

COMPACT
DIGITAL INDICATOR
WDS-180A
INSTRUCTION MANUAL

Thank you for purchasing KYOWA's product WDS-180A (Compact Digital Indicator).

Read this Instruction Manual carefully in order to make full use of the high performance capabilities of the product.

Do not use the product in methods other than described in this Manual.

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SAFETY PRECAUTIONS

PRIOR TO USE

This Manual describes detailed instructions for installing and setting up the WDS-180A Compact Digital Indicator (hereinafter referred to as the WDS-180A).

For safe use of the WDS-180A, do not forget to read the 'Safety Precautions' prior to use.

KYOWA ELECTRONIC INSTRUMENTS CO., LTD. assumes no liability for any damages resulting from user's failure to comply with the safety precautions.

SAFETY SYMBOLS

For safety operation of the WDS-180A, the following '**WARNING**' and '**CAUTION**' symbols are used in 'Safety Precautions' of this Instruction Manual.

 WARNING	Improper operation of the system may result in death or severe injury of the operator.
 CAUTION	Improper operation of the system may result in injury of the operator and physical damage of the system.

In addition, items in  **CAUTION** may lead to serious consequences. Take special attention to the Safety Symbols.

Safety Symbols	
	Indicates 'Handling Precautions.' This symbol is attached to the WDS-180A when it requires to refer to the Instruction Manual for securing safety of the operator and the product.
	Indicates 'Protective Ground Terminal.' Always connect to ground before operating the product.



WARNING

- 1) Installation and wiring work should be conducted more than 3 seconds after power OFF.
Or, electric shock hazard or damage of the product may result.
- 2) Special care should be taken not to use the WDS-180A in environment with inflammable gas or vapor.
Or, fire hazard may result.
- 3) If the WDS-180A is faulty, emitting smoke or offensive odor, or producing abnormal sound, immediately turn OFF the power. Or, electric shock or fire hazard may result. Contact KYOWA or our representative for repair.
- 4) Do not put water or foreign matters into the WDS-180A. In case if any foreign matters are entered, immediately turn OFF the power. Or, electric shock or fire hazard may result. Contact KYOWA or our representative for repair.
- 5) Always operate the WDS-180A with batteries specified in this Instruction Manual.
Or, electric shock or fire hazard may result.
- 6) Do not operate the WDS-180A in environment with excessive moisture, dust or oil dust.
Or, electric shock or fire hazard may result
- 7) Do not disassemble the WDS-180A.
Or, deterioration or malfunction of the instrument may result.



CAUTION

- 1) Before wiring, always confirm the rated power voltage of the WDS-180A and terminal arrangement. Then, conduct wiring in the correct manner.
- 2) Special care should be taken when using the WDS-180A in environment with excessive vibration.
If the WDS-180A is operated at a location with excessive vibration or with continuous vibration, it may cause measurement error and/or failure of the instrument. Take care not to drop it during transportation and avoid applying strong impact.
- 3) Basically, the WDS-180A is designed to be used by connecting a strain gage transducer to the input terminal.
When using the WDS-180A combined with other than the above, contact KYOWA or our representative.
- 4) Operate the WDS-180A by conforming to operating environment specified in this Instruction Manual. Or, malfunction and/or failure of the instrument may result.
- 5) When the all characters flicker, the battery is running low.
Immediately stop measurements and replace the battery with a new one. Or, it may cause malfunction.

1. OUTLINE

The WDS-180A is a compact and lightweight digital indicator specified for strain gage transducers. The WDS-180A is an indicator that not only displays physical quantity of the transducer but measures the initial value of the transducer in [$\mu\text{m}/\text{m}$] or [mV/V] and conducts automatic sensitivity registration when the Transducer Electronic Data Sheet (hereinafter referred to as the TEDS)-compatible transducer is connected. The WDS-180A can be used in wide application such as for checking transducers and simplified measurement.

