UCAM-60B/65B

Data Logger

UCAM-60B

UCAM-65B

Up to 20 k µm/m with a resolution as high as 0.1 µm/m measurement possible. (With Full bridge system)

UCAM-60B

- 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-65B

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

Common to UCAM-60B and UCAM-65B

- Measurement up to 20 k μm/m with a resolution of 0.1 μm/m (With full bridge system)
- Scanning at 50 ms/channel with dedicated scanners
- High-speed scanning at 20 ms/channel with internal scanners
- Up to 30 channels measurement with internal scanners
- Up to 1000 channels measurement with external scanners
- PC card slot ensuring easy data collection
- DC operated version for operation where no AC outlet is available
- Automatically set the gage mode for each channel by detecting the channel mode corresponding to the connected strain gages or strain-gage transducers possible.
- TEDS compatible (With internal scanner USS-61B/62B/63B)
- Control software UCS-60B (Optional for UCAM-60B) enables control from PC via Ethernet LAN or RS-232C. (When connecting via Ethernet LAN, use 2 straight cables and a LAN hub.)

Note 1: For TEDS, see page 9-17.

Note 2: When connecting via LAN use 2 straight cables and a LAN hub

The data logger UCAM-60B is an all-in-one measuring instrument developed in full pursuit of easier field measurement. 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-65B is a compact online data logger fully controlled from the PC.
Both models are connected to, and simultaneously be input signals from, strain gages, strain-gage transducers, civil engineering transducers with a thermal sensor, 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. Measured results are stored in internal memory. And for easy data transfer to PC, measured results are also 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 control software UCS-60B 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.

System Components

Data Loggers

Models	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 Scanners USS-61B* for general purpose
USS-62B* for general purpose with NDIS connectors**
USS-63B* for civil engineering with lightning Arresters
The main unit is accommodated up to 3 dedicated scanners.

External Scanners The main unit is connected to the following scanners via the optional scanner interface.
USB-70 series via scanner interface USI-67A

Scanner Interfaces USI-67A for USB-70 series

External I/O Unit UIO-60A

Control Software UCS-60B

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

Specifications

■**Data Logger UCAM-60B/65B**

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)

Measuring Targets \ Scanners			Dedicated Scanner	Dedicated Scanner: General purpose	Dedicated Scanner: Civil engineering
				USB-70B-10/20	USB-70B-30
strain gages and Strain-gage transducers	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
		240 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
		With temp. measuring function	Yes		Yes
Voltage	DC voltage-output instruments		Yes	Yes	Yes
Current	DC current-output instruments		Yes	Yes	Yes
Temperature	Thermocouples	K	Yes	Yes	Yes
		T	Yes	Yes	Yes
		E	Yes	Yes	Yes
		J	Yes	Yes	Yes
		R	Yes	Yes	Yes
	Platinum resistance thermometer bulbs	Pt100	Yes		Yes
		JPt100	Yes		Yes
Potentiometer sensors			Yes	Yes	Yes
Built-in lightning arresters			Yes (*1)		Yes
Scanner interface			N/A	UIS-67A	

*1. With USS-63B mounted.
*2. 120 to 1000 Ω in high-resolution mode.

Channels

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

Scanning Speed

50 ms/channel (Standard mode)
280 ms/channel (High-resolution mode)
Note: Individually switchable for desired channels.
20 ms/channel (High-speed mode)
Note: Collectively switchable for all channels of dedicated scanners.

Scanners \ Line Frequencies	50 Hz Zone	60 Hz Zone
Dedicated scanner (Standard mode)	50 ms/channel	
Dedicated scanner (High-resolution mode)	280 ms/channel	
Dedicated scanner (High-speed mode)	20 ms/channel	
USB-70 series (Standard mode only)	60 ms/channel	58.4 ms/channel

Note: 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

Measuring Targets \ Scanning Speed	Standard Mode (50 ms/channel)	High-resolution Mode (280 ms/channel)	High-speed Mode (20 ms/channel)
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 and high-speed mode are selectable for dedicated scanners only.
2. High-resolution or high-speed mode is available only with Full bridge system.

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 a thermal sensor).

Easy Measure Auto zero balancing function is activated.

Note: The selected function is applied to all channels. Coefficient

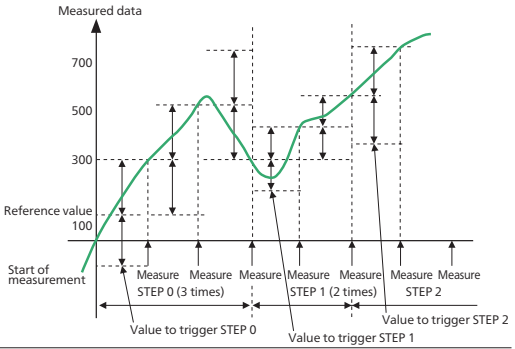
Calculation Functions Multiplication by calibration coefficients, calibration by TEDS, conversion of measured values to physical quantities, scaling and correction.

