

TD—250T

Digital Indicator

Instruction Manual

TEAC

TEAC Corporation

T001303-00J

Introduction

Thank you for purchasing a TD-250T Digital Indicator.

Be sure to read the following instructions in order to safely operate the TD-250T according to specifications.

For Your Safety

This manual describes the safety instruction for the operation of TD-250T digital indicator. Read this manual carefully and understand the contents before using the product.

Warning

Follow the instructions below, or you may be exposed to an immediate danger of major injury or death.

- Never use it exceeding the rated specifications as there is a danger of injury, fire or electrical shock.
- Never use it in a flammable gaseous environment as there is a danger of explosion.
 - Locations with corrosive and flammable gas
 - Location with water, oil or chemical splash
- If it malfunctions (any smoke, odor or noise is present), stop operating the product immediately and unplug the power cable as there is a danger of fire or electrical shock.
- Never attempt to disassemble the product.
- Carefully check connections and wiring before applying power.
- Be sure to ground the protective ground terminal.

Caution

Follow the instructions below, or you may be exposed to personal injury or mechanical damage.

- Disconnect the power cable when performing the following.
 - Attaching / detaching the optional connectors.
 - Wiring / connecting a cable to terminal blocks.
 - Connecting the ground line.
- Wait more than 5 seconds when recycling the power.
- Allow 5 minutes or more warm-up time after power on.
- When making a connection to the signal I/O connectors, check the signal name and the pin assignment to prevent a false connection. Also the power must be turned off when making connection.
- Use a shielded cable when connecting to load-cell, external I/O and options.
- Take adequate measures when operating in the following locations.
 - Near a power line
 - Where a strong electric or magnetic field is present
 - Where static electricity or noise such as from relay is generated
- Do not install under the following environment.
 - Locations exceeding the temperature or humidity specification
 - Locations in high salinity or iron
 - Location under direct vibration or shock.
- Do not operate a damaged unit.

FCC Part 15

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Caution

Changes or modifications to this equipment not expressly approved by TEAC CORPORATION for compliance could void the user's authority to operate this equipment.

DISCLAIMER

TEAC disclaims all warranty, either expressed or implied, with respect to this product and the accompanying written materials. In no event shall TEAC be liable for any damages whatsoever (including, without limitation, damages for loss of business profits, business interruption, loss of business information or other loss) arising out of the use of or inability to use this product.

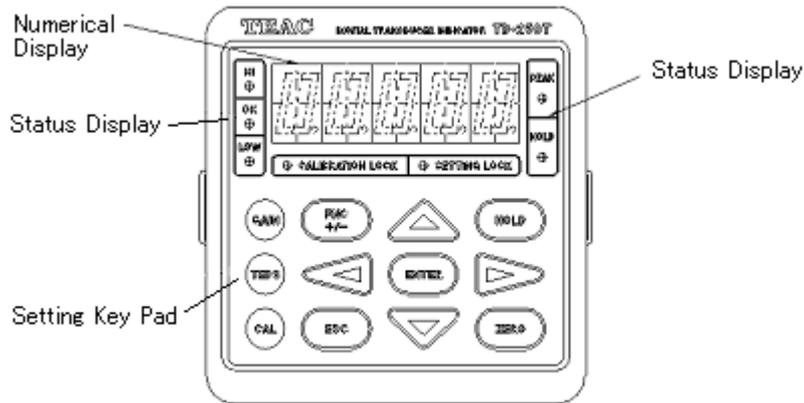
Table of Contents

1. TD-250T Controls and Functions	5
1-1 Front Panel	5
1-1-1 Status Display	5
1-1-2 Numerical Display	5
1-1-3 Control Key	6
1-2 Rear Panel	7
1-2-1 Protective Ground Terminal	7
1-2-2 Frame Ground (F.G)	7
1-2-3 Option Space	7
1-2-4 AC Power Input Terminal	7
1-2-5 Signal I/O Terminal	8
2. Connection	9
2-1 Connecting Screwless Terminal	9
2-2 Connecting Strain Gage Sensor	9
2-3 Connecting Power Input Terminal	9
2-4 Connecting TEDS Terminal	10
2-5 Connecting High/Low Level Relay	10
2-6 Connecting HOLD Signal and Digital ZERO Signal	11
2-7 Connecting Voltage Output (V-OUT)	11
3. Setup Mode	12
3-1 Selecting Setup Items	12
3-2 List of Setup Items	13
4. Calibration	14
Equivalent Input Calibration	14
Real Load Calibration	14
TEDS Calibration	14
4-1 Common Procedure in Calibration	15
Locking and Unlocking CAL Values	15
Minimum Scale Setting	15
4-2 Procedure of Equivalent Input Calibration	16
4-3 Procedure of Real Load Calibration	17
4-4 Procedure of TEDS Calibration	19
4-4-1 The Rated Capacity Display Digit in TEDS Calibration	20
5. Function Settings	21
5-1 High and Low Limit	21
5-2 High-Low Comparison Mode	22
5-3 Hysteresis	22
5-4 Digital Offset	23
5-5 Zero Vicinity	23
5-6 Digital Filter	24
5-7 Analog Filter	24
5-8 Motion Detect	25
5-9 Zero Tracking	26
5-10 Hold Mode	27
5-11 Minimum Scale	27
5-12 Display Update Rate	28
5-13 Bridge Excitation Voltage	28
5-14 External Hold Mode	29
5-15 External Output Data Moving Average Setting	29

6. Hold Function	30
6-1 Peak Hold	30
6-2 Sample Hold	31
7. Digital Zero Function	32
8. BCD Data Output (TD-250T03)	33
8-1 Connector Pin Assignment	33
8-2 Changing Logic	34
8-3 Equivalent Circuit	34
8-4 Signal Timing	35
8-5 BCD Data Refresh Rate	35
9. RS-232C Interface (TD-250T04)	36
9-1 Communication Specification	36
9-1-1 Standard	36
9-1-2 Connector Pin Assignment	36
9-1-3 Cable	36
9-2 Setting RS-232C Interface	37
9-3 Communication Mode	37
9-3-1 Mode 0	37
9-3-2 Mode 1	37
9-4 Communication Format	38
9-4-1 Mode 0	38
9-4-2 Mode 1	42
10. D/A Converter (TD-250T07)	43
10-1 Using Output Voltage and Current	43
10-2 Setting D/A Zero	44
10-3 Setting D/A Full-Scale	44
10-4 D/A Output Error	45
10-5 Resolution	45
11. Over-Scale and Error Indications	46
12. TEDS	47
12-1 TEDS Write Function (F4-5)	47
12-2 TEDS Data Recovery Function (F4-6)	48
12-3 TEDS Sensor Verification	48
13. Operation on Power On	49
14. Warranty	49
15. Specifications	50
16. External View	51

1. TD-250T Controls and Functions

1-1 Front Panel



1-1-1 Status Display

Displays the TD-250T status

HI : Lights when the indication level is higher than the preset maximum level.

(Indication Level > High Limit) The High Limit relay will be engaged.

OK : Lights when the indication level between the preset High and Low Limit level.

(Preset Low Limit \leq Indication level \leq Preset High Limit)

LOW : Lights when the indication level is lower than the preset Low Limit level.

(Indication level < Preset Low Limit) The Low Limit relay will be engaged.

PEAK : Lights when the peak hold feature is enabled.

HOLD : Lights when the indicated level is in hold state.

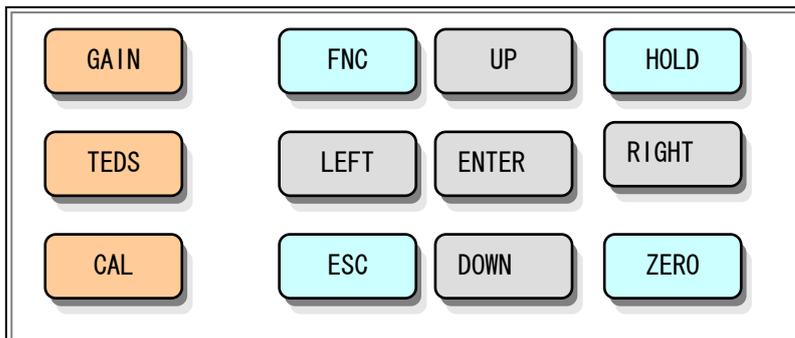
1-1-2 Numerical Display

Displays the following three indications

- 1) Indication Level
- 2) Preset Level
- 3) Overflow Status
 - A/D Converter Negative Overflow -LOAD
 - A/D Converter Positive Overflow LOAD
 - Display Underflow (below -19999) -Full
 - Display Overflow (above 19999) Full

1-1-3 Control Key

Saves setup and command operations.



【GAIN】

Performs the real load calibration



【TEDS】

Performs the calibration when a TEDS sensor is connected



【CAL】

Performs the equivalent input calibration



【FNC】

Changes to Setup menu in indication level display mode.

Changes the setup menu in setup mode.

Changes to the user define menu when pushing this key slightly longer in the indication level display mode.

Changes the sign and decimal point in setup mode.



【ESC】

Cancels the setup and returns to the indication level display.



【HOLD】

Enables the HOLD function. To release the HOLD mode, press the HOLD key again.



【ZERO】

Performs Zero calibration when the CAL LOCK is OFF.

Force the indication level reading to zero when the CAL LOCK is ON.

(Digital Zero Function)



【ENTER】

Confirms the setup selection and value.

Releases the Key Lock/Unlock in the indication level display mode when holding for a few seconds.

When KEY LOCK is enabled, all key controls are disabled. Releasing the KEY LOCK is done by holding for a few seconds.



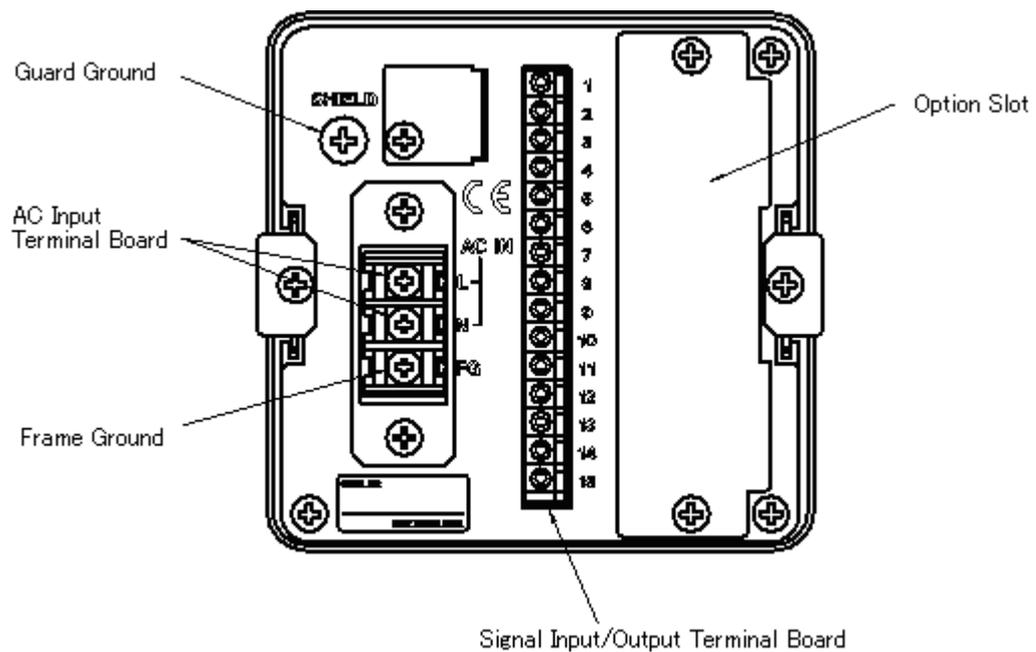
【UP/DOWN/LEFT/RIGHT】

Changes setup selections and values.



Selects a digit for making a change.

1-2 Rear Panel



1-2-1 Protective Ground Terminal

To prevent an electric shock hazard, be sure to connect the protective ground to a grounding source.

1-2-2 Frame Ground (F.G)

F.G Terminal of AC power (chassis and the F.G terminal are connected)

1-2-3 Option Space

One of the following options can be installed.

