

MODEL : DN-9000 ( ver 2.1 )  
OVER LOAD LIMITER

# User Manual



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# Contents

1. Characteristics .....	2
1-1. Mid-High Speed Changing Method .....	2
1-2. Correction Method .....	2
1-3. Output .....	2
1-4. Data Back-up .....	2
1-5. Watch dog .....	2
1-6. Option .....	2
1-7. Detection function for LOAD CELL LINE ERROR.....	2
1-8. Power .....	2
2. Specification .....	3
3. Front Face Panel .....	4
4. Terminal Board.....	5
5. Cabling Draw.....	6
6. Setting mode .....	7
6-1. Function mode .....	7
6-2. Actual load calibration .....	12
7. Product Inspection .....	13
8. OPTION (OP-02, OP-03)	
Option 02 (RS232C) .....	14
Option 03 (RS485) .....	16

## **1. Characteristics**

Thank you for choosing our product. Please refer to the User Manual or contact us when you have any problem while you are using our product.

### **1-1. Mid-High Speed Changing Method**

24bit high speed A/D changing equipment which could detect input signal of sensor at the speed of 1,000 times per second is being used.

### **1-2. Correction Method**

Correction method as actual load (Standard load) has applied.

### **1-3. Output**

The value of alarm & stop relay could be settled from the Key under over load, and the signal of contact point shall be output.

### **1-4. Data Back-up**

Input data shall not be restored due to power failure, because all the setting values shall be stored on flash memory.

### **1-5. Watch dog**

This is automatic reset function when the system has stopped by external causes such as noise and etc.

### **1-6. Option**

As addition options, RS232C, RS485 and Analog output could be used.

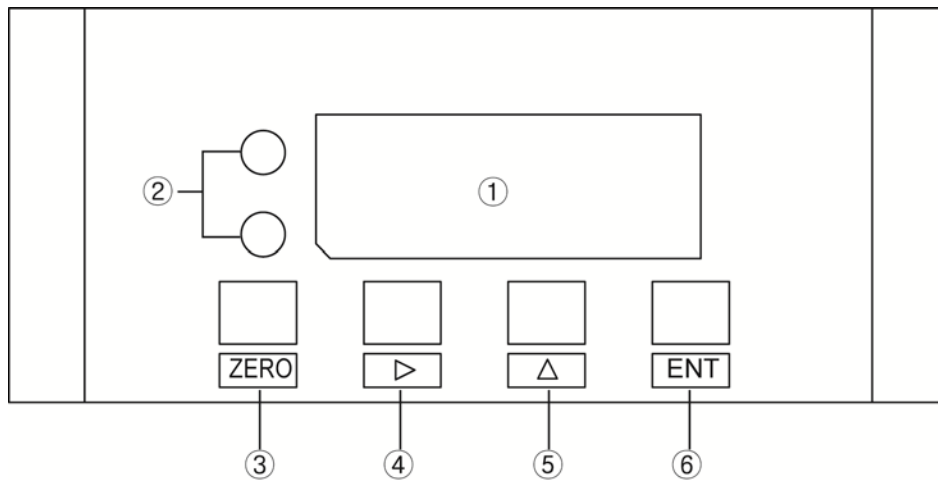
### **1-7. Power**

The power is AC 90 ~ 240V 50/60Hz as Free voltage.

## 2. Specifications

- Usable Sensor : Strain gauge type sensor (Bridge 120Ω, 350Ω, 700Ω)
- Max. Indication : -19999 ~ +99999
- A/D Changer : 24bit, 1000 times/sec
- Temperature Characteristic (Amp Characteristic)
  - Zero : 0.5μV/°C
  - Span : 50ppm/°C
- Front Face Panel
  - Measuring Value Indication : 7 segment 5 Digit, Height of Letter 14mm
  - Status Indicating LED : Red LED 2 EA
  - Key Switch : 4 EA
- Output
  - Comparison Output : A side, B side, Total Load  
OVER LOAD Alarm, Stop output  
Contact Point Capacity AC 250V 5A
- Range of Using Temperature : -10°C ~ 60, Under 82% RH (No freezing)
- Power : AC 90 ~ 240V, 50/60Hz free voltage
- Option : RS232C (OP-01), RS485 (OP-02), RS422 (OP-03),  
4~20mA or 0~10V (OP-04)

### 3. Front Face Panel



① Measuring Value Indication: It indicates measuring value and other values.

