SI 560A

DIGITAL INDICATOR
USER MANUAL

MANUAL Ver. 4.00

PROGRAM Ver. 4.00

SEWHACNM
주식회사 세화씨엔엠

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7. ERROR & TROUBLESHOOTING 63

1. BEFORE INSTALLATION

1-1. Caution / warning marks

	This mark warns the possibility to arrive death or serious injury in case of wrongly used.

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.

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

1) For the improvement of function or performance, we can change item specification without previous notice or permission.
2) Item's performance will be up-dated continuously base on previous version's performance.
3) Do not use this indicator in various temperature environment.

1-2. Copy rights

1) All Right and Authority for this Manual is belonged to SEWHA CNM CO., LTD.
2) Any kinds of copy or distribution without permission of SEWHA CNM CO., LTD. will be prohibited.
3) This manual may be changed as the version is upgraded, without previous notice.

1-3. Inquiries

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

1) Head office : SEWHACNM CO., LTD.
2) Website : http://www.sewhacnm.co.kr
3) Email : sales@sewhacnm.co.kr
4) Tel: +82 32 624 0060

2. INTRODUCTION

2-1. Introduction

Thank you for your choice of SI560A Industrial Explosion proof indicator.

This "SI 560A" model has various external interface: serial communication (Modbus available), analog output and RS232c/RS422/RS485 Communication, BCD in/out to select option for user convince and environment.

Please review and learn this instruction manual and enjoy your process efficiency with "SI560A" weighing indicator.

2-2. Feature

1) Front panel is covered with Polycarbonate film, strong against dust and water.

2) SI560A model is the standard 1/8 DIN SIZE and compact enough, so it is easy to install.

3) There are standard installed with RS-422&RS-232C or RS-485&RS-232C.

2-3. Components

Indicator	Manual

3. SPECIFICATION

3-1. Specification

Content			Specification
Load cell input Analog signal and Digital convert content	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 3.2mV/V
	Load cell Excitation		DC +5V
	A/D Conversion Method		Sigma-Delta
	Decimal Point		0, 0.0, 0.00, 0.000
	Drift	Zero	10PPM/℃
		Span	10PPM/℃
	Non Linearity		0.001% max
Operating environment	Operating Temperature Range		-10℃ ~ +40℃ [14℉ ~ 104℉]
	Operation Humidity Range		40% ~ 85% RH, Non-condensing
Front	Display		1. 15mm(0.56inch), 6 digits Red FND(Number/Word) 2. 13.5mm(0.36inch), 10 digits, Red FND(Number/Word) 3. State(Lamp) 7 digits, Red LED
	Key		7EA
Interface	Digital input		4EA, zero voltage point
	Serial interface	RS-422/485	Command mode, Modbus(RTU), Serial print
		RS-232	Command mode, Serial print
	Control relay output		4EA setting output relay
	Analog output		0~10V, 4~20mA (Selectable)
Power	DC 12~24V (SMPS option is not included, subject of advice : 24V 1A), Power consumption max 12W		
	AC (option) : 110~220V, 50~60Hz, 0.5A, Power consumption max 12W		
Size	Size : 96mm(W) x 96mm(H) x 112mm(D), Weight : 500g(DC), 700g(AC)		

3-2. Front

3-2-1. Display and key pad
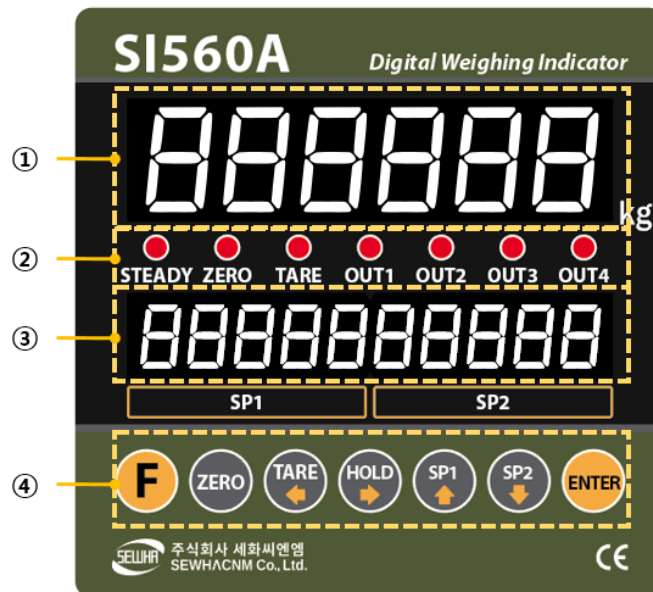
① **Display 1 : Number/word display 6 digits red FND**

② **Condition(lamp)**
- STEADY : When the weight is stable, ON.
- ZERO : When the current weight is zero, ON.
- TARE : When the "TARE" function is set, ON.
- OUT1 : When connected with OUT1(relay), ON
- OUT2 : When connected with OUT2(relay), ON
- OUT3 : When connected with OUT3(relay), ON
- OUT4 : When connected with OUT4(relay), ON

③ **Display 2 : Number/word display 10 digits red FND**

④ **Key pad**

3-2-2. Key operation

F	1. Press this key 4times, within 3secs, enter to "SET-UP" mode. 2. Press this key during 4secs, enter to "Hidden function" mode. 3. Cancel or ESC.
ZERO	1. Make weight value to Zero. 2. Enter to P/N setting at the SP value setting stage

TARE	1. Set the TARE Function
	   1st input : "TARE", 2nd input : "TARE Reset"
	   (When "HOLD" or weight value is ZERO, then this key doesn't work.)
	2. Moving the cursor to left.

HOLD	1. Set the "HOLD" Function
	   1st input : "HOLD", 2nd input : "HOLD Reset"
	   ※ When HOLD is on, "H" mark will be shown at the display.
	2. Moving the cursor to right.

SP1	1. SP1 set value setting 2. Increase the value
SP2	1. SP2 set value setting 2. Decrease the value
ENTER	1. Save 2. Manual print out key

3-2-3. Key combination

F ➡ **SP1**	SP3 Set value setting
F ➡ **SP2**	SP4 Set value setting
F ➡ **ENTER**	If the Printer is installed, You can print out the "Sub-total data". (Sub-total data cannot be displayed).
F ➡ **F** ➡ **F** ➡ **ENTER**	If the Printer is installed, You can print out the "Grand-total data". (GRAND-total data cannot be displayed.)

