UCAM-60C M14/65C M14

Data Logger

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

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

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

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

UCAM-60C M14

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

UCAM-65C M14

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

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

System Content

Data Loggers

Models	Power Supply	Control Software UCS-60B	Features
UCAM-60C-AC M14	AC	Optional	Operation keys, built-in display, printer
UCAM-60C-DC M14	DC		
UCAM-65C-AC M14	AC	Standard	PC-controlled
UCAM-65C-AC-0 M14	AC	Optional	
UCAM-65C-DC M14	DC	Standard	
UCAM-65C-DC-0 M14	DC	Optional	

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

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

Specifications

■Data Logger UCAM-60C M14/65C M14

Measuring Targets

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

Connectable Scanners

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

Measuring Targets and Connectable Scanners

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

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

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

Input Terminals
Can connect to lead wires through either soldering or screwing.
NDIS4102 (7 pins) connectors (USS-62B)

Switching Terminal Semiconductor relays

Scanning Speed
50 ms/channel (Standard mode)
0.28 s/channel (High-resolution mode) *Individually switchable for desired channels.
20 ms/channel (High-speed mode) *Only collective switching 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)	0.28 s/channel	
Dedicated scanner (High-speed mode)	20 ms/channel	
USB-70B (Standard mode only)	60 ms/channel	58.4 ms/channel

Note1: 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
Note2: Repeat measurement interval time = (Number of measuring channels × scanning speed) + data processing time (2 to 20 s) Data processing time is indeterminate, changed by measurement setting and environment.

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

Note 1: High-resolution mode and high-speed mode are selectable for dedicated scanners only.
Note 2: High-resolution mode is available only with full bridge system.
Note 3: High-speed mode is available with full bridge system, voltage, current, and potentiometer sensor.

Operating Modes Real-time, monitor, and automatic

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

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

Unit 59 units

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

Storage Internal memory
Capacity: Approx. 1.8 GB

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

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

*Resolution and accuracy be automatically changed by Autorange function.

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

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

Note 1: Available only with full bridges system.
Note 2: Bridge resistance should be 120 to 1000 Ω for bridge excitation with constant voltage.
Note 3: Bridge resistance should be 350 Ω for bridge excitation with constant current.
Measuring range 0 to ±15000 ×10^{-6} strain
0 to ±150000 ×10^{-6} strain
Note 4: Available only with dedicated scanners.
Note 5: Resolution and accuracy be automatically changed by Autorange function.

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

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

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

●Voltage Measurement (Standard Mode)
Scanning Speed 50 ms/channel
Initial Value Memory Range Same as measuring range
Measuring Range, Resolution and Accuracy

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

* Resolution and accuracy be automatically changed by Autorange function.

●Voltage Measurement (High-speed Mode)
Scanning Speed 20 ms/channel
Initial Value Memory Range Same as measuring range
Measuring Range, Resolution and Accuracy

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

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

●Current Measurement (Standard Mode)
Scanning Speed 50 ms/channel
Initial Value Memory Range Same as measuring range
Measuring Range, Resolution and Accuracy

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

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

Note 1: Available only with dedicated scanners.
Note 2: External shunt resistor (high-accuracy 250 Ω) is required.
Note 3: Stated accuracy does not include the external shunt resistor.

●Temperature Measurement with Thermocouple (Standard Mode)

Scanning Speed 50 ms/channel

Measuring Range, Resolution and Accuracy

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

Note 1: Accuracies do not include the internal reference junction compensator accuracy.
Note 2: The reference junction compensator is switchable between internal and external.
Note 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

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

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

Scanning Speed 50 ms/channel

Measuring Range, Resolution and Accuracy

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

Note: Connection is 3-wire system.

●Measurement with Potentiometer sensor (Standard Mode)

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

Measuring Range, Resolution and Accuracy

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

●Measurement with Potentiometer sensor (High-speed Mode)

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

Measuring Range, Resolution and Accuracy

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

Note: Available only with dedicated scanners.

Internal Timer Real time clock is built-in. (Battery backup)
Display Fluorescent display tube
128×64 dots (UCAM-60C M14)
Printer Printing Thermal
Paper width 58 mm (24 characters/line)
Printing speed 60 mm/s (Max.) (UCAM-60C M14)
Interface RS-232C
LAN (10BASE-T/100BASE-TX)
USB2.0 (Collects measurement data by USB Flash Drive.)
*1: Measurement data cannot be saved directly to USB memory.
*2: USB Flash Drives
Capacity: 32 GB or less, File Format: FAT32
*3: Recommend USB Flash Drives: GH-UFI-XSC2G (Manufacturer: GREENHOUSE)
File Conversion Binary measurement data can be converted to CSV. (UCAM-60C M14)
Self Diagnosis Function
Checks display (UCAM-60C M14), printer (UCAM-60C M14), bridge excitation, leadwire-off, input/output resistance, insulation resistance, mode, etc.
TEDS
Interface: IEEE1451.4 Mixed Mode Transducer Interface Class2
Applicable sensor: Should have information written in accordance with IEEE template No.33.
Cable length should be 30m or less.
*With dedicated scanner USS-61B/62B/63B.
Operating Temperature 0 to 50°C
Operating Humidity 20 to 85% (Non-condensing)
Setting Maintenance Function ACOM at measurement circuit is switchable between floating and GND connect.
Power Supply 100 to 240 VAC (AC-operated version)
10 to 16 VDC (DC-operated version)
* DC operated version has power control function.
Current Consumption
100 VAC: 0.5 A or less (With 3 dedicated scanners mounted)
12 VDC: 4.0 A or less (With 3 dedicated scanners mounted)
Dimensions
360 W × 88 H × 400 D mm (Excluding protrusions) (UCAM-60C M14)
327 W × 88 H × 365 D mm (Excluding protrusions) (UCAM-65C M14)
Weight
Approx. 6.3 kg (Excluding scanner) (UCAM-60C M14)
Approx. 9.6 kg (With 3 dedicated scanners USS-62B mounted) (UCAM-60C M14)
Approx. 5.0 kg (Excluding scanner) (UCAM-65C M14)
Approx. 8.3 kg (With 3 dedicated scanners USS-62B mounted) (UCAM-65C M14)