② Over load alarm and stop indication lamp

③ ZERO KEY3

Measuring Mode: If you push the Key for over 3 seconds, the current value shall be changed as Zero.

Set Mode: If you push the Key on the function setting mode, the measuring mode shall be recovered.

④ ►

Measuring Mode: If you push the Key, the setting value of Relay is being shown and could be changed.

Set Mode: The line as location for flash figures shall be moved.

⑤ ▲

Measuring Mode: If you push the Key, the mode for actual load correction shall be operated.

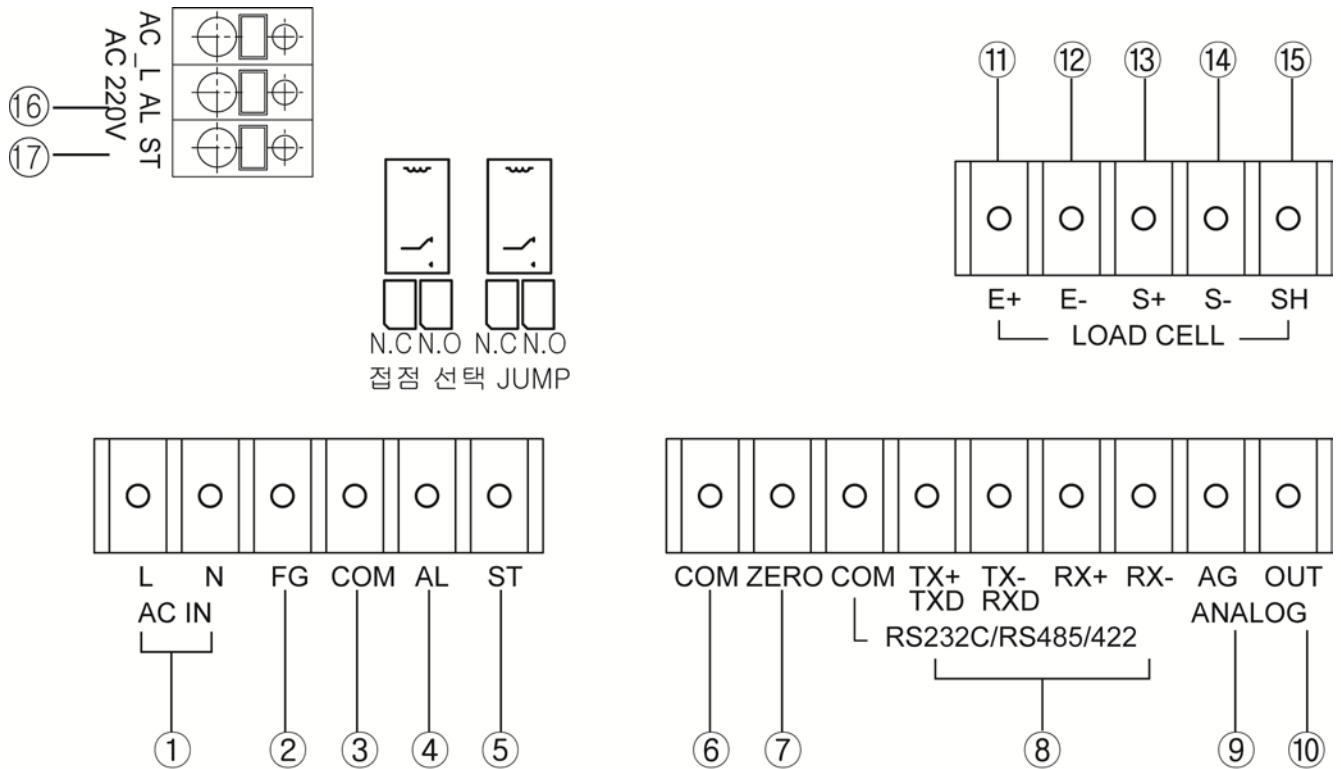
Set Mode: The flash figure shall be increased by 1 figure (number).


⑥ ENT

Measuring Mode: If you push the Key, the function mode shall be operated.

Set Mode: The setting value shall be saved.

