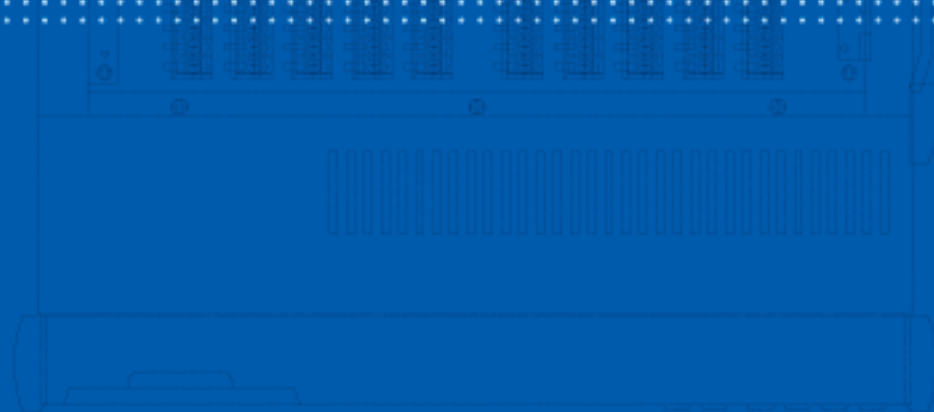


Delightful Simplicity





2 models developed in full pursuit of easier field operation **UCAM-60B/65B**

Versatile functions satisfy every need in field measurement.

The UCAM-60B is an all-in-one instrument developed in full pursuit of easier field measurement. It is fully equipped with functions required in field measurement such as easy-to-operate keys, a bright readable display and a printer for immediate confirmation of measurement results.

The UCAM-65B is a compact online data logger fully controlled through the PC. Both models can connect to, and simultaneously input signals from, strain gages, strain gage transducers, civil engineering transducers with temperature measuring function, potentiometer sensors, thermocouples and DC voltage-output instruments. They are also compatible with TEDS-installed sensors having information conforming to IEEE template No. 33. While measurement in a maximum 30 channels is possible with the mainframe only, external scanners enable measurement in a maximum 1000 channels. Measurement results are stored in internal memory. And for easy data transfer to PC, measurement results can also be saved in a flash ATA card or CF card inserted into the PC card slot. Furthermore, LAN and RS-232C interfaces are provided standard for connection to the PC, and the UCS-60B control software enables the PC to not only control the UCAM-60B/65B but also perform data processing for rosette analysis, etc. in the field by directly collecting data.



Enable simultaneous input of strain, temperature and voltage signals.
Can measure strain as small as $0.1 \mu\text{m/m}$.

Features

UCAM-60B

- Easy-to-understand English display
- Fluorescent display ensuring easy viewing in the field
- Built-in thermal printer for immediate confirmation of measurement results
- Optional UCS-60B control software can place the UCAM-60B under the control of the PC connected via LAN or RS-232C.

UCAM-65B

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

Common to UCAM-60B and UCAM-65B

- Measurement up to $20000 \mu\text{m/m}$ with a resolution of $0.1 \mu\text{m/m}$
- Scanning at 50 ms/channel with dedicated scanning units
- High-speed scanning at 20 ms/channel with dedicated scanning units
- Up to 30-channel measurement with dedicated scanning units
- Up to 1000-channel measurement with external scanners
- PC card slot ensuring easy data collection
- DC-operated version for operation where no AC outlet is available
- Can automatically set the gage mode for each channel by detecting the channel mode corresponding to the connected strain gage or strain gage transducer.
- LVDT transducers and sliding resistance transducers are applicable (option).^{*1}
- TEDS compatible^{*2} (with internal scanner USS-61B/62B/ 63B mounted)

^{*1}. Optional external scanner USB-65A is required.

^{*2}. To let the measuring instrument measure a sensor signal correctly, the measuring instrument should be adjusted based on calibration data of the sensor. Conventionally, such adjustment has been done manually. A TEDS-installed sensor has its own electronic data saved in memory. The TEDS-compatible instrument automatically performs the adjustment by reading the sensor data, thereby reducing adjustment time and preventing erroneous setting.

All-in-one data logger
developed in full pursuit of easier
field measurement

Compact online data logger
fully controlled through the PC



UCAM-60B

Fully
provided with
functions required
in field
measurement



UCAM-65B

Measurement
possible even
with the PC
disconnected

KYOWA Data Loggers UCAM-60B/65B

Compact and easy-to-operate

Controls and Indicators (UCAM-60B)