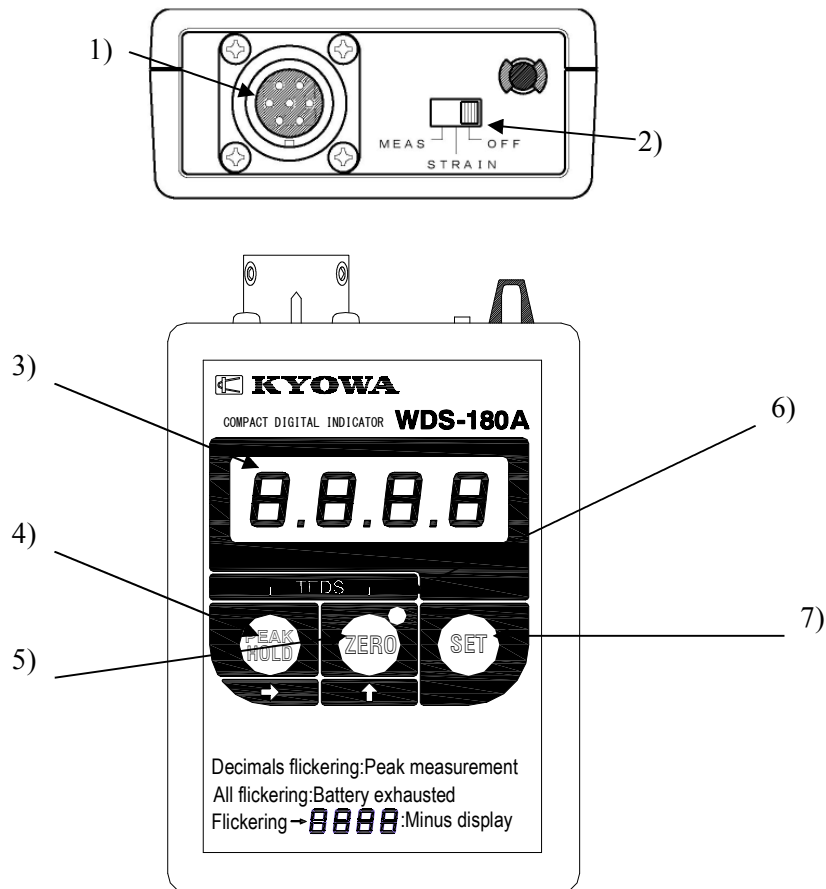
2. FEATURE

- Measures the original value (Unit: [$\mu\text{m}/\text{m}$] or [mV/V]) of the transducer by one-touch key operation.
- Displays physical quantity using the Load CAL (Actual load calibration) and sensitivity registration function.
- When connecting the WDS-180A with the TEDS-compatible transducer automatically registers the sensitivity and measures the data immediately after connection.
- The WDS-180A is lightweight and pocketable enough for field works.
- The WDS-180A can be used for long time by accessible 2 size AA batteries.

3. CONFIGURATIONS

WDS-180A Compact Digital Indicator	1
Size AA battery	2
Strap Installing Ring	1
Instruction Manual	1
Unit Seal	1
Calibration Sheet and Warranty	1

4. PARTS NAMES AND MAIN FUNCTIONS



- | | |
|--------------------------------|---|
| 1) Input Connector: | Connects the strain gage transducer. |
| 2) Power Switch: | OFF: Turns the WDS-180A OFF.
STRAIN: Strain Measuring Mode
MEAS: Displays physical quantity converted data. |
| 3) Indicator: | Displays 4 digits numerical value. |
| 4) PEAK HOLD Key: | Moves function No. , decimal point, or digit.
For PEAK HOLD operation. |
| 5) ZERO Key: | Changes numeric value. Conducts ZERO .
To confirm function settings. |
| 6) LED: | Lights up when ZERO key is pressed. |
| 7) SET Key: | Sets and determines functions. |

Note: Indicator flickers as follows.

Only all decimal point flickers	Peak holding.
All character flicker	The battery is running low.
	Immediately replace the battery with a new one.
“-” of the left end symbols flickers	In minus status.

5. CONNECTING TRANSDUCER

- Connect the transducer to the input connector.
- Applicable connector: PRC03-12A10-7M10 (TAJIMI ELECTRONICS Co.,LTD. made)
- Pin Nos. of the connector is as follows.

(Cables are separately colored based on typical KYOWA transducer cable.)

A: + side of the bridge excitation (Red)

B: - side of the bridge output (White)

C: - side of the bridge excitation (Black)

D: + side of the bridge output (Green)

E: Shield wire

F: TEDS (+)

G: TEDS (-)

Note: Do not connect signals other than TEDS to the TEDS terminal. In addition, when using other than TEDS-compatible transducer, do not connect anything.
Or, it may cause troubles.

