

 **KYOWA**

 INSTRUMENTS  
**TECHNO  
TEST**

**UCAM-80A**  
Data Logger

**Be Smart !**

— Evolution in form and technology —





Keeping an eye on changes we cannot see.

# UCAM-80A

UCAM-80A is a static strain measuring instrument that offers high accuracy, universal input, and multi-channel support.

It features a color LCD and touch panel,

an user-friendly user interface,

and useful functions such as lead wire slits and a thermal printer all in a stylish package.

A single device to keep towns and infrastructures safe.

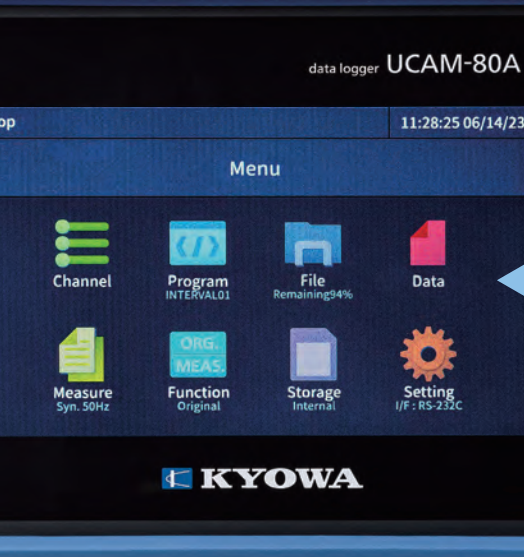


# Good form, Good usability



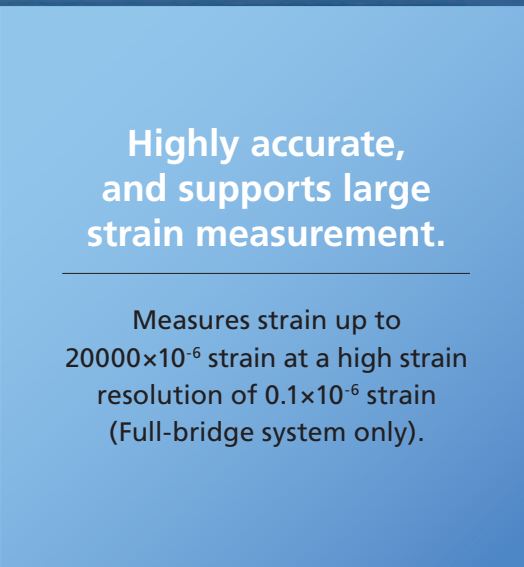
Now with an even better design and enhanced ease of use

# UCAM-80A



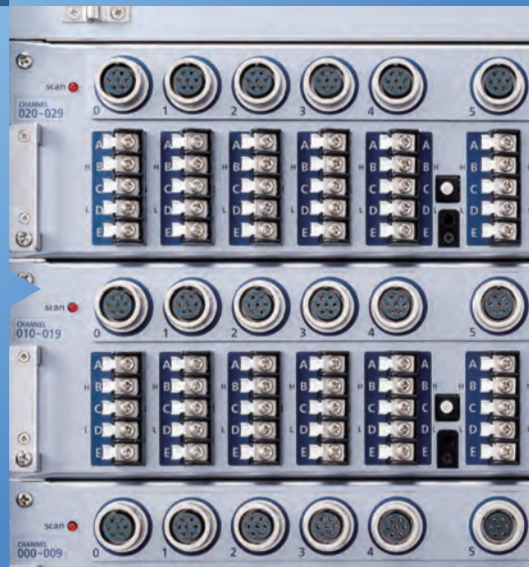
## Includes a touch panel

A new UI with text and icons features excellent usability, and makes it easy at worksites.



## Highly accurate, and supports large strain measurement.

Measures strain up to  $20000 \times 10^{-6}$  strain at a high strain resolution of  $0.1 \times 10^{-6}$  strain (Full-bridge system only).



## Improved cable management

Includes lead wire slits. Strain gage lead wires can be organized and bundled, even during multi-channel measurement.



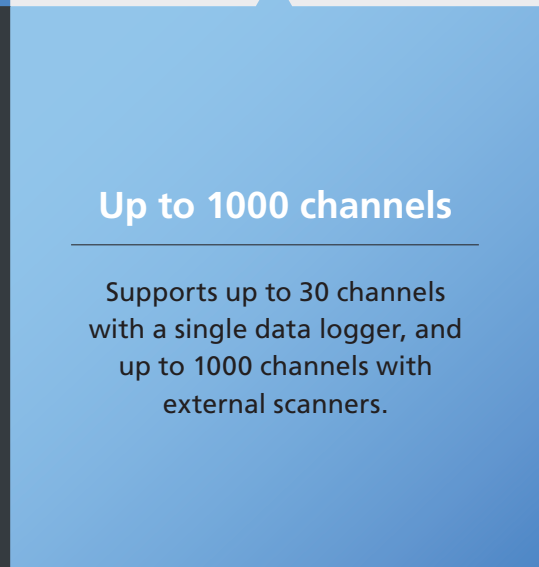
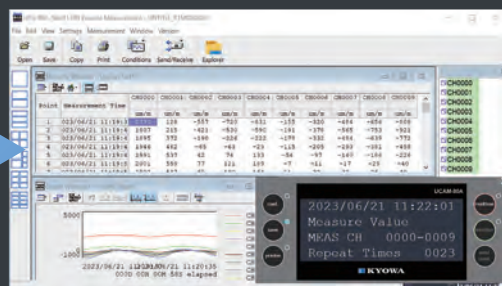
## Built-in printer

Equipped as standard with a thermal printer to print and check measurement results immediately.



## New software

Control UCAM from a remote PC, display up to 50 graphs, and run various calculations.



## Up to 1000 channels

Supports up to 30 channels with a single data logger, and up to 1000 channels with external scanners.