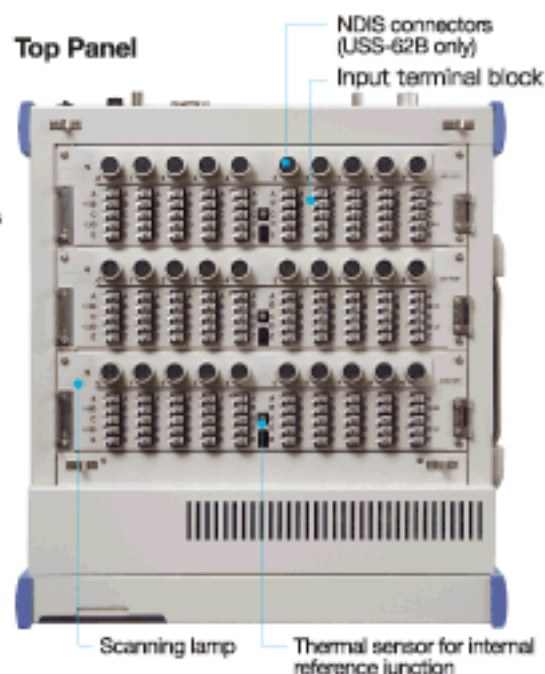
Front Panel



Rear Panel

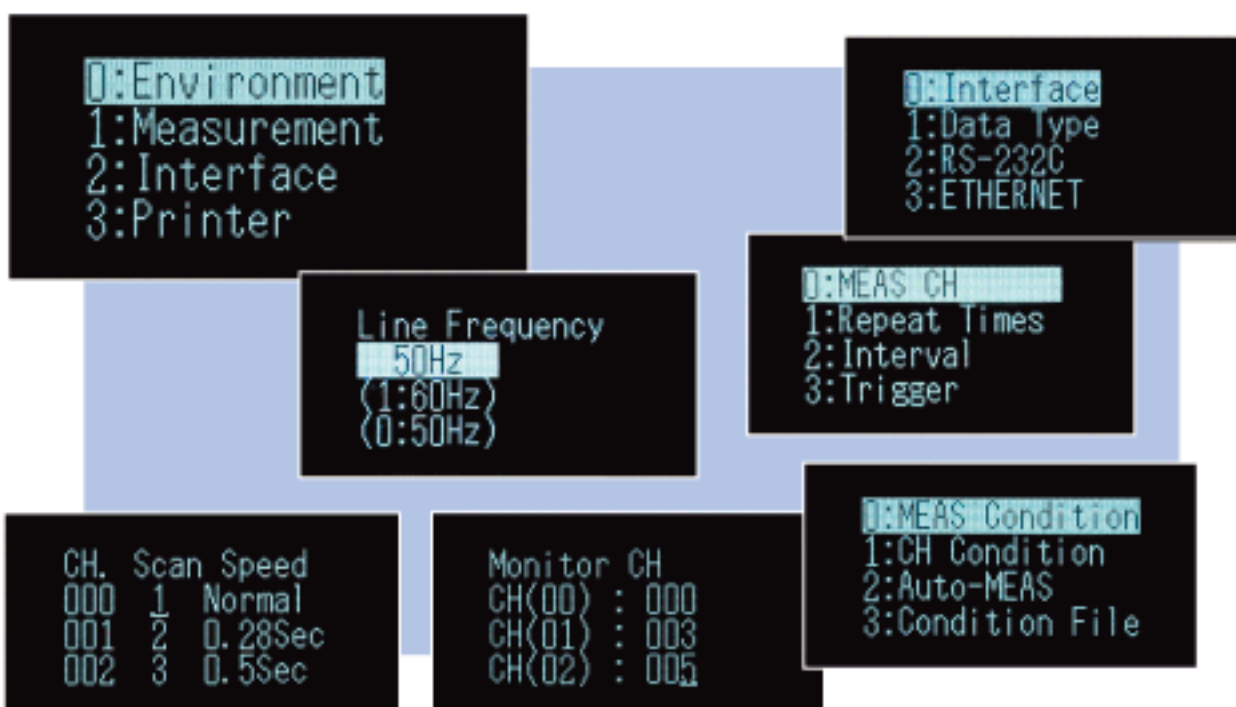


Top Panel



● Shown is the UCAM-60B with one USI-67A and 3 units of USS-62B mounted.

Typical Displays



rate UCAM-60B satisfies diversified needs in the field.

Major Key Functions



Execute keys

START/STOP Press this key to start/stop measurement. The LED lights up during measurement.

MONI Pressing this key starts measurement of a preset monitoring channel. Press again to stop monitoring.

ZERD With EASY MEASURE function selected, press this key to conduct auto zero balancing.

Input keys

ENTER Defines or executes an input item.

ESC Returns to the display one step before.

DEL Deletes a character.

FUNC Selects a measurement function.

Cursor keys

Moves the cursor leftwards.

Moves the cursor rightwards.

Moves the cursor upwards.

Moves the cursor downwards.

Function keys

SET Each press calls up a setting menu successively.

LIST Outputs preset items to the display or built-in printer.

LOCK A continuous press of this key for 3 seconds or so places all other keys in locked condition. Under the keylock condition, the LED lights up and a second press cancels the keylock condition.

PRINT Selects whether measured data is printed or not. The LED lights up to indicate data is printed.

SAVE Selects whether measured data is saved or not. The LED lights up to indicate data is saved.

COEF Selects whether coefficient calculation is made or not. The LED lights up to indicate coefficient calculation is made.

Zooming-in Possible

CH.	DATA	UNIT
000	5002	μE
001	-3996	μE
002	4499	μE

Normal display

5002	000
-3996	μE
	001
	μE

Zoomed-in display



KYOWA Data Loggers

UCAM-60B/65B

Diversified functions and high performance from experimental research

Configuration

Internal Structure

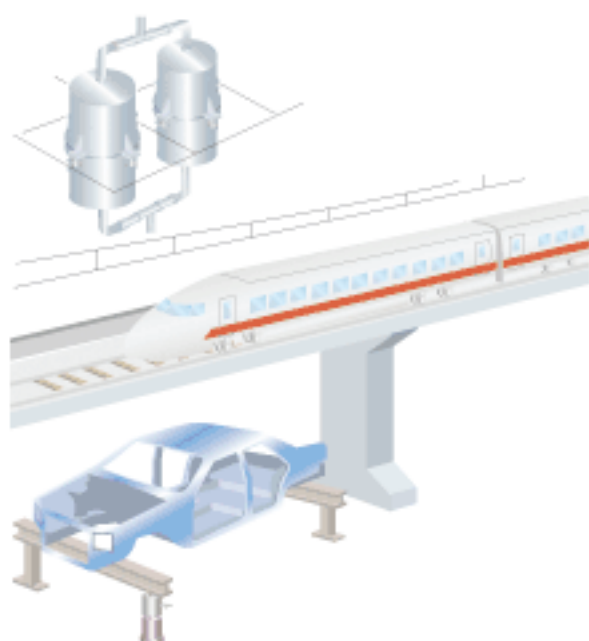
Either of the UCAM-60B and UCAM-65B has a scanner section to accommodate up to three 10-channel dedicated scanning units, thereby enabling measurement in a maximum 30 channels with the mainframe only. Built-in various measuring circuits enable measurement of a variety of signals including strain, voltage and temperature. To withstand a long term of use, both model use a semiconductor relay for all switching terminals like the former models did.

The amplifier & A-D converter section consists of the amplifier that amplifies a measured analog signal, the A-D converter that digitizes the amplified analog signal and peripheral circuits.

In addition to standard mode, both models provide high-resolution mode and high-speed mode.

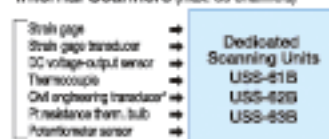
Applications

- (1) Strength tests and analysis of structures and materials
- (2) Strength tests and analysis of car bodies, chassis and suspensions
- (3) Tests, analysis and surveillance of rolling stock, aircraft and ships
- (4) Stress and temperature measurement of high/low temperature pressure vessels and piping
- (5) Construction management and maintenance of dams, tunnels and harbor facilities
- (6) Construction management and maintenance of civil engineering, buildings and bridges
- (7) Surveillance of landslides, soil inclination and crustal movement
- (8) Control and monitoring of plant equipment such as tanks and hoppers

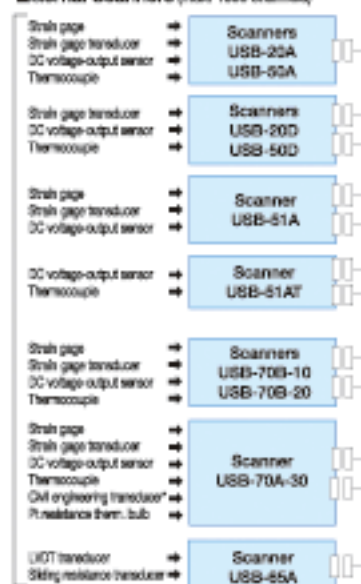


Block Diagram

Internal Scanners (max. 30 channels)



External Scanners (max. 1000 channels)