- TD-250T03 BCD Parallel Data Output
- TD-250T04 RS-232C Interface
- TD-250T07 D/A Converter

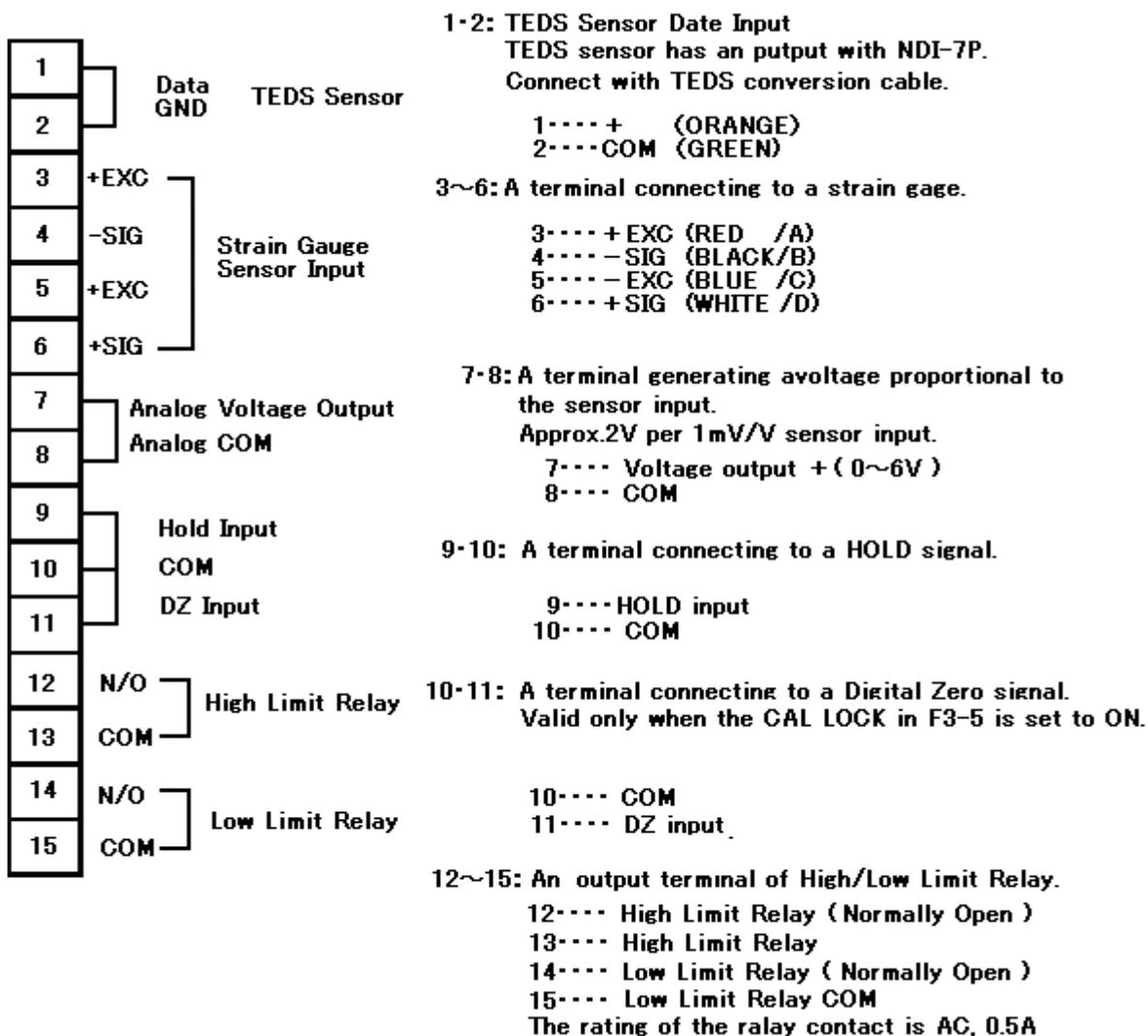
1-2-4 AC Power Input Terminal

Connects to AC power. (AC100 ~ 240V) (DC power supply is optional)

1-2-5 Signal I/O Terminal

Inputs to the control signals (HOLD, DZ), TEDS sensors, strain gage sensors.

Terminal Pin Assignment

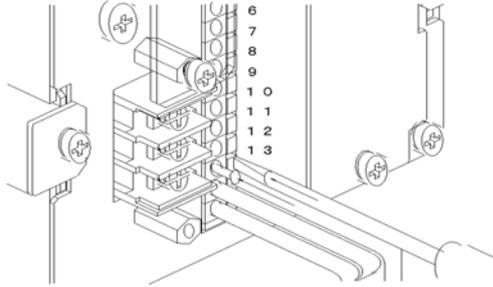


2. Connection

2-1 Connecting Screwless Terminal

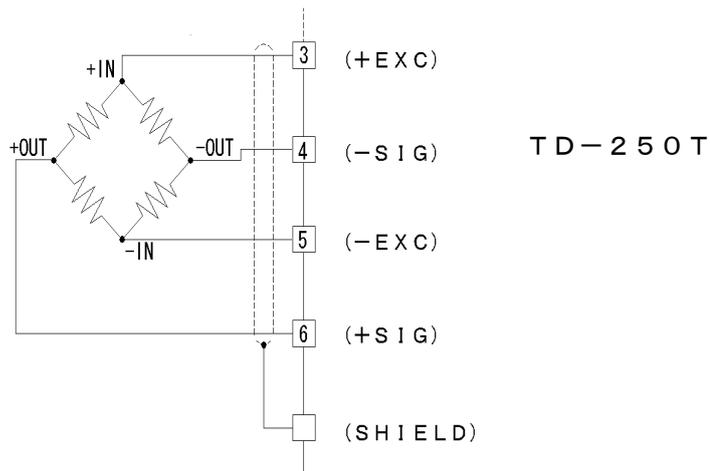
Use a mini-screw driver when connecting to the screwless terminal.

1. Strip a coating of connecting wire for 10mm~12mm and lightly twist the bare wire.
Applicable wire size is 0.4 ϕ ~ 1.2 ϕ



2. Push the button next to the wire insertion hole with a screw driver.
3. Insert a twisted wire tip carefully.
4. Release the button
5. Check for the cable to be securely clamped and does not come out with a slight tug.

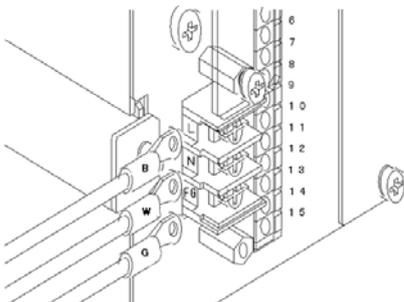
2-2 Connecting Strain Gage Sensor



With six wire cable from the load cell, shunt between +EXC and +SENSE, and between -EXC and -SENSE, then connect to #3 (+EXC) and #5 (-EXC).

2-3 Connecting Power Input Terminal

Connecting AC Power



Use a pressure terminal (M3) when connecting to the terminal
Rating: AC100V ~ 240V (50/60Hz)

Connecting DC Power (Optional)

Rating: DC10V ~ 28V (1A @12V)

2-4 Connecting TEDS Terminal

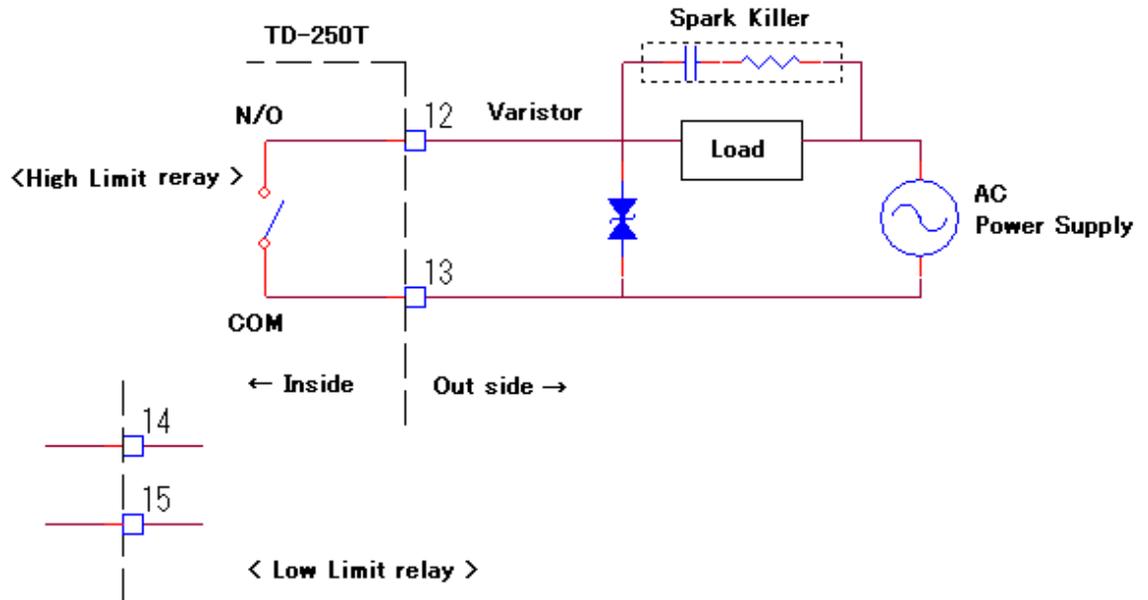
Connect the TEDS signal from the TEDS sensor.

When not using the TEDS feature, leave them un-connected.

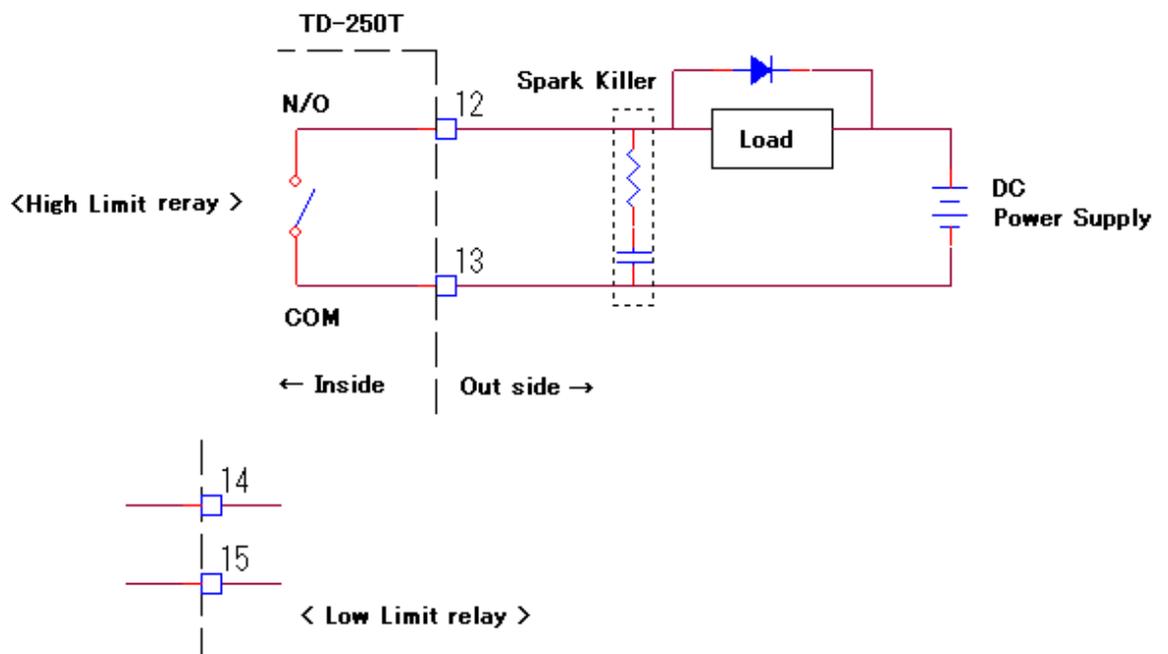
2-5 Connecting High/Low Level Relay

• Connecting External Load

1) For AC Power Load



2) For DC Power Load

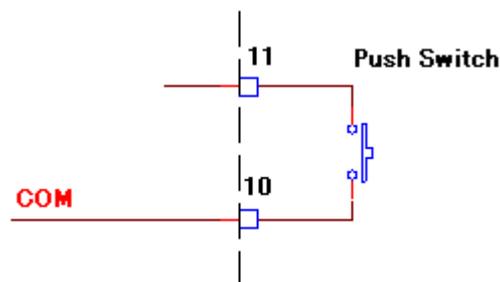
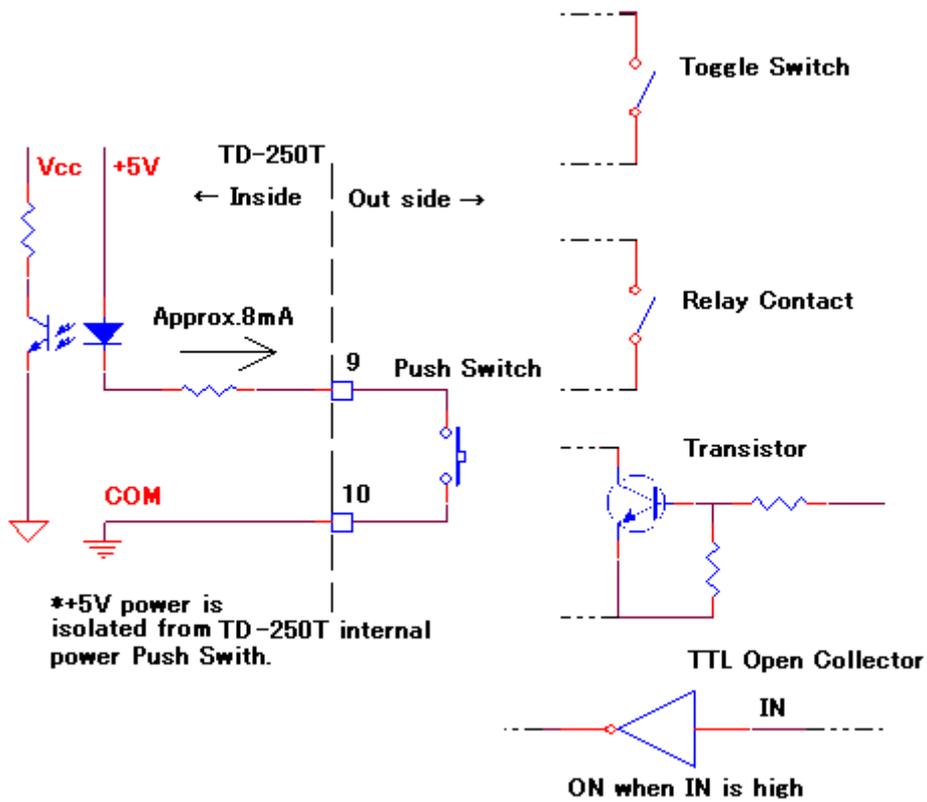


- The contact rating is 0.5A/125AVC, 1A/30VDC. Use within the power ratings.
- Install a spark killer for noise reduction close to the load circuit, such as a relay coil.
- For the AC load, use the spark killer constructed with a capacitor and resistor in series connection, and for the DC load, use a rectifying diode.

2-6 Connecting HOLD Signal and Digital ZERO Signal

• Equivalent Circuit (Input)

<HOLD Input>



- The external contact draws 8mA in ON state. Use a contact device with 10mA or more capacity.
- Do not apply voltage externally.