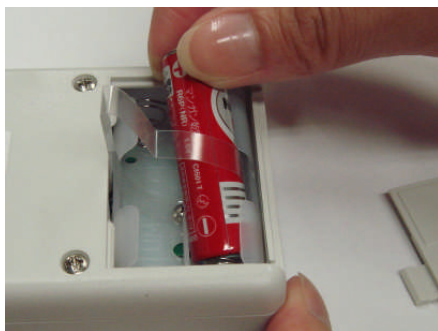
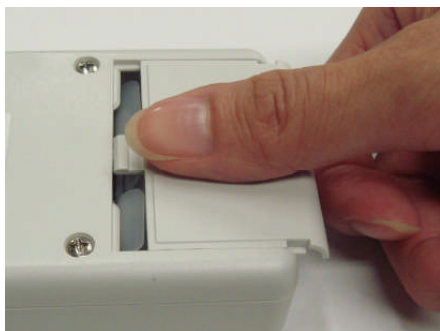
- Use as short as possible shield cable for wiring the transducer.
In addition, avoid locating the transducer from the wiring of electronic power system and noisy cable.
- The bridge excitation voltage of the WDS-180A is approximately 1 volt.
Check the recommended applied voltage of the transducer is 1 volt or more.

6. INSTALLING AND REMOVING BATTERY

Push down and open the battery case cap on the WDS-180A rear.

Locate and correctly insert accessory or commercially available size AA batteries in the battery case center band mentioned on the battery case.

Pull out the band to remove the batteries. Then batteries automatically come out.



Note: Customers are required to remove used batteries or batteries when not using the WDS-180A for a long period of time. Or, batteries may leak and connection terminal may corrode.

- Battery continuous use time

(With 120 ohm transducer connected, when batteries are used with LED OFF at room temperature 25°C)

Manganese battery: 24 hours or more

Alkaline battery: Approximately 100 hours

- To remind you to turn the WDS-180A OFF, setting the 'Auto-Power OFF (F-5)' is recommended.
The initial value is not set.

7. SETTING OPERATION AND FUNCTION

The WDS-180A is provided with 'STRAIN Mode (STRAIN)' that measures the actual output of the strain gage transducer and 'MEAS Mode (MEAS)' that displays physical quantity by multiplying coefficient.

7-1 SWITCHING STRAIN UNIT (F-1)

- The WDS-180A displays the output of the strain gage transducer in [$\mu\text{m}/\text{m}$] or [mV/V].
The unit is also used in the STRAIN mode and Sensitivity Calibration. Prior to use, set the unit to either of [$\mu\text{m}/\text{m}$] or [mV/V].
- The setting can be changed by [F-1] mode.
Please check the switching method, see "9. FUNCTION SELECTING MODE SETTING LIST."
Since the unit does not appear, use the accessory unit seal.

Note: To confirm the function settings, press **ZERO** key to go back to the normal number display.
Pressing **SET** key in the function menu is not enough to confirm function settings.

7-2 STRAIN MODE

Measures raw output of the strain gage transducer.

- 1) Power ON with the Power switch to set to 'STRAIN.'
Displays the raw output of the strain gage transducer in [$\mu\text{m}/\text{m}$] or [mV/V].
The red LED lights up when power on if the **ZERO** is conducted before power off.
To cancel or shift the indicated value to '0,' see the following item 2).

 $\mu\text{m}/\text{m}$: An integer with no decimal point appears.
 mV/V : A decimal point located in the 4th digit (.000) flickers.
- 2) Press the **ZERO** key to conduct the **ZERO**.
The red LED lights up and '0' appears as the indicated value.
To cancel, press the **ZERO** key once again. The red LED lights out and the value shifted to '0' is cancelled.
The displayed value with the red LED OFF is the 'Original value (Real output of the transducer.)'
- 3) Press the **PEAK HOLD** key to conduct the **PEAK HOLD**.
Decimal point positions of digits other than decimal point flickers and the maximum value appears.
To cancel, press the **PEAK HOLD** key once again. Flickering ends and the current value is cancelled and cleared.