## 4. Terminal Board



- ① AC IN : Power Cable Connection Terminal
- ②  FG : Earth Terminal (Please contact earth separately)
- ③ COM : RELAY output common terminal
- ④ ALARLM : Over Load ALARM output terminal
- ⑤ STOP : Over Load STOP output terminal
- ⑥ RY3 : RELAY3 output terminal
- ⑦ ZERO : ZERO input terminal
- ⑧ DG, TXD, RXD : RS232C /RS485/RS422 SERIAL INTERFACE
- ⑨ AG: Analog output GND terminal
- ⑩ OUT : Analog output terminal
- ⑪ EXC+ : Sensor supply voltage + connection terminal
- ⑫ EXC- : Sensor supply voltage - connection terminal
- ⑬ SIG+ : Sensor output signal + connection terminal
- ⑭ SIG- : Sensor output signal - connection terminal
- ⑮ SH: SHIELD of Sensor connection terminal
- ⑯ AL : ALARM LAMP output terminal
- ⑰ ST : STOP LAMP output terminal

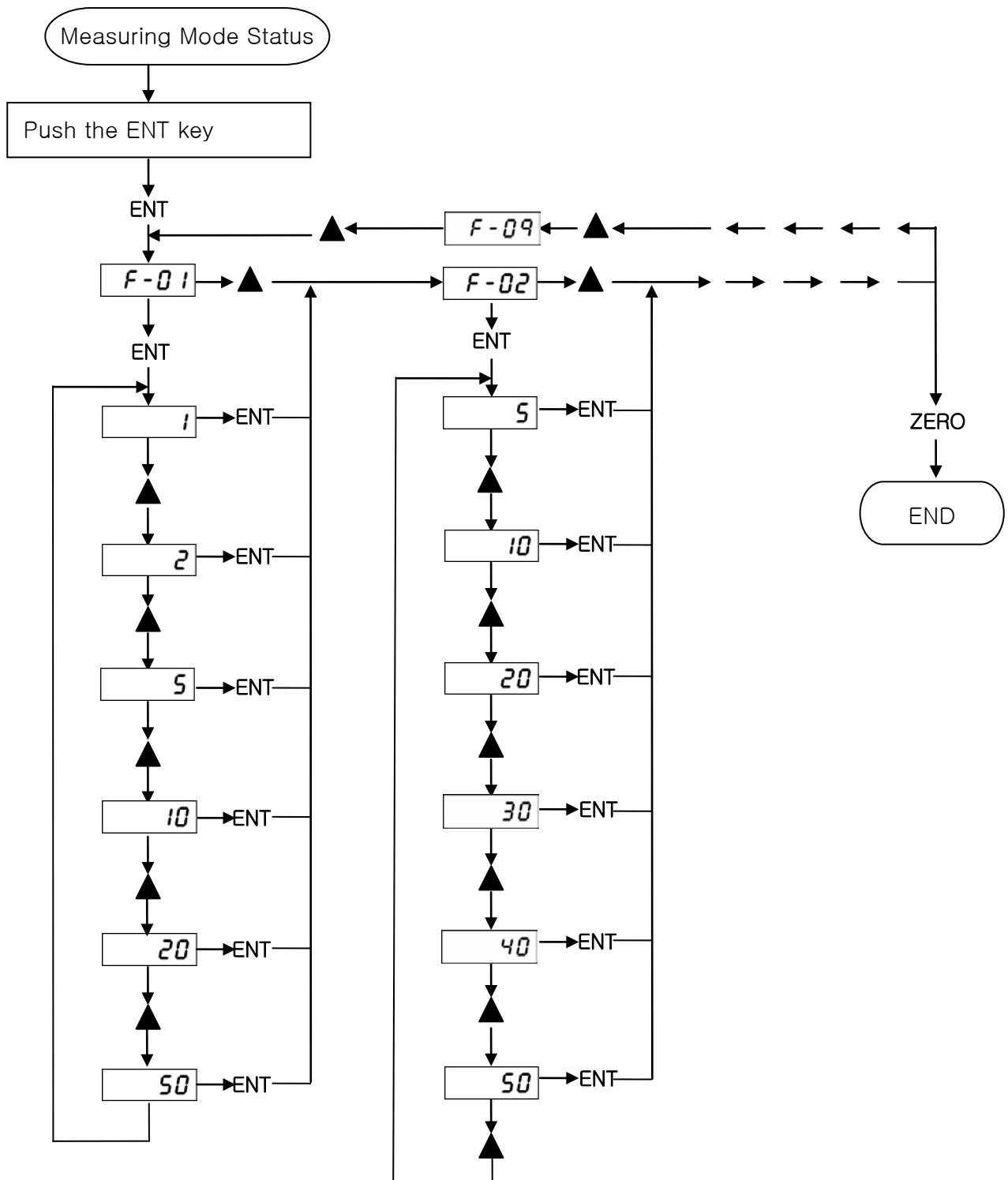
◀ Notice ▶

1. Please plug the power out during the cabling.
2. The earth (⊕ terminal) shall be made by big size of cable to protect shock voltage or obstacle against surge, and the earth shall be made separately if possible.  
(It shall be used in the place of high level of noise, and if the earth is being made with other machine, the noise will be affected.)
3. Please confirm the function of terminal and connect cables to protect failure of operation in advance.
