CE

*Approved for Digital Weigh Indicator*

# Digital Weighing Indicator
# SI 410

## User Manual


Ver.1.0 140825

SEWHACNM
주식회사 세화씨엔엠

# CONTENTS

# 1. BEFORE INSTALLATION

## Caution / Warning Marks

| | |
|---|---|
|   | This mark warns the possibility to arrive death or serious injury in case of wrongly used. |
|   | This mark cautions the possibility to arrive serious human body injury or product lose in case of wrongly used. |

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3. This manual may be changed as the version is upgraded, without previous notice.

## Inquiries

If you have any kinds of inquiries for this model, please contact your local agent or Head Office.

Head Office : SEWHACNM CO., LTD.

Website : http://www.sewhacnm.co.kr

Email : sales@sewhacnm.co.kr

# 2. INTRODUCTION

## 2-1. Introduction

Thank you for your choice of this SI 410 Industrial Digital Weighing Indicator.

This SI 410 model is high-performance weighing Indicator.

Please review and learn this instruction Manual and enjoy your process efficiency

with "SI 410" Weighing Indicator.

## 2-2. Cautions


1. Don't drop on the ground and avoid serious external damage on item.
2. Don't install under sunshine or heavy vibrated condition.
3. Don't install place where high voltage or heavy electric noise condition.
4. When you connect with other devices, please turn off the power of item.
5. Avoid from water damage.
6. For the improvement of function or performance, we can change item specification without previous notice or permission.
7. Item's performance will be up-dated continuously base on previous version's performance.

## 2-3. Features

1. SI 410 model is standard size indicator which is easy to install on the panel.
2. Front panel is covered with Polycarbonate film, strong against dust and water.
3. RS232 Serial interface is standard installed.
4. User can choose various options; Analog output 4~20mA, 0~10V / RS232C / RS422, RS485 / ETHERNET CARD / BCD OUT / BIN IN / SD Memory card

# 3. SPECIFICATION

## 3-1. Specification

| Content | | | Specification |
|---|---|---|---|
| **Analog Part** | Display Resolution | | 1/20,000 |
| | Internal Resolution | | 1/2,000,000 (±1,000,000) |
| | Input Sensitivity | | Min 0.1μV/V |
| | Max Signal Input Voltage | | Max 3.0mV/V |
| | Load cell Excitation | | DC +5V |
| | A/D Conversion Method | | Sigma-Delta |
| | Decimal Point | | 0, 0.0, 0.00, 0.000 |
| | Drift | Offset | 10PPM/℃ |
| | | Span | 10PPM/℃ |
| | Non Linearity | | 0.001% of Full Scale |
| | Analogue Sampling(sec) | | 60times / sec(MAX) |
| **Environment** | Operating Temperature Range | | -10℃ ~ +40℃ [14℉ ~ 104℉] |
| | Operation Humidity Range | | 40% ~ 85% RH, Non-condensing |
| **Function** | Calibration Mode | | Test Weight Calibration Mode<br>Simulation Calibration Mode |
| | Display | | 6 digit, 25.4mm(1inch) Red FND for Numbers<br>7 digit, Red LED for Weight unit<br>8 digit, Green LED for State alarm<br>12 digit Greed LED for Arrow |
| | Key Pad | | 14pcs Standard Key pad |
| | Additional Digital Input | | 6pcs external input key |
| **Communi-cation** | Serial Port 1<br>(RS-232) | | Data Transference<br>Command Mode<br>Serial Printer Mode<br>Modbus (RTU) |
| **Relay Output** | Relay Output | | 7pcs selectable relay output |
| **Power** | AC : 110~240V, Maximum Power Consumption 19W | | |
| **Size** | 200mm(W) x 100mm(H) x 126.5mm(D) | | Weight : 1250g |

## 3-2. Option

| | |
|---|---|
| Option1 | Serial Port (RS-422) |
| Option2 | Serial Port (RS-485) |
| Option 3 | Serial Port (RS-232) |
| Option 4 | ETHERNET CARD |
| Option 5 | Analog Output(0~20mA) |
| Option 6 | Analog Output(0~10V) |
| Option 7 | BCD OUT |
| Option 8 | BIN IN |
| Option 9 | SD Memory card |

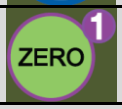
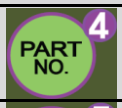
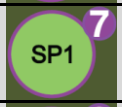
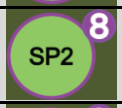
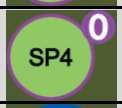
## 3-3. Front Panel

### 3-3-1. Front Panel (Display / Key Pad)

### 3-3-2. State LED

| LED | State |
|---|---|
| **STEADY** | When the weight is stable, ON. |
| **ZERO** | When the current weight is zero, ON. |
| **TARE** | When the "TARE" function is set, ON. |
| **HOLD** | When the "HOLD" function is set, ON. |
| **TxD** | When indicator sends date out through serial communication. |
| **RxD** | When indicator receives date out through serial communication. |
| **PRT** | When the weighing data is printed, ON. |
| **OUT1** | When OUT1 (Relay) is operated, ON. |
| **OUT2** | When OUT2 (Relay) is operated, ON. |
| **OUT3** | When OUT3 (Relay) is operated, ON. |
| **OUT4** | When OUT4 (Relay) is operated, ON. |
| **OUT5** | When OUT5 (Relay) is operated, ON. |
| **OUT6** | When OUT6 (Relay) is operated, ON. |
| **OUT7** | When OUT7 (Relay) is operated, ON. |
| **RUN** | When the weighing process is going on. |
| **HIGH** | When OUT4 is ON, Under Function 223-03. |
| **LOW** | Activated on only under display test mode. |
| **kg** | Displayed weight unit under Function 110-00 |
| **g** | Displayed weight unit under Function 110-01 |
| **t** | Displayed weight unit under Function 110-02 |
| **%** | Displayed weight unit under Function 110-03 |
| **pcs** | Displayed weight unit under Function 110-04 |
| **oz** | Displayed weight unit under Function 110-05 |
| **lb** | Displayed weight unit under Function 110-06 |

### 3-3-3. Key Operation

| | |
|---|---|
|  | - Press 4 times within 3secs, to enter to Function setting mode. |
|  | - Press 4 times within 3secs, to enter to "Hidden function" mode. |
|  | - Make the weight value to Zero<br>- Number 1 |
|  | - Set the TARE Function<br>1st input : "TARE", 2nd input : "TARE Reset"<br>(When "HOLD" or weight value is ZERO, then this key doesn't work.)<br>- Number 2 |
|  | - Set the "HOLD" Function<br>1st input : "HOLD", 2nd input : "HOLD Reset"<br>- Number 3 |
|  | - Product number setting<br>- Number 4 |
|  | - Print out<br>- Number 5 |
|  | - Number 6 |
|  | - SP1 set value setting<br>- Number 7 |
|  | - SP2 set value setting<br>- Number 8 |
|  | - SP3 set value setting<br>- Number 9 |
|  | - SP4 set value setting<br>- Number 0 |
|  | - Cancel or Move to previous step. |
|  | - Save and Move to next step. |

### 3-3-4. Hot key

| | |
|---|---|
|  | Double tare setting<br>(Once tare is set, Another tare is overlapped.) |
|  | Print the Sub-total out |
|  | Forced discharge |
|  | Display the current weight during 5 secs. |
|  | Display the Sub-total weight during 5 secs. |
|  | Display the Grand-total weight during 5 secs. |
|  | Print the Grand-total out |
|  | Delete the Sub-total weight |
|  | Delete the Grand-total weight |

**Tip**

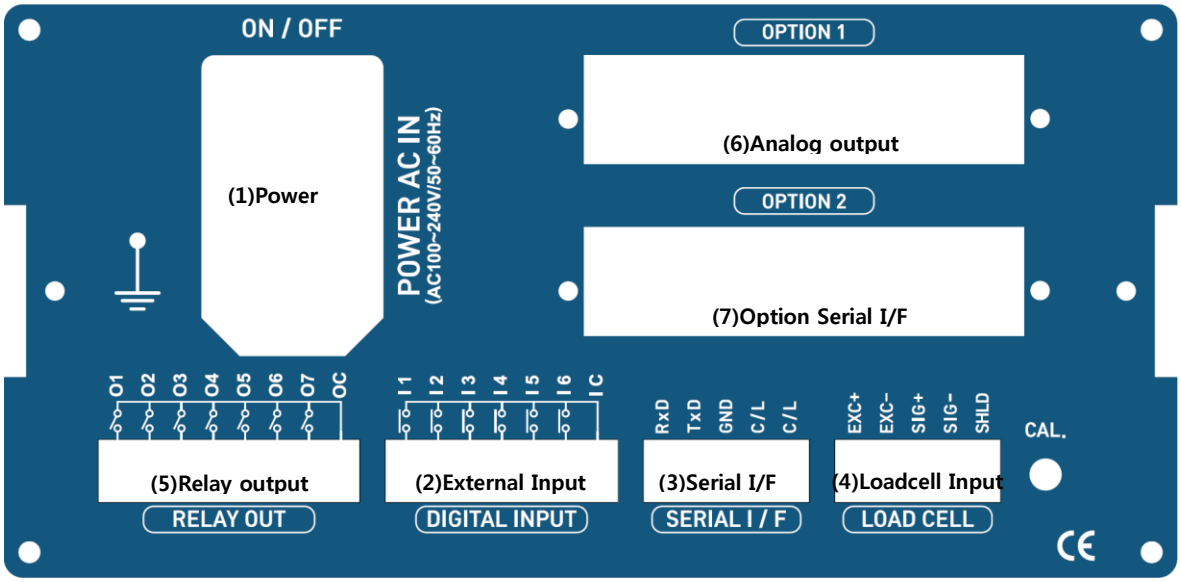
Max accumulated weighing count : 999,999times

Over 999,999times → return to “0” time

Max accumulated weight display : 999999999 (g, kg, ton)

Over 999,999,999 (g, kg, ton) → return to “0” (g, kg, ton)

## 3-4. Rear Panel




(1) AC Power input terminal

(2) External input terminal: User selectable 6EA (Function 233~238)

(3) Serial Interface terminal

| Terminal | RxD | TxD | GND | C/L | C/L |
|---|---|---|---|---|---|
| RS – 232 | Rx | Tx | GND | C/L | C/L |

(4) Loadcell Input terminal

| Terminal | EXC+ | EXC- | SIG+ | SIG- | SHLD |
|---|---|---|---|---|---|
| Loadcell | EXC+ | EXC- | SIG+ | SIG- | SHEILD |

(5) Relay output terminal: User selectable 7EA (Function 226~232), COM is common.

| Terminal | O1 | O2 | O3 | O4 | O5 | O6 | O7 | OC |
|---|---|---|---|---|---|---|---|---|
| Relay output | RELAY 1 | RELAY 2 | RELAY 3 | RELAY 4 | RELAY 5 | RELAY 6 | RELAY 7 | RELAY COM |

(6) Analog output terminal

| Terminal | - | + | |
|---|---|---|---|
| 4~20mA | (-) | (+) | Option |
| 0~10V | (-) | (+) | Option |

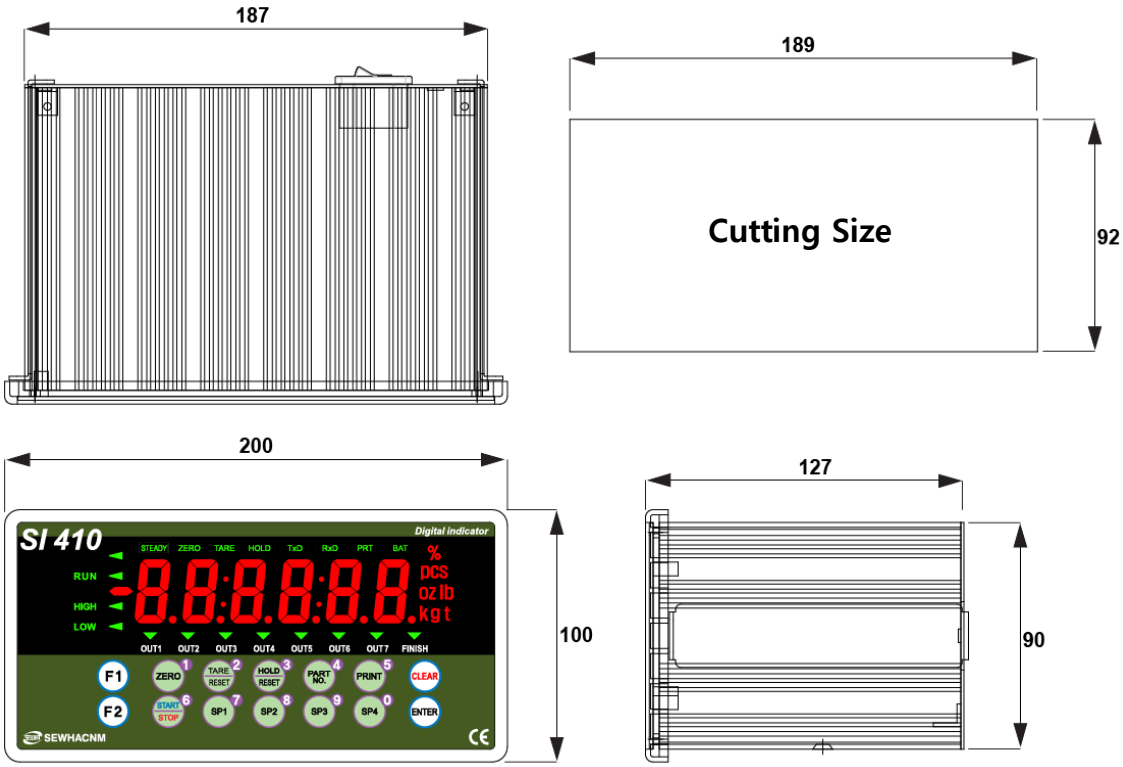
(7) Option serial interface terminal

| Terminal | 1 | 2 | 3 | 4 | |
|---|---|---|---|---|---|
| RS – 232C | GND | GND | Rx | Tx | Option |
| RS - 422 | TxD- | TxD+ | RxD- | RxD+ | Option |
| RS - 485 | Unused | Unused | D- | D+ | Option |

**Caution** Please check the Comm. and other specification in the label, attached on the cover plate first, and make connection according to that information.

# 4. Installation

## 4-1. External Dimension & Cutting Size




## 4-2. Installation Components

| | |
|---|---|
|  |  |
| SI 410 | User Manual |

## 4-3. Load cell Installation

Load Cell Wire Connection (In case of SEWHACNM's Load cell)

It depends on the manufacturer of load cell, please check the specification.


**Caution** **Under Set-up the Load cell, if EXC+ and EXC- have a short circuit, It may cause damage in the indicator.(specially analogue board)**
**If you connect other wires to Load cell terminal wrongly, it may cause damage in the analogue board.**
**Before connecting the load cell cable you have to power off and be sure to connect the cable to the terminal correctly.**
**Do not weld near the load cells , Indicators or other devices.**

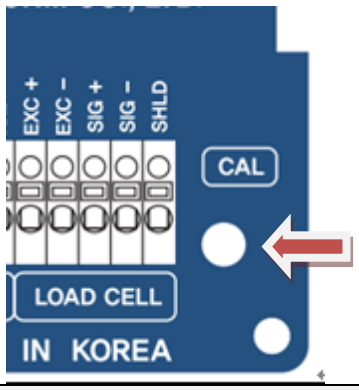
■ **Load Cell Installation**

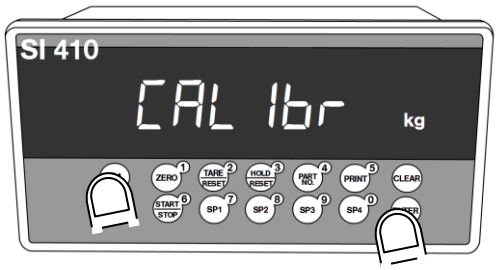
1. You can connect Max 8pcs of same capacity Load cells at once. (350 Ω)
2. You have to make horizontal balance on the ground.
3. If you install more than 2pcs of load cells, use Summing box and adjust output signal difference as minimum. It can make wrong weighing process caused by each load cell's variation.
4. If there is some temperature difference around Load cell, it can cause wrong weight measurement.
5. Don't do Welding job or Arc discharge around installation place. But, there is no choice, please disconnect power cable and Load cell cable.
6. If you measure static electricity material, please make earth between down part and up part of Load cell.

# 5. SET-UP

## 5-1. Test Weight Calibration Mode (Using test weight)

### 5-1-1. Start Test Weight Calibration Mode

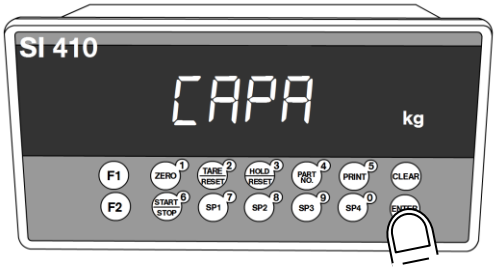


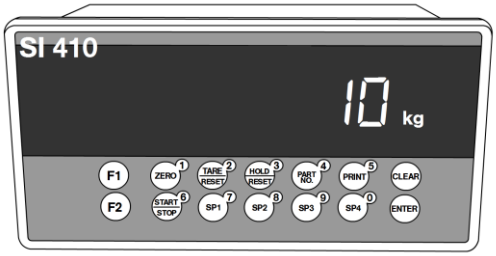




Remove "CAL-BOLT" on the Rear panel, . and press "CAL - LOCK S/W" inside. "

When "CALIBR" displays, press F1 key, select **"WCAL"** and press ENTER key.

### 5-1-3. Setting "Capacity of weighing Scale"



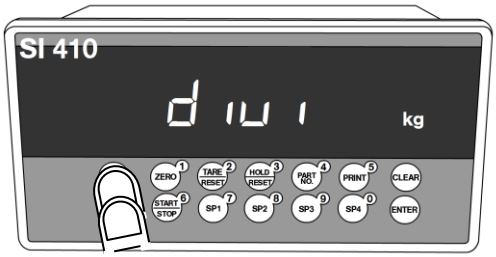

After displaying "CAPA", input max capacity with keys & Press ENTER key to save & move to next step.