Note: When the power is turned OFF, the PEAK HOLD measurement is cancelled.

- 4) Usable functions in STRAIN mode
Only [F-1: Changing strain unit] and [F-5: Auto-Power OFF] can be used.
For setting procedures, see "9. FUNCTION SELECTING MODE SETTING LIST."

Note: Even if the TEDS function is set, it does not operate in this mode.

7-3 MEAS MODE

Converts the output of the strain gage transducer to the physical quantity and displays the converted data.

7-3-1 Calibration

Registers the conversion coefficient for displaying the transducer output in physical quantity. It is essential to conduct either the 'Load CAL (Actual Load Calibration)' or 'Sensitivity CAL (Sensitivity Registration Calibration).'

7-3-2 Preparation for Calibration

- Connecting Transducer: Connect the strain gage transducer.
- Power ON: Set the Power switch to 'MEAS.'
- Conducting **ZERO**: With no load applied to the transducer, press the **ZERO** key.

Note: When conducting the Calibration, be sure to conduct the **ZERO**.

7-3-3 Load CAL (Actual Load Calibration F-2)

Actually applies the existing load and calibrates the transducer.

- Loading: Applies the existing load to the transducer.
- Function: Press the **SET** key to display [F-1].
- Load CAL (Actual Load Calibration): Press the **→** key to display [F-2].
- Rated capacity: Press the **SET** key to display the preset value.
Press the **→** and **↑** keys to set the applied load value by ignoring the decimal point.
Press the **SET** key.
- Decimal point setting: Press the **↑** key to move the decimal point.
Press the **SET** key.
- Setting Ends: [F-2] appears. Press the **ZERO** key to return to the measuring state.

7-3-4 Sensitivity CAL (Sensitivity Registration Calibration F-3)

Registers and calibrates the 'Rated Output and Rated Capacity' of the transducer.

- Function: Press the **SET** key to display [F-1].
- Sensitivity CAL (Sensitivity Registration Calibration): Press the **→** key to display [F-3].
- Rated Output: Press the **SET** key to display the preset value.
 $\mu\text{m/m}$: An integer with no decimal point appears.
 mV/V : A decimal point in the 4th digit flickers.
Press the **→** and **↑** keys to set values in the Calibration Sheet.
Press the **SET** key.
- Rated Capacity: Press the **SET** key to display the preset value.
Press the **→** and **↑** keys to set the Calibration Sheet value by ignoring the decimal point.
Press the **SET** key.
- Decimal Point Setting: Press the **↑** key to move the decimal point.
Press the **SET** key.
- Setting Ends: [F-3] appears. Press the **ZERO** key to return to the measuring state.

7-3-5 Min Digit (Minimum Digit Scale F-4)

Makes the indication stable and offers easy-to-read display.

The Min digit (Minimum digit scale) of the indicated value appears in every 1, 2, or 5 step.

- Function: Press the **SET** key to display [F-1].
- Min Digit (Minimum Digit Scale): Press the **→** key to display [F-4].
Press the **SET** key. The selected value appears and flickers.
Press the **↑** key. Select and set from the 1, 2, and 5 steps.
Press the **SET** key.
- Setting Ends: [F-4] appears. Press the **ZERO** key to return to the measuring state.

7-3-6 AUTO-POWER OFF (F-5)

Prevents wasting of battery power when you forget to turn OFF the power. Automatically turns OFF the power after the preset time from the last key operation. Setting Range: 00 to 99 minutes

- Function: Press the **SET** key to display [F-1].
- Auto-Power OFF: Press the **→** key to display [F-5].
Press the **SET** key. The set value appears and flickers.
Press the **↑** and **→** keys. Select and set from the 00 to 99.
Press the **SET** key.
- Setting Ends: [F-5] appears. Press the **ZERO** key to return to the measuring state.

Note: When the setting time is '00' minute, Auto-Power OFF does not activate.

7-3-7 Digital ZERO

Shifts the indicated value to '0.'

- To conduct the **ZERO**, press the **ZERO** key.
- The red LED lights up and '0' appears as the indicated value.
- To cancel, press the **ZERO** key once again. The LED lights out and the **ZERO** is canceled.

7-3-8 PEAK HOLD

Displays maximum value.