2-7 Connecting Voltage Output (V-OUT)

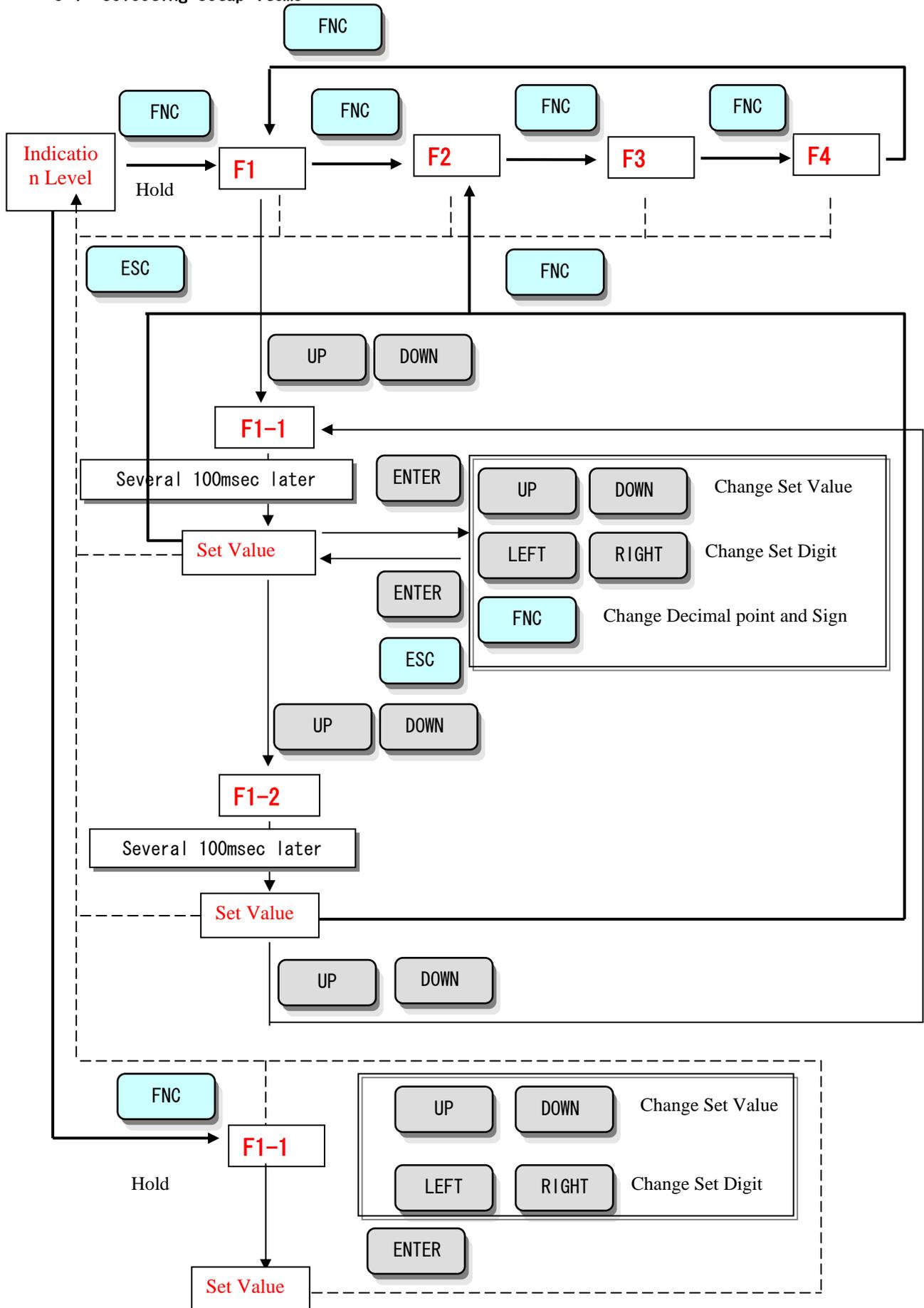
Output voltage is proportionate to the sensor input.

The output voltage is approximately 2V per sensor input 1mV/V.

(The output voltage is based on the sensor's Zero Balance being performed)

3. Setup Mode

3-1 Selecting Setup Items



3-2 List of Setup Items

Setup Mode F 1

No	Item	Default	Range	Key Lock		Ref Pg
				Setup Val	Cal. Val	
F1-1	High Limit value	75.00	-19999~19999	○		17
F1-2	Low Limit value	25.00	-19999~19999	○		
F1-3	Hysteresis	0	00000~19999	○		18
F1-4	High-Low comparison mode	0	0: Always compare	○		18
			1: Compare when stabilized			
			2: Always compare except near zero			
			3: Compare when stabilized except near zero			
F1-5	Near zero	1.00	00000~19999	○		19
F1-6	Motion detect time	1.5	0.0~9.9 (sec)	○		21
F1-7	Motion detect window	5	00~99	○		
F1-8	Zero tracking time	0	0.0~9.9 (sec)	○		22
F1-9	Zero tracking window	0	00~99	○		

Setup Mode F 2

No	Item	Default	Range	Key Lock		Ref Pg
				Setup Val	Cal. Val	
F2-1	Hold mode	1	0: Peak hold	○		23
			1: Sample hold			
F2-2	Digital offset	0	-19999~19999	○		19
F2-3	Digital filter	OFF	Moving average number	○		20
			OFF, 4, 8, 16, 32, 64 (times)			
F2-4	Analog filter	100	4, 10, 100, 3000 (Hz)	○		20
F2-5	Excitation voltage	2.5	10, 2.5 (V)		○	24
F2-6	External Hold mode	0	0: Level response	○		25
			1: Pulse response			

Setup Mode F 3

No	Item	Default	Range	Key Lock		Ref Pg
				Setup Val	Cal. Val	
F3-1	Zero enabled	ON	OFF, ON	○		-
F3-2	Hold enabled	ON	OFF, ON	○		-
F3-3	Minimum scale	0.01	00001~19999		○	23
F3-4	Display times	3	3, 6, 13, 25 (times)		○	24
F3-5	Cal. value lock	OFF	OFF, ON			-
F3-6	Setup value lock	OFF	OFF, ON			-
F3-7	Direct strain value mode	OFF	Strain display OFF, ON	○		10
F3-8	Digital Zero mode	1	0: Digital Zero 1: Analog	○		32

Setup Mode F 4

No	Item	Default	Range	Key Lock		Ref Pg
				Setup Val	Cal. Val	
F4-1	BCD refresh rate	100	1, 2, 5, 10, 20, 50, 100 (time/sec)	○		30
F4-2	RS-232C setup	13100	1 3 1 0 0 ↓ ↓ ↓ ↓ ↓ [A B C D E]	○		32
			[A] Communication mode			
			0: Command communication mode 1: Continuous TX mode			
			[B] Baud rate			
			0: 1200bps, 1: 2400bps 2: 4800bps, 3: 9600bps 4: 19200bps			
			[C] Character length			
			0: 7bit, 1: 8bit			
			[D] Parity bit			
			0: None, 1: Odd, 2: Even			
			[E] Stop bit			
0: 1bit, 1: 2bit						
F4-3	DA Zero	0	00000~19999	○		38
F4-4	DA Full scale	100.00	00001~19999	○		
F4-5	TEDS data rewrite	2.000		○		40
F4-6	TEDS data restore	0		○		41
F4-7	Out Put Data Moving Average	1	0: Off 1: On	○		29

4. Calibration

A Calibration configures the TD-250T in relation to how the strain gage sensor output is displayed. TD-250T offers the following three calibration methods.

◇Equivalent Input Calibration

It is a simple calibration method without using a real load, by manually entering the strain gage sensor's rated output (mV/V) and the rated capacity (desired value to display).

For example:

For load: 2.001mV/V - 100N
For Pressure: 2.002mV/V - 10.00MPa
For Torque: 2.502mV/V - 15.00N.m

Entering the values shown above, it automatically computes the gain and display values.

A strain gage sensor usually contains a test result sheet as shown below.

Rated Capacity..... Load (Unit: kg, ton, etc.)

Rated Output..... Voltage (Unit: mV/V)

Nonlinearity..... %R.0

Hysteresis..... %R.0

Input Terminal Resistance..... Ω

Output Terminal Resistance..... Ω

Zero Balance..... $\times 10^{-6}$

The Rated Capacity and the Rated Output are used in equivalent calibration.

These data are saved in the TEDS sensor's internal memory.

◇Real Load Calibration

It is an accurate and low-error calibration method by applying a real load to the strain gage sensor and manually entering the real load value and the maximum capacity value.

◇TEDS Calibration

It is a calibration method using the data stored in TEDS memory in which the rated output level (mV/V) and the rated capacity are recorded.

《 Before Calibration 》

When the sensor is connected and it displays "Unstable" or "Error", a calibration cannot be performed.

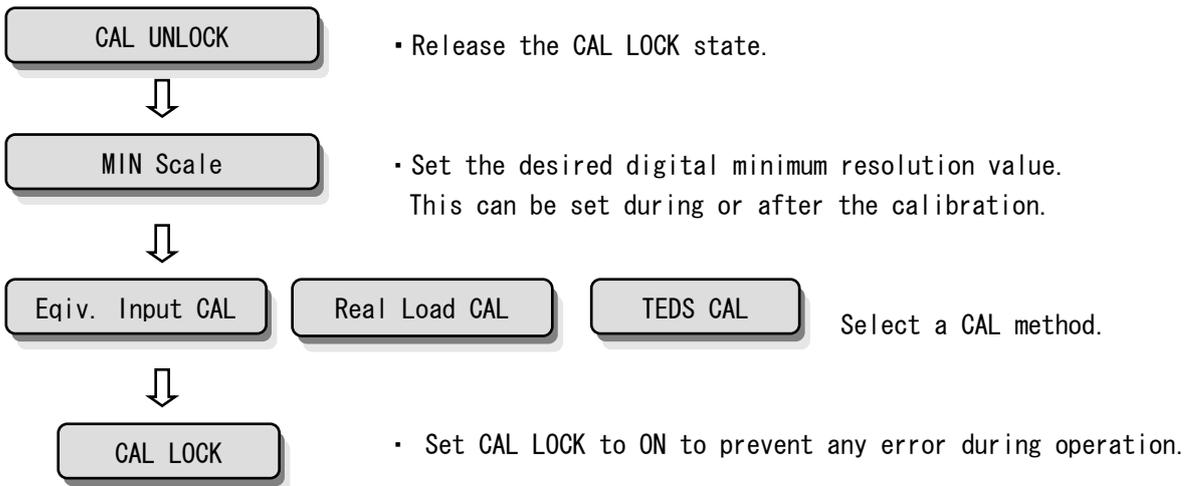
In such case, switch to the Strain Quantity Direct Read mode (F3-7), which displays the sensor output of $0 \sim \pm 3\text{mV/V}$ as $0 \sim \pm 6000$.

Press **FNC** 3 times to select Mode3, and press **UP** 6 times to select F3-7, then enter **ENTER** key. Using **UP** or **DOWN** to select "ON", then press **ENTER** key followed by **ESC**.

It switches to the Strain Quantity Direct Read mode.

4-1 Common Procedure in Calibration

Three calibration methods are available. The CAL LOCK, UNLOCK and MIN Scale setting are common in all three methods.



Locking and Unlocking CAL Values

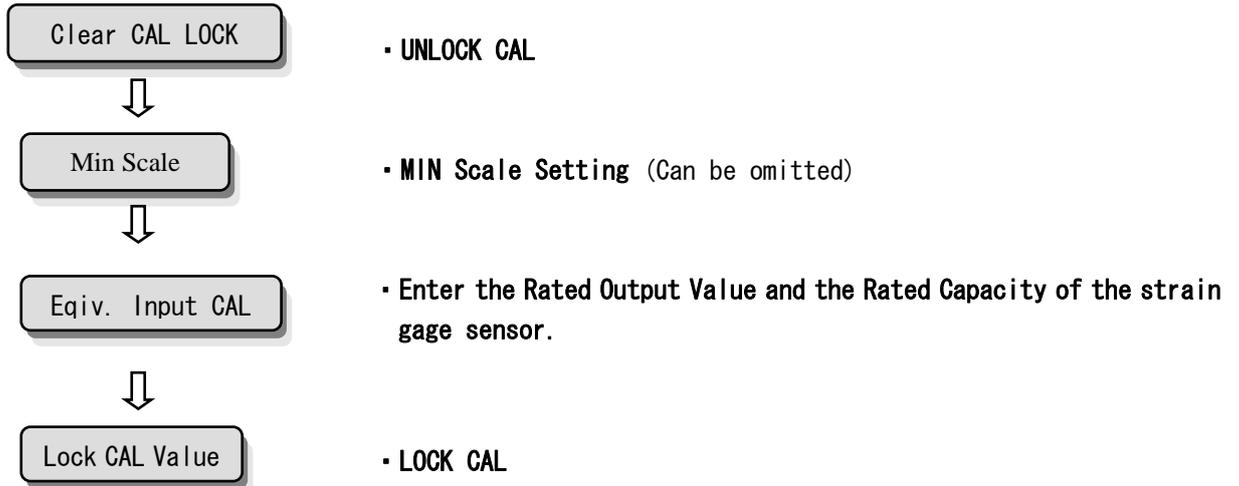
- 1) Select **MODE3**.
Press **FNC** 3 times to select **MODE3**.
- 2) Select **MODE5**.
Press **UP** 4 times to select **F3-5** then press **ENTER**.
- 3) Using **UP** or **DOWN** key, select "OFF" or "ON".
- 4) Confirm with **ENTER**, then exit from Setup mode with **ESC**.

Minimum Scale Setting (Can be omitted if no change required)

- 1) Select **MODE3**.
Press **FNC** 3 times to select **MODE3**.
- 2) Select **MODE3** by choosing "3".
Press **UP** 2 times to select **F3-3** then press **ENTER**.
- 3) Using **RIGHT** or **LEFT** key, select a digit, then using **UP** or **DOWN** key, change a value.
- 4) Confirm with **ENTER**, then exit from Setup mode with **ESC**.

