Data Loggers

Data loggers are designed to measure static strain, a phenomenon where the subject strain does not change at all or slowly changes. As seen in load tests of large-scale structures, static strain is often measured in several hundred channels and under dozens of load conditions.
Data loggers are available in 2 types: stand-alone and PC-controlled. Both are oriented to automatic multi-channel measurement as intelligent, expansible systems.
A data logger can stably measure microvolt signals in strain/stress measurement indoors and outdoors. Besides that advantage, some data loggers have a processing capability incorporated into the portable package.
Advancements in electronic components, progress in multimedia in information-related fields and downsizing of equipment have generated the following demands:

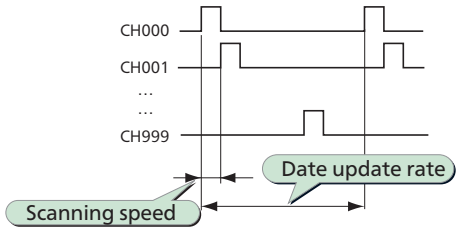
- Simultaneous measurement of various static variables including strain/stress, load, pressure, acceleration, displacement, torque, voltage and temperature
- Visual presentation of the progressive status of measurement and function that enables smooth progression of measurement while accepting the engineer's judgment.
- Unattended measurement
- More compact and lightweight design
- Capability to measure not only static phenomena but also events changing at a frequency of several Hz

To cope with these demands, Kyowa has been making every effort.

Scanning methods and synchronous sampling of all channels

Scanning methods

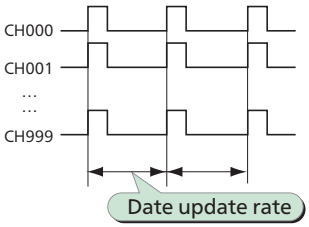
The measurement channel is switched one by one and measured.



→ There is a difference at the measurement time of each measurement channel, therefore this method is not suitable for a dynamic measurement.

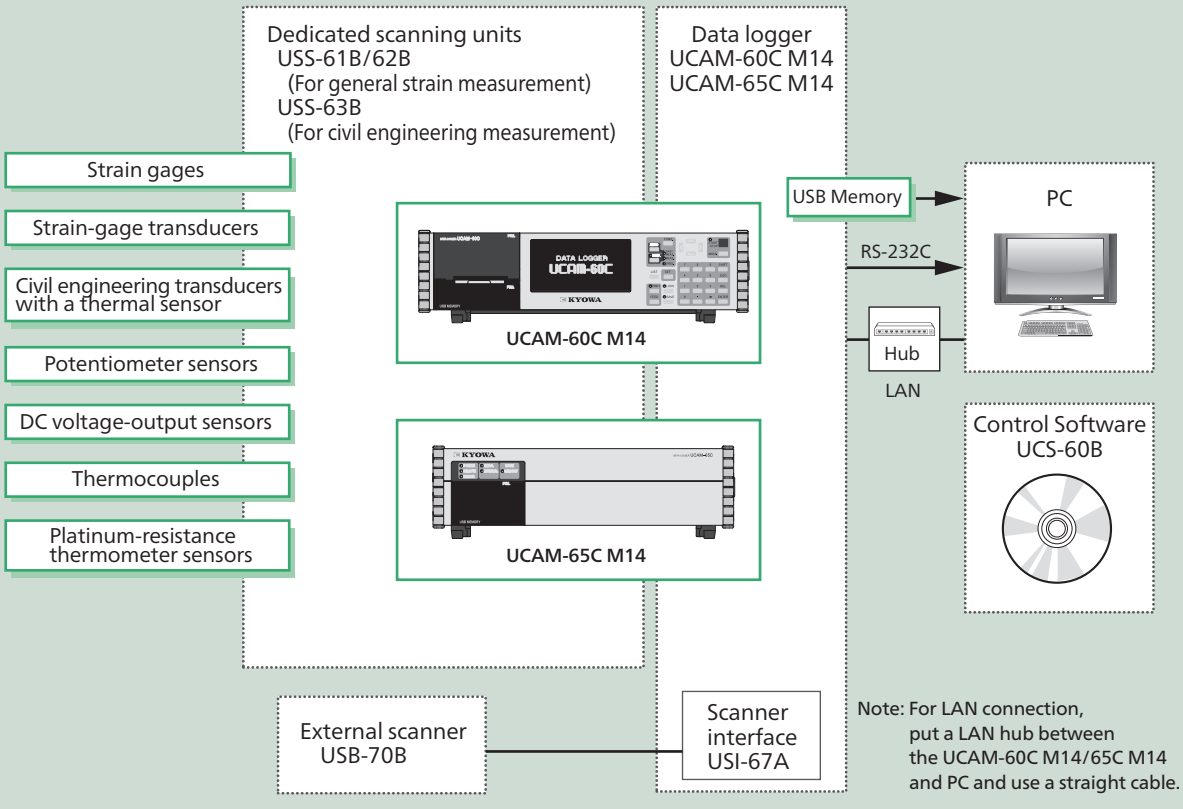
Synchronous sampling of all channels

All channels are synchronously measured (No scanning)

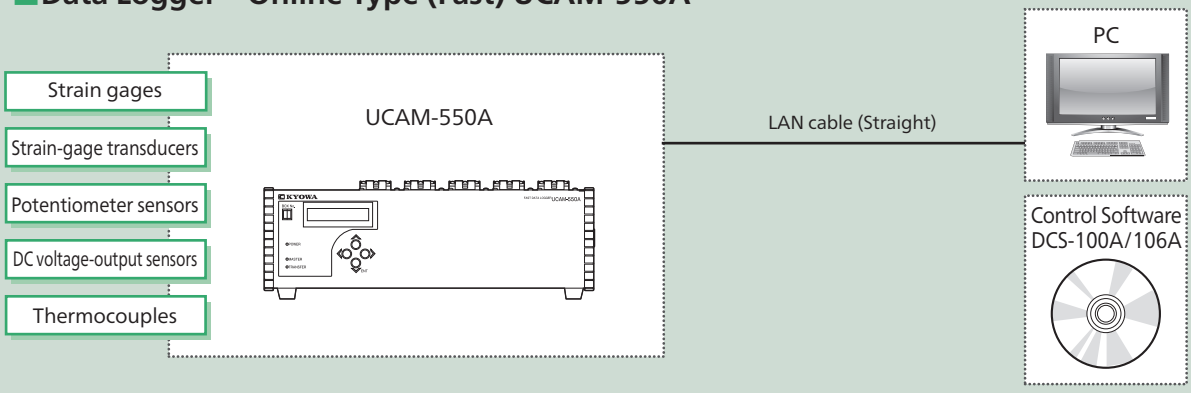


→ All channels are synchronously sampled and the data is updated every constant interval.
Therefore, a dynamic measurement is possible.

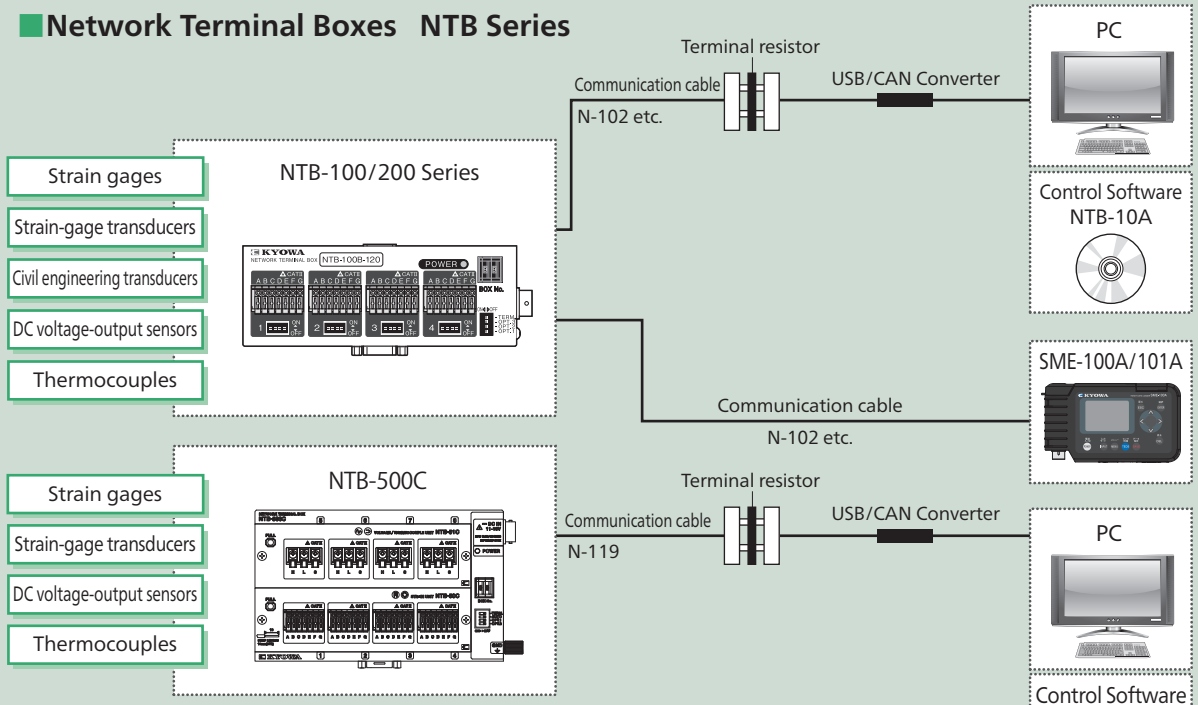
Data Loggers Universal Stand-alone Type UCAM-60C M14 Online Type UCAM-65C M14



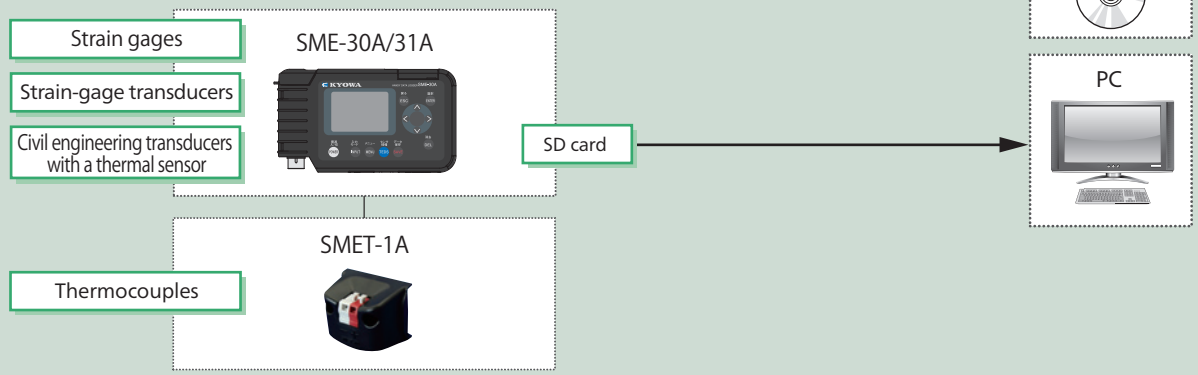
Data Logger Online Type (Fast) UCAM-550A



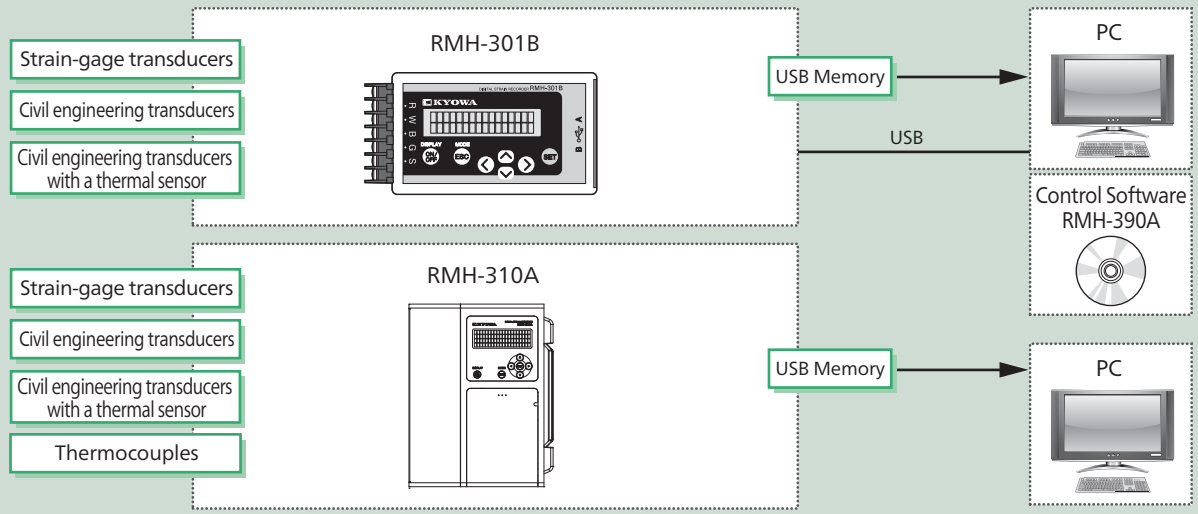
Network Terminal Boxes NTB Series



Handy Data Logger SME-30A/31A



Digital Strain Recorder RMH-301B/310A



Data Loggers

Data Logger Selection Chart

Scanning methods

Models	Max. channels	Scanning Speed	Measuring Interval	Measuring Targets	Interfaces	Power Supply	Pages
All-in-one Data Logger **UCAM-60C M14** PC-controlled Data Logger **UCAM-65C M14**  Resolution as high as 0.1 ×10⁻⁶ strain	1000	0.02 s, 0.05s, 0.28 s, 0.5 s, 1 s, 2 s, 5 s, and 10 s	1 min to 99 h 59 min in 1 min steps	Strain (Gage, transducer) Civil engineering transducers (Maybe with a thermal sensor) Potentiometer sensors Voltage Temperature (Thermocouples platinum-resistance temperature sensors)	LAN RS-232C USB memory	100 to 240 VAC or 10 to 16 VDC	**3-35**
Network Terminal Box **NTB-100/200 Series**  Field measurement is digitized.	396	0.5 s, 1 s	1 min to 99 h 59 min in 1 min steps	Strain (Gage, transducer) Civil engineering transducers (Maybe with a thermal sensor) Voltage Thermocouples	USB (USB/CAN converter)	11 to 16 VDC AC adapter (Optional accessory)	**3-45**
Handy Data Logger **SME-100A/101A**  Able to connect with the NTB-100/200 series.	33	0.5 s, 1 s	1 min to 99 h 59 min in 1 min steps	Strain (Gage, transducer) Civil engineering transducers (Maybe with a thermal sensor) Thermocouples (With thermocouple adapter SMET-1A)	SD card	AA size alkaline batteries SME-101A is compatible with AC adapter.	**3-49**
Handy Data Logger **SME-30A/31A**  Easy to operate Portable data logger	1	0.5 s, 1 s	1 min to 99 h 59 min in 1 min steps	Strain (Gage, transducer) Civil engineering transducers (Maybe with a thermal sensor) Thermocouples (With thermocouple adapter SMET-1A)	SD card	AA size alkaline batteries SME-31A is compatible with AC adapter.	**3-49**
Digital Strain Recorder **RMH-310A**  For long-term measurement in the absence of personnel	10		1 to 59 min (1 min/step) 1 to 99 hours (1 h/step)	Strain Civil engineering transducers (Maybe with a thermal sensor) Thermocouples	USB memory	Dedicated battery (Optional accessory)	**3-51**
Digital Strain Recorder **RMH-301B**  For long-term measurement in the absence of personnel	1		1 to 59 min (1 min/step) 1 to 99 hours (1 h/step)	Strain Civil engineering transducers (Maybe with a thermal sensor)	USB memory USB	Dedicated battery (Optional accessory)	**3-52**

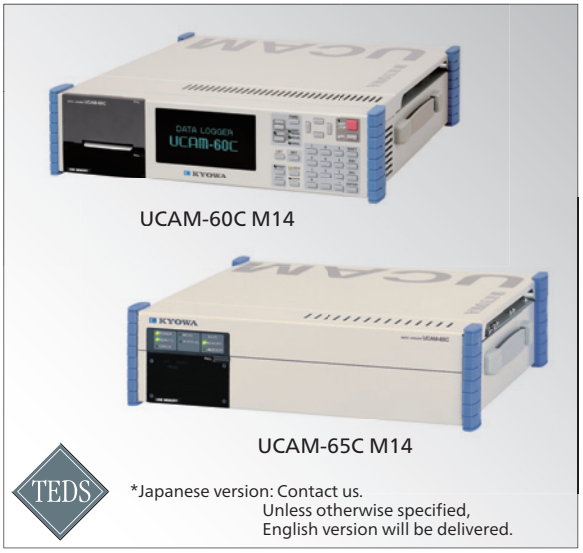
Synchronous sampling of all channels

Models	Max. channels	Sampling Speed (s)			Measuring Targets	Interfaces	Power Supply	Pages
		0.001	0.02	0.5				
Fast Data Logger **UCAM-550A**  Synchronous sampling of 1000 channel at 50 Hz*	1000		Yes		Strain (Gage, transducer) Potentiometer sensors Voltage Thermocouples	LAN	100 to 240 VAC	**3-40**
Medium Speed Network Terminal Box **NTB-500C**  Synchronous sampling and distributed deployment	64	Yes			Strain (Gage, transducer) Voltage Thermocouples	USB (USB/CAN converter)	11 to 16 VDC AC adapter (Optional accessory)	**3-43**

*Except temperature measurement using USM-51B/52B

UCAM-60C M14/65C M14

Data Logger



*Japanese version: Contact us.
Unless otherwise specified,
English version will be delivered.

Up to 20 k ×10^{-6} strain with a resolution as high as 0.1 ×10^{-6} strain measurement possible (With full bridge system)

Common to UCAM-60C M14 and UCAM-65C M14

- Saves long-term measured data in built-in memory than the conventional products. (Built-in memory: Approx. 1.8 GB)
- Measurement up to 20 k ×10^{-6} strain with a resolution of 0.1 ×10^{-6} strain (With full bridge system)
- Scanning at 50 ms/channel (With dedicated scanners)
- High-speed scanning at 20 ms/channel (With dedicated scanners)
- Up to 30 channels measurement with dedicated scanners
- Up to 1000 channels measurement with external scanners

UCAM-60C M14

- Easy to understand English presentation
- Fluorescent display tube ensuring easy viewing in the field
- Built-in thermal printer for smooth confirmation of measured results

UCAM-65C M14

- Setting measuring conditions from PC and saving measured results to PC
- Interval measurement possible with no PC connected

The UCAM-60C M14 is an all-in-one measuring instrument developed in full pursuit of easier field measurement. It has easy-to-operate keys, a bright readable display providing understandable presentation and a printer for immediate confirmation of measurement results. All these and more are incorporated in this compact unit to satisfy every need in field measurement.
The UCAM-65C M14 is a compact online data logger fully controlled from the PC.

System Content

Data Loggers

Models	Power Supply	Control Software UCS-60B	Features
UCAM-60C-AC M14	AC	Optional	Operation keys, display, printer
UCAM-60C-DC M14	DC		
UCAM-65C-AC M14	AC	Standard	Fully controlled from the PC Operation keys, display, printer none
UCAM-65C-AC-0 M14	AC	Optional	
UCAM-65C-DC M14	DC	Standard	
UCAM-65C-DC-0 M14	DC	Optional	

Dedicated Scanners (Optional)	USS-61B* (TEDS compatible)
	USS-62B* (With NDIS4102 (7 pins) connectors, TEDS compatible)(*1)
	USS-63B* (For civil engineering, with lightning arresters, TEDS compatible)
	*The dedicated scanner measures 10 channels/unit. The main unit accommodates up to 3 dedicated scanners.
External Scanners	The main unit is connected to the following scanners via the optional scanner interface. USB-70B (Via scanner interface USI-67A)
Scanner Interfaces	USI-67A for USB-70B
External I/O Unit	UIO-60A
Control Software	UCS-60B

*1 TEDS compatible function is made effective by connecting TEDS installed sensor through NDIS4102 (7 pins) connector.

Specifications

■Data Logger UCAM-60C M14/65C M14

Measuring Targets

Strain gages, strain-gage transducers, DC voltage-output or DC current-output instruments, civil engineering transducers with a thermal sensor, potentiometer sensors, thermal sensors (Thermocouples and platinum resistance thermometer bulbs)

Connectable Scanners

USS-61B, 62B, 63B (Dedicated scanners, mounted on top of the UCAM-60C M14)
The main unit is connected to the following scanners via the optional scanner interface.
USB-70B series (via USI-67A)

Measuring Targets and Connectable Scanners

Measuring Targets \ Scanners			Dedicated Scanners USS-61B USS-62B USS-63B	External Scanners: General purpose USB-70B-10/20	External Scanners: Civil engineering USB-70B-30
Strain gages and Strain-gage transducers (*3)	Quarter bridge system	120 Ω	Yes	Yes	Yes
		240 Ω	Yes	Yes	Yes
		350 Ω	Yes	Yes	Yes
	Quarter bridge (true-dummy system)	120 Ω	Yes	Yes	Yes
		350 Ω	Yes	Yes	Yes
	Half bridge 60 to 1000 Ω	Active dummy system	Yes	Yes	Yes
		Active active system	Yes	Yes	Yes
		Common dummy system		Yes	Yes
	Full bridge 60 to 1000 Ω (*2)	Opposite-leg active system	Yes	Yes	Yes
		Full bridge system	Yes	Yes	Yes
Civil engineering transducers	Full bridge 120 Ω	Constant-current excitation	Yes		
	Full bridge 350 Ω	Constant-current excitation	Yes	Yes	Yes
		Transducers with a thermal sensor	Yes		Yes
Voltage	DC voltage-output instruments		Yes	Yes	Yes
Current	DC current-output instruments		Yes	Yes	Yes
Temperature	Thermocouples	K (CA)	Yes	Yes	Yes
		T (CC)	Yes	Yes	Yes
		E (CRC)	Yes	Yes	Yes
		J (IC)	Yes	Yes	Yes
		R	Yes	Yes	Yes
	Platinum resistance thermometer bulbs	Pt100 (new JIS)	Yes		Yes
		JPt100(old JIS)	Yes		Yes
Potentiometer sensors			Yes	Yes	Yes
Built-in lighting arresters			Yes (*1)		Yes

(*1) With USS-63B mounted.
(*2) 120 to 1000 Ω in high-resolution mode.
(*3) Cannot use remote sensing sensor directly.

Channels

Max. 30 with dedicated scanners
Max. 1000 with external scanners connected
Max. 1000 with dedicated scanners and external scanners connected

Input Terminals

Can connect to lead wires through either soldering or screwing.
(screw:M3 with metal plate)
NDIS4102 (7 pins) connectors (USS-62B)

Switching Terminal Semiconductor relays

Scanning Speed

50 ms/channel (Standard mode)
0.28 s/channel (High-resolution mode)
20 ms/channel (High-speed mode)

Scanners \ Line Frequencies	50 Hz Zone	60 Hz Zone
Dedicated scanner (Standard mode)	50 ms/channel	
Dedicated scanner (High-resolution mode)	0.28 s/channel	
Dedicated scanner (High-speed mode)	20 ms/channel	
USB-70B (Standard mode only)	60 ms/channel	58.4 ms/channel

Notes: 1. Scanning speeds stated above are standard maximum speeds in respective modes. Besides these, the following speeds are set for each individual channel:0.28 s, 0.5 s, 1s, 2 s, 5 s, and 10 s.
2. High-resolution mode and high-speed mode are selectable for dedicated scanners only.
3. High-resolution mode is individually switchable for desired channels.
High-speed mode is only collective switching for all channels of dedicated scanners.
Repeat measurement interval time=(Number of Measuring channels * scanning speed)
+ data processing time (2~20 s)
Data processing time is indetenninate,changed by measurement setting and enviromnent.

Measuring Targets \ Scanning Speed	Standard Mode (50 ms/CH)	High-resolution Mode (0.28 s/CH)	High-speed Mode (20 ms/CH)
Strain (Gage & transducer)	Yes	Yes	Yes
Voltage/current-output sensor	Yes		Yes
Civil engineering transducer	Yes		
Temperature sensor (TC, Pt)	Yes		
Potentiometer sensor	Yes		Yes

Notes: 1. High-resolution mode is available only with Full bridge system.
2. High-speed mode is available Full bridge system, Voltage, Current, and Potentiometer sensor.

Operating Modes Real-time, monitor, and automatic

Measurement Functions

Initial (Initial values are measured and stored in internal memory.)
Measure (Initial values are subtracted from original values.)
Original (Raw values are measured without subtraction of initial values.)
Easy Measure (Auto zero balancing function is activated.)
* The selected function is applied to all channels.

Coefficient Calculation Function

Multiplication by calibration coefficient, calibration by TEDS, conversion of measured values to physical quantities, scaling and correction.

Unit 59 units

Automatic Measurement Function

Interval Measurement Measurement is automatically performed at preset time intervals.
Trigger Measurement A relative value (certain changing quantity) or an absolute value triggers measurement.
Trigger Interval Measurement Combination of trigger measurement and interval measurement.

Storage Internal memory
Capacity: Approx. 1.8 GB

●Strain Measurement (Standard Mode)

Constant Voltage Excitation Approx. 2 or 5 VDC
Constant Current Excitation Approx. 5.7 mA (Bridge resistance 350 Ω)
Approx. 16.7 mA (Bridge resistance 120 Ω)
Scanning Speed 50 ms/channel
Gage Factor 2.00 fixed (Coefficient calculation function enables correction with 2.00/Ks.)
Initial Value Memory Range Same as measuring range.
Measuring Range, Resolution and Accuracy

Measuring Range	Resolution	Accuracy
0 to ±50 k ×10^{-6} strain	1 ×10^{-6} strain	±(0.05% of reading + 1) ×10^{-6} strain
±50 k to ±500 k ×10^{-6} strain	10 ×10^{-6} strain	±(0.05% of reading + 10) ×10^{-6} strain

Notes: Resolution and accuracy be automatically change by Autorange function

●Strain Measurement (High-resolution Mode)

Constant Voltage Excitation Approx. 5 VDC
Constant Current Excitation Approx. 16.7 mA
(Bridge resistance 350 Ω)
Scanning Speed 0.28 s/channel
Initial Value Memory Range Same as measuring range.
Gage Factor 2.00 fixed (Coefficient calculation function enables correction with 2.00/Ks.)
Measuring Range, Resolution and Accuracy

Measuring Range	Resolution	Accuracy
0 to ±20 k ×10^{-6} strain	0.1 ×10^{-6} strain	±(0.05% of reading + 0.3) ×10^{-6} strain
±20 k to ±200 k ×10^{-6} strain	1 ×10^{-6} strain	±(0.05% of reading + 3) ×10^{-6} strain

Notes: 1. Available only with full bridges system
2. Bridge resistance should be 120 to 1000 Ω for bridge excitation with constant voltage.
3. Bridge resistance should be 350 Ω for bridge excitation with constant current.
Measuring range 0 to 15k x10^{-6} strain
0 to 150k x10^{-6} strain
4. Available only with dedicated scanners.
5. Resolution and accuracy be automatically change by Autorange function

●Strain Measurement (High-speed Mode)

Constant Voltage Excitation Approx. 2 VDC
Constant Current Excitation Approx. 5.7 mA (Bridge resistance 350 Ω)
Approx. 16.7 mA (Bridge resistance 120 Ω)
Scanning Speed 20 ms/channel
Gage Factor 2.00 fixed (Coefficient calculation function enables correction with 2.00/Ks.)
Initial Value Memory Range Same as measuring range.
Measuring Range, Resolution and Accuracy

Measuring Range	Resolution	Accuracy
0 to ±50 k ×10^{-6} strain	1 ×10^{-6} strain	±(0.08% of reading + 3) ×10^{-6} strain
±50 k to ±500 k ×10^{-6} strain	10 ×10^{-6} strain	±(0.08% of reading + 30) ×10^{-6} strain

Notes: 1. Available only with full bridges system (120 to 1000 Ω)
2. A vailable only with dedicated scanners.
3. Resolution and accuracy be automatically change by Autorange function

●Voltage Measurement (Standard Mode)

Scanning Speed 50 ms/channel
Initial Value Memory Range Same as measuring range
Measuring Range, Resolution and Accuracy

Range Mode	Measuring Range	Resolution	Accuracy	Input Resistance
V/500 mV	0 to ±50.000 mV	1 µV	±(0.05% of reading + 0.003) mV	10 MΩ or more
	±50.00 to ±500.00 mV	10 µV	±(0.05% of reading + 0.03) mV	
V/50 V	0 to ±5.0000 V	100 µV	±(0.05% of reading + 0.0002) V	1 MΩ or more
	±5.000 to ±50.000 V	1 mV	±(0.05% of reading + 0.002) V	

Note: Resolution and accuracy be automatically changed by Autorange function.

●Voltage Measurement (High-speed Mode)

Scanning Speed 20 ms/channel
Initial Value Memory Range Same as measuring range
Measuring Range, Resolution and Accuracy

Range Mode	Measuring Range	Resolution	Accuracy	Input Resistance
V/500 mV	0 to ±50.000 mV	1 µV	±(0.08% of reading + 0.006) mV	10 MΩ or more
	±50.00 to ±500.00 mV	10 µV	±(0.08% of reading + 0.06) mV	
V/50 V	0 to ±5.0000 V	100 µV	±(0.08% of reading + 0.0006) V	1 MΩ or more
	±5.000 to ±50.000 V	1 mV	±(0.08% of reading + 0.006) V	

Notes: 1. Resolution and accuracy be automatically change by Autorange function.
2. Available only with dedicated scanners

●Current Measurement (Standard Mode)

Scanning Speed 50 ms/channel
Initial Value Memory Range Same as measuring range
Measuring Range, Resolution and Accuracy

Channel Mode	Measuring Range	Resolution	Accuracy
I/50 mA	0 to ±50.00 mA	10 µA	±(0.05% of reading + 0.01) mA

Notes: 1. External shunt resistor (High-accuracy 250 Ω) is required.
2. Accuracy does not include resistance error of external shunt resistor.

●Current Measurement (High-speed Mode)

Scanning Speed 20 ms/channel
Initial Value Memory Range Same as measuring range
Measuring Range, Resolution and Accuracy

Channel Mode	Measuring Range	Resolution	Accuracy
I/50 mA	0 to ±50.00 mA	10 µA	±(0.08% of reading + 0.01) mA

Notes: 1. Available only with dedicated scanners.
2. External shunt resistor (High-accuracy 250 Ω) is required.
3. Accuracy does not include resistance error of external shunt resistor.

●Temperature Measurement with Thermocouple (Standard Mode)

Scanning Speed 50 ms/channel

Measuring Range, Resolution and Accuracy

Type	Measuring Range	Resolution	Accuracy	Internal Reference Junction Compensator Accuracy
K	-200.0 to 1230.0 °C	0.1°C	±0.7°C	±0.5 °C (With input terminal temperature balanced in an ambient) (Temp. range of 0 to 50 °C)
T	-200.0 to 400.0 °C		±0.7°C	
E	-200.0 to 660.0 °C		±0.5°C	
J	-200.0 to 870.0 °C		±0.6°C	
R	0 to 1760.0 °C		±2.2°C	

Notes: 1. Accuracies do not include the internal reference junction compensator accuracy.
2. The reference junction compensator is switchable between internal and external.
3. Thermocouple resistance should be 1 kΩ or less.

