

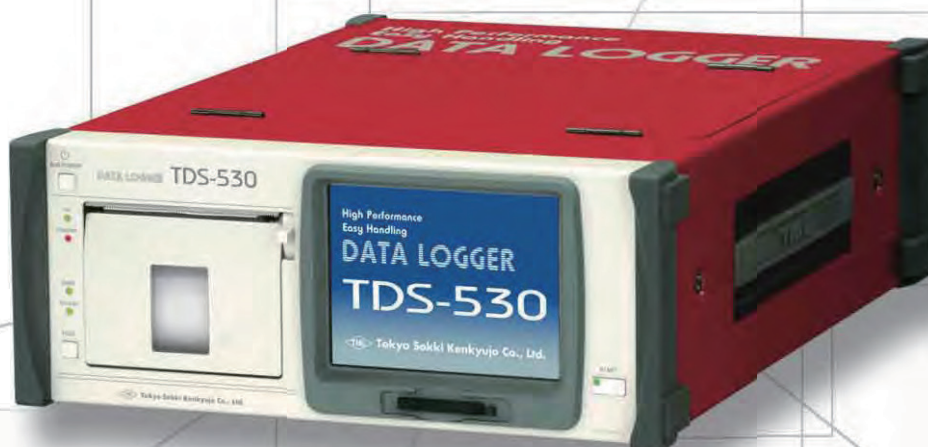
# TML

*New  
Product*

**Data Logger**

# TDS-530

**High Performance  
Portable**



**Tokyo Sokki Kenkyujo Co., Ltd.**

# High speed data logger 1000-channel scanning in 0.4 second

SUNSTAR 传感器与检测 <http://www.sensor-ic.com/> TEL: 0755-83376489 FAX: 0755-83376182 E-MAIL: szss20@163.com

# TDS-530

**High speed  
High Accuracy**

**CF card max. 1GB**

**Interface x 3**

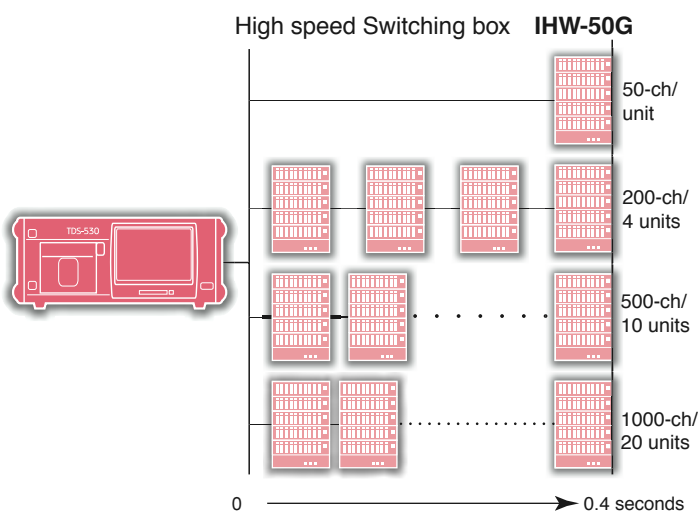
The TDS-530 is an automatic, multi-channel, scanning data logger for reading strain gauges, thermocouples, Pt RTD temperature sensors, strain gauge based (full bridge) transducers and DC voltage. New A/D converter technology provides accuracy and stability at very high scan rates. The TDS-530 in combination with our new IHW-50G high speed switching boxes can provide up to 1,000 channels of data that can be scanned in 0.4 seconds. The unit features a color LCD display and touch panel channel setup and operation. In addition, the unit may be computer controlled through an RS-232C, USB2.0 or Ethernet LAN connection.



## FEATURES

### High Speed Measurement of 1000 Channels in 0.4 sec.

Using the high speed switching box with built-in A/D converters, the TDS-530 can measure the maximum 1,000 channels in only 0.4 seconds. The connection cable is of optical fiber or RS-422. With this combination, 50, 200 and 500 channels can be scanned in 0.4 seconds.



### Color LCD Monitor with Touch Panel

The TDS-530 can be controlled manually through a color LCD display and touch-panel having excellent contrast and visibility. The display can be toggled between Japanese and English.



### Multi-measurements of Strain, Transducer, DC voltage and Temperature

The TDS-530 data logger is an all-in-one type static strainmeter. The logger can perform various measurements using strain gauges, strain gauge based transducers, DC voltage, thermocouples and Pt RTD. For strain measurements, a high resolution of  $0.1 \times 10^{-6}$  strain is provided.

