

PCD-400A/430A

Sensor Interface



Carrier wave type Compact and moderate prices

- Easy sensor connection using various types of input adapters
- Connects to PC using USB interface
- Measurement using 1 unit with 4 channels, up to 4 units with 16 channels possible
- 4 unit synchronous sampling using the connection connector set ST-1A (Optional accessory)
- Dynamic Data Acquisition Software DCS-100A (Standard accessory)
- Input adapters
 - Input adapter for strain-gage transducers UI-10A (TEDS compatible)
 - Input adapter for strain gages UI-11A (TEDS compatible)
 - Input adapter for strain gage with operating lever UI-15A
 - One-touch type input adapter for strain gages UI-16B
 - One-touch type input adapter UI-55A
 - Voltage input adapter UI-30A (For PCD-430A)
- Compact, lightweight
- Analysis of data using the Data Analysis Software DAS-200A (Optional accessory)

*For details of the input adapters, see page 3-113.

*For details of the Data Analysis Software DAS-200A, see page 4-7.

*For details of the TEDS, see page 9-17.

Connect the sensor interface to a PC via USB port. The PC will become a measuring instrument. Up to 4 units are stacked for measurement in 16 channels.

PCD-400A, PCD-430A common specifications

Measuring Targets	Strain gages and strain-gage transducers
Channels	4
Input Format	Balanced differential input
Synchronous Operation	A maximum of 4 units for 16 channels
Applicable Gage Resistance	Quarter bridge 2-wire system, 3-wire system: 120 Ω Half bridge system, full bridge system: 120 to 1000 Ω
Input Connector	D-sub 37-pin connector
Bridge Excitation	2 V _{rms}
Gage Factor	2.00 fixed
Balance Adjustment	Resistance: Within ±2% (±10 k × 10 ⁻⁶ strain) Capacitance: Within 5000 pF
Balance Adjustment Methods	Resistance: Auto balance Capacitance: CST method (Capacitance self-tracking)
Nonlinearity	Within ±0.1% FS
Range	200, 500, 1 k, 2 k, 5 k, 10 k, and 20 k × 10 ⁻⁶ strain – 7 steps Accuracy: Within ±0.5% FS
Frequency Response	DC to 200 Hz, deviation: Within ±10%
Sampling Frequencies	Max. 10 kHz (Synchronous 4-unit sampling for 16 channels at 10 kHz)
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.
A/D Converter	24 bits
Setting Value Storage	The range and balance adjustment value etc. are written to nonvolatile memory.
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)
Interfaces	USB2.0 (Conforms to High-speed USB standards. USB3.0 supported)
Stability	Temperature Zero point: Within ±0.2 × 10 ⁻⁶ strain per °C Sensitivity: Within ±0.05%/°C Time Zero point: Within ±1 × 10 ⁻⁶ strain per 8h (PCD-400A) Within ±0.5 × 10 ⁻⁶ strain per 8h (PCD-430A) Sensitivity: Within ±0.3%/8h (PCD-400A) Within ±0.15%/8h (PCD-430A)
Withstand Voltage	250 VAC for 1 minute between input and case
Operating Temperature	0 to 40°C
Operating Humidity	20 to 85% (Non-condensing)
Vibration Resistance	±29.42 m/s ² (3 G) 5 to 200 Hz (12 cycles for each axis, 10 minutes/cycle)
Power Supply	11 to 16 VDC Connector type: RM12BRD-4PH (Hirose)
Current Consumption	400A: 0.7 A or less (12 VDC), 430A: 0.9 A or less (12 VDC)
Dimensions	210 W × 35 H × 157.5 D mm (Excluding protrusions)
Weight	Approx. 700 g (PCD-400A), Approx. 750 g (PCD-430A)
Compliance	Directive 2014/30/EU (EMC) Directive 2011/65/EU (RoHS)



PCD-430A about voltage measurement mode

Measuring Targets	Voltage
Input Modes	Unbalanced
Range	1, 2, 5, 10, 20, and 50 V - 6steps Accuracy: Within $\pm 0.2\%$ FS
Frequency Response	DC to 1 kHz, deviation: -3 to 1 dB
HPF	2 steps of 0.2 Hz, OFF
LPF	Transfer characteristic: 2nd order Butterworth Cutoff frequencies: 10, 30, 100, 300 Hz and FLAT (5 steps) Amplitude ratio at cutoff point: -3 ± 1 dB Attenuation: (-12 ± 1) dB/oct.
Stability	Temperature Zero point: $\pm 0.008\%$ FS/ $^{\circ}$ C Sensitivity: $\pm 0.02\%$ / $^{\circ}$ C Time Zero point: $\pm 0.03\%$ FS/8h Sensitivity: $\pm 0.1\%$ /8h