# Applications



## Dam

- A lightning arrester protect UCAM from lightning when uses with scanning units and scanners.
- UCAM supports transducers with temperature measuring functions crucial for calibrating data due to temperature changes. A single channel can measure both physical amounts and temperature, reducing the number of channels required.
- UCAM can even be used on large dams with more than 200 channels of monitoring devices. It has even been used successfully in systems with functionality to render history and correlation diagrams, combined with custom software and PCs.
- UCAM also supports platinum resistance thermometers and contact output used in the civil engineering measurement field.



## Urban civil engineering

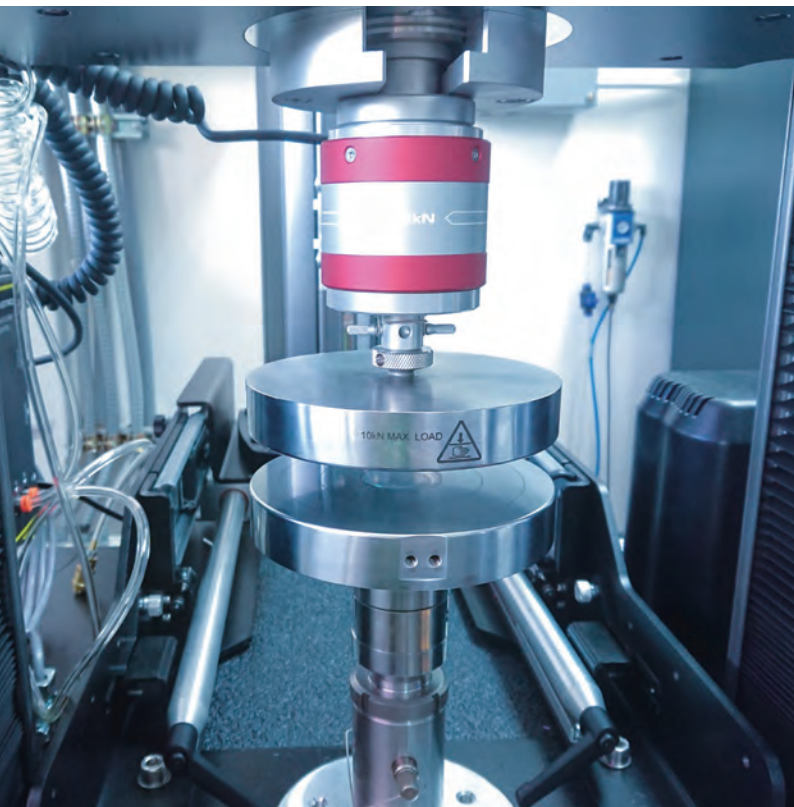
- UCAM has a solid track record is providing stable and reliable measurements over a long period of time.
- UCAM is capable of measuring up to 1000 channels, and can even support large-scale urban civil engineering measurement work.
- UCAM is compatible with existing scanners (USB-70 Series), and a single device can be connected to multiple scanners.
- UCAM is equipped with a lightning arrester to help protect it from lighting. This keeps UCAM safe even during urban civil engineering measurement work (supported scanners and scanning units only).
- UCAM is equipped with a printer. Measurement results can be printed and checked immediately.

# UCAM-80A



## Automobile

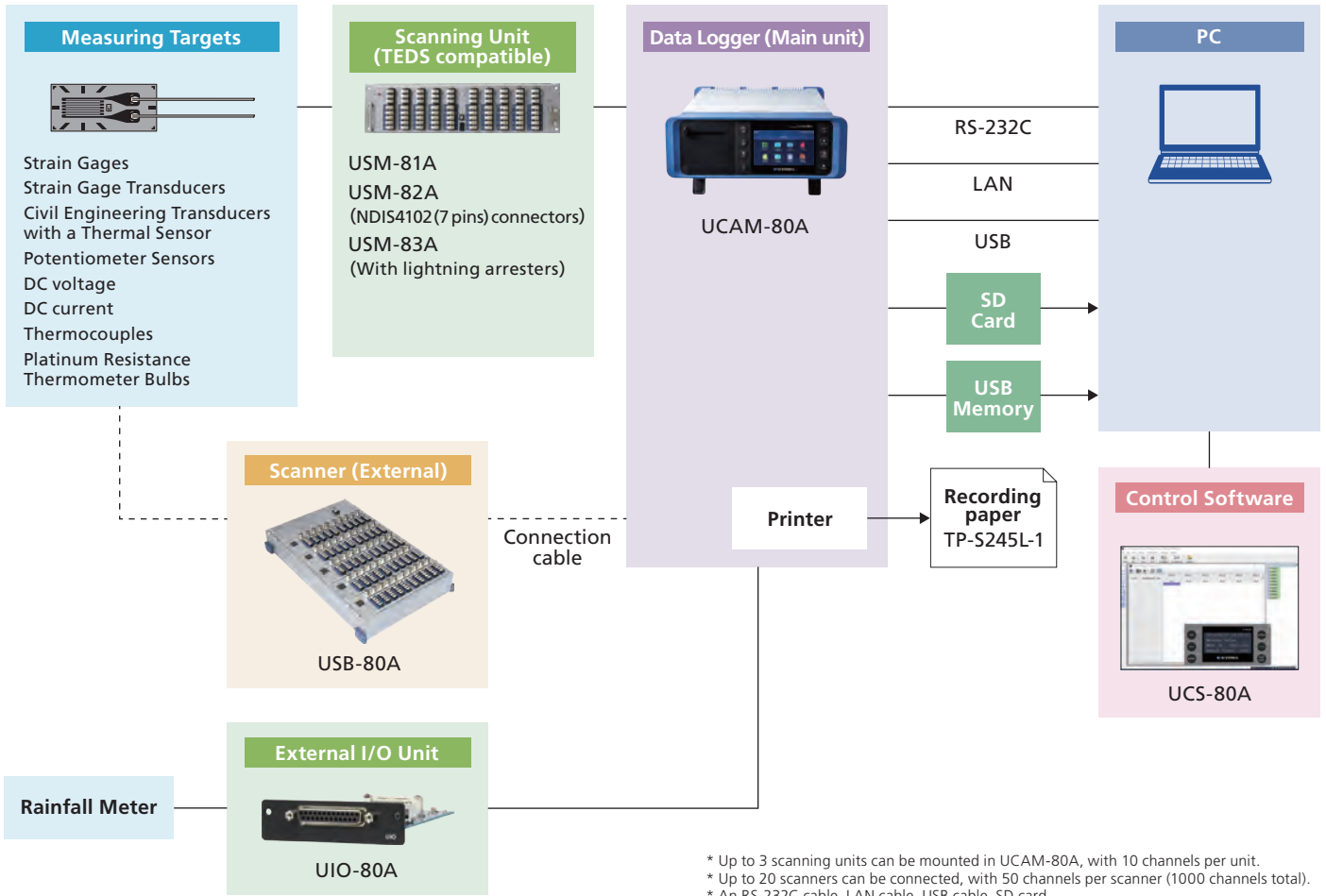
- UCAM supports a wide range of tests, including strength tests for vehicle bodies and parts (load, displacement, and strain), strength tests for new materials (material tensile testing), and evaluation tests for engines (temperature and strain measurement in constant temperature tanks).
- UCAM is capable of measuring strain and temperature at a high level of accuracy and stability, even in situations where temperature gradually changes such as during multi-channel temperature cycle tests.
- UCAM can be used with Kyowa strain gages to cover the entire measurement process, from measurement to data recording.