●Temperature Measurement with Civil Engineering Transducers with a Thermal Sensor (Standard Mode)

Scanning Speed 50 ms/channel

Measuring Range, Resolution and Accuracy

Measuring Range	Resolution	Accuracy
-50.0 to 200.0°C	0.1°C	±0.5°C

Notes: 1. Target physical quantity and temperature are measured in a single channel.
2. Strain measuring range are the same as in strain measurement in standard mode.

●Temperature Measurement with Platinum Resistance Thermometer Bulb (Standard Mode)

Scanning Speed 50 ms/channel

Measuring Range, Resolution and Accuracy

Type	Measuring Range	Resolution	Accuracy
Pt100	-200.0 to 660.0°C	0.1°C	±0.3°C
JPt100	-200.0 to 510.0°C		

Note: Connection is 3-wire system.

●Measurement with Potentiometer sensor (Standard Mode)

Scanning Speed 50 ms/channel
Initial Value Memory Range Same as measuring range
Sensor Power Supply Approx. 2 VDC
Potentiometer Resistance 1 to 10 kΩ

Measuring Range, Resolution and Accuracy

Channel Mode	Measuring Range	Resolution	Accuracy
POT.	0 to ±50.00%	0.01%	±0.1% FS

●Measurement with Potentiometer sensor (High-speed Mode)

Scanning Speed 20 ms/channel
Initial Value Memory Range Same as measuring range
Sensor Power Supply Approx. 2 VDC
Potentiometer Resistance 1 to 10 kΩ

Measuring Range, Resolution and Accuracy

Channel Mode	Measuring Range	Resolution	Accuracy
POT.	0 to ±50.00%	0.01%	±0.1% FS

Note: Available only with dedicated scanners.

Internal Timer Real time clock is built-in. (Battery backup)
Display Fluorescent display tube
128×64 dots (UCAM-60C M14)
Printer Printing Thermal
Paper width 58 mm (24 characters/line)
Printing speed 60 mm/s (Max.) (UCAM-60C M14)
Interface RS-232C
LAN (10BASE-T/100BASE-TX)
USB2.0 (Collects measurement data by USB Flash Drive.)
Notes: 1. Measurement data cannot be saved directly to USB memory.
Notes: 2. USB Flash Drives
Capacity: 32 GB or less, File Format: FAT32
Notes: 3. Recommend USB Flash Drives: GH-UFI-XSD2G (Manufacturer: GREENHOUSE)
File Conversion Binary measurement data can be converted to CSV. (UCAM-60C M14)
Self Diagnosis Function
Checks display (UCAM-60C M14), printer (UCAM-60C M14), bridge excitation, leadwire-off, input/output resistance, insulation resistance, mode, etc.
TEDS
Interface: IEEE1451.4 Mixed Mode Transducer Interface Class2
Applicable sensor: Should have information written in accordance with IEEE template No.33.
Cable length should be 30m or less.
(With dedicated scanner USS-61B/62B/63B.)
Operating Temperature 0 to 50°C
Operating Humidity 20 to 85% (Non-condensing)
Setting Maintenance Function
ACOM at measurement circuit is switchable between floating and GND connect.
Power Supply 100 to 240 VAC (AC-operated version)
10 to 16 VDC (DC-operated version)
* DC operated version has power control function.
Current Consumption
100 VAC: 0.5 A or less (With 3 dedicated scanners mounted)
12 VDC: 4.0 A or less (With 3 dedicated scanners mounted)
Dimensions
360 W × 88 H × 400 D mm (Excluding protrusions) (UCAM-60C M14)
327 W × 88 H × 365 D mm (Excluding protrusions) (UCAM-65C M14)
Weight
Approx. 6.3 kg (Excluding scanner) (UCAM-60C M14)
Approx. 9.6 kg (With 3 dedicated scanners USS-62B mounted) (UCAM-60C M14)
Approx. 5.0 kg (Excluding scanner) (UCAM-65C M14)
Approx. 8.3 kg (With 3 dedicated scanners USS-62B mounted) (UCAM-65C M14)

Standard Accessories
AC power cable P-18 (With 2-pin conversion plug CM-52) (AC-operated version), DC power cable P-76 (DC-operated version), recording paper UCAM-60A-RP (1 roll for UCAM-60C M14 only), screwdriver, spare fuse, CD-R (Instruction Manual), CD-R (Control software UCS-60B for UCAM-65C M14 only), ground wire P-72

Optional Accessories Recording paper UCAM-60A-RP (10 rolls/pack)

■Dedicated Scanner USS-61B/62B/63B

Models USS-61B (TEDS compatible)
USS-62B (With NDIS4102 (7 pins) connectors, TEDS compatible)
USS-63B (For civil engineering measurement, TEDS compatible, with lightning arresters)
Channels 10/unit
Switching Terminals Semiconductor relays
Input Terminals Connect to lead wire by either soldering or screwing.
NDIS4102 (7 pins) connectors (USS-62B)
One-touch terminal block (JT-1A) (Optional)
Lightning Arresters Built in USS-63B
Operating Temperature 0 to 50°C
Operating Humidity 20 to 80% (Non-condensing)
Dimensions 320 W × 28 H × 80 D mm (Excluding protrusions)
Weight USS-61B: Approx. 0.8 kg
USS-62B: Approx. 1.1 kg
USS-63B: Approx. 1.0 kg

Standard Accessories
NDIS4102 (7 pins) connector caps (Pre-attached to connectors, USS-62B only), terminal cover, channel label, short bar ML-1000-3H1

■Scanner Interfaces USI-67A

Connectable Scanners USB-70B
Number of Scanners Max. 20
Cable Length Max. 1 km (When connecting the UPS-70B to the USB-70B.)
Operating Temperature 0 to 50°C
Operating Humidity 20 to 85% (Non-condensing)
Dimensions 99 W × 50 H × 163 D mm (Excluding protrusions)
Weight Approx. 170 g

USI-67A

■External I/O Unit UIO-60A

Output	**ALARM signal**	4 channels (High/low limit checking)
	BUSY signal	1 channel
Input	**START signal**	1 channel
	STOP signal	1 channel
	RESET signal	1 channel
	RAINFALL signal	1 channel

Operating Temperature 0 to 50°C
Operating Humidity 20 to 85% (Non-condensing)
Dimensions 90 W × 50 H × 180 D mm (Excluding protrusions)
Weight Approx. 140 g

Standard Accessories
Screwdriver

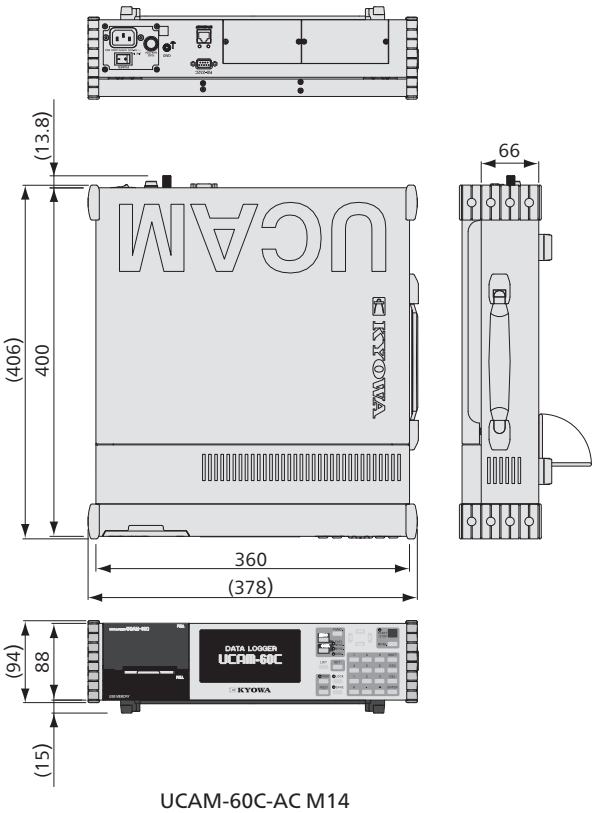
■External Scanner USB-70B

Models	USB-70B-10 (For general measurement)
	USB-70B-20 (For general measurement, with NDIS4102 (7 pins) connectors)
	USB-70B-30 (For civil engineering)
Measuring Targets	
	Strain gages
	Strain-gage transducers
	DC voltage 0 to ±50 V
	DC current 0 to ±50 mA
	Thermocouples K, T, E, J, N, B, S, R
	Platinum resistance thermometer bulbs Pt100, JPt100 (USB-70B-30)
	Civil engineering transducers with a thermal sensor (USB-70B-30)
	Potentiometer sensors
Channels	50/unit
Connection data loggers	
UCAM-60C M14, UCAM-65C M14	
An optional Scanner Interface USI-67A is required.	
Number of Connection	Up to 20
19 if there are 30 channels in the data logger	
Input Terminals	
Screw-soldering terminal blocks (M3 screw with washer)	
NDIS4102 (7 pins) connectors (USB-70B-20)	
Receptacle PRC90-231BR10-7F	
Applicable plug ex. PRC03-12A10-7M10.5	
Built-in lightning arresters (USB-70B-30)	

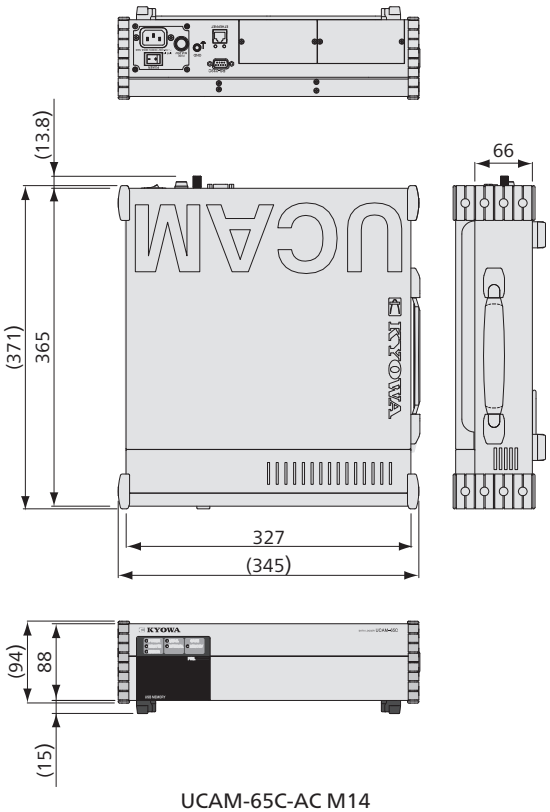
Switching Elements	Semiconductor relays
Measuring Mode	Every channel set by the data logger
Measuring Channel Number	
The upper 2-digit from every 10 channels are set with digital switches	
Power Supply	Supplied from data logger.
	If the cable is extended or if 4 or more scanners are connected, an optional UPS-70B should be mounted into the scanners.
Dimensions	302 W ×107 H × 500 D mm
	(Excluding protrusions)
Weight	USB-70B-10: Approx. 7.3 kg (Excluding UPS-70B)
	USB-70B-20: Approx. 8.5 kg (Excluding UPS-70B)
	USB-70B-30: Approx. 7.7 kg (Excluding UPS-70B)
Option	Built-in AC Power Unit UPS-70B
	100 to 240 VAC (100 to 127 VAC or 220 to 240 VAC automatic switchover)

Standard Accessories Phillips precision screwdriver
Connection cable N-24 (1 m)

■Dimensions

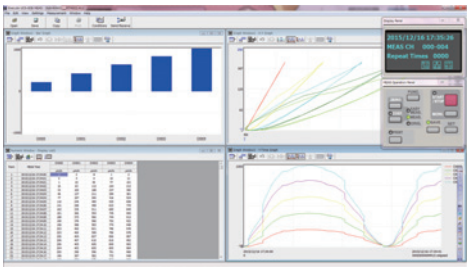


UCAM-60C-AC M14



UCAM-65C-AC M14

■Control Software UCS-60B



●Operating Environment		
OS	Windows® 8/8.1, Windows® 10	
	English/Japanese, 32/ 64 bits support	
CPU	Core 2 Duo, 2 GHz 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	
External Connection	Serial port: RS-232C, standard serial port or	
		a port connectable to USB-serial
		conversion adaptor
	LAN port: For Ethernet communication	
	GP-IB	
●Measuring Condition Setting Functions		
Controllable UCAMs	UCAM-60C/65C	
Measuring Channels	CH000 to CH999	
Measurement Functions	EASY MEAS., MEAS., ORIG., INITIAL	
Repeat Times	0 to 9999 (0: Infinite)	
Calibration Coefficient Calculation	ON/OFF selectable	
Channel Conditions	Scanner type, measuring channel mode,	
	scanning speed, calibration coefficient,	
	number of digits below decimal point, unit,	
	offset, reference temperature, initial value,	
	channel name (within 18 alphanumerics)	
Interval Measurement Conditions	Starting date/time, time interval	
Trigger Measurement Conditions	Trigger channel (Up to 4 channels),	
	AND/OR between trigger channels,	
	trigger value, offset,	
	repeat times 0 to 9999 (0: Infinite),	
	number of steps up to 99	
Trigger Interval Measurement Conditions	Trigger channel (Up to 4 channels),	
	reference value of trigger channel,	
	AND/OR between trigger channels,	
	time interval, repeat times 0 to 9999	
	(0: Infinite), number of steps up to 99	
Measuring Condition File	Reading/saving possible	
Calculation Condition Setting Functions		
Calculation Condition File	Reading/saving possible	
Measurement Functions	MEAS check, initial value measurement,	
	monitor measurement (max. 40 channels),	
	real-time measurement, automatic	
	measurement (interval, trigger	
	measurement, trigger interval),	
	change stroke measurement	
Numeric Display of Measured Data		
Numeric Window	List of the most recent data in real-time or	
	automatic measurement	
Display Formats	List of all data, list of data by measurement point,	
	initial values, check results	
Monitor Window	Data obtained in monitor measurement	
Graphic Display of Measured Data		
Types of Graph	Y-Time graph, Y-Cycle graph, X-Y graph,	
	bar graph	
Display Channels	Max. 20 (max. 10 sets of channels in X-Y graph)	
Display Operations	Zooming X and Y axes, auto scaling of X and	
	Y axes, cursor	

Data Available on Display	Depends on the number of measuring channels as follows:
	100 channels or less 10000 data
	200 channels or less 5000 data
	500 channels or less 2000 data
	501 channels or more 1000 data
Measured Data Saving Formats	KU1, UCAM-70A (ASCII), CSV, XLS (MS-Excel format)
TEDS	Reads information from TEDS-installed sensors.

●Reproduce Program

KU1 format files, UCAM-70A format files (compatible with both ASCII and binary) and UCAM-500A/B format files can be read/saved, displayed and cut/converted into CSV or XLS format files.

Calculation Condition Setting Functions	
Calculation Condition File	Reading/saving possible
Numeric Display of Measured Data	List of all data
Graphic Display of Measured Data	
Types of Graph	Y-Time graph, Y-Cycle graph,
	X-Y graph, bar graph
Display Channels	Max. 20 (max. 10 sets of channels
	in X-Y graph)
Display Operations	Zooming X and Y axes,
	auto scaling of X and Y axes, cursor
Display Condition File	Reading/saving possible

●Restrictions

To save or convert measured data into an XLS format file, the number of channels and the number of data are limited to the following:

Channels	Max. 250
Data	Max. 10000

Note that the UCS-60B is not compatible with measuring/calculation/display condition files compiled with the UCS-25A.

UCAM-550A

Fast Data Logger

UCAM-550A

PC is not included.

Synchronous sampling at 50 Hz of all channels

- ●Synchronous* sampling of all channels
- ●Synchronous measurement of 1000 channels at max. 50/s
- ●Synchronous measurement of up to 20 units possible using a LAN cable
- ●Control using Dynamic Data Acquisition Software DCS-100A
- ●5 types of measuring units available

* Except temperature measurement using USM-51B or USM-52B

To Ensure Safe Usage

DCS-100A, standard accessory, can measure up to 300 channels. Measurement up to 1000 channels requires an optional software DCS-106A.
See chapter 4.

UCAM-550A is a fast data logger that repeatedly measures a maximum of 1000 channels at an interval of 0.02 s.
Because it is capable of high-speed synchronous measurement, this unit measures a wide range of phenomena, from static to dynamic phenomena.
The following 5 types of measuring units are provided.

- ●Strain Unit USS-51B (Potentiometer sensor also supported)
- ●Voltage Unit USV-51B
- ●Thermocouple Unit UST-51B
- ●Strain/Voltage/Thermocouple Unit USM-51B, USM-52B

They support strain gages, strain-gage transducers, voltage output sensors, potentiometer sensors, and thermocouples, measure and collect strain and stress, load, pressure, and displacement, as well as voltage and temperature.
Input channels are for 1 unit a maximum of 50 channels, and with 20 units cascaded, a maximum of 1000 channels, and these are suited from small-scale to large-scale measurement.

Measuring Targets and Measuring Unit

Measuring targets \ Measuring units			USM-51B/52B*	USS-51B	USV-51B	UST-51B
Strain gages Strain-gage transducers	Quarter bridge	120 Ω	Yes	Yes		
		350 Ω	Yes	Yes		
	Half bridge 120 to 1 k Ω	Active-dummy	Yes	Yes		
		Active-active	Yes	Yes		
	Full bridge 120 to 1 k Ω	Active opposite-leg	Yes	Yes		
		Full bridge	Yes	Yes		
Potentiometer sensors		1 to 10 kΩ	Yes	Yes		
Voltage		±20 V	Yes		Yes	
Temperature	Thermocouples	K	Yes			Yes
		T	Yes			Yes
		E	Yes			Yes
		J	Yes			Yes
		R	Yes			Yes
		N	Yes			Yes*

*Requires UCAM-550A firmware version 03.00 or higher.

Specifications

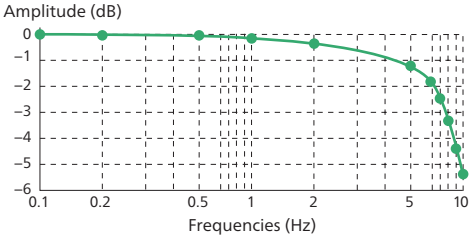
■UCAM-550A

Models UCAM-550A With DCS-100A
UCAM-550A-0 Without DCS-100A

Channels
Maximum of 50 channels/unit (Possible up to 5 units of the measuring unit)
(Each measuring unit measures 10 channels.)
Measurement is possible of up to 1000 channels at maximum by adding an optional software DCS-106A.
*The public command corresponds up to 20 units (Max. 1000 channels).
*DCS-100A corresponds to up to 6 units (Max. 300 channels).

Sampling Method Synchronous sampling of all channels

Sampling Frequencies 1, 2, 10, 20, and 50 Hz
*Response frequency depends on the measuring unit.
USM-51B/52B*, USS-51B, USV-51B, UST-51B: DC to 7.8 Hz
Deviation:0.5 to -3.5 dB
*For temperature measurement with USM-51B/52B using scanning mode, the updating rate is approx. 1 s.



Measuring Functions Original value measurement
Measure value measurement

Interfaces 10 BASE-T, 100BASE-TX
Between PC and UCAM
LAN cable (Straight) Max. 100 m
Between UCAM and UCAM
STP straight cable (See notes) Max. 100 m
Note: "STP" is the initials of Shield Twisted Pair, and an STP cable is a shielded LAN cable

Display LCD (20 digits × 2 lines)
Status display LED: POWER (When power ON, lit green)
MASTER (When master, lit green, when slave, not lit)
TRANSFER (When communications, flashing green)

Operation Keys UP, Down, Left, Right

Data Storage Measurement data is saved on a PC (No internal storage)

Operating Temperature 0 to 40°C

Operating Humidity 20 to 85% (Non-condensing)

Power Supply 100 to 240 VAC
Approx. 50 VA (With 5 USS-51B strain units installed, and 120 Ω load on all channels connected)

Dimensions 426 W × 132.5 H ×305 D mm (Excluding protrusions)

Weight Approx. 7 kg (With 5 USS-51B strain units installed)

Standard Accessories AC power cable P-18 (With a 2-pin conversion plug CM-52), ground wire P-72, DVD (DCS-100A, instruction manual)

Dedicated Optional Accessories

■Strain/Voltage/Thermocouple Unit USM-51B/USM-52B

Input Terminals
USM-51B: NDIS4102 (7 pins) connectors, and screw-soldering terminal blocks
USM-52B: NDIS4102 (7 pins) connectors, and one-touch terminal blocks

Channels 10

Measuring Targets Strain gages, strain-gage transducers, potentiometer sensors, voltage, and thermocouples

Bridge Excitation 2 VDC

Power Supply to Sensors 2 VDC, for potentiometer sensors

Gage Factor 2.00 fixed

Frequency Response DC to 7.8 Hz, deviation: 0.5, -3.5dB
(Except temperature measurement)

Burnout Check Performing burnout when checking

TEDS Reads information from TEDS-installed sensors.

Strain, Potentiometers, and Voltage

Targets	Mode	Measuring Range	Resolution	Accuracy
Strain	L	0 to ±19 k×10^{-6} strain	1×10^{-6} strain	±0.08%FS
	H	0 to ±300 k×10^{-6} strain	10×10^{-6} strain	
Potentiometers		-50% to 50%	0.01%	±0.1%FS
Voltage		-20 to 20 V	1 mV	±0.08%FS

Thermocouples

Types	Range	Accuracy* (Resolution: 0.1 °C)	
K	-200.0 to 1200.0 °C	-200.0 to below -100.0 °C	±(0.3% of reading + 0.8 °C)
		-100.0 to 1200.0 °C	±(0.2% of reading + 0.6 °C)
T	-200.0 to 350.0 °C	-200.0 to below -100.0 °C	±(0.3% of reading + 0.8 °C)
		-100.0 to 350.0 °C	±(0.2% of reading + 0.6 °C)
E	-200.0 to 800.0 °C	-200.0 to below -100.0 °C	±(0.3% of reading + 0.8 °C)
		-100.0 to 800.0 °C	±(0.2% of reading + 0.6 °C)
J	-200.0 to 750.0 °C	-200.0 to below -100.0 °C	±(0.3% of reading + 0.8 °C)
		-100.0 to 750.0 °C	±(0.2% of reading + 0.6 °C)
R	0.0 to 1600.0 °C	0.0 to below 100.0 °C	±(0.6% of reading + 1.2 °C)
		100.0 to 1600.0 °C	±(0.5% of reading + 1.0 °C)
N	-200.0 to 1250.0 °C	-200.0 to below -100.0 °C	±(0.3% of reading + 0.8 °C)
		-100.0 to 1250.0 °C	±(0.2% of reading + 0.6 °C)

* Accuracy of the Internal Reference-junction Compensator
Within ±1.0 °C (When temperature balanced at input terminals)
(The ambient temperature is 25 ±10 °C)
Within ±2.0 °C (When temperature balanced at input terminals)
(The ambient temperature is other than mentioned above.)

Standard Accessories Terminal cover UM-51B

■Strain Unit USS-51B

Channels 10

Measuring Targets Strain gage, strain-gage transducers, potentiometer sensors

Bridge Excitation 2 VDC constant voltage (Applied constantly)

Power Supply to Sensors 2 VDC constant voltage (Applied constantly)

Gage Factor 2.00 fixed
(Correction is possible at 2.00/Ks with the engineering value conversion function)

Measuring Range, Resolution, Accuracy (In static (DC) Inputting)

Target	Mode	Measuring Range	Resolution	Accuracy
Strain	L	0 to ±19 k×10^{-6} strain	1×10^{-6} strain	±0.05% FS
	H	0 to ±200 k×10^{-6} strain	10×10^{-6} strain	
Potentiometers		0 to ±50%	0.01%	±0.1% FS

Note: Measuring range is indicated when the initial measurement and the original value measurement are performed. In the case of a measure value measurement, the value of the initial measurement is subtracted in advance from the original measurement value.

Optional Accessories Terminal cover UT-50A

■Voltage Unit USV-51B

Channels 10

Measuring Targets DC voltage, voltage output type sensors

Measuring Range, Resolution, Accuracy (In static (DC) Inputting)

Measuring Range	Resolution	Accuracy	Signal Source Resistance
0 to ±20.000 V	1 mV	±0.05% FS	50 Ω or less

Standard Accessories Terminal cover UT-50A

■Thermocouple Unit UST-51B

Channels 10

Measuring Targets Temperature (Thermocouples)

Measuring Range, Resolution, Accuracy (In static (DC) Inputting)

Types		Measuring Range	Accuracy
K	L	-200.0 to 437.0°C	±0.8°C
	H	-200.0 to1200.0°C	±2.8°C
T	—	-200.0 to 350.0°C	±0.7°C
E	L	-200.0 to 260.0°C	±0.5°C
	H	-200.0 to 800.0°C	±1.7°C
J	L	0 to 330.0°C	±0.6°C
	H	0 to 750.0°C	±2.0°C
R	—	0 to 1600.0°C	±2.2°C
N	L	-200.0 to below -100.0 °C	±(0.4% of reading + 1.0 °C)
		-100 to 530.0 °C	±(0.3% of reading + 0.8 °C)
	H	-200.0 to below -100.0 °C	±(0.4% of reading + 1.2 °C)
		-100 to 1250.0 °C	±(0.3% of reading + 1.0 °C)

* When temperature balanced at input terminals, and the ambient temperature is 25 ±10 °C.
Type K, T, E, J, and R: Within ±0.5 °C
Type N: Within ±1.0 °C
Note: Accuracy does not include internal reference junction accuracy. Switching between internal and external standard connect compensators is possible. Thermocouple resistance 300 Ω or less (K type).

Standard Accessories Terminal cover UT-50A

■**Connection Cable U-17 to 20 (See chapter 8.)**

■**Isolation Transformer UPT-300B**

This is used to obtain good measurement results under bad power supply conditions (Strong noise, etc.).

■**One-touch Terminal Block JT-1A**

A terminal block that supports one-touch connection of input lead wires, and is to be attached to input terminals. 1 for each lead wire (Sale units: 10).

■**Dummy Panel UD-50A**

Covers the slots of a UCAM-550A that do not have a measuring unit installed.

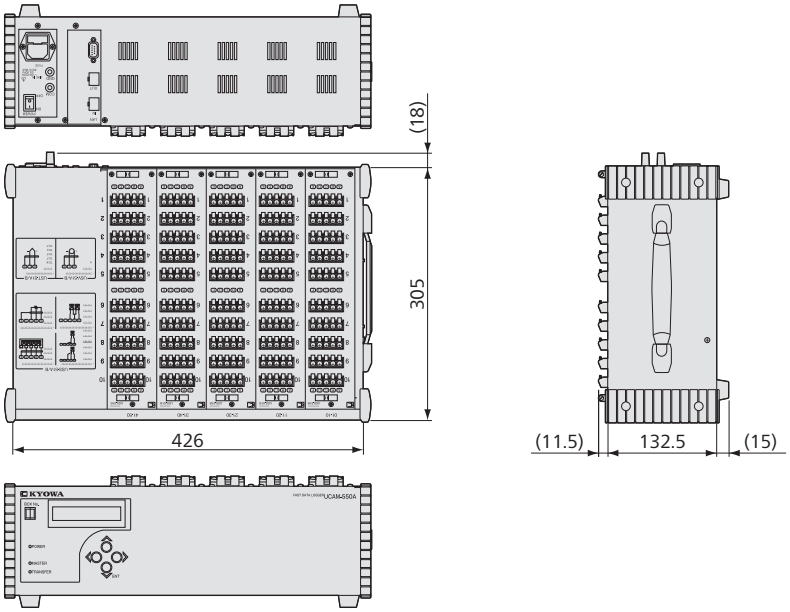
DCS-100A software, specification for control of UCAM-550A

***For details of DCS-100A, see chapter 4.**

Units	Up to 6 units (up to 300 channels.) Standard Issue
	Up to 20 units (up to 1000 channels.) With the optional DCS-106A.
Interface	LAN
Saving Format	Saves the measured data in the PC folder in the KS2 format file.
Sampling Frequency	1, 2, 10, 20, 50 Hz
Measure Mode	Manual, Manual (Set Record Data), Interval, Analog Trigger
Measurement Functions	MEASURE or ORIGINAL
	MEASURE The measured value = Sensor output value - Initial value
	ORIGINAL The measured value = Sensor output value
Calibr. Const. Operation	Sets the Calibr. const. operation ON/OFF of all channels at one time.
	Calibr. const. operation: The measured value × CAL coefficient + Offset.
Channel Conditions	Measuring ON/OFF, Measuring mode, Range, Calibr. const., Offset, Unit, Initial value, Channel name, Measuring range, Rated capacity, Rated output, Deci Digits,Chk. Val. (Up), Chk. Val. (Down) (Display items can freely be selected.)
Measuring Initial Value	Measures the initial value of each sensor.
Manual Measurement	Records data from REC to STOP or from REC to the number of data, specified on the Manual (Set Record Data).
Interval Measurement	Records data automatically based on the pre-set starting time and recording interval.

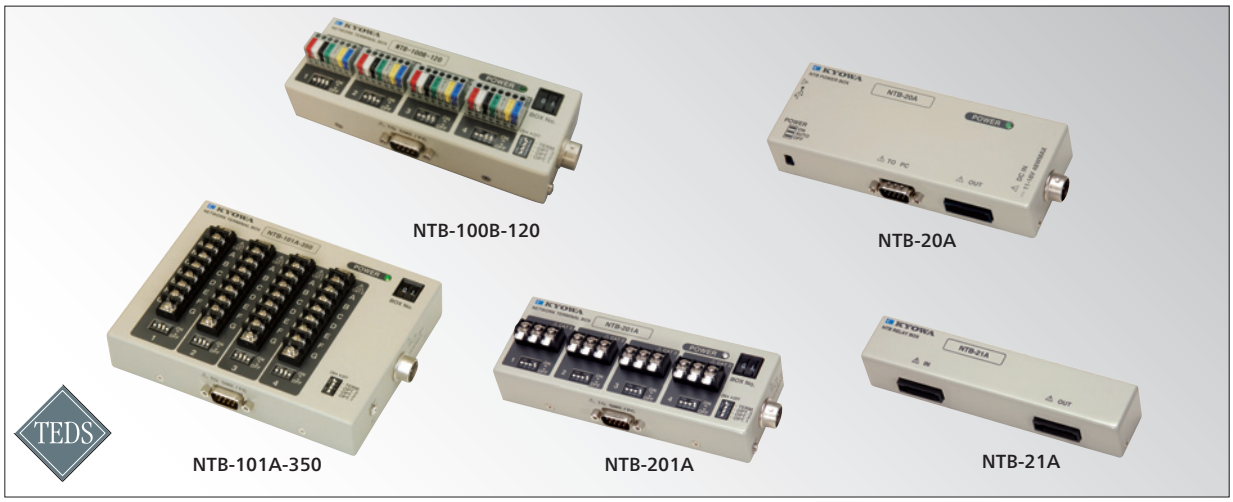
Analog Trigger Measurement	
Starts/stops recording data based on the pre-set trigger conditions.	
(Trigger level value: Fixed)	
End trigger Settable	
Delay Up to 3000 data for both start and end.	
Trigger channel Any 1 channel	
Trigger level Physical quantity	
Trigger slope Positive or Negative	
(Trigger level value: Fixed)	
End trigger Settable	
Delay Up to 3000 data for both start and end.	
Trigger channel Any 1 channel	
Trigger level Physical quantity	
Trigger slope Positive or Negative	
Changing Stroke	Changes the data, before the stoke and after the stoke, when using a displacement transducer.
Static Masurement	Every time the DCS-100A starts recording data, the DCS-100A additionally saves the moving-averaged measured data in a single CSV format file. *Measure Mode: Manual and Interval only.
Burnout Checking	(USM-51B/52B only.)
Loading TEDS Sensor Information	Loads the TEDS information automatically and sets the channel conditions. (USM-51B/52B only.)
Setting Parameter and Loading Parameter	
Loads and sets the UCAM-550A internal parameter.	
■**Setting Environment**	
Setting Hardware Configuration	Sets the number of units, device names, and measuring units. Loads the measuring unit configuration from the UCAM-550A.
Communication Check	Loads the UCAM-550A version.