- **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)**

3-3. Rear panel
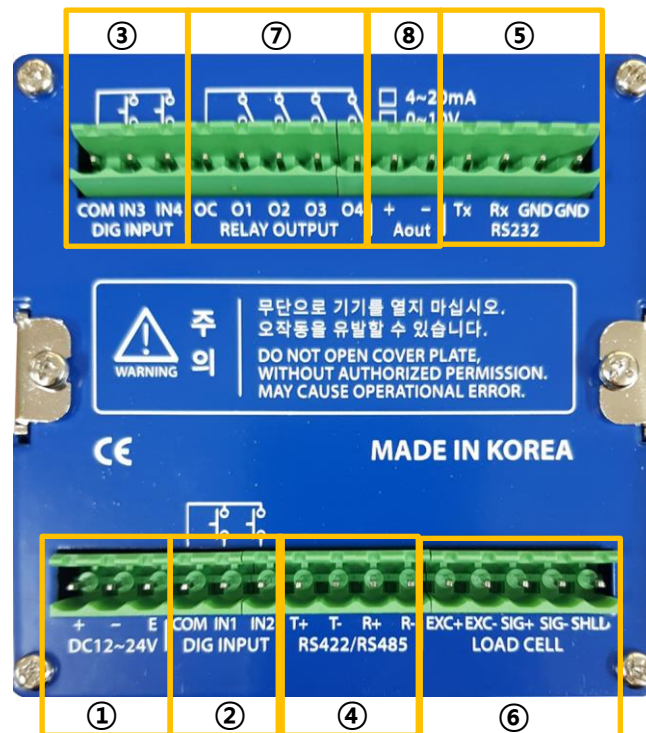
① **DC(basic)/AC(option) power input terminal**

② **External Input terminal 1 : zero voltage point**

③ **External Input terminal 2 : zero voltage point**

④ **Serial Interface 1 (RS422/485)**

⑤ **Serial Interface 2 (RS232)**

⑥ **Load cell Input**

⑦ **Relay output terminal**

⑧ **Analogue Output terminal**

> ⚠ **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   (Unit: mm)

90

96

96

98.4

96

90

9

87

112
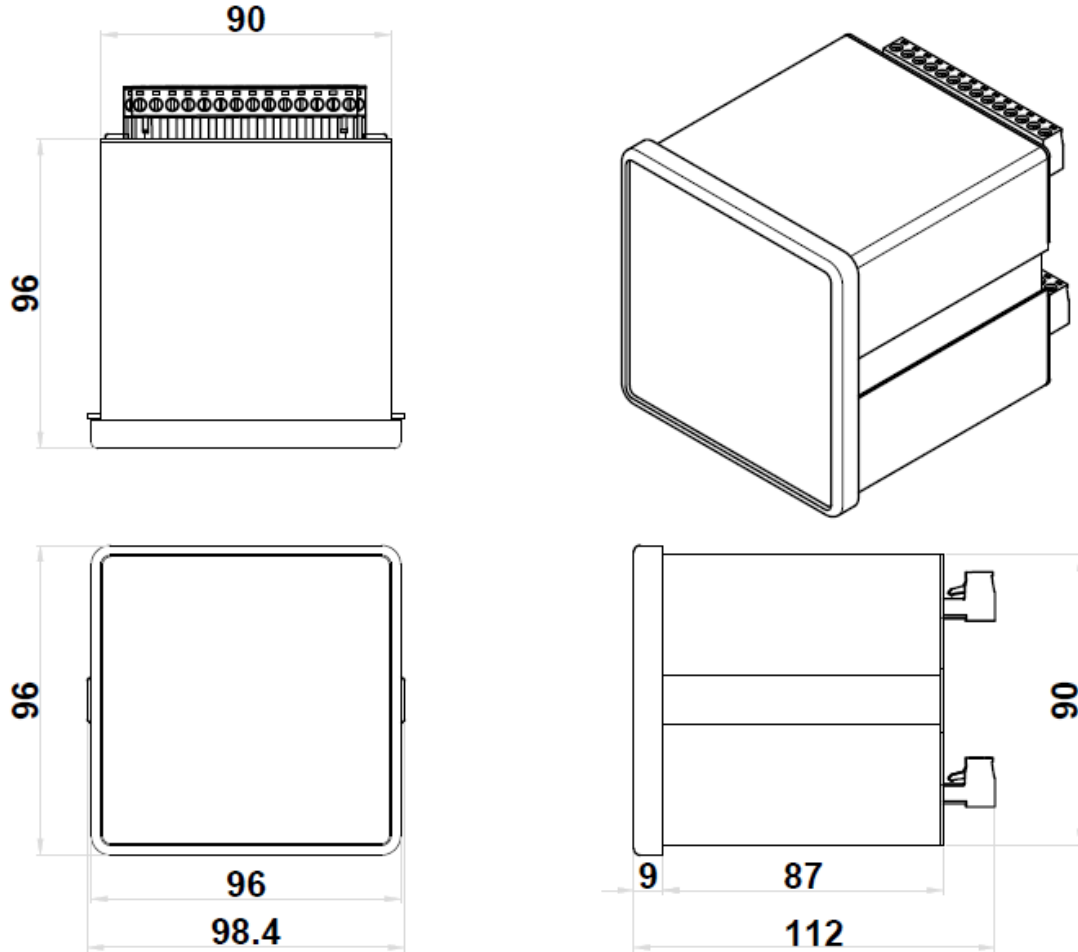
4-2. Cutting Size   (Unit: mm)

92

92
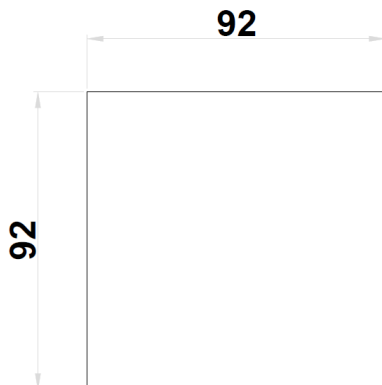
4-3. Load cell Installation

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

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

Red	**EXC+**
White	**EXC-**
Green	**SIG+**
Blue	**SIG-**
Yellow	**SHELD**

⚠ **warning**

1. When you setup the Load cell, if EXC+ and EXC- have a short circuit, It may cause damage in the indicator. (especially analogue board)
2. If you connect other wires to Load cell terminal wrongly, it may cause damage in the analogue board.
3. Do not weld near the load cells, Indicators or other devices.
4. Before connecting the load cell cable you have to power off and be sure to connect the cable to the terminal correctly.