Standard Accessories

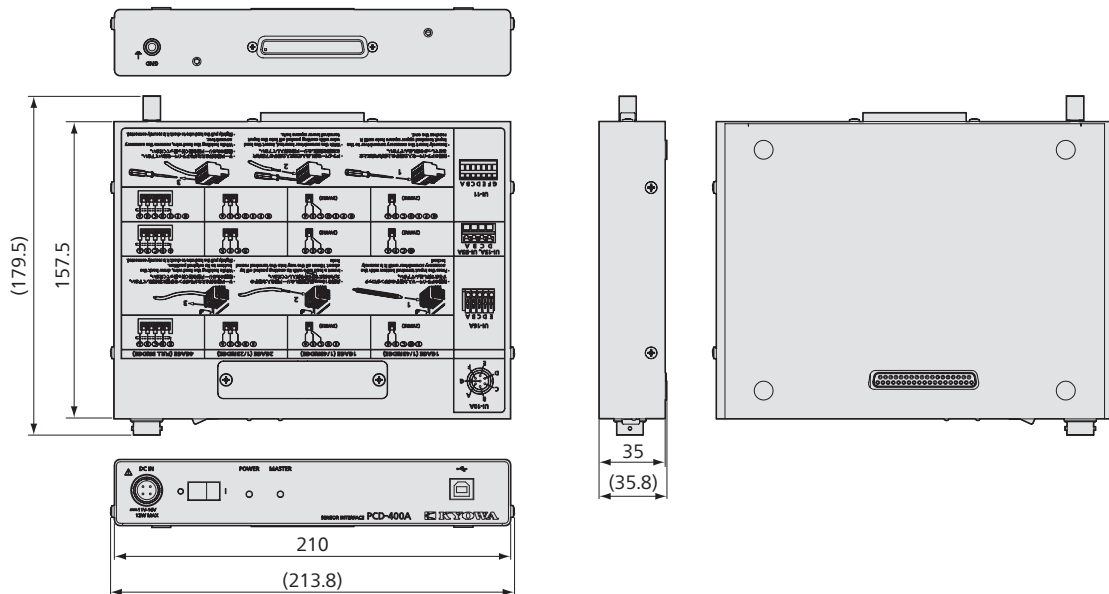
- USB cable N-38 (1 m)
- Ground wire P-72 (5 m)
- Dynamic data acquisition software DCS-100A (DVD)

Optional Accessories

- DC power cable P-76 (11 to 16 VDC, 1.8 m)
- USB cable N-39 (2 m)
- Connection cable N-97 (10 cm)
- Stacking connector set ST-1A
- Stack fixture CN-20
- AC adapter UIA345-12 (For 1 to 4 units of PCD) (For U.S.A.: UNI345-1238)
- Conversion adapter FV-1A
- Input adapter for strain-gage transducers UI-10A (TEDS compatible)
- Input adapter for strain gages UI-11A (TEDS compatible)
- Input adapter for strain gage with operating lever UI-15A
- One-touch type input adapter for strain gages UI-16B
- One-touch type input adapter UI-55A
- Voltage input adapter UI-30A
- Data analysis software DAS-200A

Dimensions

PCD-400A/430A (Figure is PCD-400A)



DCS-100A software, specification for control of PCD-400A/430A
For details of DCS-100A, see page 4-3.

