TEAC

New Product

Color Graphics Digital Indicator
TD-9000T

■ Standard Model
■ EtherNet/IP™ Model
■ CC-Link Model

The TD-9000T is a digital indicator for load management that supports two inputs, load (load cell) and stroke (displacement gauge).

Equipped with a 4.3-inch touchscreen monitor with high-speed A/D conversion of 25,000 times/sec. It realizes not only the desired operation feeling but also visibility to be able to instantly grasp the situation.

Waveforms during measurement can be checked in real time. Widely usable from daily monitoring to verification of processing data.

Specifications

■ Sensor input

Load sensor unput

Bridge voltage		2.5V / 5V / 10V ±10% (30mA current maximum, can be used with remote sensing)
Signal input range		Strain gauge sensor −3.2mV/V to 3.2mV/V
Calibration	Calibration range	0.1mV/V to 3.2mV/V
	Calibration method	Equivalent Input / Actual Load / TEDS
	Linearize function	Five-point tracking
Precision	Linearity	Within 0.01%F.S. +1digit (when input is 3.2mV/V)
	Zero drift	Within 0.5μV/°C (Input conversion value)
	Gain drift	Within ±0.005% F.S/°C
Filter	Low pass	OFF/3/10/30/100/300/1000Hz (Digital filter, −6dB/oct)
	Moving average	0 / 2 to 2048 times
	Auto digital	Only digital value display (constant judgment)
A/D conversion	Sampling rate	5000 times per second, 25000 times per second
	Resolution	24-bit (binary)
TEDS function		IEEE1451.4 class 2 mix mode interface

Displacement Sensor Input (pulse)

Pulse type	A/B phase or A phase, differential square wave (RS-422 conformance)
Maximum input freq.	2 MHz
Maximum count value	15,000,000
Calibration method	Equivalent Input / Actual Load
Moving average filter	0 / 2 to 2048 times
Power supply for sensor driving	5V (±10%), 500mA Max.

Displacement Sensor Input (voltage)

Input voltage range		±5.2V
Calibration	Calibration range	0.1 to 5.2V
	Calibration method	Equivalent Input / Actual Load
Precision	Linearity	Within 0.01%F.S. ±1digit (Input ≥3.3V)
	Zero drift	Within 0.005%F.S/°C
	Gain drift	Within 0.02%F.S/°C
Filter	Low pass	10 / 30 / 100 / 300Hz (−6dB/oct)
	Moving average	0 / 2 to 2048 times
A/D conversion	Resolution	24-bit (binary)
Power supply for sensor driving		DC 12V (±10%), 250mA Max.

Included accessories
● SENSOR connector plug 1
● CONTROL connector plug 1
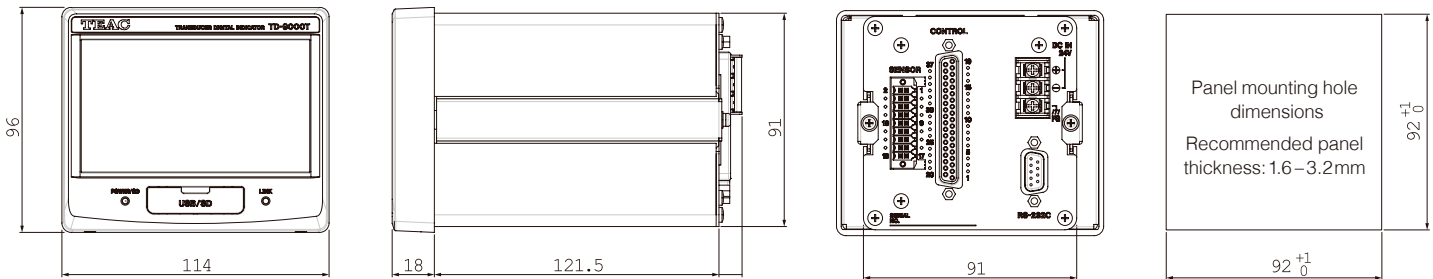● Plug case for CONTROL connector

Options
● AC adapter PA-91
　(AC100 to 240V, compliant to the safety standards of Japan and North America)
● EtherNet/IP
● CC-Link