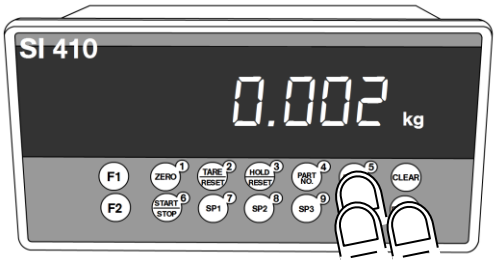
**Tip**

**If you want to set Max capacity as 1,000kg and the division is 0.1 (100g), then just input "1000".**

**F1 key for going back to zero, F2 key for gradual decrease from unit digit.**

### 5-1-4. Decimal point and division setting



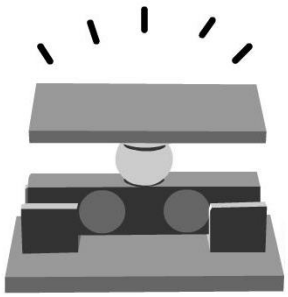




After "DIVI" is displayed, locate the decimal point with F1 and F2 keys, and set the division with PRINT 5 and SP4 0 keys. Press ENTER key to save.

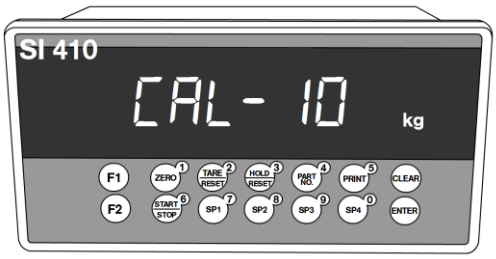
**Tip** Max decimal point will be 0.001, and digit can be selected among 1, 2, 5, 10, 20, 50. Digit and decimal point must be fulfilled under the below condition.

(division value / Max capacity value) cannot be over 1/20,000. If this condition is not fulfilled, "**err-1**" will be displayed and move back to capacity setting mode.

### 5-1-5. Measuring the "DEAD" Weight of Weighing Scale.

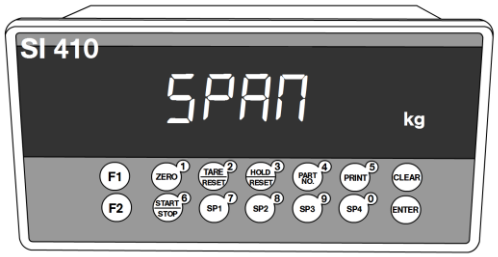
When **"DEAD"** displays, Press ENTER key, then indicator will calculate dead weight of scale part automatically (While this process, there should be nothing on the scale part.)

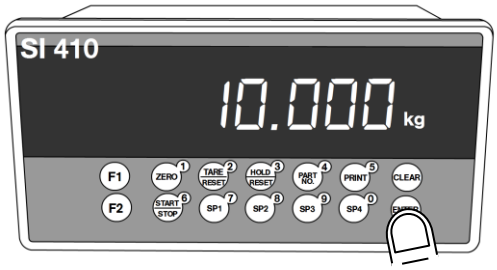



Indicator will search "DEAE weight" during 10secs automatically to find the best condition.

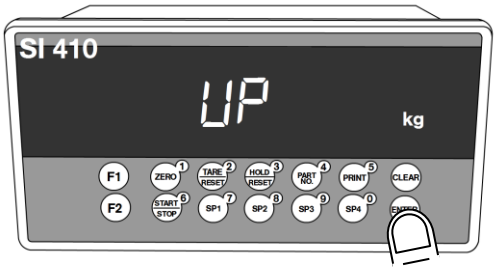
**Tip** In this step, if there is unstable condition such as some forces or Vibration on the scale part, "Error-A" will be displayed, and "DEAD value" will not be calculated. Please remove the cause of the force or vibration and process it again.

### 5-1-6. Calculating span value



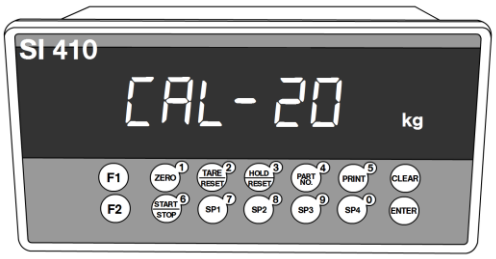




If the count is over, input the weight of your "Test Weight" and press ENTER key.

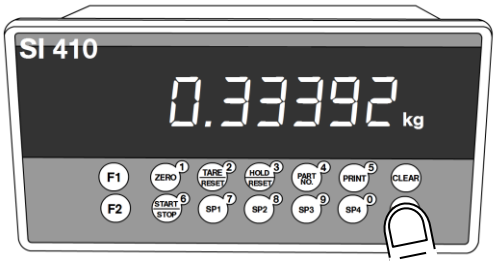




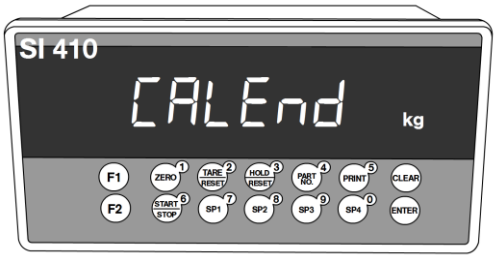
If "UP" is displayed, please load "Test Weight" on the scale part and press ENTER key.




Calculate Span value during 10~20 secs.




After calculation, span value will be displayed on the display. Then press ENTER key.



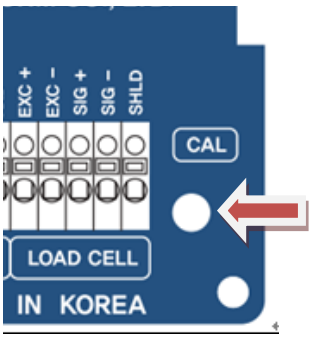

When "CALEND" is displayed and calibration is completed.

**Tip** **We recommend to proceed this span value calculation step when "STEADY" is displayed.**

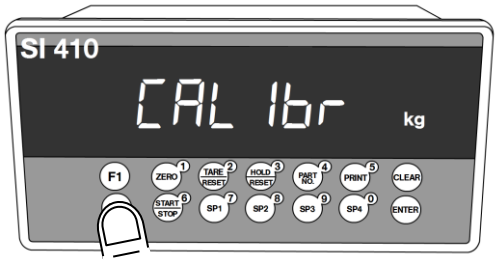
## 5-2. Simulation Calibration Mode (Calibrate without Test weight)

With this "Simulation Calibration Mode" you can make simple calibration without any "TEST weight" This calibration mode uses "Load cells' max capacity" and "Max Output Rate(mV)", so the weight adjustment degree might be less than "Test weight Calibration". The guaranteed resolution of this "Simulation Calibration" is 1/3,000.

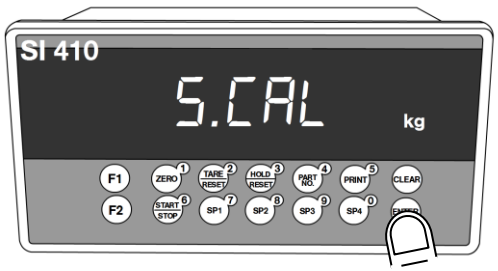
### 5-2-1. Simulation Calibration Mode Start




Remove "CAL-BOLT" on the rear panel, and press "CAL - LOCK S/W" inside.

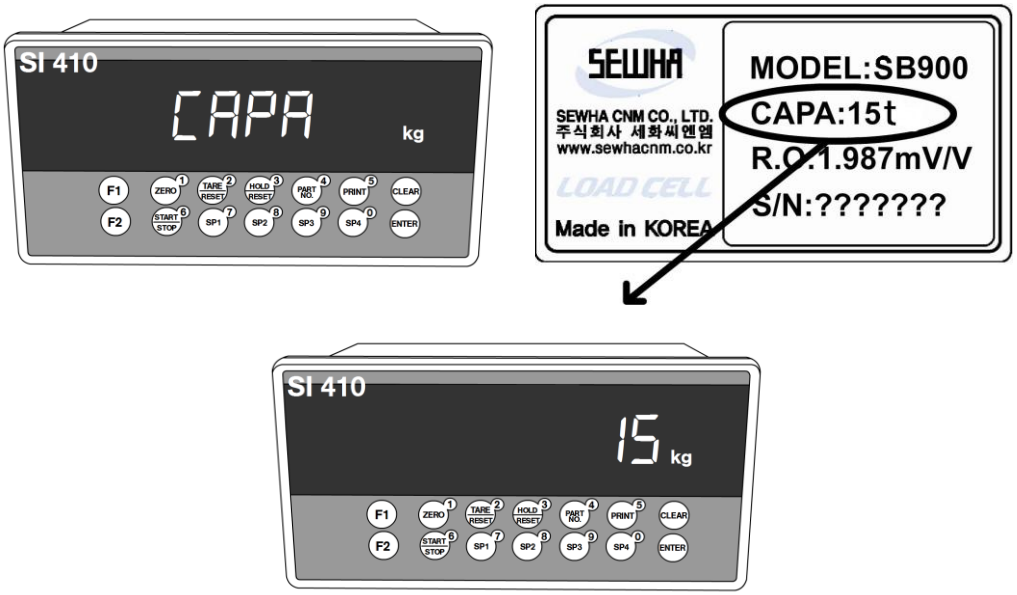



When "CALIBR" is displayed, press F2 key and select **"SCAL".**




**Press** ENTER **key to start.**

### 5-2-2. Setting "Capacity of Load Cell"



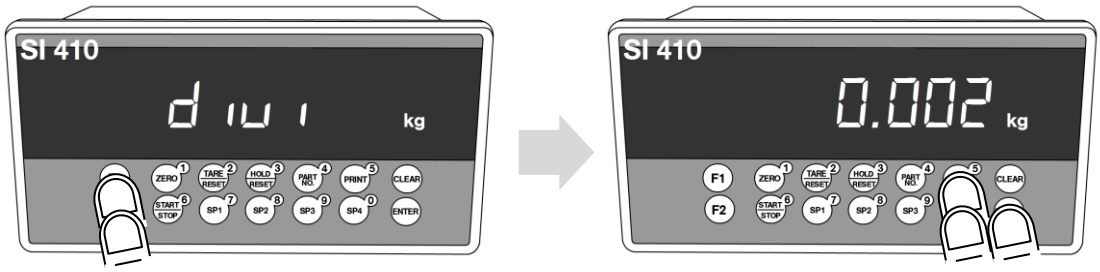

After "CAPA" displayed, Check Max Capacity of Load cell, Input the Max Capacity of Load cell. (refer the load cell label, or Test Report.) And press ENTER key.

**Tip** In case of multiple pieces of load cells are installed, Please make sum of each load cell's capacity and make setting with Max Capacity.

EX) There are 4pcs of load cells, and each load cell's Max capacity is1,000kg.

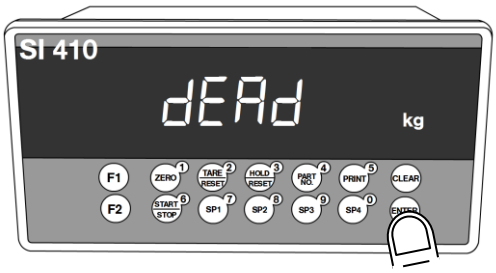
Then, total Max Capacity will be 4,000kg(1,000 x 4) and you have to input 4,000.

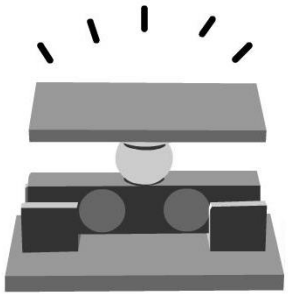
### 5-2-3. Setting "Digit / Division" value




After "DIVI" is displayed select Decimal point with F1 and F2 key, and set the division with PRINT 5 and SP4 0 key. Press ENTER key to save.

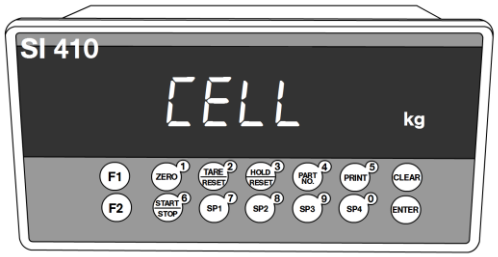
### 5-2-4. Measuring the "DEAD Weight" of Weighing Scale.

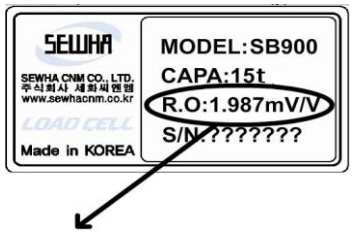


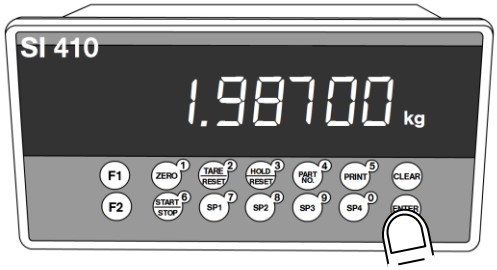



When **"DEAD"** displays, Press ENTER key, then indicator will calculate dead weight of scale part automatically.
(While this process, there should be nothing on the scale part.)

### 5-2-5. Inputting Max Output ( Rated Output Voltage / mV)

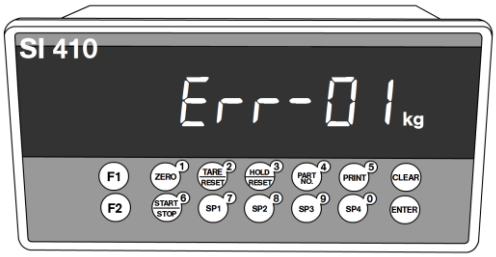


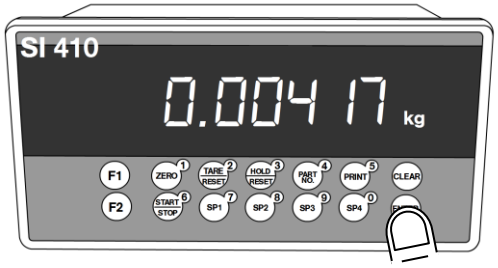




After **"mV/V"** is displayed, Check the Rated output value of Load cell.

(Refer to the load cell label, or Test Report) . And Press ENTER key to save and move to next step.




If input wrong value, there will display "Err-01", please go back to Setting "Capacity of Load Cell". After recheck the label of load cell and retry the process.




Calculated span value will be displayed. Then press ENTER key to finish the calibration step.

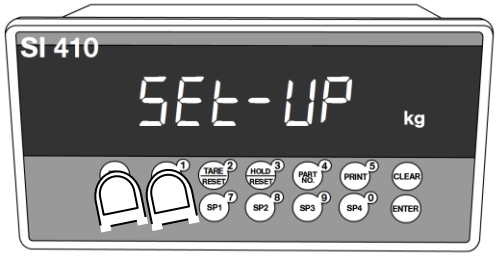
**Tip** In case of multiple pieces of load cells are connected, the rated output will be same as single load cell's. (Because plural load cells are connected with parallel connection, the sum of rated output voltage is same as single load cell's rated output)

※Due to some variation between **"State output rate"** and **"Real Output rate"** of load cell, there might be some weight difference after finishing calibration.

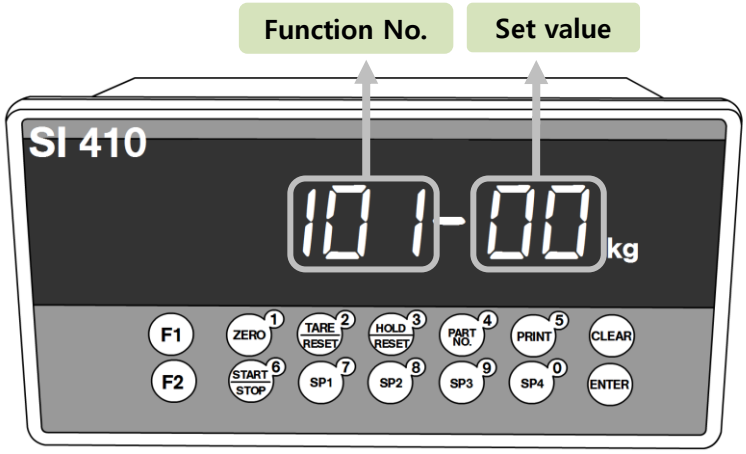
If you want to make more precise weighing process, please measure real output rate of load cell and input the measured value. Then the weight measurement will be more precise than before.

## 5-3. F-FUNCTION Setting

### 5-3-1. Starting F-FUNCTION Mode




Press F1 key 4 times → When **"SETUP"** is displayed, press ZERO key.




(1) F1 Function No. ↑ or input the function No. by number key (0~9) after select "Function No." area by pressing F2 key.

(2) Input the Set value by number key (0~9) after select 'Set value' area by pressing F2 key.

(3) ENTER key for saving data..

(4) CLEAR key for cancel and go back to previous step.