- Press the **PEAK HOLD** key to conduct the **PEAK HOLD**.
- Decimal point positions of digits other than the decimal point flicker and display the maximum value.
- To cancel, press the **PEAK HOLD** key once again. Flickering ends and the **PEAK HOLD** is cancelled.

Note: The **PEAK HOLD** is cancelled when the power is turned OFF.

8. TEDS FUNCTION

By connecting with the TEDS-compatible transducer, automatically conducts the Sensitivity CAL (Sensitivity registration calibration).

There are 'TEDS Data Sensitivity Registration' and 'Calibration File Sensitivity Registration.'

8-1 TEDS DATA SENSITIVITY REGISTRATION

Loads the rated capacity and rated output from the transducer TEDS data, automatically conducts the Sensitivity CAL (Sensitivity registration calibration), also calculates the decimal point position and displays the physical quantity.

Set the transducer to be in no load state as same as when conducting Sensitivity CAL (Sensitivity registration calibration). Conduct TEDS loading to conduct the Sensitivity CAL (Sensitivity registration calibration). The TEDS loading operation is set with the 'F-7' setting. When the 'Conducting **ZERO** after the TEDS operation' is set to '0: Conduct', after the Sensitivity CAL (Sensitivity registration calibration), the WDS-180A conducts **ZERO** to display '0.' Then, the measurement can be started immediately.

8-2 CALIBRATION FILE SENSITIVITY REGISTRATION

Loads the serial No. from the transducer TEDS data, selects the same serial No. file from the WDS-180A inner saved calibration file and automatically sets the rated output, rated capacity, decimal point position, zero value and minimum scale when registering the sensitivity.

When converting and using the transducer capacity or when obtaining initial zero is not available due to the applied load, by using the already registered calibration data, the measurement can be easily conducted.

1) Conducting TEDS loading

Conduct TEDS loading in the following procedure.

- TEDS Key Operation: Press **PEAK HOLD** and **ZERO** keys at the same time.
- If '---' appears, press **PEAK HOLD** and **ZERO** keys.
- 'ld' appears and automatically sets the sensitivity registration calibration.
- Automatically conducts TEDS loading when power ON:
Capable by Setting TEDS loading operation [F-7].

2) Selecting TEDS function (F-10)

Sets TEDS function in the 'TEDS Data Sensitivity Registration' or 'Calibration File Sensitivity Registration.'

- Function: Press the **SET** key to display [F-1].
- Calibration File Operation: Press the **→** key to display [F-10].
Press the **SET** key.
The preset value appears.
 - 0: 'TEDS Data Sensitivity Registration'
Registers the sensitivity by the transducer TEDS data.
 - 1: 'Calibration File Sensitivity Registration'
Registers the sensitivity by the Calibration file.Press and set with the **↑** key.
Press the **SET** key.
- Setting Ends: [F-10] appears. Press the **ZERO** key to return to the measuring state.

8-3 TEDS DATA SENSITIVITY REGISTRATION

The TEDS data sensitivity registration is an automatic sensitivity registration function which automatically sets the 'rated output, rated capacity and decimal point' by loading the TEDS data. Set the loading operation in the following procedure.

8-3-1 Setting TEDS Loading Operations (F-7)

Conduct or prohibit the following functions.

For setting procedures, see "9. FUNCTION SELECTING MODE SETTING LIST."

- 1) TEDS operation when power ON
When power ON in MEAS mode, automatically loads the TEDS data.
The initial value is set to '1: Prohibit.'
- 2) Conducting **ZERO** after the TEDS operation
When conducting the 'TEDS loading,' conducts **ZERO** to display '0.'
The initial value is set to '1: Prohibit.'
- 3) Rated output and rated capacity
Sets the loading execution and loading prohibition to the respective rated output and rated capacity.
The initial value is set to '0: Conduct.'

Note 1: The digital zero conducted at the TEDS operation is the standard point and is equally regarded as the calibrating zero.

Note 2: When rated output and rated capacity are set to '1: Prohibit,' the previously loaded value (Registered in the F-3) is used for calculation.

8-4 CALBRATION FILE SENSITIVITY REGISTRATION

By using the serial No. from the data obtained by the TEDS data loading, call up the same serial No. calibration file from the saved calibration file (Maximum 32 files) saved in the WDS-180A and automatically registers the rated output, rated capacity, decimal point, zero value, and Min digit when registering the sensitivity.

