



High-speed, High-accuracy, High-functionality Data Logger



Built-in measurement unit 10 channels model TS-960

Tokyo Measuring Instruments Laboratory Co., Ltd.

New model with built-in measurement unit **30 channels!**



Top Model

30chTS-963

Measuring every 0.1 seconds with high-speed mode

Capable of measuring strain gauges, strain gauge transducers, thermocouples, platinum RTD (resistance temperature detector), DC voltage, etc.

High-speed mode allows measurements every 0.1 sec. (High-speed mode allows measurements every 0.1 sec.) Built-in measuring unit capable of monitoring and displaying all 30ch points

Our unique next-generation A/D method eliminates noise and realizes highly accurate and stable measurement.

Measurement data can be recorded in 4GB internal memory, SD card is used as external recording media Equipped with 9-inch wide LCD touch panel

Comfortable operation with wide widescreen and user-friendly screen configuration

Remote data logger functionality enables operation from a web browser

Systems block diagram TS-963 (30ch) / TS-960(10ch)



Enhanced monitor display functions

Monitor update 0.1 sec.

TS-963's built-in measurement unit can monitor 30 channels!

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[1] FRAME-			C	[2] FRAME-							C
[H] CH800	+100.0 N	[M] CH010	+0 µ c	[M] CH020		-1 µ e	DH:	CH025			ıμε
[H] CH201	+141 με	[M] CH011	+1 µ ε	[M] CH821		+1 μ ε	DH:	CH956			Iμε
[M] CH882	-7με	(M) CH012	+0 µ e	[M] CH022		-2 µ e	DH:	CH827			1 µ ε
[и] снавз	+32 11 6	[m] CH013	+0.11.6	(M) CH853		+3 μ ε	DH:	CH958			με
[H] CH884	102 // 0	[n] ch014	41.00	[M] CH024		+0 µ e	DH	CH02S		+	lμε
[H] CH805	-6 4 6	[N] CH015	+0 µ c	[4] FRAME-							C
[M] CH586	+185 μ ε	[м] снетб	+0 µ c	+248 +188							
[M] CH207	+0 µ c	[N] CH017	+1 µ e	+120 +60				_	Γ		
[H] CH808	+1 μ ε	[M] CH018	+0 µ c	+0	3 8	윎	응 용	영원	꾩	N N	HAX
(M) CH868	+0 µ ε	(M) CH019	+1 µ ε	8	3 9	8	8 2	8	88	학 전	-8
	TIAL 🗳	AUTO. MEAS	R F	RECORD	ų,	MONI	TOR	1	X	MENI	J

Switching monitor display settings

Monitor function that can have 5 tables of screen display settings and can display in 4 frames



And up to 60 measurement data points can be displayed simultaneously!





Vector display function [New function]



Vector graphs can be displayed with arrows, mapping data to lengths and angles

Operability Environment Real-time operation is possible even with highspeed sampling

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Support various measurements

Support various automatic measuring functions

Interval Measurement

Repeat measurement by setting time interval and start time

Comparator measurement

Measurements are performed by comparing large and small values of reference channel values

Alarm measurement

Sets a channel to be monitored and executes alarm operation (measurement, display, beep) when the measured value exceeds a threshold value

Sampling measurement

Repeatedly measures and records at intervals of 0.1 second at the fastest

Sequence measurement

Controls other automatic measurement functions



Automatic Measurement: Main Menu

Automatic measurement functions (set various conditions and start measurement automatically) are provided.

Each automatic measurement function can be operated simultaneously.

Ten systems can be used for each of "interval measurement" and "comparator measurement.

Advanced arithmetic processing is possible with a single measuring instrument

Four arithmetic operations	4 types
General functions (absolute value/logarithm/exponentiation)	7 types on, etc.)
Trigonometric functions	15 types
Rosette functions	7 types
Multi-stage ramp	3 types
Logic functions (IF / MAX / MIN etc.)	8 types
Other functions	1 type

100 extended channels (with the ability to obtain calculation results based on a user-defined formula for each measurement value collected) are available!