## Material testing

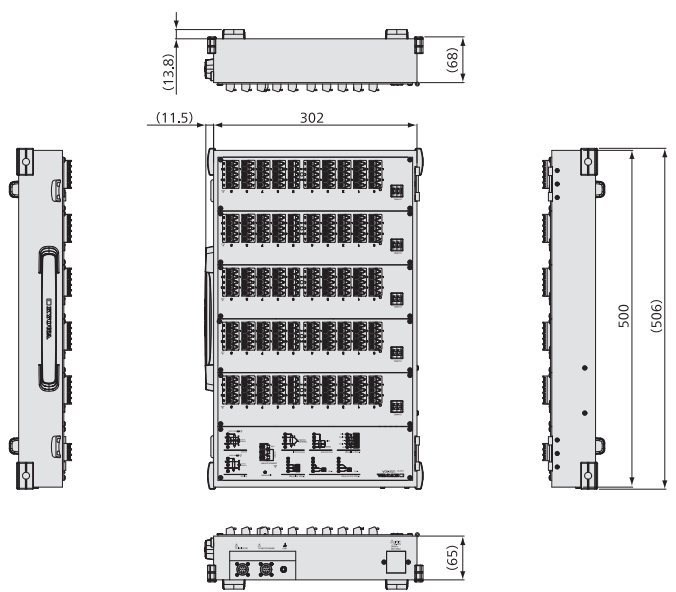
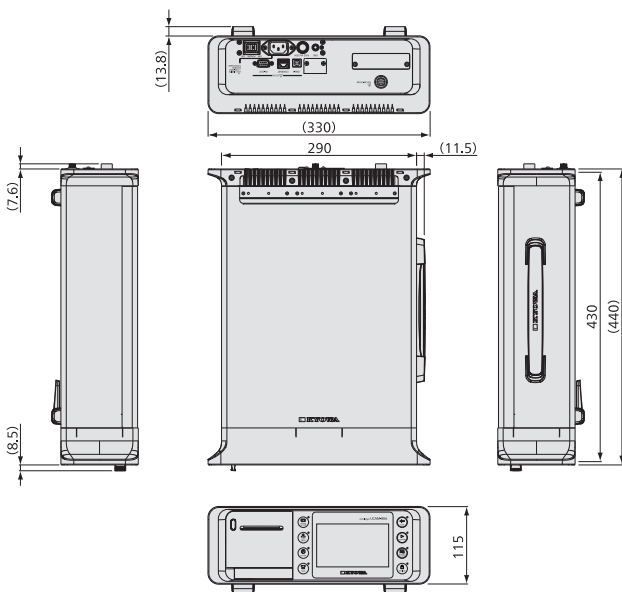
- UCAM is an excellent choice for large strain measurement with a high level of accuracy during tensile tests conducted to measure stress values up to the point where metallic materials break when a load is continuously applied.
- UCAM supports static measurement while slowly pulling a test piece. It also supports strain measurement up to the point of test piece failure, as well as a strain measurement of various structures, from the elastic region to the plastic region.
- UCAM is ideal for multi-point static material tests.
- UCAM has stable temperature characteristics, allowing it to be used to measure residual stress.

## Block Diagram



- \* Up to 3 scanning units can be mounted in UCAM-80A, with 10 channels per unit.
- \* Up to 20 scanners can be connected, with 50 channels per scanner (1000 channels total).
- \* An RS-232C cable, LAN cable, USB cable, SD card, and USB storage for connecting UCAM-80A to a PC are optional accessories.
- \* USM-81A, USM-82A, USM-83A, and UIO-80A can be used mounted to UCAM-80A.
- \* USB-80A includes an N-24 connection cable (Approx. 1.0 m).
- \* UCAM-60 Series scanning units and scanners are also compatible.

## Dimensions



UCAM-80A

● Measuring Targets and Connectable Scanners	
Measuring Targets	Strain gages, strain gage transducers, civil engineering transducers with a thermal sensor, DC voltage-output or DC current-output instruments, potentiometer sensors, thermal sensors (thermocouples and platinum resistance thermometer bulbs)
Connectable Scanning Units (Mounted on Top of the UCAM-80A)	USM-81A, USM-82A, USM-83A
Connectable Scanners	USB-80/70 Series

■ Measuring Targets and Connectable Scanners

Measuring Targets	Scanners	Scanning Units	External Scanners		
			General Purpose	Civil Engineering	
Strain Gages and Strain-gage Transducers (*)	Quarter Bridge System	120 Ω	●	●	●
		240 Ω	●	●	●
		350 Ω	●	●	●
	Quarter Bridge (True-dummy System)	120 Ω	●	●	●
		350 Ω	●	●	●
		Active Dummy System	●	●	●
	Half Bridge 60 to 1000 Ω	Active Active System	●	●	●
		Common Dummy System	—	●	●
		Opposite-leg Active System	●	●	●
	Full Bridge 60 to 1000 Ω (*2)	Full Bridge System	●	●	●
Constant-current Excitation		●	—	—	
Civil Engineering Transducers	Full Bridge 120 Ω	●	—	—	
	Full Bridge 350 Ω	●	●	●	
		Transducers with a Thermal Sensor	●	—	●

(\*)1 Can not use remote sensing sensor directly.  
 (\*2) 120 to 1000 Ω in high-resolution mode.  
 (\*3) Accessory terminal cover not attachable. When mounted on the UCAM-80A, calibration is required (with charge).

