CTRS-100 Series

Compact Recorder

●Compact & Tough

NEW

TEDS

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

Compact and tough data logger

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

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

Configuration

■Main Unit

Compact Recorder
CTRS-100A

■Remote Controller

Remote Control Unit
CTRS-RCU010A

■Battery

Battery Unit
CTRS-BATT010A

■Measuring Units

Strain/Voltage Unit
CTRS-CDV010A

Voltage Unit
CTRS-CVPS010A

Thermocouple Unit
CTRS-CTA010A

■Expansion Units

CAN Unit
CTRS-CAG010A

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

Synchronization Unit
CTRS-SYNC010A

CTRS-100A Specifications

■Control Unit Specifications

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

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

■Measuring Unit Specifications

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

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

■General Specifications

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

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

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

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

CTRS-CDV010A Specifications

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

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

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

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

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

CTRS-CVPS010A Specifications

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

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

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

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

CTRS-CTA010A Specifications

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

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

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

Optional Accessories Temperature measuring adapter CT-3A-4

Data Recorders/
Analyzers

CTRS-CAG010A Specifications

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

The Configurable CAN FD Data Bit Rate Table

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

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

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

CTRS-BATT010A Specifications

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

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

Standard Accessories Stack-connector cap (male)

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

CTRS-WLAN010A/011A Specifications

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

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

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

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

CTRS-SYNC010A Specifications

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

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

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

CTRS-RCU010A Specifications

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

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

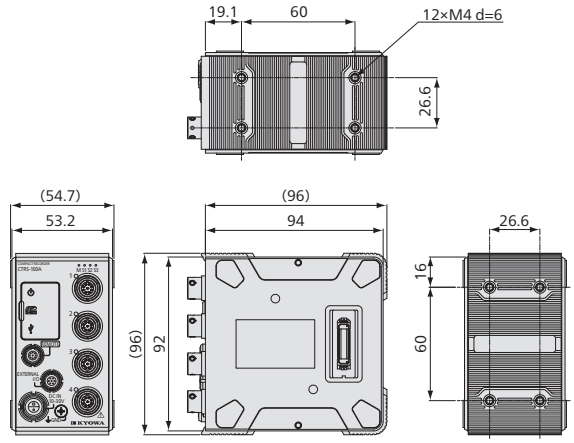
DCS-100A software, specification for control of CTRS-100 series

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

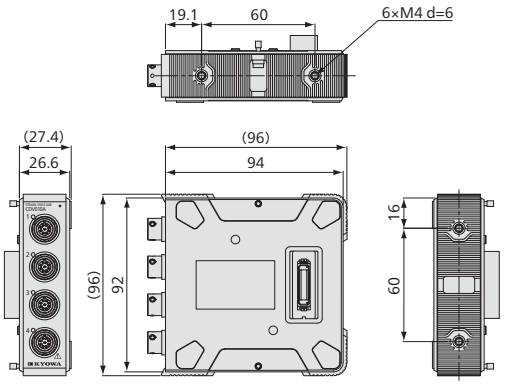
Units	Up to 4 units (up to 128 analog channels.)
Interfaces	USB (USB2.0 High Speed) or Ethernet* (10/100BASE-T)
	*A separate synchronous unit and special communication cable are necessary.
Saving Format	Saves the measured data in the CTRS-100A SD card or PC folder.
	When saving to the SD card of CTRS-100A,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