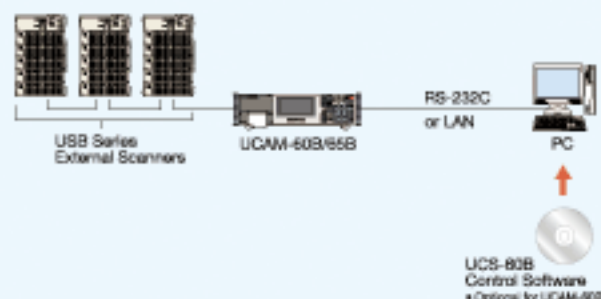


*With temp. meas. function

Typical System Configurations

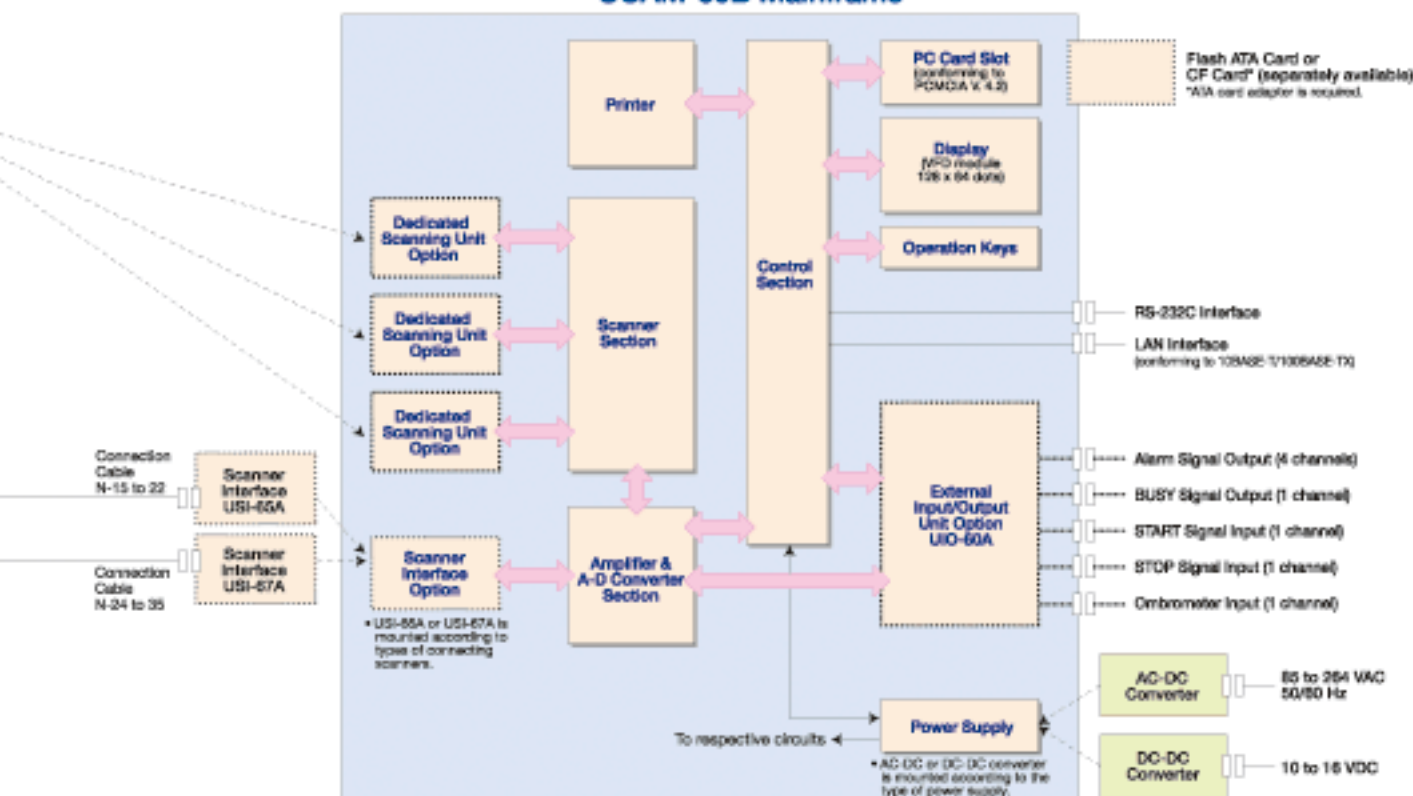
Basic System Configuration

The data logger is connected to the PC via RS-232C or Ethernet port on the rear panel. This is the basic system configuration for online measurement.



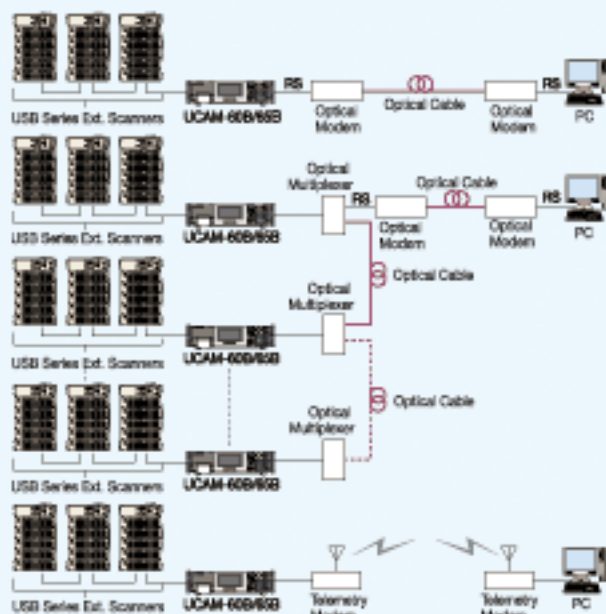
gh extensibility widen the application range
to management measurement.

UCAM-60B Mainframe



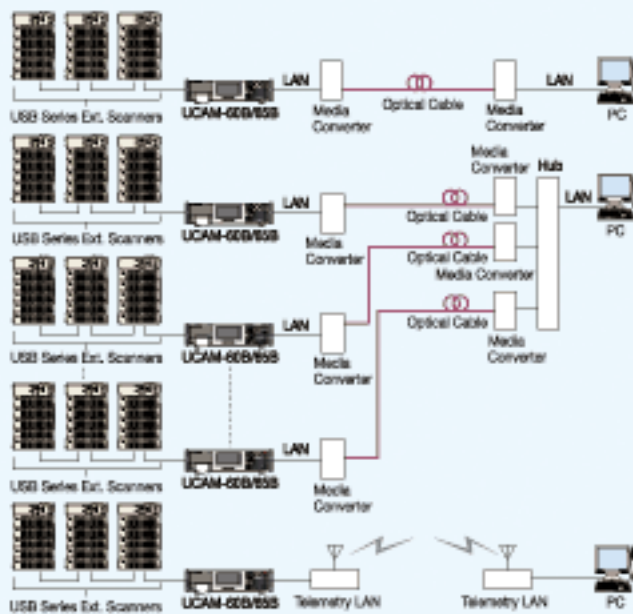
System Configuration Samples Based on RS-232C

The data logger is connected to the PC with commercially available optical modems and optical cable in between, or with telemetry modems in between. Such configurations enable the control of the data logger and data collection from remote places.



System Configuration Samples Based on Ethernet LAN

Commercially available media converters enable long-distance transmission through an optical cable. A hub enables configuration of a distributed system through optical cables. Commercially available telemetry LAN adapters also enable configuration of a telemetry system as in the case of RS-232C.



KYOWA Data Loggers

UCAM-60B/65B

Control software easily enables
of measured data on the PC

The UCS-60B control software enables the PC to control the data logger via LAN or RS-232C. The PC can perform real-time graphic and numeric presentation and calculation of measured results, thereby making it possible to fully use the high performance capabilities of the data logger.

