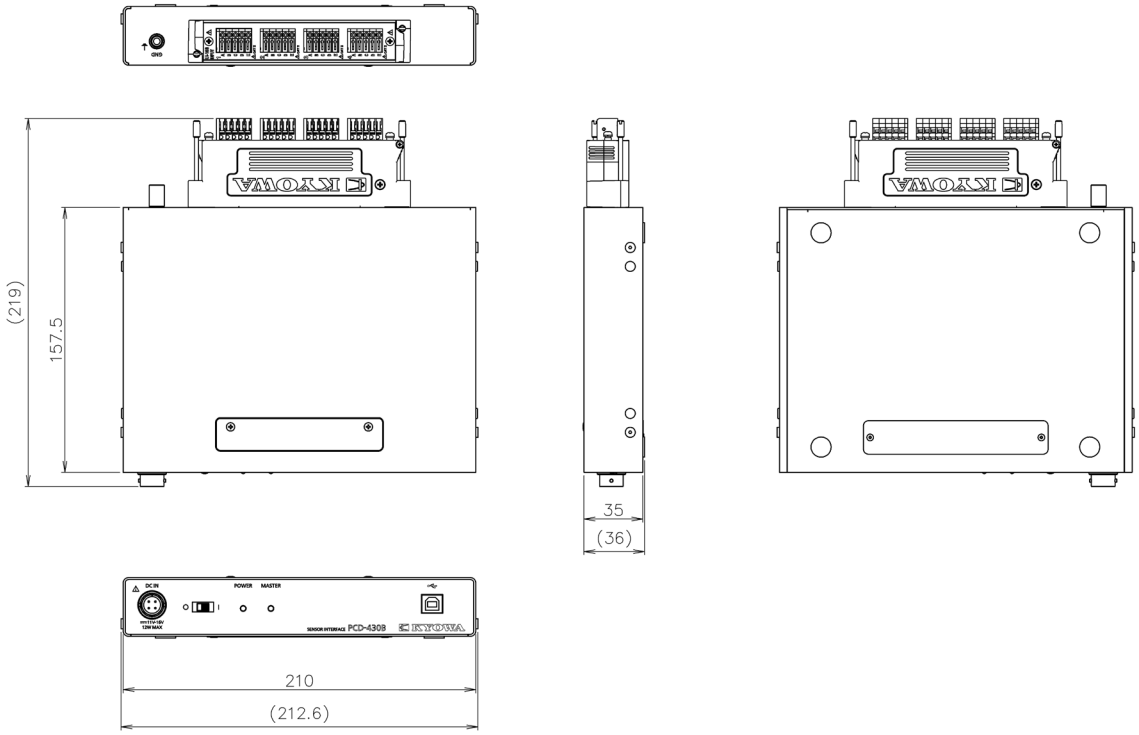
9-3 WITH INPUT ADAPTER UI-11A



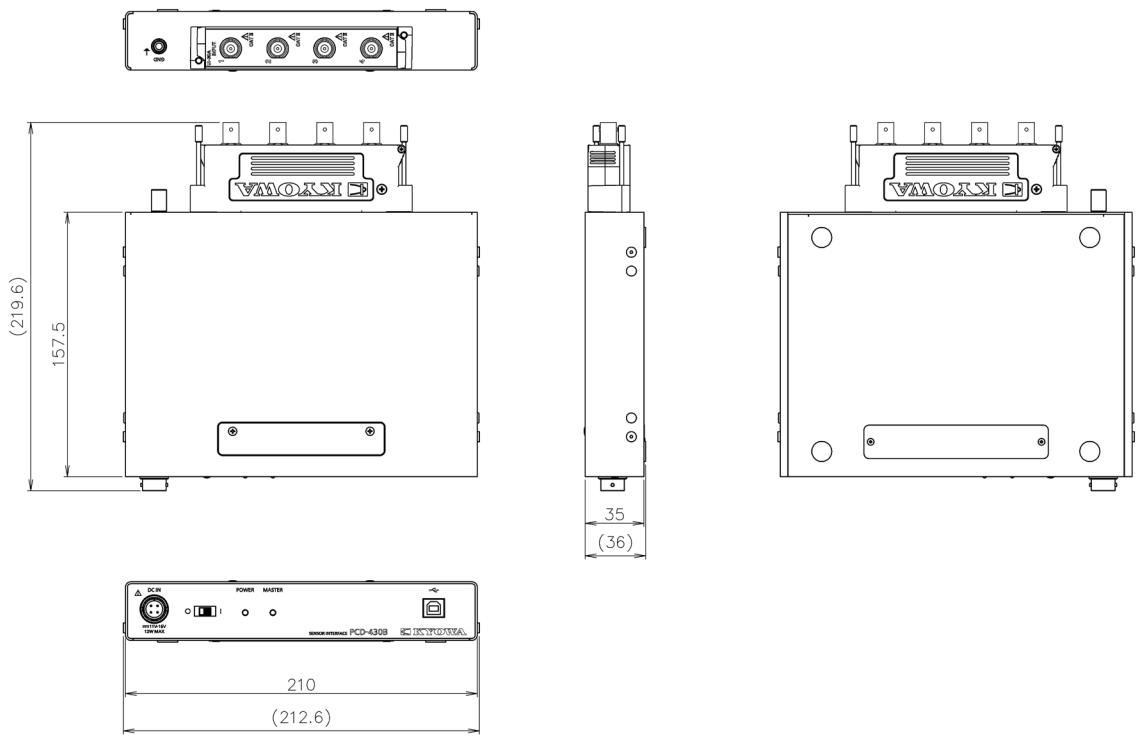
9-4 WITH INPUT ADAPTER UI-15A



9-5 WITH INPUT ADAPTER UI-16B



9-6 WITH INPUT ADAPTER UI-30A



9-7 WITH INPUT ADAPTER UI-55A