### 5-3-2. F-Function List

| F-list | Subject | Default | Contents |
|---|---|---|---|
| **101** | Equipment No. setting – ID No.setting | 01 | 01~99 |
| **102** | Weight–Back up Mode | 01 | 00:Normal mode<br>01: Weight Back up Mode(Zero)<br>02: Weight Back up Mode(Zero&Tare) |
| **103** | Weighing Data Save Method | 03 | 00: Manual: Whenever "Print" key input 01: Auto: At every steady states<br>02: Auto: At the first steady states<br>04: Manual&Auto: At every steady states<br>05:Manual&Auto: At the first steady states<br>06: Manual&Auto: After weighing is finished |
| **104** | Display Up-Date Speed | 09 | 01:Slow(1time per 1sec)<br>~ 09:Fast(60times per 1sec) |
| **105** | Main display setting | 00 | 00 : Weight<br>01 : Sub-total weight<br>02 : Grand-total |
| **108** | Buzzer sound (External input detection) | 00 | 00:Buzzer sound, 01:No Buzzer sound |
| **109** | Function / Clear key display | 00 | 00 : When press F or Clear key, display on<br>01 : When press F or Clear key, display off |
| **110** | Weight Unit | 00 | 00 : kg<br>01 : g<br>02 : ton<br>03 : %<br>04 : PCS<br>05 : OZ<br>06 : lb |
| **111** | Language | 00 | 00:Korean, 01:English |
| **201** | EMPTY Range | 100 | 00~999999 |
| **202** | Auto Zero Range | 00 | 00~99 (Unit:0.25gradation) |
| **203** | Steady Range | 08 | 01~99 (Unit:0.25gradation) |
| **204** | Steady condition check time | 10 | 01~99 (Unit:0.1sec.) |
| **205** | Digital Filter | 20 | 01:Weak vibration ~ 99:Strong vibration |
| **206** | Zero key operation mode | 00 | 00:Always active<br>01:Active under steady condition only |

| | | | |
|---|---|---|---|
| **207** | Tare Key operation mode | 00 | 00:Always active<br>01:Active under steady condition only |
| **208** | Tare key Setting | 00 | 00 : Tare Key<br>01 : Tare Weight |
| **209** | Zero key Operation Range | 02 | 00: Active within 2% of Max Capacity<br>01: Active within 5% of Max Capacity<br>02: Active within 10% of Max Capacity<br>03: Active within 20% of Max Capacity<br>04: Active within 50% of Max Capacity<br>05: Active within 100% of Max Capacity<br>06:No limit |
| **210** | Tare key Operation Range | 02 | 00: Active within 10% of Max Capacity<br>01: Active within 20% of Max Capacity<br>02: Active within 50% of Max Capacity<br>03: Active within 100% of Max Capacity |
| **211** | Auto Zero function under Tare state | 00 | 00:Disuse, 01:Use |
| **212** | Tare Delay Time | 00 | 00:Disuse, 01 ~ 10:Use (Unit:1sec.) |
| **213** | Auto tare set when weighing starts | 00 | 00:Disuse, 01:Use |
| **214** | Tare reset Timing | 00 | 00:Manual, 01:Auto at empty range,<br>02:Auto at steady condition,<br>03:Auto when finish relay out is off |
| **215** | Auto Tare reset Time | 00 | 00 : Disuse<br>01 ~ 09 : Use (Unit : 1 sec) |
| **216** | Hold Mode | 00 | 00:Sample Hold,<br>01:Peak Hold,<br>02:Average Hold |
| **217** | Hold Delay Time | 00 | 00:Disuse, 01~10:Use (Unit:1sec.) |
| **218** | Hold reset at the near zero | 00 | 00:Disuse, 01:Use |
| **219** | Auto Hold reset Time | 00 | 00:Disuse, 01~10:Use (Unit:1sec.) |
| **220** | Average Hold Time | 10 | 01 ~ 99 (Unit:0.1sec.) |
| **221** | Minus (-) Mark Display | 00 | 00:USe 01:Disuse |
| **222** | Under UNPASS/OVERLOAD state, Weight display | 00 | 00:Display, 01:No display |

| | | | |
|---|---|---|---|
| **223** | Weighing Mode | 01 | 00 : Disuse<br>01 : Limit mode 1<br>02 : Limit mode 2<br>03 : Limit mode 3<br>04 : Limit mode 4<br>05 : Limit mode 5<br>06 : Checker mode 1<br>07 : Checker mode 2<br>08 : Packer mode<br>09 : User's choice packer mode<br>10 : Limit mode 6<br>11 : Limit mode 7<br>12 : Accumulating mode 1<br>13 : Accumulating mode 2 |
| **224** | Relay Control Type | 00 | 00:Minus&Plus weight Control 01: Plus weight Control |
| **225** | Relay Output Auto / Manual Setting | 00 | 00:Auto., 01:Manual(User custom) |
| **226** | Relay Output 1 Setting | 00 | 00 : Disuse 01: SP1 02 : SP2 03 : SP3 04 : SP4 05: Finish 06 : Zero 07 : Error |
| **227** | Relay Output 2 Setting | 00 | 00 : Disuse 01: SP1 02 : SP2 03 : SP3 04 : SP4 05: Finish 06 : Zero 07 : Error |
| **228** | Relay Output 3 Setting | 00 | 00 : Disuse 01: SP1 02 : SP2 03 : SP3 04 : SP4 05: Finish 06 : Zero 07 : Error |
| **229** | Relay Output 4 Setting | 00 | 00 : Disuse 01: SP1 02 : SP2 03 : SP3 04 : SP4 05: Finish 06 : Zero 07 : Error |
| **230** | Relay Output 5 Setting | 00 | 00 : Disuse 01: SP1 02 : SP2 03 : SP3 04 : SP4 05: Finish 06 : Zero 07 : Error |
| **231** | Relay Output 6 Setting | 00 | 00 : Disuse 01: SP1 02 : SP2 03 : SP3 04 : SP4 05: Finish 06 : Zero 07 : Error |
| **232** | Relay Output 7 Setting | 00 | 00 : Disuse 01: SP1 02 : SP2 03 : SP3 04 : SP4 05: Finish 06 : Zero 07 : Error |
| **233** | External Input 1 Setting | 01 | 00 : Disuse 01 : Zero 02 : Tare 03 : Tare reset 04 : Tare/Tare reset 05 : Hold 06 : Hold reset 07 : Hold/Hold reset 08 : Start(Packer mode) 09: Stop(Packer mode) 10: Start/Stop(Packer mode) 11 : Print 12 : Sub-total Print 13 : Grand-total Print 14:Forced discharge |

| | | | |
|---|---|---|---|
| **234** | External Input 2 Setting | 04 | 00 : Disuse 01 : Zero 02 : Tare 03 : Tare reset 04 : Tare/Tare reset 05 : Hold 06 : Hold reset 07 : Hold/Hold reset 08 : Start(Packer mode) 09: Stop(Packer mode) 10: Start/Stop(Packer mode) 11 : Print 12 : Sub-total Print 13 : Grand-total Print 14:Forced discharge |
| **235** | External Input 3 Setting | 07 | 00 : Disuse 01 : Zero 02 : Tare 03 : Tare reset 04 : Tare/Tare reset 05 : Hold 06 : Hold reset 07 : Hold/Hold reset 08 : Start(Packer mode) 09: Stop(Packer mode) 10: Start/Stop(Packer mode) 11 : Print 12 : Sub-total Print 13 : Grand-total Print 14:Forced discharge |
| **236** | External Input 4 Setting | 11 | 00 : Disuse 01 : Zero 02 : Tare 03 : Tare reset 04 : Tare/Tare reset 05 : Hold 06 : Hold reset 07 : Hold/Hold reset 08 : Start(Packer mode) 09: Stop(Packer mode) 10: Start/Stop(Packer mode) 11 : Print 12 : Sub-total Print 13 : Grand-total Print 14:Forced discharge |
| **237** | External Input 5 Setting | 13 | 00 : Disuse 01 : Zero 02 : Tare 03 : Tare reset 04 : Tare/Tare reset 05 : Hold 06 : Hold reset 07 : Hold/Hold reset 08 : Start(Packer mode) 09: Stop(Packer mode) 10: Start/Stop(Packer mode) 11 : Print 12 : Sub-total Print 13 : Grand-total Print 14:Forced discharge |
| **238** | External Input 6 Setting | 14 | 00 : Disuse 01 : Zero 02 : Tare 03 : Tare reset 04 : Tare/Tare reset 05 : Hold 06 : Hold reset 07 : Hold/Hold reset 08 : Start(Packer mode) 09: Stop(Packer mode) 10: Start/Stop(Packer mode) 11 : Print 12 : Sub-total Print 13 : Grand-total Print 14:Forced discharge |
| **239** | Finish Relay Output Delay Time (T1) | 10 | 00 ~ 99 (Unit:0.1sec.) |
| **240** | Finish Relay Output Time (T2) | 10 | 00 ~ 99 (Unit:0.1sec.) |
| **241** | Weight Judge Delay Time (T3) | 10 | 00 ~ 99 (Unit:0.1sec.) –Checker Mode |
| **243** | Weight Judge Time (T4) | 10 | 00 ~ 99 (Unit:0.1sec.) –Checker Mode |
| **249** | Forced discharge Time | 00 | 00 ~ 99 (Unit : 0.1sec) |
| **250** | Drip control setting | 00 | 00 : Disuse<br>01 : Use |

| | | | |
|---|---|---|---|
| **251** | Zero state lamp output standard | 00 | 00 : Near Zero<br>01 : Zero |
| **253** | Near zero output Setting Under tare ON state | 00 | 00:Zero Output<br>01:Actual zero output except Tare weight |
| **254** | Set point save | 00 | 00:Apply to current P/N<br>01:Apply to every P/N |
| **301** | Parity / Stop bit | 00 | 00:Databit 8, Stopbit 1, Paritybit Non<br>01:Databit 8, Stopbit 1, Paritybit Odd<br>02:Databit 8, Stopbit 1, Paritybit Even<br>03:Databit 7, Stopbit 1, Paritybit Odd<br>04:Databit 7, Stopbit 1, Paritybit Even |
| **302** | Serial Communication Speed | 02 | 00: 2,400bps 01: 4,800bps 02: 9,600bps 03: 14,400bps 04: 19,200bps<br>05: 28,800bps 06: 38,400bps<br>07: 57,600bps 08: 76,800bps<br>09: 1115,200bps |
| **303** | Data transmission mode | 00 | 00:Simplex / Stream Mode<br>01:Duplex / Command Mode<br>02:Print Mode |
| **304** | "Check-Sum" under command mode | 00 | 00:Disuse, 01:Use |
| **305** | Data Format under Stream Mode | 00 | 00 : Format1 (19byte)<br>01 : Format 2 (22byte)<br>02 : Format 3 (17byte)<br>03 : Format 4 (22byte)<br>04 : Format 5 (15byte) |
| **306** | Date transference under stream mode | 00 | 00:Countinuously<br>01:Single time on every steady state<br>02:Single time at the first steady point<br>03:Single time output after weighing finish<br>04:When input Print key |
| **307** | Modbus Transmit Data MSB/LSB location | 00 | 00:Standard, 01:Change |
| **308** | Parity / Stop bit (Option Port) | 00 | 00: Data bit8, Stop bit1, Parity bit Non<br>01: Data bit8, Stop bit1, Parity bit Odd<br>02: Data bit8, Stop bit1, Parity bit Even<br>03: Data bit7, Stop bit1, Parity bit Non<br>04: Data bit7, Stop bit, Parity bit Even |

| | | | |
|---|---|---|---|
| **309** | Serial Communication Speed (Option Port) | 02 | 00: 2,400bps 01: 4,800bps 02: 9,600bps 03: 14,400bps 04: 19,200bps 05: 28,800bps 06: 38,400bps 07: 57,600bps 08: 76,800bps 09: 1115,200bps |
| **310** | Data transmission mode | 00 | 00:Simplex / Stream Mode<br>01:Duplex / Command Mode<br>02:Print Mode |
| **311** | "Check-Sum" under command mode (Option Port) | 00 | 00: Disuse, 01: Use |
| **312** | Data Format under Stream Mode (Option Port) | 00 | 00:Format1, 01:Format2, 02:Format3<br>03:Format4 04:Format5 |
| **313** | Date transference under stream mode<br>(Option Port) | 00 | 00:Countinuously<br>01:Single time on every steady state<br>02:Single time at the first steady point<br>03:Single time output after weighing finish<br>04:When input Print key |
| **316** | Date transference under Ethernet<br>(Option Port) | 00 | 00:Simplex / Stream Mode<br>01:Duplex / Command Mode<br>02 :Modbus (RTU) |
| **317** | "Check-Sum" under Ethernet (Option Port) | 00 | 00: Disuse, 01: Use |
| **318** | Data Format under Ethernet Stream Mode Ethernet (Option Port) | 00 | 00 : Format1 (19byte)<br>01 : Format 2 (22byte)<br>02 : Format 3 (17byte)<br>03 : Format 4 (22byte)<br>05 : Format 5 (15byte) |
| **319** | Date transference under Ethernet stream mode<br>(Option Port) | 00 | 00:Countinuously<br>01:Single time on every steady state<br>02:Single time at the first steady point<br>03:Single time output after weighing finish<br>04:When input Print key |
| **352** | Print Format Setting | 00 | 00: Continuous Print, 01: Single Print |
| **354** | Print Output Delay Time Setting | 00 | 00~09 (Unit:1sec.) |
| **355** | Paper Withdraw Rate setting (After Continuous/Single Print) | 00 | 00~09 (Unit:1line add) |

| | | | |
|---|---|---|---|
| **356** | Paper Withdraw Rate setting (After SUB/Grand-total Print) | 00 | 00~09 (Unit:1line add) |
| **357** | Sub-total date delete after printing | 00 | 00 : No delete<br>01 : Delete |
| **358** | Grand-total date delete after printing | 00 | 00 : No delete<br>01 : Delete |
| **401** | Analog Output Applying Weight Range | 00 | 00: Absolute number(-&+)<br>01: Positive number(only +) |
| **402** | Analog Output Direction | 00 | 00: Forward 01:Reverse |
| **403** | Analog Output Standard | 00 | 00: CAPACITY, 01:SP1<br>02: SP2, 03:SP3, 04:SP4<br>05: CAPACITY(Gross weight under Tare) |
| **404** | BIN IN (Product number change) | 00 | 00 : Disuse<br>01 : Units digit, tenth digit separation<br>02 : Units digit, tenth digit No separation |
| **405** | IP setting 1 | | 0~255 |
| **406** | IP setting 2 | | 0~255 |
| **407** | IP setting 3 | | 0~255 |
| **408** | IP setting 4 | | 0~255 |
| **409** | Subnet mask setting 1 | | 0~255 |
| **410** | Subnet mask setting 2 | | 0~255 |
| **411** | Subnet mask setting 3 | | 0~255 |
| **412** | Subnet mask setting 4 | | 0~255 |
| **413** | Gateway setting 1 | | 0~255 |
| **414** | Gateway setting 2 | | 0~255 |
| **415** | Gateway setting 3 | | 0~255 |
| **416** | Gateway setting 4 | | 0~255 |
| **417** | Port setting | | 0~65000 |

◆ **Weighing Data Saving time point and print**

| Weighing Data Save Method (F-function 103) | | Print input (Key, Communication, External input) | Printing out data | Saving Data |
|---|---|---|---|---|
| 00 | Manual | ○ | Current weight | Current weight |
| | | X | X | X |
| 01 | Auto: At every steady states | ○ | Recent stable weight | X |
| | | X | Steady weight | Steady weight |
| 02 | Auto: At the first steady states | ○ | Recent stable weight | X |
| | | X | Steady weight | Steady weight |
| 03 | Manual& Auto: At every steady states | ○ | Recent finish weight | X |
| | | X | Finish weight | Finish weight |
| 04 | Manual& Auto: At the first steady states | ○ | Current weight | Current weight |
| | | X | Steady weight | Steady weight |
| 05 | Manual / Auto : When weighing is finished | ○ | Current weight | Current weight |
| | | X | Steady weight | Steady weight |
| 06 | Manual | ○ | Current weight | Current weight |
| | | X | Finish weight | Finish weight |

### 5-3-4. Hidden Function

How to enter Hidden function setting mode : Press 

key 4 times and input your password.