Measurement Display

Main Display



FUNC. Button
Selects a measuring function.

START/STOP Button
Starts/stops measurement.

MONI. Button
Starts/stops monitor measurement.

SET Button
Opens a condition setting window.

SAVE Button
Saves measured data.

Display Panel

ZERO Button
Measures zero with EASY MEAS. function selected.

PRINT Button
Turns on/off the built-in printer of UCAM-60A/B.

COEF. Button
Executes coefficient calculation.

Display of
numeric values
in a list

Max. 4 graph
windows on display
(Each graph can contain
data of up to 20 channels.)

Measured data can
be saved
in various formats.
KYOWA standard KJ1,
ASCII (UCAM-70A), CSV, XLS

Calculation
(arithmetic operation,
statistic processing,
rosette analysis)

Reading/saving
measuring or
calculation
condition file

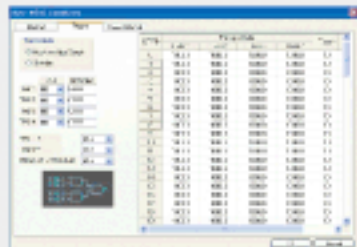
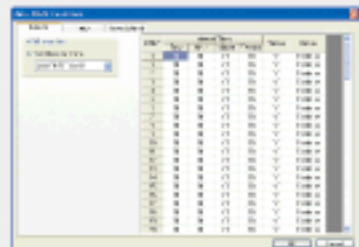
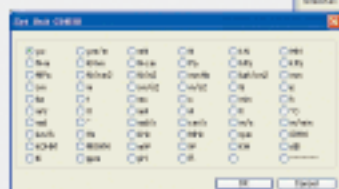
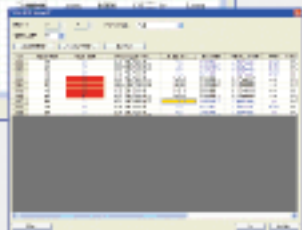
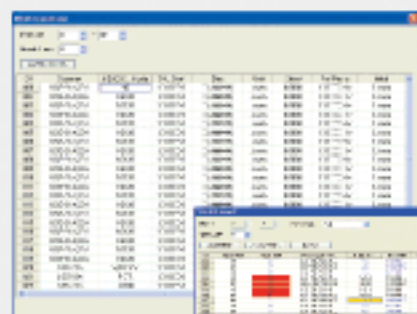
Software
English/Japanese
selectable



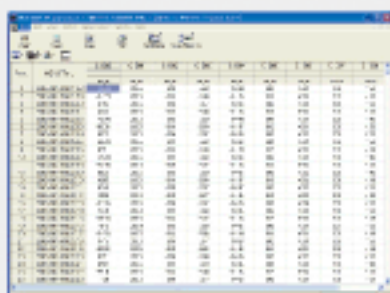
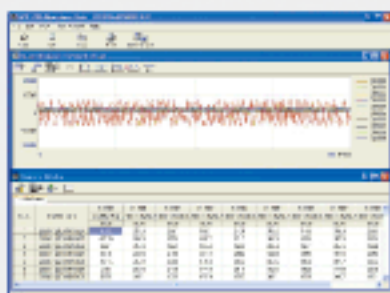
ables graphic and numeric presentation or calculation

C.

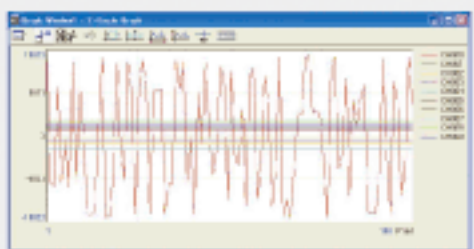
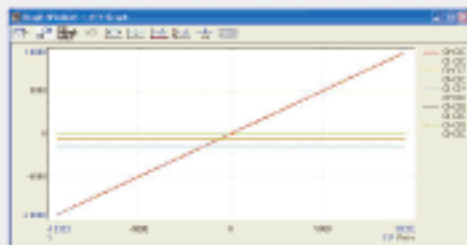
Condition Setting Windows



Monitor Windows



Data Reproduction Windows



Specifications

System Components

Data Logger (Mainframe)

Model	Power Supply	Control Software UCS-60B
UCAM-60B-AC	AC only	Optional
UCAM-60B-DC	DC only	Optional
UCAM-65B-AC	AC only	Standard
UCAM-65B-AC-0		Optional
UCAM-65B-DC	DC only	Standard
UCAM-65B-DC-0		Optional

Dedicated Scanning Units: TEDS-compatible, 10 channels each
 USS-61B for general purpose
 USS-62B for general purpose with NDIS connectors*1
 USS-63B for civil engineering with lightning arrester
 The mainframe can accommodate up to 3 dedicated scanning units.

External Scanners: The mainframe can connect to the following scanners via the optional scanner interface.
 USB-70 series via scanner interface USI-67A
 USB-65A via scanner interface USI-67A
 USB-51A/51AT via scanner interface USI-65A
 USB-20A/50A via scanner interface USI-65A
 USB-20D/50D via scanner interface USI-65A

Scanner Interfaces:

USI-67A for USB-70 series/65A
 USI-65A for USB-20/50/51

External Input/Output Unit: UIO-60A

Control Software: UCS-60B

*1. TEDS-compatible function is made effective by connecting TEDS-installed sensor through NDIS connector.

Data Loggers UCAM-60B/65B

Applicable Sensors

Strain gages, strain gage transducers (TEDS compatible), civil engineering transducers with temperature measuring function, DC voltage-output or DC current-output instruments, potentiometer sensors, thermal sensors (thermocouples and platinum resistance thermometer bulbs), LVDT transducers (with USB-65A connected), sliding resistance transducers (with USB-65A connected)

Scanners and Applicable Sensors

Applicable Sensors			Dedicated Scanning Unit	External Scanner							
				General purpose				Civil engineering			
				USB-70A/B-10/20	USB-51A	USB-51AT	USB-20A, USB-50A	USB-65A	USB-70A/B-30	USB-20D, USB-50D	
Strain gages and strain gage transducers	Quarter bridge	120 Ω	●	●	●		●		●		
		240 Ω	●	●			●		●		
		360 Ω	●	●			●		●		
	Quarter bridge (true-dummy technique)	120 Ω	●	●	●		●		●		
		240 Ω	●	●			●		●		
	Half bridge 60 to 1000 Ω	Active-dummy technique	●	●	●		●		●		
Civil engineering transducers	Full bridge 60 to 1000 Ω*1	Active-active technique	●	●	●		●		●		
		Common dummy technique	●	●					●		
		Opposite side active technique	●	●	●		●		●		
	Full bridge 120 Ω	Full-bridge technique	●	●	●		●		●	●	
		Constant-current excitation	●	●							
		Constant-current excitation	●	●							
Voltage	LVDT transducers	With temp. measuring function	●								
								●			
								●			
	Sliding resistance transducers										
Current	DC voltage-output instruments		●	●	●		●*4		●		●
			●	●					●		
			●	●					●		
	DC current-output instruments		●	●	●		●*4		●		●
			●	●					●		
			●	●					●		
Temperature	Thermocouples	K (CA)	●	●	●		●*4		●		
		T (CC)	●	●	●		●*4		●		
		E (CHC)	●	●	●		●*4		●		
		J (CC)	●	●	●		●*4		●		
		R	●	●	●		●*4		●		
	Platinum resistance thermometer bulbs	PT100 (new JIS)	●						●		
Potentiometer sensors		JPT100 (old JIS)	●						●		
			●	●					●		
Built-in lightning arrester			●*2					●			
Scanner interface*3			Not required	USI-67A	USI-65A			USI-67A			USI-65A