Measuring Targets	Scanners	Scanning Units	External Scanners		
			General Purpose	Civil Engineering	
Voltage	DC Voltage-output Instruments	●	●	●	
Current	DC Current-output Instruments	●	●	●	
Temperature	Thermocouples	K(CA)	●	●	●
		T(CC)	●	●	●
		E(CRC)	●	●	●
		J(IC)	●	●	●
	R	●	●	●	
	Platinum Resistance Thermometer Bulbs	Pt100 (new JIS)	●	—	●
JPt100 (old JIS)		●	—	●	
	Potentiometer Sensors	●	●	●	
	Built-in Lighting Arresters	USM-83A USS-63B only	—	●	

Input Channels Max 30 with Scanning Units  
 Max 1000 with External Scanners connected  
 Max 1000 with Scanning Units and External Scanners connected

■ Scanning Speed

Scanners	Line Frequencies	50 Hz Zone	60 Hz Zone
		Scanning Units (Standard Mode)	50 ms/channel
Scanning Units (High-resolution Mode)	280 ms/channel		
Scanning Units (High-speed Mode)	20 ms/channel	16.7 ms/channel	
USB-80/70 Series (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, 1 s, 2 s, 5 s, and 10 s.  
 2. Repeat measurement interval time = (Number of measuring channels x scanning speed) + data processing time (less than 5 seconds)  
 Data processing time is indeterminate, changed by measurement setting and environment. Data processing time is when the printer is set to not print.  
 3. Standard mode and high-resolution mode can be set for each channel.  
 4. High-speed mode is only collective switching for all channels of Scanning Units.

Measuring Targets	Scanning Speed		
	Standard Mode	High-resolution Mode	High-speed Mode
Strain (Gage & Transducer)	●	●	●
Voltage/Current-output Sensor	●	×	●
Civil Engineering Transducer	●	×	×
Temperature Sensor (TC, Pt)	●	×	×
Potentiometer Sensor	●	×	●

Notes  
 1. High-resolution mode and high-speed mode can be measured only with the Scanning Units, not with the USB-80/70 series.  
 2. In high-resolution mode and high-speed mode, strain mode is Full bridge system only.

Operating Modes	Real-time, monitor, and automatic
Measurement Functions	•Initial: Initial values are measured and stored in internal memory. •Original: Raw values are measured without subtraction of initial values. •Measure: Initial values are subtracted from original values. Notes: 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	•Trigger Measurement: A relative value (certain changing quantity) or an absolute value triggers measurement. •Interval Measurement: Measurement is automatically performed at preset time intervals. •Trigger Interval Measurement: Combination of trigger measurement and interval measurement.
Change Stroke Measurement	Single channel only
Storage	Internal memory 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 ±50k × 10 <sup>-6</sup> strain	1 × 10 <sup>-6</sup> strain	In case of Scanning Units ±(0.05% of reading +1) × 10 <sup>-6</sup> strain In case of USB-80/70 ±(0.07% of reading +2) × 10 <sup>-6</sup> strain
±50k to ±500k × 10 <sup>-6</sup> strain	10 × 10 <sup>-6</sup> strain	In case of Scanning Units ±(0.05% of reading +10) × 10 <sup>-6</sup> strain In case of USB-80/70 ±(0.07% of reading +20) × 10 <sup>-6</sup> strain

Notes  
 1. Resolution and accuracy be automatically change by Autorange function.  
 2. Constant voltage bridge excitation approx. 5 VDC can only be available with Scanning Units.

● Strain Measurement (High-resolution Mode)	
Constant Voltage Excitation	Approx. 5 VDC
Constant Current Excitation	Approx. 14.3 mA (Bridge resistance 350 Ω)
Scanning Speed	0.28 s/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 ±20k × 10 <sup>-6</sup> strain	0.1 × 10 <sup>-6</sup> strain	±(0.05% of reading + 0.3) × 10 <sup>-6</sup> strain
±20k to ±200k × 10 <sup>-6</sup> strain	1 × 10 <sup>-6</sup> strain	±(0.05% of reading +3) × 10 <sup>-6</sup> 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. For constant current excitation, bridge resistance 350 Ω only.  
 4. Available only with Scanning Units.  
 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 (50 Hz zone) 16.7 ms/channel (60 Hz zone)
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 ±50k × 10 <sup>-6</sup> strain	1 × 10 <sup>-6</sup> strain	±(0.08% of reading +3) × 10 <sup>-6</sup> strain
±50k to ±500k × 10 <sup>-6</sup> strain	10 × 10 <sup>-6</sup> strain	±(0.08% of reading +30) × 10 <sup>-6</sup> strain

Notes  
 1. Available only with full bridges system (120 to 1000 Ω).  
 2. Available only with Scanning Units.  
 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	In case of Scanning Units ±(0.05% of reading +0.003) mV In case of USB-80/70 ±(0.07% of reading +0.004) mV	10 MΩ or more
	±50.00 to ±500.00 mV	10 μV	In case of Scanning Units ±(0.05% of reading +0.03) mV In case of USB-80/70 ±(0.07% of reading +0.04) mV	
V/50 V	0 to ±5.0000 V	100 μV	In case of Scanning Units ±(0.05% of reading +0.0002) V In case of USB-80/70 ±(0.07% of reading +0.0003) V	1 MΩ or more
	±5.000 to ±50.000 V	1 mV	In case of Scanning Units ±(0.05% of reading +0.002) V In case of USB-80/70 ±(0.07% of reading +0.003) V	

Notes: Resolution and accuracy be automatically change by Autorange function.