⚠ **warning**

※ 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 upper part of Load cell.

4-4. External output

1) Each output relay function can be changed on Function number 233~236.

2) Connected with zero voltage point
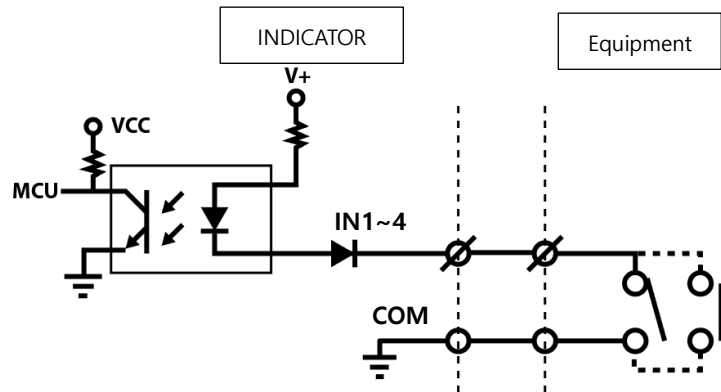
3) Terminal component

  - Top, Bottom

  - COM : Input common terminal(V+ : 12V DC)

  - Ⅰ1~Ⅰ4 : Input signal(Output relay: zero voltage point –relay or switch signal)

4-5. Serial interface

4-5-1. RS422

RS422 interface is strong for electrical noise, and it is available for below 1km distance. The RS422 is full-duplex communication, it can connect to external equipment such as PC, PLC, printer or etc. with fast speed and multiple use. (Max 32ea indicator)
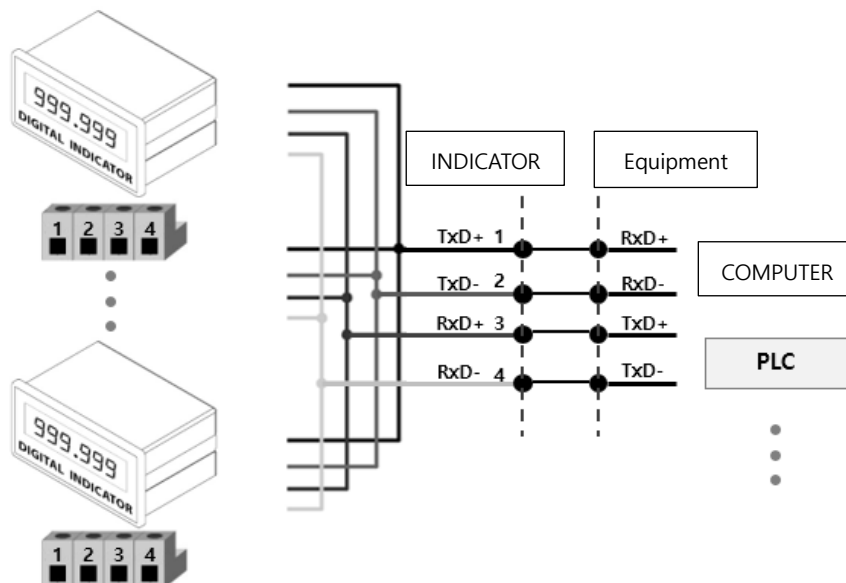
4-5-2. RS485

RS485 interface is strong for electrical noise, and it is available for below 1km distance. The RS422 is half-duplex communication, it has slower speed than RS422.

RS485 can connect to external equipment such as PC, PLC, printer or etc. with multiple use. (Max 32ea indicator)
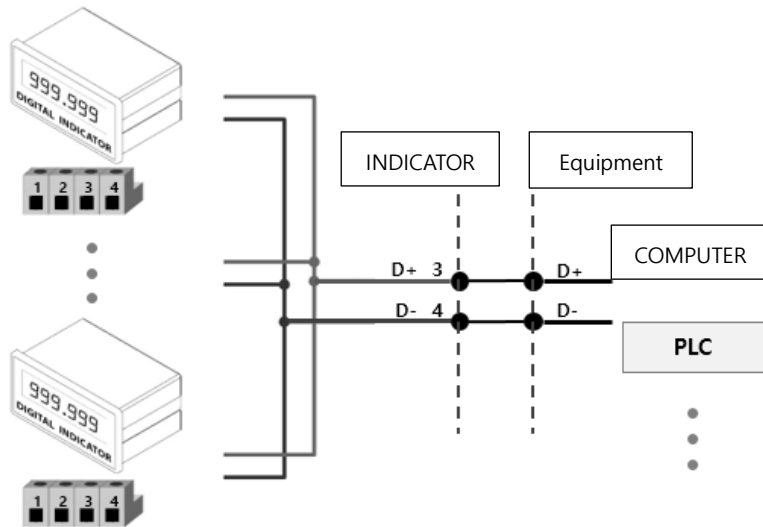
4-5-3. RS232C

RS232C interface is weak for electrical noise, so it is available for below 10meters distance. User can use the RS232C interface to connect with external equipment such as PC, PLC, printer, external display or etc.
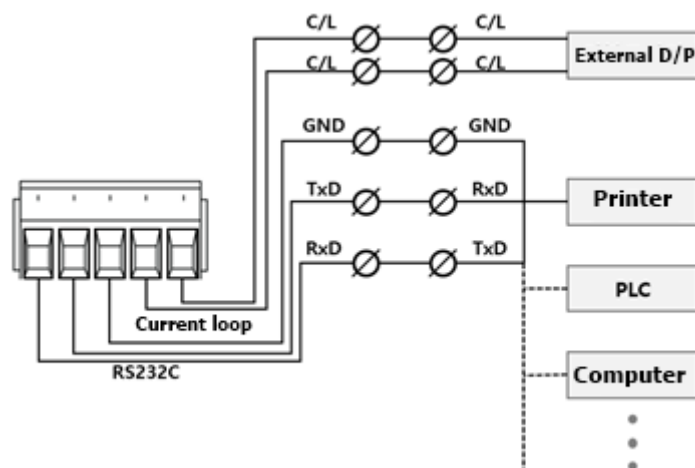
⚠️ Caution	**Serial communication interface is sensitive to electric noise.** **Install isolated place from Power cable or other electric cables and wires, and please use shielded cable for better performance.**

4-6. Relay outputs

Relay output 4EA(NO: Normal Open) : User can change relay output setting on function number 226~229.