Extended Channel Settings

$\sim \alpha$		•	-1	22/11/25 17	': 40: 26
🔅 Extende	ed channel setting				
CH.	Operational expression	Display digit	Unit	Name	GRP.
009	Ex1(CH(1),CH(2),CH(3))	########	με	MAX-ST	
001	En1(CH(1),CH(2),CH(3))	#######	με	MIN-ST	
002	Gx1(CH(1),CH(2),CH(3))	#######	με	MAX-GS	
003	P1(CH(1),CH(2),CH(3))	#####. #	deg	DEG	-
@04	Ex1(CH(4),CH(5),CH(6))	#######	με	MAX-ST	$\mathbf{\nabla}$
005	En1(CH(4),CH(5),CH(6))	#######	με	MIN-ST	-
006	Gx1(CH(4),CH(5),CH(6))	#######	με	MAX-GS	¥
007	P1(CH(4),CH(5),CH(6))	#####. #	deg	DEG	ALL
008		#######	με		HLL
009		#######	με		CLR
		2,5	Cancel	🗸 Monit	or screen

Extended channel setting: arithmetic equation setting

~° M				Ð			22/1	1/25 1	7: 40: 18
Extended 🔅	channel set	ting: Operat	ional expre	ssion setting					
Operational expression									
Page.	1 Pa	ge. 2					CLR	Backs	sPace
Abs	E	Exp	Log	Pow	СН	/	*	-	+
Sqr	Int	Sin	Cos	Tan	CH@	7	8	9	(
Soc	Casaa	Cotop	Мах	Min	Ι	4	5	6)
380	COSEC	Cotan	Md.X	MITT	Ι@	1	2	3	
	Ιf	=	<	>		0			
					÷,	🗧 Cancel		Monit	or screen

Pa9e.	1 Pa	a9e. 2		
Atn	Arcsin	Arccos	Arccosec	Arccotan
Hsin	Hcos	Htan	Hsec	Fy4
Ex1	En1	Gx1	P1	Sx1
Sn 1	Tx1	Icd	lev	Icp

TS-963 (30ch) / TS-960(10ch) Main Specifications

Measuring	g performance	
	Using Measurement box	1000 points at maximum
Number of measuring	Using both Measurement box and Built-in	(2000 points at maximum when temperature-integrated strain gauges are used)
	Using Built-in	TS-960 : 10 points (possible up to 20 points when
point	measurement unit	TS-963 : 30 points (possible up to 60 points when temperature-integrated strain gauges are used)
Data updat	e rate	Display and record measurements update cycle 0.1 sec.
Measuring	speed	High-speed mode (0.1 seconds) High-accuracy mode (0.4 seconds(50Hz)/0.34 seconds(60Hz)
Measureme	ent mode	Initials, Direct, Simple Measure
Compensat	tion mode	Comet NON, Comet A, Comet B
	Number of setting table	5
	Number of display frame	0~4
Nonitor	Display mode	Value, MAX • MIN, Chart (Y-T), Chart (X-Y), Chart (BAR) Vector
	Manual measurement	Start key (START button on touch screen)
Measurement	Automatic measurement	Interval measurement, Comparator measurement, Alarm measurement, Sampling measurement, Sequence measurement
	Interface	LAN、USB、RS-232C
	Coefficient	±(0.00000~200000)
	Unit	$\mu \epsilon$, mV, $^{\circ}$ C, kgf, mm, etc.
	Decimal point	Display after decimal point is set arbitrarily to 0 ~ 5 digit
	Offset	Possible to write to each measurement channel
		Type of connected sensor is set
Channel setting	Sensor mode	Strain Quarter bridge 3-wire 120 / 240 / 350 Ω Half bridge common dummy, Half bridge Full bridge, Full bridge constant current 350Ω Full bridge high resolution mode Full bridge constant current 350Ω high resolution mode Full bridge 0-2V mode Temperature-integrated strain gauge 120 / 240 / 350 Ω
		Voltage 640mV, 64V
		Temperature Thermocouple T/ K/ J/ B/ S/ R/ E/ N, Pt100 3W
	Channel name	Arbitrarily set by alphabet capital letter, numeral and/or symbol of up to 8 digits
Sensor ID	Function	Reading and setting of sensor ID, Writing to sensor ID
	Function	Operation with function and operation between channels
Extended	Number of channel	100 channels
channel	Usable variable	Channel, Extended channel, Constant
setting	Operation	Four arithmetic operations/General functions/Trigonometric functions/Functions for rosette analysis/Functions for multi-layer inclinometer/Logical functions/Other function
	During measurement	Open check
Check function	Sensor	Insulation check, Sensitivity check, Dispersion check, Thermocouple burnout check, Leadwire resistance check, Bridge output check
	Extended channel	Processing time check
	Analog output	Calibration output Zero and arbitrary output in the range of output level
	Setting list display	Measurement channel setting, Channel setting, Reference junction setting, Extended channel setting, Analog output setting, Interval setting, Comparator setting, Alarm setting, Sampling setting, Sequence setting, Initial value, Leadwire resistance, Bridge output, etc.
Time		