4-2 Procedure of Equivalent Input Calibration

The calibration procedure is as follow.



Equivalent Input Calibration

1) Select Equivalent Input Calibration

Press **CAL** then press **ENTER**.

2) Rated Output is displayed in the display unit as (X.XXX) mV/V.

3) The bottom digit flashes. Using **RIGHT** or **LEFT**, select a digit, then using **UP** or **DOWN**, change the value.

4) Confirm with **ENTER** and change to the sensor rated capacity value entry mode.

5) The bottom digit flashes. Using **RIGHT** or **LEFT** select a digit, then using **UP** or **DOWN** change the value.

※To change the decimal point, press **FNC** while the desired digit is flashing.

6) Confirm with **ENTER**

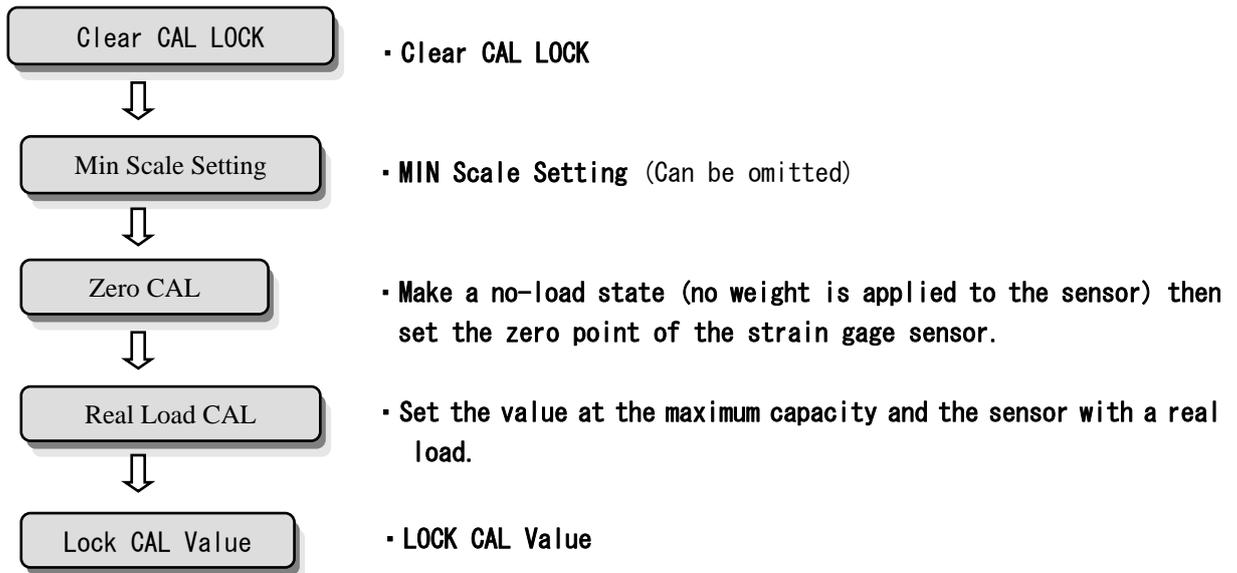
7) Set zero point with no-load sensor connected. Confirming that the sensor has no load, press **ZERO** then **ENTER**.

When the value changes to zero, preceded by "CAL2E", the equivalent input calibration is completed.

8) If an error is indicated, make a necessary correction and repeat the calibration.

4-3 Procedure of Real Load Calibration

The calibration procedure is as follow.



Real Load Calibration

- 1) Confirm that the sensor has no-load then press **ZERO** , **ENTER** .
- 2) When the value changes to zero preceded by "CAL2E" , the equivalent input calibration is completed.
- 3) Apply a real load and press **GAIN** , **ENTER** .
- 4) The bottom digit flashes. Using **UP** or **DOWN** , change a value, using **RIGHT** or **LEFT** , change a digit, then set the real load value.
※To change the decimal point, press **FNC** while the desired digit is flashing.
- 5) Confirm with **ENTER** . It switches to the maximum capacity entry mode.
- 6) The bottom digit flashes. Using **UP** or **DOWN** , change a value, using **RIGHT** or **LEFT** , change a digit, then set the maximum capacity value.
※To change the decimal point, press **FNC** while the desired digit is flashing.
- 7) Confirm with **ENTER** .
- 8) If an error is indicated, make a necessary correction and repeat the calibration.

<Example: Real Load Calibration>

Case when the real load = 50N and maximum capacity = 100N.

In 4), enter 50.00 (or 50.0 or 50)

In 6), enter 100.00 (or 100.0 or 100)

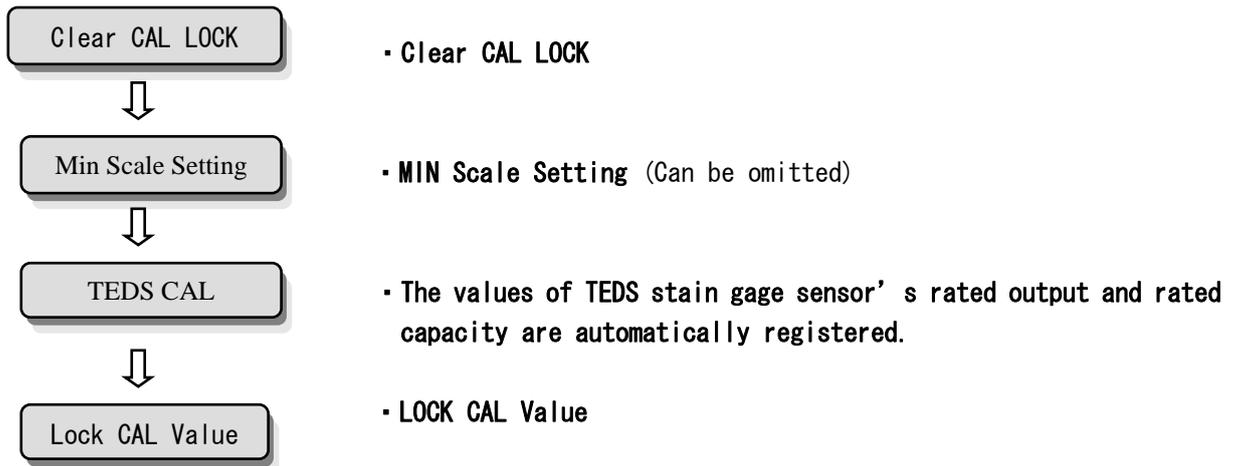
※When the sensor input is less than 0.3mV/V with real load, calibration cannot be performed. The values exceeding 3.0mV/V at maximum capacity cannot be set.

For example, with the example above, if the input at 50N is 2.0mV/V, the calculated maximum capacity value of 100N is to be 4.0mV/V. Such calibration cannot be set.

※ When the values of the real load and the maximum capacity are equal, the procedure 8) is not necessary.

4-4 Procedure of TEDS Calibration

The calibration procedure is as follow.



TEDS Calibration

1) Select TEDS Calibration.

Press **TEDS** then **ENTER** .

2) The display shows “—O—” and the TEDS sensor data is retrieved.

3) The retrieved rated output (X.XXX) mV/V is displayed. The bottom digit flashes.

4) Press **ENTER** .

5) The rated capacity is retrieved from the TEDS memory and displayed.

The value of significant figure 4000 or less is displayed. (units are ignored)

When changing the displayed value, using **RIGHT** or **LEFT** , select a digit, then using **UP** or **DOWN** change a value.

※To change the decimal point, press **FNC** while the desired digit is flashing.

6) Confirm with **ENTER** .

7) Set zero point with no-load sensor connected. Confirming that the sensor has

no load, press **ZERO** then **ENTER** .

When the value changes to zero, preceded by “CAL2E” , the TEDS calibration is completed.

8) If an error is indicated, make a necessary correction and repeat the calibration.

4-4-1 The Rated Capacity Display Digit in TEDS Calibration

The sensitivity calibration is performed by retrieving the TEDS memory data. A variety of rated capacities exists, and their rated capacity indication values in TEDS calibration are shown in the table below.

TEDS Sensor Data		Calibrated Result	
X.XXX mV/V	Rated Capacity	X.XXX mV/V	Indicated Value
.	1 N	.	01.000
.	2 N	.	02.000
.	3 N	.	03.000
.	4 N	.	04.000
.	5 N	.	005.00
.	10 N	.	010.00
.	20 N	.	020.00
.	30 N	.	030.00
.	40 N	.	040.00
.	50 N	.	0050.0
.	100 N	.	0100.0
.	200 N	.	0200.0
.	300 N	.	0300.0
.	400 N	.	0400.0
.	500 N	.	00500
.	1 kN	.	01.000
.	2 kN	.	02.000
.	3 kN	.	03.000
.	4 kN	.	04.000
.	5 kN	.	005.00

5. Function Settings

5-1 High and Low Limit

When the indication value exceeds the the preset High Limit, the HI relay turns ON, and falls below the preset Low limit, LOW relays turns ON.

HI/LOW relay output condition

HI : Indicated value > High limit

LOW : Indicated value < Low limit

Setting a High Limit

1) Select **MODE1**.

Press **FNC** to select **MODE1**.

2) Confirm **F1-1** in the display and press **ENTER**.

3) The bottom digit flashes. Using **UP** or **DOWN**, change a value, using **RIGHT** or **LEFT**, select a digit, then set a desired value.

※To change the sign, press **FNC** while the desired digit is flashing.

4) Confirm with **ENTER** then exit from Setup mode with **ESC**.

Setting a Low Limit

1) Select **MODE1**.

Press **FNC** to select **MODE1**.

2) Select 1 in **MODE2**.

Press **UP** once then **ENTER** to select **F1-2**.

3) The bottom digit flashes. Using **UP** or **DOWN** change a value, using **RIGHT** or **LEFT**, select a digit, then set a desired value.

※To change the sign, press **FNC** while the desired digit is flashing.

4) Confirm with **ENTER** then exit from Setup mode with **ESC**.

※ When an invalid value as a condition below is entered, “Err08” is shown.

High Limit value \leq Low Limit value

The available Hysteresis window is equal in both High Limit and Low Limit side.

5-4 Digital Offset

It deducts a preset value from the indication value. When the digital offset is set, the indication value minus preset offset value is displayed. Use this feature when zero cannot be set in no-load or wanting to add an offset.

$$(\text{Displayed value}) = (\text{Actual value}) - (\text{Digital offset preset value})$$

Setting

- 1) Select **MODE2**.
Press **FNC** twice to select **MODE2**.
- 2) Select 2 in **MODE2**.
Press **UP** once then **ENTER** to select **F2-2**.
- 3) The bottom digit flashes. Using **UP** or **DOWN** change a value, using **RIGHT** or **LEFT**, select a digit, then set a desired value.
- 4) Confirm with **ENTER** then exit from Setup mode with **ESC**.

5-5 Zero Vicinity

It detects when the indication value is close to zero.

The operation and non-operation near zero are closely related to the High-Low Limit comparison. Refer to "High-Low Comparison Mode" in pg. 18.

Setting

- 1) Select **MODE1**.
Press **FNC** twice to select **MODE1**.
- 2) Select 5 in **MODE1**.
Press **UP** 4 times then **ENTER** to select **F1-5**.
- 3) The bottom digit flashes. Using **UP** or **DOWN** change a value, using **RIGHT** or **LEFT**, select a digit, then set a desired value.
- 4) Confirm with **ENTER** then exit from Setup mode with **ESC**.

It operates in absolute value near zero.

5-6 Digital Filter

It applies a moving average to the A/D converted data to reduce the fluctuation of the indication value. The available number of moving average is from 4 to 64.

Setting

- 1) Select **MODE2**.
Press **FNC** twice to select **MODE2**.
- 2) Select 3 in **MODE2**.
Press **UP** twice then **ENTER** to select **F2-3**.
- 3) The bottom digit flashes. Using **UP** or **DOWN**, select a desired value.

OFF	: No averaging
4	: 4 times
8	: 8 times
16	: 16 times
32	: 32 times
64	: 64 times
- 4) Confirm with **ENTER** then exit from Setup mode with **ESC**.

5-7 Analog Filter

It is a low-pass filter that filters the input signal from the strain gage sensor and removes unwanted noise components. The cutoff frequency can be set between 4Hz and 3KHz. The higher the cut-off frequency is set, the faster the response is expected. However the noise component tends to appear more in faster response.

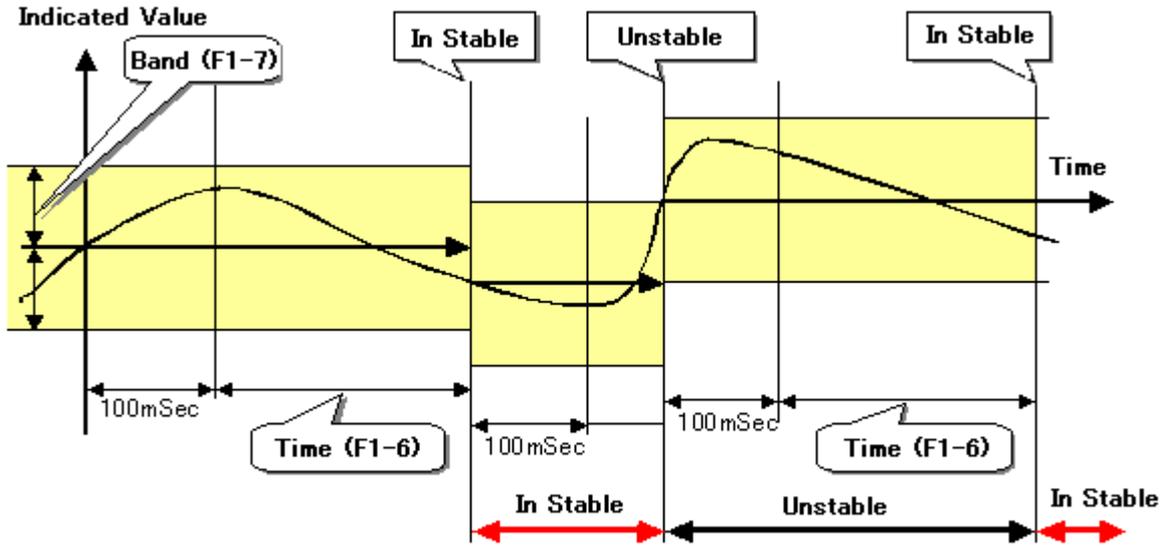
Setting

- 1) Select **MODE2**.
Press **FNC** twice to select **MODE2**.
- 2) Select 4 in **MODE2**.
Press **UP** 3 times then **ENTER** to select **F2-4**.
- 3) The bottom digit flashes. Using **UP** or **DOWN**, select a desired value.