4-6-1. Relay specification

Coiling Rating	12VDC
Contact Ratings	1A 24VDC

4-6-2. Relay output inner circuit
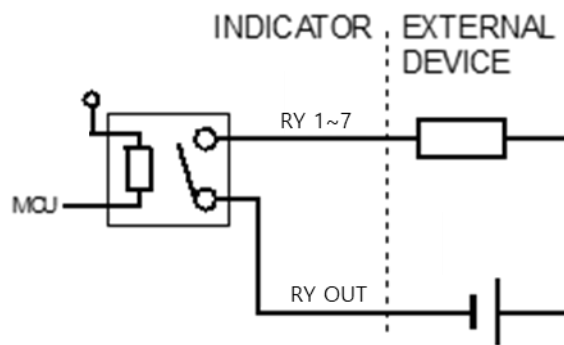
1) Terminal block
   - OC : Output common
   - O1~O4 : Output (Zero voltage relay output)

4-7. Analog output

※ **How to select analog output (Iout or Vout)**

  ① User can select the Iout or Vout on the inner interface board when they disassembled indicator.

  ② Enter the HF13 and select the analog current output interface and 00 : I-out or 01 : V-out.

<①Switch picture>

| Vout
(0~10V) | Iout
(4~20mA) |
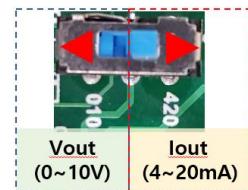
4-7-1. Analog current output interface (4~20mA)

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

Current output	Resolution	Temperature coefficient	Max load impedance
4mA ~ 20mA	1/1,000	0.01%/℃	500Ω MAX.

⚠ 주 의

- In calibration mode or Ad-Err condition, analog output will not activate.
- 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 1/1,000.

1) Circuit composition and connector

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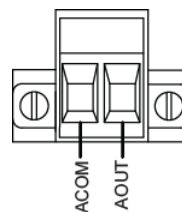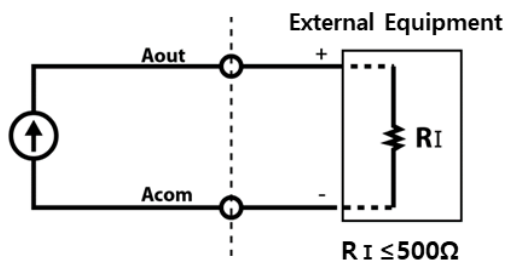
ACOM	AOUT
-	+

2) Analog current output adjust (HF13-00)

  ① Factory default setting – if displayed weight is 0, current output is 4mA, displayed weight is maximum, current output is 24mA.

  ② Hot to adjust

    - If weight is 0, but current output is 0mA, you can correct the difference value in hidden function HF14(Set the HF14 4.00 makes 4.0 mA)

    - If weight is max, but current output is 24mA, you can correct the difference value in hidden function HF15(Set the HF15 -4.00 makes 20 mA)

4-7-2. Analog voltage output interface (0~10V)

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

Output voltage	0~10VDC output
Accuracy	1/1,000

> ⚠️ 주 의
> - **In calibration mode or Ad-Err condition, analog 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 1/1,000.**

1)) Circuit composition and connector

0-10V will be out proportioned on current weight.
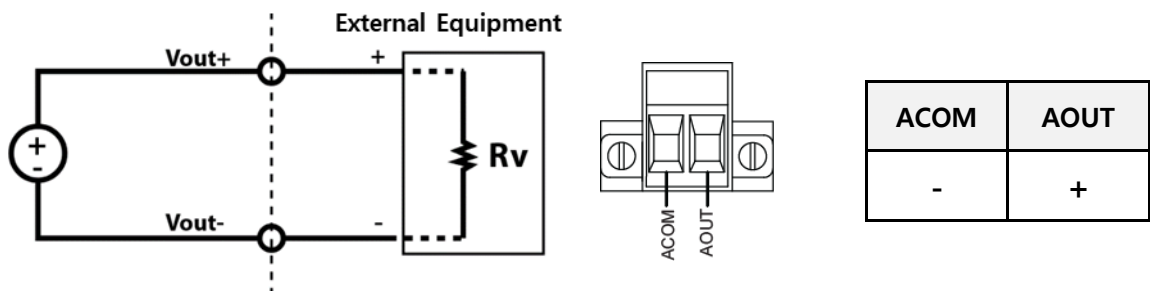
2) Analog voltage output adjust (HF13-01)

① Factory default setting – if displayed weight is 0,, voltage output is 0V, displayed weight is maximum, voltage output is 10V.

② If current output is not matched as 0-10V, because of field situation, user can adjust the output value. Adjusting way is written in ③

③ How to adjust
  - If weight is 0, but voltage output is not 0V, you can correct the difference value in hidden function HF14
  - If weight is max, but voltage output is not 10V, you can correct the difference value in hidden function HF15.

5. SETUP

5-1. Calibration

Calibration is the process of adjusting weight balance between "Real Weight" on the Load Cell and "Displayed weight of Indicator". When you replace Load Cell or Indicator, you have to do Calibration process once again.

⚠️ 주 의	- **Before start to the calibration mode,** - **Please turn on the indicator and preheat about 15 min.**