Dimensions

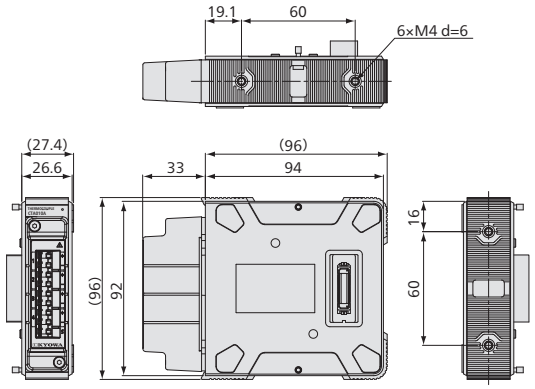
Compact Recorder CTRS-100A



Strain/Voltage Unit CTRS-CDV010A

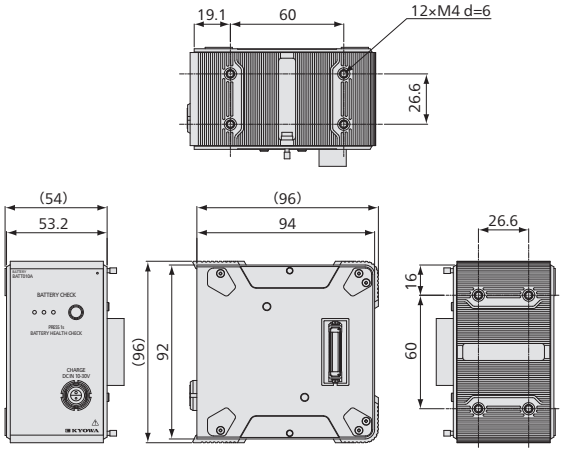


Thermocouple Unit CTRS-CTA010A

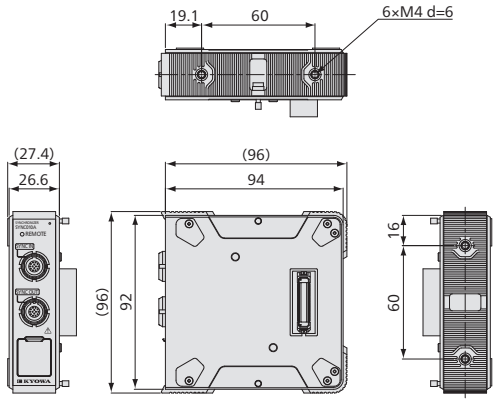


*Including the temperature measuring adapter

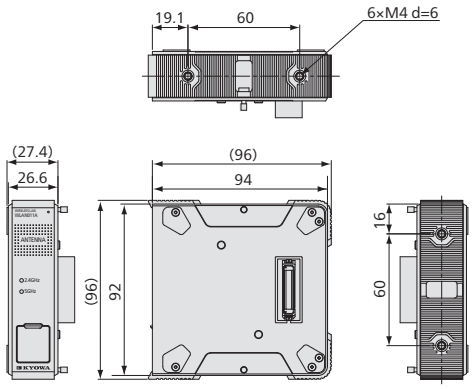
Battery Unit CTRS-BATT010A



Synchronization Unit CTRS-SYNC010A



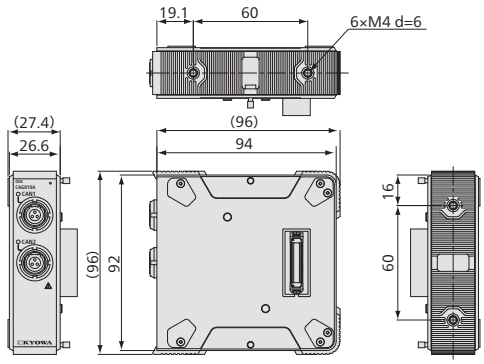
Wireless LAN Unit for U.S. CTRS-WLAN011A*1



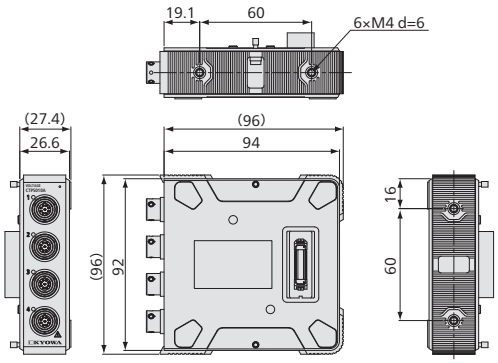
*1 CTRS-WLAN010A is the same in dimensions.