*1. 120 to 1000 Ω in high-resolution mode. *2. With USS-63B mounted. *3. Use either of the scanner interfaces for connection to external scanners.
 *4. With temperature measuring unit UST-10 mounted

Number of Measuring Channels:

Max. 30 with dedicated scanning units
 Max. 1000 with external scanners connected
 Max. 1000 with dedicated scanning units plus external scanners

Scanning Speed

50 ms/channel (standard mode)
 250 ms/channel (high-resolution mode), individually selectable for desired channels
 20 ms/channel (high-speed mode), collectively selectable for all channels of dedicated scanning units

Scanner	Line Frequency	50 Hz Zone	60 Hz Zone
Dedicated scanning unit (standard mode)		50 ms/channel	
Dedicated scanning unit (high-resolution mode)		250 ms/channel	
Dedicated scanning unit (high-speed mode)		20 ms/channel	
USB-70 series (standard mode only)		60 ms/channel	58.4 ms/channel
USB-50/51 series (standard mode only)		80 ms/channel	66.7 ms/channel

Note: Scanning speeds stated above are standard maximum speeds in respective modes. Besides these, the following speeds per channel can be set: 0.28 s, 0.5 s, 1 s, 2 s, 5 s and 10 s.

Applicable Sensor	Scanning Speed	Standard Mode (50 ms/channel)	High-Resolution Mode (250 ms/channel)	High-Speed Mode (20 ms/channel)
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 are selectable for dedicated scanning units only.
 2. High-resolution or high-speed mode is available only with full bridge.

Operating Modes: Real-time, Monitor, and Automatic

Measurement Functions

INITIAL: Initial values are measured and stored in internal memory (except for temperatures measured by civil engineering transducers with temperature measuring function).

ORIGINAL: Raw values are measured without subtraction of initial values.

MEASURE: Initial values are subtracted from original values (except for temperatures measured by civil engineering transducers with temperature measuring function).

EASY MEASURE: Auto zero balancing function is activated.

Note: The selected function is applied to all channels.

Coefficient Calculation Function

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

Engineering Units: 59 units

Automatic Measurement Functions

Trigger Measurement: A relative value (certain changing quantity) or an absolute value triggers measurement. In addition to the usual trigger function, a variable trigger function is provided with which the trigger value changes at each step during measurement. With this special function, a trigger value and the number of measurement times (repeat times) under the trigger condition can be registered for each step to perform a series of automatic measurements in the order of steps. The maximum number of steps available for setting is 15 and the number of repeat times may be a value selected from a range of 1 to 9999 or infinite.

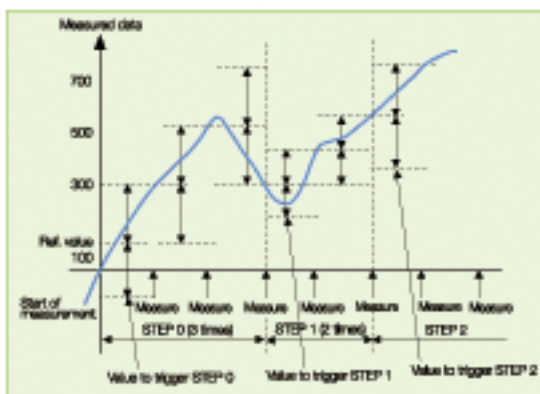
Trigger channel: 1 desired channel

Trigger value: A desired real number of 6 effective figures or less

Reference value: Amount of level shift to determine the first trigger value (selected from the same range as for the trigger values)

Number of repeat times: 1 to 9999 (0 for infinite times)

Number of measurement steps: Maximum 15



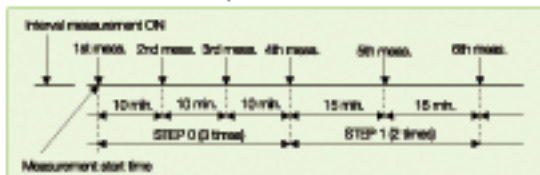
Interval Measurement: Measurement is automatically performed at preset time intervals.

Starting time setting: Year/month/day and hour/minute/second

Interval setting: Days and hours/minutes/seconds (maximum 99 days and 12:59:59)

Number of repeat times: 1 to 9999 (0 for infinite times)

Maximum number of steps: 15



Trigger Interval Measurement: Combination of trigger measurement and interval measurement.

Trigger value: Absolute value

Number of measurement times: Max. 9999

Interval setting: Days and hours/minutes/seconds (maximum 99 days and 12:59:59)

Storage Function: Internal memory, approx. 7 MB

Flash ATA card or CF card (optional): the capacity depends on the card.

Note: ATA card adapter is required.

Strain Measurement (Standard Mode)

Bridge excitation

Constant voltage excitation: Approx. 2 or 5 VDC

Constant current excitation

Approx. 5.7 mA (bridge resistance 350 Ω)

(up to 5 km with a 4-conductor (0.5 mm²) shielded cable)

Approx. 16.7 mA (bridge resistance 120 Ω)

(up to 2 km with a 4-conductor (0.5 mm²) shielded cable)

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 $\pm 50000 \mu\text{m/m}$	1 $\mu\text{m/m}$	$\pm 0.05\%$ of reading + 1 $\mu\text{m/m}$
0 to $\pm 600000 \mu\text{m/m}$	10 $\mu\text{m/m}$	$\pm 0.05\%$ of reading + 10 $\mu\text{m/m}$

Strain Measurement (High-Resolution Mode)

Bridge excitation

Constant voltage excitation: Approx. 5 VDC

Constant current excitation: Approx. 16.7 mA (bridge resistance 350 Ω)

(up to 2 km with a 4-conductor (0.5 mm²) shielded cable)

Scanning speed: 260 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 $\pm 20000 \mu\text{m/m}$	0.1 $\mu\text{m/m}$	$\pm 0.05\%$ of reading + 0.3 $\mu\text{m/m}$
0 to $\pm 200000 \mu\text{m/m}$	1 $\mu\text{m/m}$	$\pm 0.05\%$ of reading + 3 $\mu\text{m/m}$

Notes: 1. Available only with full bridge (bridge resistance 120 to 1000 Ω).