Setting	Year, Month, Day, Hour, Minute, Second			
Display / Operation				
Display LCD panel	9 inch TFT liquid crystal display (with touch screen)			
Display device Resolution	$800 \times 480 \text{ dots}$			
Output	DVI			
Operation	Touch screen, POWER key, FUNCTION key, START key Remote data logger function			
Recording				
Internal Function	Measured data recording/reproduction, Setting file save			
memory Capacity	4 Gbyte			
SD card Function	Measured data recording/reproduction/copy, Setting file save/copy, Sensor ID writing/reading			
Capacity	4 Gbyte (specified by TML)			
Analog output				
Function	Voltage output of measured value of arbitrary channel			
Number of output point	20 points			
Output range	±10V, ±5V, 0-5V			
Capacity (Full scale)	\pm 999999 at maximum			
Output accuracy	Output specifications conform to the specifications of each unit			
Data renewal time	Linked to measurement cycle, fastest 0.1 sec.			
*Analog output unit EU-10VO is required for every 10 points.				
Power supply				

Power supply voltage	AC100~240V 50/60Hz					
Maximum power consumption	TS-960 : 70VA MAX / TS-963 : 152VA MAX					
For design and						
Environment						
Operating environment	0~+50°C 85%RH or less (No condensation)					
Others						
	TS-960 : 328 (W) × 148 (H) × 200 (D) mm					
External dimensions	TS-963 : 328 (W) × 174 (H) × 424 (D) mm					
	(Excluding rubber protectors and projecting parts)					
Weight	TS-960 : Approx.5kg /TS-963 : Approx.10kg					
Built-in measuremer	nt unit (common to all mode)					
Duite in measuremen						
Common to all mode						
Number of measuring point	TS-960 : 10points / TS-963 : 30points					
Input terminal	Accepts both screwing and soldering					
Quick connection terminal	NDIS connector receptacle					