■Dimensions



NTB-100/200 Series

Network Terminal Box



Digitization of field measurements

- Network output conforms with to CAN, enables a single wire connection
- The wide area, decentralized arrangement will be useful for the infrastructure of building and civil engineering.
- Digitizing data adjacent to the sensor, enables transmission of digital data robust against noise.
- Compact, lightweight and affordable, allowing a small-sized system to be built on site easily.
- Various ways of docking and connection are provided, broadening system applications.
- Measurement is started immediately with the NTB-10A software.

NTB-100/200 series is a measuring instrument that extends with one cable, and a decentralized arrangement.
A single unit measures 4 channels, and allows up to 99 units to be connected, so measurement up to 396 channels is possible.
By placing an NTB near a sensor, only a single communication cable is required to build a total distance of a 1 km wide area network
The digital transmission is hardly affected by noise, thus useful for building a wide area network.
Directly connects various sensors including strain gages, facilitates measurement in the field such as construction or building site, or for indoor experiments and researches.
Voltage as well as thermocouples are measured by NTB-201A.
Allows SME-100A/101A (page 3-49) to be connected.

NTB-100 Series Specifications

Network Terminal Box Models

Models*	Bridge excitation	Sensor input terminal	Quarter bridge
NTB-100B-120	Constant-voltage	One-touch terminal	120 Ω
NTB-101A-120	Constant-voltage	Screw soldering terminal	120 Ω
NTB-100B-350	Constant-voltage	One-touch terminal	350 Ω
NTB-101A-350	Constant-voltage	Screw soldering terminal	350 Ω
NTB-110B-350	Constant-current	One-touch terminal	For Full bridge only
NTB-111A-350	Constant-current	Screw soldering terminal	For Full bridge only

*Control Software NTB-10A Standard accessory.
NTB-10A is optional for models with suffix "-0".

Network Terminal Box and Measuring Targets

Bridge excitation	Measuring targets			NTB Models: General-purpose strain measurement: NTB-100B-120 NTB-101A-120	NTB Models: General-purpose strain measurement: NTB-100B-350 NTB-101A-350	NTB Models: Civil engineering measurement: NTB-110B-350 NTB-111A-350
Constant voltage	Strain gages	Quarter bridge	120 Ω	Yes		
			350 Ω		Yes	
	Strain-gage transducers	Half-bridge 120 to 1000 Ω	Active-active system	Yes	Yes	
		Full-bridge 120 to 1000 Ω	Full bridge	Yes	Yes	
Constant current	Civil engineering transducers	Full bridge 350 Ω	Full bridge			Yes
			Civil engineering transducer with thermal sensors			Yes

Channels	4
Scanning Speed	Approx. 0.5 s/channel: 0 to ± 30 k ×10^{-6} strain
	Approx. 1 s/channel: ± 30 k ×10^{-6} strain or more
	Approx. 1 s/channel: With civil engineering transducers with a thermal sensor
Bridge Excitation	Approx. 2 VDC for constant-voltage bridge excitation
	Approx. 5.6 mA for constant-current bridge excitation
	(At bridge resistance 350 Ω)
Measuring Range	Strain measurement
	0 to ± 300 k ×10^{-6} strain (Constant-voltage bridge excitation)
	0 to ± 30 k ×10^{-6} strain (Constant-current bridge excitation)
	Temperature measurement with civil engineering
	transducers with a thermal sensor: -30.0 to 70.0°C
Resolution	Strain measurement
	0 to ± 30 k ×10^{-6} strain: 1 ×10^{-6} strain
	± 30 k to ± 300 k ×10^{-6} strain: 10 ×10^{-6} strain
	Temperature measurement with civil engineering
	transducers with a thermal sensor: 0.1°C
Accuracy	Strain measurement
	0 to ± 30 k ×10^{-6} strain: ± (0.05% of reading + 2) ×10^{-6} strain
	± 30 k to ± 300 k ×10^{-6} strain: ± (0.1% of reading + 20) ×10^{-6} strain
	Temperature measurement with civil engineering
	transducers with a thermal sensor: ± 0.5°C
TEDS	Reads information from TEDS-installed sensors.
	Channel name writing (Kyowa ID only)

Power Save Mode	Provided ON/OFF using "OPT.3" DIP switch.
Interfaces	Dedicated interface conforming to CAN, cable extension up to 1 km
Operating Temperature	-10 to 50°C
Operating Humidity	20 to 85% (Non-condensing)
Power Supply	11 to 16 VDC
Current Consumption	(At 12 VDC)
	Constant-voltage bridge excitation
	Operation: 100 mA or less
	Waiting: 60 mA or less
	Standby (In power save mode): 40 mA or less
	Constant-current bridge excitation
	Operation: 70 mA or less
	Waiting: 60 mA or less
	Standby (In power save mode): 40 mA or less
Dimensions	One-touch type: 150 W × 28 H × 55 D mm (Excluding protrusions)
	Screw soldering type: 150 W × 28 H × 110 D mm (Excluding protrusions)
Weight	One-touch type: Approx. 310 g
	Screw soldering type: Approx. 650 g

Standard Accessories DC power cable P-76, ground wire P-72, wire connection seals, rubber feet, screwdriver (For one-touch type only), terminal block (For screw soldering type only), control software (NTB-10A), instruction manual (CD-R)

Optional Accessories
Y cable N-103 (10 cm)
Communication cable N-102 (1 m)
Communication cable H-11681 (3 m)
Communication cable H-11682 (5 m)
Communication cable H-11683 (10 m)
*Please contact us for communication cables other than those listed above.
AC adapter SA-10A-EDS
(100 to 240 VAC) (For U.S.A.: UNI318-1215-EDS)
Connection board/clip CN-1A
DIN rail mounting plate
Terminal resistor CANTERM120
USB/CAN converter LEAFLIGHT HS V2

NTB-201A Specifications

Channels	4
Scanning Speed	Approx. 0.5 s/channel
Measuring Targets	Voltage, thermocouples

Voltage-output Measurement

Range	Measuring range	Resolution	Accuracy	Input resistance
10 V	0 to ±10.0000 V	100 µV	±(0.1% of reading+0.0003 V)	Approx. 1 MΩ
50 V	0 to ±50.000 V	1 mV	±(0.1% of reading+0.003 V)	Approx. 1 MΩ

Thermocouples

Types	Range	Accuracy (Resolution: 0.1 °C)	
K	-200.0 to 1230.0°C	-200.0 to below -100°C -100.0 to 1230.0°C	±(0.2% of reading +0.3°C) ±(0.1% of reading +0.2°C)
T	-200.0 to 400.0°C	-200.0 to below -100°C -100.0 to 400.0°C	±(0.2% of reading +0.3°C) ±(0.1% of reading +0.2°C)
E	-200.0 to 660.0°C	-200.0 to below -100°C -100.0 to 660.0°C	±(0.2% of reading +0.3°C) ±(0.1% of reading +0.2°C)
J	-200.0 to 870.0°C	-200.0 to below -100°C -100.0 to 870.0°C	±(0.2% of reading +0.3°C) ±(0.1% of reading +0.2°C)
R	0.0 to 1760.0°C	0.0 to below 100°C +100.0 to 1760.0°C	±(0.2% of reading +0.8°C) ±(0.125% of reading +0.6°C)
N	-200.0 to 1300.0°C	-200.0 to below -100°C -100.0 to 1300.0°C	±(0.2% of reading +0.3°C) ±(0.1% of reading +0.2°C)

* Accuracy of Internal Reference-junction Compensator
Within ±0.5 °C, when temperature balanced at input terminals, and the ambient temperature is 0 to 50 °C.
Within ±1.0 °C, when temperature balanced at input terminals, and the ambient temperature is -10 to 0 °C.

Notes:
1 . Accuracies do not include the accuracies of the internal reference junction compensator and the sensors.
2. The reference junction compensator is switchable between internal and external.
3. The thermocouple resistance should be 1 kΩ or less.

Check Functions	Burnout check
Power Save Mode	Provided ON/OFF using "OPT.3" DIP switch.
Interfaces	Dedicated interface conforming to CAN.
Operating Temperature	-10 to 50°C
Operating Humidity	20 to 85% (Non-condensing)
Power Supply	11 to 16 VDC
Current Consumption	Operation: 100 mA or less
(At 12 VDC)	Waitng: 100 mA or less
	Standby (In power save mode): 40 mA or less
Dimensions	150 W × 28 H × 55 D mm (Excluding protrusions)
Weight	Approx. 320 g

Note: TEDS function is unusable.

Standard Accessories DC power cable P-76
Ground wire P-72

NTB power supply box NTB-20A
NTB relay box NTB-21A

The power supply line and CAN communications line are integrated into one wire, enabling decentralized arrangement outdoors or in other locations where securing a power supply is difficult.

●NTB power supply box NTB-20A

■Power save function (AUTO mode)

When the PC power supply is OFF, then the power supply of the NTB-20A connected by a USB cable is off.

■Power supply output limitation function

When a power supply exceeding the power supply range for operating the NTB-20A is input, for safety, the power supply output from the serial connector and the OUT connector is turned OFF.

●NTB Series Connected Units and Cable Length

With USB port

NTB series connected units	Cable length
1	200 m or less
2	100 m or less

When AC adapter or DC power supply used

NTB series connected units	Cable length
1	1000 m or less
2	840 m or less
3	560 m or less
4	470 m or less
5	330 m or less
6	280 m or less
7	240 m or less
8	200 m or less
9	180 m or less
10	160 m or less
11	150 m or less
12	130 m or less
13	120 m or less
14	120 m or less
15	110 m or less
16	100 m or less

When UIA345-12 used
When SA-10A-EDS used

Power Save Functions	Provided
	In POWER switch "AUTO" mode (*1)
Operating Temperature	-10 to 50°C
Operating Humidity	20 to 85% (Non-condensing)
Power Supply Input	USB port: 5 VDC
	External power supply: 11 to 16 VDC
	(AC adapter, DC power supply)
Current Consumption	When using 12 VDC (Using AC adapter)
	OFF mode: 7.0 mA or less
	AUTO mode: 7.0 mA
	ON mode: 30.0 mA or less
	When using 5 VDC (Using USB port)
	OFF mode: 5.0 mA or less
	AUTO mode: 30.0 mA or less
	ON mode: 30.0 mA or less
Dimensions	150 W × 28 H × 55 D mm (Excluding protrusions)
Weight	Approx. 260 g

(*1) In "AUTO" mode, turning off the PC power supply automatically turns OFF the power supply to the NTB-20A (NTB power supply box).
When using "AUTO" mode, ensure that the PC and NTB-20A (NTB power supply box) are connected using a USB cable.

Optional Accessories
Connection cable N-38 (1 m), N-39 (2 m)
Communication cable N-102 (1 m)
Communication cable H-11681 (3 m)
Communication cable H-11682 (5 m)
Communication cable H-11683 (10 m)

●NTB relay box NTB-21A

■Power supply output limitation function

When power supply exceeding the range is input into NTB, the power supply output from the serial connector is turned to OFF.

Input Voltage Range	11 to 16 VDC
Operating Temperature	-10 to 50°C
Operating Humidity	20 to 85% (Non-condensing)
Dimensions	150 W × 28 H × 29 D mm (Excluding protrusions)
Weight	Approx. 160 g

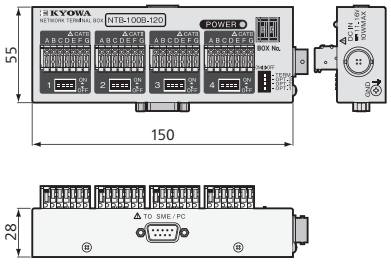
Optional Accessories Power and communication cable N-114

●Network terminal box control software NTB-10A

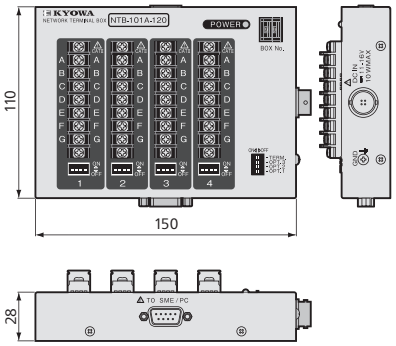
Operating Environment	
OS	Windows® 8/8.1, Windows® 10
	Japanese/English, 32/64 bits support
CPU	Core 2 Duo, 2 GHz or advanced
Memory	If 32-bit OS, 2 GB or more
	If 64-bit OS, 4 GB or more
Hard Disk	Empty storage 10 MB or more
	(Excluding the target data file size.)
Display	1024×768 pixels or more
USB/CAN Converter	Manufacture: KVASER
	Model: LEAFLIGHT HS V2
Measuring Units	NTB series: 1 to 99 (Max. 396 channels)
Measuring Functions	RELATIVE measurement (Relative value
	measurement): Each value is obtained by
	subtracting the ZERO value.
	*ZERO value is equivalent to the initial unbalance
	value. Capable of obtaining the ZERO value at
	arbitrary timig.
Channels Conditions	Meas channel ON/OFF, CAL coefficient calculation
	ON/OFF, CAL coefficient, Offset, Unit, Dec. digits,
	resistance at 0°C, CH Name (20 characters)
Measuring Condition File	Load and save

Measuring Operations	MONITOR Meas (Measures ZERO value during
	MONITOR measurement.)
	One-time measurement
	Continuous measurements
	INTERVAL Meas (To be specified the number of
	measurements)
Interval Measurement	Interval start time
	Interval time
	Repeat 0 to 9999 (0 to infinite)
	Interval measuring steps: 5
Numeric Display	Available windows: 1
	Window switch: List only
Graph Display	Y-time, BAR graph
	Max. 8 channels/graph
Measured Data Saving Function	The measured data is saved with the CSV format.
TEDS	Reads sensor's information and sets to channel
	condition automatically.
	Channel name writing
Data File Destination	PC hard disk
File Split	No split
	Split every hour
	Split every day

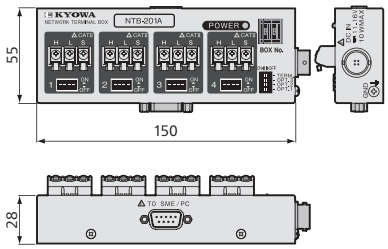
■Dimensions



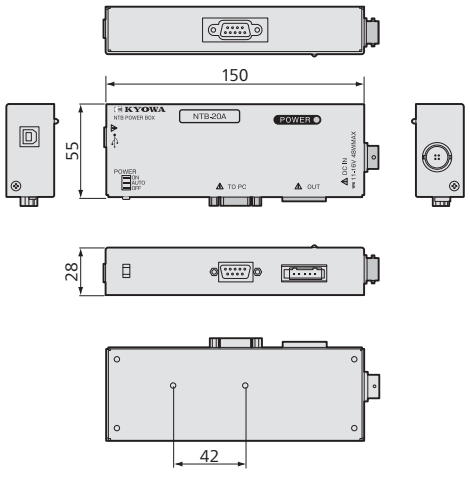
NTB-100B-120



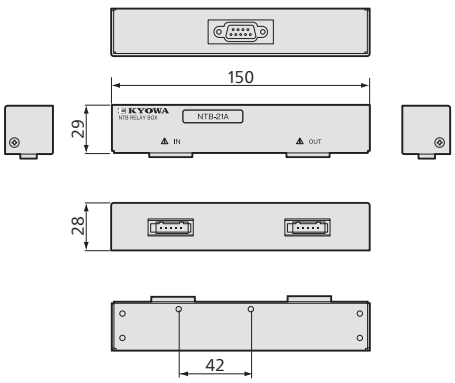
NTB-101A-120



NTB-201A



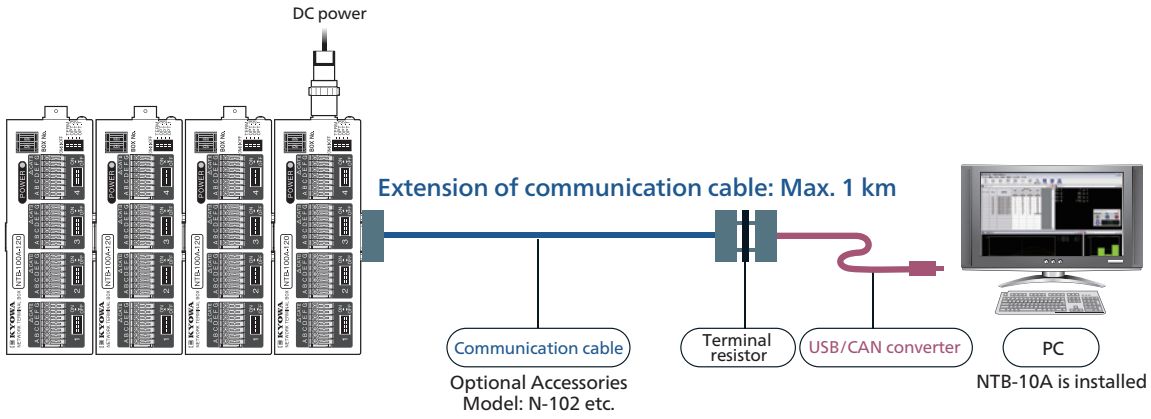
NTB-20A



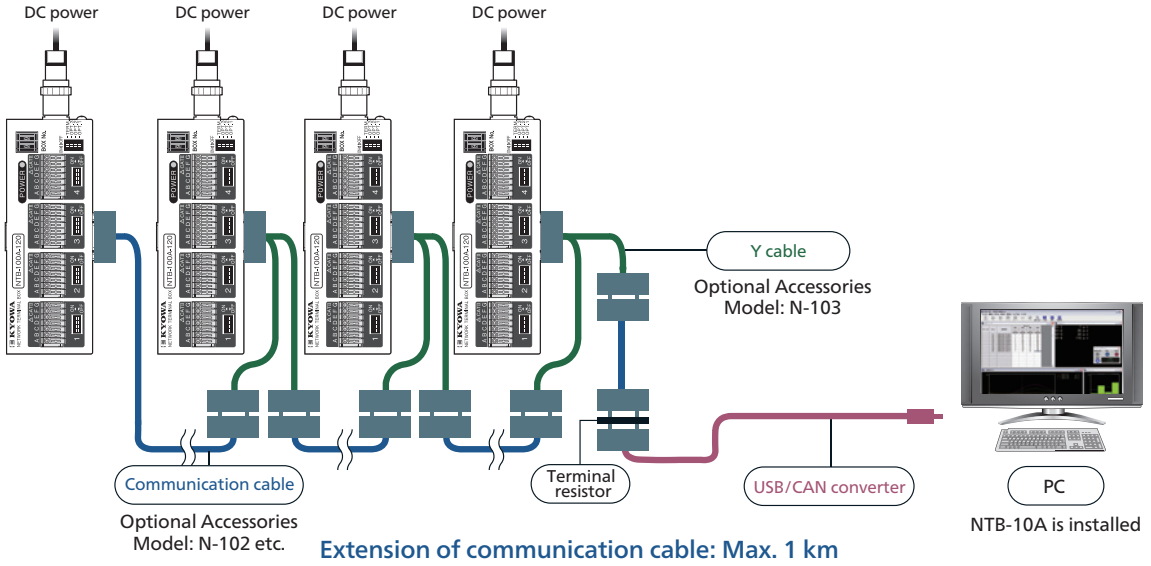
NTB-21A

System Content

Case A 4-NTB docked connection (*Up to 8 units are possible)

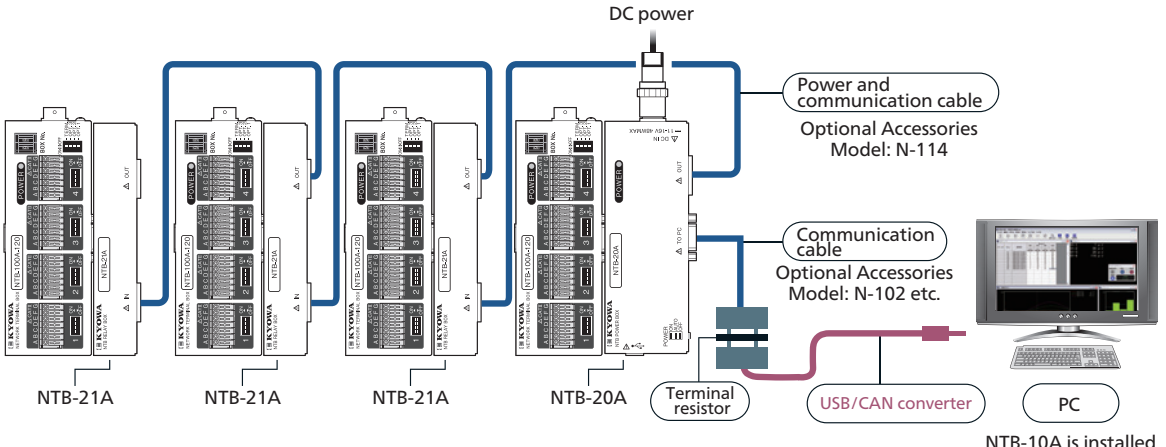


Case B 4-NTB distributed connection (*Up to 99 units are possible)



Case C If using an NTB power supply (NTB-20A) and NTB relay boxes (NTB-21A) for dispersed usage

(The diagram below uses 4 units, and the cable length will differ depending on the connected units. See table on page 3-46.)



*If power and communication cable is other than 50 m in length, please contact us.

SME-30A/31A/100A/101A

Handy Data Logger

Compact & lightweight
Palm size, therefore easily to carry

- Built-in bridge circuit for direct connection of a strain gage
- Wide measuring range: ±300 k ×10^{-6} strain
- Data saved in a CSV file in SD card is read and controlled by a PC.
- Driven by AA batteries (Easy to get)
- TEDS compatible (Not only reading, but also writing possible)

No time waiting for measuring after power on.
The strap is useful for field inspection and for confirming proper sensor installation.
The SD card (option) simplifies data transmission to PC.
Using the attached input cable, a strain gage is easily connected.
The SME-100A/101A measures data of up to 33 channels by connecting the NTB-100/200 series.

Models

Function / Models	Channels	AC adapter compatible	NTB-100/200 series connection
SME-30A	1		
SME-31A		Yes	
SME-100A	1		Yes
SME-101A	Max. 33	Yes	

SME-30A/31A/100A/101A Specifications

Channels	1 (when using single SME)
	Max. 33 channels by connecting the NTB.
	*Max. 33 channels (SME-100A/101A+ 32 channels of the NTB)
Sampling Period	Approx. 0.5 s: 0 to ± 30 k ×10^{-6} strain
	Approx. 1 s: ± 30 k ×10^{-6} strain or more
	Approx. 1 s: Civil engineering transducers with a thermal sensor
Measuring Functions	RELATIVE measurement (Relative value measurement):
	Each value is obtained by subtracting the ZERO value.
	*ZERO value is equivalent to the initial unbalance value.
	Capable of obtaining the ZERO value at arbitrary timing
Arithmetic Operations	Calculation using coefficients
Measuring Targets	Strain gages, strain-gage transducers,
	civil engineering transducers with a thermal sensor

Bridge systems	Compatible gage resistance
Quarter bridge	120, 240, and 350 Ω
Half/full bridge	120 to 1000 Ω

Bridge Excitation	Constant-voltage bridge excitation: Approx. 2 VDC
	Constant-current bridge excitation: Approx. 5.6 mA
	(Bridge resistance 350 Ω)
Measuring Range	At strain measurement
	0 to ± 300 k ×10^{-6} strain (Constant-voltage bridge excitation)
	0 to ± 20 k ×10^{-6} strain (Constant-current bridge excitation)
	When measuring temperature with civil engineering transducers with a thermal sensor: -30.0 to 70.0°C
Resolution	At strain measurement
	0 to ± 30 k ×10^{-6} strain: 1 ×10^{-6} strain
	± 30 k to ± 300 k ×10^{-6} strain: 10 ×10^{-6} strain
	When measuring temperature with civil engineering transducer with a thermal sensor: 0.1°C
Accuracy (With Full Bridge NDIS4102 (7 pins) Connector)	
	At full bridge strain measurement
	0 to ± 30 k ×10^{-6} strain: ± (0.05% of reading + 2) ×10^{-6} strain
	± 30 k to ± 300 k ×10^{-6} strain: ± (0.1% of reading + 20) ×10^{-6} strain
	When measuring temperature with civil engineering transducers with a thermal sensor: ± 0.5°C
Check Functions	Insulation resistance measurement: 2 M to 100 M Ω
	Resistance measurement: 0 to 20 kΩ
Interval Measurement	1 min to 99 h 59 min in 1 min steps
	Starting time: year/month/day/hour/minute
Storage	SD card (Option)
Applicable Cards	256 MB, 512 MB, 1 GB, 2 GB (FAT16)
	(SDHC and SDXC not supported)
Display	Monochrome LCD, 128 × 64
TEDS	Reads information from TEDS-installed sensors.
	Channel name writing
	(Kyowa ID only in up to 10)
Operating Temperature	-10 to 50°C
Operating Humidity	20 to 85% (Non-condensing)
Power Supply	2 AA alkaline batteries
	Consecutive Operation Time Approx. 10 h
	(With alkaline batteries)
	*Nickel metal hydride batteries are also used.
	*An AC adapter (Optional, SW-0522E) is provided for SME-31A/101A.
Auto Power Off	Power is automatically turned off if no key operation is detected for 5 minutes. In interval measuring mode with an interval of 3 minutes or longer, power is automatically turned off during standby period and turned on again 1 minute before the next measurement is started. (ON/OFF of Auto Power Off is settable.)
Dimensions	188 W × 41 H × 108.4 D mm (Excluding protrusions)
Weight	Approx. 450 g (Excluding batteries)
Compliance	Directive 2014/30/EU (EMC)
	Directive 2011/65/EU, (EU)2015/863
	(10 restricted substances) (RoHS)

Standard Accessories
Input cable U-119
AA alkaline battery × 2
Shoulder belt
Hand strap
Instruction manual (CD-R)
Communication cable N-102 (SME-100A/101A)

Optional Accessories
AC adapter SW-0522E (For SME-31A/101A)
Temperature measuring adapter for SME SMET-1A

SMET-1A Specifications

Measuring Targets	Thermocouples (K, T)	
Channels	1	
Sampling Frequencies	Approx. 0.5 s	
Input	Terminal block	
	Applicable wires	Solid wire: UL AWG14 to 28
		Twisted wire: UL AWG20 to 24

Measuring Range, Accuracy, Resolution

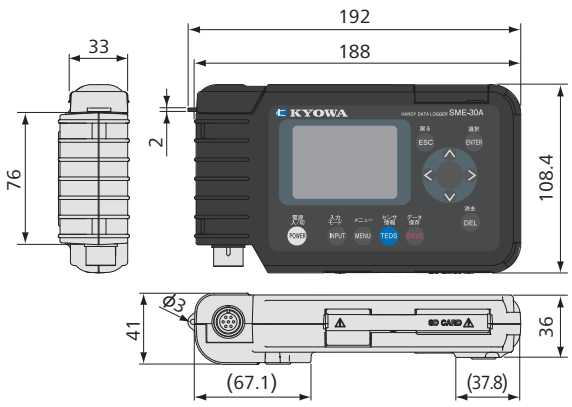
Types	Measuring range	Resolution	Accuracy		Accuracy of internal reference junction compensator (25 ±10°C)
K	-200.0 to 1230.0°C	0.1°C	-200.0 to below -100.0°C	±(0.2% of specified value + 0.6)°C	±2.0 °C
			-100.0 to 1230.0°C	±(0.1% of specified value + 0.4)°C	±1.0 °C
T	-200.0 to 400.0°C		-200.0 to below -100.0°C	±(0.2% of specified value + 0.6)°C	±2.0 °C
			-100.0 to 400.0°C	±(0.1% of specified value + 0.4)°C	±1.0 °C

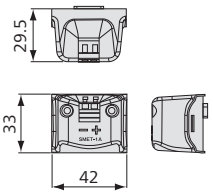
Notes: 1. Accuracy does not include the accuracy of the sensor.
2. For the standard junction compensator, switching between internal and external is possible using the SME.
3. Thermocouple resistance is 1 kΩ or less.

Check Functions	Burnout check (By operation of SME)
Operating Temperature	-10 to 50°C
Operating Humidity	20 to 85% (Non-condensing)
Dimensions	42 W × 33 H ×29.5 D mm (Excluding protrusions)
Weight	Approx. 35 g
Compliance	Directive 2014/30/EU (EMC)
	Directive 2011/65/EU, (EU)2015/863
	(10 restricted substances) (RoHS)

Standard Accessories: Mounting screw×2
Instruction manual (CD-R)

■Dimensions





SMET-1A

SME-30A/31A/100A/101A (SME-31A/100A/101A is the same in dimensions.)

RMH-301B

Digital Strain Recorder

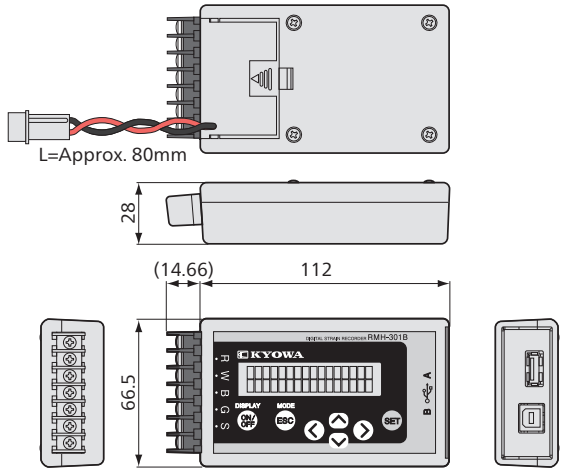
●Collects data by USB memory.

Suitable for long-term measurement in the absence of personnel under the environment without external power supply

●Small & lightweight
●Equipped with a display used to confirm setting conditions and measured values
●Easy to collect data by USB memory

RMH-301B is a battery-powered data collection device with low power consumption, suitable for long-term measurement in the absence of personnel at the places without external power supply such as long-distance mountainous and heavy-snowfall area.
Enables to strain-gage civil engineering transducers and civil engineering transducers with a thermal sensor and of single-channel measurement.
Equipped with operation panel and display enables operation relating to measuring condition setting and measurement.
The optional software (RMH-390A) can be used to control and collect data via USB interface.