### Onboard High Speed Printer

High speed printing of 20 lines/sec. is possible.

### Built-in 10-channel Switching Box

The TDS-530 is available with 10, 20 or 30 channels on-board. Each bank of 10 channels is available in either standard or high speed units.



strain  
gauges



transducers



DC voltage



thermo-  
couples



Pt RTD

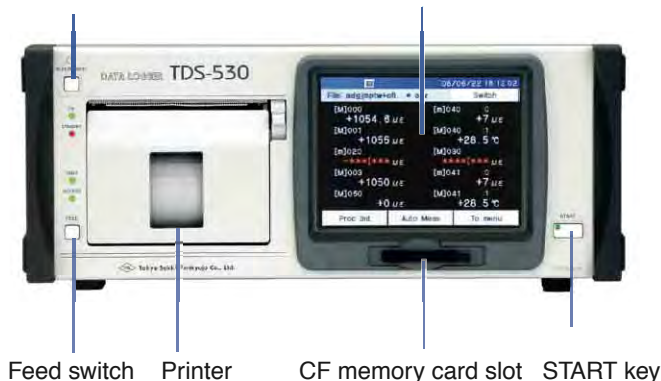


## Front panel

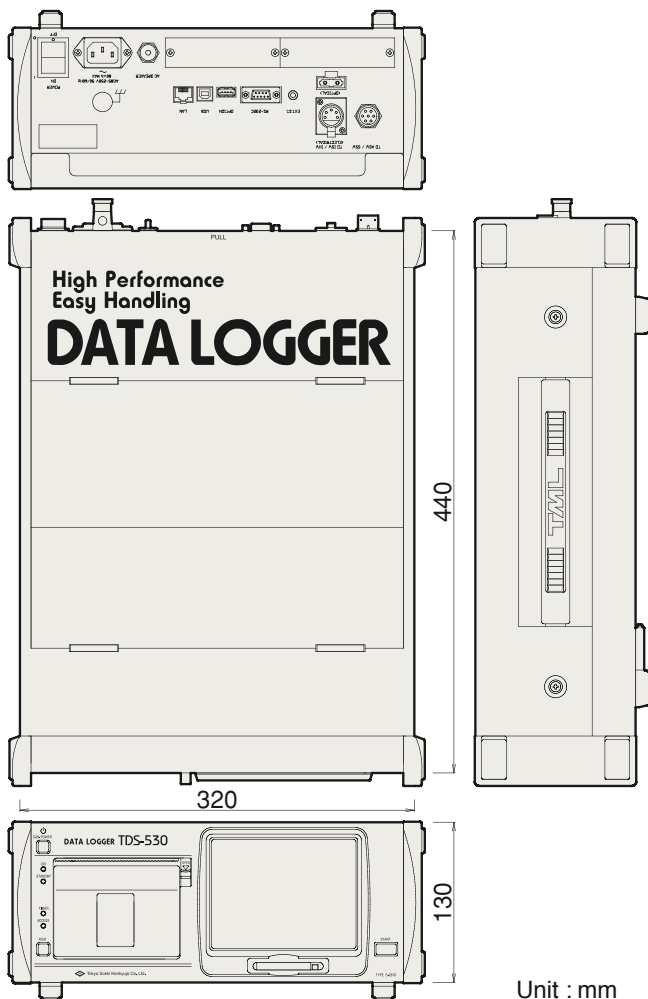
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Sub-power switch