4. In the event of accident which has made by intentionally disjoint and modification without consent of the Company, the responsibility shall be borne by the User and A/S shall not be made.

## 5. Setting Modes

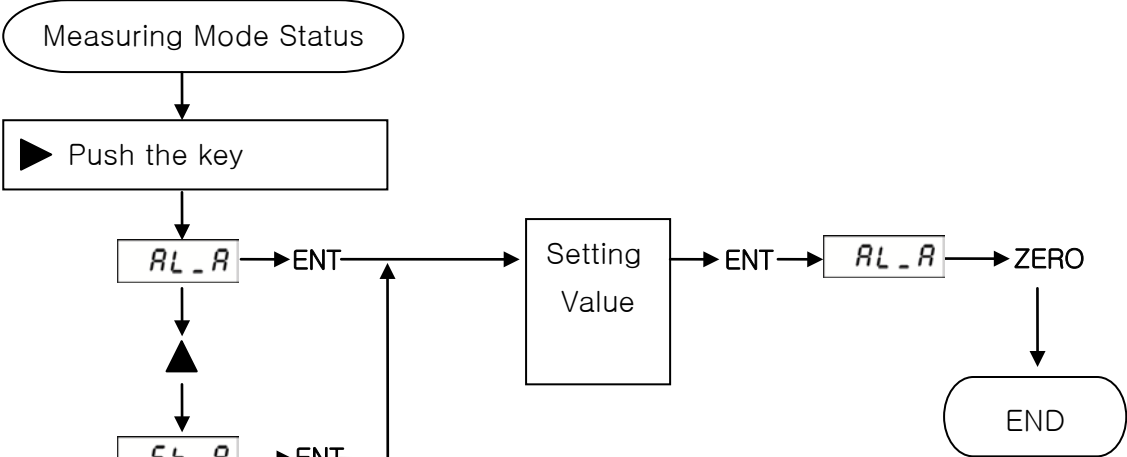
### 6-1. Function mode (Function Setting)

#### 1) Function setting method





2) OVER LOAD ALARM, STOP Output Value Setting Method



**RL\_A** "A" side Over load alarm Setting Value  
**St\_A** "A" side Over load stop Setting Value

# Function mode list #

			기준설정값
F-01	Division	1, 2, 5, 10, 20, 50	1
F-02	Display filter	0.05, 0.25, 0.50, 1.00, 1.50, 2.00sec	1.00
F-03	Buzzer setting	0, 1	1
F-04	Relay Delay time	0 ~ 9.9 sec	1.0
F-05	DAC capacity	0 ~ 9999	1000
F-08	ID Number	0 ~ 32	0
F-09	Baud rate	2400, 4800, 9600	9600
F-10	Pass word	0 ~ 9999	0000

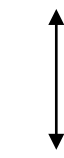
F-01. Division (Setting of Indication as Minimum Unit)

(Standard Setting Value: 1)

1	Indicates as 1 unit (0, 1, 2, 3, 4 …….)
2	Indicates as 2 unit (0, 2, 4, 6, 8 …….)
5	Indicates as 5 unit (0, 5, 10, 15 …….)
10	Indicates as 10 unit (0, 10, 20, 30 …….)
20	Indicates as 20 unit (0, 20, 40, 60 …….)
50	Indicates as 50 unit (0, 50, 100, 150 …….)