■Dimensions



Specifications

■Hardware		
Channels	1	
Applicable Transducers	Strain-gage transducers	
	Strain-gage civil engineering transducers	
	Civil engineering transducer with a thermal sensor	
Compatible Bridge Resistance	350 Ω (Full-bridge system)	
Cable Length	Max. 2.0 km	
	(4-conductor (0.5 mm²) shielded cable)	
Gage Factor	2.00 fixed	
Bridge Current	Approx. 2.19 mA DC (Constant current)	
Temperature Measurement Current		
	Approx. 0.24 mA DC (Constant current)	
Measuring Range	Strain:	±20000 ×10^{-6} strain
	Temperature:	-30.0 to 70.0°C
Resolution	Strain:	1 ×10^{-6} strain
	Temperature:	0.1°C
Measuring Accuracy	Strain:	±0.1%FS
	Temperature:	±0.5°C
Data Storage	Strain:	30720 times
	Temperature:	30720 times
	Strain + temperature:	20475 times
Clock	Year (2 digits of the Gregorian calendar),	
	month, date, hour, and minute	
Measuring Interval	1 to 59 minutes (1 minute/step)	
	1 to 99 hours (1 hour/step)	
Display	LCD (16 digits×2 lines)	
Operation	Arrow keys, ON/OFF, SET, ESC	
Interface	USB1.1*	
Power Supply	6 to 15 VDC, optional battery pack	
Current Consumption	During operation: 100 mA or less	
	Standby status: 100 μA or less	
Input Specifications	Bolt (M3)	
	Applicable press-fitted terminal: RAV, 1.25-3 or equivalent	
Operating Temperature	-20 to 50°C (0 to 50°C for data collection)	
Operating Humidity	10 to 95% (Non-condensing)	
Operating Environment	Dust or the inductive noise of a bulk motor must not be present.	
Dimensions	112 W × 28 H × 66.5 D mm (Excluding protrusions)	
Weight	Approx. 180 g	
■Control Software RMH-390A (Optional Accessories)		
OS	Windows Vista® (32 bits, Japanese version)	
Interface	USB Interface (RMH-301B)	
	CD-ROM or DVD	
	(For software installation)	
CPU	PentiumIII, 1 GHz or advanced	
Memory Required	RAM 512 MB or more	
Hard Disk	Hard disk capacity: 20 MB or more	
	(For installation, excluding that for data)	
	Spare capacity: 10 MB or more	
	(Excluding that for saving measuring data)	
Graphic	High resolution video (Super VGA):	
	800 × 600 or more	
	Adapter and monitor: 1024 ×768	
	Full-color or more	
Others	Keyboard and Microsoft Mouse or compatible pointing devices	

Standard Accessories: Instruction manual (CD-R)

Optional Accessories: USB cable N-38 (1 m), N-39 (2 m)
Battery Pack RB-5A (5 Ah), RB-10A (10 Ah)
Control Software RMH-390A

* Some models of USB memory may not collect data correctly. For recommended models, please contact us.
* Control Software RMH-390A is Japanese version only.

RMH-310A

Digital Strain Recorder

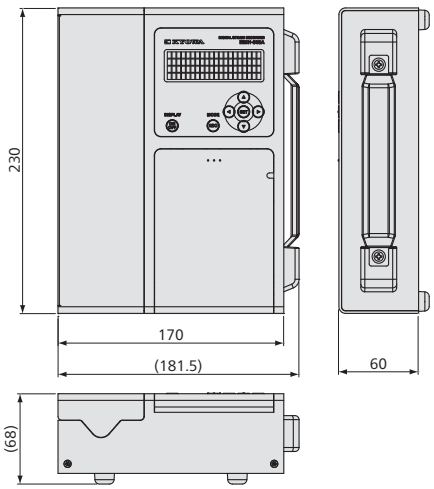
●Collects data by USB memory.

Suitable for long-term measurement in the absence of personnel under the environment without external power supply

- ●Display is provided to enable confirmation of setting conditions and measured values.
- ●Data can easily be collected in USB memory.
- ●No control software required. Keys are provided for operation as an independent unit.
- ●Measurement with thermocouples possible (K, T)

RMH-310A is a battery-operated digital strain recorder featuring low power consumption. Thus, it is suitable for unattended long-term measurement in remote places, mountainous regions and heavy snowfall districts where no power supply is available. This 10-channel recorder can connect to strain-gage civil engineering transducers, civil engineering transducers with temperature measuring function and thermocouples. The operating panel and display enable the user to set measuring conditions and perform measurement-related operation.

■Dimensions



Specifications

Channels	10	
Applicable Transducers	Strain-gage civil engineering transducers	
	Civil engineering transducer with a thermal sensor	
	Strain-gage transducers	
	Thermocouples (Types K and T)	
Compatible Bridge Resistance	350 Ω (Full-bridge system)	
Cable Length	Max. 2.0 km (4-conductor (0.5 mm^2) shielded cable)	
Gage Factor	2.00 fixed	
Bridge Current	Approx. 2.19 mA DC (Constant current)	
Measuring Range	Strain	±20000 ×10^{-6} strain
	Temperature (Civil engineering transducer with a thermal sensor)	-30.0 to 70.0°C
	Temperature (Thermocouple)	K: -200 to 1200 °C
		T: -200 to 350°C
Resolution	Strain	1 ×10^{-6} strain
	Temperature (Civil engineering transducer with a thermal sensor)	0.1°C
	Temperature (Thermocouple)	0.1°C
Accuracy	Strain	±0.1% FS
	Temperature (Civil engineering transducer with a thermal sensor)	±0.5°C
	Temperature (Thermocouple)	(Reference value)
		±(0.1% of reading +1.0)°C
	Internal point-of-contact compensator: Within ±2.0°C (At the time of an input terminal temperature balance)	
	Note: The accuracy of an internal reference point-of-contact compensator and accuracy of a thermocouple are not included in measurement accuracy.	
Temperature Stability	Strain	Zero point Within ±1 ×10^{-6} strain/°C
		Sensitivity Within ±0.02%/°C
	Temperature (Civil engineering transducer with a thermal sensor)	
		Zero point Within ±0.025%FS/°C
		Sensitivity Within ±0.04%/°C
	Temperature (Thermocouple)	
		Zero point Within ±0.025%FS/°C
		Sensitivity Within ±0.04%/°C
Measuring Time	Within 40 s/10 channels (Scanning)	
Temperature Measurement Current	0.24 mA DC (Constant current)	
Data Storage	32000 times/channel	
Clock	Year (2 digits of the Gregorian calendar), month, date, hour, and minute	
Measuring Interval	1 to 59 minutes (1 minute/step)	
	1 to 99 hours (1 hour/step)	
Check Function	Sensor check (Parallel resistance method and during strain measurement)	
	Battery voltage	
	Memory check	
Display	LCD (20 digits × 4 lines, with no back light)	
Display Functions	The contents of the data below are displayed on LCD.	
	Measurement state, current time, data acquisition, real-time monitor, measurement start, measurement stop, condition setting, self-check, date setting, backup data collection, and version display	
Operation	Arrow keys, ON/OFF, SET, ESC	
Interface	USB 2.0 (Only saved in USB memory)	
Power Supply	6 to 15 VDC, optional battery pack	
Current Consumption	During operation: 100 mA or less	
	Standby status: 100 µA at 6 VDC	
Input Specifications	M3 terminals for both solder and screw	
Number of Measurement Times		
	7000 times or more (When measuring at intervals of 10 minutes at 23ºC using the optional RB-10A battery pack [10 Ah])	
Operating Temperature		
	–20 to 50ºC (Varies depending on the operating temperature when using USB memory)	
Operating Humidity	10 to 95%	
Operating Environment	Dust or the inductive noise of a bulk motor must not be present.	
Dimensions	170 W × 230 H × 60 D mm (Excluding protrusions)	
Weight	2 kg or less (Excluding the battery)	
Others	Lightning surge protector provided (SD4-75)	

Standard Accessories Battery cable (For battery pack other than RB-10A)
USB memory for collection data
(Industrial temperature range extended model)
*Auxiliary tool, instruction manual, specifications, outside drawings are saved in the provided USB memory.
Menu sheet

Optional Accessories Battery Pack RB-5A (5 Ah), RB-10A (10 Ah)

Data Recorders/Analyzers

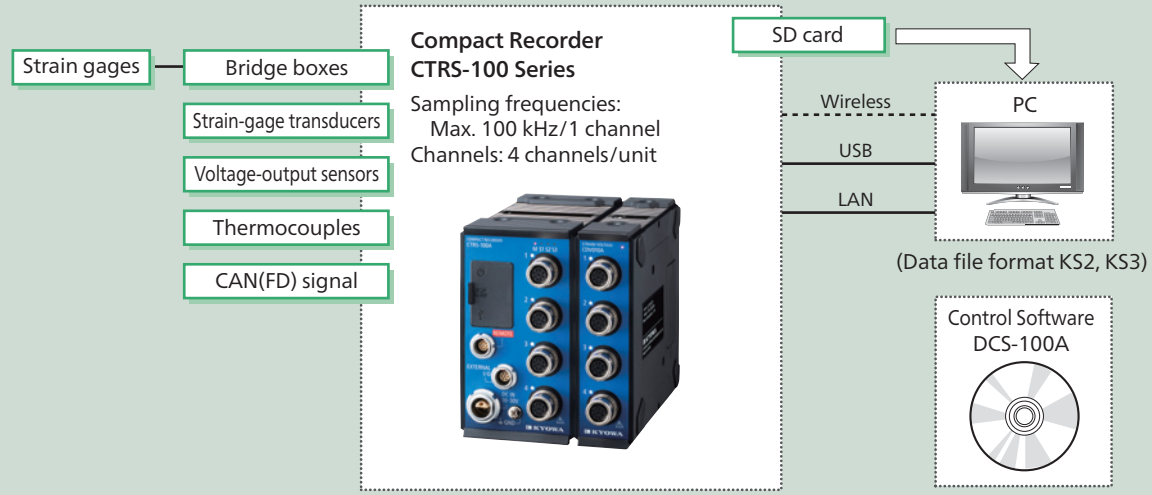
Presently, strain/stress measuring instruments are required not only to enable stable measurement of microvolt signals in indoor and outdoor applications but also to provide data processing capability for compact portable packages. Furthermore, recent advancements in electronics and the trends in information-related fields toward multimedia and downsizing have generated diversified needs including:

- ●Simultaneous measurement of static or dynamic variables ranging from strain/stress to load, pressure, acceleration, displacement, torque, temperature and frequency using not only strain gages and transducers but also voltage-output sensors, thermocouples and pulse-output sensors
- ●Real-time monitoring to enable smooth measurement under the engineer's judgment and control
- ●Statistical processing and waveform analysis of variables under measurement for time and labor savings
- ●Unattended wireless operation

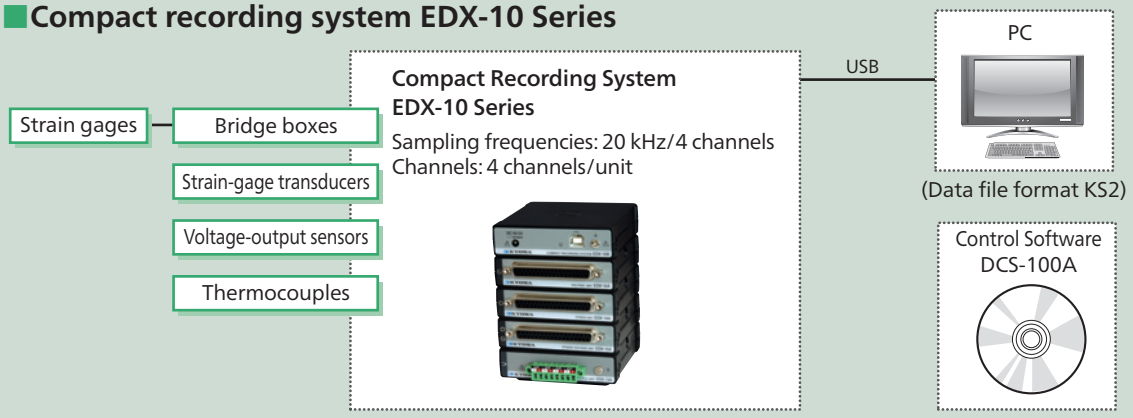
To cope with these demands, Kyowa has been making every effort to:

- •Diversify signal conditioners, develop multi-channel signal conditioner systems and make the processing speed higher,
- •Downsize the instruments and systems,
- •Add monitor functions,
- •Enable processing of data under measurement,
- •Provide instruments and systems with various interfaces such as USB and LAN for operation under PC control,
- •Enable long-term data recording with various storage media such as hard disk and flash memory card.

■Compact recorder CTRS-100 Series

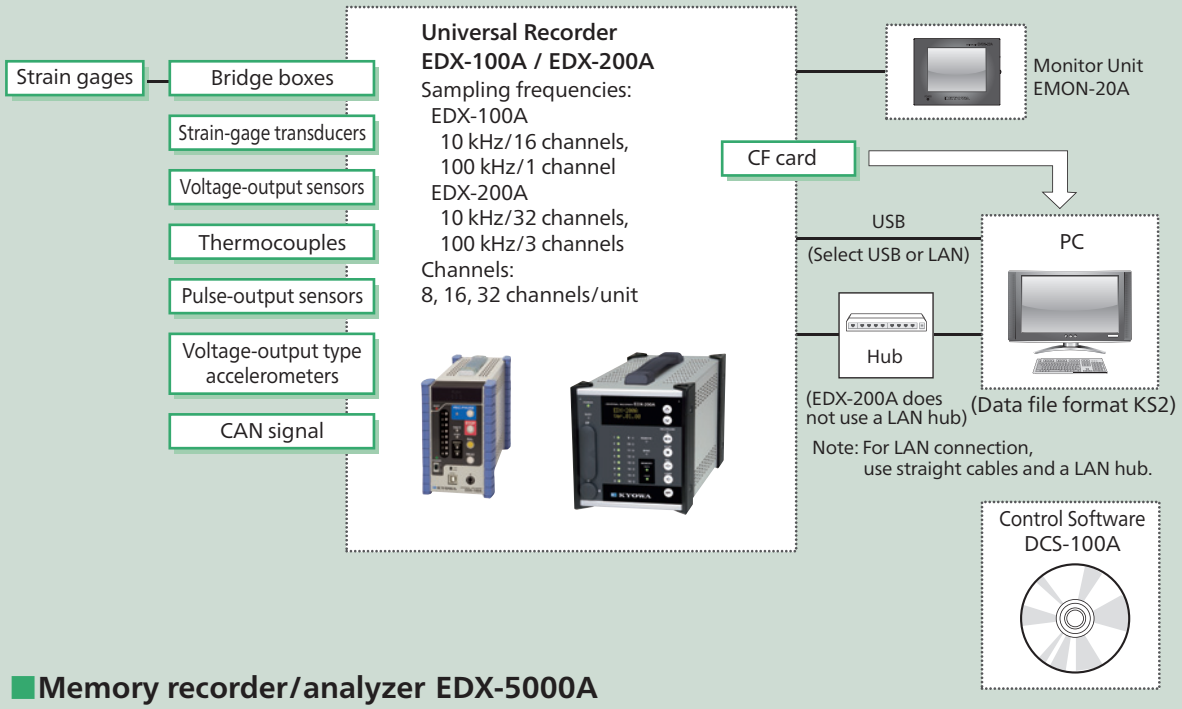


■Compact recording system EDX-10 Series

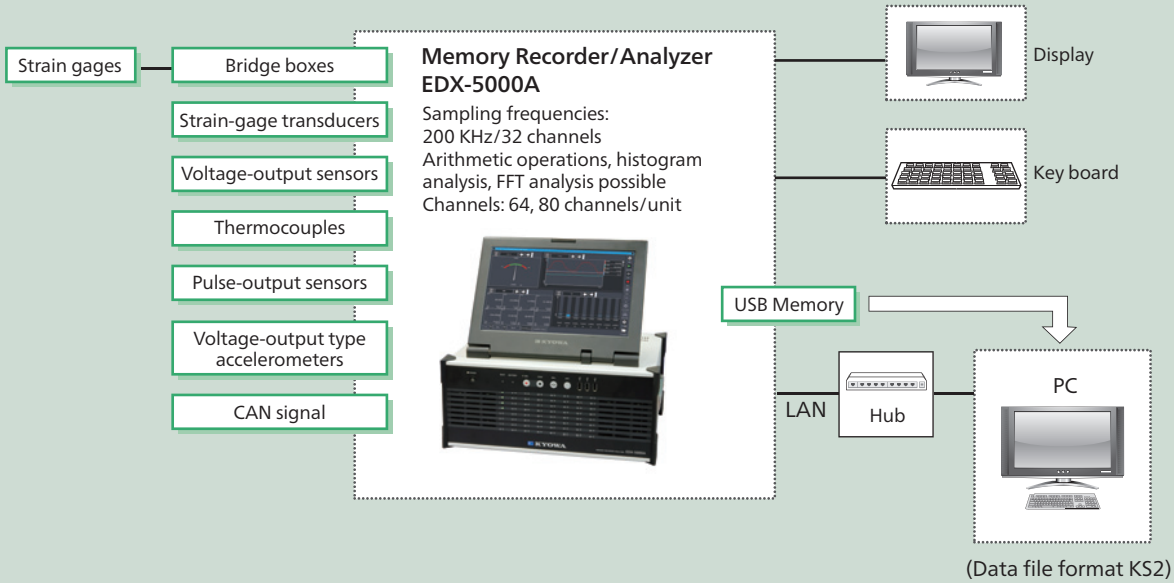


Data Recorders/
Analyzers

Universal recorder EDX-100A, EDX-200A



Memory recorder/analyzer EDX-5000A



Data Recorders/ Analyzers

CTRS-100 Series

Compact Recorder

●Compact & Tough

NEW

TEDS

*CTRS-100A, CTRS-CDV010A, CTRS-BATT010A, CTRS-SYNC010A, CTRS-RCU010A: RoHS compliant models are available. Inquiries are welcome.

Compact and tough data logger

●Modular type for easy expansion and up to 128 channels
●High installation and flexibility
●Shock resistance: 490 m/s² (50 G)
●All channels synchronous 20 kHz (For 4 channels)
Measurement of 1 channel at max. 100 kHz (For strain or voltage measurement)
●Wireless real-time monitoring is possible (When using wireless LAN unit)
●CAN FD compatible (When using CAN unit)

CTRS-100 Series is a compact, lightweight and impact-resistant construction, this can be applied to measurements of various stress in environments where exposed to vibrations and impact in limited spaces such as driving test of two-wheeled vehicles and on actual ships, and to measurements on table-tops.

Configuration

■Main Unit

Compact Recorder
CTRS-100A

■Remote Controller

Remote Control Unit
CTRS-RCU010A

■Battery

Battery Unit
CTRS-BATT010A

■Measuring Units

Strain/Voltage Unit
CTRS-CDV010A

Voltage Unit
CTRS-CVPS010A

Thermocouple Unit
CTRS-CTA010A

■Expansion Units

CAN Unit
CTRS-CAG010A

Wireless LAN Unit for U.S.*
CTRS-WLAN011A
*CTRS-WLAN010A for Japan

Synchronization Unit
CTRS-SYNC010A

CTRS-100A Specifications

■Control Unit Specifications

Connector	
USB Connector	Micro USB Type-B
Remote Control Connector	Used to connect the remote control unit
External I/O Connector	Model: ECA.0B.307.CLN
	Compatible connector: FGA.0B.307.CLAD52
Operating Switch	POWER
Main Unit Display	Status LED
	SD card access indicator LED
Data Recording Media	Kyowa recommended industrial-use SD card
	SD standards: SDHC
	Capacity: 4 GB, 16 GB
	Format: FAT32
	(Operation is not guaranteed if an SD card other than the recommended product is used.)
Communication Interface	USB (USB2.0 High Speed)
	Ethernet*1 (10/100BASE-T)
Number of Units that Can Be Connected	
Measuring Unit	Up to 7 units can be connected per CTRS-100A. (Total of 32 channels)
Expansion Unit	Up to 5 units can be connected per CTRS-100A. However, 2 or more same units cannot be connected and used.
Synchronization between Devices	
Synchronization Method	Use a synchronization unit and synchronous cable to connect CTRS-100As.
Maximum Number of Units that Can Be Synchronized	
	The maximum is four CTRS-100As, and a maximum of 128 measurement channels can be synchronized.
Recorded Data	Data is recorded to each unit's SD card or a PC. *2
Recorded Data	
File Saving Location	SD card
	PC*2
Data Format	Kyowa standard format KS3
Maximum Data File Size	4 GB/1-data-file
	(1 GB = 1000000000 bytes) *3
Data Collection	Online collection: Collect by control software (PC)
	Offline collection: Collect by directly reading data from an SD card to the PC
Measurement Condition Setting Method	
Online Setting	Set by control software (PC)
Offline Setting	Set by reading the measurement-condition settings on the SD card
Recording Modes	
Manual	The user performs operations to start or stop recording.
Trigger (Compound Trigger)	Automatic recording is performed based on the trigger condition setting.
Interval	Automatic recording is performed based on the recording start time and recording interval settings.
Sampling	
Method	Synchronous sampling of all channels
Frequency	1-2-5 series
	1, 2, 5, 10, 20, 50, 100, 200, 500, 1k, 2k, 5k, 10k, 20k, 50k, 100k Hz
	2^n series
	4, 8, 16, 32, 64, 128, 256, 512, 1024, 2048, 4096, 8192, 16384, 32768, 65536 Hz
	Maximum sampling frequency that can be set: 100 kHz / number of measurement channels
External Clock	Clock input from an external device is used as the sampling clock.
	A frequency from 1 Hz to 100 kHz can be set in 1-Hz increments.
	Input a clock within the range of the specified frequency ±5%.
	Voltage level: High-level voltage 2.4 to 5 V Low-level voltage 0 to 0.8 V
	DUTY: 30 to 70%

Trigger Functions	
Trigger Type	・Analog input signal (Analog trigger)
	・External trigger input signal (No-voltage contact, open collector, signal with high-level voltage 2.4 to 5 V and low-level voltage 0 to 0.8 V)
	・Manual (If the REC button is pressed in the trigger awaiting state, recording starts.)
Trigger Level	Any level within the range of ±FS can be set.*4
Trigger Slope	Slope (positive), slope (negative)
Pre-trigger	Specify the amount of data to save from before the start trigger point.
	Any amount up to 524288 data items/the number of measurement channels can be set.
Post-trigger	Specify the amount of data to save from after the end trigger point.
	Any amount up to 524288 data items/the number of measurement channels can be set.
Backup Function	
Backup Target	Setting conditions, balance-adjustment value (Zero suppress value)
Saving Location	Internal nonvolatile memory
External Clock Output	
Signal Level	5 VDC
	The inverted or non-inverted signal can be set.
Division	A clock signal that is synchronized with the sampling clock is divided and output.
	Any division ratio in the range from 1 to 65534 can be set.
Output Modes	Select from always output the clock, only output it while recording, or no output it.
Other Functions	
Specification of the Number of Data Items to Record	
	When the specified number of data items is recorded, recording automatically finishes.
Automatic Recovery Function in Power Interruption*5	
	While recording, if the power supply is interrupted due to a power outage, etc., you can select whether to switch to battery power and continue recording or close the file being recorded and then shut down.
	If the option to shut down is selected, you can select whether to resume recording after the power is restored or enter the standby state.
Recording Recovery Function	
	You can select whether to resume recording or enter the standby state when the POWER switch is turned off while recording and then turned back on.
File Name Assignment	
	Automatically assign a file number or recording date to the recorded-data file name.
Trigger Signal Output	
	Output a trigger signal when in the trigger (Compound trigger) recording mode.
	While on standby: 5 VDC, while recording: 0 VDC

■Measuring Unit Specifications

Item		Strain Measurement	Voltage Measurement
Channels		4	
Input Connector	**Connector Shape**	NDIS4109 (Small round 9 pins) receptacle Model: EPRC07-RX9FNDIS	
	Compatible Plug	NDIS4109 (Small round 9 pins) plug Model: EPRC07-P9MNDIS	
Measuring Targets		Strain gages*6 Strain-gage transducers	Voltage
Compatible Bridge Resistance		When bridge excitation is set to 2 V 120 to 1000 Ω When bridge excitation is set to 5 V 350 to 1000 Ω	—
Gage Factor		2.00 fixed	—
Bridge Excitation/ Sensor Excitation		2, 5 VDC	2, 5 VDC *7 OFF (0 V)
		A maximum of 20 mA per channel can be output.	

Input Impedance		——	3.6 MΩ±10 %
Input Modes		Balanced differential input	
Measuring Range	Setting Method	Any range method or OFF	
	Settable Range	Minimum: 1000 × 10^{-6} strain Maximum: 50000 × 10^{-6} strain	Minimum: 1 V Maximum: 50 V
	Setting Steps	・1000 to 10000 × 10^{-6} strain 100 × 10^{-6} strain steps ・10000 to 50000 × 10^{-6} strain 1000 × 10^{-6} strain steps	・1 to 10 V 0.1 V steps ・10 to 50 V 1 V steps
Range Accuracy		Within ±0.2% FS	
Nonlinearity		Within ±0.1% FS	
Temperature Stability	Zero Point	Within ±(0.009% FS + 0.9 × 10^{-6} strain)/°C	Within ±(0.009% FS + 0.21 mV)/°C
	Sensitivity	Within ±0.03%/°C	
Time Stability	Zero Point	Within ±(0.09% FS + 9 × 10^{-6} strain)/8 h	Within ±(0.09% FS + 0.1 mV)/8 h
	Sensitivity	Within ±0.3%/8 h	
Balance Adjustment	Setting	For each channel, ON, OFF, or NONE can be selected. ON: Execute balance adjustment and set the measured value to zero. OFF: Do not execute balance adjustment again. NONE: Balance adjustment can be disabled to check the initial unbalanced value (input voltage).	
	Operating Method	Execute the balance operation by using the control software*2 or operate the special-remote-control BAL switch.	
	Adjustment Method	Auto balance (Saved in nonvolatile memory)	
	Adjustment Range	Within ±10000 × 10^{-6} strain	Within ±10 V
	Accuracy	Within ± (0.1% FS + 2 × 10^{-6} strain)	Within ±0.1% FS
	NONE Accuracy	Within ±1% FS*8	Within ±0.2% FS
Input Range		Within ±60000 × 10^{-6} strain	Within ±60 V
Common-mode Input Voltage		——	Within ±20 V
Absolute Maximum Rating	Input	±5 V	±70 V
Frequency Response		DC to 20 kHz, -3 ±1 dB (At 20 kHz)	
LPF	Transfer Characteristics	5th-order Butterworth	
	Cutoff Frequency	10, 20, 50, 100, 200, 500, 1k, 2k, 5k, 10k Hz as well as FLAT*9, AUTO*10	
	Amplitude Ratio at Cutoff Point	-3±1 dB	
	Attenuation Characteristics	-30±3 dB/oct.*11	
HPF	Cutoff Frequency	0.2, 1 Hz and OFF	
AD Conversion	Resolution	24 bits	
	Method	Synchronous sampling of all channels	
Indicator		Channel-status LED	
Other Functions	Input Resistance Check Functions	Bridge resistance check function Accuracy within ±2% Used for sensor connection checks	
	TEDS	Read the TEDS information and apply it to the measurement conditions.*2	

■General Specifications

Power Connector	Model: ECP.1S.302.CLL
Power Supply	10 to 30 VDC
Power Consumption	Approx. 3.5 W (When supplying 12 VDC)
Operating Temperature	-10 to 50°C
Operating Humidity	20 to 90% (Non-condensing)
Storage Temperature	-20 to 60°C
Vibration Resistance	49.0 m/s^2 (5 G), 5 to 200 Hz
Shock Resistance	490 m/s^2 (50 G), 11 ms or less, half sine wave
Dimensions	53.2 W × 92 H × 94 D mm (Excluding protrusions or protectors)
Weight	Approx. 420 g
Terminal	GND terminal: M3 bind
Utility Nuts	Size: M4, 12 places

* The measuring unit specifications apply to the state in which the temperature has stabilized after a preheating time of 30 minutes.
*1 A separate synchronization unit and special communication cable are necessary.
*2 Only when online control is performed by a PC
*3 Maximum recording time depends on number of measurement channels and sampling frequency.
Maximum recording time : 1000000000 ÷ number of measurement channels ÷sampling frequency
*4 Analog input signal only
*5 Only when the battery unit is connected
*6 A separate bridge box is necessary.
*7 When the sensor excitation is 2 VDC, the positive side of the sensor excitation is +1 V and the negative side is -1 V.
When the sensor excitation is 5 VDC, the positive side of the sensor excitation is +2.5 V and the negative side is -2.5 V.
*8 When the bridge resistance is 350 Ω
*9 When FLAT is set, the cutoff frequency is set to approx. 25 kHz.
However, the cutoff point amplitude ratio specification is not applied.
*10 When AUTO is set, the cutoff frequency is set to approx. 1/4 the specified sampling frequency.
*11 Excluding cutoff frequencies over 5 kHz

Standard Accessories
Stack-connector caps (female) ×2
SD card (4 GB)
USB cable
CTRS DC power cable P-79
Ground wire P-78
Ballpoint screwdriver
Input connector caps ×4

Optional Accessories
CTRS AC adapter UIA345-12-L-JP
(For U.S.A.: UNI345-1238-L-US)
Various measuring units
Various expansion units
Remote control unit
Connector cap BRA.0B.200.PCSG
Connector cap BRA.1B.200.PCSG
4109P-S32-7 (4-conductor shielded) N-129
4109P-S32-7 (6-conductor shielded) U-136
4109P-BNC plug U-137
4109P-BNC jack U-129
4109P-R05 jack U-138
EXTERNAL I/O cable U-133
SD card (4 GB)
SD card (16 GB) RP-SDFC16SW1
Dynamic Data Acquisition Software DCS-100A
(Please use the latest version.)