●Voltage Measurement (High-speed Mode)				
Scanning Speed	20 ms/channel (50 Hz zone) 16.7 ms/channel (60 Hz zone)			
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. Available only with Scanning Units.  
2. Resolution and accuracy be automatically change by Autorange function.

●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 μV	In case of Scanning Units ±(0.05% of reading +0.01) mA In case of USB-80/70 ±(0.07% of reading +0.02) 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 (50 Hz zone) 16.7 ms/channel (60 Hz zone)			
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 μV	±(0.08% of reading +0.01) mA	

Notes  
1. Available only with Scanning Units.  
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 External Reference Junction Compensator *1	Accuracy Internal Reference Junction Compensator *2
K T E J	-200.0 to 1230.0°C -200.0 to 400.0°C -200.0 to 660.0°C -200.0 to 870.0°C	0.1°C	In case of Scanning Units •Above -50°C ±(0.05% of reading +0.4°C) •Below -50°C ±(0.1% of reading +0.5°C)	●Ambient temperature 15 to 35°C In case of Scanning Units •Above -50°C ±(0.05% of reading +0.9°C) •Below -50°C ±(0.1% of reading +1.0°C)
			In case of USB-80/70 •Above -50°C ±(0.07% of reading +0.6°C) •Below -50°C ±(0.14% of reading +0.7°C)	In case of USB-80/70 •Above -50°C ±(0.05% of reading +1.9°C) •Below -50°C ±(0.1% of reading +2.0°C)
R	0 to 1760.0°C	0.1°C	In case of Scanning Units •Above +150°C ±(0.05% of reading +1.4°C) •Below +150°C ±(0.1% of reading +2.0°C)	●Ambient temperature 15 to 35°C In case of Scanning Units •Above +150°C ±(0.05% of reading +1.9°C) •Below +150°C ±(0.1% of reading +2.5°C)
			In case of USB-80/70 •Above +150°C ±(0.07% of reading +2.0°C) •Below +150°C ±(0.14% of reading +2.8°C)	●Ambient temperature 0 to 50°C In case of Scanning Units •Above +150°C ±(0.05% of reading +2.9°C) •Below +150°C ±(0.1% of reading +3.5°C)
				In case of USB-80/70 •Above +150°C ±(0.07% of reading +3.5°C) •Below +150°C ±(0.14% of reading +4.3°C)

\*1 Accuracies do not include the internal reference junction compensator accuracy.  
\*2 With input terminal temperature balanced in an ambient.  
Notes  
1. The reference junction compensator is switchable between internal and external.  
2. Thermocouple resistance should be 1 kΩ or less.  
3. JIS C1602:2015, IEC 60584-1: 2013

●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	In case of Scanning Units Within ±0.5°C In case of USB-80/70 Within ±0.7°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 850.0°C	0.1°C	In case of Scanning Units Within ±0.3°C In case of USB-80/70 Within ±0.4°C	
JPt100	-200.0 to 510.0°C			

Notes  
Connection is 3-wire system.  
JIS C1604: 2013, IEC60751: 2008  
JIS C1604: 1989 (JPT100)

●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 kΩ to 10 kΩ			
□ Measuring Range, Resolution and Accuracy				
Channel Mode	Measuring Range	Resolution	Accuracy	
POT.	0 to ±50.00%	0.01%	In case of Scanning Units Within ±0.1% FS In case of USB-80/70 Within ±0.14% FS	

●Measurement with Potentiometer Sensor (High-speed Mode)				
Scanning Speed	20 ms/channel (50 Hz zone) 16.7 ms/channel (60 Hz zone)			
Initial Value Memory Range	Same as measuring range			
Sensor Power Supply	Approx. 2 VDC			
Potentiometer Resistance	1 kΩ to 10 kΩ			
□ Measuring Range, Resolution and Accuracy				
Channel Mode	Measuring Range	Resolution	Accuracy	
POT.	0 to ±50.00%	0.01%	Within ±0.1% FS	

Notes: Available only with Scanning Units.

●Temperature Stability	
Zero Point	Strain Measurement (Full bridge system) Within ±0.1×10 <sup>-6</sup> strain/°C Voltage Measurement (V/500 mV) Within ±0.1 μV/°C Voltage Measurement (V/50 V) Within ±10 μV/°C Temperature Measurement with Thermocouple (K, T, E, J) Within ±0.02°C/°C Temperature Measurement with Thermocouple (R) Within ±0.14°C/°C Temperature Measurement with Platinum Resistance Thermometer Bulb Within ±0.01°C/°C Measurement with Potentiometer Sensor Within ±0.001%/°C
Sensitivity	Within ±0.01%/°C
Internal Timer	Real time clock is Built-in (Battery backup) Accuracy: 20 s/month (Ambient temperature 25°C)
Display	5-inch color display (TFT) Capacitive touch panel Status LED
Speaker	Sounds when operated or when an error occurs.
Printer	Printing: Thermal Paper width: 58 mm (32 characters/line)
Interface	
To PC Interface	RS-232C LAN (10BASE-T/100BASE-TX), USB 2.0 NDIS4102 (7 pin) (To USB-80/70 interface) SD card slot (SD card can be used to store data from the internal memory or back up the recorded data to SD card. Compatible: SDHC card) Notes: 1. SD card capacity: 32 GB or less File Format: FAT32 2. The following SD card has been tested by KYOWA. Manufacturer: HAGIWARA Solutions Model: NSDB-004GS (N245E) Capacity: 4 GB
Other Interfaces	USB 2.0 (Collects measurement data by USB Flash Drive.) Notes 1. Measurement data cannot be saved directly to USB memory. 2. USB Flash Drives capacity: 32 GB or less File Format: FAT32 3. The following USB memory device has been tested by KYOWA. Manufacturer: Green house Model: GH-UFI-XSD2G Capacity: 2 GB
File Conversion	Measurement data can be converted to CSV.
Self-diagnosis Function	Checks display, printer, bridge excitation, lead-wire-off, input/output resistance, insulation resistance, mode, terminal temperature.