4	: 4Hz
10	: 10Hz
100	: 100Hz
3000	: 3KHz
- 4) Confirm with **ENTER** then exit from Setup mode with **ESC**.

5-8 Motion Detect

Set parameters to detect the stability. The signal is compared with the one from 100 msec prior, and if it fits within the preset amplitude range, then such condition continues for the preset length, it determines that the indication value is STABLE.



The stable/unstable condition is closely related to the High-Low Limit comparison. Refer to “High-Low Comparison Mode” in pg. 18.

Setting

- 1) Set Motion Detect time. Select 6 in **MODE1**.
Press **FNC** then **UP** five times to select **F1-6**.
- 2) Press **ENTER** and the bottom digit flashes. Using **UP** or **DOWN**, change a value, using **RIGHT** or **LEFT**, select a digit, then select a desired value. Confirm with **ENTER**.
- 3) Select a Motion Detect Range.
Press **UP** to select **F1-7**, then **ENTER**.
- 4) The bottom digit flashes. Using **UP** or **DOWN**, change a value, using **RIGHT** or **LEFT**, select a digit, then select a desired value.
- 5) Confirm with **ENTER** then exit from Setup mode with **ESC**.

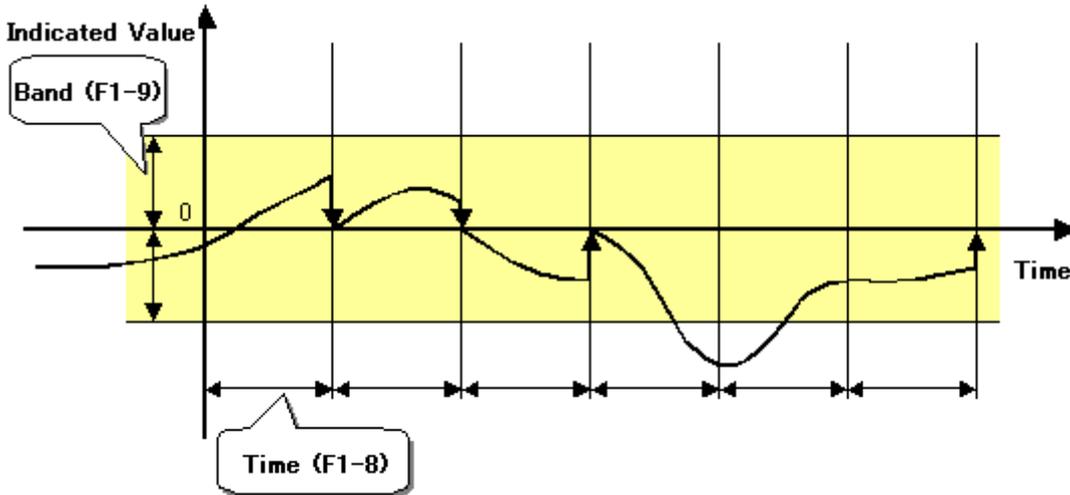
A range of Motion Detect Delay is 0.0 ~ 9.9.

A range of Motion Detect Band is 00 ~ 99.

5-9 Zero Tracking

A gradual zero drift is automatically detected and compensated.

- It automatically moves a drifted zero point to zero at every preset time interval, only when the drift is within a specified amount.
- The tracking delay is 0.1~9.9 sec and the tracking band is set in weight unit.
- The Zero Tracking is disabled when the tracking delay and the tracking band are set to "0".
- It is active only when the setup mode "F3-5", CAL LOCK is ON and "F3-1", ZERO is ON.



Setting

- 1) Set Zero Tracking Time. Select 8 in **MODE1**.
Press **FNC** then **UP** 7 times to select F1-8.
- 2) Press **ENTER** and the bottom digit flashes. Using **UP** or **DOWN** to change a value, using **RIGHT** or **LEFT** to select a digit, select a desired value. Confirm with **ENTER**.
- 3) Set Zero Tracking Band
Press **UP** to select F1-0 then press **ENTER**.
- 4) The bottom digit flashes. Using **RIGHT** or **LEFT** to change a value, using **UP** or **DOWN** to select a digit, select a desired value.
- 5) Confirm with **ENTER** then exit from Setup mode with **ESC**.

The range of Zero Tracking Delay is 0.0~9.9sec.

The range of Zero Tracking Band is 00~99.

5-10 Hold Mode

TD-250T has the Peak Hold function and the Sample Hold feature. The former holds the peak (maximum) input signal level, and the latter holds an input signal at an arbitrary time.

Setting

The HOLD function is available only when the **MODE F3-2** is set to ON.

- 1) Select **MODE2**
Press **FNC** twice to select **MODE2**.
- 2) Select 1 in **MODE2** then press **ENTER**.
- 3) The display flashes. Using **UP** or **DOWN**, select a desired value.

1: Sample Hold
0: Peak Hold
- 4) Confirm with **ENTER** then exit from Setup mode with **ESC**.

5-11 Minimum Scale

Set the minimum value or resolution of the change in digital value.

Setting

- 1) Select **MODE3**.
Press **FNC** 3 times to select **MODE3**.
- 2) Select 3 in **MODE3**.
Press **UP** 2 times then **ENTER** to select **F3-3**.
- 3) The bottom digit flashes. Using **UP** or **DOWN** to change a value, using **RIGHT** or **LEFT** to select a digit, select a desired value.
- 4) Confirm with **ENTER** then exit from Setup mode with **ESC**.

5-12 Display Update Rate

Set the display update rate of the indicator. The sample frequency of the A/D converter is 100 per second.

Setting

- 1) Select **MODE3**
Press **FNC** 3 times to select **MODE3**.
- 2) Select 4 in **MODE3**.
Press **UP** 3 times then **ENTER** to select **F3-4**.
- 3) The bottom digit flashes. Using **UP** or **DOWN** select a desired refresh rate from 3 ~ 25/sec.
- 4) Confirm with **ENTER** then exit from Setup mode with **ESC**.

5-13 Bridge Excitation Voltage

Set the bridge excitation voltage for the strain gage sensor.

Setting

- 1) Select **MODE2**.
Press **FNC** 2 times to select **MODE2**.
- 2) Select 5 in **MODE2**.
Press **UP** 4 times then **ENTER** to select **F2-5**.
- 3) The bottom digit flashes. Using **UP** or **DOWN** select either 2.5V or 10V.
- 4) Confirm with **ENTER** then exit from Setup mode with **ESC**.

* When the TEDS sensor is connected, the sensor data is retrieved then automatically set to B.V, which is lower than the sensor's maximum excitation voltage.

5-14 External Hold Mode

Select a response setting of the External Hold input (pin 9 & 10 of In/Out terminal).

Setting

1) Select **MODE2**.
Press **FNC** 2 times to select **MODE2**.

2) Select 6 in **MODE2**.
Press **UP** 5 times then **ENTER** to select **F2-6**.

3) The bottom digit flashes. Using **UP** or **DOWN**, select a desired value.
1: Pulse Response
0: Level Response

4) Confirm with **ENTER** then exit from Setup mode with **ESC**.

5-15 External Output Data Moving Average Setting

For D/A converter, RS-232C, BCD data output, to set its moving average processing (64 times) for stability or not. For Factory ship out setting is valid.

Moving average processing for stability:

It is the one method for reduce output data variation with multiplying 64 times of movingaverage when less variation for internal A/D data value (wobbling as noise).

Setting

1) Select **MODE2**.
Press **FNC** 4 times to select **MODE4**.

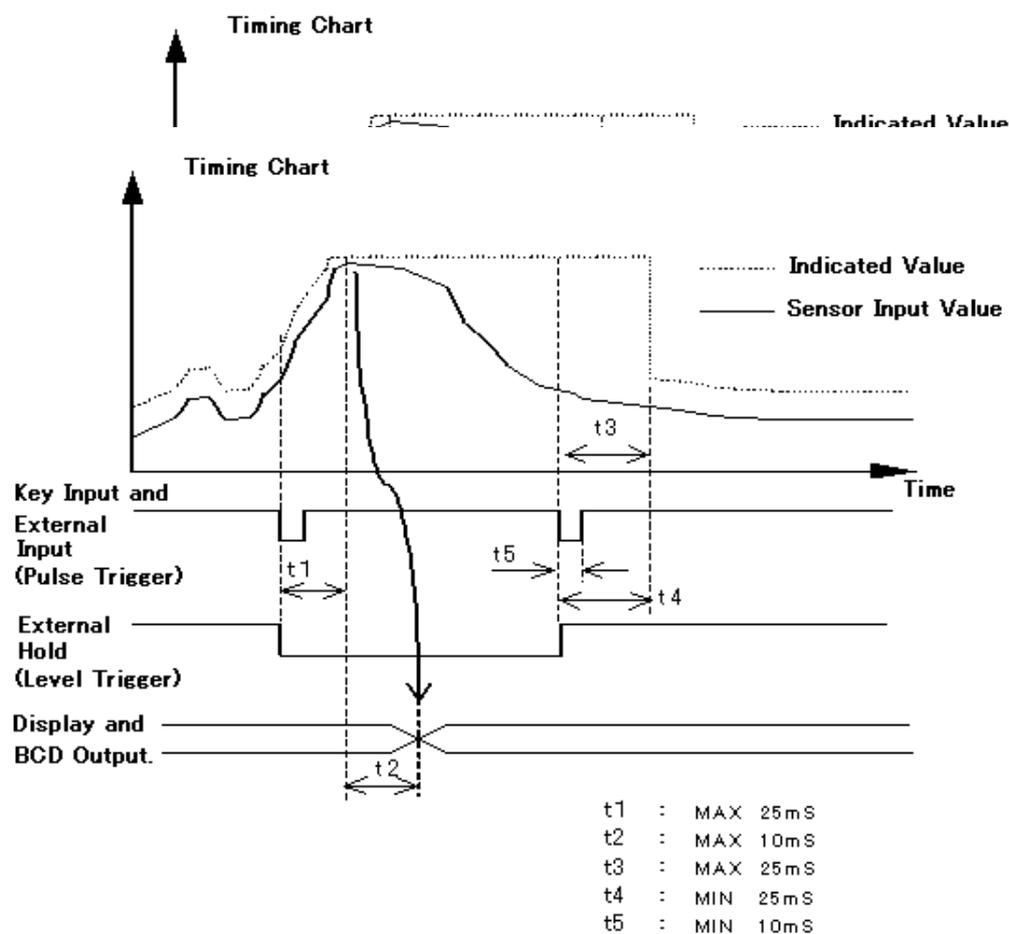
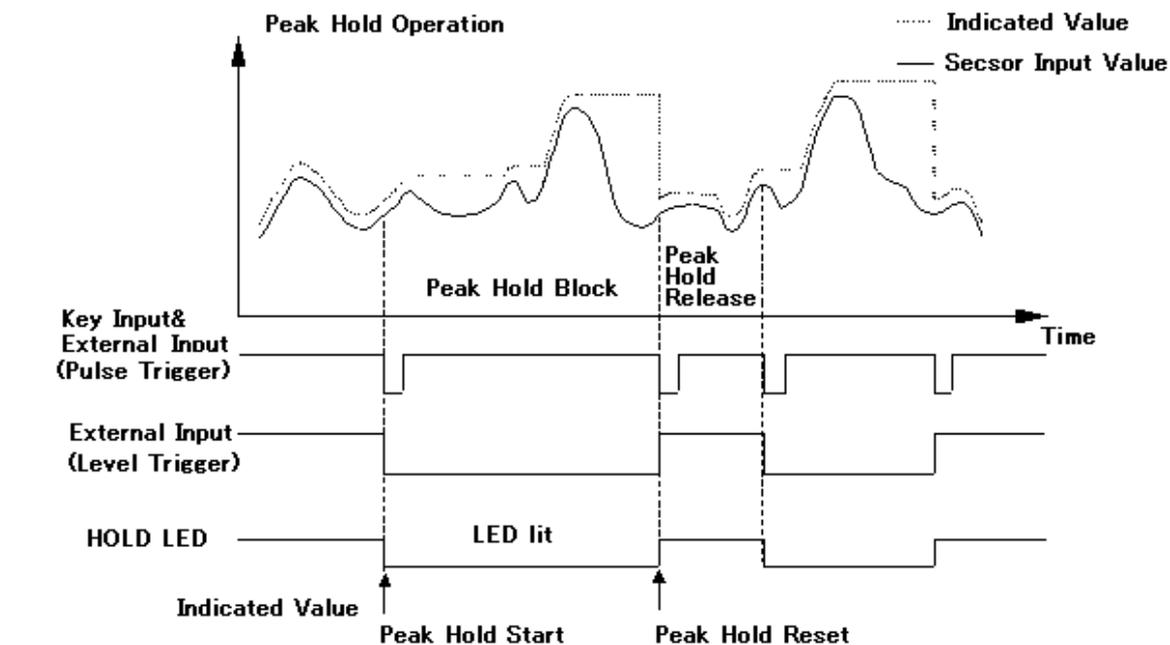
2) Select 7 in **MODE4**.
Press **DOWN** 1 times then **ENTER** to select **F4-7**.