Dimensions

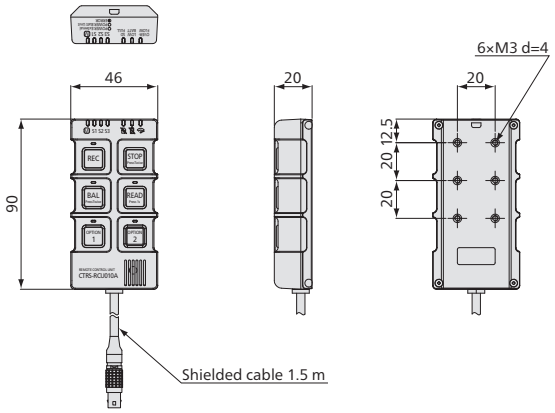
CAN Unit CTRS-CAG010A



Voltage Unit CTRS-CVPS010A



Remote Control Unit CTRS-RCU010A



Simplified Configuration of the CTRS-100 Series

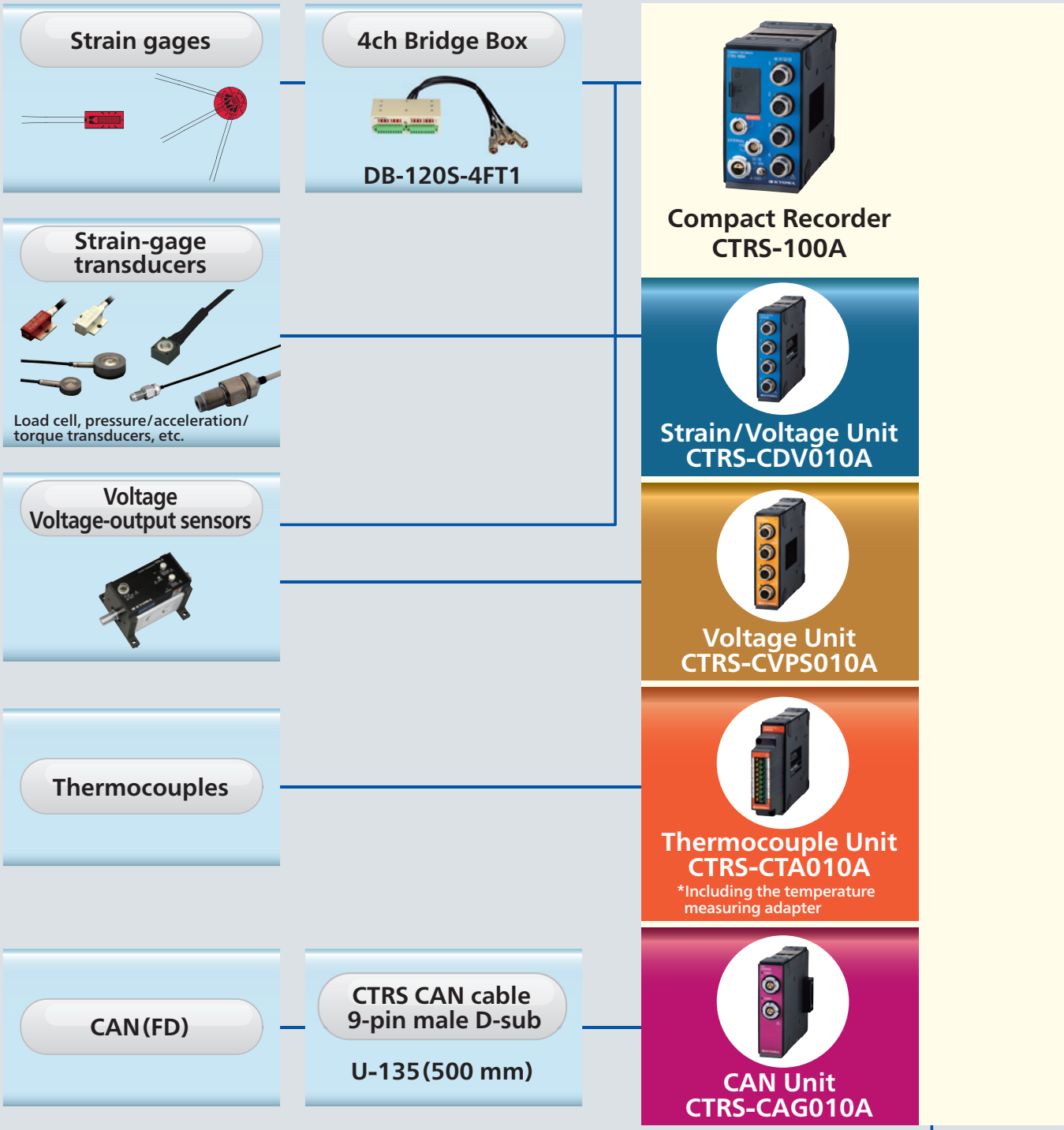