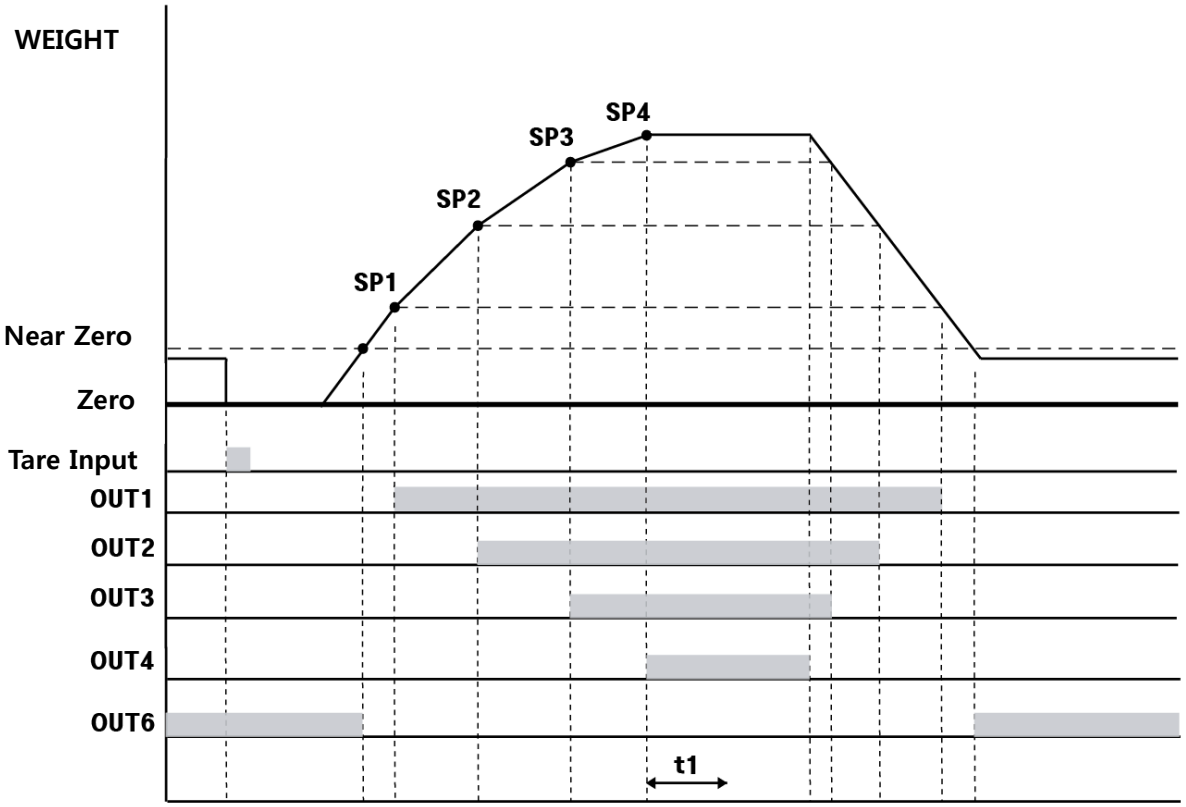
Default password is 

(0410).

| | | | |
|---|---|---|---|
| **Serial Number Check** | | | |
| **HF01** | Check your device's serial number | | |
| **Operation time check** | | | |
| **HF02** | Check how long hours it has been operated. (Power ON) Unit : 1hour | | |
| **S/W Version Check** | | | |
| **HF03** | Check the currently applied program version. | | |
| **H/W Version Check** | | | |
| **HF04** | Check the currently applied hardware version. | | |
| **DATE(Y,M,D) Check / Modification** | | | |
| **HF05** | Check the date or adjust when it is wrong. | | |
| **TIME(H,M,S) Check / Modification (24Hours)** | | | |
| **HF06** | Check the time or adjust when it is wrong. | | |
| **Password Setting (4digit)** | | | |
| **HF07** | Password is required when you enter to hidden function.<br>Enter the password twice.<br>  <br><br>**1 2 3 4 5 6 7 8 9 0**<br>Password combination within **0~9.** | | |
| **Maximum Capacity Weight Check** | | | |
| **HF08** | Check the max capacity which is set under calibration mode. | | |
| **Division Check** | | | |
| **HF09** | Check the division which is set under calibration mode. | | |
| **Test weight Check** | | | |
| **HF10** | Check the weight of test weight which is used for your last calibration. | | |
| **Analog value of ZERO** | | | |
| **HF11** | Check the analog value of ZERO. | | |
| **Analog Output Use Setting** | | | |
| **HF13** | ● | 00 | 4-20mA out |
| | | 01 | 0-10V out |

| | |
|---|---|
| **Minimum Analog Output Setting** | |
| **HF14** | Minimum analog output can be adjusted. F1 key for – value setting.<br>Input range : -20 ~ +20 , Default : 0 |
| **Maximum Analog Output Setting** | |
| **HF15** | Maximum analog output can be adjusted. F1 key for – value setting.<br>Input range : -20 ~ +20 , Default : 0 |
| **Function List Factory Reset** | |
| **HF16** | Change to default F-setting |

◆**Weighing mode 1. - Limit mode 1. (223-01) – Simple comparison weighing**



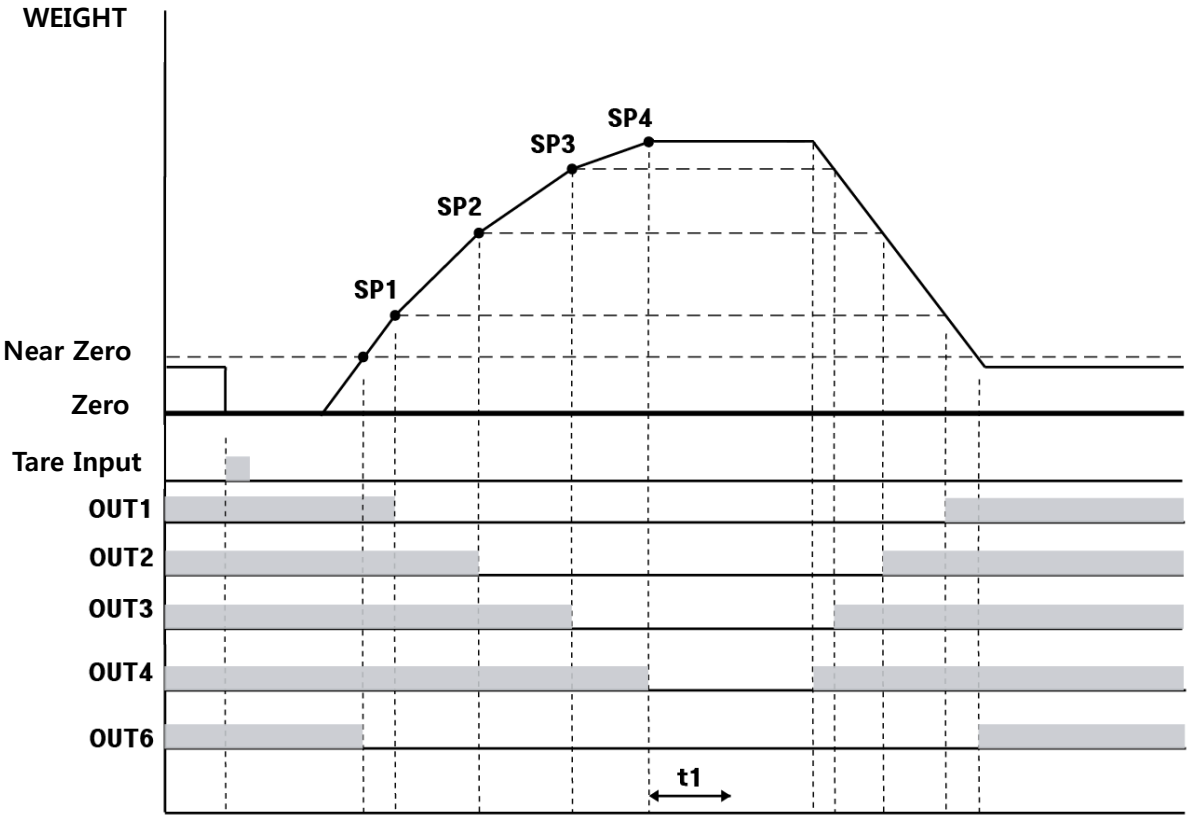

**Time set**

| Time | Contents |
|---|---|
| **t1** | Finish Relay Output Delay Time (Function 239)<br>When Function 103-3 or 103-6, save the date after t1 time. |

**Relay output**

| Relay | Condition | Relay | Condition |
|---|---|---|---|
| **OUT 1** | Current weight ≥ SP1 (ON)<br>Current weight < SP1 (OFF) | **OUT 2** | Current weight ≥ SP2(ON)<br>Current weight < SP2(OFF) |
| **OUT 3** | Current weight ≥ SP3(ON)<br>Current weight < SP3(OFF) | **OUT 4** | Current weight ≥ SP4(ON)<br>Current weight < SP4(OFF) |
| **OUT 6** | Within near zero range<br>(Function 201) (ON) | | |

### ◆Weighing mode 2. - Limit mode 2. (223-02) – Simple comparison weighing



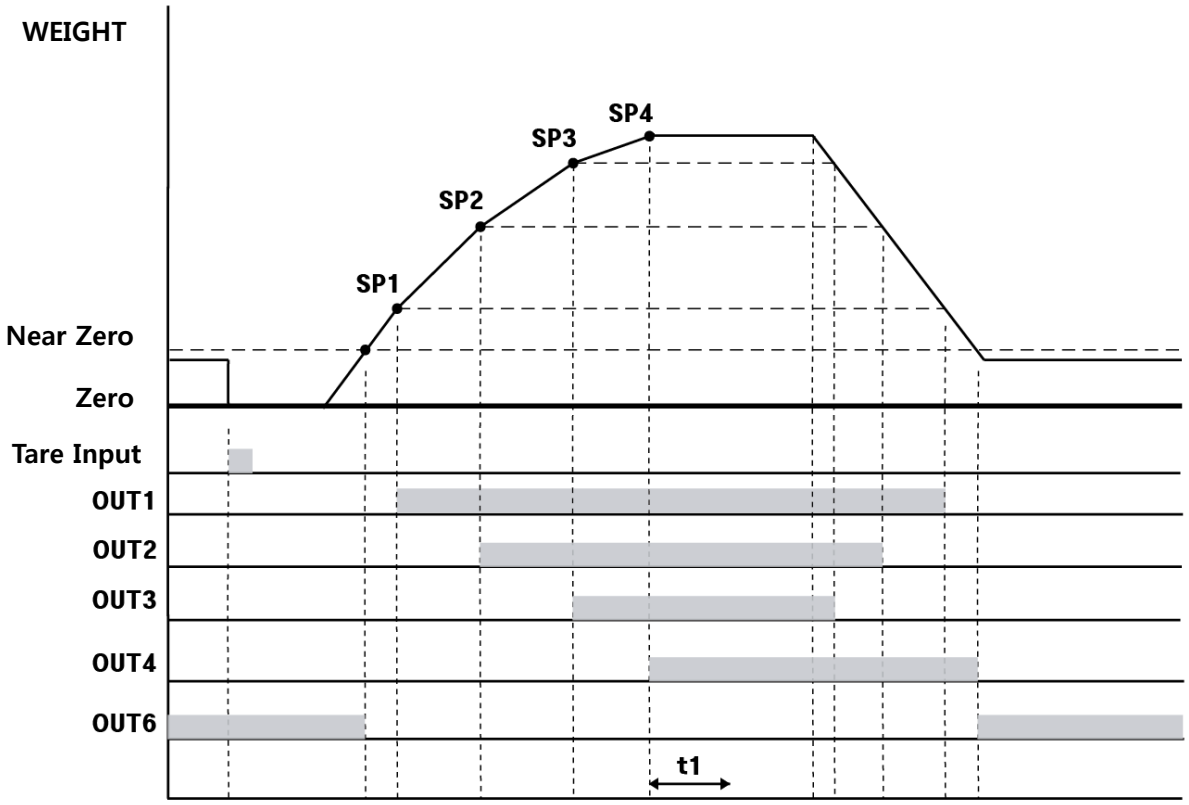

**Time set**

| Time | Contents |
|---|---|
| **t1** | Finish Relay Output Delay Time (Function 239)<br>When Function 103-3 or 103-6, save the date after t1 time. |

**Relay output**

| Relay | Condition | Relay | Condition |
|---|---|---|---|
| **OUT 1** | Current weight ≥ SP1 (OFF)<br>Current weight < SP1 (ON) | **OUT 2** | Current weight ≥ SP2(OFF)<br>Current weight < SP2(ON) |
| **OUT 3** | Current weight ≥ SP3(OFF)<br>Current weight < SP3(ON) | **OUT 4** | Current weight ≥ SP4(OFF)<br>Current weight < SP4(ON) |
| **OUT 6** | Within near zero range<br>(Function 201) (ON) | | |

### ◆Weighing mode 3. - Limit mode 2. (223-03) – Simple comparison weighing




**Time set**

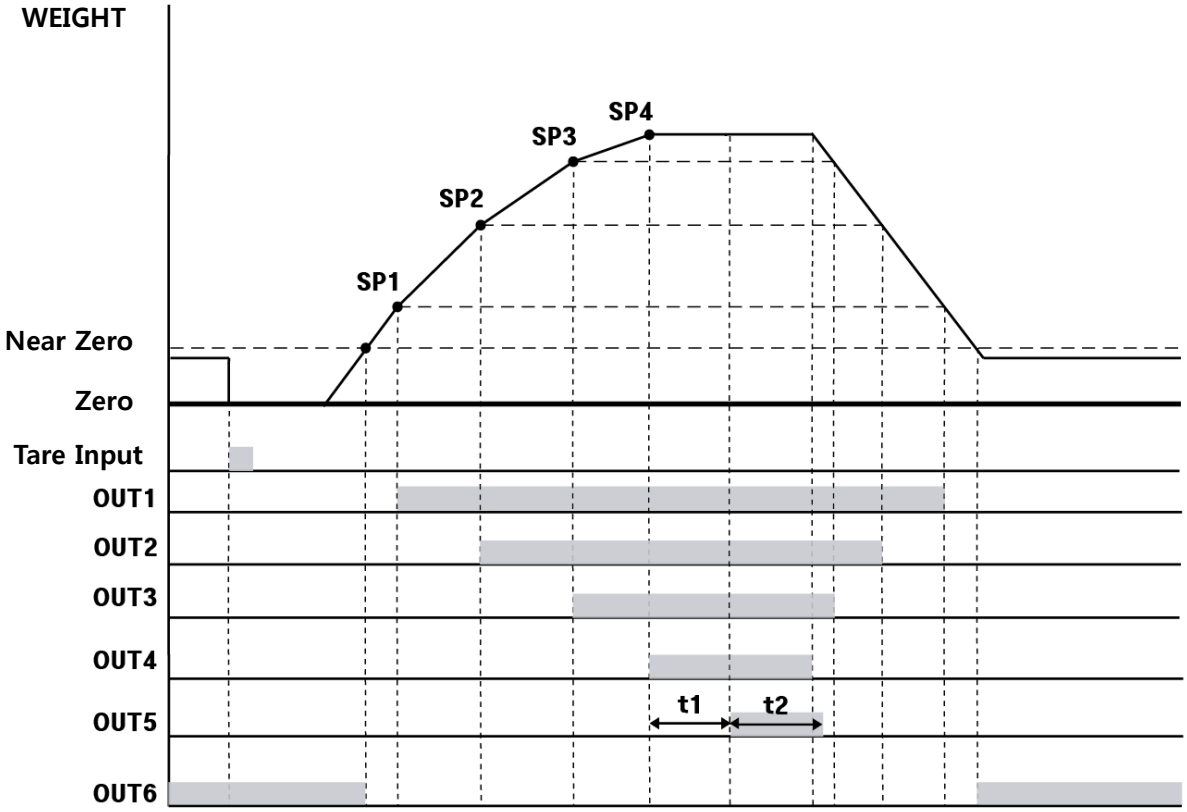
| Time | Contents |
|---|---|
| **t1** | Finish Relay Output Delay Time (Function 239)<br>When Function 103-3 or 103-6, save the date after t1 time. |

**Relay output**

| Relay | Condition | Relay | Condition |
|---|---|---|---|
| **OUT 1** | Current weight ≥ SP1 (ON)<br>Current weight < SP1 (OFF) | **OUT 2** | Current weight ≥ SP2(ON)<br>Current weight < SP2(OFF) |
| **OUT 3** | Current weight ≥ SP3(ON)<br>Current weight < SP3(OFF) | **OUT 4** | Current weight ≥ SP4(ON)<br>Current weight <Near Zero(OFF) |
| **OUT 6** | Within near zero range<br>(Function 201) (ON) | | |

**◆Weighing mode 4. - Limit mode 4 (A Dry contact) (223-04)**

**– Relay ON when weight reaches to set value**




**Time set**

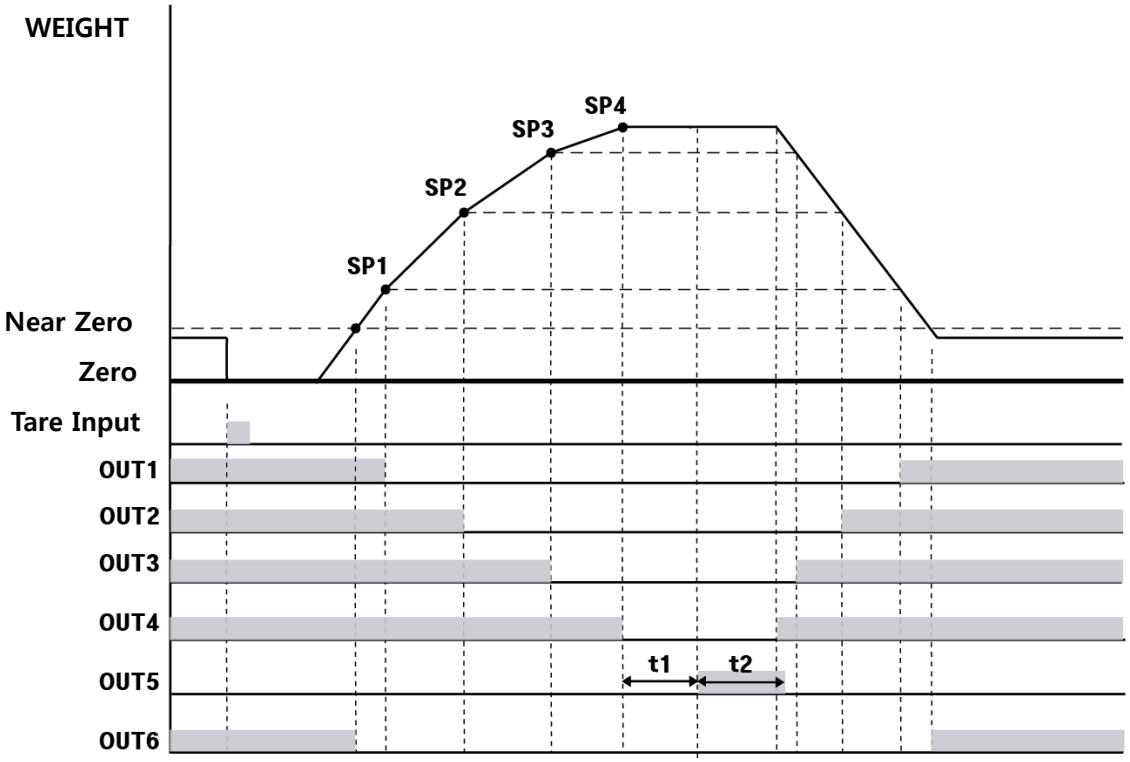
| Time | Contents |
|---|---|
| **t1** | Finish Relay Output Delay Time (Function 239)<br>When Function 103-3 or 103-6, save the date after t1 time. |
| **t2** | Finish Relay Output Time (Function 240) |