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 30 m or less. (With Scanning Units USM-81A, USM-82A, USM-83A, USS-61B, USS-62B, USS-63B)
Operating Temperature		0 to 50°C
Operating Humidity		20 to 85% (Non-condensing)
Storage Temperature		-20 to 60°C
Setting Maintenance Function		ACOM at measurement circuit is switchable between floating and GND connect.
Power Supply		AC 100 to 240 V 50/60 Hz
Current Consumption		0.5 A or less: 100 VAC (With 3 Scanning Units mounted)
Degrees of Protection		IP20 (JIS C 0920/IEC 60529)
Dimensions		290 (W) ×115 (H) ×430 (D) mm (Excluding protector, protrusions)
Weight		Approx. 6.2 kg (Excluding Scanning Units) Approx. 8.7 kg (With 3 Scanning Units USM-82A mounted, Excluding terminal cover)
Compliance		Directive 2014/30/EU (EMC) Directive 2014/35/EU (LVD) Directive 2011/65/EU, (EU)2015/863(10 restricted substances) (RoHS)
Standard Accessories		AC power cable P-18 (With 2-pin conversion plug CM-52) ×1 Recording paper TP-S245L-1 ×1 Screwdriver 1 Spare fuse 1 CD-R (Instruction Manual) ×1 Ground wire P-72 ×1 LAN connector caps ×1 D-sub connector caps ×1
Optional Accessories		Dummy panel UD-80A Recording paper TP-S245L-1 Control software UCS-80A

## USM-81A/82A/83A

<b>Model</b>	USM-81A (TEDS compatible) USM-82A (With NDIS4102 (7 pins) connectors, TEDS compatible) USM-83A (For civil engineering measurement, TEDS compatible, with lightning arresters)
<b>Number of Mountable Units</b>	3 units can be mounted on UCAM-80A.
<b>Switching Terminal</b>	Semiconductor relays
<b>Channels</b>	10/Unit
<b>Input Terminals</b>	Connect to lead wire by either soldering or screwing. NDIS4102 (7 pins) connectors (USM-82A)
<b>Operating Temperature</b>	0 to 50°C
<b>Operating Humidity</b>	20 to 85% (Non-condensing)
<b>Dimensions</b>	320 (W) × 28 (H) × 80 (D) mm (Excluding protrusions)
<b>Weight</b>	USM-81A: Approx. 0.8 kg USM-82A: Approx. 0.9 kg USM-83A: Approx. 0.9 kg (Including terminal cover)
<b>Compliance</b>	Directive 2014/30/EU (EMC) Directive 2011/65/EU, (EU)2015/863 (10 restricted substances) (RoHS)
<b>Standard Accessories</b>	NDIS4102 (7 pins) connectors caps (USM-82A only) ×10 Terminal cover ×1 Channel label ×1 Short bar ML-1000-3H1 ×10
<b>Optional Accessories</b>	One-touch terminal block JT-1A

## USB-80A

<b>Model</b>	USB-80A-10 (For general measurement) USB-80A-20 (For general measurement, with NDIS4102 (7 pins) connectors) USB-80A-30 (For civil engineering)
<b>Measuring Targets</b>	• Strain gages • Strain-gage transducers • DC voltage • DC current • Thermocouples • Civil engineering transducers with a thermal sensor (USB-80A-30) • Platinum resistance thermometer bulbs Pt100, JPt100 (USB-80A-30) • Potentiometer sensors
<b>Input Channels</b>	50/unit
<b>Connection Data Loggers</b>	UCAM-80A, UCAM-60C M14*, UCAM-65C M14* *Scanner interface USI-67A must be incorporated.
<b>Number of Connection</b>	Up to 20 *19 if there are 30 channels in the data logger.
<b>Input Terminals</b>	• Screw-soldering terminal blocks (M3 screw with washer) • NDIS4102 (7 pins) connectors (USB-80A-20) Receptacle PRC90-231BR10-7F Applicable plug ex. PRC03-12A10-7M10.5 • Built-in lightning arresters (USB-80A-30)
<b>Channel Mode</b>	Every channels set by the data logger
<b>Measuring Channel Number</b>	The upper 2-digit from every 10 channels are set with digital switches.
<b>Power Supply</b>	• Supplied from data logger. • If the cable is extended or if 4 or more scanners are connected, an optional UPS-80A should be mounted into the scanners.
<b>Degrees of Protection</b>	IP30 (JIS C 0920/IEC 60529)
<b>Dimensions</b>	302 (W) × 107 (H) × 500 (D) mm (Excluding protrusions)
<b>Weight</b>	USB-80A-10 : Approx. 7.0 kg (Excluding UPS-80A) : Approx. 7.2 kg (When UPS-80A is attached) USB-80A-20 : Approx. 8.0 kg (Excluding UPS-80A) : Approx. 8.2 kg (When UPS-80A is attached) USB-80A-30 : Approx. 7.3 kg (Excluding UPS-80A) : Approx. 7.5 kg (When UPS-80A is attached)
<b>Compliance</b>	Directive 2014/30/EU (EMC) Directive 2014/35/EU (LVD) Directive 2011/65/EU, (EU)2015/863(10 restricted substances) (RoHS)
<b>Standard Accessories</b>	Screwdriver ×1 Connection cable N-24 (Approx. 1.0 m) ×1 NDIS4102 (7 pins) connectors caps (USB-80A-20 only) ×50
<b>Option</b>	Built-in AC Power Unit UPS-80A (100 to 240 VAC 50/60 Hz, Approx. 30 VA) • UPS-80A is used built into USB-80A. • If incorporating UPS-80A, specify when ordering USB-80A. • If incorporating UPS-80A later, USB-80A must be taken back. Connection cables N-25 to 35 (Approx. 2.0 to 1000 m)