CTRS-CDV010A Specifications

Item		Strain Measurement	Voltage Measurement
Channels		4	
Input Connector	Connector Shape	NDIS4109 (Small round 9 pins) receptacle Model: EPRC07-RX9FNDIS	
	Compatible Plug	NDIS4109 (Small round 9 pins) plug Model: EPRC07-P9MNDIS	
Measuring Targets		Strain gages*1 Strain-gage transducers	Voltage
Compatible Bridge Resistance		When bridge excitation is set to 2 V 120 to 1000 Ω When bridge excitation is set to 5 V 350 to 1000 Ω	——
Gage Factor		2.00 fixed	——
Bridge Excitation/ Sensor Excitation		2, 5 VDC	2, 5 VDC *2 OFF (0 V)
		A maximum of 20 mA per channel can be output.	
Input Impedance		——	3.6 MΩ±10%
Input Modes		Balanced differential input	
Measuring Range	Setting Method	Any range method or OFF	
	Settable Range	Minimum: 1000 × 10^{-6} strain Maximum: 50000 × 10^{-6} strain	Minimum: 1 V Maximum: 50 V
	Setting Steps	・1000 to 10000 × 10^{-6} strain 100 × 10^{-6} strain steps ・10000 to 50000 × 10^{-6} strain 1000 × 10^{-6} strain steps	・1 to 10 V 0.1 V steps ・10 to 50 V 1 V steps
Range Accuracy		Within ±0.2% FS	
Nonlinearity		Within ±0.1% FS	
Temperature Stability	Zero Point	Within ± (0.009% FS + 0.9 × 10^{-6} strain)/°C	Within ± (0.009% FS + 0.21 mV)/°C
	Sensitivity	Within ±0.03%/°C	
Time Stability	Zero Point	Within ± (0.09% FS + 9 × 10^{-6} strain)/8 h	Within ± (0.09% FS + 0.1 mV)/8 h
	Sensitivity	Within ±0.3%/8 h	
Balance Adjustment	Setting	For each channel, ON, OFF, or NONE can be selected. ON: Execute balance adjustment and set the measured value to zero. OFF: Do not execute balance adjustment again. NONE: Balance adjustment can be disabled to check the initial unbalanced value (Input voltage).	
	Operating Method	Execute the balance operation by using the control software*3 or operate the special-remote-control BAL switch.	
	Adjustment Method	Auto balance (Saved in nonvolatile memory)	
	Adjustment Range	Within ±10000 × 10^{-6} strain	Within ±10 V
	Accuracy	Within ± (0.1% FS + 2 × 10^{-6} strain)	Within ±0.1% FS
	NONE Accuracy	Within ±1% FS*4	Within ±0.2% FS
Input Range		Within ±60000 × 10^{-6} strain	Within ±60 V
Common-mode Input Voltage		——	Within ±20 V
Absolute Maximum Rating	Input	±5 V	±70 V
Frequency Response		DC to 20 kHz, -3 ±1 dB (At 20 kHz)	
LPF	Transfer Characteristics	5th-order Butterworth	
	Cutoff Frequency	10, 20, 50, 100, 200, 500, 1k, 2k, 5k, 10k Hz as well as FLAT*5, AUTO*6	
	Amplitude Ratio at Cutoff Point	-3±1 dB	
	Attenuation Characteristics	-30±3 dB/oct.*7	
HPF	Cutoff Frequency	0.2, 1 Hz and OFF	
AD Conversion	Resolution	24 bits	
	Method	Synchronous sampling of all channels	
Indicator		Status LED, channel-status LED	
Other Functions	Input Resistance Check Functions	Bridge resistance check function Accuracy within ±2% Used for sensor connection checks	
	TEDS	Read the TEDS information and apply it to the measurement conditions.*3	

Power Supply	Supplied by the CTRS-100A or CTRS-BATT010A
Power Consumption	Approx. 2.1 W (When supplying 12 VDC)
Operating Temperature	-10 to 50°C
Operating Humidity	20 to 90% (Non-condensing)
Storage Temperature	-20 to 60°C
Vibration Resistance	49.0 m/s² (5 G), 5 to 200 Hz
Shock Resistance	490 m/s² (50 G), 11 ms or less, half sine wave
Dimensions	26.6 W × 92 H × 94 D mm (Excluding protrusions and protectors)
Weight	Approx. 240 g
Utility Nuts	Size: M4, 6 places

* The measuring unit specifications apply to the state in which the temperature has stabilized after a preheating time of 30 minutes.
*1 A separate bridge box is necessary.
*2 When the sensor excitation is 2 VDC, the positive side of the sensor excitation is +1 V and the negative side is -1 V.
When the sensor excitation is 5 VDC, the positive side of the sensor excitation is +2.5 V and the negative side is -2.5 V.
*3 Only when online control is performed by a PC.
*4 When the bridge resistance is 350 Ω
*5 When FLAT is set, the cutoff frequency is set to approx. 25 kHz.
However, the cutoff point amplitude ratio specification is not applied.
*6 When AUTO is set, the cutoff frequency is set to approx. 1/4 the specified sampling frequency.
*7 Excluding cutoff frequencies over 5 kHz

Standard Accessories
Stack-connector cap (female)
Stack-connector cap (male)
Input connector caps ×4

Optional Accessories
4109P-S32-7 (4-conductor shielded) N-129
4109P-S32-7 (6-conductor shielded) U-136
4109P-BNC plug U-137
4109P-BNC jack U-129
4109P-R05 jack U-138

CTRS-CVPS010A Specifications

Channels	4 (Isolated input circuit)
Input Connector	
Connector Shape	NDIS4109 (Small round 9 pins) receptacle
	Model: EPRC07-RX9FNDIS
Compatible Plug	NDIS4109 (Small round 9 pins) plug
	Model: EPRC07-P9MNDIS
Measuring Targets	Voltage
Sensor Excitation	5, 10 VDC, OFF
	Accuracy: Within ±0.2%
	Channel 1 and 2: A maximum of 35 mA per channel can be output.
	Channel 3 and 4: A maximum of 15 mA per channel can be output.
Input Impedance	(1.8 MΩ+1.8 MΩ) ±10%
Input Modes	Balanced differential input
Measuring Range	
Setting Method	Any range method or OFF
Settable Range	Minimum: 0.2 V
	Maximum: 50 V
Setting Steps	0.2 to 10 V: 0.1 V steps
	10 to 50 V: 1 V steps
Range Accuracy	Within ±0.2% FS
	(Apply to an ambient temperature of 23 ±5°C and a stable temperature after 30 minutes of preheating time.)
Nonlinearity	Within ±0.1% FS
Temperature Stability	
Zero Point	Within ±(0.009% FS + 0.21 mV)/°C
Sensitivity	Within ±0.03%/°C
Time Stability	
Zero Point	Within ±0.05% FS/8 h
Sensitivity	Within ±0.05%/8 h
Zero Suppress	
Setting	For each channel, ON, OFF, or NONE can be selected. ON: Execute zero suppress and set the measured value to zero. OFF: Do not execute zero suppress again. NONE: Zero suppress can be disabled to check the initial unbalanced value (Input voltage).
Operating Method	Execute the zero suppress by using the control software or operate the special-remote-control BAL switch.

Adjustment Method	Auto balance (Saved in nonvolatile memory)
Adjustment Range	When 0.2 to 0.9 V range: Within ±5 V
	When 1 to 50 V range: Within ±10 V
Accuracy	Within ±0.1% FS
NONE Accuracy	When 0.2 to 0.4 V range: Within ±1 mV
	When 0.5 to 50 V range: Within ±0.2% FS
	(Apply to an ambient temperature of 23 ±5°C
	and a stable temperature after 30 minutes of
	preheating time.)
Input Voltage Range	Within ±60 V
Common-mode Input Voltage	Within ±20 V
Absolute Maximum Rating	
Input	±70 V
Frequency Response	DC to 20k Hz (At 20k Hz input, -3 ±1 dB)
LPF	
Transfer Characteristics	5th-order Butterworth
Cutoff Frequency	10, 20, 50, 100, 200, 500, 1k, 2k, 5k, 10k Hz,
	FLAT, AUTO
	When FLAT is set, the cutoff frequency is set to
	approx. 25k Hz.
	When AUTO is set, the cutoff frequency is set to
	approx. 1/4 the specified sampling frequency.
Amplitude Ratio at Cutoff Point	-3±1 dB
Attenuation Characteristics	When the cutoff frequency is less than 5k Hz:
	-30 ±3 dB/oct.
	When the cutoff frequency exceeds 5k Hz:
	-30 (+3, -12) dB/oct.
HPF	
Cutoff Frequency	0.2, 1 Hz and OFF
Attenuation Characteristics	-6 dB/oct.
AD Conversion Resolution	24 bits
Sampling Method	Synchronous sampling of all channels
Indicator	Status LED, channel-status LED
Other Functions	
TEDS	Read the TEDS information and apply it to the
	measurement conditions.
	(Only when online control is performed by a PC.)
Isolation	Between input to GND (Non-isolated between
	channels), withstand voltage 250 VAC for
	1 minute.
Power Supply	Supplied by the CTRS-100A or CTRS-BATT010A
Power Consumption	Approx. 3.1 W (When supplying 12 VDC)
Operating Temperature	-10 to 50°C
Operating Humidity	20 to 90% (Non-condensing)
Storage Temperature	-20 to 60°C
Vibration Resistance	49.0 m/s^2 (5 G), 5 to 200 Hz
Shock Resistance	490 m/s^2 (50 G), 11 ms or less, half sine wave
Dimensions	26.6 W × 92 H × 94 D mm
	(Excluding protrusions and protectors)
Weight	Approx. 240 g
Utility Nuts	Size: M4, 6 places

Standard Accessories Stack-connector cap (female)
Stack-connector cap (male)
Input connector caps × 4

Optional Accessories 4109P-S32-7(6-conductor shielded) U-136
4109P-BNC PLUG U-137
4109P-BNC jack U-129
4109P-R05 JACK U-138

CTRS-CTA010A Specifications

Channels	4
Input Connector[*1]	
Connector Shape	Push-in spring connection
Connection Capacity	Conductor cross section solid / flexible
	0.2 mm^2...1.5 mm^2
	Conductor cross section AWG / kcmil 24...16
	Stripping length 8 mm
Measuring Targets	Thermocouples
Measuring Targets[*2]	K, T, J, N
Measuring Range	K: -200.0 to 1370.0 C
	T: -200.0 to 400.0 C
	J: -200.0 to 1200.0 C
	N: -200.0 to 1300.0 C
Resolution	0.1 °C
Accuracy	
External Reference Junction Compensator	
Above -100 C Within	0.1% of reading 0.4 °C
Below -100 C Within	0.2% of reading 0.6 °C
Internal Reference Junction Compensator	
Ambient temperature 15 °C to 3 °C	
Above -100 C Within	0.1% of reading 1.4 °C
Below -100 C Within	0.2% of reading 1.6 °C
Ambient temperature -10 °C to 50 °C	
Above -100 C Within	0.1% of reading 2.4 °C
Below -100 C Within	0.2% of reading 2.6 °C
Sampling System	Scanning
Inside Sampling Frequencies	Approx. 0.5 Hz, approx. 2.0 Hz
Indicator	State indicator LED
Check Functions	Burnout check
Withstand Voltage	500VAC for 1min. between input and case
	(Output)
Power Supply	Supplied by the CTRS-100A or CTRS-BATT010A
Power Consumption	Approx. 0.7 W (when supplying 12 VDC)
Operating Temperature	-10 to 50 °C
Operating Humidity	20 to 90% (Non-condensing)
Storage Temperature	-20 to 60 °C
Vibration Resistance	49.0 m/s^2 (5 G), 5 to 200 Hz
Shock Resistance	490 m/s^2 (50 G), 11 ms or less, half sine wave
Dimensions	26.6 W × 92 H × 94 D mm (Excluding protrusions or protectors)
	26.6 W × 92 H × 127 D mm (Excluding protrusions or protectors, including the temperature measuring adapter)
Weight	Approx. 240 g, excluding the temperature measuring adapter
	Approx. 260 g, including the temperature measuring adapter
Utility Nuts	Size: M4, 6 places

*The measuring unit specifications apply to the state in which the temperature has stabilized after a preheating time of 30 minutes.
*1 Mounted on temperature measuring adapter
*2 Thermocouple resistance 1 kΩ or less

Standard Accessories Stack-connector cap (female)
Stack-connector cap (male)
Temperature measuring adapter CT-3A-4

Optional Accessories Temperature measuring adapter CT-3A-4

Data Recorders/
Analyzers

CTRS-CAG010A Specifications

CAN Ports	2
CAN Port Connector	ECB.1B.303.CLN LEMO made
	(Compatible plug FGB.1B.303.CLAD62Z)
CAN Protocol	ISO/DIS 11898-1 compliant
	*Support for CAN and CAN FD Frames
Supported Physical Layer	ISO 11898-2 and ISO 11898-5
	*Low Speed CAN not supported
Termination Resistor	Implementation (Selectable ON/OFF)
Communication Speed	1000, 800, 500, 250, 125, 100, 83.3, 62.5,
	50, 33.3, 25, 20, 10 kbps
CAN FD Data Bit Rate	5, 4, 2, 1, 0.5 Mbps, OFF
	*Limited by communication speed. Refer to
	The Configurable CAN FD Data Bit Rate Table.
CAN Recording Mode	Selected CAN ID mode (max. 1024 messages)
	All CAN ID mode
	*CAN trigger is not available
	(with all CAN ID mode).
Listen Only Mode	(Selectable ON/OFF)
	*CAN data output is not available with listen
	only mode.
CAN Data Output	Predetermined CAN data can be output up
	to 32 messages at one time.
CAN Data Output Timing	Output at start/ Output at stop/
	Interval/ Manual
CAN Trigger	Received CAN messages can be used as
	trigger source.
CAN Trigger Type	Manual / Analog / Digital / Composite
Other Function	Automatic communication speed check
Power Supply	Supplied by the CTRS-100A or CTRS-BATT010A
Power Consumption	Approx. 0.6 W (when supplying 12 VDC)
Operating Temperature	-10 to 50°C
Operating Humidity	20 to 90% (Non-condensing)
Storage Temperature	-20 to 60°C
Vibration Resistance	49.0 m/s^2 (5 G), 5 to 200 Hz
Shock Resistance	490 m/s^2 (50 G), 11 ms or less, half sine wave
Dimensions	26.6 W × 92 H × 94 D mm
	(Excluding protrusions or protectors)
Weight	Approx. 220 g
Utility Nuts	Size: M4, 6 places

The Configurable CAN FD Data Bit Rate Table

Communication Speed [kbps]	CAN FD Data Bit Rate [Mbps]
1000, 800	2, 1, OFF
500, 250	5, 4, 2, 1, 0.5, OFF
125	2, 1, 0.5, OFF
100, 83.3, 62.5	1, 0.5, OFF
50, 33.3	0.5, OFF
25, 20, 10	OFF

Standard Accessories Stack-connector cap (female)
Stack-connector cap (male)

Optional Accessories CTRS CAN cable 9-pin male D-sub U-135

CTRS-BATT010A Specifications

Type of Battery	Lithium-ion battery
	United Nations Recommendations on the Transport
	of Dangerous Goods UN 38.3 safety tests: Passed
	The UN 38.3 safety test certification and a certificate
	of Safe Transport of Chemical Goods (Test Report)
	issued by the Shanghai Research
	Institute of Chemical Industry, China: Received
Input (DC IN)	10 to 30 VDC
	Connector: ECP.1S.302.CLL (LEMO)
	Compatible plug: FFA.1S.302.CLA** (LEMO)
	** stands for the collet type, size number, etc.
Output	Voltage 10 VDC
	Current Maximum: 2.5 A (Ambient temperature: 0 to 40°C)
	Maximum: 1.5 A (Ambient temperature: -10 to 0°C)
	Maximum: 2.0 A (Ambient temperature: 40 to 50°C)
Operating Switch	Battery-check switch
	Press once : Remaining battery power check
	The battery-check LED indicates the
	remaining battery power.
	Hold down (For approx. one second) :
	Battery integrity check
	The battery-check LED indicates the
	integrity.
Indicator	Status LEDs: 1
	During external-power operation: Lit up in blue
	During battery operation: Lit up in purple
	(The LED flashes purple when the remaining battery
	power is less than 30%.)
	When an error occurs: Flashes red
	Battery-check LEDs: 3
	When checking the remaining battery power (Lit up
	in blue)
	●/●/● 100 to 70%
	●/●/— 69 to 30%
	●/—/— 29 to 0%
	* Flashes red at 5% or less
	When checking the integrity (Lit up in purple)
	●/●/● Good
	●/●/— Caution
	●/—/— Replacement required
	When an error occurs: Flashes red (All 3)
	(●: Lit up, -: Off)
Charging Time[*1]	
When Charging the Battery Alone	
	4.5 h or less (Ambient temperature 10 to 40°C)
	7.0 h or less (Ambient temperature 0 to 10°C)
When Supplying Power to the System and Charging the Battery at the Same Time	
	7.0 h or less (Ambient temperature 10 to 40°C)
	10.0 h or less (Ambient temperature 0 to 10°C) [*2]
Discharge Time	During 2.5 A (25 W) output: 60 min or more
	During 0.5 A (5 W) output: 300 min or more
	* When using a new battery at an ambient
	temperature of 25 ±10°C
	(Reference) The power consumption of each unit is
	as follows:
	CTRS-100A 3.5 W
	CTRS-CDV010A 2.1 W
	CTRS-SYNC010A 0.3 W
Because the total power consumption in the case of analog measurement	
on 32 channels + the use of synchronization unit is approx. 18.5 W,	
operation for 80 minutes or more is possible.	
Operating Temperature	
Charging	0 to 40°C
Discharging	-10 to 50°C
Operating Humidity	20 to 90% (Non-condensing)
Storage Temperature	-20 to 50°C
* In the case of long-term storage for one month or more, avoid high	
temperatures or humidity, and store the unit at 40°C or less.	
Vibration Resistance	49.0 m/s^2 (5 G), 5 to 200 Hz
Shock Resistance	490 m/s^2 (50 G), 11 ms or less, half sine wave
Dimensions	53.2 W × 92 H × 94 D mm
	(Excluding protrusions or protectors)
Weight	Approx. 570 g
Utility Nuts	Size: M4, 12 places
Battery Pack Replacement	Handled by Kyowa
	(Replacement by the user is not possible.)

*1 If the battery is hot, it may stop charging before it is fully charged for safety reasons. This is not a malfunction.
*2 Depending on the environment, charging may stop before the battery is fully charged for safety reasons. This is not a malfunction.

Standard Accessories Stack-connector cap (male)

Optional Accessories CTRS AC adapter UIA345-12-L-JP
(For U.S.A.: UNI345-1238-L-US)
CTRS DC power cable P-79
Connector cap BRA.1B.200.PCSG

CTRS-WLAN010A/011A Specifications

Item		Details
Supported Functions		Collection of collected data, setting of measurement conditions, real-time monitoring *1
Operating Switch		"WIRELESS" : Enables or disables the wireless LAN unit operation. "SETUP" : Use the "Easy connection function" *2. "RESET" : Reset SSID and security key to factory default.
Indicator		Status LED, Wireless LAN status LED (2.4 GHz and 5 GHz)
Radio Section	Compliance Standard	IEEE 802.11 a/b/g/n/ac
	Frequency	2.4 GHz and 5 GHz
	Channel	CTRS-WLAN010A 2.4 GHz : 1 to 13 ch 5 GHz : 36, 40, 44, 48 ch (W52) *3 CTRS-WLAN011A 2.4 GHz : 1 to 11 ch 5 GHz : 36, 40, 44, 48 ch (W52) *3 149, 153, 157, 161, 165 ch (W58) *3
	Security	WPA2-PSK(AES), WPA-PSK(AUTO/TKIP) *4, None
	Network Type	Access point mode
	Number of Simultaneous Connections to a PC	1
	Antenna	Built-in antenna
	Country *5	CTRS-WLAN010A: Japan CTRS-WLAN011A: U.S.
	Other Functions	Easy connection function, DHCP server function *6
Power Supply		Supplied by the CTRS-100A or CTRS-BATT010A
Power Consumption		Approx. 2.0 W (When supplying 12 VDC)
Operating Temperature		-10 to 50°C
Operation Humidity		20 to 90% (Non-condensing)
Storage Temperature		-20 to 60°C
Vibration Resistance		49.0 m/s² (5 G), 5 to 200 Hz
Shock Resistance		490 m/s² (50 G), 11 ms or less, half sine wave
Dimensions		26.6 W × 92 H × 94 D mm (Excluding protrusions or protectors)
Weight		Approx. 200 g
Utility Nuts		Size: M4, 6 places

*1 Depending on the radio wave environment of the installation location, the monitor may stop due to a decrease in the transfer rate of wireless LAN communication.
*2 Communicate with WPS (Wi-Fi Protected Setup) compatible devices and use wireless LAN Easy to configure complex security settings. (Equivalent to WPS 2.0)
*3 5 GHz band is for indoor use only. (Do not use outdoors)
*4 When WPA-PSK(AUTO/TKIP) is selected, the "Easy connection function" cannot be used.
*5 Not available in other countries.
*6 The IP address of the wireless connection device (PC) can be set automatically.

Standard Accessories Stack-connector cap (male)
Stack-connector cap (female)

Optional Accessories CTRS Network Utility Software
*Free of charge, please download from our website.

CTRS-SYNC010A Specifications

Connector	Synchronous input connector
	Synchronous output connector
Indicator	Status LED
	REMOTE LED
Operating Switch	
4-bit DIP Switch	ETHERNET-USB communication switch: 1 bit
	Device ID setting: 2 bits
	Reserved: 1 bit
Synchronous Operation Function	
Number of Unit that Can Be Connected	
	A maximum of four units can be connected in a cascade by using synchronous cable.
Recorded Data	Recorded data can be saved to the SD card for each CTRS-100A as a separate file or to a PC (Only when online control is performed by the PC).
Ethernet Communication	Communication is possible by connecting a communication cable. * Ethernet communication is possible at a distance of up to 52.8 m by extending the communication cable by using an RJ-45 relay connector (Kyowa recommended items) and LAN cable (Kyowa recommended items).
Distance between Devices	2 m or less
Power Supply	Supplied by the CTRS-100A or CTRS-BATT010A
Operating Temperature	-10 to 50°C
Operating Humidity	20 to 90% (Non-condensing)
Storage Temperature	-20 to 60°C
Vibration Resistance	49.0 m/s² (5 G), 5 to 200 Hz
Shock Resistance	490 m/s² (50 G), 11 ms or less, half sine wave
Power Consumption	Approx. 0.3 W
Dimensions	26.6 W × 92 H × 94 D mm (Excluding protrusions and protectors)
Weight	Approx. 200 g
Utility Nuts	Size: M4, 6 places

Standard Accessories Stack-connector cap (female)
Stack-connector cap (male)

Optional Accessories CTRS sync cable N-130
CTRS communication cable N-131
LAN cable 20m NWYC5E-STP-S-BL-20
LAN cable 50m LD-CTTBU500
RJ-45 relay adapter ADT-EX-STPN
Connector cap BRA.1B.200.PCSG

CTRS-RCU010A Specifications

Operating Button Switch	
REC	Start recording.
	Operating method: Press the button once.
STOP	Stop recording.
	Operating method: Press the button once or twice.*1
BAL	Execute a balance operation.
	Operating method: Press the button twice or hold it down.*1
READ	Read the condition settings from the SD card.
	Operating method: Hold down the button.
OPTION 1, OPTION 2	Use the control software to assign any function to these buttons for use.
	Operating method: Press the button once.
	•Monitor
	•Delete the latest data file
	•Over reset
	•PAUSE
Indicator	Status LED
	Remaining-battery-power indicator LED
	Remaining-SD-card-space indicator LED
	Range-over indicator LED
	REC LED
	BAL LED
	READ LED
	OPTION 1 LED
	OPTION 2 LED
Other Functions	Built-in buzzer
	Strap hole
Operating Temperature	-10 to 50°C
Operating Humidity	20 to 90% (Non-condensing)
Storage Temperature	-20 to 60°C
Vibration Resistance	49.0 m/s² (5 G), 5 to 200 Hz
Shock Resistance	490 m/s² (50 G), 11 ms or less, half sine wave
Power Consumption	Approx. 0.2 W
Dimensions	46 W × 90 H × 20 D mm (Excluding protrusions)
Weight	Approx. 120 g
Utility Nuts	Size: M3, 6 places

*1 This can be switched by using the control software.
* Hold down: To press and hold down a button for at least one second.
Press twice: To press a button switch twice within 0.5 seconds.

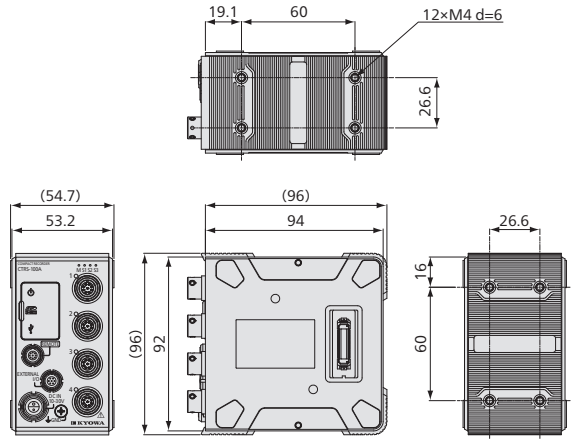
DCS-100A software, specification for control of CTRS-100 series

***For details of DCS-100A, see chapter 4.**

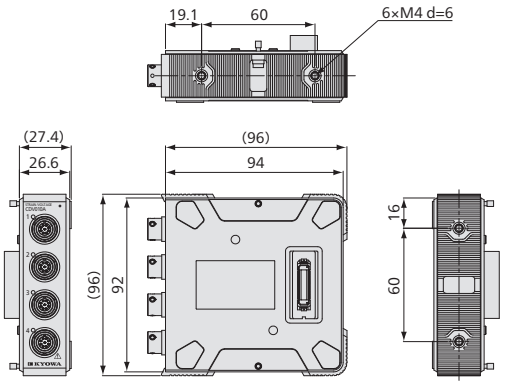
Units	Up to 4 units (up to 128 analog channels.)
Interfaces	USB (USB2.0 High Speed) or Ethernet* (10/100BASE-T)
	*A separate synchronous unit and special communication cable are necessary.
Saving Format	Saves the measured data in the CTRS-100A SD card or PC folder.
	When saving to the SD card of CTRS-100A, save the KS3 file to the SD card of CTRS-100A.
	Save and convert to a KS2 file (01.06) when retrieving the PC.
	When saving to PC folder, save as KS2 file (01.06).
Channel Conditions	Measuring ON/OFF, Measuring mode, Range (Arbitrary input), HPF, LPF, Balance adjustment ON/OFF/NONE, Input resistance check ON/OFF, Calibr. const., Offset, Cable correction value, Offset ZERO Value, Unit, Channel name, Measuring range, Rated capacity, Rated output, Deci Digits, Chk. Val. (Up), Chk. Val. (Down), Offset ZERO ON/OFF, TEDS User Data, TEDS Sensor Model, TEDS Sensor S/N, TEDS ROMID (Display items can freely be selected.)
TEDS	Loads the TEDS information automatically and sets the channel conditions.
Setting Parameter and Loading Parameter	
	Loads and sets the CTRS-100A internal parameter.
Saving and Loading Meas Condition File	
	Loads and saves the meas condition file. (Extension: C1H)
	The meas condition file includes environment settings, channel conditions, measuring conditions, display conditions on graphs and on numeric windows, and arithmetic operation conditions (Optional).
Saving and Loading CTRS-100A Condition File	
	Loads and saves the CTRS-100A condition file (Extension:SET) by using the SD card.
Collecting Data File	Convert KS3 files in CTRS-100A SD card to KS2 files and recover.
Deleting Data File	PC deletes the file (KS3) saved in the CTRS-100A SD card.
Formatting SD Card	PC formats the CTRS-100A SD card.
Setting Environment	
Setting Hardware Configuration	
	Sets Interface, the number of units and device names.
	Loads the hardware configurations from the CTRS-100A.
Communication Check	Loads the CTRS-100A version.
Device Confirmation	LEDs, on the CTRS-100A front panel, light up.
Others	Remote control unit operation beep, balance standard value, PAUSE ON/OFF, detailed hardware information display
When the CAN Unit is Installed	
Recording CAN Data	Records up to 1024 message CAN data per one unit. (as the KC3 file).
	* When saving to PC folder, Up to 1 CAN unit to be measured.
CAN Data Output	Start, Stop, Interval, Manual
■When Saving the Measured Data in the CTRS-100A SD Card	
Sampling Frequencies	1 Hz to 100k Hz (1-2-5 series, 2^n series, external clock)
	*Limited by the number of channels.
Number of Data/CH	Up to 1000000000 data
Measure Modes	Manual, Manual (Set Record Data), Interval, Analog Trigger, External Trigger, Manual Trigger, Complex Trigger
Manual Measurement	Records data from REC to STOP or from REC to the number of data, specified on the Manual (Set Record Data).
	Recorindg start time settable.
Interval Measurement	Records data automatically based on the preset starting time and recording interval.
Trigger Measurement	Starts/stops recording data based on the preset trigger conditions.
Common Trigger Conditions	
End Trigger	Settable
Delay	Up to 524288 data for both start and end.
	*The delay time varies with the number of channels.
Analog Trigger Conditions	
Trigger Channels	Any 1 channel of the master unit
Trigger Level	Physical quantity
Trigger Slope	Positive or Negative
External Trigger Conditions	
Trigger Slope	Positive or Negative
Manual Trigger Conditions	
Complex Trigger Conditions	
Trigger Source	Select from the analog channels (any 4 channels of the master unit), external trigger, or manual trigger.
	Capable of judging the trigger source by using the logical AND and OR operators.
Trigger Level	Physical quantity
Trigger Slope	Positive or Negative
CAN Trigger Conditions	
Common CAN	Trigger conditions
End Trigger	Settable
Delay	Only end.
	With measurement CH : Up to 174762 s,
	No measurement CH : Up to 65535 s
	The delay time varies with the sampling frequency and the number of channels.
Manual Trigger Conditions	
Analog Trigger Conditions	
Trigger Channel	Any 1 signal of the master unit
Trigger Level	Physical quantity
Trigger Slope	Positive or Negative
Digital Trigger Conditions	
Trigger Channel	Any 1 signal of the master unit
Trigger Bit	Any 1 bit
Trigger Slope	Positive, Negative, or Level
Complex Trigger Conditions	
Trigger Source	Trigger channel (any 8 signals of the master unit)
	Select form analog trigger or digital trigger.
	Trigger sources can be logically identified by AND / OR at once.
Repeated Recording	When recording data for a long time, the DCS-100A saves data, every preset number of data or every preset interval, in the KS3 format file.
	*Measure Mode: Manual (Set Record Data) only.
Data File	File name, File Title,
	Grant rule: File No. or Recording start time.
	File No.: 3 to 5 digits.
■When Saving the Measured Data in the PC Folder	
Sampling Frequencies	1 Hz to 100k Hz (1-2-5 series, 2^n series, external clock)
	*Limited by the number of channels.
File Size	Up to the data drive capacity.
Measure Modes	Manual, Manual (Set Record Data), Interval, Analog Trigger
Manual Measurement	Records data from REC to STOP or from REC to the number of data, specified on the Manual (Set Record Data).
Interval Measurement	Records data automatically based on the preset starting time and recording interval.
Analog Trigger Measurement	Starts/stops recording data based on the preset trigger conditions.
End Trigger	Settable
	Delay Up to 524288 data for both start and end.
	*The delay time varies with the number of channels.
Trigger Channels	Any 1 channel
Trigger Level	Physical quantity
Trigger Slope	Positive or Negative
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.
	*Measure Mode: Manual and Interval only.
Repeated Recording	When recording data for a long time, the DCS-100A saves data, every preset number of data or every preset interval, in the KS2 format file.
	*Measure Mode: Manual (Set Record Data) only.
Data File	File name, File Title
	Grant rule: File No. only.
	File No.: 4 digits only.