**Relay output**

| Relay | Condition | Relay | Condition |
|---|---|---|---|
| **OUT 1** | Current weight ≥ SP1 (ON)<br>Current weight < SP1 (OFF) | **OUT 4** | Current weight ≥ SP4 (ON)<br>Current weight < SP4 (OFF) |
| **OUT 2** | Current weight ≥ SP2 (ON)<br>Current weight < SP2 (OFF) | **OUT 5** | After SP4<br>After t1 set time<br>During t2 set time (ON) |
| **OUT 3** | Current weight ≥ SP3 (ON)<br>Current weight < SP3 (OFF) | **OUT 6** | Within near zero range (Function 201) (ON) |

**◆Weighing mode 5. - Limit mode 5. (B Dry contact) (223-05)**

**- Relay OFF when weight reaches to set value**



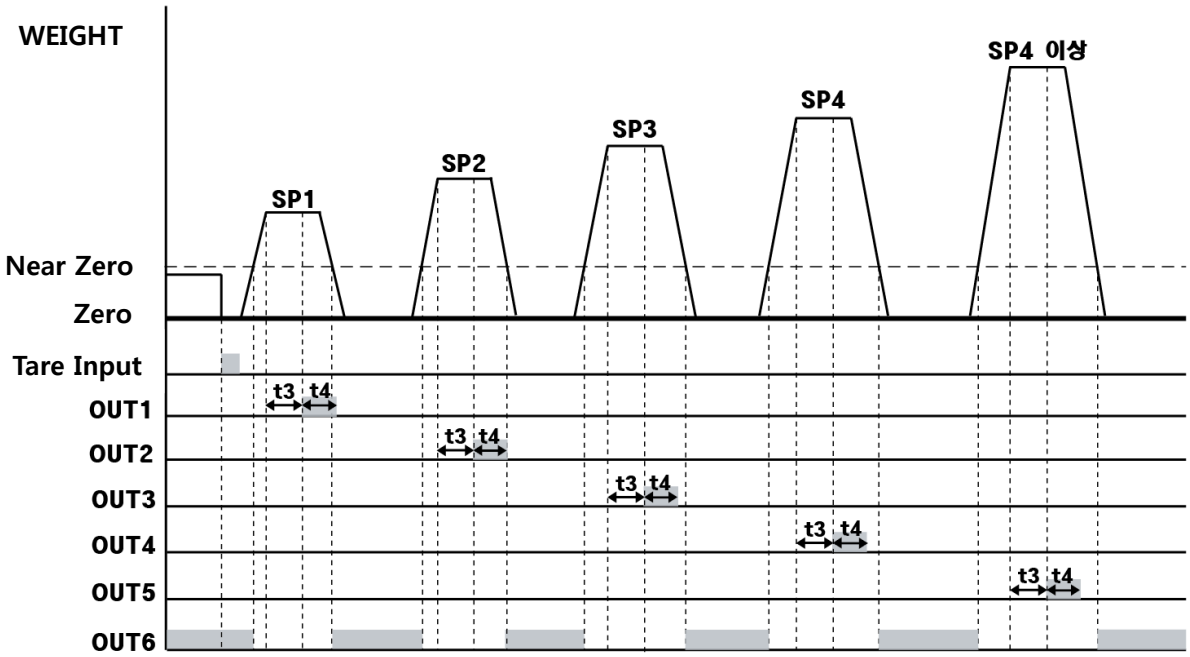

**Time set**

| Time | Contents |
|---|---|
| **t1** | Finish Relay Output Delay Time (Function 239)<br>When Function 103-3 or 103-6, save the date after t1 time. |
| **t2** | Finish Relay Output Time (Function 240) |

**Relay output**

| Relay | Condition | Relay | Condition |
|---|---|---|---|
| **OUT 1** | Current weight < SP1 (ON)<br>Current weight ≥ SP1 (OFF) | **OUT 4** | Current weight < SP4 (ON)<br>Current weight ≥ SP4 (OFF) |
| **OUT 2** | Current weight < SP2 (ON)<br>Current weight ≥ SP2 (OFF) | **OUT 5** | After SP4<br>After t1 set time<br>During t2 set time (ON) |
| **OUT 3** | Current weight < SP3 (ON)<br>Current weight ≥ SP3 (OFF) | **OUT 6** | Within near zero range (Function 201) (ON) |

### ◆Weighing mode 6. - Checker mode 1. (223-06) – Simple comparison mode 1.



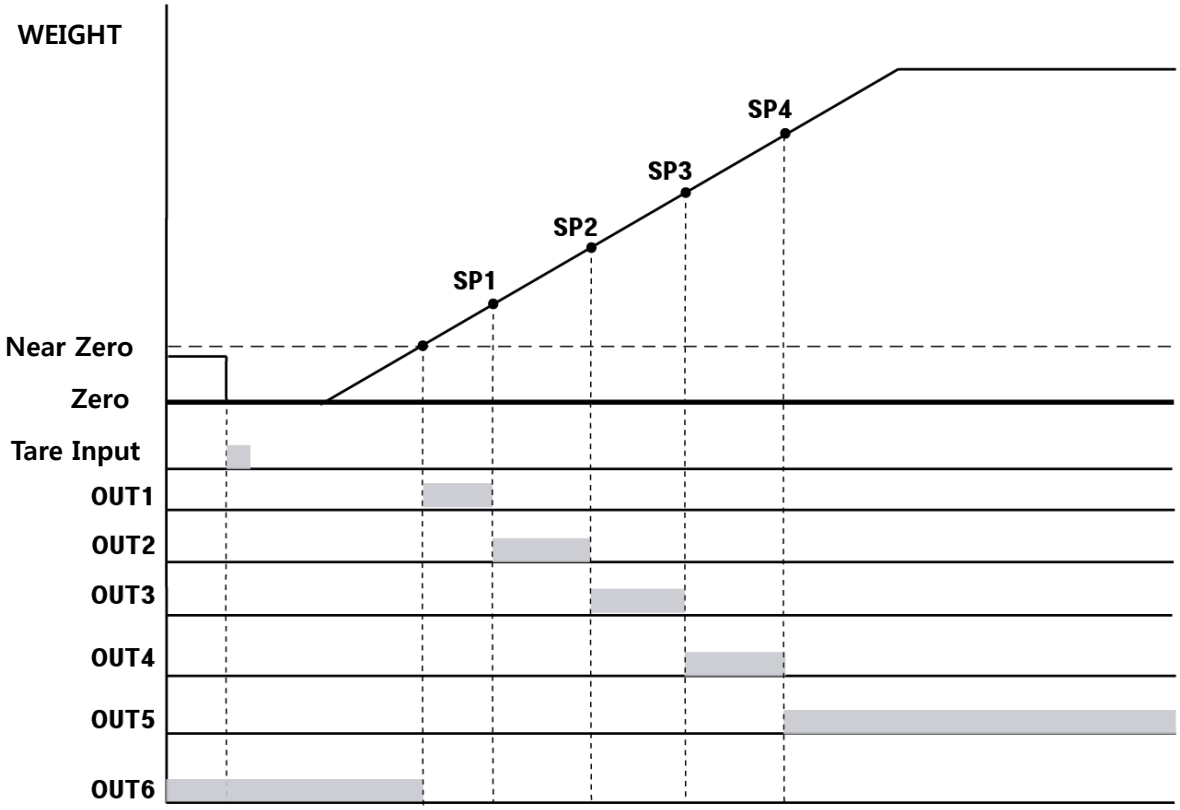

**Time**

| Time | Contents |
|---|---|
| **t3** | Weight Judge Delay Time (Function 241)<br>Save weight date after t3, under Function 103-3 or 103-6 t3. |
| **t4** | Weight Judge Time (Function 243) |

**Relay output**

| Relay | Condition | Relay | Condition |
|---|---|---|---|
| **OUT 1** | Near zero < Steady weight ≤ SP1 (ON) | **OUT 4** | SP3 < Steady weight ≤ SP4 (ON) |
| **OUT 2** | SP1 < Steady weight ≤ SP2 (ON) | **OUT 5** | SP4 < Steady weight (ON) |
| **OUT 3** | SP2 < Steady weight ≤ SP3 (ON) | **OUT 6** | Within near zero range (Function 201) (ON) |

◆**Weighing mode 7. - Checker mode 2. (223-07) - Simple comparison mode 2.**

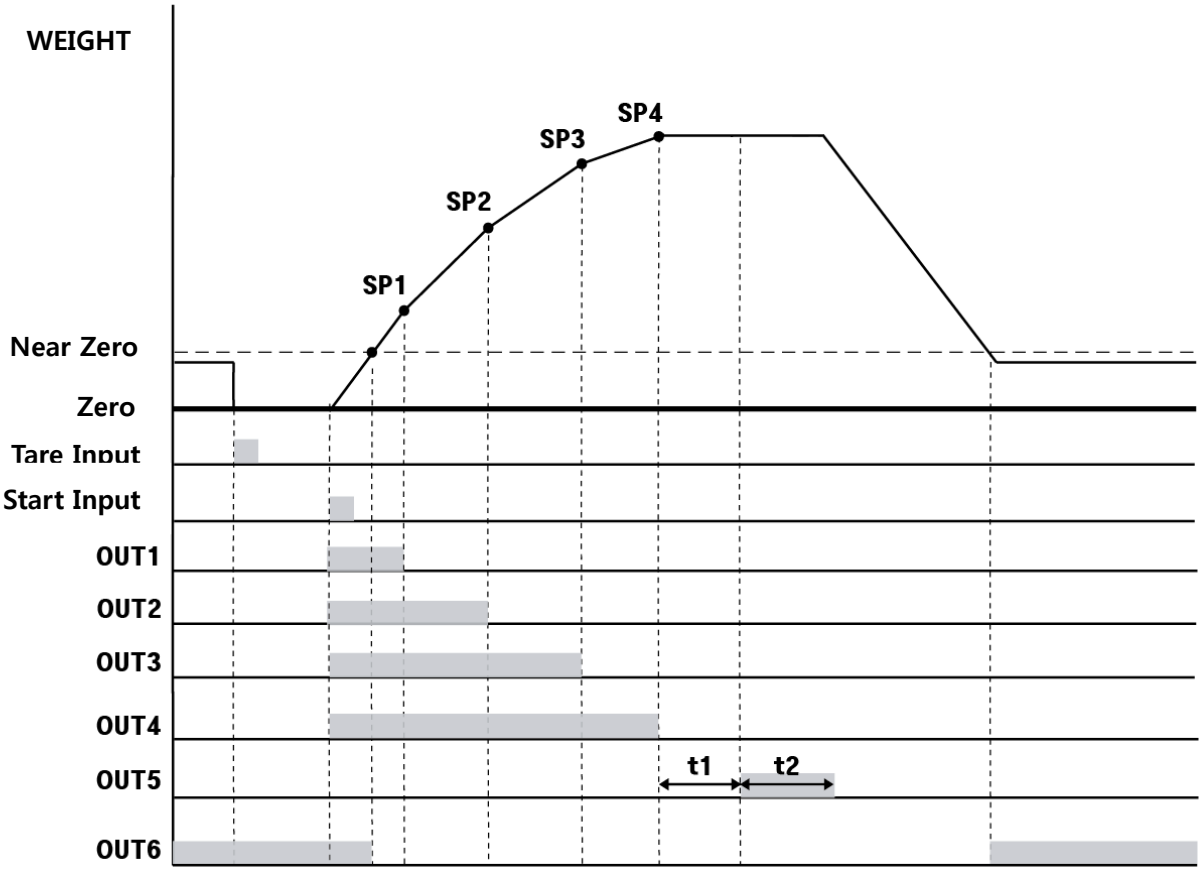



**Relay output**

| Relay | Condition | Relay | Condition |
|---|---|---|---|
| **OUT 1** | Near zero < Current weight ≤ SP1 (ON) | **OUT 5** | SP4 < Current weight (ON) |
| **OUT 2** | SP1 < Current weight ≤ SP2 (ON) | **OUT 6** | Within near zero range (Function 201) (ON) |
| **OUT 3** | SP2 < Current weight ≤ SP3 (ON) | **OUT 7** | Cell-Error (ON) |
| **OUT 4** | SP3 < Current weight ≤ SP4 (ON) | | |

**※No Accumulation.**

◆**Weighing mode 8. – Packer mode (223-08)**




**Time**

| Time | Contents |
|---|---|
| **t1** | Finish Relay Output Delay Time (Function 239)<br>When Function 103-3 or 103-6, save the date after t1 time. |
| **t2** | Finish Relay Output Time (Function 240) |

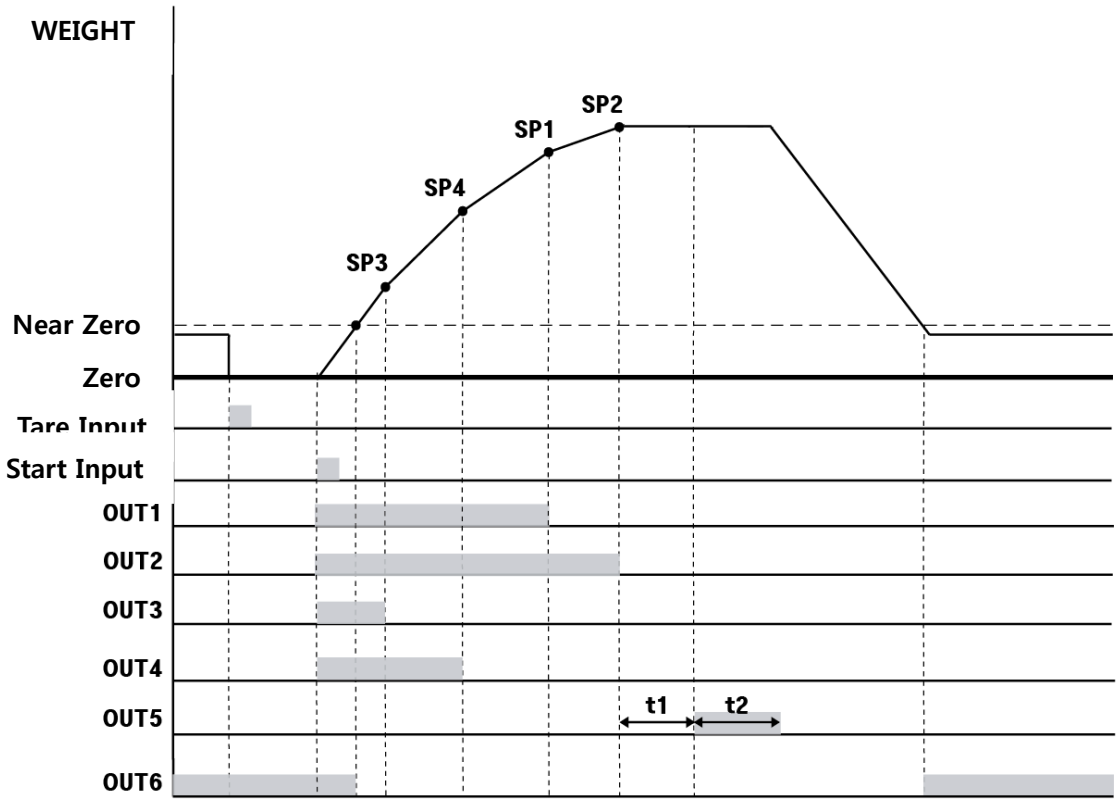
**Relay output**

| Relay | Condition | Relay | Condition |
|---|---|---|---|
| **OUT 1** | Start On (ON)<br>Current weight ≥ SP1 (OFF) | **OUT 4** | Start On (ON)<br>Current weight ≥ SP4 (OFF) |
| **OUT 2** | Start On (ON)<br>Current weight (OFF) | **OUT 5** | After SP4<br>After t1 set time<br>During t2 set time (ON) |
| **OUT 3** | Start On (ON)<br>Current weight ≥ SP3 (OFF) | **OUT 6** | Within near zero range (Function 201) (ON) |

**※Free fall control : After weighing is finished, if the weight is changed during t1, it will adjust weighing finished weight by using drip gate. (Function 250-01)**

### ◆Weighing mode 9. – User's choice packer mode (223-09)

**– relay output order is selectable by user**




**Time**

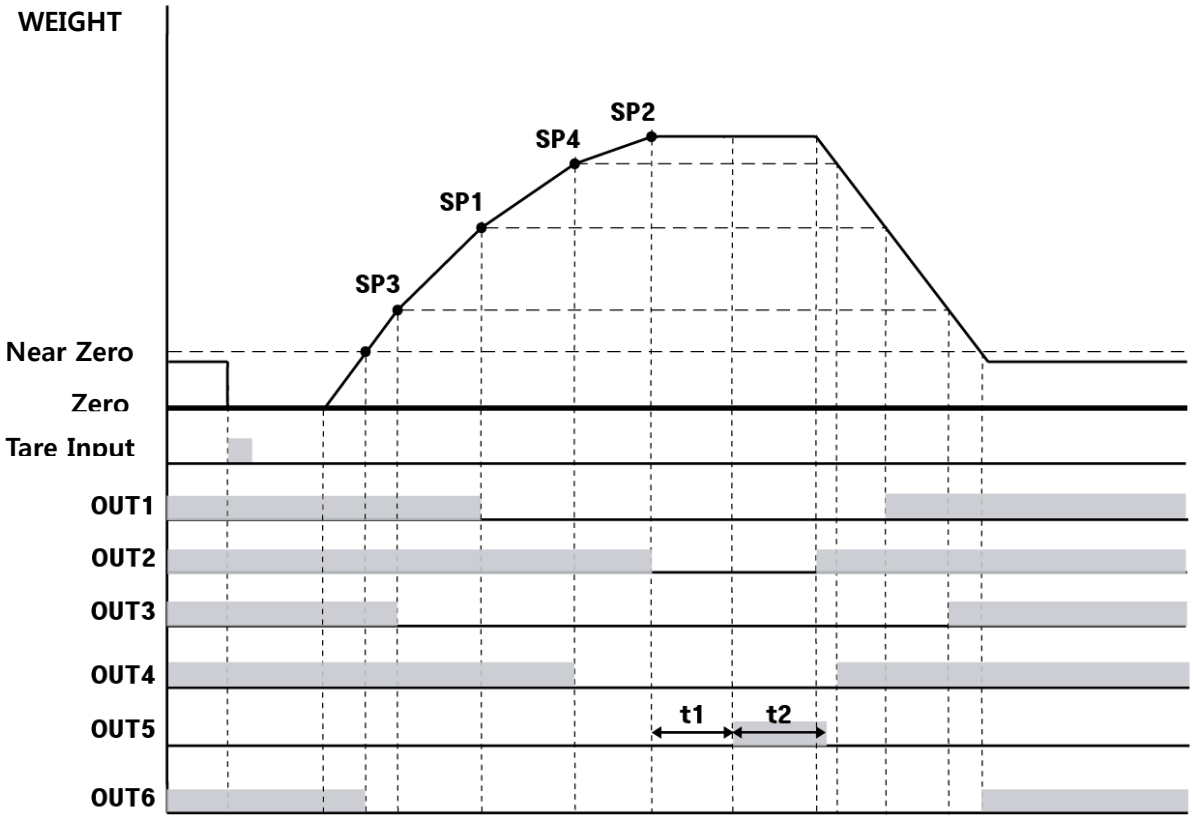
| Time | Contents |
|---|---|
| **t1** | Finish Relay Output Delay Time (Function 239)<br>When Function 103-3 or 103-6, save the date after t1 time. |
| **t2** | Finish Relay Output Time (Function 240) |