F-02. Display filter (setting Display speed)

(Standard Setting Value: 5)

0.05	<div style="text-align: center;"> <p>Speedy</p>  <p>Slow</p> </div>
0.25	
0.50	
1.00	
1.50	
2.00	

### F-03. Inside Buzzer setting mode

(Standard Setting Value: 1)

0	Buzzer off
1	Buzzer on

### F-04. Relay Delay time mode

(Standard Setting Value: 1.0)

00 }	00 : N/A
9.9	0.1 ~ 9.9 : Unit as sec for setting of delayed time of output operation (0.1 sec ~9.9 sec)

### F-05. DAC capacity (Analog Output value Setting) (option)

(Standard Setting Value: 10000)

0 }	Setting of rating capacity for analog output <Cases of Setting Value and Output>																						
+99999	<table border="1"> <thead> <tr> <th rowspan="2">Setting Value</th> <th colspan="2">Voltage Output (<math>\pm 10V</math>)</th> <th colspan="2">Current Output (4 ~20mA)</th> </tr> <tr> <th>Indicating Value</th> <th>Output</th> <th>Indicating Value</th> <th>Output</th> </tr> </thead> <tbody> <tr> <td rowspan="3">+10000</td> <td>-10000</td> <td>-10V</td> <td>-10000</td> <td>-</td> </tr> <tr> <td>0</td> <td>0V</td> <td>0</td> <td>4mA</td> </tr> <tr> <td>+10000</td> <td>+10V</td> <td>+10000</td> <td>20mA</td> </tr> </tbody> </table>	Setting Value	Voltage Output ( $\pm 10V$ )		Current Output (4 ~20mA)		Indicating Value	Output	Indicating Value	Output	+10000	-10000	-10V	-10000	-	0	0V	0	4mA	+10000	+10V	+10000	20mA
Setting Value	Voltage Output ( $\pm 10V$ )		Current Output (4 ~20mA)																				
	Indicating Value	Output	Indicating Value	Output																			
+10000	-10000	-10V	-10000	-																			
	0	0V	0	4mA																			
	+10000	+10V	+10000	20mA																			

### F-08. ID Number (Number Setting for Communication Equipment)

(Standard Setting Value: 00)

00 }	00 : No setting of equipment number (Stream mode : always data transmission)
32	01 ~32 : Setting of equipment number (Command mode : Data transmission by command)

### F-9. Baud rate

(Standard Setting Value: 9600)

2400	2400 bps	<input type="radio"/>	<input type="radio"/>
4800	4800 bps	<input type="radio"/>	<input type="radio"/>
9600	9600 bps	<input type="radio"/>	<input type="radio"/>