Engineering Units 59 units

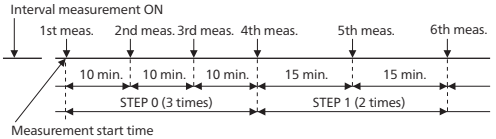
Automatic Measurement Functions

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 measurement times (Repeat times) under the trigger condition is registered for each step to perform a series of automatic measurements in the order of steps.
The maximum steps available for setting is 15 and the repeat times may be a value selected from a range of 1 to 9999 or infinite.
Trigger channels: 1 desired channel
Trigger value: A desired real number of 6 effective figures or less Reference
Reference value: Amount of level shift to determine the first trigger value (Selected from the same range as for the trigger values)
Repeat times: 1 to 9999 (0 for infinite times)
Measuring steps: Maximum 15



INTERVAL MEASUREMENT Measurement is automatically performed at preset time intervals.
Starting time setting: Year, month, day, hour, minute, and second
Interval setting: Days and hours: minutes: seconds (In a range of 00 and 00:00:01 to 99 and 12:59:59)
Repeat times: 1 to 9999 (0 for infinite times)
Maximum steps: 15



TRIGGER INTERVAL MEASUREMENT
Combination of trigger measurement and interval measurement.
Trigger value: Absolute value.
Measuring times: Max. 9999
Interval time: Available in a range of
1 second to 99 days 23 hours:59 minutes:59 seconds

Storage Internal memory, approx. 7 MB
Flash ATA card (Optional); the capacity depends on the card.

●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 ±50 k μm/m	1 μm/m	±(0.05% of reading + 1) μm/m
±50 k to 500 k μm/m	10 μm/m	±(0.05% of reading + 10) μm/m

●Strain Measurement (High-Resolution Mode)

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 280 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 ±20 k μm/m	0.1 μm/m	±(0.05% of reading + 0.3) μm/m
±20 k to 200 k μm/m	1 μm/m	±(0.05% of reading + 3) μm/m

Notes: 1. Available only with full bridge system (120 to 1000 Ω)
2. Bridge resistance should be 350 Ω for bridge excitation with constant current.
3. Measuring range is 0 to 15 k μm/m for bridge excitation with constant current.
4. Available only with dedicated scanners.

●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 ±50 k μm/m	1 μm/m	±(0.08% of reading + 3) μm/m
±50 k to 500 k μm/m	10 μm/m	±(0.08% of reading + 30) μm/m

Notes: 1. Available only with Full bridge system
2. Available only with dedicated scanners.

●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 + 3) mV	10 MΩ or more
	±50.00 to 500.00 mV	10 μV		
V/50 V	0 to ±5.0000 V	100 μV	±(0.05% of reading + 2) V	1 MΩ or more
	±5.000 to 50.000 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
V/500 mV	0 to ±50.000 mV	1μV	±(0.08% of reading + 6) mV	10 MΩ or more
	±50.00 to 500.00 mV	10 μV		
V/50 V	0 to ±5.0000 V	100 μV	±(0.08% of reading + 6) V	1 MΩ or more
	±5.000 to 50.000 V	1 mV		

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

●Temperature Measurement with Thermocouples (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 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
JPt100	-200.0 to 510.0°C		

Note: Connection is 3-wire system

●Measurement with Potentiometer Sensor

Scanning speed 50 ms/channel (Standard mode)
20 ms/channel (High-speed mode)
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
Printing (UCAM-60B) Thermal
Paper width 58 mm (24 characters/line), UCAM-60A-RP
Printing speed 60 mm/s
PC Card Slot Conforms with 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, disconnection, I/O resistance, Insulation resistance, mode, etc. Checking of I/O resistance and mode is available only for dedicated scanners.
TEDS
Interfaces: 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.
Operating Temperature 0 to 50°C
Operating Humidity 20 to 85% RH (Non-condensing)

Power Supply 100 to 240 VAC (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. 6.3 kg, UCAM-65B: Approx. 5.0 kg (Excluding scanner)

Standard Accessories
AC power cable P-18 with 2-pin conversion plug CM-39 (AC-operated version) DC power cable P-76 (DC-operated version)
Recording paper UCAM-60A-RP (1 roll for UCAM-60B only)
Screwdriver, Spare fuse, Instruction Manual (CD-R)
Control Software UCS-60B for UCAM-65B only (CD-R)