## UIO-80A

<b>Contact Output</b>	Alarm Signal	4 channels
	Busy Signal	1 channel
	Output Mode	Photocoupler-isolated open collector output
	Rated Output	30 VDC max., 10 mA max. (resistance load)
<b>Contact Input</b>	Start Signal	1 channel
	Stop Signal	1 channel
	Reset Signal	1 channel
	Input Mode	No-voltage contact input
<b>Pulse Input</b>	Rainfall Signal	1 channel (Contact input, Pulse width: 0.1 s or more, Pulse interval: 1 s or more)
<b>Signal Connection</b>		D-sub 25-pin connector
<b>Operating Temperature</b>		0 to 50°C
<b>Operating Humidity</b>		20 to 85% (Non-condensing)
<b>Dimensions</b>		85 (W) × 23 (H) × 114.1 (D) mm (Excluding protrusions)
<b>Weight</b>		Approx. 64 g
<b>Compliance</b>		Directive 2014/30/EU (EMC) Directive 2011/65/EU, (EU)2015/863 (10 restricted substances) (RoHS)
<b>Standard Accessories</b>		D-sub 25-pin connector XM3A-2521 ×1

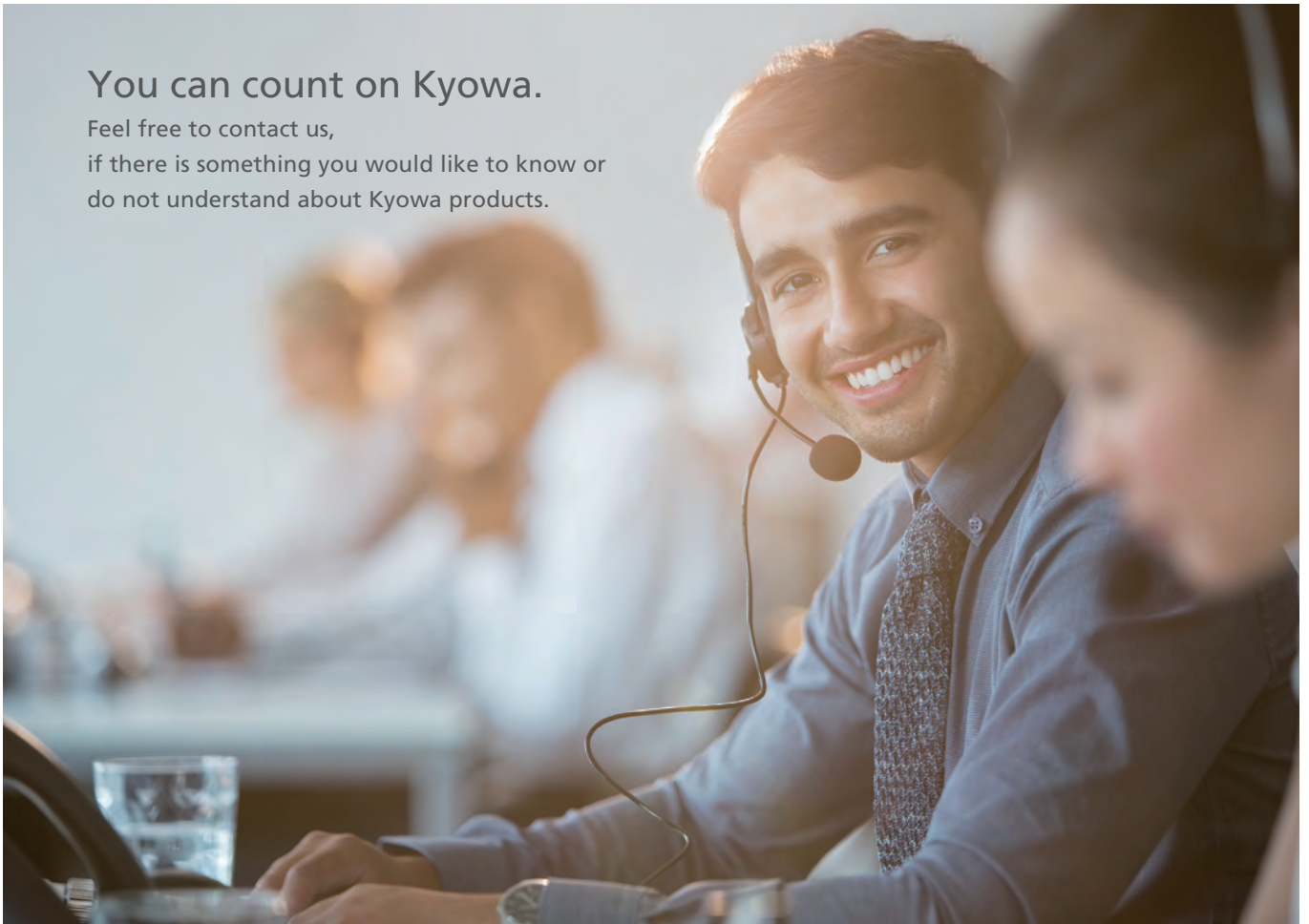
## UCS-80A

<b>● Operating Environment</b>	
<b>OS</b>	Windows® 8.1, Windows® 10, Windows® 11 Japanese/English, 32/64-bit supported (64-bit only for Windows® 11)
<b>CPU</b>	Intel Core i5 2 GHz equivalent or above
<b>Memory</b>	32-bit OS: 2 GB or higher 64-bit OS: 4 GB or higher
<b>Display</b>	Resolution of 1024 × 768 or above
<b>● Measurement Software</b>	
<b>Interfaces</b>	
<b>Serial Port LAN Port USB Port</b>	Use connected over RS-232C. Use connected over Ethernet. Use connected over USB.
<b>Measurement Condition Setting Functions</b>	
<b>Controllable Data Logger Measurement Channel Range Measurement Functions Measurement Count Calibration Coefficient Calculation Channel Conditions</b>	UCAM-80A  CH0000 to CH0999  Measure value, original value, initial value  0 to 9999 (0: endless) ON/OFF setting (all at once)  Measurement ON/OFF, scanner, measurement channel mode, scanning speed, calibration coefficient, unit, offset, reference resistance, initial value, channel name (within 18 single-byte or 9 double-byte characters) Interval measurement start time, interval measurement interval time, repeat times (0 to 9999 [0: unlimited]), steps (0 to 99) Trigger channel (any four channels), trigger channel AND/OR, trigger value, reference value, repeat times (0 to 9999 [0: unlimited]), steps (0 to 99) Trigger channel (any four channels), trigger channel AND/OR, reference value, interval measurement interval time, repeat times (0 to 9999 [0: unlimited]), steps (0 to 99) Cold junction compensation, power frequency, measurement timing, voltage/temperature initial value subtraction, rainfall input setting possible. Up to four channels, upper/lower limit value setting, hysteresis setting possible. Loading/saving
<b>Interval Measurement Conditions Trigger Measurement Conditions Trigger Interval Measurement Conditions System Control</b>	Interval measurement start time, interval measurement interval time, repeat times (0 to 9999 [0: unlimited]), steps (0 to 99) Trigger channel (any four channels), trigger channel AND/OR, trigger value, reference value, repeat times (0 to 9999 [0: unlimited]), steps (0 to 99) Trigger channel (any four channels), trigger channel AND/OR, reference value, interval measurement interval time, repeat times (0 to 9999 [0: unlimited]), steps (0 to 99) Cold junction compensation, power frequency, measurement timing, voltage/temperature initial value subtraction, rainfall input setting possible. Up to four channels, upper/lower limit value setting, hysteresis setting possible. Loading/saving
<b>Alarm Conditions Measurement Condition File Operations Calculation Condition Setting/Execution Functions Calculation Condition File Operations TEDS Compatibility</b>	Arithmetic operations using channel data can be used. Built-in function can be used in arithmetic expressions. Loading/saving  TEDS built-in sensor information can be loaded and set to channel conditions.