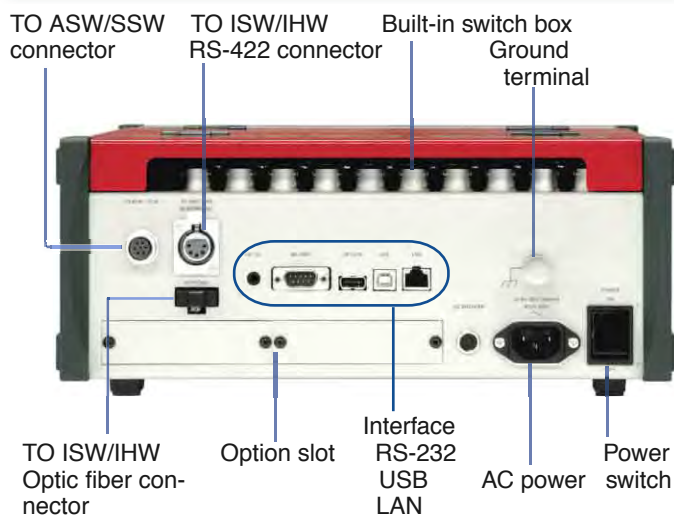
Color LCD with touch-panel keys



## Outer view



## Back panel



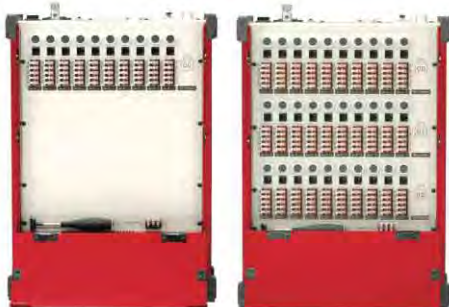
## OPTIONS

### Built-in Switching Box Extension

Factory installed option

Standard unit : Equivalent to switching box **ISW-G**  
High speed unit : Equivalent to switching box **IHW-G**

Specify the number of 10-channel units of on-board data acquisition desired (maximum of 3 units). Both standard and high speed units are available.



### DC Driving System

Factory installed option

DC Power Unit 12V **DCC-530-12**  
RPC-1A Connection Adaptor **DCC-530-RPC**

### External Starter CR-917

### TML-NET Network Driver NDR-100

This is a driver interface which runs TML-NET compatible transducers or network modules from the data logger. Distributed data acquisition system is set up.



### Lower Power Telemetry Modem TRG-200L / TRG-700L

This low-power wireless transmission requires no special license. The wireless modem used for data transmission is ideally suited for battery driven long term unattended remote measurement.

### Exclusive Recording Paper P-80

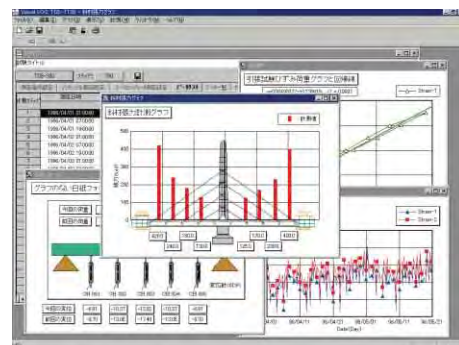
5 rolls/box



### Measurement Software

**Visual LOG<sup>®</sup>**

Static Measurement Software **TDS-7130**



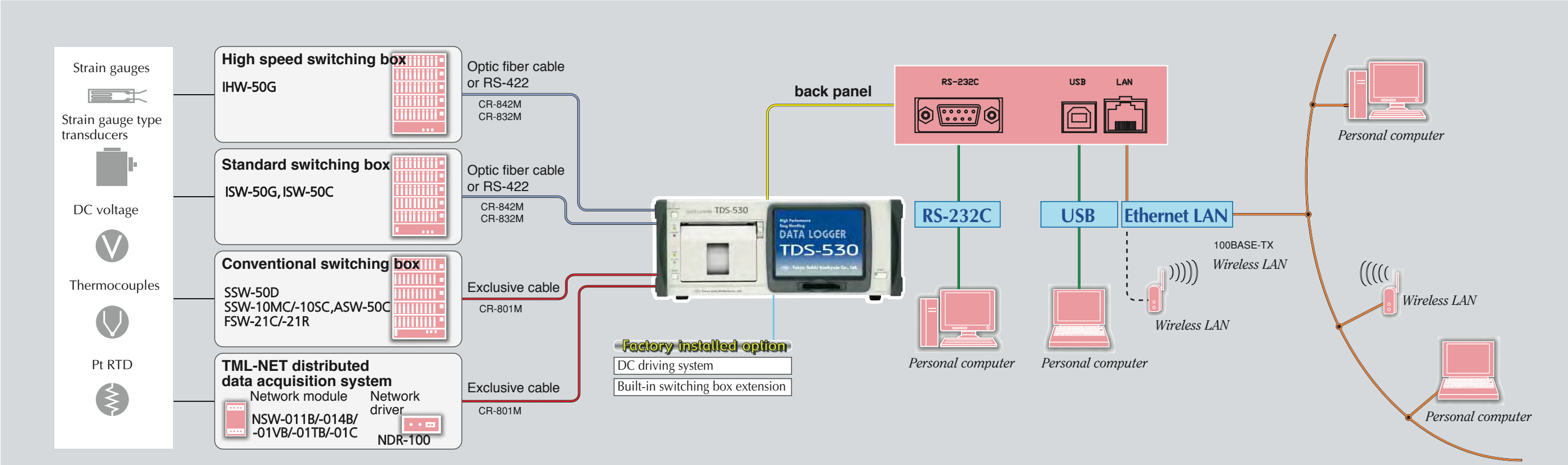
### Compact Flash Memory Cards



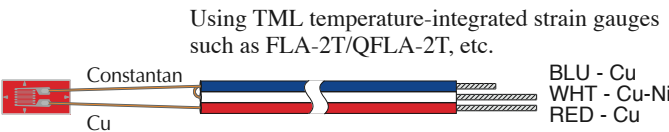
128MB/512MB/1GB  
NB: Our specified cards should be used.