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

■Dedicated Scanner 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 Arresters)
Channels 10/unit
Switching Terminals Semiconductor relays
Input Terminals Connect to lead wire by either soldering or screwing.
NDIS 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 85% RH (Non-condensing)
Dimensions 320 W x 28 H x 80 D mm (Excluding protrusions)
Weight USS-61B: Approx. 800 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

Connectable Scanners USB-70 series
Connectable Scanners Max. 20
Operating Temperature 0 to 50°C
Operating Humidity 20 to 85% RH (Non-condensing)
Dimensions 99 W x 50 H x 163 D mm (Excluding protrusions),
Weight Approx. 160 g

USI-67A

■External I/O Unit UIO-60A

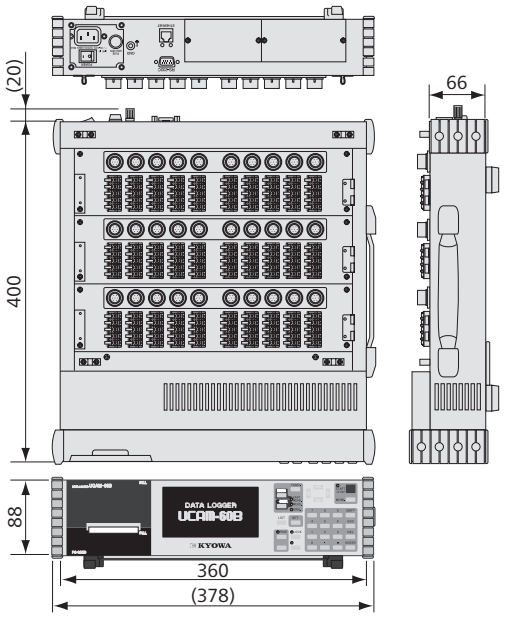
Output **ALARM signal:** 4 channels (High/low limit checking)
BUSY signal: 1 channel
Input **START signal:** 1 channel
STOP signal: 1 channel
RESET signal: 1 channel
RAINFALL signal: 1 channel
Operating Temperature 0 to 50°C
Operating Humidity 20 to 85% RH (Non-condensing)
Dimensions: 90 W x 50 H x 180 D mm (Excluding protrusions),
Weight: Approx. 140 g

■External Scanners USB-70B

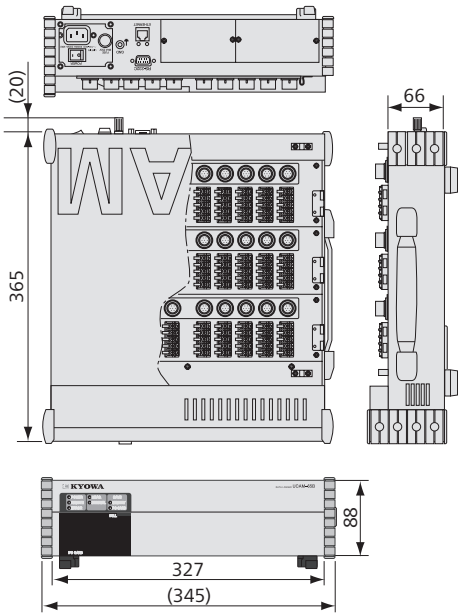
Models
USB-70B-10 (For general strain measurement)
USB-70B-20 (For general strain meas., with NDIS connectors)
USB-70B-30 (For civil engineering, with lightning arresters)
Channels 50/unit
Measuring Channel Mode
Selected for each channel from the mainframe
Measuring Targets
USB-70B-10: Strain gages, Strain-gage transducers, potentiometer, DC voltage-output instruments, thermocouples
USB-70B-20: Strain gages, Strain-gagee transducers, potentiometer, DC voltage-output instruments, thermocouples (Transducer with NDIS connector is required)
USB-70B-30: Strain gages, strain-gage transducers, potentiometer, DC voltage-output instruments, thermal Sensors (Thermo-couples, platinum resistance thermometer bulbs, civil engineering transducers with a thermal sensor), lightning arresters 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 100 to 240 VAC (100 to 127 VAC or 220 to 240 VAC automatic switchover)
Operating Temperature 0 to 50°C
Operating Humidity 20 to 85% RH (Non-condensing)
Dimensions 302 W x 107 H x 500 D mm (Excluding protrusions)
Weight Approx. 7.3 kg (USB-70B-10)
Approx. 8.5 kg (USB-70B-20)
Approx. 7.7 kg (USB-70B-30)

Standard Accessories Connection Cables N-24 (1 m)

■Dimensions



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



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