3) The bottom digit flashes. Using **UP** or **DOWN**, select a desired value.
1: On
0: Off

4) Confirm with **ENTER** then exit from Setup mode with **ESC**.

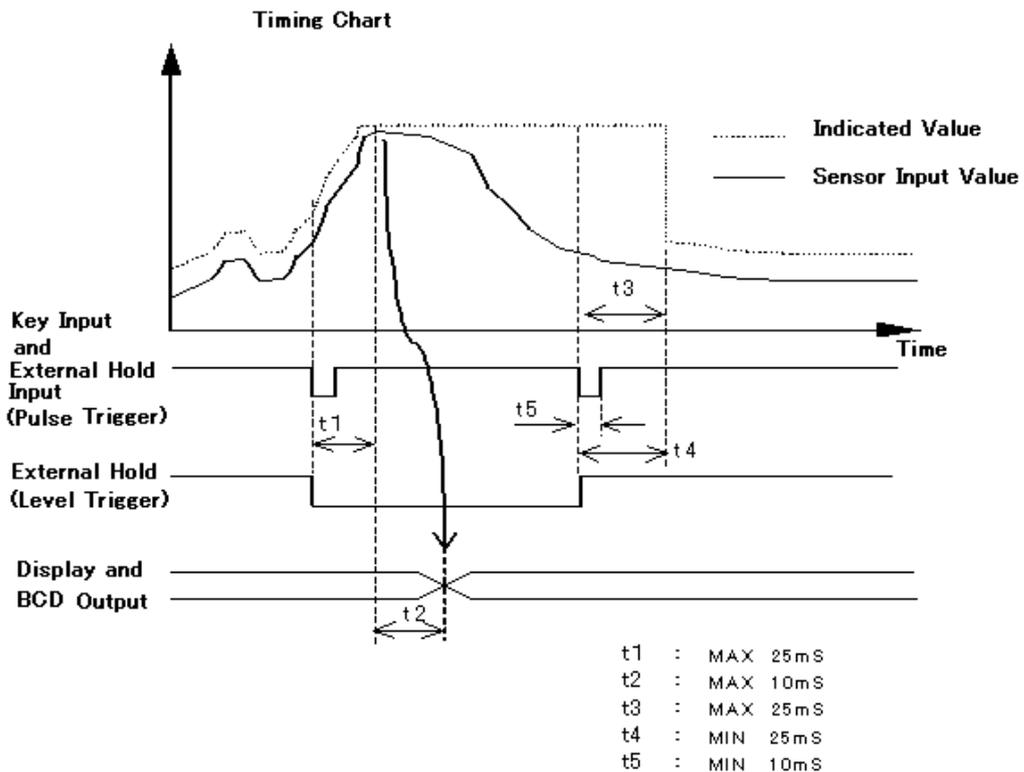
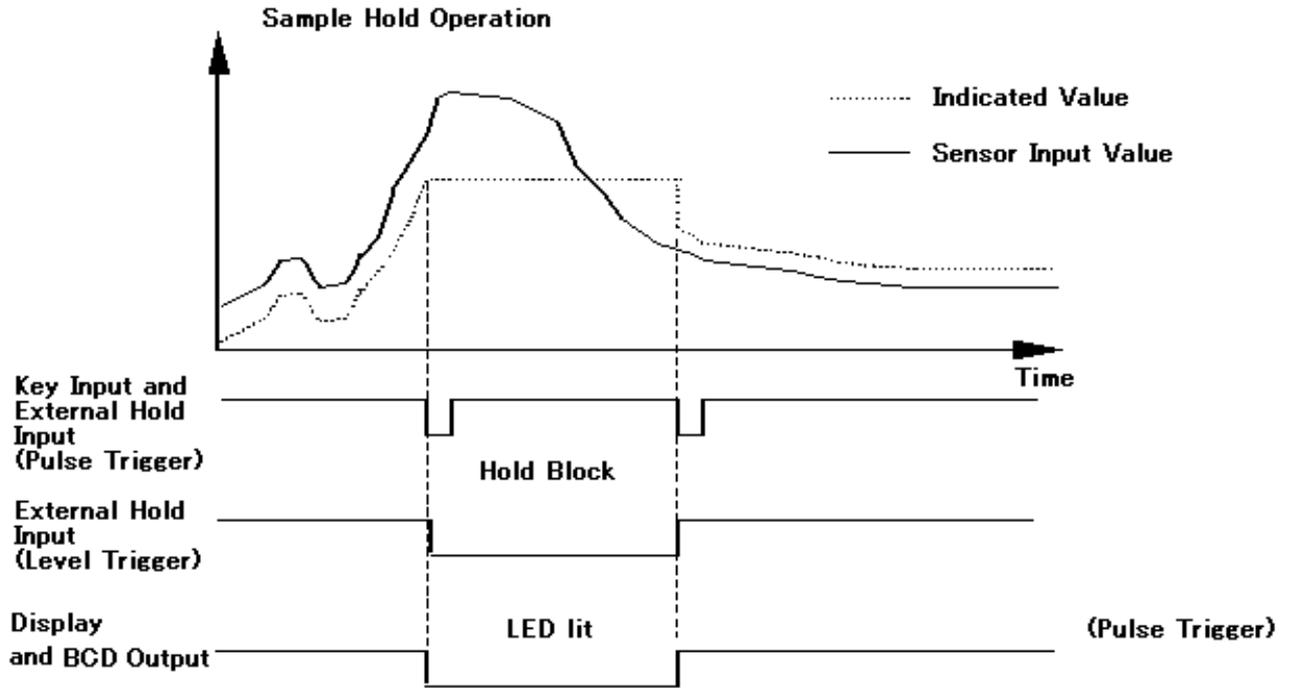
6. Hold Function

6-1 Peak Hold



- t1:** A time to display the Peak Hold value from the when the Hold input is shorted.
- t2:** A time for the A/D converter to sample the analog signal.
- t3:** A time to release the analog peak hold value once the Hold input has been opened.
- t4:** A minimum reset time that is required to release the displayed value on hold.
- t5:** A minimum time for Hold function to operate.

6-2 Sample Hold



- t1: A time display the Peak Hold value from the time when the Hold input is shorted.
- t2: A time for the A/D converter to sample the analog signal.
- t3: A time to release the analog peak hold value once the Hold input has been opened.
- t4: A minimum reset time that is required to release the displayed value on hold.
- t5: a minimum time for Hold function to operate.

7. Digital Zero Function

It is a function to reset the indication value to zero with a key operation.

Operation

- 1) Perform Digital Zero.

Press  .

- 2) When the indication value changes to zero, it is complete.

It operates only when the **CAL LOCK** of setup mode **F3-5** is ON, and the **ZERO** of **F3-1** is ON. The digital zero is cleared once the power is turned off.

- 3) For Digital Zero Function.

This indicator can be selected by **F3-8** for Zero balance with both analog and digital mode or only with digital mode.

“1” for **F3-8** case. Zero balance with both analog and digital mode.

This function is approx 1 sec. Zero balance can be taken with analog, so when zero balance completed, the back side terminal pin 7 and pin 8 of analog voltage output becoming nearly ZERO [V]. For Factory ship out setting is 1.

“0” for **F3-8** case. Zero balance with only digital circuit and it will complete about 0.1 sec.

8. BCD Data Output (TD-250T03)

The BCD Data Output is an interface that outputs the indication value in BCD coded value. This interface is used when connecting to a computer, process controller, sequencer, etc. It is convenient when using controlling, recording or data collection processes. The TD-250T internal circuit and the external connecting circuit are electrically isolated with a photo coupler.

* Install an included ferrite core on the output cable to reduce unwanted radiation.

8-1 Connector Pin Assignment

Amphenol Connector 36 pin

No.			No.		
1	Output	COM	19		COM
2	"	1	20		NC
3	"	2	21		"
4	"	4	22	Output	Zero Vicinity
5	"	8	23		Negative(Polarity)
6	"	10	24		OVER
7	"	20	25		P. C(Stable)
8	"	40	26		STROBE
9	"	80	27	Input	BCD Date Hold
10	"	100	28	"	Date Logic Switch
11	"	200	29		NC
12	"	400	30		"
13	"	800	31		"
14	"	1000	32		"
15	"	2000	33		"
16	"	4000	34		"
17	"	8000	35		"
18	"	10000	36		"

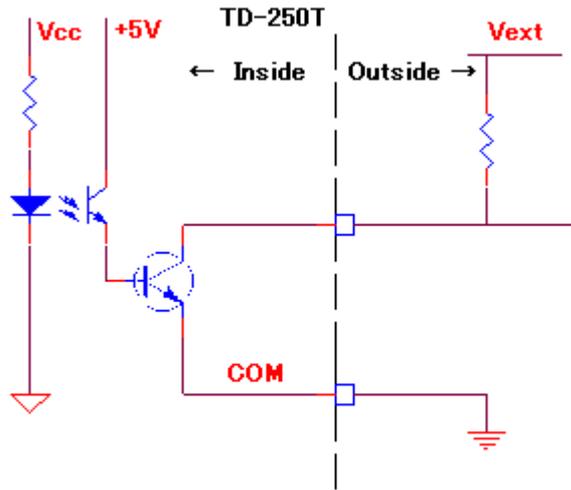
Adaptive Connector : DDK-5730360 corresponding

8-2 Changing Logic

Make a logic selection of the output signal using a pin 28.

False logic – when COM and pin28 are open, True logic – when both are shorted

8-3 Equivalent Circuit Output

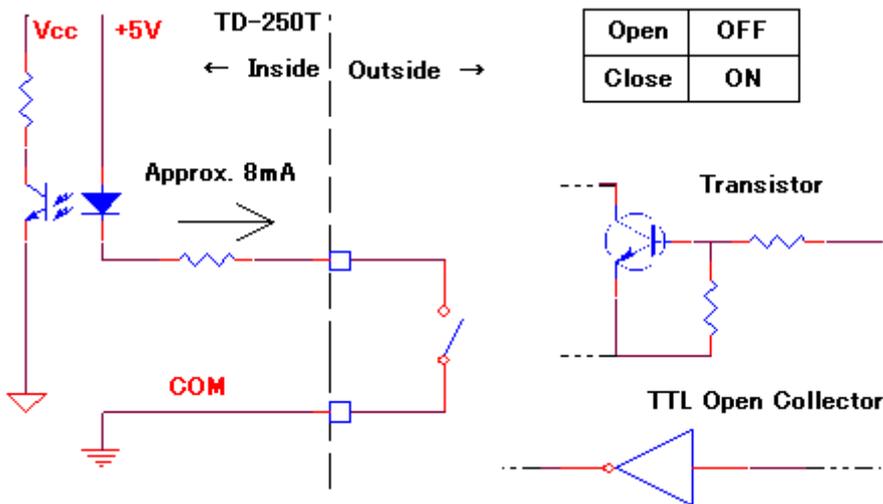


$$V_{ce} = 30V(\text{max}) \quad I_c = 50mA(\text{max})$$

Output Date		Logic	
		Negative Logic	Positive Logic
0	Output Transistor (Output Pin Level)	OFF (H)	ON (L)
1	Output Transistor (Output Pin Level)	ON (L)	OFF (H)

← Logic Switch (28pin)

Input



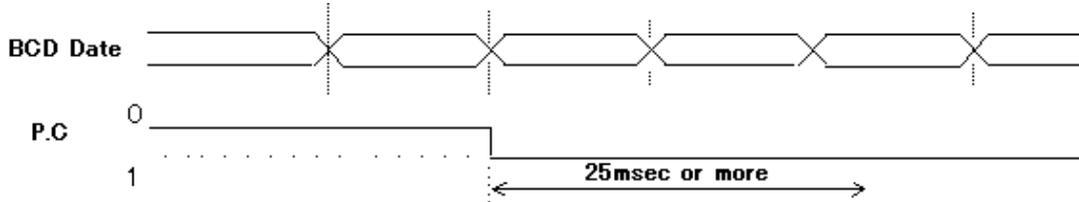
Caution

- Never apply voltage externally to the input.
- Use an external device with a capacity of 10mA or more.

8-4 Signal Timing

- PC

It turns ON synchronizing with the BCD data when stable. When reading the data, be sure to wait 25msec or more from the P.C End edge timing.

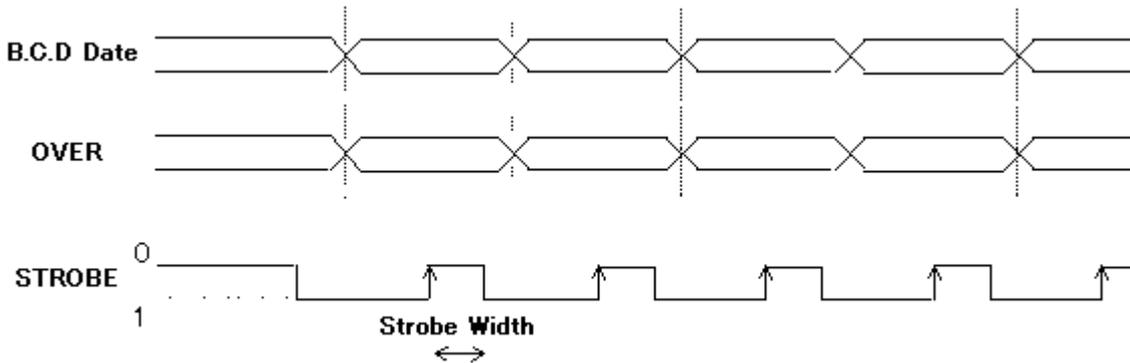


- OVER

It outputs when -LOAD, LOAD, OFL1 or OFL2.