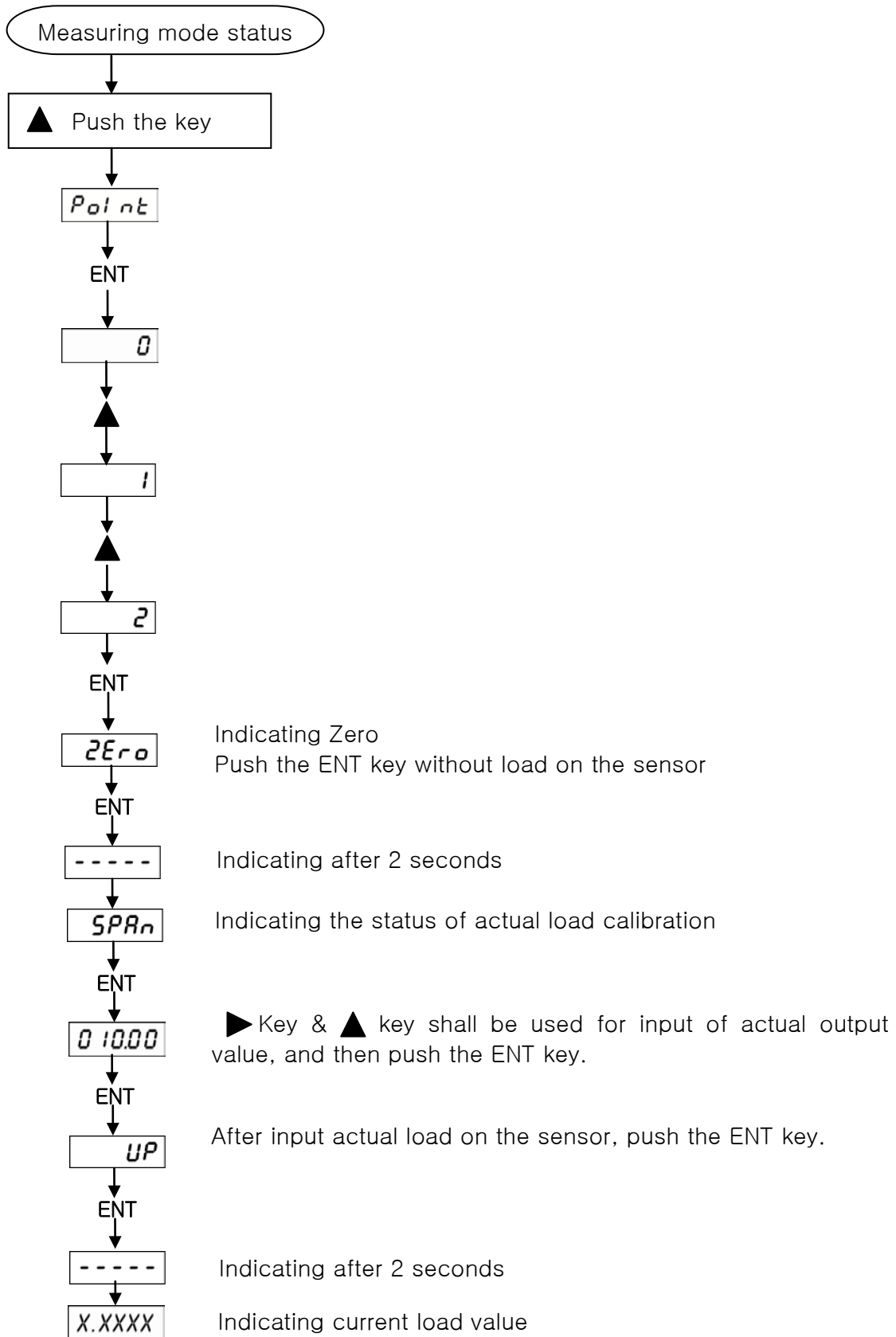
### F-10. Pass word setting

(Standard Setting Value: 0000)

0000 } 9999	0000 : No use pass word function. 0001 ~9999 : Use pass word function

- ※ If you set the pass word function, you should input pass word to get into the Relay setting, Actual load correction and Function mode.  
But, Zero function may be used.