Dimensions

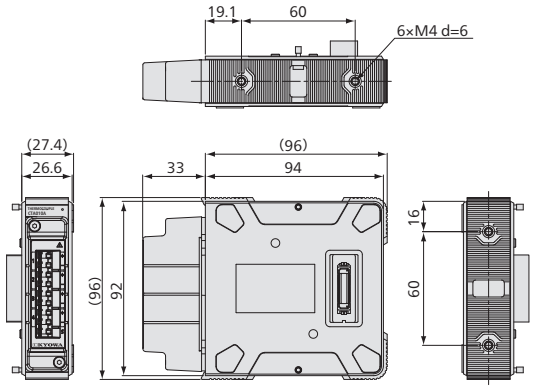
Compact Recorder CTRS-100A



Strain/Voltage Unit CTRS-CDV010A

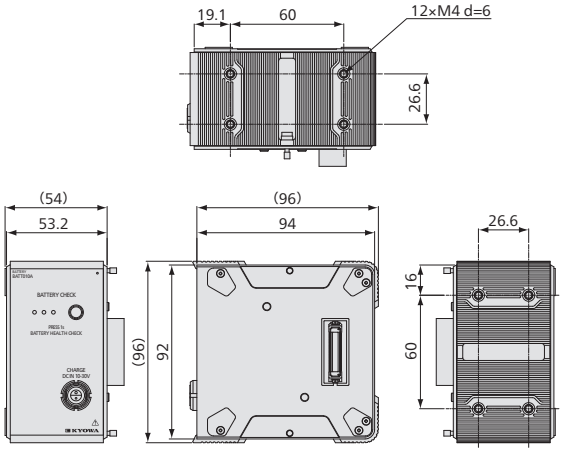


Thermocouple Unit CTRS-CTA010A

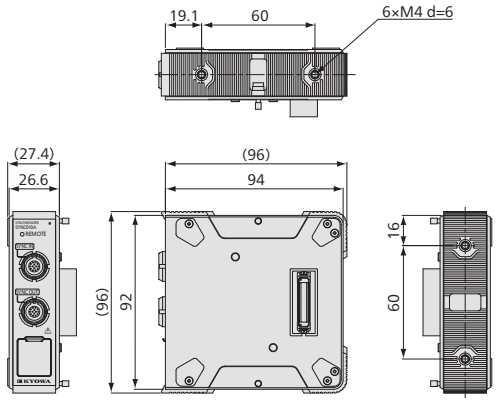


*Including the temperature measuring adapter

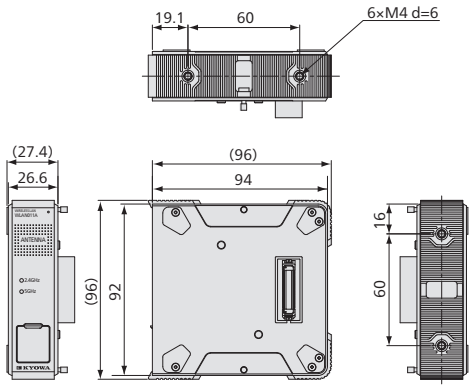
Battery Unit CTRS-BATT010A



Synchronization Unit CTRS-SYNC010A



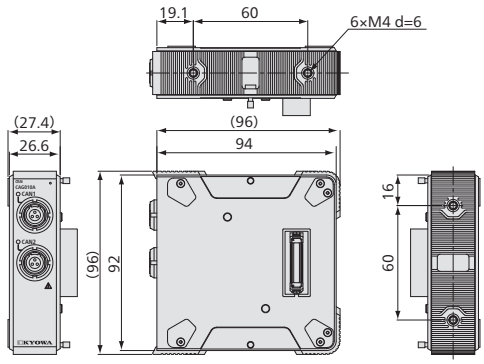
Wireless LAN Unit for U.S. CTRS-WLAN011A*1



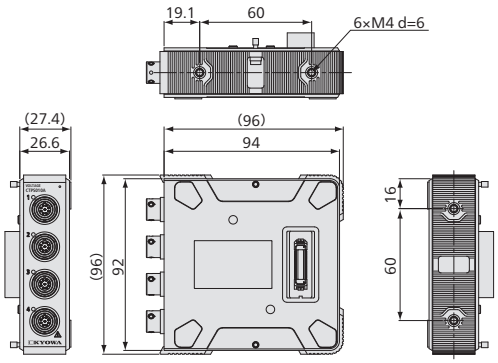
*1 CTRS-WLAN010A is the same in dimensions.

Dimensions

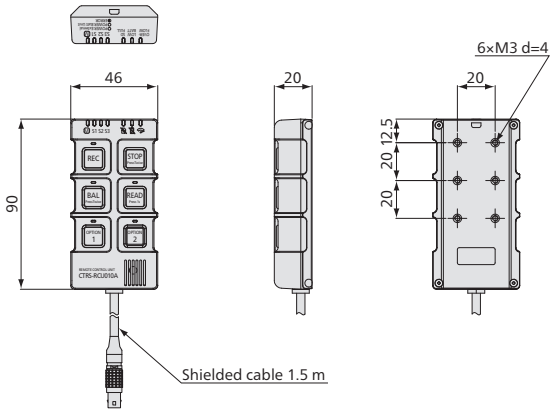
CAN Unit CTRS-CAG010A



Voltage Unit CTRS-CVPS010A



Remote Control Unit CTRS-RCU010A



Simplified Configuration of the CTRS-100 Series

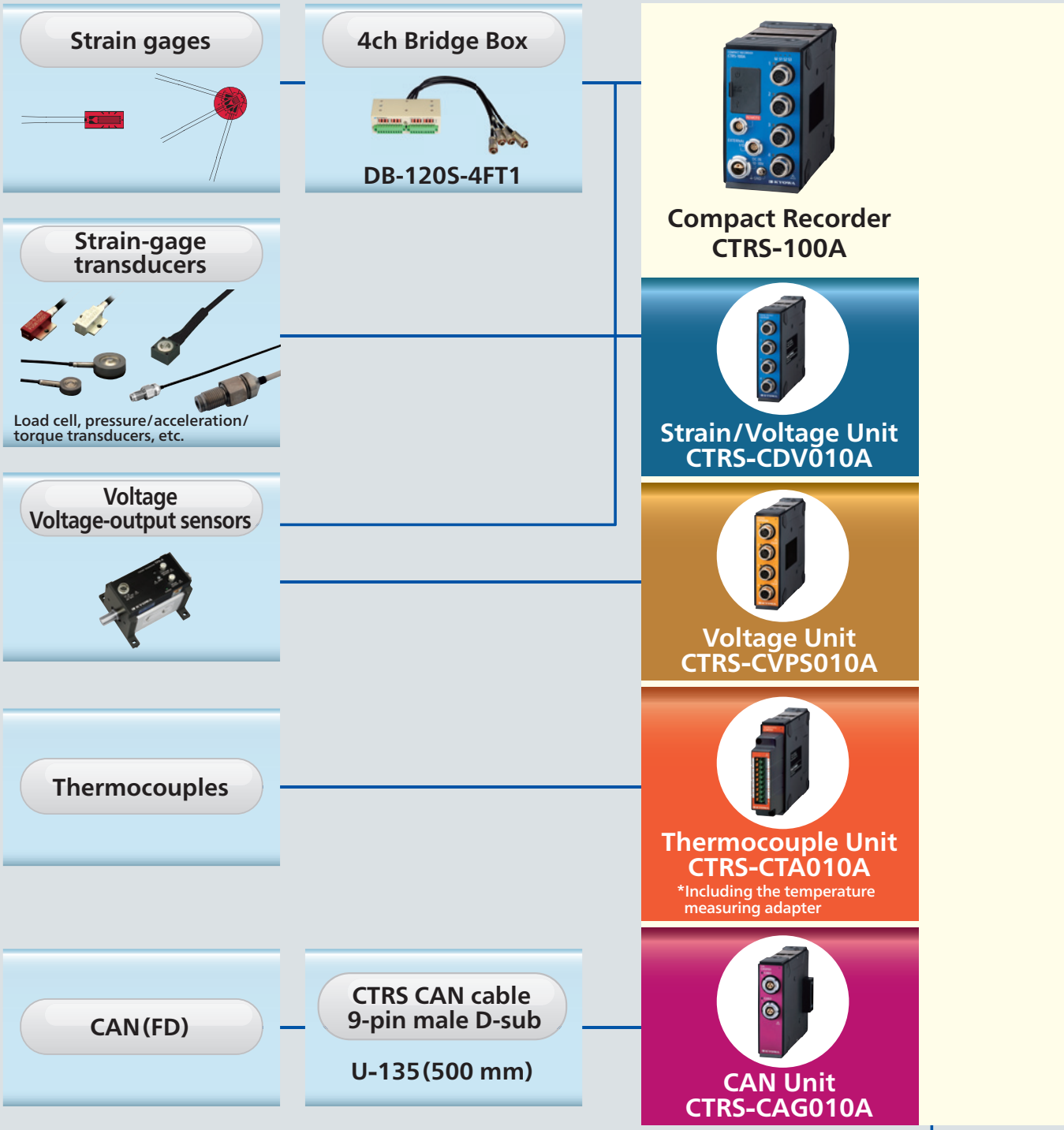
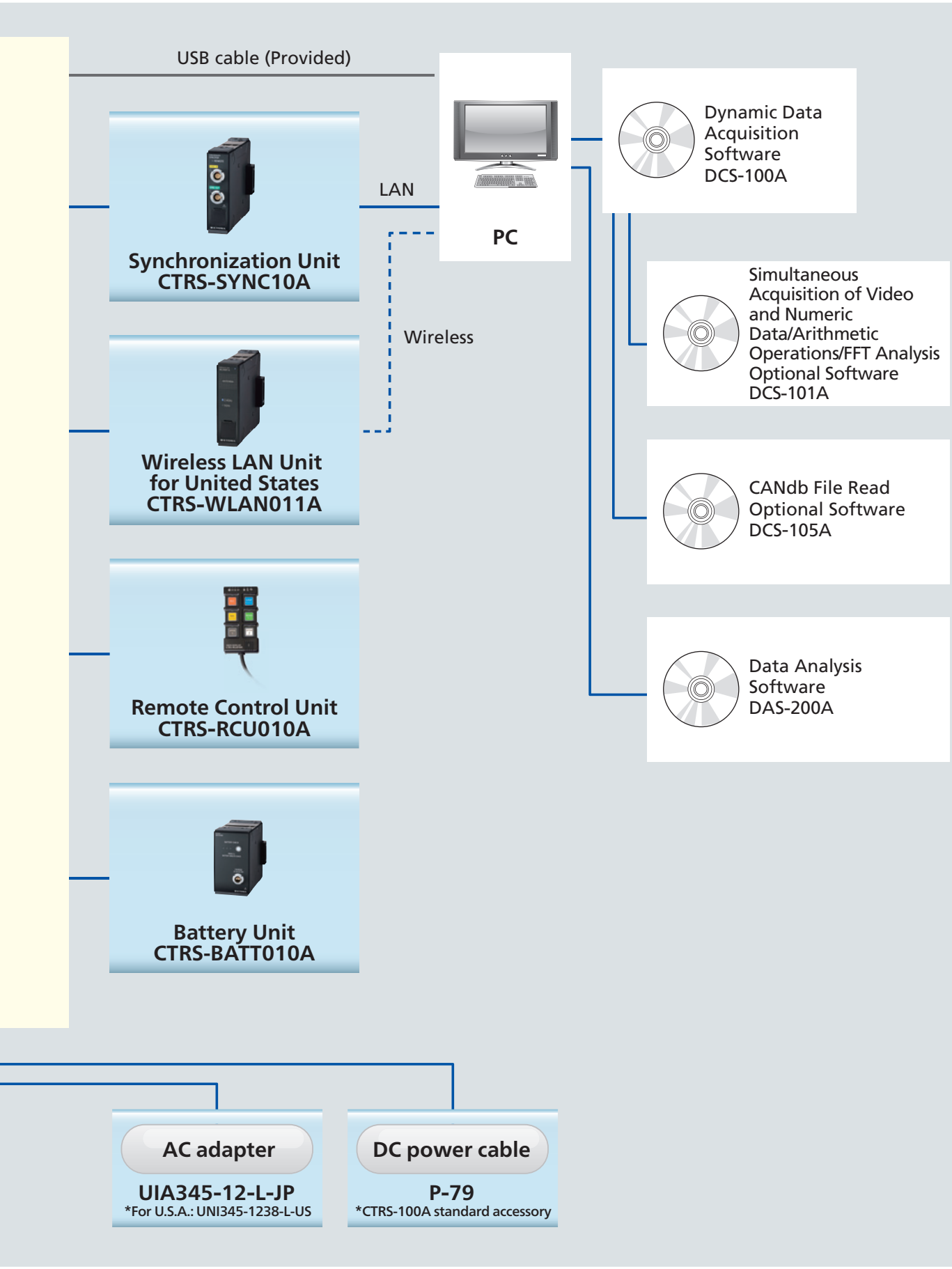


Table of Conversion cable for NDIS4109 (Small round 9 pins)

Please use the conversion cables below if the end of the transducer or bridge box cable is the NDIS4102 (7 pins) or a similar connector.

Models	Sensor side	Measuring instrument side
N-129	S32-7 (4 pins)	4109p
U-129	BNC jack	
U-136	S32-7 (6 pins)	
U-137	BNC plug	
U-138	R05 jack	


USB cable (Provided)
LAN
Wireless
PC
Dynamic Data Acquisition Software DCS-100A
Simultaneous Acquisition of Video and Numeric Data/Arithmetic Operations/FFT Analysis Optional Software DCS-101A
CANdb File Read Optional Software DCS-105A
Data Analysis Software DAS-200A
Synchronization Unit CTRS-SYNC10A
Wireless LAN Unit for United States CTRS-WLAN011A
Remote Control Unit CTRS-RCU010A
Battery Unit CTRS-BATT010A
AC adapter
UIA345-12-L-JP
*For U.S.A.: UNI345-1238-L-US
DC power cable
P-79
*CTRS-100A standard accessory

EDX-10 Series

Compact Recording System

Compact & lightweight, with a simple configuration, all channels synchronous 20 kHz high-speed sampling (For 4 channels)

The EDX-10 series is measuring instruments that measure simply by being connected to a PC using the USB interface.
The EDX-11A and EDX-14A measure strain-gage transducers, pressure, displacement, etc.
The EDX-12A measures voltage, the EDX-15A measures force, pressure, displacement, and voltage, and the EDX-13A measures temperature with a thermocouple.
A single unit for 4-channel measurement, 4 units for 16 channels, thus it is suitable for small-scale measurement.
Up to 4 measuring units are powered by USB interface, no separated power supply is required.

- With stacked connection, no synchronization cable is required, therefore wiring-saving.
- Max. sampling frequency 20 k Hz for 4 channels of a single measuring unit in sync.
- Compact & lightweight
- Simple connection using USB interface
- The standard accessory, Dynamic Data Acquisition Software DCS-100A, makes it easier to monitor or acquire data.
- Data is recorded as KS2, which is Kyowa standard file format. The optional Data Analysis Software reads the file.
- Sensors are easily connected with one-touch input cables or input adapters.

■Control Unit EDX-10B

This unit controls measuring units and performs communication with PC via USB interface.

Specifications

Interfaces	USB2.0 compliant
	Connector configuration: USB standard B receptacle
Measurement Units	Max. 4 (16 channels)
Sampling Frequencies	1 Hz to 20 k Hz (1 to 4 channels)
	1 Hz to 10 k Hz (1 to 8 channels)
	1 Hz to 5 k Hz (1 to 16 channels)
Operating Temperature	0 to 40°C
Operating Humidity	20 to 90% (Non-condensing)
Power Supply	5 VDC USB bus-power*1, *2, or AC adapter*3
Current Consumption	140 mA or less (5 VDC)
Weight	Approx. 170 g
Dimensions	84.0 W × 26.6 H × 84.0 D mm
	(Excluding protrusions)
Control Software	DCS-100A
Compliance	Directive 2014/30/EU (EMC)
	Directive 2011/65/EU, (EU)2015/863
	(10 restricted substances) (RoHS)

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

Optional Accessories AC adapter UN310-0515 (For U.S.A.: UN312-0520)

*1 When using USB bus-power, please connect directly to the USB port of the PC without using a USB hub.
*2 The number of measuring units at USB bus-power operation, refer to the following table.

USB ports	The number of EDX-11A	The maximum number of the unit
USB 3.0	0	Max. 4
	1	Max. 2
	2	
USB 2.0	0	Max. 2
	1	Max. 1

*3 When using AC adapter, the maximum connection units is 4 units in any combination of EDX-11A, 12A, 13A, 14A and 15A.

Data Recorders/ Analyzers

■Strain Measuring Unit EDX-14A

A low power consumption unit for measuring strain based on the DC bridge excitation.

Specifications

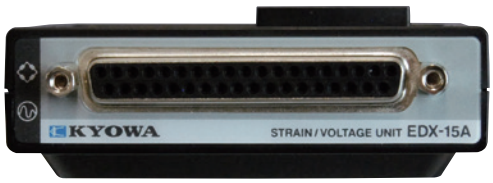
Measuring Targets	Strain-gage transducers, strain gages*
Channels	4
Measuring Range	10 k, 50 k ×10^{-6} strain (2 steps)
Compatible Bridge Resistance	120 Ω to 1 kΩ
Bridge Excitation	1 VDC
Gage Factor	2.00 fixed
Range Accuracy	Within ±0.3%FS
Balance Adjustment	Within ±1/2 F.S. of setting range
Nonlinearity	Within ±0.1%FS
AD Converter	24 bits
Frequency Response	DC to 2 kHz
LPF	Transfer characteristic: 2nd order Butterworth
	Cutoff frequencies: 100 Hz, 2 k Hz
Operating Temperature	0 to 40°C
Operating Humidity	20 to 90% (Non-condensing)
Input Connector	D-sub 37-pin connector
Power Supply	5 VDC supplied by control unit
Current Consumption	140 mA or less
	(120 Ω load with all channels connected,
	at power supply 5 VDC)
Weight	Approx. 150 g
Dimensions	84.0 W × 26.6 H × 84.0 D mm
	(Excluding protrusions)
Compliance	Directive 2014/30/EU (EMC)
	Directive 2011/65/EU, (EU)2015/863
	(10 restricted substances) (RoHS)

*Bridge boxes or input adapters are required for strain measurement.

Standard Accessories
Strain input cable U-124 (30 cm)

Optional Accessories
Bridge box connection cable U-126 (50 cm)
Input connector set EDX10-DSUB
Input adapter UI-51A
One-touch type input adapter UI-52A
Bridge adapter for quarter bridge system UI-53B-120/350
Bridge adapter for quarter bridge system UI-54B-120/350
One-touch type input adapter UI-55A

■Strain/Voltage Measuring Unit EDX-15A



A unit for measuring both strain and voltage.

Specifications

Measuring Targets	Strain gage transducer and strain gage (*1)
	Voltage (Unbalanced input)
Channels	4
Measuring Range	Strain measurement:10k, 50k×10^{-6}strain (2 range)
	Voltage measurement:10, 50 V (2 range)
Compatible Bridge Resistance	Strain measurement:120 to 1kΩ
	Voltage measurement:-
Bridge Excitation	Strain measurement:1 VDC
	Voltage measurement:-
Gage Factor	Strain measurement:2.00 fixed
	Voltage measurement:-
Range Accuracy	Within ±0.3%FS
Balance Adjustment	Within ±1/2 F.S. of setting range
Nonlinearity	Within ±0.1%FS
AD Converter	24 bits
Frequency Response	DC to 2 kHz
LPF	Transfer characteristic: 2nd order Butterworth
	Cutoff frequencies: 100 Hz, 2 k Hz
Operating Temperature	0 to 40°C
Operating Humidity	20 to 90% (Non-condensing)
Input Connector	D-sub 37-pin connector
Power Supply	5 VDC supplied by control unit
Current Consumption	150 mA or less
	(120 Ω load with all channels connected,
	at power supply 5 VDC)
Weight	Approx. 150 g
Dimensions	84.0 W × 26.6 H × 84.0 D mm
	(Excluding protrusions)
Compliance	Directive 2014/30/EU (EMC)
	Directive 2011/65/EU, (EU)2015/863
	(10 restricted substances) (RoHS)

*Bridge boxes or input adapters are required for strain measurement.

Standard Accessories
Strain input cable U-124 (30 cm)
Conversion adapter FV-1A ×4

Optional Accessories
Bridge box connection cable U-126 (50 cm)
Input connector set EDX10-DSUB
Input adapter UI-51A
One-touch type input adapter UI-52A
Bridge adapter for quarter bridge system UI-53B-120/350
Bridge adapter for quarter bridge system UI-54B-120/350
One-touch type input adapter UI-55A
BNC input cable U-125 (30 cm)

■Voltage Measuring Unit EDX-12A

A unit for measuring voltage

Specifications

Measuring Targets	Voltage
Channels	4 (Single end)
Measuring Range	10 V, 50 V (2 steps)
Range Accuracy	Within ±0.3%FS
Balance Adjustment	Within ±1/2 F.S. of setting range
Nonlinearity	Within ±0.1%FS
AD Converter	24 bits
Frequency Response	DC to 2 kHz
LPF	Cutoff frequencies: Lo(100Hz), Hi(2kHz)
	Transfer characteristic: 2nd order Butterworth
Operating Temperature	0 to 40°C
Operating Humidity	20 to 90% (Non-condensing)
Input Connector	D-sub 37-pin connector
Power Supply	5 VDC supplied by control unit
Current Consumption	110 mA or less (5 VDC)
Weight	Approx. 150 g
Dimensions	84.0 W × 26.6 H × 84.0 D mm
	(Excluding protrusions)
Compliance	Directive 2014/30/EU (EMC)
	Directive 2011/65/EU, (EU)2015/863
	(10 restricted substances) (RoHS)

Standard Accessories: Input adapter UI-51A

Optional Accessories: BNC input cable U-125 (30 cm)
Bridge box connection cable U-126 (50 cm)
Input connector set EDX10-DSUB
One-touch type input adapter UI-52A

■Thermocouple Measuring Unit EDX-13A

A unit for measuring temperature by using thermocouples

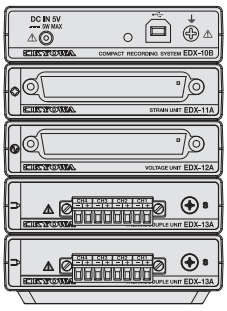
Specifications

Measuring Targets	Thermocouples
Channels	4
Measuring Targets	K, T, J, N (Resistance of thermocouple: 1 kΩ or less)
	(See the table below for details about the
	temperature measuring range, etc.)
Check Functions	Burnout check
AD Converter	24 bits
Sampling System	Scanning
Inside Sampling Frequencies	Approx. 0.5 Hz, approx. 2.0 Hz
Operating Temperature	0 to 40°C
Operating Humidity	20 to 90% (Non-condensing)
Input Connector	Screw type terminal box
Power Supply	5 VDC supplied by control unit
Current Consumption	120 mA or less (5 VDC)
Weight	Approx. 130 g
Dimensions	84.0 W × 26.6 H × 84.0 D mm
	(Excluding protrusions)
Compliance	Directive 2014/30/EU (EMC)
	Directive 2011/65/EU, (EU)2015/863
	(10 restricted substances) (RoHS)

Standard Accessories: Terminal box 1piece, screwdriver 1piece

Types	Range	Accuracy (Resolution: 0.1 °C)		Accuracy of internal reference junction compensator
K	–200.0 to 1370.0°C	–200.0 to below -100.0°C –100.0 to 1370.0°C	±(0.2% of reading + 0.6°C) ±(0.1% of reading + 0.4°C)	±1.0°C (Input terminal temperature at equilibrium) (Ambient temperature: 25 ±10°C) Mount the EDX-13A on the bottom when using it with measuring units other than the EDX-13A. ±2.0°C (Input terminal temperature in equilibrium) [For temperatures other than those in the ambient temperature and operating temperature described above]
T	–200.0 to 400.0°C	–200.0 to below -100.0°C –100.0 to 400.0°C	±(0.2% of reading + 0.6°C) ±(0.1% of reading + 0.4°C)	
J	–200.0 to 1200.0°C	–200.0 to below -100.0°C –100.0 to 1200.0°C	±(0.2% of reading + 0.6°C) ±(0.1% of reading + 0.4°C)	
N	–200.0 to 1300.0°C	–200.0 to below -100.0°C –100.0 to 1300.0°C	±(0.2% of reading + 0.6°C) ±(0.1% of reading + 0.4°C)	

Note:The measurement accuracy does not include the accuracy of the internal reference junction compensator and thermocouples.
The measurement error of the internal reference junction compensator
= Error due to the measurement accuracy
+ Error of the internal reference junction compensator
+ Error of the thermocouples
To satisfy the accuracy of internal reference junction compensator ±1.0°C, measurement conditions are as follows.
Condition 1: Mount the EDX-13A on the bottom when using it with measuring units other than the EDX-13A.
Condition 2: When measuring data, put the units down.



■Strain Measuring Unit EDX-11A

A unit for measuring strain based on the DC bridge excitation.

Specifications

Measuring Targets	Strain-gage transducers, strain gage*
Channels	4
Measuring Range	10 k, 50 k ×10^{-6} strain (2 steps)
Balance Adjustment	Within ±1/2 F.S. of setting range
Compatible Bridge Resistance	120 Ω to 1 kΩ
Bridge Excitation	2 VDC
Gage Factor	2.00 fixed
Range Accuracy	Within ±0.3%FS
Nonlinearity	Within ±0.1%FS
AD Converter	24 bits
Frequency Response	DC to 2 kHz
LPF	Transfer characteristic: 2nd order Butterworth
	Cutoff frequencies: 100 Hz, 2 k Hz
Operating Temperature	0 to 40°C
Operating Humidity	20 to 90% (Non-condensing)
Input Connector	D-sub 37-pin connector
Power Supply	5 VDC supplied by control unit
Current Consumption	180 mA or less
	(120 Ω load with all channels connected,
	at power supply 5 VDC)
Weight	Approx. 150 g
Dimensions	84.0 W × 26.6 H × 84.0 D mm
	(Excluding protrusions)
Compliance	Directive 2014/30/EU (EMC)
	Directive 2011/65/EU, (EU)2015/863
	(10 restricted substances) (RoHS)

*Bridge boxes or input adapters are required for strain measurement.

Standard Accessories Strain input cable U-124 (30 cm)

Optional Accessories
Bridge box connection cable U-126 (50 cm)
Input connector set EDX10-DSUB
Input adapter UI-51A
One-touch type input adapter UI-52A, UI-55A
Bridge adapter for quarter bridge system UI-53B-120/350
Bridge adapter for quarter bridge system UI-54B-120/350

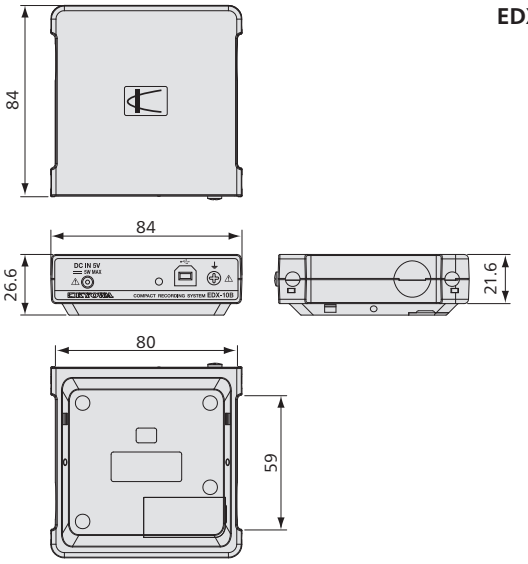
DCS-100A software (standard accessory), specification for control of EDX-10B

***For details of DCS-100A, see chapter 4.**

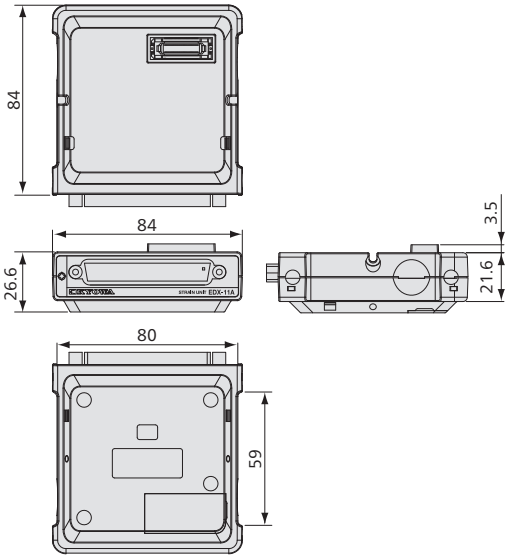
Units	Up to 4 units (up to 16 channels)
Interfaces	USB
Saving Format	Saves the measured data in the PC folder in the
	KS2 format file.
Channel Conditions	Measuring ON/OFF, Measuring mode, Range,
	Low-pass filter, Balance adjustment
	ON/OFF, Calibr. const., Offset, Unit,
	Channel name, Measuring range, Rated capacity,
	Rated output, Deci Digits, Chk. Val. (Up), Chk. Val.
	(Down)(Display items can freely be selected.)
Sampling Frequency	1 Hz to 20k Hz (1/2/5 system)
	*Limited by the number of channels.
Measure Mode	Manual, Manual (Set Record Data), Interval,
	Analog Trigger
Manual Measurement	Records data from REC to STOP or from REC to
	the number of data, specified on the Manual
	(Set Record Data).
Interval Measurement	Records data automatically based on the pre-set
	starting time and recording interval.
Analog Trigger Measurement	Starts/stops recording data based on the
	pre-set trigger conditions.
Trigger Condition	End trigger Settable
	Delay Up to 262144 data/CH for both start and end.
	The delay time varies with the number of channels.
	Trigger channel Any 1 channel
	Trigger level Physical quantity
	Trigger slope Positive or Negative
Static Measurement	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.
	*Measure Mode: Manual and Interval only.
Repeated Recording	When recording data for a long time,
	the DCS-100A saves data, every pre-set number
	of data or every pre-set interval, in the KS2
	format file.
	*Measure Mode: Manual (Set Record Data) only.
Setting Environment	
Setting Hardware Configuration	
	Sets the device names and measuring units.
	Sets the device name to the EDX-10B.
	Loads the hardware configurations from the
	EDX-10B.