STEP 1. Enter the calibration
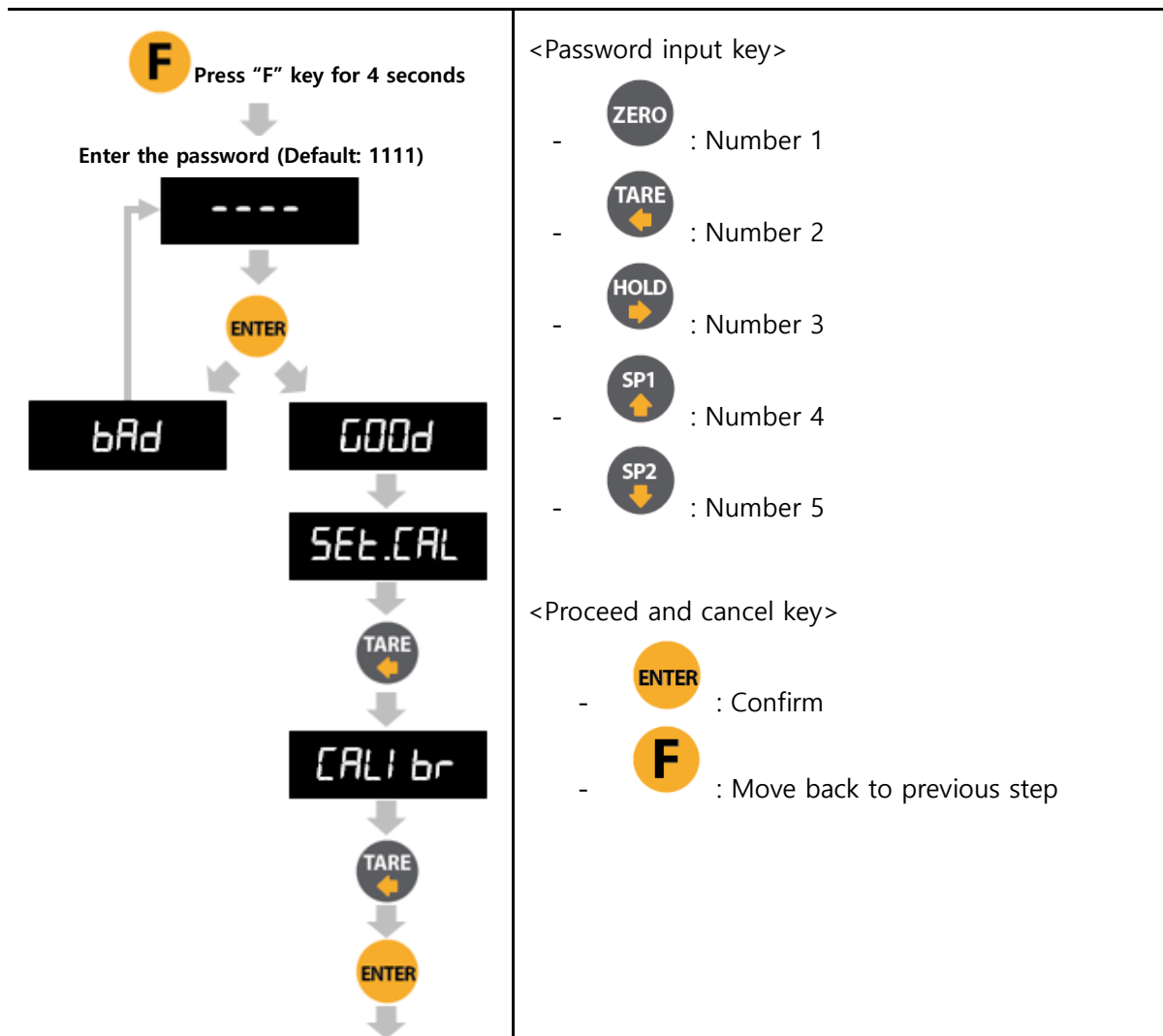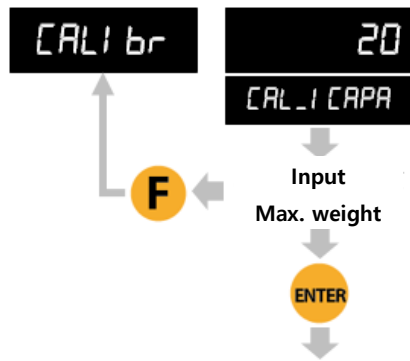
F **Press "F" key for 4 seconds**

↓

Enter the password (Default: 1111)

```
- - - -
```

↓

ENTER

↓

bAd   GOOd

↓

SEt.CAL

↓

TARE

↓

CALI br

↓

TARE

↓

ENTER

↓

<Password input key>

- **ZERO** : Number 1
- **TARE** : Number 2
- **HOLD** : Number 3
- **SP1** : Number 4
- **SP2** : Number 5

<Proceed and cancel key>

- **ENTER** : Confirm
- **F** : Move back to previous step

STEP 2. Unit Setting

`CALI br` `20` `CAL_I CAPA` Input Max. weight **ENTER** **F**	- TARE HOLD : Adjust decimal point - SP1 SP2 : Adjust number - ENTER : Save and move to next step - F : Cancel and move to previous step

EX : If you want to set Max capacity as 50.00kg (Division: 0.01kg), input 50.

STEP 3. Decimal point and division setting

`CAPA` `0.01` `CAL_2 d iu i` Decimal point and Division **F** **ENTER** `Err-01` `dEAd`	- TARE HOLD : Adjust decimal point - SP1 SP2 : Adjust division - ENTER : Save and move to next step - F : Cancel and move to previous step

- **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.**

STEP 4. Measuring the "DEAD" Weight of Weighing Scale

d ini	dEAd
	CAL_3

Make sure your scale is **EMPTY**

F

ENTER

CAL- 10
~
CAL- 19

SPAn	Err-A

- **ENTER** : Save and move to next step

- **F** : Cancel and move to previous step

※ **When "Err-A" displays, remove the things on the scale part, external noise or vibration and carry out calibration again.**

STEP 5. Span calibration

dEAd	20.00
	CAL_5 SPAn

F Input balance weight

ENTER

UP ➤ **F**

Load the
Balance weight

ENTER

CAL-20
~
CAL-29

CALEnd	Err-04

- **TARE** **HOLD** : Adjust decimal point

- **SP1** **SP2** : Adjust number

- **ENTER** : Save and move to next step

- **F** : Cancel and move to previous step

※ **Err-004 :** Standard weight value is over than
Max Capacity

※ **Err-005 :** Standard weight value is less than
10% of Max Capacity

5-2. Simulation Calibration (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.

HF13 must be set with "01" to progress simulation calibration mode.