■ Device settings

Power supply		24V DC (±10%) 13W, AC100-240V (AC adapter is optional)
Environment	Temperature	0°C to 40°C (Operating) / −20°C to 60°C (Storage)
	Humidity	85% RH or less (without condensation)
Dimensions/ Weight		Approx. 114 x 96 x 140 mm (protrusions not included) / About 960g
Applicable standards	EMC	FCC (class A)
	Safety	CE, UL
Display		4.3 inch LCD color resistive touch panel
Display range		−32000 to +32000
Language		Japanese / English / Chinese / Korean
Screen		Digital load value, Waveform, Archive data, Setting
Waveform	X-axis — Time	80ms*/170ms*/400ms/800ms/2.0s/4.0s/10.0s/ 30.0s/60.0s/120.0s　*cannot be selected when the sampling frequency is set to 5 kHz.
	X-axis — Displacement	2000 / 4000 / 6000 / 8000 / 10000 / 15000 / 20000 / 30000
	Y-axis	Load (STD) / Load and displacement (biaxially)
Comparison waveform	Band judgment	Offset reference band / Designated value band
	Multi-zone judgment	Up to 5 judgment zones can be set by device/ external signal
	Comparison judgment	Load: HH / HI / OK / LO / LL Displacement: HI / OK / LO
	Hold setting	Constant comparison, sampling, peak, bottom, peak to peak, maximum/minimum, inflection point and average value
	Beep function	Sounding when judgments are not OK (ON / OFF Switchable)
Measurement work settings	Number of works	16 (Work can be copied)
	Switching	External input signal / manual
Data recording		Built-in memory (up to 70) or SD cards
D/A converter	Output range	Isolated, Current (4-20mA), Voltage (−10V to +10V)
	Conversion rate	Same as A/D converting rate
	Resolution	current output: about 1/43000, voltage output: about 1/59000 (when set to ±10V)
	Impedance	350Ω or less (Current output) / 2kΩ or more (Voltage output)
Communication interface		RS-232C (D-sub 9-pin), USB
Control input/ output signal (Photocoupler Insulation)	Input signal	Differential pulse displacement sensor (A phase, B phase), Back light On/Off, Touch panel lock, reset, work select, hold zone select, clear, judgment On/Off, Measurement Start/End, Preset displacement, Digital zero *Signals are input when shorted/opened between any input terminal and the COM terminal.
	Output signal	Load judgment (HH/HI/OK/LO/LL), Displacement judgment (HI/OK/LO), Load cell error, Unit error, Measurement Completed, Trigger (1, 2), Band judgment (HI, OK, LO) *NPN open collector (Sync type) *Maximum Current: 20mA/Voltage: 30V
Check functions		Load cell check (static strain/interruption detection), contact terminal check
Date and time setting		Date (YYYY/MM/DD, etc.) / time can be set
Recording media		SD / SDHC (2 to 32GB, Class 10 recommended)

External drawings

Units: mm

Panel mounting hole dimensions

Recommended panel thickness: 1.6 – 3.2mm

114
96
18
121.5
91
91
92 +1/0
92 +1/0

Touchscreen　Waveform　Judgments　D/A OUT　Linearization　Static strain　External record (SD card)　RS-232C　4 languages　RoHS　TEDS

High-speed sampling 25,000 times/sec

Compact body + easy-to-read large LCD

Load + displacement 2-input real-time judgment
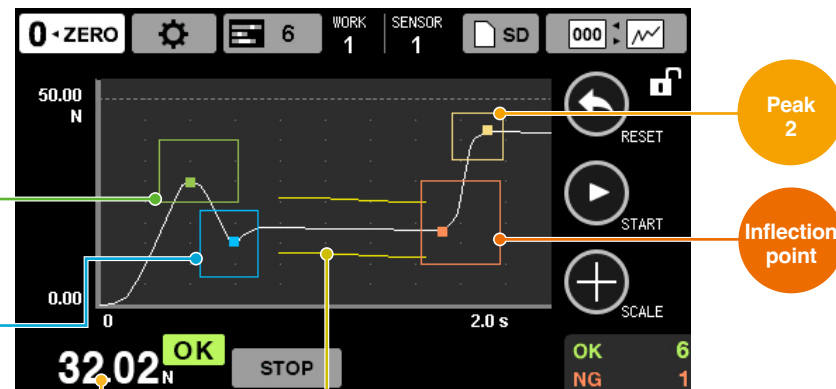
https://loadcell.jp/en

Combination judgment

Simultaneous judgment by combining band and multi-zone judgments. Even complicated waveforms can be judged in detail.

Values are held by judgment methods set in respective zones.

The indicator value shows the value of "Peak 1". The hold value to be shown can be designated in settings.

Peak 1

Bottom

Peak 2

Inflection point


Continuous judgment

NG is shown in red

Deviation points are shown in red

Continuous judgment is conducted when "CONTINUE" is the status displayed on the screen.
Support for 4 contacts of high high limit, high limit, low limit, and low low limit. OK/NG judgment in real time for the load value for a certain value.