High-speed mode

Ctoreli	monorumons and (LI)		ol nol -)					
Strain	measurement (High-	spee	eu mode)					
Bridge excitation			DC2V 4r	ns(50Hz)				
Initial value memory range			± 16000	10×10 ⁻ ° strain				
Temperature coefficient of accuracy			±0.002%rdg/℃					
Secula	ar change of accuracy		$\pm 0.02\%$	ordg/year				
			N	leasuring range	Resolution			
		ľ	± 40	000×10^{-6} strain	1×10^{-6} strain			
Measu	uring range and		± 80	\pm 80000 × 10 ⁻⁶ strain 2× 10 ⁻⁶ st				
resolu	Ition		± 160	$\pm 160000 \times 10^{-6}$ strain 4×10^{-6} str				
			± 320	±320000×10 ⁻⁶ strain 8×10 ⁻⁶ strain				
			± 640	1000×10 ⁻⁶ strain	16×10 ⁻⁶ strain			
	(22% 1 5%)		±(0.08%	±(0.08%rdg+3digit)(Quarter bridge, Half bridge, Full bridge)				
Accur	acy (23 C±5 C)		±(0.08%	rdg+6digit)(Full bridg	e 0 - 2V mode)			
Strain	magging mant with co	ncta	nt curron	t mothod (Eull bridge	a aphy) (High speed mode)			
Duidan		lista			e only) (high-speed mode)			
Bridge	excitation		DComA	4ms(50Hz)				
Bridge	e resistance		35002					
Initial	value memory range		± 16000	0×10⁻⁵strain				
Temper	rature coefficient of accura	cy	± 0.002	%rdg/℃				
Secula	ar change of accuracy		±0.02%	orda/vear				
			M	easuring range	Resolution			
		ł	+ 40	000×10^{-6} strain	1 X 10 ⁻⁶ strain			
Measu	uring range		- 40 + 80	000×10^{-6} strain	2×10^{-6} strain			
and re	esolution		± 160	1000×10^{-6} strain	4×10^{-6} strain			
			± 320	1000×10^{-6} strain	8×10 ⁻⁶ strain			
			± 640	1000×10 ⁻⁶ strain	16×10 ⁻⁶ strain			
Accur	$acv(23^{\circ}C + 5^{\circ}C)$		+ (0.08%	(vda+3diait)	Tot To Stan			
/ teedr	de)(25 e = 5 e)		=(0.00)	andg i baigit)				
DC vo	ltage measurement (I	High	i-speed r	node)				
In tata I	V1/1		± 160.00	00mV				
initial va	alue memory range V1/10	00	± 16.000	700				
Temne	rature coefficient of accura	acv.	±0.0024%rda/°C					
Socula	ar change of accuracy		$\pm 0.0021/310g/C$					
Secula	al change of accuracy		10.024	70109/ year	Deselution			
			IVI	easuring range	Resolution			
				± 40.000mV	0.001mV			
	V1/1		-	± 80.000mV	0.002mV			
				E 160.000mV	0.004mV			
				E 320.000mV	0.008mV			
Measu	uring range – – – – – – – – – – – – – – – – – – –		-	± 4.00001/	0.010111			
and re	esolution			± 4.0000V ± 8.0000V	0.0001V			
	\/1/10	0		± 16,0000V	0.00027			
	V1/10			\pm 10.0000V \pm 32.0000V	0.00047			
				± 52.0000V	0.0016V			
Accur	200/22°C±E°C) V/1/1	-	±(0.0000/ 0.0010/					
When me		0	$\pm (0.0070100+001011)$					
TVI EI III	vining average is used VI/I(JU	±(0.08%rdg+6digit)					
Accura	acy(23°C±5°C) <u>V1/1</u>							
When mo	oving average is not used V1/1(00	±(0.08%rdg+50digit)					
Pt-RTD) temperature measurem	ent l	(IIS C1604	·2013 JEC 60751-1·200	8 Pt100) (High-speed mode)			
Applie	rahlo Pt_RTD	ici ici i	P+1004	.2015/100 00751 1.200	or croo, (nigh speed mode)			
Applic			2	2+2140				
Ivieasu	uring method		3-wire (I	~L3VV)				
Linear	ization		Digital processing					
Tempe	erature coefficient of accu	irac	± 0.0020)%rdg/℃				
Secula	ar change of accuracy		$\pm 0.05\%$	ordg/year				
Measu	uring range		-200~+850°C					
Resolu	ution		0.1°C					
Accur	acv(23°C+5°C)		$\pm (0.1\% d_{0} \pm 0.3\%)$					
Accura			÷(0.1%)	1uy+0.5 C)				
Thermocouple temperature measurement (JIS C1602:2015, IEC 60584-1:2013) (High-speed mode)								
Applicable thermocouple T,K,J,B,S,R,E.N								
Lineari	zation	Dic	nital proce	essina				
			,	Acci	1racv(23°C+5°C)			
Type	Measuring range	Re	solution	(External DIC)	(Internal DIC)			
	250 20000	0.1	00	(External RJC)	(Internal KJC)			
	- 250 ~ - 200°C	0.1	°C	± (0.31%rdg+1.9"	$\pm (0.31\% rdg + 5.2\%)$			
т	- 200 ~ - 100°C		°C	工(U.14%rdg+U.8℃ 土(0.110/rdg+0.5%	$\pm (0.14\% \text{rag} \pm 2.1\%)$			
	-100 ~ 0°C 0.		C	± (0.11%rdg+0.5 ($\pm (0.080(rda + 0.0^{\circ}C))$			
	0 0 1 400%	0 1		$\pm (0.08\% rdg + 0.4\%) \pm (0.08\% rdg + 0.9\%)$				
	0 ~ +400℃	0.1		± (0.06%idg+0.4 (_) <u>+(0.08%10g+0.9 C))</u>			
Note: F	0 ∼ + 400℃ For K, J, B, S, R, E, N the	0.1 ermc	couples,	see QR Code Detail	ed Specifications.			