SYSTEM DIAGRAM

High performance Portable



Simultaneous measurement of strain and temperature with one channel



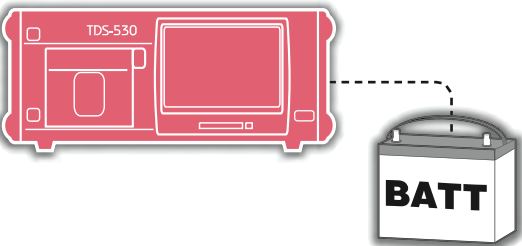
The temperature-integrated strain gauge has till now needed 2 channels for strain and temperature, but with the TDS-503, both strain and thermocouple type T can be measured at one channel by connection in 3-wire quarter bridge.



NB: The simultaneous measurement is available with not only built-in switching box but with ISW-50G or IHW-50G switching box.

DC driving system Option

DC driving system can be provided as a factory installed option. Besides AC operation, DC driving is possible by merely connecting to a commercial battery.



1-Gauge 4-Wire Strain Measurement Patent

Strain measurement can be made by only connecting a modular plug (RJ12).

Our 1-gauge 4-wire strain measurement method makes it possible to connect the modular plug coming in 4 wire system from a strain gauge. Time consuming soldering/wiring work needed for multi-channel measurements is eliminated by using the modular plugs. The 4-wire method features:

- Unnecessary correction in quarter bridge method
- No sensitivity drop due to leadwire resistance
- No influence of leadwire thermal output
- No influence of contact resistance
- Lead-free connection with modular plugs



The built-in switching box of the TDS-530 has modular-plug compatible connector receptacles as well as ordinary connector terminals and NDIS connector receptacles.

Main Compatible Switching Boxes

High Speed Switching Box IHW-50G

50 channels/0.4 sec. (1 unit)  
1000 channels/0.4 sec. (20 units)



An optional model with both terminals and connectors

Switching Box ISW-50G

50 channels/2 sec. (1 unit)  
1000 channels/2 sec. (20 units)



An optional model with both terminals and connectors

Switching Box SSW-50D

50 channels/3 sec. (1 unit)  
1000 channels/60 sec. (20 units)



Comparison of functions of main compatible switching boxes

Switching Box	No. of channels	Connector compatible	1G4W	Strain	Const. current	High resolution	DC voltage	Thermo-couples	Pt RTD	Arrestor	Scanning speed	1000-channel measurement	Switching relay	Remarks
IHW-50G	50	—	●	●	●	●	●	●	●*1	●	0.04S	0.4S	Semiconductor relay	1-channel simultaneous measurement using temperature integrated strain gauge available
IHW-50G-05		●	●	●	●	●	●	●	●*1	●	0.04S	2S	Semiconductor relay	
ISW-50G	50	—	●	●	●	●	●	●	●*1	●	0.04S	3S	Semiconductor relay	1-channel simultaneous measurement using temperature integrated strain gauge available
ISW-50G-05		●	●	●	●	●	●	●	●*1	●	0.06S	60S	Semiconductor relay	
ISW-50C	50	—	—	●	●	●	●	●	—	—	0.06S	60S	Special relay	
ISW-50C-05		●	—	●	●	●	●	●	—	—	0.06S	60S	Special relay	
SSW-50D	50	—	●	●	●	●	●	●	—	—	0.06S	60S	Special relay	
SSW-50D-05		●	●	●	●	●	●	●	—	—	0.06S	60S	Special relay	
ASW-50C	50	—	—	●	●	●	●	●	—	—	0.06S	60S	Special relay	
ASW-50C-05	50	●	—	●	●	●	●	●	—	—	0.06S	60S	Special relay	

\*1: Pt RTD with 100Ω 3-wire only available



# SPECIFICATIONS

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Number of channels 1000

## Strain Measurement (in normal mode)

Bridge excitation DC2V 24ms(50Hz)  
Initial unbalance memory range  $\pm 160000 \times 10^{-6}$  strain