Dimensions

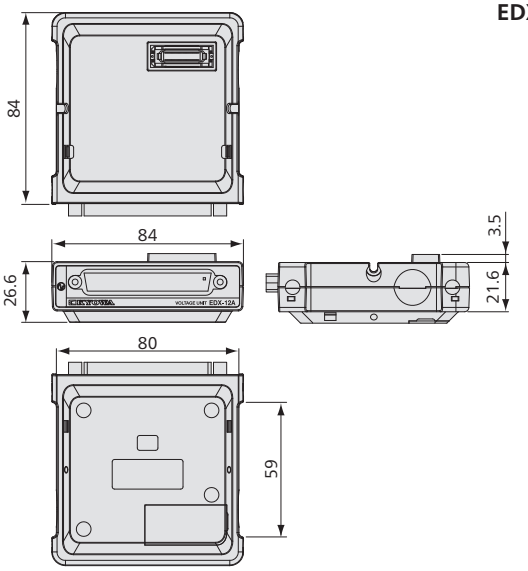
EDX-10B



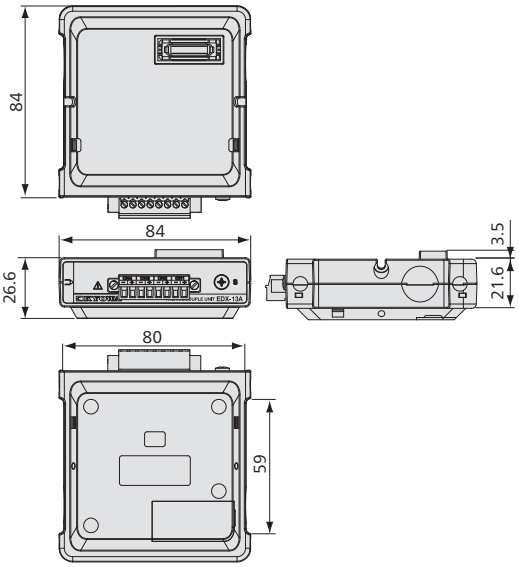
EDX-11A



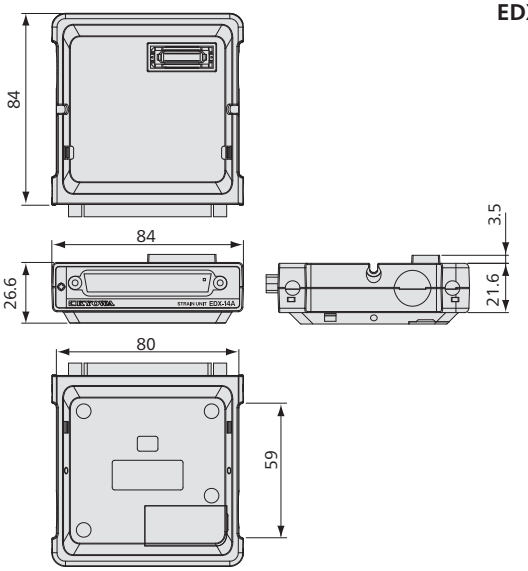
EDX-12A



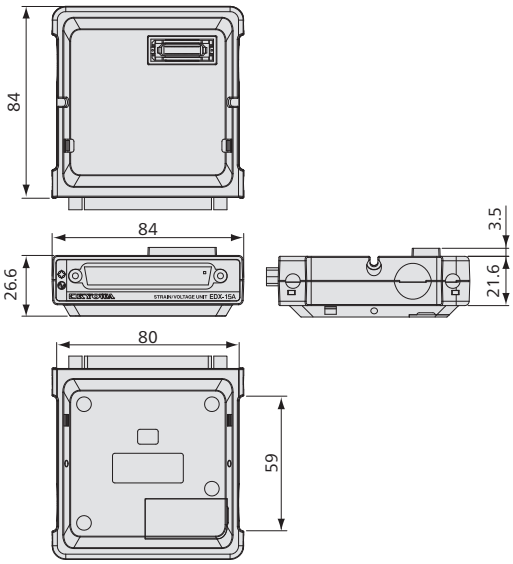
EDX-13A



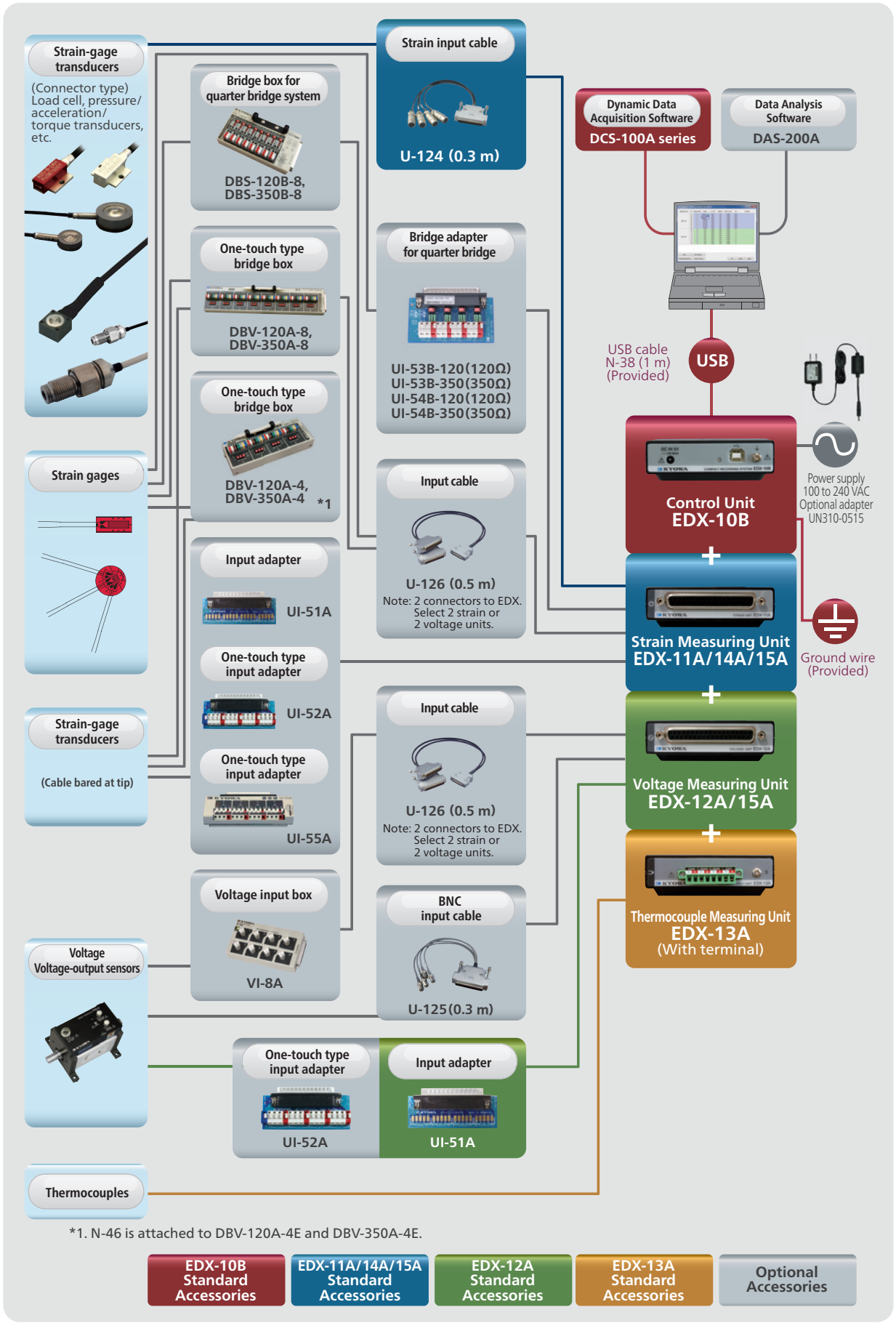
EDX-14A



EDX-15A



Simplified configuration of the EDX-10 series



*1. N-46 is attached to DBV-120A-4E and DBV-350A-4E.

EDX-10B Standard Accessories | EDX-11A/14A/15A Standard Accessories | EDX-12A Standard Accessories | EDX-13A Standard Accessories | Optional Accessories

Data Recorders/ Analyzers

EDX-200A

Universal Recorder

*EDX-200A-2H, EDX-200A-4H: CE compliant models are available. Inquiries are welcome.

Improved real-time processing function with high-speed DSP

- Incorporated real-time digital filter.
  8th digital filter enables acquisition of clear waveform.
- High-speed/low-speed dual sampling
  Measurement of high-speed and low-speed phenomena while reducing data quantities is possible.
- All channels synchronous 10 kHz high-speed sampling (For 32 channels)
  Measurement of 3 channels synchronous at max. 100 kHz
- Variety of input conditioner cards
- One-wire synchronous (Except EDX-200A-1)
  With a maximum of 8 units, large scale measurements in distributed arrangement can be supported.

●Conditioner cards (See page 3-93.)

Strain/Voltage/Acceleration Measurement Card	CVM-41A
Strain/Voltage Measurement Card	CDV-40B(-F)
Dynamic Strain Amplifier Card	DPM-42B
	DPM-42B-F
	DPM-42B-I
	DPM-42B-I-F
Thermocouple Card	CTA-40A
F/V Converter Card	CFV-40A
Charge Amplifier Card	CCA-40A(-F)
CAN Card	CAN-41A
Strain/Voltage Measurement Isolation Card	CDV-44AS/46AS
Constant Current Amplifier Card	CDA-44AS/45AS
AD Converter Cards	AD-40AS(-F)

●Option cards (See page 3-81.)

Multichannel CAN card	ECAN-40A
Time synchronization card	ETIM-40A
GPS/multichannel CAN card	EGPC-40A

Specifications

Models

Model name	Max. Channels*1	Slots for conditioner cards	Slots for optional functions	DCS-100A*2	DCS-101A*3
EDX-200A-2H	16	2	1	Yes	
EDX-200A-2H-0					
EDX-200A-2H-1				Yes	Yes
EDX-200A-4H	32	4	1	Yes	
EDX-200A-4H-0					
EDX-200A-4H-1				Yes	Yes
EDX-200A-4T	32	4	1	Yes	
EDX-200A-4T-0					
EDX-200A-4T-1				Yes	Yes
EDX-200A-1	8	1		Yes	
EDX-200A-1-1				Yes	Yes

Notes: *1. Max. input channels are when 8 channels input cards inserted.
*2. Dynamic Data Acquisition Software
*3. Simultaneous Acquisition of Video and Numeric Data/Arithmetic Operations/FFT Analysis Optional Software

Measuring Targets	Strain (Gage, transducer), voltage, thermocouples, pulse (F/V), piezoelectric acceleration (Built-in amplifier), CAN signals, GPS
Conditioner Cards for Analog Inputs	
	The conditioner cards for EDX series
	(For the details, see page 3-93.)
	[Note] The EDX-200A-4T can use only the CVM-41A, CDV-40B, CDV-40B-F and CAN-41A which performed temperature extension processing. When you use the EDX-200A-4T, you cannot replace any conditioner cards.
	[Note] The EDX-200A limits the number of CFV-40A. EDX-200A-1/2H: The number of CFV-40A is up to 1. EDX-200A-4H: The number of CFV-40A is up to 2.
Conditioner Cards for CAN Data Inputs	
	CAN card (2 ports, max. 256 channels): CAN-41A
	[Note] Can install one CAN-41A to the final slot.
	[Note] The EDX-200A-4T can use only the CAN-41A which performed temperature extension processing. When you use the EDX-200A-4T, you cannot replace any conditioner cards.
Voice Memo Input	1 channel (Voice memo can be recorded with measured data.)
	The RCU-42A (optional) is necessary.
	To playback the recorded voice memo, use the DAS-200A (optional).
Sampling	
Sampling Method	Simultaneously all channels
Sampling Mode	Normal: Records all channels' data at the same sampling clock.
	Dual: Enables high-speed sampling or low-speed sampling to every CH for recording.

Sampling Frequencies

Normal-sampling Mode

1-2-5 series	1 Hz to 100 kHz	
	1 Hz to 2 kHz	When using CAN-41A
2^n series	2 to 65536 Hz	
	2 to 2048 Hz	When using CAN-41A

Dual-sampling Mode

High-speed sampling [Sf]		
	1-2-5 series	1 Hz to 100 kHz
		1 Hz to 2 kHz when using CAN-41A
	2^n series	2 to 65536 Hz
		2 to 2048 Hz when using CAN-41A
Low-speed sampling [Ss]		
	1-2-5 series	The division frequencies from high-speed sampling, and Ss ≤ Sf/4
	2^n series	The division frequencies from high-speed sampling, and Ss ≤ Sf/4

Channels

Normal-sampling Mode	Max. 32 channels, 320 k/I (I is the integer part of the set sampling frequency.)	
Dual-sampling Mode	Max. 64 channels, 320 k/I (I is the integer part of the set sampling frequency.). "High-speed and low-speed" setting counts as 2 channels.	
When Using CAN-41A	EDX-200A-4H	Max. 24 + Channels of CAN data
	EDX-200A-2H	Max. 8 + Channels of CAN data
	EDX-200A-1	Channels of CAN data
	EDX-200A-4T	Max. 24 + Channels of CAN data

The Number of Sampling Frequency

Normal-sampling Mode

"320000/ The number of channels" or less

Dual-sampling Mode

High-speed sampling frequency: "320000/ The number of channels" or less.

"High-speed and low-speed" setting counts as 2 channels.

Digital Filter	Butterworth filter (IIR)
	Type of filter: LPF, HPF
	Order of a filter: 1 to 8
	Amplitude ratio at cutoff point: -3dB
	Attenuation: -6 × N dB/oct. (N is order of the filter)
	Simultaneously use with built-in LPF possible.
	Application on CAN data not possible.
Data Recording Unit	CF card
	Capacity: 128 MB to 16 GB (our recommended only)
	Maximum data file size (available data file size to be recorded)
	When the number of repeat times is 1: 4 GB/data file
	When the number of repeat times is 2: 1 GB/data file
	(1GB = 1000000000 bytes)
Indicator	Channel status display LED:
	EDX-200A-2H: 16; EDX-200A-4H/4T: 32; EDX-200A-1: 8
	Unit status display LED:
	EDX-200A-2H/4H/4T: 7; EDX-200A-1: 4
	Unit status display organic EL monitor:
	EDX-200A-2H/4H/4T: 1; EDX-200A-1: 0

Control Switch

UP/DOWN	: Changes the display on the small indicator.
REC/PAUSE	: Starts and pauses data recording.
STOP	: Stops data recording.
BAL.	: Execute the balance.
LOAD	: Loads and sets conditions.
OPT.	: Conducts the pre-set arbitrary function.
ID	: Sets the EDX-200A identification No.
POWER	: POWER switch
USB/LAN	: Selects a communication interface (USB /LAN)

[NOTE] The EDX-200A-1 does not have the UP/DOWN switch and ID switch.

External Control Connector	CONT. IN and CONT. OUT (for remote control and synchronous operation)
	[NOTE] The EDX-200A-1 does not have the CONT. OUT connector for the synchronous operation
Communication interfaces	USB(USB2.0 High Speed) 1 port
	Connector: Series B receptacle connector
	LAN(10/100BASE-T) 2 ports
	LAN IN connector: For PC communication
	LAN OUT connector For synchronous operation
	Connector: RJ45 modular jack connector
	[NOTE] The EDX-200A-1 does not have the LAN OUT connector for the synchronous operation.
Synchronous Operation	Max. 8 EDX-200A units can be connected for synchronous operation by using synchronous cables N-95 N-128.
	Max. 8 EDX-200A units can be connected for synchronous operation by using LAN cables.
	[NOTE] The synchronous operation is not available with the EDX-200A-1.

How To Setting Conditions

Online setting: Set measuring conditions on the PC via the LAN or USB interface.

Offline setting: Set measuring conditions by allowing the EDX-200A to read measuring conditions in the CF card. (Use DCS-100A to set measuring conditions.)

Saving Conditions Store the conditioner cards' setting conditions and measuring conditions in nonvolatile memory in the EDX-200A.

When turning ON the EDX-200A, the user can immediately start data recording with previously set conditions.

Measuring Modes Manual measurement/trigger measurement/ interval measurement

Manual Measurement	The user starts and stops data recording, or data recording is stopped according to the previously set parameters.
	Voice memo can be recorded simultaneously when measuring in this mode
Trigger Measurement	Data is automatically recorded with preset trigger conditions.
	Note: Trigger measurement is not available by CAN data of the CAN-41A
Interval Measurement	Data is automatically recorded with preset interval conditions.

Available measurements in the dual-sampling mode

High-speed sampling channel	Low-speed sampling channel
Manual measurement	Manual measurement
Trigger measurement	Manual measurement
	Interval measurement
Interval measurement	Interval measurement

Starting and Stopping Data Recording

Data recording starts/stops by using the PC, panel switches or the RCU-42A

Balance Operation	Adjust the balance of the strain input channel and conduct the zero suppress of the voltage input CH of the CVM-41A by using the PC, control switches (on the front panel) or the RCU-42A
Format of Recorded Data	KYOWA's standard KS2 format
	Data in this format can be analyzed using the optional DAS-200A Data Analysis Software.
Data Collection	Online data collection using the PC or offline data collection by allowing the PC to directly read the CF card
TEDS Function	TEDS function is available only when online control from the PC.
	TEDS compatible conditioner cards: CDV-40B (-F), DPM-42B (-F), DPM-42B-I (-F), CCA-40A (-F), CDV-44AS, CDA-44AS, CDA-45AS, CVM-41A
Power Supply	EDX-200A-4H: 10 to 36 VDC
	EDX-200A-2H: 10 to 36 VDC
	EDX-200A-1: 10 to 33 VDC
	EDX-200A-4T: 10 to 36 VDC
	Connector type: RM12BRD-4PH (Hirose)
Current Consumption	EDX-200A-2H: Approx. 1.6 A (12 VDC with 4 CDV-40B cards installed)
	EDX-200A-4H: Approx. 2.6 A (12 VDC with 2 CDV-40B cards installed)
	EDX-200A-4T: Approx. 2.6 A (12 VDC with 4 CDV-40B cards installed)
	EDX-200A-1: Approx.1.0 A (12 VDC with 1 CDV-40B card installed)
Operating Temperature	0 to 50°C (EDX-200A-4T: -20 to 65°C)
Operating Humidity	20 to 90% (Non-condensing)
Storage Temperature	-20 to 60°C (EDX-200A-4T: -30 to 70°C)

Vibration Resistant

49.0 m/s^2 (5 G), 5 to 55 Hz 1 cycle 1 min., each axis 15 cycles (Non-operating)

29.4 m/s^2 (3 G), 5 to 55 Hz 1 cycle 1 min., each axis 15 cycles (Operating)

Impact Resistant 196.1 m/s^2 (20 G)/11 ms, 294.2 m/s^2 for EDX-200A-1

Dimensions (Excluding protrusions)

	EDX-200A-4H: 165 W × 132.5 H ×255 D mm
	EDX-200A-2H: 120 W × 132.5 H ×255 D mm
	EDX-200A-4T: 185.2 W × 142.8 H ×255D mm
	EDX-200A-1: 148 W × 53 H × 257 D mm
Weight	EDX-200A-4H: Approx. 2.1 kg (Approx. 2.6 kg with 4 CDV-40B cards installed.)
	EDX-200A-2H: Approx. 1.8 kg (Approx. 2.0 kg with 2 CDV-40B cards installed.)
	EDX-200A-4T: Approx. 3.7 kg (Approx. 4.2 kg with 4 CDV-40B cards installed.)
	EDX-200A-1: Approx. 0.9 kg (Approx. 1.1 kg with 1 CDV-40B card installed.)
Compliance	Directive 2014/30/EU (EMC)
	(EDX-200A-1 only)
	Directive 2011/65/EU, (EU)2015/863
	(10 restricted substances) (RoHS)
	(EDX-200A-1 only)

Standard Accessories

DC power cable P-76
USB cable N-38
Ground wire P-72
CF card (1 GB) inserted in the slot
Fuses (8 A for 4-slot model, 5 A for 2-slot model)
Dummy panel
Installed on the free slots before shipment
  EDX-200A-4H: 3 pcs
  EDX-200A-2H: 1pc
  EDX-200A-4T: None
EDX accessory bag
 Dynamic data acquisition software DCS-100A (DVD)*
*DCS-100A is optional for models with suffix "-0
 Instruction manual (In English & Japanese, in the above DVD)

Optional Accessories

EDX-200A AC adapter 4H, 4T: UEA360-1540 (For U.S.A.: SPU61A-106 15 V)
EDX-200A AC adapter 2H, -1: UIA345-12 (For U.S.A.: UNI345-1238)
Fixing adapter
EDX dummy panel EDX1P-DUMMY
Remote control unit RCU-42A
Battery unit for instantaneous power failure EDB-41B (EDX-200A-2H/4H)
Monitor unit EMON-20A
Synchronous cable N-128

DCS-100A software (standard accessory), specification for control of EDX-200A

(Not included with EDX-200A-4H-0, EDX-200A-2H-0)
*For details of DCS-100A, see chapter 4.

Units	Up to 8 units (up to 256 channels.)
Interfaces	LAN or USB
Saving Format	Saves the measured data in the EDX-200A CF card
	or PC folder in the KS2 format file.
Channel Conditions	Measuring ON/OFF, Measuring mode, Range,
	High-pass filter, Low-pass filter,Balance adjustment
	ON/OFF, CAL range, CAL ON/OFF, Calibr. const.,
	Offset, Unit,Channel name, Measuring range,
	Rated capacity, Rated output, Deci Digits,
	Chk. Val.(Up), Chk. Val. (Down), Internal sensitivity
	compensation ON/OFF, Offset ZERO ON/OFF,
	Digital filter (High-pass filter: Any cutoff frequency,
	Low-pass filter: Any cutoff frequency), Sampling
	frequency (High, Low, High + Low)
	(Display items can freely be selected.)
Loading TEDS Sensor Information	
	Loads the TEDS information automatically and sets
	the channel conditions.
Dual-sampling Measurement	
	The high-speed sampling data and low-speed
	sampling data appear on the Numeric windows/
	Graph windows.
	The high-speed sampling data and low-speed
	sampling data are saved in different files.
Setting Parameter and Loading Parameter	
	Loads and sets the EDX-200A internal parameter.
Collecting Data File	PC collects the KS2 format file saved in the
	EDX-200A CF card, via LAN/USB.
Deleting Data File	PC deletes the KS2 format file saved in the
	EDX-200A CF card, via LAN/USB.
Formatting CF Card	PC formats the EDX-200A CF card via LAN/USB.
Setting Environment	
Setting Hardware Configuration	
	Sets the number of units and device names.
	Loads the hardware configurations from the EDX-200A.
Communication Check	Loads the EDX-200A version.
Setting IP Address	PC sets the EDX-200A via LAN/USB.
	Saves the IP address setting file in the CF card.
Device Confirmation	LEDs, on the EDX-200A front panel, light up.
Others	Oscillator switching (internal/external), operating
	beep sound, balance standard value, AD data
	format (16 bits/24 bits), synchronous operation
	mode (Use or Not in use)

Applicable Optional Cards

Functions / Cards	Recording CAN Data *1	Interval (GPS synchronization) Measurement *1, *2	Point ZERO (Manual) Measurement *1, *2	Recording GPS Data *1, *2	Setting DIO *3
ECAN-40A	Yes				Yes
ETIM-40A		Yes	Yes	Yes	Yes
EGPC-40A	Yes	Yes	Yes	Yes	Yes

*1: When data is saved in CF card
*2: When the card is installed in host EDX
*3: When control signals are from a remote control unit
  A. Data is saved in the CF card.
  B. If synchronous operation, only host EDX is settable.

CAN Data Acquisition	Max. 512 channels/unit of CAN data is possible.
	(In the EDX-200A CF Card, as the E4A file).
Point Zero Manual Measurement	
	In multiple units of EDX-200A, allows acquisition
	to be started at zero second (0 ms) based on clock
	data of GPS satellite.
GPS Synchronous Interval Measurement	
	Allows multiple units of EDX-200A to be started
	acquisition based on clock data of GPS satellite.
GPS Data Acquisition	Monitors and records GPS data such as latitude,
	longitude, direction of movement, speed.
	GPS data is saved to CF card in EDX-200A as
	NMEA format.
DIO Settings	
I/O Points	Max. 8
I/O Settings	Sets every bit of digital input, digital output,
	and remote-control input.
■Measuring Conditions for Saving Data in CF Card	
Sampling Frequencies	1 Hz to 100 kHz
	(1-2-5 series, 2^n series, or external clock)
	(Depends on measuring channels.
	Dual sampling is supported.)
Data File Size	Max. 4 GB
Measuring Modes	Manual, manual (Data points preset), interval,
	analog trigger, external trigger, and composite
	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.
Trigger Measurement	Start/stop recording based upon specified
	trigger conditions.
Common Trigger Conditions	
End Trigger	Settable
Delay	Up to 262144 data for both start and end.
	The delay time varies with the number of channels.
Analog Trigger	
Trigger Channels	Any channel
Trigger Level	Sets in physical quantity.
Trigger Slope	Up, down
External Trigger Conditions	
Trigger Slope	Up, down
Composite Trigger Conditions	
Trigger Source	Select from the analog channels (Any 4 channels of
	the master unit), external trigger, or manual trigger.
	Capable of judging the trigger source by using the
	logical AND and OR operators.
Trigger Level	Sets in physical quantity.
Trigger Slope	Up, down
Repetition Acquisition	In long-term data acquisition, a specified
	amount of data (or time) is saved in KS2 file .
	*Workable in manual mode (Data points preset).
■Measuring Conditions for Saving Data in PC Hard Disk	
Sampling Frequencies	1 Hz to 100 kHz (1-2-5 series, 2^n series,
	or external clock)
Data File Size	Capacity of the hard disk
Measuring Modes	Manual, manual (Data points preset), interval,
	and analog trigger
Manual Measurement	Records data from REC to STOP or from REC to
	the number of data, specified on the Manual
	(Set Record Data).
Interval Measurement	Records data automatically based on the preset
	starting time and recording interval.
Analog Trigger Measurement	
Starts/stops recording data based on the preset trigger conditions.	
End Trigger	Settable
Delay	Up to 262144 data for both start and end.
	The delay time varies with the number of
	channels.
Trigger Channels	Any 1 channel
Trigger Level	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 (or time) is saved in KS2 file.
	*Workable in manual mode (Data points preset).

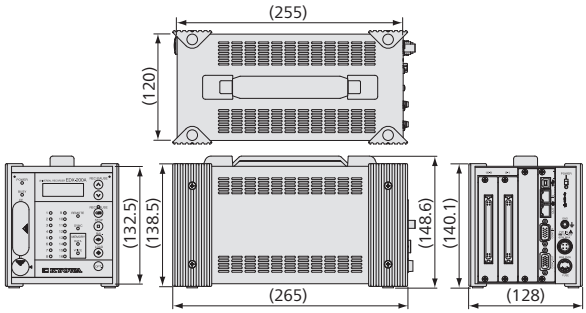
●Remote Control Unit RCU-42A

The front panel operation of the mainframe can be performed on this remote control unit. With a buzzer from the unit, an alarm sound can be clearly heard even when the sound from the device is missed.

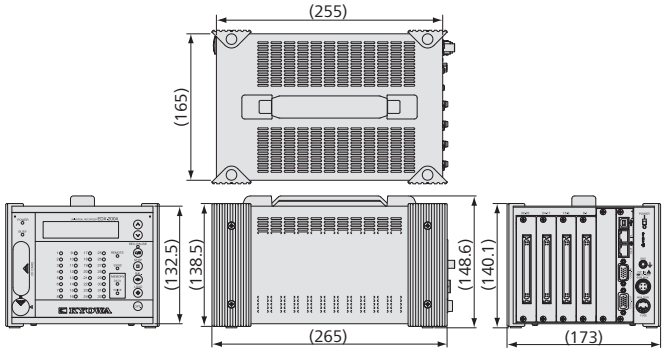
Control Functions	REC/PAUSE : Starts/pauses data acquisition
	STOP : Stops data acquisition
	BAL : Balancing
	OPT. : Optional function
	VOICE MEMO :Recording with the built-in microphone
Indication	Recording, pausing and balancing are indicated with LED.
Buzzer	Equivalent to the EDX recorder unit buzzer
Cable Length	Approx. 1.5 m
Dimensions	35 W× 125 H×22 D (mm) *Excluding protrusions
Weight	Approx. 220 g

■Dimensions

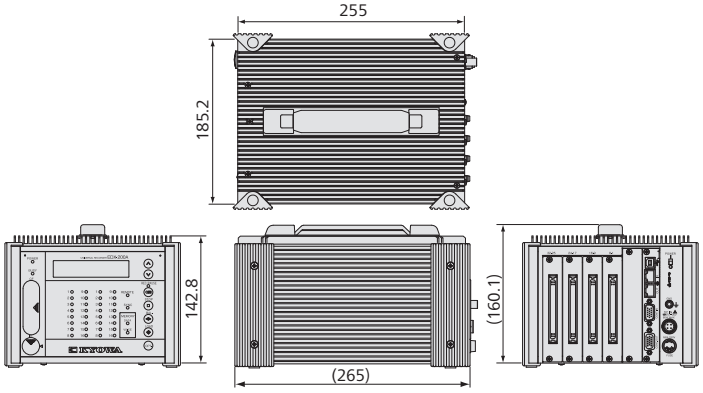
EDX-200A-2H



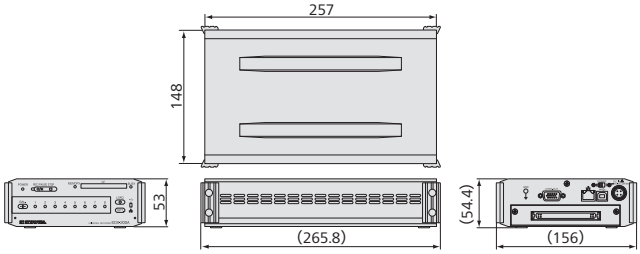
EDX-200A-4H



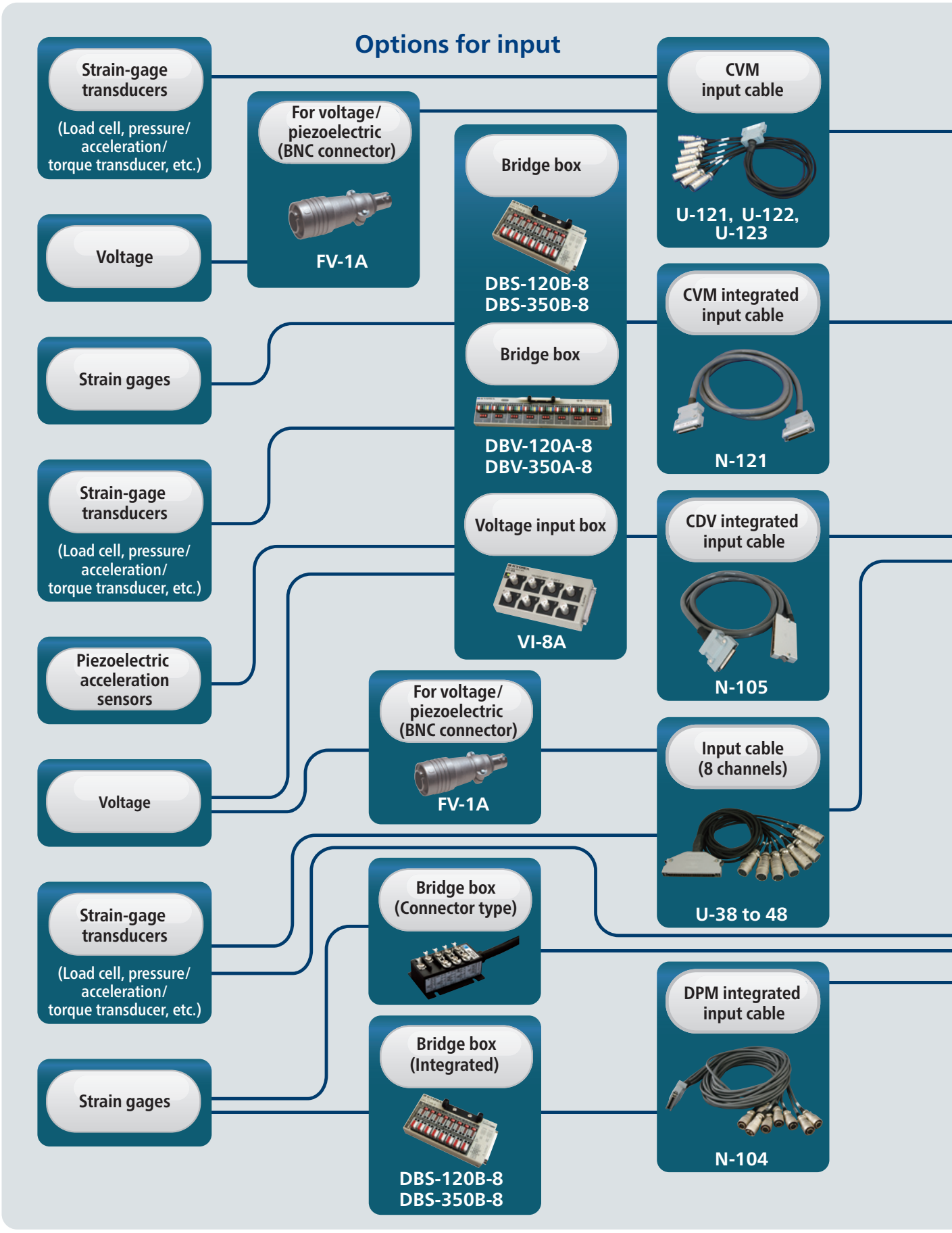
EDX-200A-4T

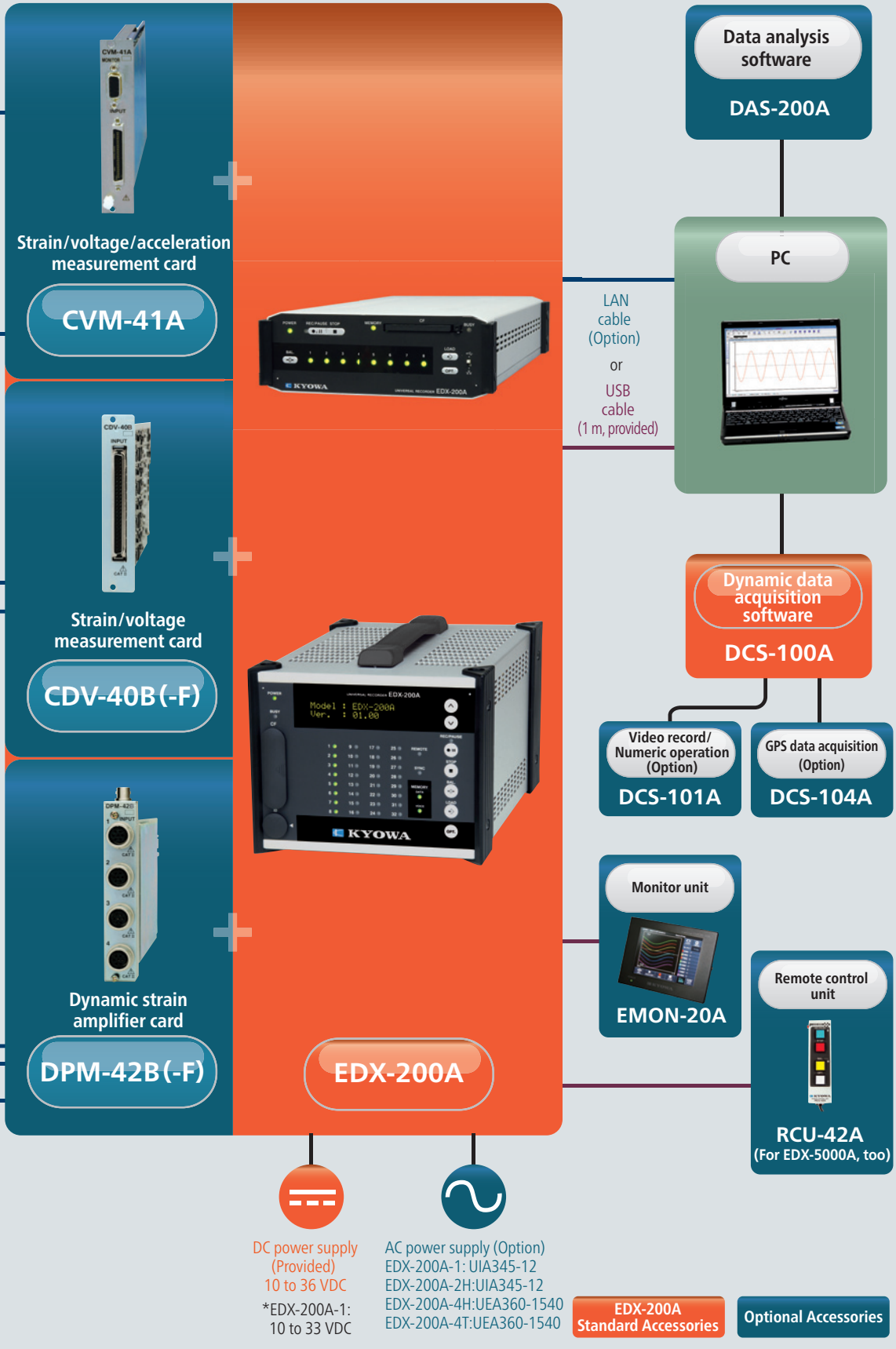


EDX-200A-1



Simplified configuration of the EDX-200A




Strain/voltage/acceleration measurement card
CVM-41A
Strain/voltage measurement card
CDV-40B(-F)
Dynamic strain amplifier card
DPM-42B(-F)
EDX-200A
Data analysis software
DAS-200A
PC
LAN cable (Option)
or
USB cable (1 m, provided)
Dynamic data acquisition software
DCS-100A
Video record/ Numeric operation (Option)
DCS-101A
GPS data acquisition (Option)
DCS-104A
Monitor unit
EMON-20A
Remote control unit
RCU-42A
(For EDX-5000A, too)
DC power supply (Provided)
10 to 36 VDC
*EDX-200A-1:
10 to 33 VDC
AC power supply (Option)
EDX-200A-1: UIA345-12
EDX-200A-2H:UIA345-12
EDX-200A-4H:UEA360-1540
EDX-200A-4T:UEA360-1540
EDX-200A Standard Accessories
Optional Accessories

EDX-200A-2H/4H/4T Option Cards

ECAN-40A ETIM-40A EGPC-40A

CE

The option cards for EDX-200A which can measure CAN data and GPS information.