2. Bridge resistance should be 350 Ω for bridge excitation with constant current.

3. Measuring range is 0 to $\pm 15000 \mu\text{m/m}$ for bridge excitation with constant current.

4. Available only with dedicated scanning units.

Strain Measurement (High-Speed Mode)

Bridge excitation

Constant voltage excitation: Approx. 2 VDC

Constant current excitation:

Approx. 5.7 mA (bridge resistance 350 Ω)

(up to 5 km with a 4-conductor (0.5 mm²) shielded cable)

Approx. 16.7 mA (bridge resistance 120 Ω)

(up to 2 km with a 4-conductor (0.5 mm²) shielded cable)

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 $\pm 50000 \mu\text{m/m}$	1 $\mu\text{m/m}$	$\pm 0.05\%$ of reading + 5 $\mu\text{m/m}$
0 to $\pm 600000 \mu\text{m/m}$	10 $\mu\text{m/m}$	$\pm 0.05\%$ of reading + 30 $\mu\text{m/m}$

Notes: 1. Available only with full bridge

2. Available only with dedicated scanning units.

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
V500 mV	0 to $\pm 50.000 \text{ mV}$	1 μV	$\pm 0.05\%$ of reading + 3	10 M Ω or more
	0 to $\pm 500.00 \text{ mV}$	10 μV		
V50 V	0 to $\pm 5.0000 \text{ V}$	100 μV	$\pm 0.05\%$ of reading + 2	1 M Ω or more
	0 to $\pm 50.000 \text{ V}$	1 mV		

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
V500 mV	0 to $\pm 50.000 \text{ mV}$	1 μV	$\pm 0.05\%$ of reading + 6	10 M Ω or more
	0 to $\pm 500.00 \text{ mV}$	10 μV		
V50 V	0 to $\pm 5.0000 \text{ V}$	100 μV	$\pm 0.05\%$ of reading + 2	1 M Ω or more
	0 to $\pm 50.000 \text{ V}$	1 mV		

Note: Available only with dedicated scanning units.

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
V50 mA	0 to $\pm 50.00 \text{ mA}$	10 μA	$\pm 0.05\%$ of reading + 0.01 mA

Notes: 1. External shunt resistor (high-accuracy 250 Ω) is required.

2. Stated accuracy does not include the 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
V50 mA	0 to $\pm 50.00 \text{ mA}$	10 μA	$\pm 0.05\%$ of reading + 0.01 mA

Notes: 1. Available only with dedicated scanners.

2. External shunt resistor (high-accuracy 250 Ω) is required.

3. Stated accuracy does not include the external shunt resistor accuracy.

KYOWA Data Loggers

UCAM-60B/65B

Temperature Measurement with Thermocouples (Standard Mode)

Scanning speed: 50 ms/channel

Measuring range, Resolution and Accuracy

Type	Measuring Range	Resolution	Accuracy	Internal Reference Junction Compensation Accuracy
K	-200.0 to 1250.0°C	0.1°C	±0.7°C	±0.5°C (with input terminal temperature balanced in an ambient temperature 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 1750.0°C		±2.2°C	

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

Temperature Measurement with Civil Engineering Transducers with Temperature Measuring Function (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 can be measured in a single channel.
2. Strain measuring ranges 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
JP100	-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

Clock (UCAM-60B): Real-time clock is built in (battery backup 5 years).

Display (UCAM-60B): Fluorescent display tube, 128 x 64 dots

Printer (UCAM-60B)

Printing system: Thermal

Paper width: 58 mm (24 characters/line), UCAM-60A-RP

Printing speed: 80 mm/sec

PC Card Slot: Conforms to PCMCIA Ver. 4.2.

Accepts a commercially available flash ATA card or CF card (ATA card adapter required).

Interfaces: RS-232C and LAN (10BASE-T/100BASE-TX)

File Conversion: CSV conversion

Self-diagnosis Function:

Checks display, printer, bridge excitation, leadwire-off, input/output resistance, insulation resistance, mode, etc.

• Checking of input/output resistance and mode is available only for dedicated scanning units.

TEDS Compatibility*

Interface: IEEE 1451.4 Mixed Mode Transducer Interface Class 2

Applicable sensor: Should have information written in accordance with IEEE template No. 33; cable length should be 30 m or less.

*With scanning unit: USS-61B, USS-62B or USS-63B mounted.

Operating Temperature & Humidity Range:

0 to 50°C, 20 to 85% RH (noncondensing)

Power Supply:

85 to 264 VAC, 50/60 Hz (AC-operated version)

10 to 16 VDC (DC-operated version)

Note: DC-operated version has power control function.

Current Consumption:

0.5 A or less (100 VAC; with 3 dedicated scanners mounted)

4 A or less (12 VDC; with 3 dedicated scanners mounted)

Dimensions

UCAM-60B: 360(W) x 88(H) x 400(D) mm (excluding protrusions)

UCAM-65B: 327(W) x 88(H) x 365(D) mm (excluding protrusions)

Weight

UCAM-60B: Approx. 8 kg

UCAM-65B: Approx. 4.6 kg

Standard Accessories

AC power cable P-18 with conversion adapter CM-33 (AC-operated version),

DC power cable P-57 (DC-operated version),

Recording paper UCAM-60A-RP (1 roll for UCAM-60B only),

Screwdriver, Spare fuse, Instruction Manual (CD), Simplified operation

guide, CD (Control Software UCS-60B for UCAM-65B only)

Optional Accessories

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

AC adapter for DC-operated version (Contact us for details.)

Dedicated Scanning Units USS-61B/62B/63B

Models:

USS-61B (TEDS compatible)

USS-62B (with NDIS connectors, TEDS compatible)

USS-63B (for civil engineering measurement, TEDS compatible, with lightning arrester)

Number of Measuring Channels: 10/unit

Switching Terminals: Semiconductor relays

Input Terminals:

Can connect to leadwires through either soldering or screwing.

NDIS connectors (USS-62B)

Quick-fitting terminal block JT-1A (optional)

Lightning Arrester: Provided (USS-63B only)

Operating Temperature & Humidity Range:

0 to 50°C, 20 to 80% RH (noncondensing)

Dimensions: 320(W) x 28(H) x 80(D) mm (excluding protrusions)

Weight

USS-61B: Approx. 600 g (including terminal cover)

USS-62B: Approx. 1 kg (including terminal cover)

USS-63B: Approx. 900 g (including terminal cover)

Standard Accessories

Terminal cover, Channel label and for USS-62B, NDIS connector caps (pre-attached to connectors)

Scanner Interfaces USI-67A/65A

USI-67A

Connectable Scanners: USB-70 series

Number of Connectable Scanners: Max. 20, total length of connection cables up to 1 km

Operating Temperature & Humidity Range:

0 to 50°C, 20 to 85% RH (noncondensing)

Dimensions: 98(W) x 50(H) x 163(D) mm (excluding protrusions)

Weight: Approx. 160 g

USI-65A

Connectable Scanners: USB-20A/50A/50D/51A/51AT

Number of Connectable Scanners: Max. 20, total length of connection cables up to 200 m

Operating Temperature & Humidity Range:

0 to 50°C, 20 to 85% RH (noncondensing)

Dimensions: 98(W) x 50(H) x 163(D) mm (excluding protrusions)

Weight: Approx. 180 g



USI-67A



USI-65A

External Input/Output 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 & Humidity Range:

0 to 50°C, 20 to 85% RH (noncondensing)

Dimensions: 90(W) x 50(H) x 180(D) mm (excluding protrusions)

Weight: Approx. 140 g

External Scanners **USB-70B Series/65A**

USB-70B Series

Models:

- USB-70B-10: For general strain measurement
- USB-70B-20: For general strain measurement, with NDIS connectors
- USB-70B-30: For civil engineering measurement, with lightning arrester

Number of Measuring Channels: 50/unit

Measuring Channel Mode:

Selected for each channel from the mainframe

Connectable Sensors

- USB-70B-10: Strain gages, strain gage transducers, potentiometer sensors, DC voltage-output instruments, thermocouples
- USB-70B-20: Strain gages, strain gage transducers, potentiometer sensors, DC voltage-output instruments, thermocouples (transducers with NDIS connector can be connected)
- USB-70B-30: Strain gages, strain gage transducers, potentiometer sensors, DC voltage-output instruments, thermal sensors (thermocouples, platinum resistance thermometer bulbs, civil engineering transducers with temperature measuring function), lightning arrester built in

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 scanners.