Connection of box / unit

Applicable	Measurement box Measurement unit	EX-50H, EU-10H, EU-10D, EI-01P			
type	Output unit	EU-10VO			
Number of	Measurement box Measurement unit	100 units at maximum			
connection	Output unit	2 units at maximum			
Extension dista	ance	100 m (between instruments)			
Connection cable		EX connection cable CR-892M(2m), CR-895M(5m), CR-8901(10m), CR-8902(20m), CR-8905(50m), CR-8910(100m)			
Note: Concerning	g the number of cor	nnected measuring boxes, one EX-50H is converted into five boxes			
Standard	accessories	i			
Operation manual (CD)		1			
AC power cable (CR-01)		1			

AC power cable (CR-01) 1 Ground wire (CR-20) 1 SD card 1 Warranty certificate 1 copy

TS-963 (30ch) / TS-960(10ch) Specifications - Appearance and dimensions



TS-963 (30ch) / TS-960(10ch) - Related Product (Switching Box)

T-ZACCS ROX MEASUREMENT BOX EX-50H



MEASUREMENT BOX

High-speed processing achieved by the adoption of new communication system in addition to our unique measurement capability with high accuracy and stability

- Measures 50 points in 0.1 seconds at the fastest (Measurement of up to 1000 points possible connecting 20 boxes)
- Highly accurate and stable measurement achieved by our unique next-generation A/D conversion method
- Measurement of strain gauges, strain gauge type transducers, thermocouples, Pt-RTDs and dc voltage

T-ZACCS UNIT MEASUREMENT UNIT EU-10H



MEASUREMENT UNIT

High-speed processing achieved by the adoption of new communication system in addition to our unique measurement capability with high accuracy and stability

- Measures 10 points in 0.1 seconds at the fastest, 100 units connection at maximum (including the TS-960 built-in)
- Highly accurate and stable measurement achieved by our unique next-generation A/D conversion method
- Measurement of strain gauges, strain gauge type transducers, thermocouples, Pt-RTDs and dc voltage

▼ TS-963 (30ch) / TS-960(10ch) - Related Product

T-ZRES UNIT DIGITAL DISPLACEMENT SENSOR MEASUREMENT UNIT EU-10D MEASUREMENT UNIT

This is a 10-channel measuring unit exclusively for TS-960/TS-963. It can measure digital displacement sensors with 10 measurement points.Can be used with T-ZACCS BOX EX-10H, T-ZACCS UNIT EU-10H, and EU-10VO at the same time.







Outputs analog data corresponding to the measured data or calculation result acquired by TS-960/TS-963.

PROTOCOL CONVERTER

This switchbox protocol converter for T-ZACCS9 TS-963/-960 can be connected to T-ZACCS9 TS-963/-960 to operate ISW-50G/IHW-50G switchboxes.

One switchbox can be operated with one unit of this converter.



Repeater for connection between T-ZACCS 9 / T-ZACCS BOX / T-ZACCS UNIT to extend the communication distance. The repeater can be used to extend the 100 m extension distance between devices by a further 100 m.

Approval Certificate **ISO9001** Design and manufacture of strain gauges, strain measuring equipment and transducers



Tokyo Measuring Instruments Lab.

The contents of this catalog are subject to change without prior notice. The contents of this catalog are as of September 2024. TML Parm E-3016C.

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