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

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

■Dedicated Scanner USS-61B/62B/63B

Models USS-61B (TEDS compatible)
USS-62B (With NDIS4102 (7 pins) connectors, TEDS compatible)
USS-63B (For civil engineering measurement, TEDS compatible, with lightning arresters)
Channels 10/unit
Switching Terminals Semiconductor relays
Input Terminals Connect to lead wire by either soldering or screwing.
NDIS4102 (7 pins) connectors (USS-62B)
One-touch terminal block (JT-1A) (Optional)
Lightning Arresters Built in USS-63B
Operating Temperature 0 to 50°C
Operating Humidity 20 to 85% (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
NDIS4102 (7 pins) connector caps (Pre-attached to connectors, USS-62B only), terminal cover, channel label

■Scanner Interfaces USI-67A

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

USI-67A

■External I/O Unit UIO-60A

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

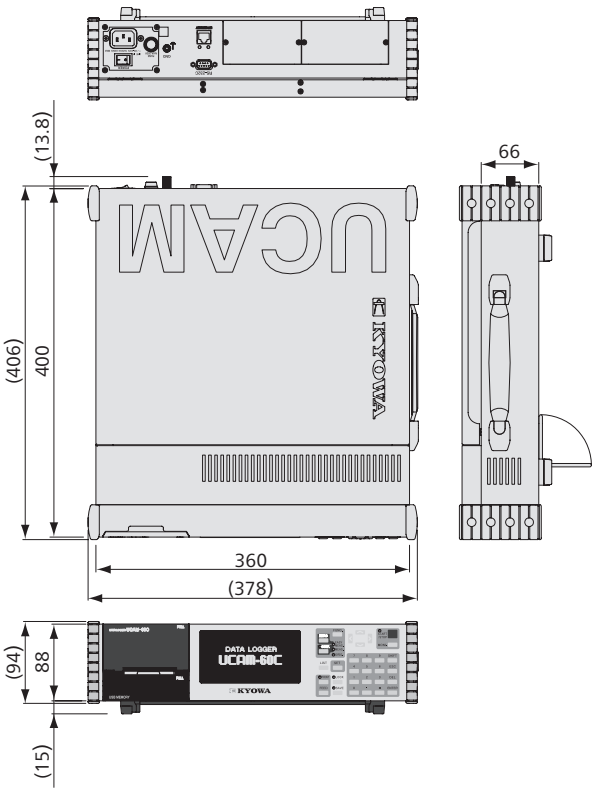
Operating Temperature 0 to 50°C
Operating Humidity 20 to 85% (Non-condensing)
Dimensions 90 W x 50 H x 180 D mm (Excluding protrusions)
Weight Approx. 140 g

USB-70B Specifications

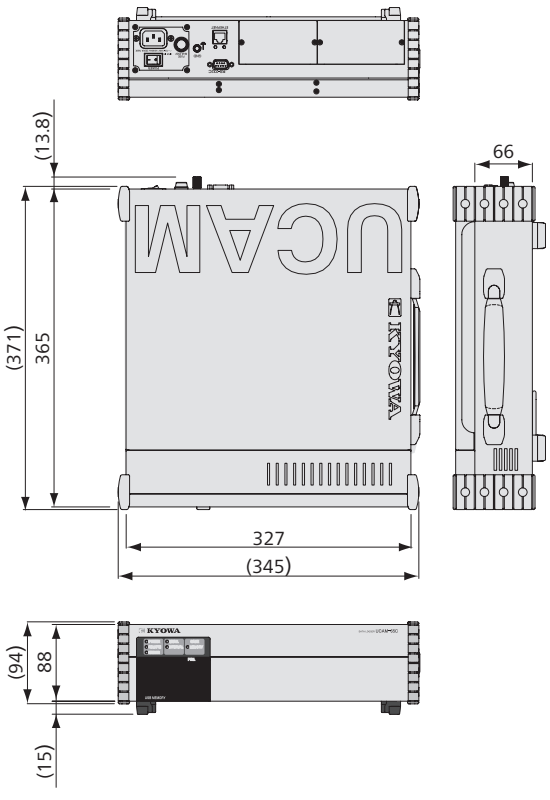
Models	USB-70B-10 (For general strain measurement)
	USB-70B-20 (For general strain measurement, with NDIS4102 (7 pins) connectors)
	USB-70B-30 (For civil engineering, with lightning arresters)
Channels	50/unit
Measuring Channel Mode	
	Selected for each channel from the mainframe
Input	
USB-70B-10:	Strain gages, strain-gage transducers, potentiometer, DC voltage-output instruments, thermocouples
USB-70B-20:	Strain gages, strain-gage transducers, potentiometer, DC voltage-output instruments, thermocouples (Transducer with NDIS4102 (7 pins) connector is required)
USB-70B-30:	Strain gages, strain-gage transducers, potentiometer, DC voltage-output instruments, thermal sensors (Thermocouples, 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 Specifications> 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% (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 cable N-24 (1 m)

Dimensions



UCAM-60C-AC M14



UCAM-65C-AC M14