Notification by beep sound in addition to the display

Band judgment
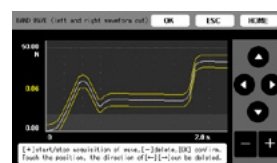
Band setting with saved waveform and measurement waveform

OK/NG judgment by comparing a measurement value with a reference curve having high and low ranges. The increase or decrease of the load to changes in time and displacement is judged by a series of flows.
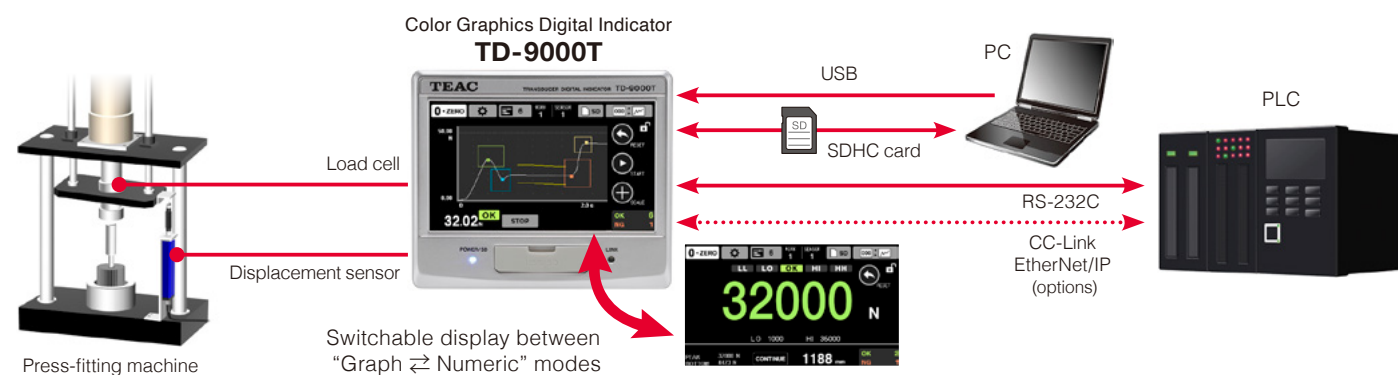
Multi-zone judgment

Up to five zone designations. ● ● ● ● ●

Zone switching from external input is also possible.

OK/NG judgment in a maximum of 5 zones for one process.
Judgment in combination with various holds (constant comparison, sampling, peak, bottom, peak to peak, average value, maximum/minimum and inflection point).

Color Graphics Digital Indicator
TD-9000T

Load cell

Displacement sensor

Press-fitting machine

Switchable display between "Graph ⇄ Numeric" modes

USB

SDHC card

RS-232C

CC-Link EtherNet/IP (options)

PC

PLC

Free download from the Web

Dedicated offline data viewer TD-View

TD-View is software that displays and statistically analyzes the data recorded on the SD/SDHC card on a personal computer. It shows its true ability in statistical process control. Displayable contents vary depending on hold mode and others. Not merely individual measurement data (Time-Load, Time-Displacement, Displacement-Load), but also trends and histograms of OK/NG judgment points for the entire list and statistically calculated values (Data, OK/NG Count, Average, Maximum, Minimum, Variance, S.D, Fluct., Cp) are displayed.
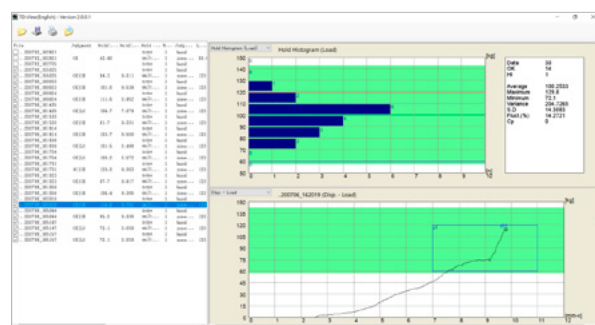
Recommended Operating Environment
CPU: 2nd generation Intel® Core™ i5, 3.0GHz or faster
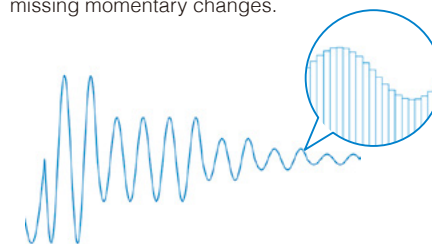OS: Windows 10
Memory: 4GB or more

Download site
https://loadcell.jp/td-9000t/

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1 **High-speed processing 25000 times/sec**

Realizing more reliable measurement without missing momentary changes.