**Relay output**

| Relay | Condition | Relay | Condition |
|---|---|---|---|
| **OUT 1** | Start On (ON)<br>Current weight ≥ SP1 (OFF) | **OUT 4** | Start On (ON)<br>Current weight ≥ SP4 (OFF) |
| **OUT 2** | Start On (ON)<br>Current weight ≥ SP2 (OFF) | **OUT 5** | After SP4<br>After t1 set time<br>During t2 set time (ON) |
| **OUT 3** | Start On (ON)<br>Current weight ≥ SP3 (OFF) | **OUT 6** | Within near zero range (Function 201) (ON) |

**※Free fall control : After weighing is finished, if the weight is changed during t1, it will adjust weighing finished weight by using drip gate. (Function 250-01)**

**◆Weighing mode 10. – Limit mode 6 (B Dry contact) - User's choice relay output 1 (Function 223-10) - relay output order is selectable by user**



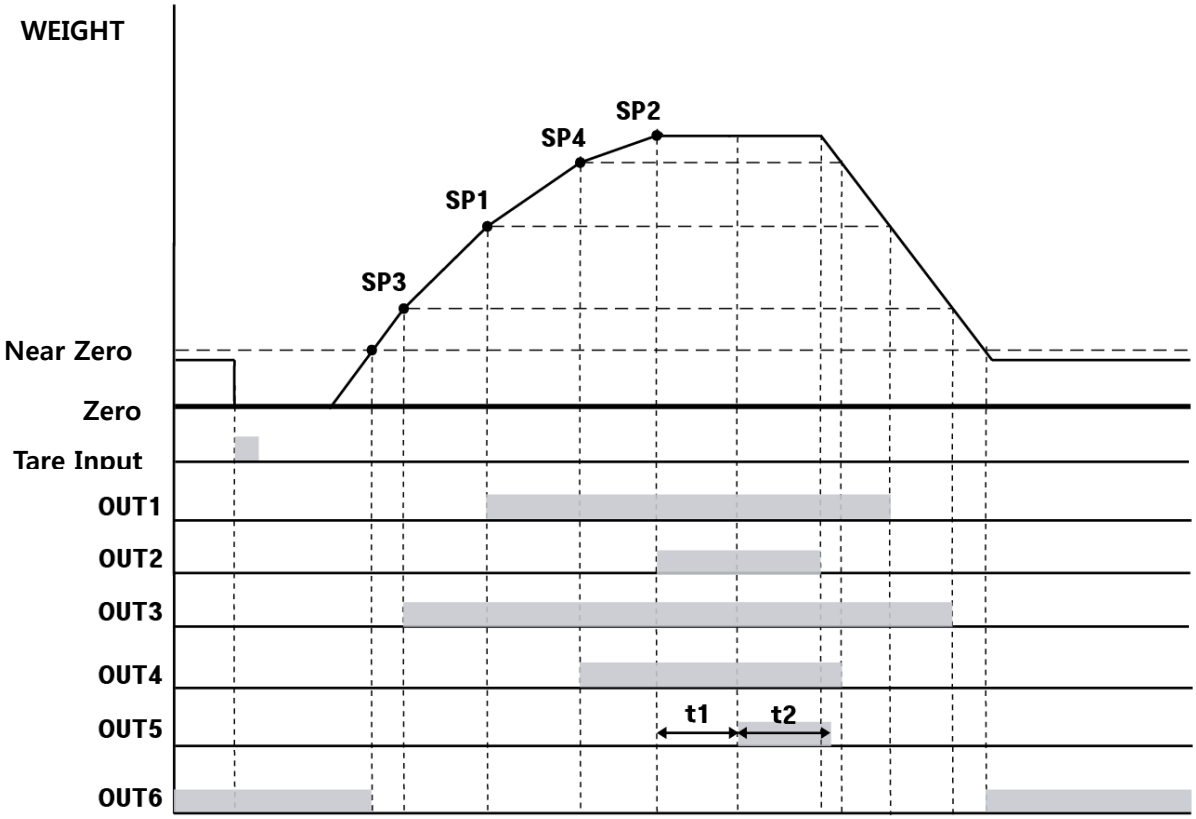

**Time**

| Time | Contents |
|---|---|
| **t1** | Finish Relay Output Delay Time (Function 239)<br>When Function 103-3 or 103-6, save the date after t1 time. |
| **t2** | Finish Relay Output Time (Function 240) |

**Relay output**

| Relay | Condition | Relay | Condition |
|---|---|---|---|
| **OUT 1** | Current weight < SP1 (ON)<br>Current weight ≥ SP1 (OFF) | **OUT 4** | Current weight < SP4 (ON)<br>Current weight ≥ SP4 (OFF) |
| **OUT 2** | Current weight < SP2 (ON)<br>Current weight ≥ SP2 (OFF) | **OUT 5** | After SP2<br>After t1 set time<br>During t2 set time (ON) |
| **OUT 3** | Current weight < SP3 (ON)<br>Current weight ≥ SP3 (OFF) | **OUT 6** | Within near zero range (Function 201) (ON) |

**◆Weighing mode 11. – Limit mode 7 (A Dry contact) -User's choice relay output 2 (Function 223-11) - relay output order is selectable by user**




**Time**

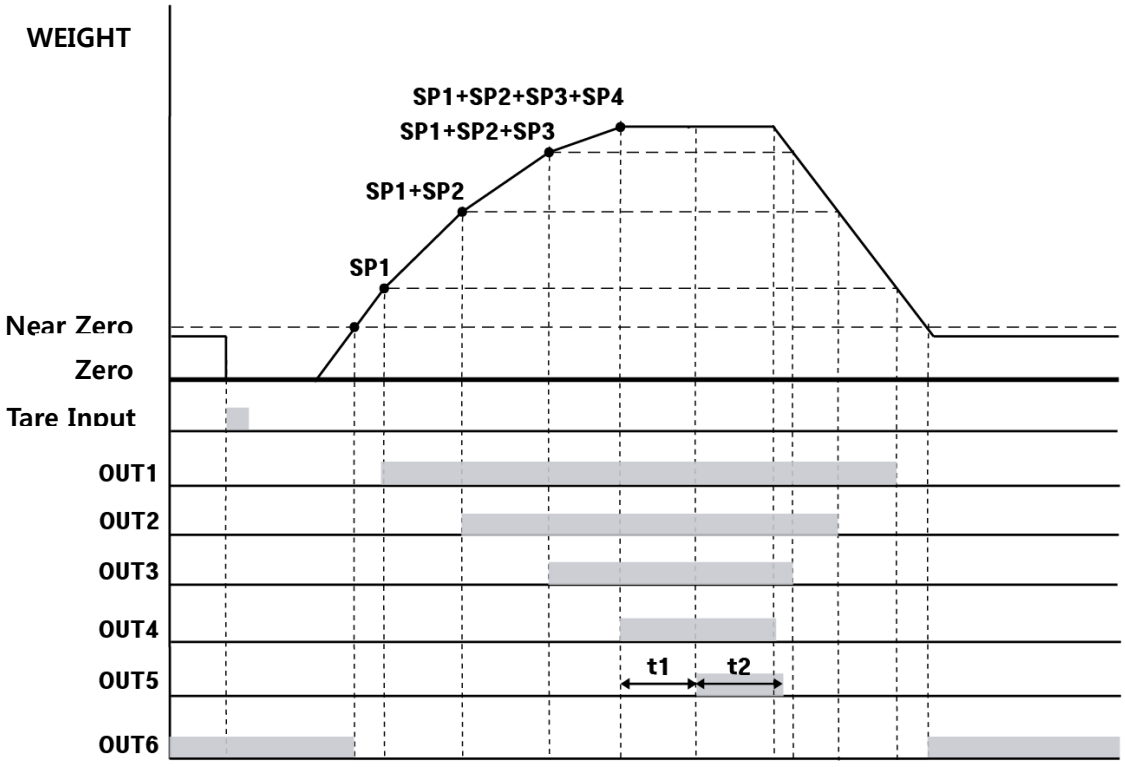
| Time | Contents |
|---|---|
| **t1** | Finish Relay Output Delay Time (Function 239)<br>When Function 103-3 or 103-6, save the date after t1 time. |
| **t2** | Finish Relay Output Time (Function 240) |

**Relay output**

| Relay | Condition | Relay | Condition |
|---|---|---|---|
| **OUT 1** | Current weight ≥ SP1 (ON)<br>Current weight < SP1 (OFF) | **OUT 4** | Current weight ≥ SP4 (ON)<br>Current weight < SP4 (OFF) |
| **OUT 2** | Current weight ≥ SP2 (ON)<br>Current weight < SP2 (OFF) | **OUT 5** | After SP2<br>After t1 set time<br>During t2 set time (ON) |
| **OUT 3** | Current weight ≥ SP3 (ON)<br>Current weight < SP3 (OFF) | **OUT 6** | Within near zero range (Function 201) (ON) |

**◆Weighing mode 12. – Accumulation mode 1. (223-12)**

**-Each set point need to be the difference between each steps.**




**Time**

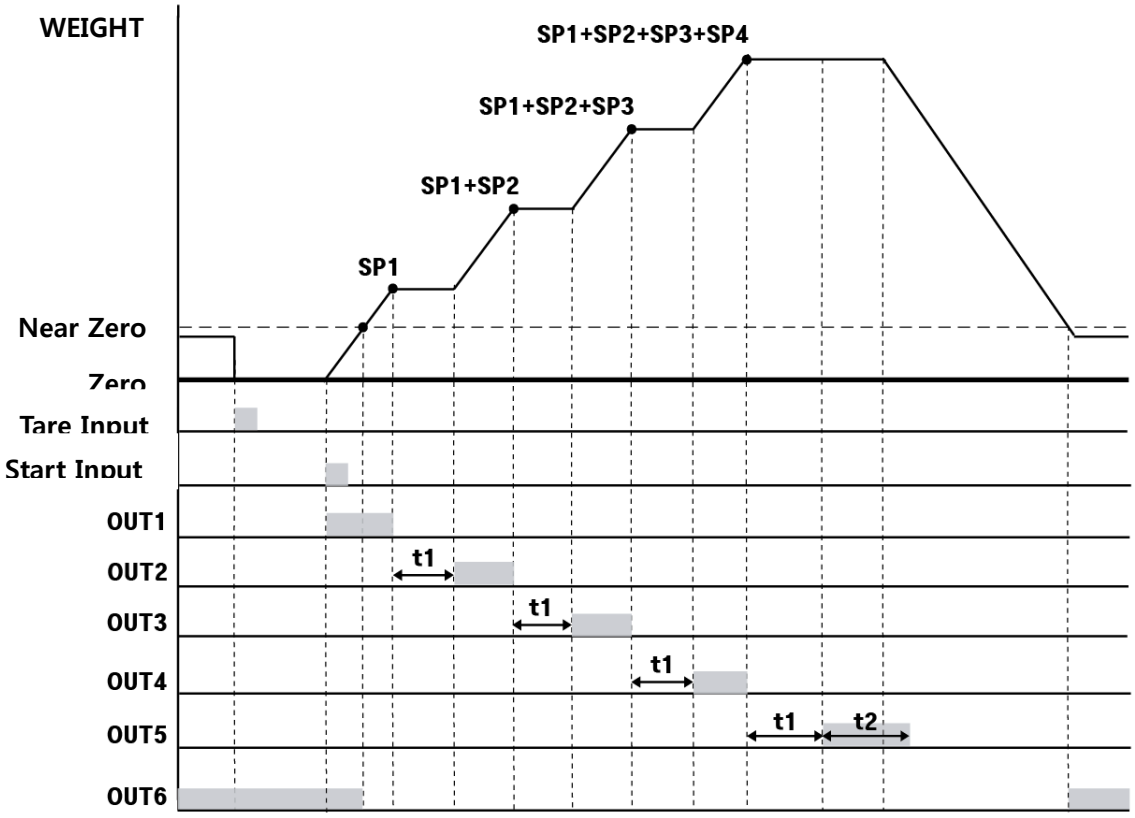
| Time | Contents |
|---|---|
| **t1** | Finish Relay Output Delay Time (Function 239)<br>When Function 103-3 or 103-6, save the date after t1 time. |
| **t2** | Finish Relay Output Time (Function 240) |

**Relay output**

| Relay | Condition | Relay | Condition |
|---|---|---|---|
| **OUT 1** | Current weight ≥ SP1 (ON)<br>Current weight < SP1 (OFF) | **OUT 4** | Current weight ≥ SP1+SP2+SP3+SP4 (ON)<br>Current weight < SP1+SP2+SP3+SP4 (OFF) |
| **OUT 2** | Current weight ≥ SP1+SP2 (ON)<br>Current weight < SP1+SP2 (OFF) | **OUT 5** | After SP1+SP2+SP3+SP4 이후<br>After t1 set time<br>During t2 set time (ON) |
| **OUT 3** | Current weight ≥ SP1+SP2+SP3 (ON)<br>Current weight < SP1+SP2+ SP3 (OFF) | **OUT 6** | Within near zero range (Function 201) (ON) |

**◆Weighing mode 13 - Accumulation mode 2. (223-13)**

**- Each set point need to be the difference between each steps.**




**Time**

| Time | Contents |
|---|---|
| **t1** | Finish Relay Output Delay Time (Function 239)<br>When Function 103-3 or 103-6, save the date after t1 time. |
| **t2** | Finish Relay Output Time (Function 240) |

**Relay output**

| Relay | Condition | Relay | Condition |
|---|---|---|---|
| **OUT 1** | Start input (ON)<br>Current weight ≥ SP1 (OFF) | **OUT 4** | SP1+SP2+SP3 ≤<br>Current weight <<br>SP1+SP2+SP3+SP4 (ON) |
| **OUT 2** | SP1 ≤ Current weight < SP1+SP2 (ON) | **OUT 5** | After SP1+SP2+SP3+SP4<br>After t1 set time<br>During t2 set time (ON) |
| **OUT 3** | SP1+SP2 ≤ Current weight <<br>SP1+SP2+SP3 (ON) | **OUT 6** | Within near zero range (Function 201) (ON) |

## 5-4. Test Mode

**Caution** **Before starting the TEST mode, please remove other connected devices.**

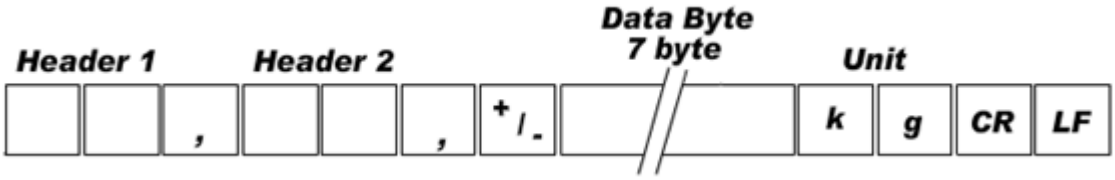
| | | |
|---|---|---|
| **Test Mode** | Analog Value | Press F1 key 4times → TARE/RESET 2 → ZERO 1 |
| | Analog Variation Value | Press F1 key 4times → TARE/RESET 2 → TARE/RESET 2 |
| | Key | Press F1 key 4times → TARE/RESET 2 → HOLD/RESET 3 |
| | Display | Press F1 key 4times → TARE/RESET 2 → PART NO. 4 |
| | External Input | Press F1 key 4times → TARE/RESET 2 → PRINT 5 |
| | Relay Output | Press F1 key 4times → TARE/RESET 2 → START/STOP 6 |
| | Analog out | Press F1 key 4times → TARE/RESET 2 → SP1 7 |
| | Standard serial I/F | Press F1 key 4times → TARE/RESET 2 → SP2 8 |
| | Option serial I/F | Press F1 key 4times → TARE/RESET 2 → SP3 9 |

# 6. INTERFACE

## 6-1. Serial Interface

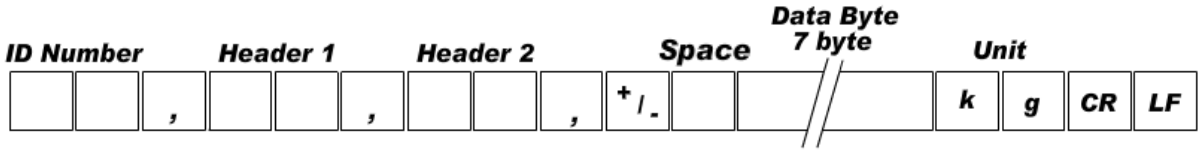
### 6-1-1. Data Format

**(1) Data Format 1 : ID Number is not be transferred. (Refer F-function 305-00) -19byte**




| Header1 | Header2 |
|---|---|
| OL : OVER LOAD | NT : NET-WEIGHT(Tare is not set) |
| ST : STEADY | GS : when setting TARE |
| US : UNSTEADY | |