■Multichannel CAN Card ECAN-40A

- ●CAN input of up to 512 channels
- ●Capable of CAN data output
- ●With software DCS-105A to read CANdb files.

With this card installed in the option slot, CAN input of up to 512 channels can be added without sacrificing the number of analog input channels.

■Time Synchronization Card ETIM-40A

- ●Enable synchronized interval measurement between remotely-placed EDX-200A units by receiving clock data from GPS satellite.
- ●GPS sensor (Standard Accessory)

ETIM-40A inserted to the option slot enables synchronous interval measurement among multiple units of EDX-200A based on clock data of GPS satellite. GPS data including position data, also can be acquired.

■GPS/Multichannel CAN Card EGPC-40A

- ●Simultaneous acquisition of GPS & CAN data (Up to 512 channels)
- ●GPS data acquisition without using a PC

EGPC-40A inserted to the option slot enables simultaneous acquisition of CAN and GPS data or synchronous start of multiple units of EDX-200A.

ECAN-40A Specifications

Applicable Models	EDX-200A-4H EDX-200A-2H
	(Installed in option slot)
	*For EDX-200A-4T, please use ECAN-40A M72.
CAN Ports	2 (High-speed CAN/low-speed CAN selectable)
Channels	Up to 512 (Total for 2 ports)
Compatible CAN Input Channels	CAN2.0A/B (Conforming to ISO-11898, ISO-11519-2)
Baud Rates	High speed CAN
	1000, 800, 500, 250, 125, 100, 83.3, 62.5, 50, 33.3, 25, 20, and 10 [kbps]
	Low speed CAN
	125, 100, 83.3, 62.5, 50, 33.3, 25, 20, and 10 [kbps]
CAN Data Output	
Output at start: Output any given CAN data when AD conversion starts	
Output at stop: Output any given CAN data when AD conversion stops	
Manual output: Output any given CAN data at an arbitrary timing.	
Interval output: Output any given CAN data in a predetermined fixed cycle.	
Digital I/O	
I/O Points	Max. 8
I/O Settings	Switch among digital input, digital output and remote-controlled input for each bit (Common applied to all).
	*Remote control input: Start and stop measuring, execute BAL, etc.
Input Type	Isolated type, TTL level input
Input Voltage	Max. 5 VDC
Isolation Methods	Digital isolator
Output Type	Isolated type, open collector type output (With 10 kΩ internal pull-up resistors)
Output Voltage	5 VDC
Output Current	25 mA max. (Per point)
Isolation Methods	Digital isolator
Connector Type	CAN port D-sub connector (Male) 9-pin
	Digital I/O port MDR connector (Female) 14-pin
Operation Temperature	0 to 50°C, ECAN-40A M72 is -20 to 65°C
Operation Humidity	20 to 90% (Non-condensing)
Storage Temperature	-20 to 60°C, ECAN-40A M72 is -30 to 70°C
Dimensions	22.0 W × 128.0 H × 221.5 D mm
Weight	Approx. 170 g
Compliance	Directive 2014/30/EU (EMC)
	Directive 2011/65/EU, (EU)2015/863 (10 restricted substances) (RoHS)

Note: When using EDX-200A and DCS-101A for arithmetic operation, no CAN measurement is possible.

Standard Accessories: Connector plug for digital I/O ports
Shell case
CANdb File Read Optional Software DCS-105A

ETIM-40A Specifications

Applicable Models	EDX-200A-4H, EDX-200A-2H
	(Installed in the option slot)
	*For EDX-200A-4T, please use ETIM-40A M72.
Synchronization	Synchronizes the recording start time of remote
	EDX-200A units by using the time data received
	from GPS satellites.
GPS Data	Latitude, longitude, elevation, course over ground,
	speed, time, receiving conditions, the number
	of satellites in use, etc.
	Saving format: NMEA format
Digital I/O	
I/O Points	Max. 8
I/O Settings	Switch among digital input, digital output and
	remote-controlled input for each bit
	(Common applied to all).
	*Remote control input: Start and stop measuring,
	execute BAL, etc.
Input Type	Isolated type, TTL level input
Input Voltage	Max. 5 VDC
Isolation Methods	Digital isolator
Output Type	Isolated type, open collector type output
	(With 10 kΩ internal pull-up resistors)
Output Voltage	5 VDC
Output Current	25 mA max. (Per point)
Isolation Methods	Digital isolator
Connector Type	GPS sensor port D-sub connector (Male) 9-pin
	Digital I/O port MDR connector (Female) 14-pin
Operation Temperature	0 to 50 °C
	ETIM-40A M72 is -20 to 65°C
Operation Humidity	20 to 90% (Non-condensing)
Storage Temperature	-20 to 60 °C
	ETIM-40A M72 is -30 to 70°C
Dimensions	22.0 W × 128.0 H × 221.5 D mm
Weight	Approx. 160 g
Compliance	Directive 2014/30/EU (EMC)
	Directive 2011/65/EU, (EU)2015/863
	(10 restricted substances) (RoHS)

Standard Accessories
Connector plug for digital I/O ports
GPS sensor (Cable length: 5 m)
Shell case

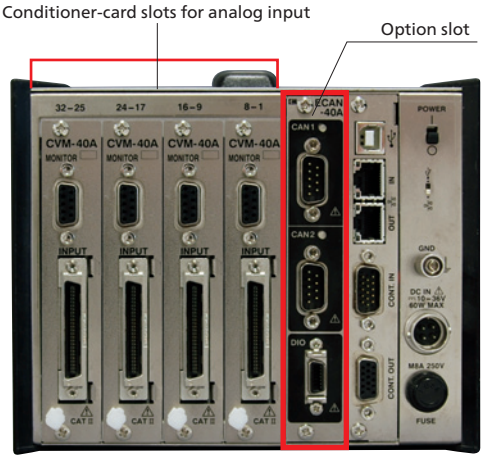
EGPC-40A Specifications

Applicable Models	EDX-200A-4H, EDX-200A-2H
	(Installed in option slot)
	*For EDX-200A-4T, please use EGPC-40A M72.
I/O Ports	GPS/CAN Shared Port 1 Dsub connector 9 pins (male)
	CAN only port 1 Dsub connector 9 pins (male)
	Digital I/O port 1 MDR connector 14 pins (female)
Channels	Up to 512
Compatible CAN Versions	CAN2.0A/B (Conforming to ISO-11898,
	ISO-11519-2)
Baud Rates	High speed CAN
	1000, 800, 500, 250, 125, 100, 83.3, 62.5, 50, 33.3,
	25, 20, and 10 [kbps]
	Low speed CAN
	125, 100, 83.3, 62.5, 50, 33.3, 25, 20, and 10 [kbps]
CAN Data Output	
Output at start: Output any given CAN data when AD conversion starts	
Output at stop: Output any given CAN data when AD conversion stops	
Manual output: Output any given CAN data at an arbitrary timing.	
Interval output: Output any given CAN data in a predetermined fixed cycle.	
GPS Data	Latitude, longitude, elevation, course over ground,
	speed, time, receiving conditions, the number
	of satellites in use, etc.
	Saving format: NMEA format
Synchronization	Synchronizes the recording start time of remote
	EDX-200A units by using the time data received
	from GPS satellites.
Digital I/O	
I/O Points	Max. 8
I/O Settings	Switch among digital input, digital output and
	remote-controlled input for each bit
	(Common applied to all).
	*Remote control input: Start and stop measuring,
	execute BAL, etc.
Input Type	Isolated type (Digital isolator), TTL level input
Input Voltage	Max. 5 VDC
Output Type	Isolated type (Digital isolator)
	Open collector type output
	(With 10 kΩ internal pull-up resistors)
Output Voltage	5 VDC
Output Current	25 mA max. (Per point)
Operation Temperature	0 to 50 °C
	EGPC-40A M72 is -20 to 65°C
Operation Humidity	20 to 90% (Non-condensing)
Storage Temperature	-20 to 60 °C
	EGPC-40A M72 is -30 to 70°C
Dimensions	22.0 W × 128.0 H × 221.5 D mm
Weight	Approx. 170 g
Compliance	Directive 2014/30/EU (EMC)
	Directive 2011/65/EU, (EU)2015/863
	(10 restricted substances) (RoHS)

Note: When using EDX-200A and DCS-101A for arithmetic operation, no CAN measurement is possible.

Standard Accessories
Connector plug for digital I/O ports
GPS sensor (Cable length: 5 m)
Shell case
CANdb File Read Optional Software DCS-105A

Example



Equipped on EDX-200A-4H

EDX-100A

Universal Recorder

Compact & lightweight, up to 256 channels measurement

- Compact & lightweight
- Available with 1, 2 and 4 slots
- LAN port for establishing multichannel network (Max. 256 channels)

*For the Data Analysis Software DAS-200A, see chapter 4.

Note:
For LAN connection, use straight cables and a LAN hub.

●Conditioner cards (See page 3-93.)

Strain/voltage measurement card	CDV-40B/40B-F
Dynamic strain amplifier card	DPM-42B
	DPM-42B-F
	DPM-42B-I
	DPM-42B-I-F
Thermocouple card	CTA-40A
F/V converter card	CFV-40A
Charge amplifier card	CCA-40A/40A-F
CAN card	CAN-41A
Strain/voltage measurement isolation card	CDV-44AS/46AS
Constant current amplifier card	CDA-44AS/45AS
Strain/voltage/acceleration measurement card	CVM-41A
AD converter card	AD-40AS/40AS-F

Note: If the CVM-41A is installed in the EDX-100A, and the Bridge Excitation is set to BV 10 V, or the Power Supply to Sensors is set to 10 VDC (±5 V) ,then the number of settable channels of CVM-41A in EDX-100A is 3 times of units of CVM-41A.
Note: The EDX-100A limits the number of CFV-40A.
The number of CFV-40A is up to 1 for EDX-100A-1.
The number of CFV-40A is up to 2 for EDX-100A-2, EDX-100A-4.

Specifications

Models

Model name	Max. Channels	Card Slots	DCS-100A*1	DCS-101A*2	Remarks
EDX-100A-1	8	1	Yes		
EDX-100A-1-0					
EDX-100A-1-1			Yes	Yes	
EDX-100A-2	16	2	Yes		
EDX-100A-2-0					
EDX-100A-2-1			Yes	Yes	
EDX-100A-4	32	4	Yes		
EDX-100A-4-0					
EDX-100A-4-1			Yes	Yes	
EDX-100A-1H	8	1	Yes		With handle grip
EDX-100A-1H-0					
EDX-100A-1H-1			Yes	Yes	
EDX-100A-2H	16	2	Yes		
EDX-100A-2H-0					
EDX-100A-2H-1			Yes	Yes	
EDX-100A-4H	32	4	Yes		
EDX-100A-4H-0					
EDX-100A-4H-1			Yes	Yes	

Note: *1. Dynamic Data Acquisition Software
*2. Simultaneous Acquisition of Video and Numeric Data/ Arithmetic Operations/FFT Analysis Optional Software

Channels	See table above.
Analog Input	Optional conditioner cards
	Implement with DPM, CDV, CTA, CFV, CCA, CVM
	installed
	For details, see page 3-93.
CAN Data Input	Accepts one card of CAN-41A
Voice Memo Input	1 channel.
	Record voice memos included with recordings
	alongside with measurement data (during manual
	measurements) using a dedicated remote control
	(optional accessory)
Sampling Frequency	
Sampling Methods	Synchronous sampling of all channels
Sampling Frequencies	
	1Hz to 100kHz(1-2-5 series): for 1 channel measurement
	1Hz to 10kHz(1-2-5 series): for 16 channel measurement
	1Hz to 5kHz(1-2-5 series): for 32 channel measurement
	1Hz to 1kHz(1-2-5 series): for CAN data measurement
Data Storage	CF cards recommended by Kyowa
	(128 MB to 8 GB; 45× speed or higher)
	Offline data transfer to computers is enabled after the
	recording is complete
Setting Conditions	
Online: From the PC via LAN or USB port	
Offline: By reading from the CF card which has measuring conditions	
written with the DCS-100A data acquisition software	
Saving Conditions	Amplifier setting conditions and measuring conditions
	are saved in the internal nonvolatile memory, enabling
	immediate setup with previous conditions upon power-on.
Measuring Modes	
Manual	Data recording is manually started or stopped when
	data is recorded to a preset number of measured data.
	Manual mode allows recording of voice memo during data
	recording.
Trigger	Data recording is automatically started when the preset trigger
	condition is satisfied.
	Note that any CAN data mustn't be used as a trigger condition
Interval	Data recording is periodically made at preset intervals.
Manual Start/Stop of Data Recording	
	Possible by using the PC or by pressing the switch on the
	front panel or from the dedicated remote control unit
Balance Adjustment	
	Strain input channels are balanced by pressing the BAL.
	switch on the front panel or from the dedicated remote
	control unit or from the PC.

Saved Data Format	
	Kyowa standard format KS2, which enables data analysis with the optional Data Analysis Software DAS-200A
Collecting Data	LAN or USB port enables online data transfer to the PC, while CF card enables offline data transfer.
TEDS	Reads sensor's information and sets to channel condition automatically.
	Supported conditioner cards: CDV-40B (-F), DPM-42B (-F), DPM-42B-I (-F), CCA-40A (-F), CDV-44AS, CDA-44AS/45AS, CVM-41A, AD-40AS (-F)
Synchronous Operation	
	Synchronous cable enables cascade connection of up to 8 units of the EDX-100A. While data is recorded as a separate file in the CF card inserted into each unit, files of all cards are combined into a single file after online or offline data transfer to the PC.
Analog Output	All, except for CDV-40B (-F), AD-40AS (-F), and CAN-41A.
	Conditioner cards provide an analog output connector, enabling voltage monitoring (±5 VFS).
CF Card Slot	1 (For data recording and condition setting)
Interfaces	LAN and USB (For control and data transfer), switchable
LAN I/F	10BASE-T／100BASE-TX Connector: RJ45 modular jack
USB I/F	Conforms to USB 2.0 (High speed).
	Connector: Series B receptacle
Operation Switches	REC/PAUSE: Starts/pauses data recording.
	STOP: Stops data recording.
	BAL.: Executes balance adjustment.
	READ: Reads and sets conditions.
	ID: Sets ID No. of EDX-100A.
	LAN/USB: Switches communication port.
Indicators	Operation status indicator LEDs: 7
	Channel status indicator LEDs: The number corresponds to the number of channels provided.
External Control Connectors	
	CONT IN and CONT OUT (For remote control and synchronous operation)
Operating Temperature	0 to 50°C
Operating Humidity	20 to 90% (Non-condensing)
Storage Temperature	-20 to 60°C
Vibration Resistant	±29.42 m/s^2 (3 G), 5 to 55 Hz (When operating)
	±49.03 m/s^2 (5 G), 5 to 55 Hz (When not operating)
Impact Resistant	196.1 m/s^2 (20 G)/11 ms
Power Supply	10 to 18 VDC
	Connector: RM12BRD-4PH (Hirose)
	DC power supply or optional dedicated AC adapter is required.
Current Consumption	
EDX-100A-1:	Approx. 1.2 A (When operated on 12 VDC with 1 CDV-40B card mounted and full load applied)
EDX-100A-2:	Approx. 1.8 A (When operated on 12 VDC with 2 CDV-40B cards mounted and full load applied)
EDX-100A-4:	Approx. 2.8 A (When operated on 12 VDC with 4 CDV-40B cards mounted and full load applied)
Dimensions	EDX-100A-1: 70.0 W × 132.5 H × 255 D mm
	EDX-100A-2: 92.5 W × 132.5 H × 255 D mm
	EDX-100A-4: 137.5 W × 132.5 H × 255 D mm
	*Excluding protrusions
Weight	EDX-100A-1: 1.6 kg (1.7 kg with 1 CDV-40B card mounted)
	EDX-100A-2: 1.8 kg (2.0 kg with 2 CDV-40B cards mounted)
	EDX-100A-4: 2.0 kg (2.6 kg with 4 CDV-40B cards mounted)

Standard Accessories

DC power cable P-76
Ground wire P-72
USB cable N-38
CF card (1 GB)
DVD (Dynamic data acquisition software DCS-100A)
*DCS-100A is optional for models with suffix "-0".

Optional Accessories

USB cable N-39 (2 m)
Synchronous cable N-128
Camera synchronous cable N-98, N-99, N-101
AC adapter UIA345-12 (For U.S.A.: UNI345-1238)
Cable fixture
Synchronous extension unit ESYN-30A
Remote control unit RCU-41A
Battery unit for instantaneous power failure EDB-41B
Monitor unit EMON-20A
Dummy panel EDX2000-DUMMY

DCS-100A software, specification for control of EDX-100A

***For details of DCS-100A, see chapter 4.**

Units	Up to 8 units (up to 256 channels.)
Interfaces	LAN or USB
Saving Format	Saves the measured data in the EDX-100A CF card or PC folder in the KS2 format file.
Channel Conditions	Measuring ON/OFF, Measuring mode, Range, High-pass filter, Low-pass filter,Balance adjustment ON/OFF, CAL range, CAL ON/OFF, Calibr. const., Offset, Unit, Channel name, Measuring range, Rated capacity, Rated output, Deci Digits, Internal sensitivity compensation ON/OFF, Offset ZERO ON/OFF (Display items can freely be selected.)
Loading TEDS Sensor Information	
	Loads the TEDS information automatically and sets the channel conditions.
Setting Parameter and Loading Parameter	
	Loads and sets the EDX-100A internal parameter.
Collecting Data File	PC collects the KS2 format file, saved in the EDX-100A CF card, via LAN/USB.
	To collect the KS2 format file, insert the CF card in the PC.
Deleting Data File	PC deletes the KS2 format file, saved in the EDX-100A CF card, via LAN/USB.
Setting Environment	
Setting Hardware Configuration	
	Sets the number of units and device names.
	Loads the hardware configurations from the EDX-100A.
Communication Check	Loads the EDX-100A version.
Setting IP Address	PC sets the EDX-100A via LAN/USB.
	Saves the IP address setting file in the CF card.
Device Confirmation	LEDs, on the EDX-100A front panel, light up.
Others	Oscillator switching (internal/external), operating beep sound
■When Saving the Measured Data in the EDX-100A CF Card	
Sampling Frequency	1 Hz to 100k Hz 1/2/5 system, 2n system, external clock)*Limited by the number of channels.
File Size	Up to 2 GB.
	*The number of data varies with the number of channels.
Measure Mode	Manual, Manual (Set Record Data), Interval, Analog Trigger, External Trigger,Complex Trigger
Manual Measurement	Records data from REC to STOP or from REC to the number of data, specified on the Manual (Set Record Data).
Interval Measurement	Records data automatically based on the pre-set starting time and recording interval.
Trigger Measurement	Starts/stops recording data based on the pre-set trigger conditions.
Common trigger conditions	
End Trigger	Settable
Delay	Up to 262144 data for both start and end.
	The delay time varies with the number of channels.
Analog Trigger Conditions	
Trigger Channel	Any 1 channel of the master unit
Trigger Level	Physical quantity
Trigger Slope	Positive or Negative
External Trigger Conditions	
Trigger Slope	Positive or Negative
Complex Trigger Conditions	
Trigger Source	Select from the analog channels (any 2 channels of the master unit) or external trigger.
	Capable of judging the trigger source by using the logical AND and OR operators.
Trigger Level	Physical quantity
Trigger Slope	Positive or Negative
■When saving the measured data in the PC folder	
Sampling Frequency	1 Hz to 100k Hz (1/2/5 system, 2n system, external clock)
File Size	Up to the hard disk capacity.
Measure Mode	Manual, Manual (Set Record Data), Interval, Analog Trigger
Manual Measurement	Records data from REC to STOP or from REC to the number of data, specified on the Manual (Set Record Data).

Interval Measurement	Records data automatically based on the pre-set starting time and recording interval.
Analog Trigger Measurement	Starts/stops recording data based on the pre-set trigger conditions.
End Trigger	Settable
Delay	Up to 262144 data for both start and end.
	The delay time varies with the number of channels.
Trigger Channel	Any 1 channel
Trigger Level	Physical quantity
Trigger Slope	Positive or Negative
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.
	*Measure Mode: Manual and Interval only.
Repeated Recording	When recording data for a long time, the DCS-100A saves data, every pre-set number of data or every pre-set interval, in the KS2 format file.
	*Measure Mode: Manual (Set Record Data) only.

■Remote Control Unit RCU-41A

Control Functions	①"REC/PAUSE":	Starts/pauses data recording.
	②"STOP":	Stops data recording.
	③"BAL":	Executes balance adjustment.
	④"VOICE MEMO":	Records voice memo.
Indicators	REC/PAUSE, BAL	
Cable Length	Approx. 1.5 m	
	(Used by connecting to the CONT IN connector of the EDX-100A recorder unit)	
Dimensions	35 W × 110 H × 20 D mm	
	*Excluding protrusions	
Weight	Approx.200 g	

■Synchronous Extension Unit ESYN-30A

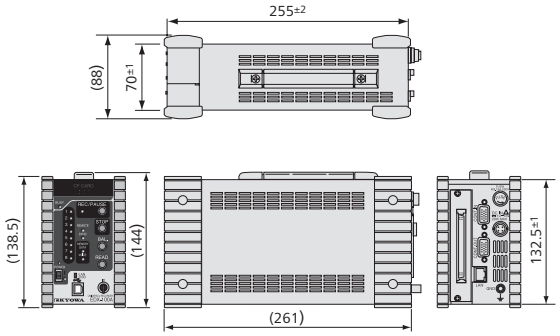
Display	POWER LED	
	With EDX-3000B connected:	Lit green
	With EDX-100A connected:	Lit orange
Numbers of Connected Recorder		
EDX-3000B synchronous operation:		Max. 10
EDX-100A synchronous operation:		Max. 8
EDX-3000B, EDX-100A mixed synchronous operation *1:		Max. 8
Total Synchronous Cable Length *2		
EDX-3000B synchronous operation:		1000 m or less
EDX-100A synchronous operation:		50 m or less
EDX-3000B, EDX-100A mixed synchronous operation *1:		50 m or less
Synchronous Cable Length between Devices		
EDX-3000B synchronous operation:		100 m or less
EDX-100A synchronous operation:		50 m or less
EDX-3000B, EDX-100A mixed synchronous operation *1:		50 m or less
Dimensions	92 W × 24.6 H ×55 D mm (Excluding protrusions)	
Weight	250 g or less	

*1 The ID number of EDX-100A must be higher than an ID number of EDX-3000B.
*2 Not including the synchronous cable length.
Note: When using ESYN-30A, do not use a remote control unit.

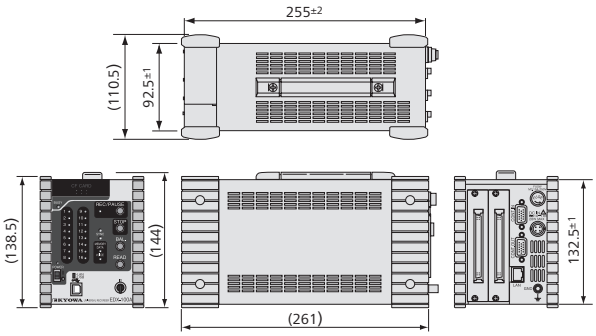
Optional Accessories EDX connection cables N-106, N-107
Terminators ESYN-1A (For slave),
ESYN-2A (For master)
Extension cables N-108, N-109, N-110, N-111

■Dimensions

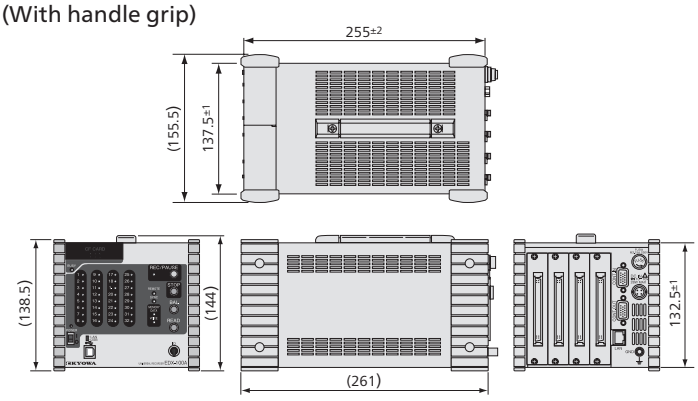
●1 Slot
EDX-100A-1
EDX-100A-1H
(With handle grip)



●2 Slots
EDX-100A-2
EDX-100A-2H
(With handle grip)



●4 Slots
EDX-100A-4
EDX-100A-4H
(With handle grip)



Data Recorders/ Analyzers

EMON-20A

Monitor Unit

- Monitoring any 8-channel data
- Touching the panel to control the EDX-100A and EDX-200A
- Setting channel conditions (Measure ON/OFF, channel modes, measuring range, LPF, sampling frequencies, etc.)
- Confirming recorded data on the spot

Specifications

Applicable Recorders	EDX-100A and EDX-200A (Max. 3 units in sync)	
Display	LCD: 5.7" color TFT, 320 × 240	
	Touchscreen: Analog resistive film type	
	POWER LED : ON (Power ON)	
	Flashing (Back right is OFF, Updating)	
	OFF (Power OFF)	
Display Contents	Y-time graph: Max. 8 channels. It is not possible	
	to select some channels over several EDXs that is	
	in synchronous operation.	
	Numeric monitoring: Max. 8 channels. It is not	
	possible to select some channels over several EDXs	
	that is in synchronous operation.	
	Data confirmation: Max. 8 channels	
Control Items	Measuring items: Monitor start (MONITOR),	
	stop (STOP), record (REC), and balance (BAL)	
	Channel conditions: Measuring range,	
	switching modes, LPF	
	Measuring conditions: Sampling frequencies	
Other Functions	EMON-20A settings	
	Language (Japanese/English), background color	
	(black/white), operating beep (ON/OFF),	
	back light (lighting time), network settings,	
	preset values initialization	
	Measuring unit information	
	EDX model, the number of EDX units,	
	EDX version, EDX ID, EDX IP address,	
	EDX subnet mask, conditioner card model	
Coupling Cable	Dedicated cable within 5 m	
Power Supply	10 to 36 VDC or AC exclusive adapter	
Current Consumption	450 mA or less (12 VDC)	
	200 mA or less (24 VDC)	
Dimensions	166 W × 29 H × 128.5 D mm (Excluding protrusions)	
Weight	Approx. 550 g	
Vibration Resistant	29.4 m/s^2 (3 G), 5 to 200 Hz	
Shock Resistance	147.0 m/s^2 (15 G), 11 ms or less	
Operating Temperature	0 to 50°C	
Operating Humidity	20 to 80% (Non-condensing)	
Control Available Conditioner Card		
Strain/Voltage/Acceleration Measurement Card	CVM-41A	
Strain/Voltage Measurement Card	CDV-40B, CDV-40B-F	
Dynamic Strain Measurement Card	DPM-42B, DPM-42B-F,	
	DPM-42B-I,	
	DPM-42B-I-F	
Thermocouple Card	CTA-40A	
F/V Converter Card	CFV-40A	
Charge Amplifier Card	CCA-40A, CCA-40A-F	
Strain/Voltage Measurement Insulation Card	CDV-44AS	
Direct Rated Current Expansion Card	CDA-44AS, CDA-45AS	
A/D Converter Card	AD-40AS, AD-40AS-F	
CAN Card*1	CAN-41A	
*1 Monitoring data and recording data are available.		
Confirming with recorded data and changing CAN setting condition are		
not available.		

Standard Accessories

Connection cable (Approx. 5 m)

Optional Accessories

AC adapter UIA345-12 (For U.S.A.: UNI345-1238)
DC power cable P-76

*For custom-designed products, contact us.
*Requires the EDX-100A/200A firmware version 02.00 or higher.

Dimensions