2 **Compact + Large touchscreen**

A 4.3-inch wide touchscreen monitor is mounted on a general-purpose 92 x 92mm panel mounting hole size.

91mm

91mm

4.3-inch touchscreen monitor

3 **Displacement input is a standard feature**

Supporting pulse input (A/B phase or A phase, differential square wave (RS-422 compliant)) and voltage input ±5.2V. Not just Time-Load but also Displacement-Load management is possible.

Judgment by both load and displacement

4 **Output functions**

4-1 Analog output
● Voltage output: 0 to ±10V
● Current output: 4 to 20mA

4-2 Digital output
● RS-232C
● USB
RS-232C and USB cannot be used at the same time.
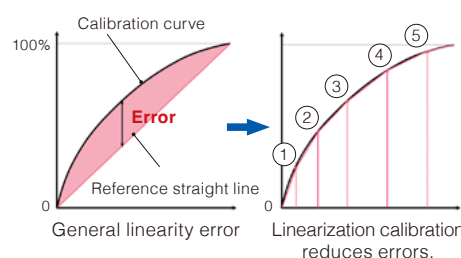
5 **Intelligent calibration functions**

5-1 TEDS function (Sensor Plug and Play)

Realizing sensitivity automatic calibration by supporting TEDS. Contributing to reducing complicated procedures and management in calibration.

Calibration information

Compatible with IEEE1451.4 (V1.0), support for 4K-bit products, Class 2 mixed-mode interface

5-2 Linearization calibration function

Calibration curve

100%

Error

Reference straight line

0

General linearity error

⑤
④
③
②
①

0

Linearization calibration reduces errors.

By linearly interpolating between any five points, an output with little error close to the output characteristics can be obtained.

6 **Data saving functions**

6-1 Built-in memory saving (up to 70)

Not only measurement values, but also waveforms and judgment results are saved in the main unit memory. The saved data can be used for judgment settings of other measurements.
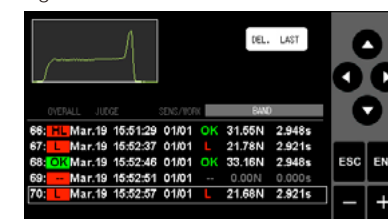
6-2 Equipped with SD card drive

Measurement data, setting information, judgment results (OK/NG, judgment values) and others are saved in CSV format on the SD card, which can be verified with your spreadsheet software.

Display example

|	A	B	C	D
1	[Information]			
2	Device ID	0		
3	Date	2020/3/12		
4	Time	19:27:09		
5	Sensor No.			
6	Work No.	1		

*One (1) data size approx. 30KB-60KB
*Data is processed and recorded for 2240 dots on the horizontal axis of the screen. The processing interval varies depending on the full-scale value on the horizontal axis. However, the judgment method value is not a processing target.
*To ensure stable recording, use an SD/SDHC card with a capacity of 2GB or more. Please refer to the instruction manual for details.

7 **Judgment result display function**

The data you care about can be checked on the spot with the judgment result.
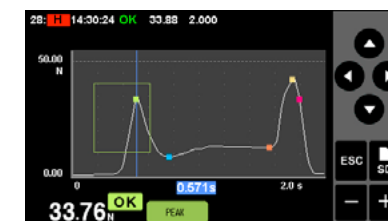
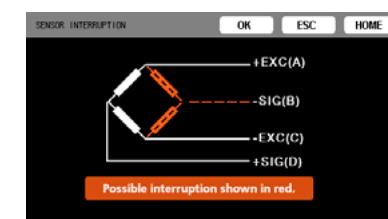**8** **Load cell diagnostic functions**

8-1 Static strain display

The function can investigate defects such as load cell deterioration and plastic deformation.

8-2 Disconnection detection

Also, the disconnection detection allows to check the location of the load cell disconnection.

9 **Useful functions**

9-1 EXT. TERMINAL check

Possible to check the control I/O signal status, which can be used for wiring checks and others.

9-2 Multilingual support

Languages can be switched among Japanese, English, Chinese, and Korean.

9-3 Screen BMP function

The contents displayed on the home screen can be saved and exported as a bitmap image.

9-4 Compliance of various regulations and standards

CE, UL,
FCC (Class A)

9-5 Support for date and time settings

The date and time are recorded along with the measurement results.

Communication options

A variety of fieldbuses are available as options to support various systems.
● EtherNet/IP
● CC-Link

Power option

AC adapter
● PA-91 (AC100 to 240V, compliant to the safety standards of Japan and North America)