Reference: By using this function, the measurement can be conducted with ease when the rated capacity unit is converted or when conducting **ZERO** is not available.

8-4-1 Creating Calibration File

Set the calibration value to the WDS-180A to conduct correct measurement.

- Connect the TEDS transducer.
- With no load applied to the transducer, press the **ZERO** key to display '0.'
- Change and set the calibration value by loading the 'TEDS Data Sensitivity Registration' or by the Load CAL (Actual load calibration) or Sensitivity CAL (Sensitivity registration calibration) functions. In addition, set the minimum scale as required.
For setting procedures, see "8-3 TEDS DATA SENSITIVITY REGISTRATION" and "7-3 MEAS MODE."

8-4-2 Registering File (F-11)

Currently set calibration value and set value are saved in the file No. (1 to 32) by the 'Operating Calibration File' (F-11.)

Contents of the above saved items are Serial No., rated capacity, rated output, decimal point, zero value, and Min digit.

(Clearing file is also conducted with this function.)

- Function: Press the **SET** key to display [F-1].
- Calibration File Operation: Press the **→** key to display [F-11].
Press the **SET** key.
Preset status '1), 2), 3), and 4)' appear.
 - 1) Tenth digit of the file No. (0 to 3)
 - 2) First digit of the file No. (1 to 9)
 - 3) Presence or absence of data (Display only)
 - 0: Absence
 - 1: Presence
 - 4) File Registration
 - 0: Stop
 - 1: Register (When the above 3)=0)
 - 2: Overwrite (When the above 3)=0 and 1)
 - 3: Clear

Press the **→** and **↑** keys to set digits.
Press the **SET** key.

- Ends Setting: [F-11] appears.
Press the **ZERO** key to return to the measuring state.

Registering the same serial No. is prohibited. When the serial No. is already registered, the file No. flickers. At this time, clear the flickering file No. to register.

Note 1: When the zero value of this file is set as standard, be sure to set the Setting TEDS Loading Operations to '1: Prohibit.'

When '2: Conduct' is selected, '0' appears.

Note 2: The WDS-180A can not connect multiple TEDS transducers at the same time.

Displays error and no TEDS function is conducted.

Note 3: For details of each error, see "10. ERROR CODE TABLE."

9. FUNCTION SELECTING MODE SETTING LIST

- Press the **SET** key more than 3 seconds in the measuring state. [F-1] appears to activate the function selecting mode.
- For changing the function, press the $\rightarrow$ key to display the target mode.
- Pressing the **SET** key displays setting contents.
- After changing the setting contents (Displaying [F-*]), press the **ZERO** key to return to the measuring state.

Mode	Key Operation and Movement	Description
F-1 Changing Strain Unit (Initial Value: $\mu\text{m}/\text{m}$)	Every time the $\rightarrow$ key is pressed, the unit switches. $\mu\text{m}/\text{m}$ Displays with no decimal point. mV/V Displays the decimal point at the 4th digit (.000). After determine the unit, press the SET key.	• Set output unit of the transducer. [$\mu\text{m}/\text{m}$]/[mV/V] • The display flickers with the original value.
F-2 Load CAL (Actual Load Calibration)	Press the $\rightarrow$ and $\uparrow$ keys to set the applied load value by ignoring the decimal point. Press the SET key. Press the $\uparrow$ key to move the decimal point. Press the SET key.	• Calibrates the transducer by using the actual load. Prior to conduct the Load CAL (Actual load calibration), • Set the transducer to be in no load state and press ZERO key to display '0.' • Apply the existing load to the transducer.
F-3 Sensitivity CAL (Sensitivity Registration Calibration) (Initial Value: 9000 $\mu\text{m}/\text{m}$ 9000 display with no decimal point)	• The rated output (Set value) appears in [$\mu\text{m}/\text{m}$] or [mV/V]. Press the $\rightarrow$ and $\uparrow$ keys to set the rated output of the Calibration Sheet. Press the SET key. • The rated capacity (Set value) appears. Press the $\rightarrow$ and $\uparrow$ keys to set the rated capacity of the Calibration Sheet by ignoring the decimal point. Press the SET key. • The decimal point (Preset value) appears. Press the $\uparrow$ key to move the decimal point. Press the SET key.	• Set the rated output and rated capacity of the transducer to calibrate the transducer. Prior to conduct the Sensitivity CAL (Sensitivity registration calibration), • Set the transducer to be in no load state and press ZERO key to display '0.'
F-4 Min Digit (Minimum Digit Scale) (Initial Value: 1)	The set value appears and flickers. Press the $\uparrow$ key and set desired digit, 1, 2, or 5. Press the SET key.	• Stables the indication when the Min Digit (Minimum digit scale) is unstable.
F-5 Auto-Power OFF (Initial Value: 00)	The preset value appears and flickers. Press the $\rightarrow$ and $\uparrow$ keys. Select and set from 00 to 99. Press the SET key.	• Function that reminds you to turn OFF the power. • When 00 appears, the Auto-Power OFF does not activate.