## 6-2. Actual load calibration



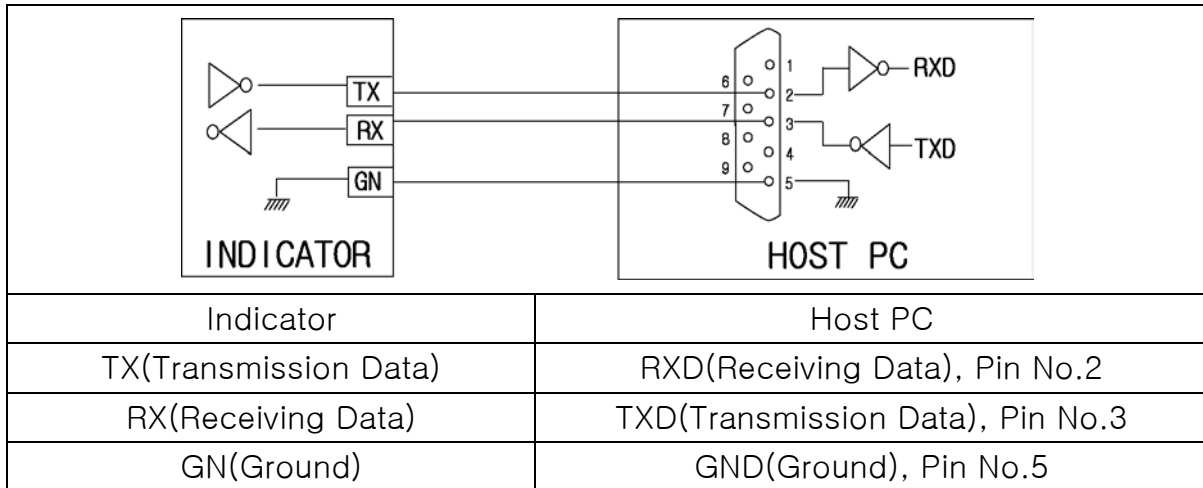
## 7. Product Inspection

Trembling of Display	<ul style="list-style-type: none"> <li>• Load cell Broken</li> <li>• Load cell insulation resistance</li> <li>• Interference</li> </ul>	<ul style="list-style-type: none"> <li>• Load cell input, output</li> <li>• Check resistance</li> <li>• Check load cell insulation resistance</li> </ul>	<ul style="list-style-type: none"> <li>• Insulation resistance (Cable &amp; Case, Over 1000 Mohm)</li> </ul>
When the weight is being increased or is not being returned to Zero.	<ul style="list-style-type: none"> <li>• Defects of load cell</li> </ul>	<ul style="list-style-type: none"> <li>• Check loadcell insulation resistance</li> </ul>	
	<ul style="list-style-type: none"> <li>• Contact failure of load cell</li> </ul>	<ul style="list-style-type: none"> <li>• Check cable connection between loadcell and the body</li> <li>• Check disconnection of load cell cable</li> </ul>	
The weight has changed to (-)	<ul style="list-style-type: none"> <li>• Wrong cable connection of load cell</li> </ul>	<ul style="list-style-type: none"> <li>• Check connection of load cell output cable</li> </ul>	<ul style="list-style-type: none"> <li>• Output: (+SIG) (-SIG)</li> </ul>
Indicated as "OVER" or "UNDER"	<ul style="list-style-type: none"> <li>• Load cell damaged</li> <li>• Unstable connection of load cell</li> </ul>	<ul style="list-style-type: none"> <li>• Check status of load cell and cable connection</li> </ul>	

## 8. OPTION

### #Option-02 (RS232C)

RS232C Interface shall be arranged as separated cabling from AC Power and electric cablings, because it is sensitive against electric noise. The cable shall be used as Shield Cable.



1. TYPE : EIA-232C
2. Method : Half duplex, Asynchronous type
3. Baud-rate : Selection of 2400, 4800, 9600bps
4. Parity : No Parity
5. Data bit : 8 bit
6. Stop bit : 1bit
7. Stream mode (Ex. Data +1234.5 Transmission)

ASCII	S	T	,	N	T	,	+	0
HEX	53H	54H	2CH	4EH	54H	2CH	2BH	30H

ASCII	1	2	3	4	.	5	CR	LF
HEX	31H	32H	33H	34H	2EH	35H	0DH	0AH

#### 1) BYTE1, BYTE2

- . DATA Stable : S T . DATA Unstable: U S
- . DATA OVERFLOW: O L . DATA UNDERFLOW: U L

#### 2) BYTE3 ~ BYTE6 : Fixed Letter (, N T ,)

- 3) BYTE7 ~ BYTE14 : DATA 8 BYTE(+/- included)
- 4) BYTE15 : CARRIAGE RETURN
- 5) BYTE16 : LINE FEED

8. Command mode

OP-03 : Refer to RS485



## #Option-03 (RS485)

RS485 Interface shall be arranged as separated cabling from AC Power and electric cabling, because it is sensitive against electric noise. The cable shall be used as Shield Cable.

1. TYPE : RS485
2. Method : Half duplex, Asynchronous type
3. Baud-rate : Selection of 2400, 4800, 9600bps
4. Parity : No Parity
5. Data bit : 8 bit
6. Stop bit : 1bit

Please set the number of equipment referring to INDICATOR Manual.  
(Possible to set for 1 ~ 32 channel)

### 7. Command Type (PC -> INDICATOR)

ASCII	I	D	0	1	P
HEX	49H	44H	30H	31H	50H

- 1) BYTE1, BYTE2 : Fixed Letter (ID)
- 2) BYTE3, BYTE4 : Equipment Number (1 ~ 32)
- 3) BYTE5 : Order command (P, Z)

### 8. Command Table

P	50H	Transmission of current value of commanded equipment
Z	5AH	Operate the current value of commanded equipment as ZERO

9. Transmission DATA Type (INDICATOR → PC)

ASCII	I	D	0	0	1	,	+	0
HEX	53H	54H	30H	30H	31H	2CH	2BH	30H

ASCII	1	2	3	4	.	5	CR	LF
HEX	31H	32H	33H	34H	2EH	35H	0DH	0AH

- 1) BYTE1, BYTE2 : Fixed Letter (ID)
- 2) BYTE3 ~ BYTE5 : Equipment Number (1 ~ 32)
- 3) BYTE6 : Fixed Letter (,)
- 4) BYTE7~BYTE14 : DATA 8byte (+/- included)
- 5) BYTE15 : CARRIAGE RETURN
- 6) BYTE16 : LINE FEED