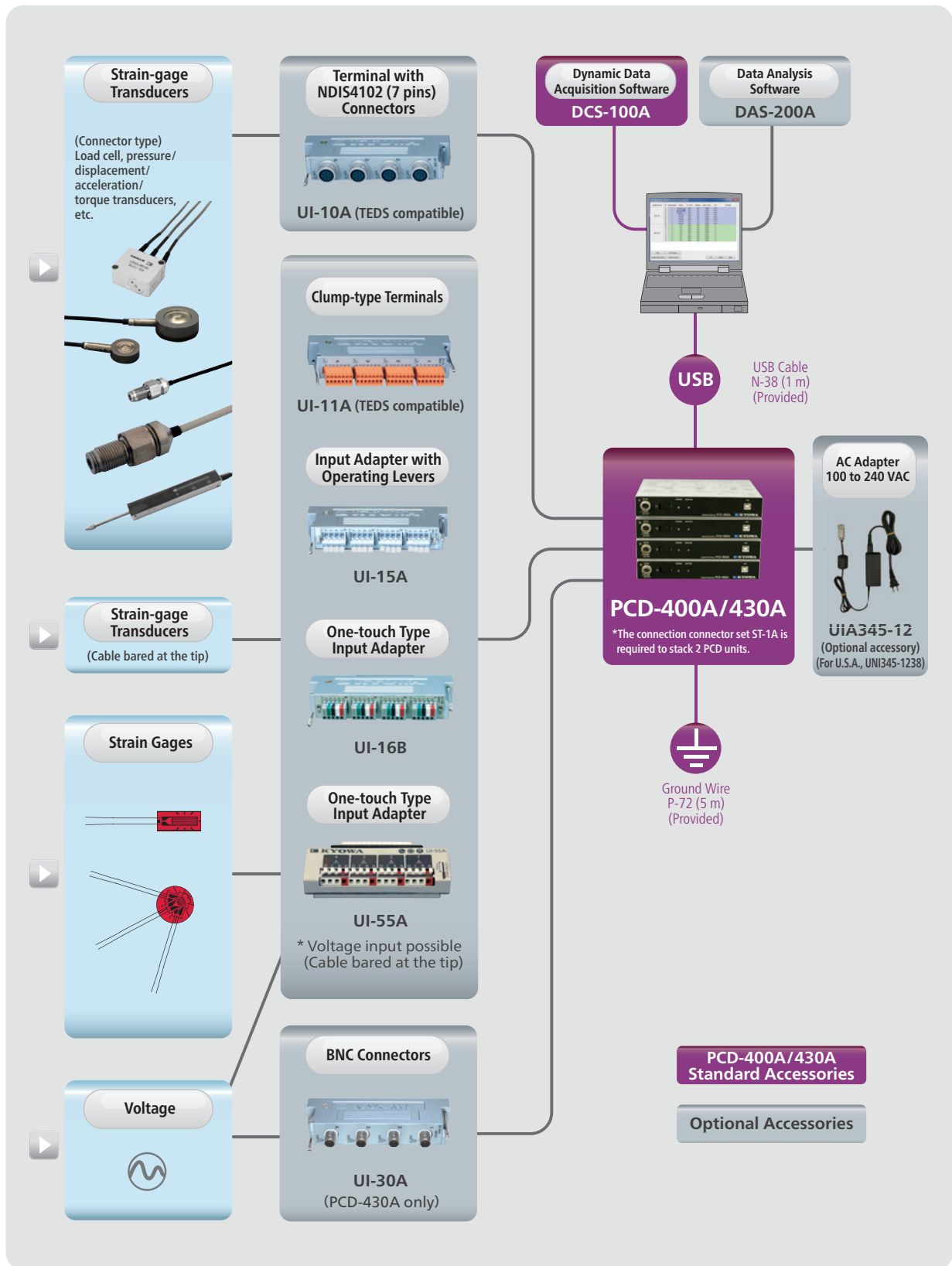
Controllable Units	Max. 4 (Max. 16 channels)
Interfaces	USB
Data Storage	Measured data is saved to data folder in the PC (in KS2 format).
Channel Conditions	Measurement ON/OFF, strain mode, range, LPF, balance ON/OFF, calibration coefficient, offset, gage factor, unit, channel name, measuring range, Deci Digits, rated capacity, rated output, upper limit check, lower limit check, offset zero ON/OFF (Any display item is selectable)
Sampling Frequencies	1 Hz to 10 kHz (1-2-5 series)
Measuring Modes	Manual, manual (Data points preset), interval, and analog trigger
Manual Measurement	Measurement is made from a press of the REC button to a press of the STOP button or by completion of recording using a preset number of measurements.
Interval Measurement	Measurement is made automatically at preset intervals from the preset starting time.
Analog Trigger Measurement	Start/stop recording based upon specified trigger conditions.
Trigger Conditions	
End Trigger	Settable
Delay	For both start and end, max. 640000 data / channel.
Trigger Channels	Any 1 channel
Trigger Level	Sets in physical quantity.
Trigger Slope	Up, down
Static Measurement	Every time the DCS-100A starts recording data, the DCS-100A additionally saves the moving-averaged measured data in a single CSV format file in manual and interval modes.
Repetition Acquisition	In long-term data acquisition, a specified amount of data is saved in KS2 file at specified intervals. *Workable in manual mode (Data points preset).
Hardware Configuration	Unit name settings possible on the PCD-400A/430A Number of connected units readable from the PCD-400A/430A
Automatic Data File Conversion	Automatic file conversion upon the termination of measurement (CSV, XLS, XLSX, and RPC III formats)
Arbitrary Unit Settings	Up to 3 user's unit's of measurement are settable