STEP 1. Enter the calibration
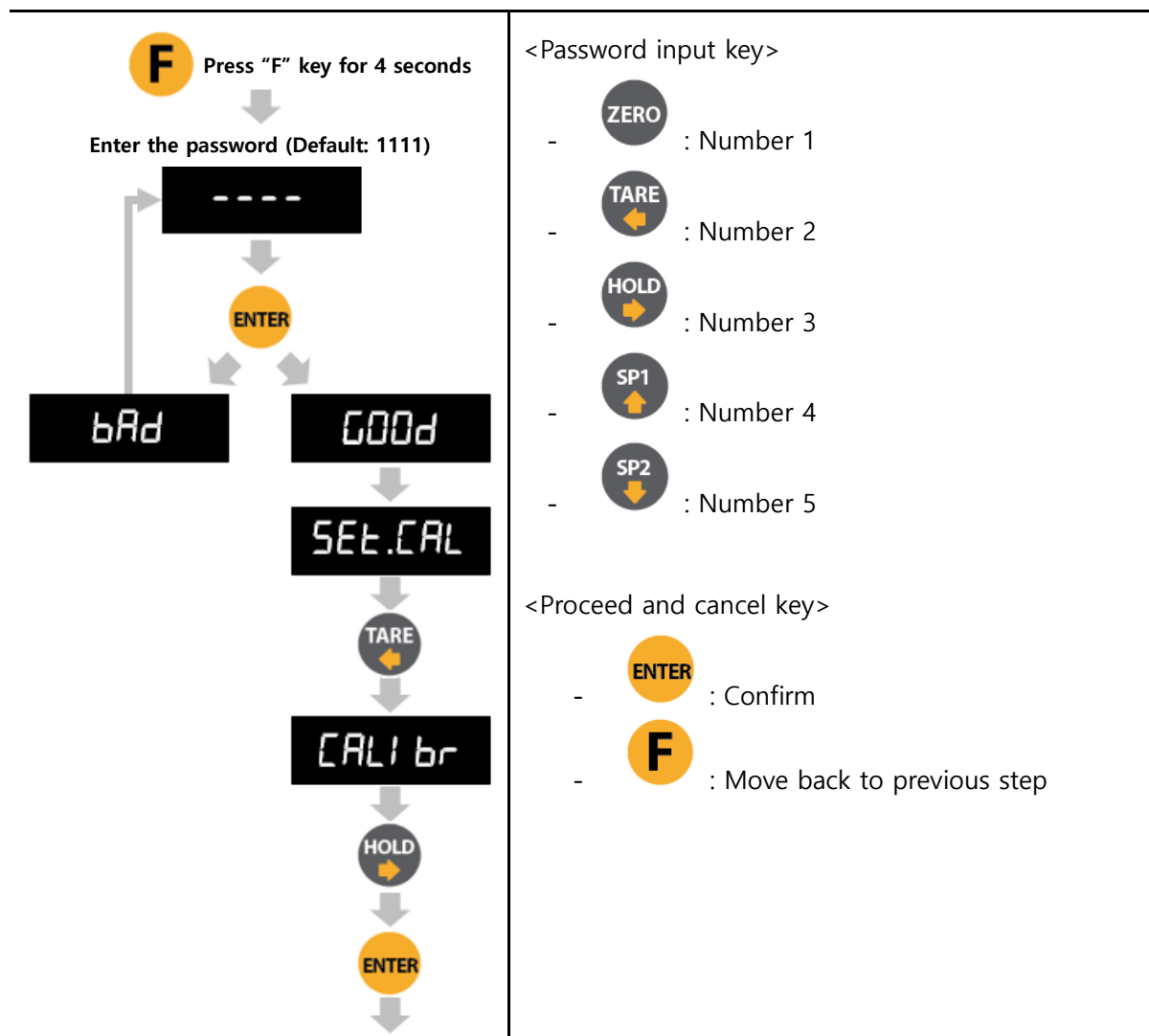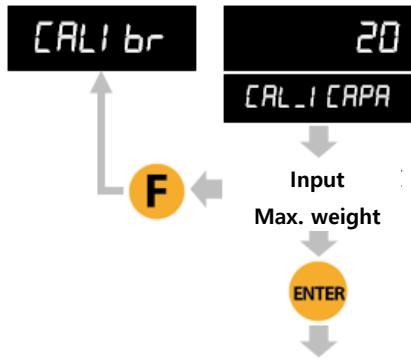
(F) **Press "F" key for 4 seconds**

Enter the password (Default: 1111)

- - - -

ENTER

bAd   GOOd

SEt.CAL

TARE

CALI br

HOLD

ENTER

<Password input key>

- **ZERO** : Number 1

- **TARE** : Number 2

- **HOLD** : Number 3

- **SP1** : Number 4

- **SP2** : Number 5

<Proceed and cancel key>

- **ENTER** : Confirm

- **F** : Move back to previous step

STEP 2. Unit Setting

CALI br   20

CAL_I CAPA

F ← Input Max. weight

ENTER

- [TARE] [HOLD] : Adjust decimal point
- [SP1] [SP2] : Adjust number
- [ENTER] : Save and move to next step
- F : Cancel and move to previous step

MODEL: xxxxx

CAPA: 20kg

R.O: 1.429mV/V

S/N : xxxxxxx

<Load cell label picture example>
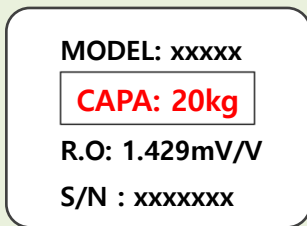
- **The maximum capacity means that added all installed load cells.**
- ※ **(Number of Load cell * Max capacity weight of each Load cell)**

STEP 3. Decimal point and division setting

CAPA   di ul

Decimal point and division

ZERO ← 0.01

F

Err-01   dEAd

- [TARE] [HOLD] : Adjust decimal point
- [SP1] [SP2] : Adjust division
- [ENTER] : Save and move to next step
- F : Cancel and move to previous step

- 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.

STEP 4. Measuring the "DEAD" Weight of Weighing Scale

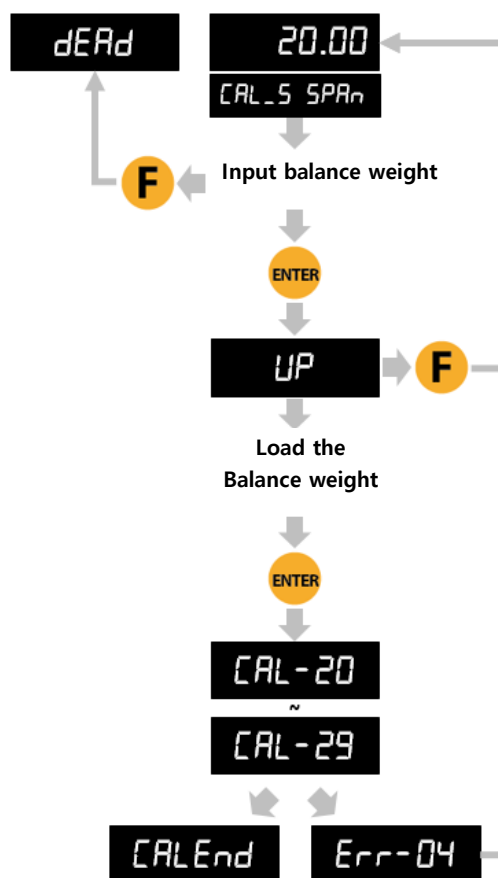|	
d ini dEAd CAL_3 F ← Make sure your scale is EMPTY ENTER CAL- 10 ~ CAL- 19 SPAn Err-A	※ **ENTER** : Save and move to next step ※ **F** : Cancel and move to previous step ※ **When "Err-A" displays, remove the things on the scale part, external noise or vibration and carry out calibration again.**