- STROBE

The strobe pulse is output synchronizing with the BCD data. When reading the data, fetch the data at the rising edge of this pulse. The refresh rate of the BCD data can be changed in Setup.



8-5 BCD Data Refresh Rate Setting

1) Select **MODE4**.

Press **FNC** 4 times to select F4-1, then press **ENTER**

2) The display flashes. Using **UP** or **DOWN**, select a desired value.

1:	1 time/sec
2:	2 times/sec
5:	5 times/sec
10:	10 times/sec
20:	10 times/sec
50:	50 times/sec
100:	100 times/sec

3) Confirm with **ENTER** then exit from Setup mode with **ESC**.

9. RS-232C Interface (TD-250T04)

The RS-232C interface is used to read status or data from, or write setup data to TD-250T. It is used when connecting to a computer, process controller, sequencer, etc. It is convenient when controlling or recording. The TD-250T internal circuit and the external connecting circuit are electrically isolated with a photo coupler.

9-1 Communication Specification

9-1-1 Standard

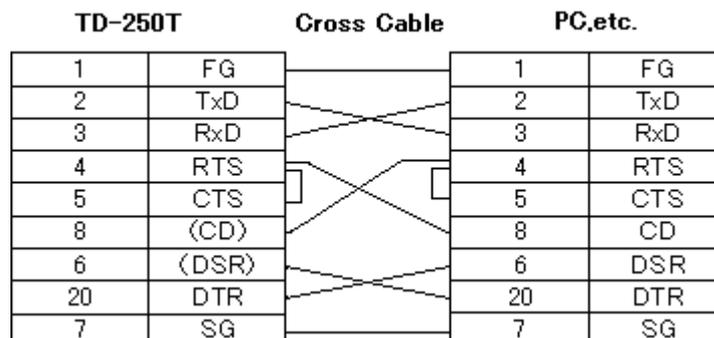
Signal Level:	RS-232C Compatible
Transmission Distance:	Approx. 15m
Communication Method:	Synchronous, Full Duplex
Transfer Speed:	1200, 2400, 4800, 9600, 19200bps
Start Bit:	1
Bit Length:	7 or 8 selectable
Stop Bit:	1 or 2 selectable
Parity Bit:	None, Odd or Even selectable
Code:	ASCII

9-1-2 Connector Pin Assignment

Adaptive Plug: 25-pin D-SUB Connector (DB-25P-NR made by JAE)

No.			No.		
1		FG	14		
2	Output	T x D	15		
3	Input	R x D	16		
4	Output	RTS	17		
5	Input	CTS	18		
6			19		
7		SG	20	Output	D T R
8			21		
9			22		
10			23		
11			24		
12			25		
13			26		

9-1-3 Cable



9-2 Setting RS-232C Interface

Set up the RS-232C communication parameters of RD-250T.

Setting

1) Select **MODE4**.
 Press **FNC** 4 times to select **MODE4**.

2) Select 2 in **MODE4**
 Press **UP** once then **ENTER** to select **F4-2**.

3) The bottom digit flashes. Using **UP** or **DOWN** to change a value, **RIGHT** Or **LEFT** to select a digit, set a parameters.
 Refer to the table below

1 ↓ [A	3 ↓ B	1 ↓ C	0 ↓ D	0 ↓ E]
[A] Communication Mode				
0 Command Communication Mode				
1 Continuous Broadcast Mode				
[B] Baudrate				
0: 1200bps 1: 2400bps 2: 4800bps				
3: 9600bps 4: 19200bps				
[C] Character Length				
0: 7bit 1: 8bit				
[D] Parity Bit				
0: None 1: Odd 2: Even				
[E] Stop Bit				
0: 1bit 1: 2bit				

4) Confirm with **ENTER** then exit from Setup mode with **ESC**.

9-3 Communication Mode

9-3-1 Mode 0

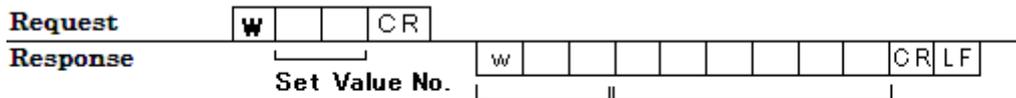
Reading an indication value, status setup values, or writing setup values can be conducted by a command from the host PC.

9-3-2 Mode 1

An indication value and the status are continuously transmitted.

Digital Offset	W 0 5	CR LF	(Set Value LOCK)
Zero Vicinity	W 0 6 0	CR LF	(Set Value LOCK)
Digital Filter	W 1 1 0 0 0 0 0	CR LF	(Set Value LOCK)
	<div style="border: 1px solid black; padding: 5px; width: fit-content;"> 0:OFF 1:4times 2:8times 3:16times 4:32times 5:64times </div>		
Analog Filter	W 1 2 0 0 0 0 0	CR LF	
	<div style="border: 1px solid black; padding: 5px; width: fit-content;"> 0: 4Hz 1: 10Hz 2:100Hz 3:3000Hz </div>		
MD (stable time)	W 1 3 0 0 0 0 0	CR LF	(Set Value LOCK)
MD (stable band)	W 1 4 0 0 0 0 0	CR LF	(Set Value LOCK)
Zero Tracking (time)	W 1 5 0 0 0 0 0	CR LF	(Set Value LOCK)
Zero Tracking (band)	W 1 6 0 0 0 0 0	CR LF	(Set Value LOCK)
Hold Mode	W 1 7 0 0 0 0 0	CR LF	(Set Value LOCK)
	<div style="border: 1px solid black; padding: 5px; width: fit-content;"> 0: Peak Hold 1: Sample Hold </div>		
LOCK	W 2 1 0 0	CR LF	
	<div style="display: flex; justify-content: space-between;"> <div style="border: 1px solid black; padding: 5px; width: 45%;"> Set Value LOCK 0:OFF 1:ON </div> <div style="border: 1px solid black; padding: 5px; width: 45%;"> Hold is effective 0:OFF 1:ON </div> </div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="border: 1px solid black; padding: 5px; width: 45%;"> Calibration LOCK 0:OFF 1:ON </div> <div style="border: 1px solid black; padding: 5px; width: 45%;"> Zero is effective 0:OFF 1:ON </div> </div>		
Minimum Scale	W 2 2 0	CR LF	(Set Value LOCK)
Display Cycle	W 2 3 0 0 0 0 0	CR LF	(Set Value LOCK)
	<div style="border: 1px solid black; padding: 5px; width: fit-content;"> 0:3times/min 1: 6times/min 2:13times/min 3:25times/min </div>		

• Reading Setup Values



Set Value No. The same format as writing set values.

• Command (host PC → TD-250T)

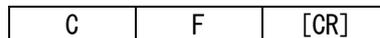
Setting HOLD

When HOLD enabled (F3-2 ON) No Response



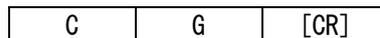
Releasing HOLD

When HOLD enabled (F3-2 ON) No Response



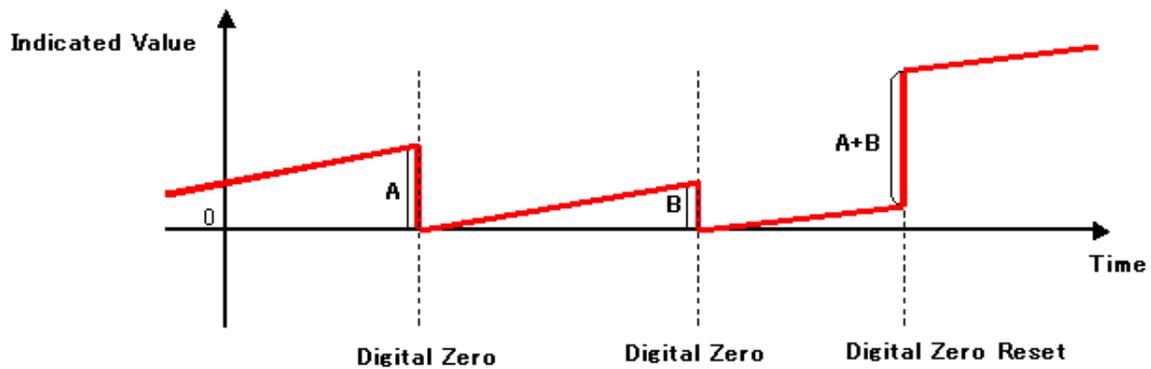
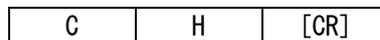
Digital Zero

When Zero enabled + CAL LOCK (F3-1 ON + F3-5 ON) No Response



Digital Zero Reset

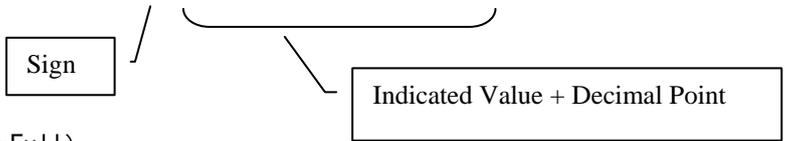
When Zero enabled + CAL LOCK (F3-1 ON + F3-5 ON) No Response



9-4-2 Mode 1

The indication value is continuously transmitted.

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
G	S	,	①	,	②	,	③	,	④	,	±							[CR]	[LF]



- ① 0 . . . Overload (\pm LOAD、 \pm Full)
 S . . . Stable
 M . . . Unstable
 H . . . Hold

Priority H > 0 > (S or M)

- ② A . . . Zero Tracking OFF
 T . . . Zero Tracking ON

- ③ H . . . Max Relay ON
 L . . . Min Relay ON
 G . . . Max and Min Rely OFF
 F . . . Comp Relay OFF

Priority (H or L) > F > G

- ④ N . . . Zero Vicinity OFF
 Z . . . Zero Vicinity ON

10. D/A Converter (TD-250T07)

It is a D/A converter to output analog signal referencing to the TD-150T indication value. The ranges of analog voltage output is $0 \sim \pm 10\text{V}$, and the current output is $4 \sim 20\text{mA}$. Using the D/A Zero and D/A Full-Scale settings, a desired analog output Zero (0V , 4mA) and Full-Scale ($\pm 10\text{V}$, 20mA) are obtained. The D/A output and the main body circuit are electrically isolated. The resolution is $1/\pm 10,000$ per $0 \sim \pm 10\text{V}$, and the sample speed is $100/\text{sec}$. The output has about $+10\%$ of over-range head room.

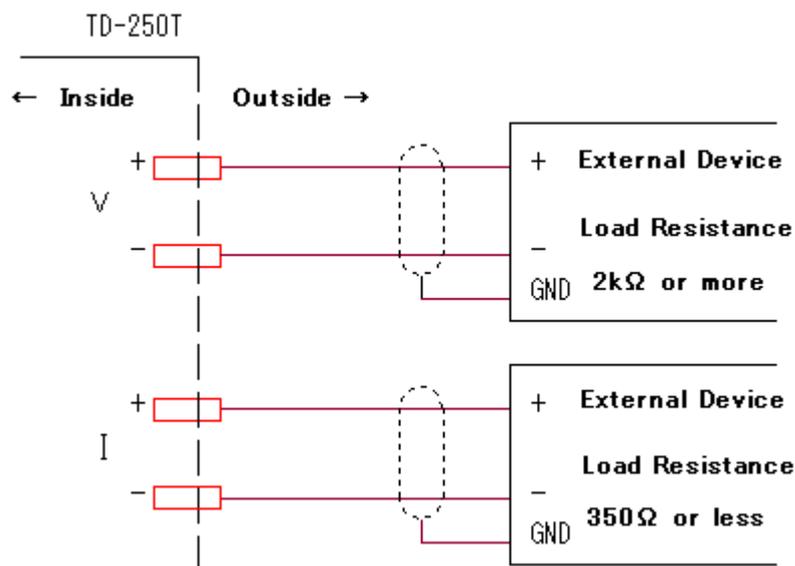
The output is 0V when the output current is 4mA , and 10V when 20mA . The Full-Scale of the output current and the output voltage cannot be separately selected.

- * Be sure to install the included Ferrite core to the output cable, to reduce the unwanted noise radiation.

10-1 Using Output Voltage and Current

For the voltage output, connect an external device (with $2\text{k}\Omega$ or more load resistance) to the "V"+(plus) and the "V"-(minus).

For the current output, connect an external device to the "I"+(plus) and the "I"-(minus). The maximum load resistance should not exceed $350\ \Omega$ including the cable resistance.



10-2 Setting D/A Zero Setting

- 1) Select **MODE4**
Press **FNC** 4 times to select **MODE4**.
- 2) Select 3 in **MODE4**.
Press **UP** 2 times then **ENTER** to select **F4-3**.
- 3) The bottom digit flashes. Using **UP** or **DOWN** to change a value, **RIGHT** or **LEFT** to select a digit, set a desired value.
- 4) Confirm with **ENTER** and exit from the Setup mode with **ESC**.

10-3 Setting D/A Full-Scale Setting

- 1) Select **MODE4**
Press **FNC** 4 times to select **MODE4**.
- 2) Select 4 in **MODE4**.
Press **UP** 3 times then **ENTER** to select **F4-4**.
- 3) The bottom digit flashes. Using **UP** or **DOWN** to change a value, **RIGHT** or **LEFT** to select a digit, set a desired value.
- 4) Confirm with **ENTER** and exit from the Setup mode with **ESC**.