PCD-400A/430A Recommended products for combination

Data Analysis Software DAS-200A

→ 4-7

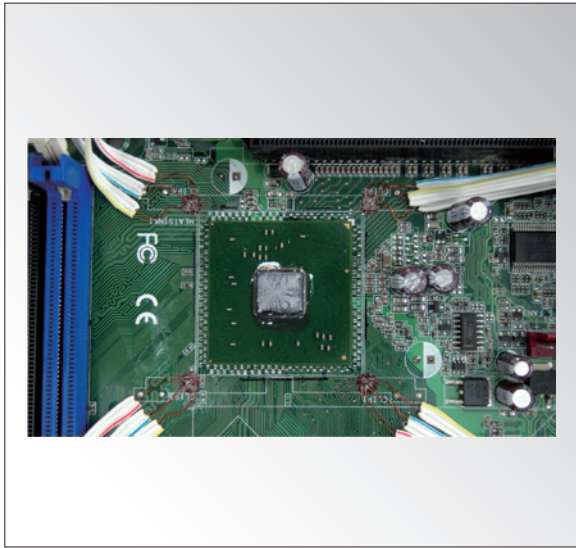
Simplified Configuration of the PCD-400A and PCD-430A



Data Recorders/
Analyzers

PCAS-1000A

Printed Circuit Assembly Stress Measurement Set



Enables everyone to easily evaluate reliability of PCA*

The printed circuit assembly stress measurement set PCAS-1000A is suitable for efficient quality control or quality assurance for PCA.

The PCAS-1000A includes software and sensor interface (data logger), specialized for stress measurements described in IPC/JEDEC-9704A**.

It will help beginners to measure PCB (Printed Circuit Board) stress easily.

* PCA: Printed Circuit Assembly

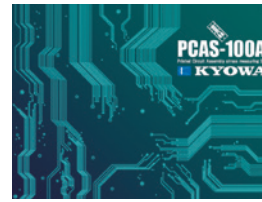
** Evaluation method for PCA using strain gauges is regulated by IPC/ JEDEC-9704A and it is valid for quality evaluation or failure analysis.

PCAS series

Models	Data Acquisition	Data Analysis	Creating Report	Available Channels	With PCD-400A	Pages
PCAS-100A	Yes	Yes	Yes	16		4-9
PCAS-200A		Yes	Yes	128		4-10
PCAS-1000A	Yes	Yes	Yes	16	Yes	3-81



Contents



Printed Circuit Assembly Stress Measuring Software PCAS-100A



Sensor Interface PCD-400A



Storage Case



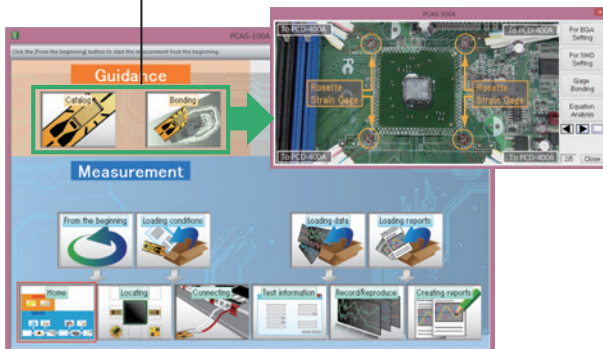
One-touch Type Input Adapter UI-55A

Note: Strain gages, adhesives and PC are not included.