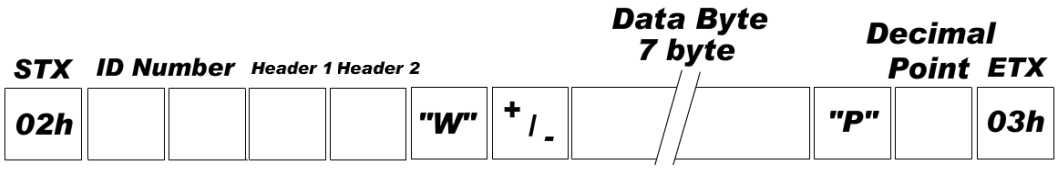
**(2) Data Format 2 : ID Number+Data Transference (Refer F-function 101, 305-01) -22byte**




ID Number : Function 101

| Header1 | Header2 |
|---|---|
| OL : OVER LOAD | NT : NET-WEIGHT(Tare is not set) |
| ST : STEADY | GS : when setting TARE |
| US : UNSTEADY | |

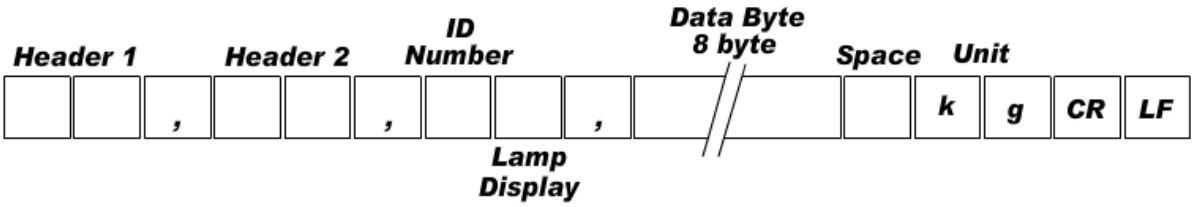
**(3) Data Format 3 : ID Number + State (Refer function 305-02) – 17 byte**




ID Number : Function 101

| Header1 | Header2 |
|---|---|
| OL : OVER LOAD | NT : NET-WEIGHT(Tare is not set) |
| ST : STEADY | GS : when setting TARE |
| US : UNSTEADY | |

**(4) Format 4 (ID Number, Function 101, 305-03) – 22 byte**



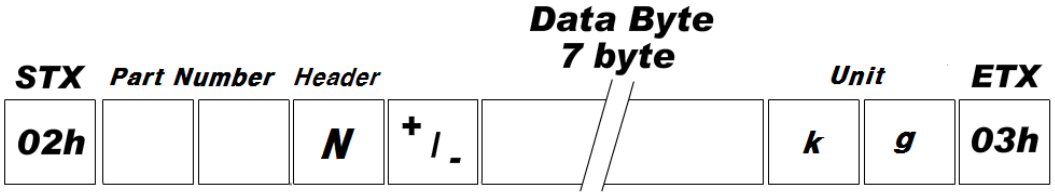

ID Number : Function 101

| Header1 | Header2 |
|---|---|
| OL : OVER LOAD | NT : NET-WEIGHT(Tare is not set) |
| ST : STEADY | GS : when setting TARE |
| US : UNSTEADY | |

램프 표시 설명

| Bit 0 | Bit 1 | Bit 2 | Bit 3 | Bit 4 | Bit 5 | Bit 6 | Bit 7 |
|---|---|---|---|---|---|---|---|
| ZERO | TARE | Gross Weight | Print | HOLD | 1 | STEADY | 1 |

**(5) Format 5 (P/N, Judgement weight, Weight transmission, 305-04) : For checker mode– 15byte**



### 6-1-2. Command Mode

Under "Command Mode", Indicator will recognize the receipt of Order based on 02h(STX) and 03h(ETX) signal, and transfers 06h(ACK), 15h(NAK).

| Error Code (Function 304 - 01 or 311 - 01) | | | |
|---|---|---|---|
| **0 (30h)** | Normality | **3 (33h)** | Number data Error |
| **1 (31h)** | Check-Sum Error | **4 (34h)** | Excess of write data's allowable range |
| **2 (32h)** | Data length Error | | |

### 6-1-3. Read Command

| Subject | Command | Length of transmission data | |
|---|---|---|---|
| | | Under the function 305/312 - 00,01,03,04 | Under the function 305/312 - 02 |
| **Current Weight** | **STX ID RCWT ETX** | **22 byte** | **22 byte** |
| **Current data** | **STX ID RCWD ETX** | **44 byte** | **48 byte** |
| **Sub-total date** | **STX ID RSUB ETX** | **29 byte** | **30 byte** |
| **Sub-total weighing times** | **STX ID RSNO ETX** | **14 byte** | **14 byte** |
| **Grand-total data** | **STX ID RGRD ETX** | **29 byte** | **28 byte** |
| **Weighing completion value** | **STX ID RFIN ETX** | **15 byte** | **18 byte** |
| **Current time data** | **STX ID RTIM ETX** | **14 byte** | |
| **Current date data** | **STX ID RDAT ETX** | **14 byte** | |
| **Tare weight** | **STX ID RTAR ETX** | **15 byte** | **18 byte** |
| **SP1** | **STX ID RSP1 ETX** | **15 byte** | **17 byte** |
| **SP2** | **STX ID RSP2 ETX** | **15 byte** | **17 byte** |
| **SP3** | **STX ID RSP3 ETX** | **15 byte** | **17 byte** |
| **SP4** | **STX ID RSP4 ETX** | **15 byte** | **17 byte** |
| **SP1, SP2, SP3, SP4** | **STX ID RSPA ETX** | - | **38 byte** |
| **Current P/N transmission** | **STX ID RPNO ETX** | **10 byte** | |
| **Current weight, Input, Output state** | **STX ID RWRS ETX** | **29 byte** | **31 byte** |

### 6-1-4. Write Command

| Subject | Command | Length of transmission data) | |
|---|---|---|---|
| | | Under the function 305/312 - 00,01,03,04 | Under the function 305/312 - 02 |
| Zero | STX ID WZER ETX | 8 byte | |
| Tare | STX ID WTAR ETX | 8 byte | |
| Tare Reset | STX ID WTRS ETX | 8 byte | |
| Hold | STX ID WHOL ETX | - | 8 byte |
| Hold Reset | STX ID WHRS ETX | - | 8 byte |
| Print | STX ID WPRT ETX | 8 byte | |
| Sub-total Print | STX ID WSPR ETX | 8 byte | |
| Grand-total Print | STX ID WGPR ETX | 8 byte | |
| Delete Sub-total | STX ID WSTC ETX | 8 byte | |
| Delete Grand-total | STX ID WGTC ETX | 8 byte | |
| Run | STX ID WSTR ETX | 8 byte | |
| Stop | STX ID WSTP ETX | 8 byte | |
| Time setting | STX ID WTIM TIME (HHMMSS) ETX | 14 byte | |
| Date setting | STX ID WDAT DATE (YYMMDD) ETX | 14 byte | |
| SP1 | STX ID WSP1 SP1 value ETX | 15 byte | 15 byte |
| SP2 | STX ID WSP2 SP2 value ETX | 15 byte | 15 byte |
| SP3 | STX ID WSP3 SP3 value ETX | 15 byte | 15 byte |
| SP4 | STX ID WSP4 SP4 value ETX | 15 byte | 15 byte |
| P/N change | STX ID WPNO P/N ETX | 10 byte | |
| SP1, SP2, SP3, SP4 | STX ID WSPA SP1, SP2, SP3, SP4 value ETX | - | 36 byte |
| P/N, SP1, SP2, SP3, SP4 | STX ID WFTD P/N SP1, SP2, SP3, SP4 value ETX | - | 38 byte |

### 6-1-5. Modbus Memory Map

**Tip**

- **RO : Read Only**
- **RW : Read Write**
- **Each P/N's set point can't over max capacity of Indicator.**
  **ex)35.00kg = 3,500 (0xDAC)**
- **When you input date and time, it should be 6digit.**

**ex) 1st January 2014 = 140101 (0x22345)**

**15(H) : 50(M) : 17(S) = 155017 (0x25D89)**

- **Refer the memory register for regarding Lamp, Error, Digital Input, Standard Key, Special Key**
- **Modbus Function Codes**
  **'03' (0x03) : Read Holding Registers**
  **'04' (0x04) : Read Input Registers**
  **'06' (0x06) : Write Single Registers**
  **'16' (0x10) : Write Multiple Registers**
- **CRC Check Method is CRC-16.**

| Add-ress | Leng-th | Featur e | Description |
|---|---|---|---|
| 1 | 2 | RO | Capacity |
| 3 | 2 | RO | None(0x00) |
| 5 | 2 | RO | Analog Value |
| 7 | 2 | RO | Span Value |
| 9 | 1 | RO | Division |
| 10 | 1 | RO | Decimal point |
| 11 | 2 | RO | Current Weight |
| 13 | 2 | RO | Tare Weight |
| 15 | 2 | RO | Measured Weight |
| 17 | 2 | RO | Digital input |
| 19 | 2 | RO | Lamp |
| 21 | 2 | RO | Error |
| 23 | 1 | RO | Weighing Mode |
| 24 | 1 | RO | Weighing Step |
| 25 | 2 | RO | Current P/N Sub-total count |
| 27 | 2 | RO | Current P/N Sub-total Weight |
| 33 | 2 | RO | Grand-total Count |
| 35 | 2 | RO | Grand-total Weight |
| 437 | 2 | RW | Date |
| 439 | 2 | RW | Time |
| 441 | 1 | RW | Key value |
| 443 | 1 | RW | Relay output |
| 444 | 1 | RW | P/N |
| 445 | 2 | RW | Current P/N Set point 1 |
| 447 | 2 | RW | Current P/N Set point 2 |
| 449 | 2 | RW | Current P/N Set point 3 |
| 451 | 2 | RW | Current P/N Set point 4 |

## 6-1-6. Modbus memory register

**(1) Digital input register (Address : 17, Length : 2)**

| 0 | 1 | 2 | 3 |
|---|---|---|---|
| INPUT1 | INPUT2 | INPUT3 | INPUT4 |

**(2) Lamp register (Address : 19, Length : 2)**

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| Steady | Zero | Tare | OUT1 | OUT2 | OUT3 | OUT4 | Hold |

**(3) Error register (Address : 21, Length : 2)**

| 0 | 1 | 2 |
|---|---|---|
| Loadcell Error | Over Load | Set point Error |

**(4) Key register (Address : 441, Length : 1)**

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Start | Stop | Zero | Tare | Tare Removal | Hold | Hold Removal | Print | Sub-total print | Sub-total delete | Grand-total Print | Grand-total delete |

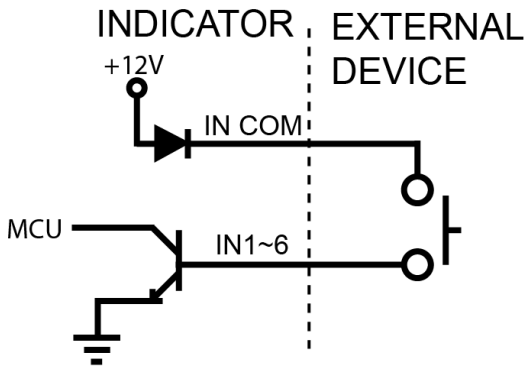
**(5) Relay output register (Address : 443, Length : 1)**

| 0 | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| OUT1 | OUT2 | OUT3 | OUT4 | OUT5 | OUT6 | OUT7 |

## 6-2. External input

Each external input's function is selectable from function 233~238.

### 6-2-1. External input circuit composition



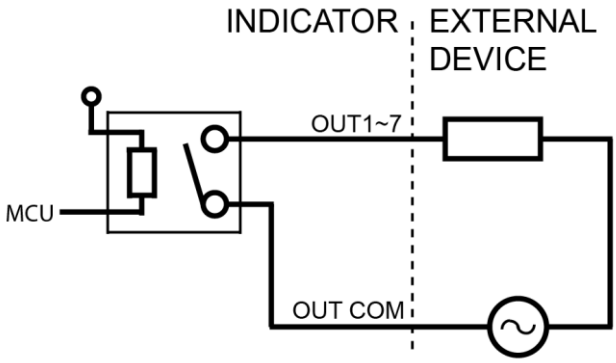

## 6-3. Relay output

7pcs relay out A dry : Each relay output's function is selectable from function 226~232.

### 6-3-1. Specification

| Contact Ratings VDC | Contact Ratings VAC |
|---|---|
| 24V 3A | 250V 3A |

### 6-3-2. Relay output circuit composition




**Tip** **If you enter to Calibration or Test mode, Relay output will be off except OUT7.**

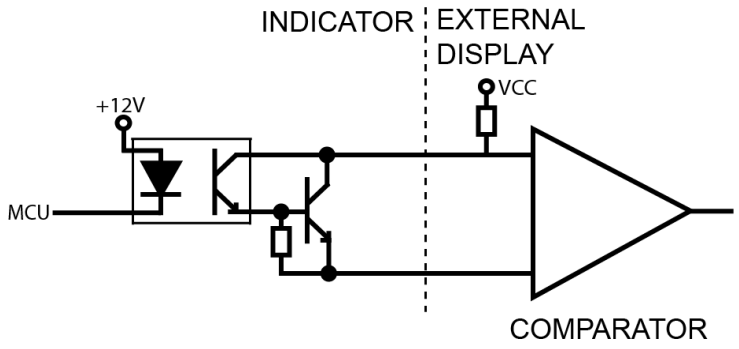
**Caution** **If you use higher voltage than relay specification, indicator might be damaged.**

## 6-4. Current loop

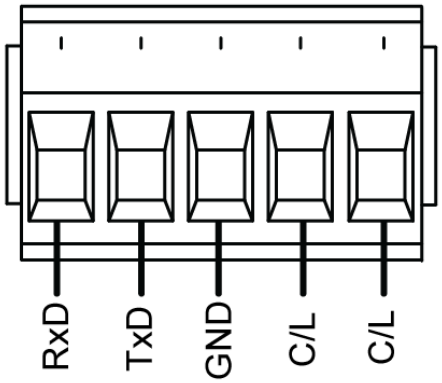
Current loop is suitable for middle distance transmission because stronger than RS-232C against electric noise. (About 100M)

**Tip** **Maximum communication speed is 9,600.**

### 6-4-1. Current loop circuit composition




### 6-4-2. Connection




| RxD | TxD | GND | C/L | C/L |
|---|---|---|---|---|
| RS232 | RS232 | RS232 | TxD | TxD |

## 6-5. Analogue I-Output Interface : 4~20mA

This output card converts weight value to Analog output signal (4~20mA) and transfers to external devices(Recorder, P.L.C), controlled by voltage output.

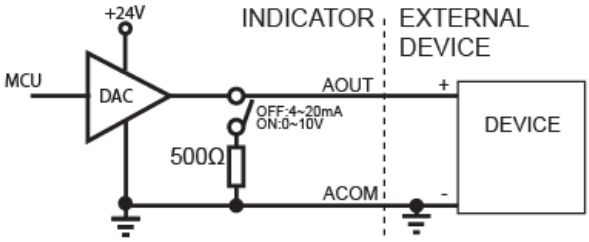
### 6-5-1. Specification

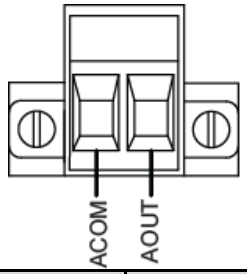
| Output current | Accuracy | Temperature compensation | Max Loaded Impedance |
|---|---|---|---|
| 0㎃ ~ 22㎃ | 1/5,000 | 0.01%℃ | 500Ω MAX. |

**Under Calibration mode or "CELL-ERR" condition, Analogue output will not activated.**
**If the output is deactivated, the last output signal value will be hold until next activation.**
**This is not suitable for the system which requires high accuracy over 1/5,000.**

### 6-5-1. Circuit composition and connector

4-20mA will be out proportioned on current weight.




| ACOM | AOUT |
|---|---|
| - | + |

### 6-5-3. Output Adjustment

(1) **Default analog output value is 4mA(weight zero) ~ 20mA(Full capacity).**

(2) **The analogue output value is adjusted with DIGITAL MULTI-METER.**

(3) **How to adjust analog output value.**

Step1) Connect Digital multi meter to the Indicator (A out terminal).

Step2) Enter "F-function HF14 Minimum Analog Output Setting" mode.

Step3) Adjust the displaying value of indicator with keys(by 9,999) to make Digital multi meter's value as minimum(ex:4mA) and save.(When the SI 460C indicate about 5,200 , the Digital multi meter indicates about 4mA)

Step4) Enter "F-function HF15 Maximum Analog Output Setting" mode

Step5) after connect digital multi meter to the indicator, then adjust the displaying value of indicator with keys (by 32,768) to make Digital multi meter's value as maximum (ex:20mA).

**※ This D/A Converter has Max 1/5,000 accuracy, so this output is not suitable for high accuracy application, more than 1/5,000.**

## 6-6. Analog V-Output Interface :0~10V

This output card converts weight value to Analog output signal (0~10V) and transfers to external devices(Recorder, P.L.C), controlled by voltage output.