10. ERROR CODE TABLE

Error message	Contents	Countermeasures
IdEr	Failed to communicate with a TEDS-compatible sensor.	Make sure TEDS-compatible sensors are connected.
noEr	The serial No. (****) does not exist.	Make sure serial Nos. are correct.
oL	The indicating value is exceeding the input range.	Exceeding the input range. Use the input signal within $\pm 5\text{mV/V}$.
Ad	Sensor cables are not connected.	Make sure wirings are correct.
Err	Calibration constants are incorrect.	Make sure the E value sensitivity is $\times 10$ to $\times 0.01$ (excluding decimal point) against input strains ($\mu\text{m/m}$).
Er02	The target file has data.	Clear (3) or overwrite (2) the data.
Er03	Failed to calibrate TEDS data.	TEDS data is incorrect. Do not use TEDS data.
Er00	Failed to load data files or incorrect data.	If the same error message appears, contact Kyowa or our representatives. When requesting repair, always give error statuses and error messages.
Er01	Failed to write EEPROM while saving data files.	
Er04	Failed to write EEPROM while overwriting data files.	
Er06	Failed to write EEPROM while clearing data files.	
EP0 to EP7	EEPROM area is not working properly.	Failure Contact Kyowa or our representatives. When requesting repair, always give error statuses and error messages.

11. SPECIFICATIONS

Applicable Transducer	Strain Gage Transducer with full bridges Input Resistance: 60 to 1000 ohm
Bridge Excitation	Approximately 1 VDC (Constant)
Input Range	$\pm 10000 \mu\text{m/m}$ ($\pm 5.0 \text{ mV/V}$) including zero adjustment range Strain: Within $\pm 9999 \mu\text{m/m}$
Sampling	Approximately 3 times/sec
Sensitivity Registering Function	Load CAL (Actual Load Calibration) Sensitivity CAL (Sensitivity Registration Calibration) TEDS CAL
TEDS Function	TEDS Data Sensitivity Registration Calibration by loading the data of TEDS-compatible transducer. Calibration File Sensitivity Registration Calibration by the inner saved Calibration file.
Zero Function	Conducts digital zero within the input range
Display	7-segment type LCD -9999 to 9999
Display accuracy.....	$\pm(0.05\% \text{rdg} + 5 \text{digit}) \mu\text{m/m}$
Display Switching Function	$\mu\text{m/m}$ or mV/V
Mode	STRAIN Mode: Displays either unit [$\mu\text{m/m}$] or [mV/V]. MEAS Mode: Displays physical quantity by using the calibration function.
Min Digit (Minimum Digit Scale) ..	1, 2, and 5 steps selectable. (When in MEAS mode)
PEAK HOLD	Digitally maintains the maximum value during the measurement.
Auto-Power OFF	Set to '1 to 99' minutes or '00.'
Operating Temperature Range	-5 to 40°C
Operating Humid Range	20 to 85% RH (Non-condensing)
Battery	Size AA battery: 2
Operating Time	Continuously approximately 24 hours (With 120 ohm transducer connected, when manganese batteries are used with LED OFF at room temperature 25°C)
Dimensions	66.5 (W) $\times$ 92 (H) $\times$ 28 (D) Protruded portion not included
Weight	Approximately 180 g
Optional	Voltage Monitor Output Terminal

12. EXTERNAL VIEW