STEP 5. Span calibration

dEAd 0.00000 CAL_5 SPAn Input load cell R/O value F ← 1.42900 ENTER Calculated span value 0.07775 CALEnd Err-01 ENTER	- **TARE** **HOLD** : Adjust decimal point - **SP1** **SP2** : Adjust number - **ENTER** : Save and move to next step - **F** : Cancel and move to previous step

---

MODEL: xxxxx

CAPA: 20kg

R.O: 1.429mV/V

S/N : xxxxxxx

<Load cell label picture example>

※ **When input the wrong value "Er-001" shows. In this case need to check load cell label again.**

5-3. Function setting

Function setting could set the indicator to operate perfectly with surrounding condition.

5-3-1. Starting F-FUNCTION Mode

Press "F" key for 4 times within 3 seconds.

SEt-UP

TARE

IO I-OI → **F**

Move to Function
Number

Input Function
Number

ENTER

Set Function Value

ENTER

SAUE → **F**

IO2-O3
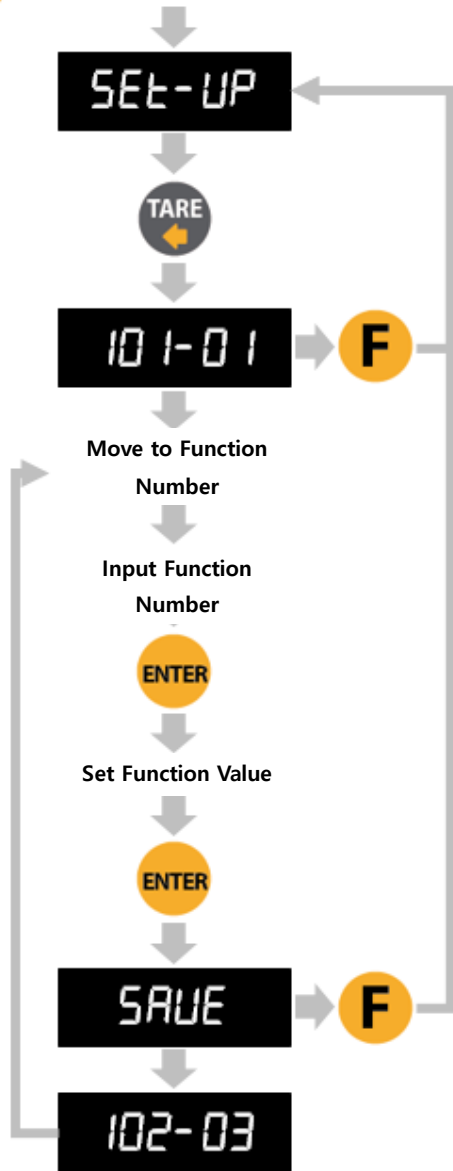
- TARE HOLD : Adjust decimal point

- SP1 SP2 : Adjust number

- ENTER : Move to function number
    Save function value

F : Cancel and move to previous step

- **Display Information**

① ② ③

IO I-OI
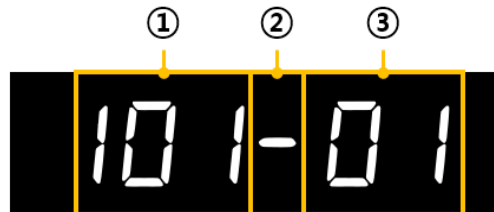
1. Function number

2. PRINT : Increase function number as 1

3. Value of each function address

5-3-2. F-Function List

No.	Subject	Default	Content
101	Equipment No. setting (ID No.)	01	01~99
102	Weight–back up mode	01	00 : Normal mode 01 : Weight back up mode(Zero) 02 : Weight back up mode(Zero & Tare)
103	Weighing data save method & Print setting	03	00 : Manual: Whenever "Print" key input 01 : Auto: At every steady states 02 : Auto: At every steady states (Higher than near zero range) 03 : Auto: When weighing is finished 04 : Manual&Auto: At every steady states 05 : Manual&Auto: At the first steady states (Higher than near zero range) 06 : Manual&Auto: When weighing is finished
104	Display up-date speed	09	01 : 1 time/seconds 02 : 2 time/seconds 03 : 3 time/seconds 04 :6 time/seconds 05 :10 time/seconds 06 : 15 time/seconds 07 : 20 time/seconds 08 : 30 time/seconds 09 : 60 time/seconds
105	Display brightness	02	00 : Low ~ 07 : High
108	Buzzer setting when external input	00	00 : Buzzer on 01 : Buzzer off
110	Unit setting	00	00 : kg 01 : g 02 : ton
111	Print language setting	00	00 : Korean 01 : English
201	Near zero range	00	00 ~ 999999
202	Auto zero range	00	00 ~ 99 (Unit: 0.25 gradation)
203	Steady range	08	01 ~ 99 (Unit: 0.25 gradation)
204	Steady condition check time	10	01 ~ 99 (Unit: 0.1 seconds.)
205	Digital filter	10	01: Weak vibration ~ 99: Strong vibration
206	Zero key operation mode	00	00: Always active 01: Active when it is steady only
207	Tare key operation mode	00	00 : Always active 01 : Active when the weight is steady