<b>Measurement Functions</b>	Measurement check, initial measurement, monitor measurement (max. 50 channels), real-time measurement, automatic measurement (interval measurement, trigger measurement, trigger interval measurement), stroke change measurement (single channel, measurement channel range)
<b>Measurement Data Numerical Data Display Functions</b>	
<b>Numeric Window Display Formats Number of Data Items that can be Displayed in Display List 1 Monitor Window</b>	Displays measurement data from real-time measurement or automatic measurement. Display list 1, display list 2, initial value measurement data display, check result display Most recent 1000 data items  Provides summary display of measurement data from monitor measurement. Limit values can be set on each channel.
<b>Measurement Data Graph Display Functions</b>	
<b>Graph Types Display Channels Display Operations Number of Data Items that can be Displayed</b>	Y-TIME, Y-CYCLE, X-Y graph, BAR graph Max. 20 channels (X-Y graph: max. 10 pairs of channels) Zoom X/Y axis, auto scale X/Y axis, display cursor Measurement data from real-time measurement or automatic measurement The maximum number of measurement data items displayed depends on the number of measurement channels: Measurement channels Within 100 channels: 10000 data items Within 200 channels: 5000 data items Within 500 channels: 2000 data items 501 or more channels: 1000 data items Measurement data from monitor measurement: 1000 data items
<b>Cursor Display Auto Scaling</b>	Measurement data displayed at cursor position Can be auto scaled at X-axis or Y-axis.
<b>Measurement Data Saving</b>	
<b>File Formats File Splitting Automatic File Conversion</b>	KU1 format, UCAM-70A format (ASCII), CSV format Hourly, daily, per measurement KU1 format files can be automatically converted to CSV format once measurement is finished. File name, saving location settings
<b>Saving to UCAM</b>	File name, saving location settings
<b>Dual Display Support</b>	Numeric window, graph window, or monitor window can be moved to the sub display.
<b>● Reproduction Software</b>	
<b>Data Files that can be Loaded</b>	
<b>KU1 Format</b>	KU1 (KU1 format data files recorded during initial value measurement, real-time measurement, interval measurement, trigger measurement, or trigger interval measurement)
<b>UCAM-70A Format (ASCII)</b>	INI, RTM, ITI, TRG, T_I
<b>Measurement Data Display Functions</b>	
<b>Measurement Data Numerical Data Display Function Measurement Data Graph Display Functions Graph Types Display Channels Display Operations Display Cursor Auto Scaling Display Condition File Operations</b>	Display list 1 only  Y-TIME, Y-CYCLE, X-Y graph, BAR graph Max. 20 channels (X-Y graph: max. 10 pairs of channels) Zoom X/Y axis, auto scale X/Y axis, display cursor Measurement data displayed at cursor position Can be auto scaled at X-axis or Y-axis. Loading/saving
<b>Calculation Condition Setting Functions</b>	Arithmetic operations using channel data can be used. Built-in function can be used in arithmetic expressions.
<b>Calculation Condition File Operations</b>	Loading/saving
<b>Measurement Data Extraction, File Conversion</b>	Can extract measurement data from a given data range or channel range, and convert files to CSV format.
<b>Measurement Data Combination</b>	Can combine two data files into a single data file.

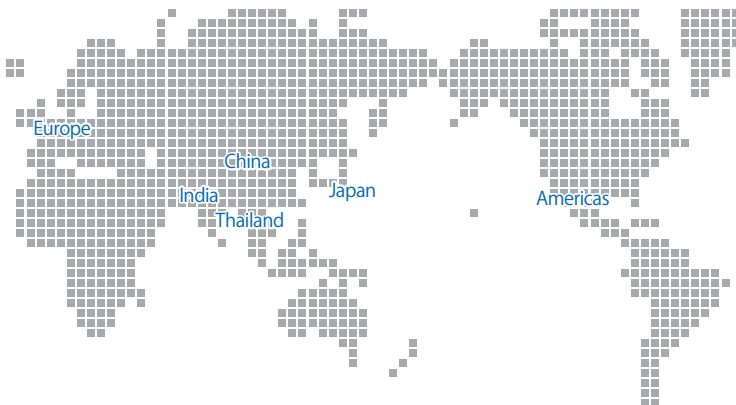
Notes  
UCS-80A cannot load measurement condition files, calculation condition files, or display condition files saved on UCS-60B.  
UCS-80A cannot load data files exceeding 2000 channels.

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### Safety Precautions

Be sure to observe the safety precautions given in the instruction manual, in order to ensure correct and safe operation.

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