Setting Examples

Example 1		Example 2		Example 3	
DA Zero	000.00	DA Zero	020.00	DA Zero	020.00
DA Full-Scale	100.00	DA Full-Scale	100.00	DA Full-Scale	-100.00
Ind. Value	DA Output	Ind. Value	DA Output	Ind. Value	DA Output
100.00	10V	120.00	10V	120.00	-10V
:	:	:	:	:	:
000.00	0V	020.00	0V	020.00	0V
:	:	:	:	:	:
-100.00	-10V	-80.00	-10V	-80.00	10V

Example 4	
DA Zero	-10.00
DA Full-Scale	20.00
Ind. Value	DA Output
10.00	10V (20mA)
:	:
000.00	5V (12mA)
:	:
-10.00	0V (4mA)

10-4 D/A Output Error

The output error is shown only when the D/A option is installed.

dErr DA output exceeds +10.9V, outside of linear range
 -dErr DA output exceeds -10.9V, outside of linear range

10-5 Resolution

The D/A converter has a resolution of $1/\pm 10,000$ per $0\sim\pm 10V$, and $1/10,000$ per $4\sim 20mA$.

11. Over-Scale and Error Indications

Display	Description
Load	ADC Plus Over
-Load	ADC Minus Over
Full	Indication Plus Over (19999 or more)
-Full	Indication Minus Over (-19999 or less)
oFul	Actual input is more than 3.3mV/V
-oFul	Actual input is less than -3.3mV/V
Err00	Zero balance is timed out
Err01	Input in CAL is more than 3.3mV/V
Err02	
Err03	Span setting is 0000
Err04	Sensor output is not enough for adjustment (0.28mV/V)
Err05	Sensor output is negative
Err06	Valid TEDS sensor is not connected
Err07	Incorrect password for TEDS writing
Err08	Invalid setting parameter
Err09	Exceeding output rating (more than 0.28mV/V, or less than 3.3mV/V)
Err0A	Sensor is different from the one of the TEDS CAL time
ErrFF	Other errors
dErr	DA output is more than 10.9V
-dErr	DA output is more than -10.9V
cErr0	C-000 check error (internal RAM)
cErr1	C-001 check error (external SRAM)
cErr2	C-002 check error (SC10 EEPROM)
cErr3	C-003 check error (SC11 DS2480B)

12. TEDS

By connecting a sensor complying with IEEE1451.4 (Transducer Electronic Data Sheet (TEDS)), TD-250T can retrieve the rated output values stored in the sensor, and applies them to the indicator's calibration process. It also can save the self-calibrated values into the TEDS sensor.

The following TEDS sensors are compatible with such functions.

TEDS Specification			
IEEE1451.4 (V0.9)	IEEE1451.4 (V1.0)		
	Template ID		
	Bridge Sensors (33)	Strain Gage (35)	Others
×	⊙	○	×

⊙ : TEDS calibration correspondence、F4-5、F4-6 correspondence

○ : TEDS calibration correspondence

× : Non-correspondence

12-1 TEDS Write Function (F4-5)

It updates the calibration data stored in the TEDS sensor with the data from which the real load or equivalent calibration has been performed.

Refer to “4-4-1 The Rated Capacity Display Digit in TEDS Calibration” for the indication values. For example, when performing the real load calibration and writing the indication value of “100.00” into the TEDS memory, and then the TEDS calibration is performed, the capacity indication value is NOT “100.00” but “0100.0”.

Writing Data

- 1) Select **MODE 4**
Press **FNC** 4 times to select **MODE4**.
- 2) Select 5 in **MODE4**.
Press **UP** 4 times then **ENTER** to select **F4-5**.
- 3) The bottom digit flashes. Using **UP** or **DOWN**, and **RIGHT** or **LEFT**, enter as “00015”.
- 4) Confirm the entry with **ENTER**.
- 5) A moment after “--0--” is displayed, the calibration value of the equivalent or real input previously performed is displayed. Confirm by pressing **ENTER** 2 times.
- 6) Then enter the year, month and day that the calibration is conducted using **RIGHT**, **LEFT**, **UP** and **DOWN** keys.
- 7) A moment after “--0--” is displayed during the data write, it displays **MODE4** then returns to the key entry state.
- 8) Press **ESC** to finish **MODE4** and return to the display mode.

12-2 TEDS Data Recovery Function (F4-6)

It restores the TEDS data with the factory default values that is stored in the TEDS' SUB area.

Recovering Data

- 1) Select **MODE4**
Press **FNC** 4 times to select **MODE4**.
- 2) Select 6 in **MODE4**.
Press **UP** 4 times then **ENTER** to select **F4-5**.
- 3) The bottom digit flashes. Using **UP** or **DOWN** , and **RIGHT** or **LEFT** , enter as "00015" .
- 4) Confirm the entry with **ENTER** .
- 5) A moment after "--0--" is displayed, the recovery data is retrieved from the TEDS memory and the rated output is displayed. Confirm by pressing **ENTER** .
- 6) Then the indication value is displayed. Confirm by pressing **ENTER** .
- 7) A moment after "--0--" is displayed during the data write, it displays **MODE4-6** then returns to the key entry state.
- 8) Press **ESC** to finish **MODE4** and return to the display mode.

12-3 TEDS Sensor Verification

The 1-Wire device in the TEDS sensor stores a device specific 64-bit Registration number. By remembering the Registration Number during the calibration, a TD-250T verifies the same TEDS sensor used in the TEDS calibration.

This 64-bit Registration Number will not alter even if the TEDS data, such as rated output, in the EEPROM is updated.

MSB		64bit Registration ROM Number	LSB
8bit		48bit	8bit
CRC		Serial Number	Family Code

<On TEDS Calibration>

Saves 64bit Registration Number

<On Equivalent Input, Real Load Calibration>

Clears 64bit Registration Number with zero

13. Operation on Power On

When the power is turned on with the following keys pressed, the specified operation check is performed.

Operation	Key	Check Items
Self Check	ESC	Internal RAM External SRAM SC10 (EEPROM) SC11 (DS2480B)
Self Check & Setting to Default (Init. Factory Setting)	ESC + ENTER	Internal RAM External SRAM SC10 (EEPROM) SC11 (DS2480B)

Display during Self Check:

- **C-000** Internal RAM Read Write Check
- **C-001** External SRAM Read Write Check
- **C-002** SC10 (EEPROM) Read Write Check
- **C-003** SC11 (DS2480B) Communication Check

14 Warranty

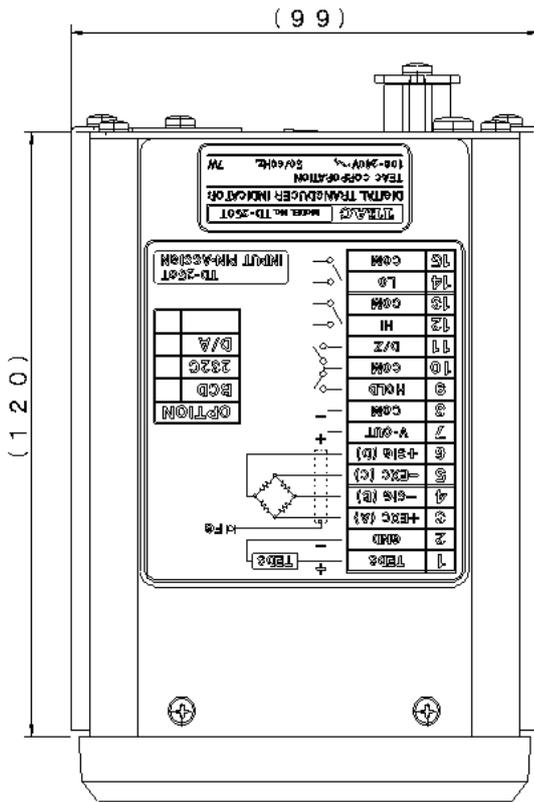
TEAC warrants that TD-250T has been manufactured in accordance with the prescribed specifications and is free from defects in material and/or workmanship.

If any non-conformity to the specifications or defect in material and/or workmanship is found during the warranty period, contact our sales department or the dealer from whom you purchased our product.

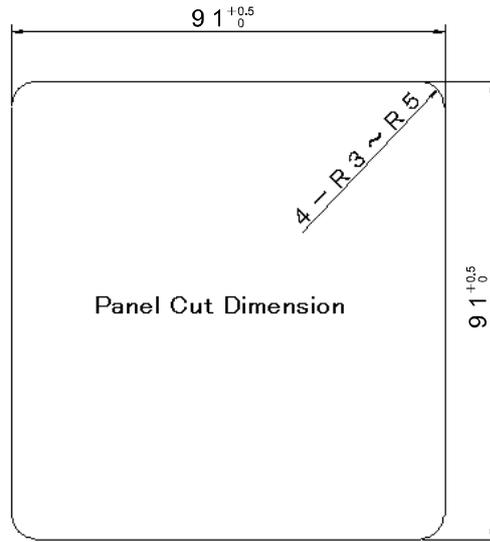
15. Specifications

- 1) Excitation Voltage : DC10V, 2.5V \pm 10%
Current : 120mA when using DC power option (30mA)
- 2) Signal I/O range : 0 \sim \pm 3.0mV/V
- 3) Equivalent Input/TEDS
Calibration Range : 0.3 \sim 3.0mV/V
Calibration Accuracy : 0.1%F.S. or less @ sensitivity 0.5mV/V or more
- 4) Zero Adj. Range : 0 \sim \pm 2.0mV/V
- 5) Min. Input Sensitivity : 1 μ V/count
Guaranteed 1/10000 @ 1mV/V or more input
- 6) Accuracy Non-Linearity : 0.02%F.S. or less @ input 1mV/V or more
Zero Drift : 0.5 μ V/ $^{\circ}$ C or less (input converted value)
Gain Drift : 25ppm/ $^{\circ}$ C F.S. or less
- 7) A/D Conversion Rate : 100 times/sec
- 8) Analog Filter : 4, 10, 100Hz(default), 3KHz
Selectable on the front panel
- 9) TEDS Function : IEEE1451.4 Class2 Mix Mode Interface
- 10) Peak Hold Function (Analog and Digital Methods)
Response Speed : Approx. 1KHz (Width 2mS : 3mV/V Input @ Analog Filter 3KHz)
Accuracy : 0.2% FS or less
Reset Time : 50 μ s or less
- 11) Display Char. Height : 16mm 7 segments red LED, 5 digits numeric display
Display Range : \pm 19999
Decimal Point : Selectable
Display Cycle : 3, 6, 13 or 25/sec
- 12) Display Items Status : HI, OK, LOW, PEAK, HOLD, CALIBRATION LOCK, SETTING LOCK LED 7
- 13) Setup Items CAL Setup : Zero CAL/Span CAL (TEDS CAL, Real Load CAL, Equiv. Input CAL)
Function Setup : High Limit, Low Limit, High/Low Limit Comp. Mode, Hysteresis, Zero Vicinity, Digital Filter, Analog Filter, Motion Detect, Zero Tracking, Digital Zero, Zero Offset, Hold Mode, Key Lock, Minimum Scale, Display Cycle, Excitation Voltage, B.C.D. Refresh Rate, RS-232C, D/A Converter
- 14) External Signal : High/Low Limit Relay Contact Output, Analog Voltage Output
Hold Signal Input, Digital Zero Signal Input
- 15) Options : B.C.D. Parallel Data Output TD-250T03
RS-232C Interface TD-250T04
D/A Converter Voltage Current Output TD-250T07
- 16) Power Supply : AC85V \sim 264V Approx. 7W
DC10V \sim 28V Approx. 9W (Option)
- 17) Ambient Condition Temp. : Operation -10 \sim +40 $^{\circ}$ C
Storage -40 \sim +80 $^{\circ}$ C
Humidity : 85% RH or less (non-condensation)
- 18) Dimensions : 96W x 96H x 146D (mm) (excluding protrusion)
- 19) Weight : Approx. 1Kg
- 20) Accessories : AC cable 3m
CD-ROM Operation Manual 1
Quick Operation Manual 1
B.C.D. Output Connector Plug 57-30360 DDK 1
when B.C.D. Option is used
Ferrite Core B.C.D when D/A Option is used
- 21) Standard EMC : VCCI (class A)
EN61326 (class A) EN61000-3-2
EN61000-3-3
Safety Standard : EN61010-1

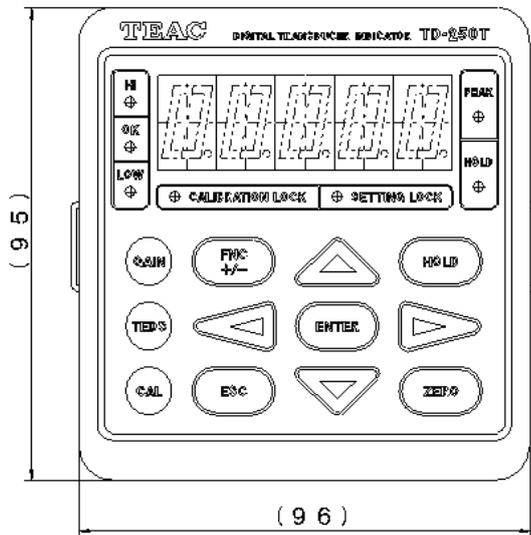
16. External View



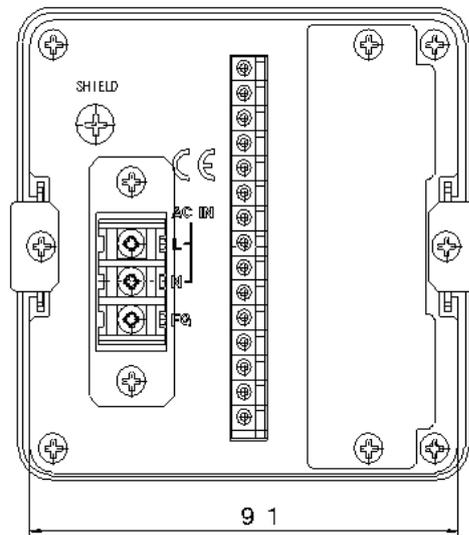
(Top)



※ Recommended Thickness
1.6mm~3.0mm



(Front)



(Back)