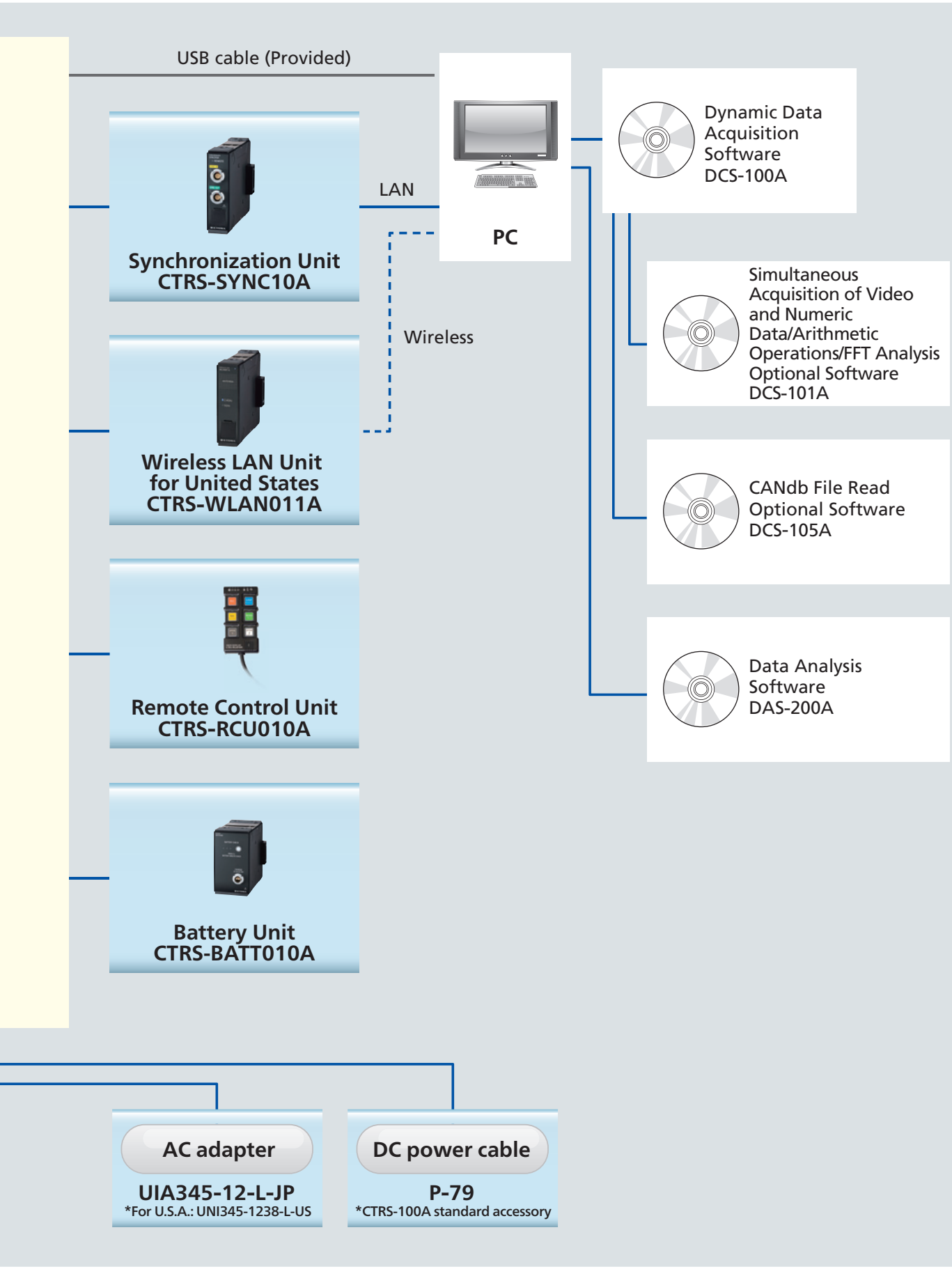


Table of Conversion cable for NDIS4109 (Small round 9 pins)

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

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


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