Measuring range	Resolution	Scanning speed 50Hz/60Hz
$\pm 40000 \times 10^{-6}$ strain	$1 \times 10^{-6}$ strain	With the built-in switching box, IHW-50G, ISW-50G 40ms/34ms
$\pm 80000 \times 10^{-6}$ strain	$2 \times 10^{-6}$ strain	With ASW-50C, SSW-50C/-50D, ISW-50C 60ms/50ms
$\pm 160000 \times 10^{-6}$ strain	$4 \times 10^{-6}$ strain	
$\pm 320000 \times 10^{-6}$ strain	$8 \times 10^{-6}$ strain	
$\pm 640000 \times 10^{-6}$ strain	$16 \times 10^{-6}$ strain	

## Strain Measurement (in high resolution mode, full bridge only)

Bridge excitation DC5V 48ms (50Hz)  
Initial memory range  $\pm 16000.0 \times 10^{-6}$  strain

Measuring range	Resolution	Scanning speed 50Hz/60Hz
$\pm 4000.0 \times 10^{-6}$ strain	$0.1 \times 10^{-6}$ strain	With the built-in switching box, IHW-50SG, ISW-50G 120ms/100ms
$\pm 8000.0 \times 10^{-6}$ strain	$0.2 \times 10^{-6}$ strain	With ASW-50C, SSW-50C/-50D, ISW-50C 160ms/134ms
$\pm 16000.0 \times 10^{-6}$ strain	$0.4 \times 10^{-6}$ strain	
$\pm 32000.0 \times 10^{-6}$ strain	$0.8 \times 10^{-6}$ strain	
$\pm 64000.0 \times 10^{-6}$ strain	$1.6 \times 10^{-6}$ strain	

## DC Voltage Measurement

Initial memory range V 1/1  $\pm 160.000$ mV  
V 1/100  $\pm 16.0000$ V

## Thermocouple Temperature Measurement

Applicable thermocouples JIS C1602-1955 T,K,J,B,S,R,E,N  
Linearization Digital operation

## Pt RTD Temperature Measurement

Applicable Pt RTD JIS C1604-1997 Pt100  
Measuring method 3-wire (Pt3W), 4-wire (Pt4W)  
(Pt13W only for the built-in switching box)  
Linearization Digital operation

Measurement Mode INITIAL, DIRECT, MEASURE

## Switching Box Scanning Time (in normal strain mode) (50Hz)

No. of channels	IHW-50G	ISW-50G	AWS/SSW
50	0.4 sec.	2 sec.	3 sec.
500	0.4 sec.	2 sec.	30 sec.
1000	0.4 sec.	2 sec.	60 sec.

## Channel Switching Method

Scanning Automatic from first to last channel(Jump available)  
Infinite scanning in FREE RUN mode (max. 10-ch)  
Monitoring Repetition of monitor channels (max. 10 channels)  
Y-T, graphic monitor (max. 10 channels)  
Measurement start Start key and external contact (manual)  
FREE RUN, Interval Timer, Monitor Comparator  
LAN, USB, RS-232C

## Channel Settings

Settable for each channel  
Coefficient  $\pm (1.00000 \times 10^{-9} \sim 1.00000 \times 10^{+9})$   
Unit  $\mu\epsilon$ , mV, N,  $^{\circ}\text{C}$ , mm, etc. up to 38 units  
Decimal point Optically settable 0~6 digits for display below decimal point  
Initial value Writable for each channel

## Sensor mode

Strain 3-wire 1/4 bridge 120/240/350 $\Omega$   
1/2 common dummy, 1/2 and Full bridge  
Full bridge constant current 350 $\Omega$ ,  
Full bridge high resolution mode  
Full bridge constant current 350 $\Omega$  and High resolution mode  
1-gauge 4-wire 120/240/350 $\Omega$   
DC voltage V 1/1 [640mV] V 1/100 [64V]  
Temperature T,K,J,B,S,R,E,N, Pt100 3W, Pt100 4W  
Others TML-NET, temperature-integrated strain gauges with 120/240/350 $\Omega$ , JUMP, etc.

## SIMPLE Measure

Full SIMPLE Coefficient 1.000/ Unit  $\mu\epsilon$ / No decimal point  
Auto SIMPLE Coefficient 1.000 / Unit and decimal point follow sensor mode.