### 6-6-1. Specification

| | |
|---|---|
| Output Voltage | 0~10V DC output |
| Accuracy | 1/5,000 |

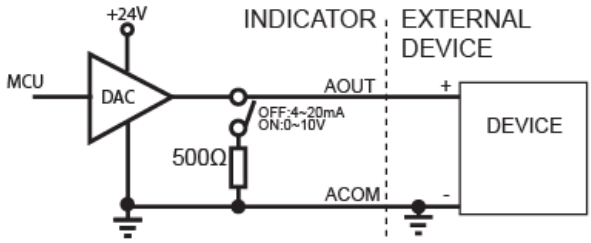
**Under Calibration mode or "CELL-ERR" condition, Analogue output will not activated.**

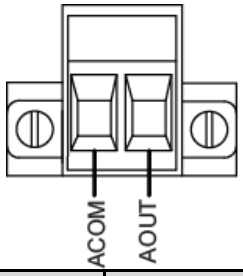
**If the output is deactivated, the last output signal value will be hold until next activation.**

**This is not suitable for the system which requires high accuracy over 1/5,000.**

### 6-6-2. Circuit composition and connector

0-10V will be out proportioned on current weight.




| ACOM | AOUT |
|---|---|
| - | + |

### 6-6-3. Output Adjustment

(1) **Default analog output value is 0V(weight zero) ~ 10V(Full capacity).**

(2) **The analogue output value is adjusted with DIGITAL MULTI-METER.**

(3) **How to adjust analog output value.**

Step1) Connect Digital multi meter to the Indicator (A out terminal).

Step2) Enter "F-function HF14 Minimum Analog Output Setting" mode.

Step3) Adjust the displaying value of indicator with keys(by 9,999) to make Digital multi meter's value as minimum(ex:0V) and save.(When the SI 460C indicates about 30,150 , the Digital multi meter indicates about 10V)

Step4) Enter "F-function HF15 Maximum Analog Output Setting" mode

Step5) after connect digital multi meter to the indicator, then adjust the displaying value of indicator with keys (by 32,768) to make Digital multi meter's value as maximum (ex:10V).

**※ This D/A Converter has Max 1/5,000 accuracy, so this output is not suitable for high accuracy application, more than 1/5,000.**

## 6-7. Analog output selection

(1) On the option board, there is switch for analog output selection 4-20mA or 0-10V.

(2) "HF13 Analog output setting" should be changed also.

## 6-8. Print Interface

**It can be connected with all kinds of Serial interface printer, but the printing format is already programmed and fixed with SE7200/7300 model.**

### 6-8-2. English Format

```
==============================
DATE :              2009-05-10
TIME :                18:00:10
 COUNT               WEIGHT
     1            +   1.330kg
     2            +   5.350kg
     3            +   1.380kg
     4            +   2.330kg
```

**Continuous Print Format(Function 352-00)**

```
==============================
DATE :              2009-05-10
TIME :                18:00:10
 COUNT               WEIGHT
     2            +   5.350kg


==============================
DATE :              2009-05-10
TIME :                18:00:10
 COUNT               WEIGHT
     3            +   1.280kg
```

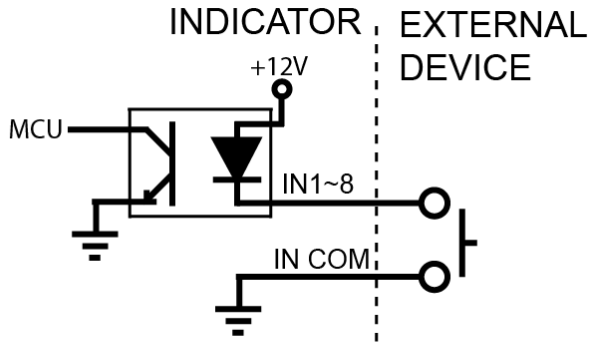
**Single Print Format(Function 352-01)**

```
==============================
            TOTAL
DATE :              2009-05-10
TIME  :               18:00:10
COUNT :                     10
TOTAL WEIGHT :      258.145kg
==============================
        TOTAL DELETE
==============================
```

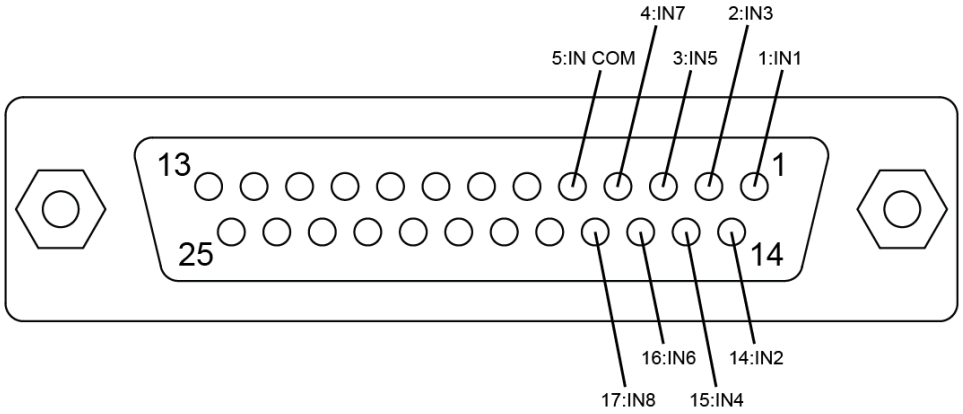
**Grand-total Print**

## 6-9. BIN IN card (Changing Product number)

### 6-9-1. BIN IN card circuit composition



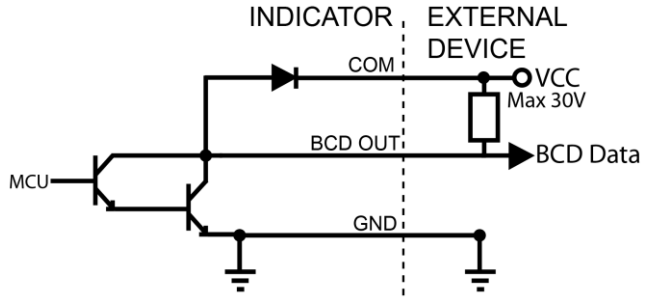

### 6-9-2. BIN IN card connection




| PIN No. | 1 | 14 | 2 | 15 | 3 | 16 | 4 | 17 | 5 |
|---|---|---|---|---|---|---|---|---|---|
| Role | IN1 | IN2 | IN3 | IN4 | IN5 | IN6 | IN7 | IN8 | IN COM |
| Function 404-00 | 1 | 2 | 4 | 8 | 10 | 20 | 40 | - | - |
| Function 404-01 | 1 | 2 | 4 | 8 | 16 | - | - | - | - |

## 6-10. BCD OUT Card (Weight data out) (Function 310-00)

### 6-10-1. Circuit composition



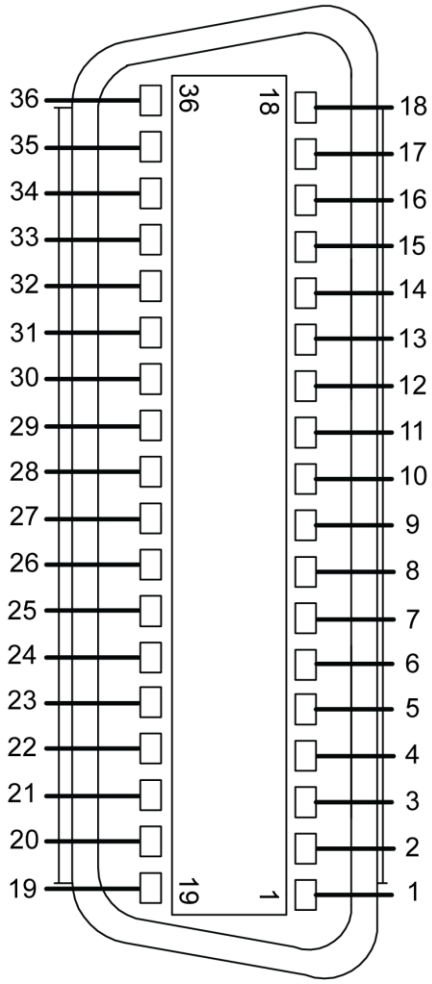

### 6-10-2. Card switch setting

| Switch | Standard | On operation |
|---|---|---|
| NON-INVERT | HIGH | LOW |
| INVERT | LOW | HIGH |

### 6-10-3. BCD OUT card specification

| | |
|---|---|
| MAX Input Voltage | 30V 500mA |

### 6-10-4. BCD OUT card connection



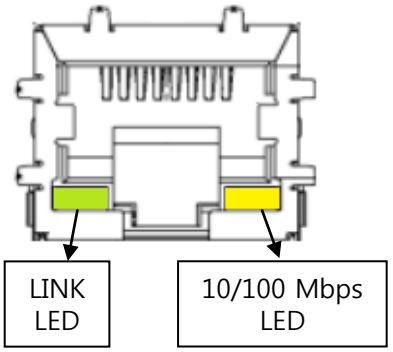

| Role | Pin No. | Role | Pin No. |
|---|---|---|---|
| 1X1 | 19 | 4X10000 | 28 |
| 2X1 | 2 | 8X10000 | 11 |
| 4X1 | 20 | 1X100000 | 29 |
| 8X1 | 3 | 2X100000 | 12 |
| 1X10 | 21 | 4X100000 | 30 |
| 2X10 | 4 | 8X100000 | 13 |
| 4X10 | 22 | COM | 32 |
| 8X10 | 5 | Net-weight (HIGH) | 31 |
| 1X100 | 23 | Total weight (LOW) | 31 |
| 2X100 | 6 | GND | 1, 14 |
| 4X100 | 24 | Disuse | 15 |
| 8X100 | 7 | Decimal point 0.000 | 33 |
| 1X1000 | 25 | Decimal point 0.00 | 16 |
| 2X1000 | 8 | Decimal point 0.0 | 34 |
| 4X1000 | 26 | Mark (Output : -) | 17 |
| 8X1000 | 9 | Disuse | 35 |
| 1X10000 | 27 | Disuse | 18 |
| 2X10000 | 10 | Overload | 36 |

## 6-11. Ethernet card

Using this Ethernet communcation, indicator and other external devices can be communicate (10/100Mbps). )Function 405~417)

Depending on your selection from function 310 (Stream mode or command mode), this function is rely on function 311~313.

| | |
|---|---|
| **Function 310-00 (Stream mode)** | 312-00, 01, 02, 03, 04 |
| | 313-00, 01, 02, 03 |
| **Function 310-01 (Command mode)** | 311-00, 01 |




## 6-12. SD memory card

Weighing data will be saved to SD memory card depends on your function 103.

### 6-12-1. Saving format (File name: YYMMDD.CSV (Ex: 140728.CSV))

| DATE | TIME | ID | PART | SERIAL | WEIGHT | UNIT |
|---|---|---|---|---|---|---|
| 2014-07-18 | 12:18:04 | 1 | 50 | 22 | 301.4 | kg |
| 2014-07-18 | 12:18:10 | 1 | 50 | 23 | 301.4 | kg |
| 2014-07-18 | 12:18:10 | 1 | 50 | 24 | 301.4 | kg |

### 6-12-2. Grand-total weight format (파일명: TYYMMDD.CSV (Ex: T140728.CSV))

Grand-total weight will be saved when Grand-total print is pressed.

| DATE | TIME | TOTAL COUNT | TOTAL WEIGHT | UNIT |
|---|---|---|---|---|
| 2014-07-18 | 12:27:30 | 17 | 4622.0 | Kg |
| **ID** | **PART No** | **SERIAL** | **WEIGHT** | **UNIT** |
| 1 | 1 | 5 | 1207.4 | Kg |
| 1 | 2 | 8 | 2383.4 | Kg |
| 1 | 3 | 2 | 506.6 | Kg |
| 1 | 4 | 2 | 524.6 | Kg |

### 6-12-3. Recommanded model

| Memory | Model | Form factor | Class |
|---|---|---|---|
| 4G | SanDisk SDHC 4G | SDHC | 4 |

**Caution** **Regular BACK UP is recommended because there is limit of memory.**
**How to do memory card format : Connect SD card to PC, and select FORMAT from PC system folder. Select FAT32 from file system**

## 6-13. Option card combination

Maximum 2EA of option card can be instlled. Below combination is available.

| | SERIAL (232) | SERIAL (422,485) | ETHER NET | BCD OUT | BIN I&O | AOUT | SD CARD |
|---|---|---|---|---|---|---|---|
| **SERIAL(232)** | X | X | O | O | O | O | O |
| **SERIAL(422,485)** | X | X | O | O | O | O | O |
| **ETHERNET** | O | O | X | X | O | O | O |
| **BCD OUT** | O | O | X | X | O | O | O |
| **BIN I&O** | O | O | O | O | X | O | O |
| **AOUT** | O | O | O | O | O | X | O |
| **SD CARD** | O | O | O | O | O | O | X |

# 7. Error & Treatment

## 7-1. Load Cell Installation

| Error | Cause | Treatment | Remarks |
|---|---|---|---|
| Weight Value is unstable | 1) Load cell broken<br>2) Load cell isolation resistance error<br>3) Weighing part touches other devices or some weight is on the weighing part<br>4) Summing Board Error | 1) Measure input/output resistance of Load cell.<br>2) Measure Load cell isolation resistance | 1. Input Resistance of "EXC+" and "EXC-" is about 400Ω ±30<br>2. Output Resistance of "SIG+" and "SIG-" is about 350Ω ±3.5<br>3. Isolate Resistance is more than 100MΩ |
| Weight Value is increased regular rate, but not return to "Zero" | 1) Load cell Error<br>2) Load cell connection Error | 1) Check Load cell connection<br>2) Measure Load cell Resistance | |
| Weight Value is increased to under Zero | Load cell Output wire (SIG+, SIG-) is switched | Make wire correction | |
| "UN PASS" display | Load cell broken or Indicator connection Error | Load cell Check<br>Load cell connection Check | |
| | Power was "ON" when some weight is on the load cell. | Remove weight on the Load cell | |
| "OL" or "UL" display(Over Load) | 1) Load cell broken or Indicator connection Error<br>2) Loading over than Max Capacity | 1) Load cell Check<br>2) Load cell connection Check<br>3) Remove over loaded weight | |

## 7-2. Calibration Process

| Display | Cause | Treatment |
|---|---|---|
| **Eerr01** | When Max capacity/digit value is over 20,000 | Re-input the Max Capacity, less than 20.00<br>(Max Capacity / Digit) |
| **Eerr04** | Standard weight value is over than Max Capacity | Re-input Standard weight value with Number keys, under Max Capacity |
| **Eerr05** | Standard weight value is less than 10% of Max Capacity | Re-input Standard weight value with Number keys, more than 10% of Max Capacity |
| **Eerr06** | Amp. Gain is too big | Check standard weight's weight with set value.<br>If there is difference between set value and real weight, please re-input the value (set value is too small) |
| **Eerr07** | Amp. Gain is too small | Check standard weight's weight with set value.<br>If there is difference between set value and real weight, please re-input the value (set value is too big) |
| **Eerr08** | Under "F-function" model, set value is "N.A" | Check the correct value and re-input |
| **err-a** | When there is continuous vibration on the weighing part,, indicator cannot process calibration any more. | - Find vibration cause and remove<br>- Load cell check<br>- Load cell cable and connecting condition check |

## 7-3. Digital Weighing Indicator

| Display | Cause | Treatment |
|---|---|---|
| "CELL-Er"<br><br>or<br><br>"OVEr" | 1. Load cell Error<br>2. Load cell cable Error<br>3.Load cell connection Error<br>4. A/D Board Error<br>5.If Analogue value<br>is over 1,040,000.<br>※ When weigh "-" value,<br>If it is over set max capa, "OVER" is displayed.<br>Ex) Even though set max capa is "100" and it is over "-100", "OVER" is displayed. | 1. Under "TEST" mode 1, check analogue value. If you cannot get any analogue value or there is no change although adding load, please check load cell, load cell cable, connection conditions first.<br>2. Replace another load cell, and check the indicator condition. If you have same problem, please replace new indicator and check A/D board error.<br>3. Try to connect the indicator's A/D with the other indicator.<br>4. Check the power and connection of terminal. |
| "UnPASS" | 1. Power is ON, when some materials are on weighing part.<br>※ Under "Normal Mode", if there are more than 20% loading of Max capacity, "**Un-Pass**" display will be appeared and indicator will stay until removing the load.<br>※Setting Back-up mode it can memory empty value, and it becomes set value without displaying" Un-pass") | 1. If you set "Normal Mode", please check weighing part empty or not before turn on the power. If there are some materials in/on weighing part, please remove those materials and turn on the power.<br>2. Please try to set F-function 102-02(Back-up) mode so that the indicator can remember first empty value. |
| "SEt" | When Power is on, "SET" displays.<br>It means<br>EEPROM has some problem. | Please contact the distributor or Head Office. |
| "HALt" | H/W has some problem. | |
| "t-Err" | The dead Battery | |

※ Under **"Cell-er"**, Zero key, Tare key, Hold key and print key will not be activated.

**WARRANTEE CETIFICATION**

This product is passed "Sewhacnm's strict quality test.

If there is defect of manufacturing or abnormal detection within warrantee period, please contact our Agent or Distributor with this Warrantee certificate.

Then, we will repair or replace free of charge.

**WARRANTEE CLAUSE**

**1. The Warrantee period, we can guarantee, is one(1) year from your purchasing date**

**2. Warrantee Exception Clause**

- Warrantee period is expired.
- Any kinds of Mal-function or defection caused by Modification or Repair without Sewhacnm's permission.
- Any kinds of Mal-function, Defection, or External damage, caused by operator
- Any kinds of Mal-function, Defection, caused by using spare part from Non-Authorized Distributor or Agent.
- Any kinds of Mal-function, Defection, caused by not following Warnings or Cautions mentioned on this manual.
- Any kinds of Mal-function, Defection caused by "Force Majeur", like Fire, Flood.
- Without presentation of this **"Warrantee Certification".**

**3. Other**

- Any kinds of "Warrantee Certification" without authorized Stamp is out of validity

**SEWHACNM Co.,Ltd.**

#504, 302Dong, 397, Seokcheon-ro, Ojeong-gu, Bucheon-si, Gyeonggi-do, Korea

**Made in KOREA**

Website : http://www.sewhacnm.co.kr ,

Email : sales@sewhacnm.co.kr

| | |
|---|---|
| **Product** | Digital Weighing Indicator |
| **Model** | SI 410 |
| **Serial No.** | |
| AUTHORIZED STAMP | |