Standard Accessories USB cable N-38 (1 m)
AC adapter UIA345-12 (For U.S.A.: UNI345-1238)
Printed circuit assembly stress measuring software PCAS-100A (CD-R x 1)
Dynamic data acquisition software DCS-100A

Optional Accessories DC power cable P-76 (11 to 16 VDC, 1.8 m)
USB cable N-39 (2 m)
Connection cable N-97 (10 cm)
Ground wire P-72 (5 m)

The Guidance lets you check kinds of strain gages and a bonding method.



Easy steps of measurement

Arrange mounted components and strain gages on a virtual PCB. Then the software will determine channels and instrument setting conditions.

You can input test information that will be used for a report, etc.

Press a few buttons, and the software will automatically measure the strain.

Measured data enables you to easily prepare a report. You are also able to obtain the strain rate, which is required by the standard, easily.

Printed Circuit Assembly Stress Measuring Software PCAS-100A

The PCAS-100A is the most suitable software to test printed circuit assembly variously in accordance with IPC/JEDEC-9704A.

It enables instrument setting, data acquisition and report preparation to be done in a seamless flow, therefor ensuring even a beginner of strain measurement can easily perform the task.

PCAS-100A Specifications

Use	Testing of printed circuit assemblies using strain gages Target work steps: ICT, BFT, heat sink assembly, system board integration, or system assembly
Operating Environment	
OS	Windows® Vista, 7, 8, 8.1, or 10, English/Japanese 32, 64 bits support
CPU	Intel Core i3 or advanced
Memory	If 32-bit OS, 2 GB or more If 64-bit OS, 4 GB or more
Display	1024×768 pixels or more 1280×1024 or more recommended
Measuring Conditions	
Channels	16 (e.g. Uniaxial gages ×16 or triaxial gages ×5)
Setting Conditions	Gage types (Quarter bridge of 1G2W, 1G3W, 2G2W, 2G3W, 3G2W, 3G3W, half bridge, and full bridge) Measuring range (200, 500, 1 k, 2 k, 5 k, 10 k, and 20 k ×10 ⁻⁶ strain) Gage factor
Measuring Modes	Manual, manual (Data points preset)
Sampling Frequencies	100, 200, 500, 1 k, 2 k, 5 k, and 10 k Hz
LPF	Cutoff frequencies: 10, 30, 100 Hz, and FLAT
Measuring Condition Files	Saves and loads pre-set measuring conditions.
Measuring Instruments	
Applicable Instruments	PCD-400A, PCD-430A (Max. 4 units)
Applicable Gage Types	Uniaxial, biaxial, and triaxial
Guidance	
Catalog	Searches suitable strain gages for PCA stress test.
Bonding	Describes the method of bonding strain gages on the PCB.
Monitor	
Y-time Graph	X axis is time (s). Y axis is strain (Uniaxial-gage, principal, diagonal)
Strain-rate Graphs	X axis is strain-rate, Y axis is maximum principal strain. * Strain rate is the rate of change in strain per unit time.
Y Axis Range	Auto-scale 1, 2, 5, 10, 20, 50, 100, 200, 500, 1 k, 2 k, 5 k, 10 k, and 20 k ×10 ⁻⁶ strain
Data Files	
Saving File Formats	Kyowa standard file format KS2
Report	
Report Types	Graph and table reports
Graph Reports	Y-time graphs, strain-rate graphs
Table Reports	Maximum principal strain, minimum principal strain, diagonal strain, and strain-rate
Clipboard	Copies graphs and tables. Other application software may use them.
Printing	Print out reports
Report Files	Report files (PCR format) are saved, read and edited.

Sensor Interface PCD-400A

Connect the sensor interface to a PC via USB port. The PC will become a measuring instrument. Up to 4 units are stacked for measurement in 16 channels.

PCD-400A specifications

Measuring Targets	Strain gages and strain-gage transducers
Channels	4
Input Modes	Balanced differential input
Synchronous Operation	A maximum of 4 units for 16 channels
Applicable Gage Resistance	
	Quarter bridge 2-wire system, 3-wire system: 120 Ω Half bridge system, full bridge system: 120 to 1000 Ω
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	Temperature Zero point: Within ±0.2 ×10 ⁻⁶ strain per °C Sensitivity: Within ±0.05%/°C
	Time Zero point: Within ±1 ×10 ⁻⁶ strain per 8 h Sensitivity: Within ±0.3%/8 h
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Analyzers