## Check Function

Insulation, stabilized insulation, sensitivity, dispersion, thermocouple disconnection, etc.  
Self-diagnosis Confirmation of firmware operation environment  
Time Accuracy  $\pm 1$  sec/day ( $23^{\circ}\text{C} \pm 5^{\circ}\text{C}$ )  
FREE RUN Repetition of scan



Approval Certificate ISO9001

Design and manufacture of strain gauges, strain measuring equipment and transducers

Interval timer

Function

Automatic measurement at the set intervals or real time

Time

Year/Month/Day/Hour/Minute/Second

Accuracy

$\pm 1$  sec./day ( $23^{\circ}\text{C} \pm 5^{\circ}\text{C}$ )

Time intervals

Hour/Minute/Second, Settable for every step up to 99 hrs. 59 min. and 59 sec.

Real time start

Settable start time (day/hour/minute/second) for every step

Number of start times

Max. 99 times per step or infinite

Number of steps

Programmable maximum 50 steps

GOTO step

Programmable loop to previous step

GOTO comparator

Moves to step 1 of monitor comparator

Sleep function

Automatic power OFF when halting more than 1 minute

## Monitor comparator

Function

Automatic measurement according to the set amount of change

Amount of change in input

Settable for every step, max.  $\pm 999999$

Number of start times

Max. 99 times per step or infinite

Number of steps

Programmable maximum 50 steps

GOTO step

Programmable loop to previous step

GOTO interval

Moves to step 1 of interval

## Data Memory

Capacity of data

8M byte (for 2000 scans with 1000 channels) in Binary recording format

## Memory card

Standards

Compact flash TYPE 1

Applicable card

Compact flash card 32MB ~ 1GB

## Interface

Display

Indicator

Color TFT liquid crystal display (with touch panel)

Resolution

320 x 240 dots

Contents

Measurement data, setting list, numerical monitor, etc.

## Printer

Printing method

Thermal line dot method, 24 digits/line

Printing speed

0.05 sec./line (200mm/s)

Applicable paper

P-80 (80mm wide, 25m/roll, 7200 lines/roll)

## Built-in switching box

Number of channels

Max. 30 (Standard 10 channels)

Switching relay

Semiconductor relay (surge absorber provided)

Strain measurement

3-wire 1/4 bridge 120, 240, 350 $\Omega$   
1/2 bridge 60 ~ 1000 $\Omega$   
1/2 bridge common dummy 60 ~ 1000 $\Omega$ \*  
Full bridge 60 ~ 1000 $\Omega$   
Full bridge constant current 350 $\Omega$   
Full bridge high resolution 120 ~ 1000 $\Omega$   
Full bridge constant current high resolution 350 $\Omega$   
1-gauge 4-wire 120, 240, 350 $\Omega$   
\* 1/2 bridge common dummy is not available in high resolution mode.

## Sensor cable extension

Full bridge constant current 350 $\Omega$  Within 400 $\Omega$  in total resistance of cable  
Full bridge constant current high resolution 350 $\Omega$  Within 160 $\Omega$  in total resistance of cable

Sensitivity change (when using our standard 0.5mm<sup>2</sup> 4-core shielded cable)  
Full bridge constant current 350 $\Omega$   $+0.1 \sim -0.5\%$ /100 $\Omega$  in total resistance of cable

Full bridge constant current high resolution 350 $\Omega$   $+0.1 \sim -0.5\%$ /100 $\Omega$  in total resistance of cable

Leadwire resistance correction range Comet B (3-wire 1/4 bridge, 1/2 bridge common dummy)

Comet B (3-wire 1/4 bridge, 1/2 bridge common dummy)

Gauge resistance	Leadwire resistance correction range
120 $\Omega$	Less than 100 $\Omega$
240 $\Omega$	Less than 200 $\Omega$
350 $\Omega$	Less than 300 $\Omega$

## DC voltage measurement

V 1/1  $\pm 640$ mV

V 1/100  $\pm 64$ V

## Input impedance

More than 1M $\Omega$

## Temperature measurement

Applicable thermocouples

T,K,J,B,S,R,E,N JIS C1602-1995

Applicable Pt RTD

Pt100 (500mA constant current 3-wire system) JIS C1604-1997

## Operating Environments

0 ~  $+50^{\circ}\text{C}$ , less than 85% RH (without condensation)

## Power supply

AC85 ~ 250V 50/60Hz 80VA max.

## Dimensions

320 (W) x 130 (H) x 440 (D)mm excluding projected parts

## Weight:

8 kg. (with 10-channl built-in switching box)

Specifications subject to change without prior notice



Tokyo Sokki Kenkyujo Co., Ltd.

www.tml.jp/e

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