UPS-70B operates on 90 to 132/180 to 264 VAC (no switchover required), 50/60 Hz

Operating Temperature & Humidity Range:

0 to 50°C, 20 to 85% RH (noncondensing)

Dimensions: 302(W) x 107(H) x 500(D) mm (extruding protrusions)

Weight:

Approx. 7.3 kg (USB-70B-10/30)

Approx. 8.5 kg (USB-70B-20)



USB-70B-20

USB-65A

Connectable Sensors:

- LVDI transducers
- Sliding resistance transducers (1 or 2 elements)
- Please contact us for details on connectable sensors.

Connectable Data Loggers: UCAM-60/65 series

- Scanner interface USI-67A is required.
- Mixed use with USB-70 series is possible.

Number of Measuring Channels: 50/unit

Input Terminal:

Can connect to leadwires through either soldering or screwing.

Switching Terminals: Semiconductor relays

Measurement with LVDI Transducers

Sensor power supply: 500 Hz, 1 Vrms, sine wave

Scanning speed: 1 s/channel

Measuring range, Resolution and Accuracy:

Measuring Range	Resolution	Accuracy
0 to ± 1000.00 R	0.01 R	Within $\pm 1\%$ FS

Measurement with Sliding Resistance Transducers

Sensor power supply: 2 VDC (with no load)

Scanning speed: 50 ms/channel

Measuring range, Resolution and Accuracy:

Measuring Range	Resolution	Accuracy
0 to $\pm 100.00\%$	0.01%	Within $\pm 1\%$ FS

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 scanners.

UPS-70B operates on 90 to 132/180 to 264 VAC (no switchover required), 50/60 Hz

Operating Temperature & Humidity Range:

0 to 50°C, 20 to 85% RH (noncondensing)

Dimensions: 302(W) x 107(H) x 500(D) mm (extruding protrusions)

Weight: Approx. 10 kg



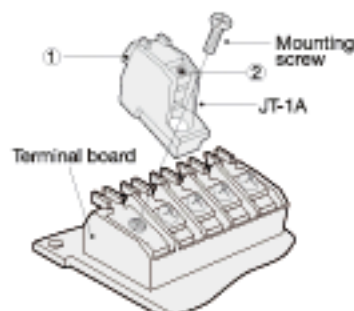
USB-65A

Optional Accessory to Scanners

Quick-fitting Terminal Block JT-1A

Mounted to an input terminal of the scanner, the JT-1A enables quick fitting of leadwires to the input terminal. Note that it causes error in temperature measurement with a thermocouple by internal reference junction compensation. Also, if the JT-1A is mounted, the standard terminal cover cannot be used.

(Selling unit: 10 pieces; one piece is required for each leadwire cable.)



Pressing ① part with the tip of a ballpoint pen or the like, insert the leadwire cable into ② part.

Software Specifications

Control Software UCS-60B

The UCS-60B is the static measurement software that enables the PC to control the UCAM-60B/65B. The excellent functions enhance the performance of these data loggers.

PC Requirements

Processor: Pentium III 1 GHz or the equivalent (Pentium 4, 2 GHz or higher recommended) (Windows Vista is provided with Pentium 4, 2 GHz or higher)
Memory: 512 MB or more (1 GB or more recommended) (Windows Vista provides 2 GB or more.)
Hard Disk: Blank space 20 MB or more
Display: Resolution 1024 x 768 dots or more, High Color (16 bits or more)
OS: Microsoft Windows 98/SE/Millennium/2000 Professional/XP (32-bit)/Vista (32-bit)
Serial Port: For RS-232C communication
LAN Port: For Ethernet communication

Measurement-Related Functions

Controllable Data Loggers: UCAM-60A/B, UCAM-65A/B, UCAM-20PC, UCAM-500A/B

Number of Channels: 2000 (within 2000 in total of measuring, temperature and calculating channels)

Measuring Condition Setting Functions:

System setting (setting of internal/external scanners, etc.)
 Measuring channel range, measuring function and scanning speed depend on the applied data logger.
Measuring Channels: 000 to 999

Measuring Functions:

EASY MEASURE, MEASURE VALUE, ORIGINAL VALUE, INITIAL VALUE

Repeat Times: 0 to 9999 (0: Infinite)

Calibration Coefficient Calculation: ON/OFF setting possible

Channel Conditions: Type of scanner, measuring channel mode, calibration coefficient, number of digits below decimal point, unit, offset, temperature reference value, initial value, scanning speed, channel name (within 18 alphanumeric)

Interval Measurement Conditions: Starting date/time, interval, number of measuring times (0 to 9999; 0 = Infinite), number of steps (up to 99)

Trigger Measurement Conditions: Trigger channels (desired 4 channels), reference values of trigger channels, AND/OR between trigger channels, trigger values, number of measuring times (0 to 9999; 0 = Infinite), number of steps (up to 99)

Trigger Interval Measurement Conditions: Trigger channels (desired 4 channels), reference values of trigger channels, AND/OR between trigger channels, interval, number of measuring times (0 to 9999; 0 = Infinite), number of steps (up to 99)

Reading/Saving Measuring Condition File

Automatic Reading of Channel Mode: Possible for strain gages and strain-gage transducers connected to dedicated scanning units of UCAM-60A/B and UCAM-65A/B

Reading/Saving Calculation Condition File: Possible

Measurement Functions: Measurement check, initial value measurement, monitor measurement (max. 40 channels), real-time measurement, automatic measurement (interval, trigger, trigger interval), stroke change

• Monitor, trigger or trigger interval measurement can be used for setting calculation target channels.

Numeric Indication of Measured Data: Real-time measurement and automatic measurement results in a list. Results of measurement check, initial value measurement and monitor measurement in a list only

Number of numeric windows: Max. 1

Number of monitor windows: Max. 1

Graphic Indication of Measured Data

Types of Graph: Y-Time, Y-Cycle, X-Y, bar graph; 1 channel/graph, 20 channels/graph

Number of Display Channels: Max. 20 (max. 10 sets of channels with X-Y graph)

Cursor indication, scale enlargement, auto scale, comparison display

Number of Graph Windows: Max. 50

Number of Measured Data Points on Display: Depends on the number of channels as follows:

≤100 channels	10000
≤200 channels	5000
≤500 channels	2000
≤1000 channels	1000
≥1001 channels	500

Measured Data Saving Formats: KYOWA standard KU1, UCAM-70A, CSV, XLS (Excel)

Print Function: Numeric data and graphs can be printed out. The built-in printer of UCAM-60A/B can be set to ON or OFF.

TEDS Compatibility: UCAM-60B/65B can read information of TEDS-installed sensor.

Reproduction-Related Functions

Number of Channels: 2000 (within 2000 channels in total of measuring, temperature and calculating channels)

Reproducible File Formats: KU1 and UCAM-70A (ASCII/binary compatible). In addition to reproduction of data saved in these formats, the software enables coupling of files in the same format, cropping of a desired portion, and converting to CSV or XLS format.

Reading/Saving Calculation Condition File: Possible

Numeric Indication of Measured Data: Numeric window where measured values are listed and can be edited as desired.

Number of Numeric Windows available on single screen: Max. 1

Graphic Indication of Measured Data:

Types of Graph: Y-Time, Y-Cycle, X-Y

1 channel/graph, 20 channels/graph

Number of Display Channels: Max. 20 (max. 10 sets of channels with X-Y graph)

Cursor indication, scale enlargement, auto scale, scale setting for each individual channel

Number of Graph Windows available on single screen: Max. 50

Reading/Saving Display Condition File: Possible

Print Function: Numeric and graph windows can be printed out.

Calculation-Related Functions

Number of Inputtable Characters in Expression: 100

Operators: +, -, *, /, (,), ^

Intrinsic Functions:

Statistical Operation

MAX	To obtain the maximum value among channels
MIN	To obtain the minimum value among channels
SUM	To obtain the sum of data in all channels
AVG	To obtain the average of data in all channels
STD	To obtain the standard deviation in all channels
DEV	To obtain the standard deviation in %
MAT	To obtain the maximum value in a channel
MIT	To obtain the minimum value in a channel
SUT	To obtain the sum of data in a channel
AVT	To obtain the average of data in a channel
STT	To obtain the standard deviation in a channel
PRE	To obtain the previous data in a channel

Counting

CNT To obtain the number of measuring times

Rosette Analysis

HMX	To obtain the maximum principal strain
HMN	To obtain the minimum principal strain
HSM	To obtain the maximum shearing strain
SMX	To obtain the maximum principal stress
SMN	To obtain the minimum principal stress
SSM	To obtain the maximum shearing stress
DEG	To obtain principal strain direction

Trigonometric Functions

SIN	Sine
COS	Cosine
TAN	Tangent
ASI	Arc sine
ACO	Arc cosine
ATA	Arc tangent

Restrictions

To save measured data in the XLS format or to convert the measured data file into an XLS format file, the number of channels and the number of measured values are restricted as follows:

Number of channels: Max. 250
Number of data points: Max. 10000

UCS-60B cannot read any measuring condition file, calculation condition file and display condition file compiled with UCS-60A or UCS-25A.

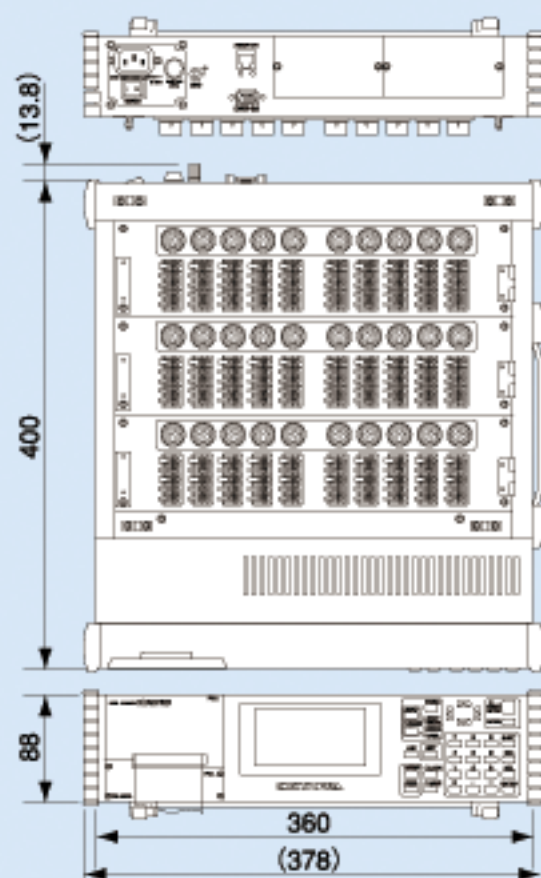
Restrictions on UCAM-20PC

- 1) EASY MEASURE function cannot be used.
- 2) Number of monitor channels: Max. 20
- 3) Not compatible with TEDS

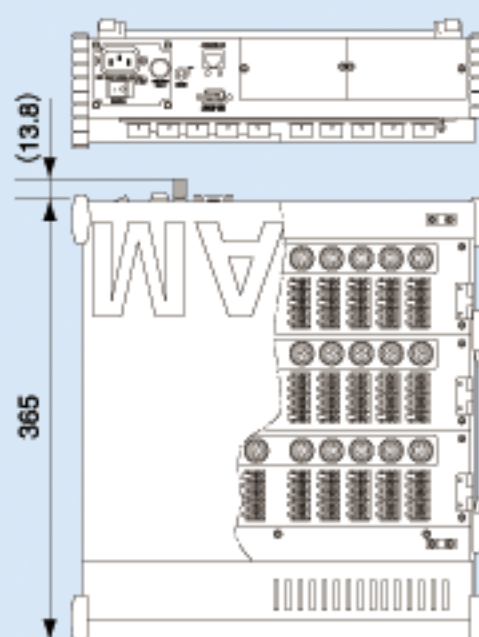
Restrictions on UCAM-500A/B

- 1) EASY MEASURE function cannot be used.
- 2) Number of monitor channels: Max. 50
- 3) Comparison graph display is not available.
- 4) Not compatible with TEDS
- 5) No trigger interval measurement

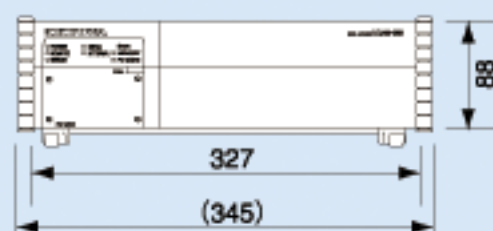
Dimensions



UCAM-60B
(with 3 units of USS-62B mounted)



UCAM-65B
(with 3 units of USS-62B mounted)





JQA-0821
JQA-EM4824

Specifications are subject to change without notice for improvement.



Safety precautions

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

Reliability through integration



KYOWA ELECTRONIC INSTRUMENTS CO., LTD.

Overseas Department:

3-5-1, Chofugaoka, Chofu, Tokyo 182-8520, Japan

Phone: +81-42-489-7220 Facsimile: +81-42-488-1122

<http://www.kyowa-ei.com>

e-mail: overseas@kyowa-ei.co.jp

Cat. No. 304C-U44

Manufacturer's Representative