No.	Subject	Default	Content
209	Zero key operation range	02	00: Active within 2% of max capacity 01: Active within 5% of max capacity 02: Active within 10% of max capacity 03: Active within 20% of max capacity 04: Active within 50% of max capacity 05: Active within 100% of max capacity 06: No limit
210	Tare key operation range	02	00 : Active within 10% of max capacity 01 : Active within 20% of max capacity 02 : Active within 50% of max capacity 03 : Active within 100% of max capacity
211	Auto zero when tare is set	00	00 : Disuse 01 : Use
212	Tare delay time	00	00 : Disuse (Input key or output) 01~10 : Use (Unit : 1 second)
213	Auto tare set in turn on	00	00 : Disuse 01 : Use
214	Auto tare reset	00	00 : Manual 01 : Under zero reset 02 : When steady reset 03 : When finish reset
215	Auto tare reset time	00	00 : Disuse 00 ~ 09 : use (Unit : 1second)
216	Hold mode	00	00: Sample hold 01: Peak hold 02: Average hold
217	Hold delay time	00	00 : Disuse 01 ~ 10 : Use (Unit : 1second)
218	Hold reset at the near zero	00	00: Disuse 01: Use
219	Hold reset delay time	00	00 : Disuse 01 ~ 10 : Use (Unit : 1second)
220	Average hold time	10	01~99 (Unit: 0.1second) Hold average weight during set time

No.	Subject	Default	Content	
221	Minus (-) mark display	00	00 : Use 01 : No display	
222	UNPASS/OVERLOAD state, weight display	00	00 : Display (After display UP or OL, current weight will display repeatedly) 01 : No display (Display UP or OL repeatedly)	
223	Weighing mode	01	00 : Disuse 01 : Limit Mode 1 02 : Limit Mode 2 03 : Limit Mode 3	04 : Packer Mode 1 05 : Packer Mode 2 06 : Packer Mode 3 07 : Accumulate Mode 1 08 : Accumulate Mode 2
224	Weighing method	00	00 : Absolute weight control 01 : Positive weight control	
225	Relay output Auto/Manual	00	00 : Auto (Set as each weighing mode, it will operate automatically. Please refer to Function 226 to 229.) 01 : Manual (User can set each relay output from Function 226 to 229.)	
226	Relay output 1	xx	00 : Disuse 01 : Near Zero 02 : SP1 03 : SP2	04 : SP3 05 : SP4 06 : Shortfall
227	Relay output 2	xx		
228	Relay output 3	xx		
229	Relay output 4	xx		
233	External input 1	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/Accumulate) 09 : Stop (Packer/Accumulate) 10 : Start/Stop (Packer/Accumulate) 11 : Print 12 : Print grand-total
234	External input 2	04		
235	External input 3	07		
236	External input 4	11		

No.	Subject	Default	Content	
239	Finish relay output delay time	10	00 ~ 99(Unit : 0.1sec) 00 : Finish Relay output at steady state 20 : Finish Relay output after 2.0 seconds 99 : Finish Relay output after 9.9 seconds	
240	Finish relay output time	10	00 ~ 99(Unit : 0.1sec) 00 : Relay output until the weight is lower than near zero range 01 : Relay output for 0.1 seconds 20 : Relay output for 2.0 seconds	
251	Near zero output setting when tare is set	00	00 : Zero output 01 : Actual zero output except Tare weight	
253	Near zero range external output setting when tare is set	00	00 : Output when zero (Tare set) 01 : Output when actual zero (Except for tare weight)	
301	Parity / stop bit (Serial port 1)	00	00: Data bit8, stop bit1, parity bit Non 01: Data bit8, stop bit1, parity bit Odd 02: Data bit8, stop bit1, parity bit Even 03: Data bit7, stop bit1, parity bit Odd 04: Data bit7, stop bit1, parity bit Even	
302	Communication speed (Serial port 1)	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 : 115,200bps
303	Communication mode (Serial port 1)	00	00: Simplex / Stream mode 01: Duplex 02: Print 03: Modbus(RTU)	
304	"Check-Sum" in Duplex mode (Serial port 1, Function 303-01)	00	00 : Disuse 01 : Use (Including Error Code, please refer to CH. 6-1-10.)	

No.	Subject	Default	Content	
305	Format in stream mode (Serial port 1)	00	00 : Format 1 (18byte) 01 : Format 2 (21byte) 02 : Format 3 (17byte) 03 : Format 4 (22byte)	
306	Transference in stream mode (Serial port 1)	00	00 : Continuously 01 : Single time on every steady state 02 : Single time at the first steady point 03 : Single time output after weighing finish 04 : When input "F" key	
307	Modbus LSB/MSB (Serial port 1)	00	00 : MSB -> LSB 01 : LSB -> MSB	
308	Parity / stop bit (Serial port 2)	00	00: Data bit8, stop bit1, parity bit Non 01: Data bit8, stop bit1, parity bit Odd 02: Data bit8, stop bit1, parity bit Even 03: Data bit7, stop bit1, parity bit Odd 04: Data bit7, stop bit1, parity bit Even	
309	Communication speed (Serial port 2)	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 : 115,200bps
310	Communication mode (Serial port 2)	02	00 : Simplex / Stream mode 01 : Command mode 02 : Print	
311	"Check-Sum" in Duplex mode (Serial port 2, Function 303-01)	00	00 : Disuse 01 : Use	
312	Format in stream mode (Serial port 2)	00	00 : Format 1 (19byte) 01 : Format 2 (22byte) 02 : Format 3 (17byte) 03 : Format 4 (22byte)	

No.	Subject	Default	Content
313	Transference in stream mode (Serial port 2)	00	00 : Continuously 01 : Single time on every steady state 02 : Single time at the first steady point 03 : Single time output after weighing finish 04 : When input "F" key
352	Print mode	00	00 : Continuously 01 : Each
354	Print delay time	00	00 ~ 09 (Unit: 1 sec) * Print after set value.
355	Print paper margin (Print continuously/each)	00	00 ~ 09 (Unit: 1 line)
356	Print paper margin (Print sub-total or grand-total)	00	00 ~ 09 (Unit: 1 line)
358	Data reset after print grand-total	00	00 : No delete 01 : Delete
401	Analog output range	00	00 : Absolute (-/+) 01 : Positive (+ only)
402	Analog output direction	00	00 : Forward (4~20mA, 0→10V) 01 : Reverse (20~4mA, 10→0V)
403	Analog Output Standard	00	00 : Display value is Max Capacity 01 : Display value is SP1 setting standard 02 : Display value is SP2 setting standard 03 : Display value is SP3 setting standard 04 : Display value is SP4 setting standard 05 : Display value is Max Capacity 　　　(When tare, the GROSS weight showing)

◆ **Weighing Mode 1 – Limit mode (Function 223-01) - Relay "ON" when weight reaches set value**
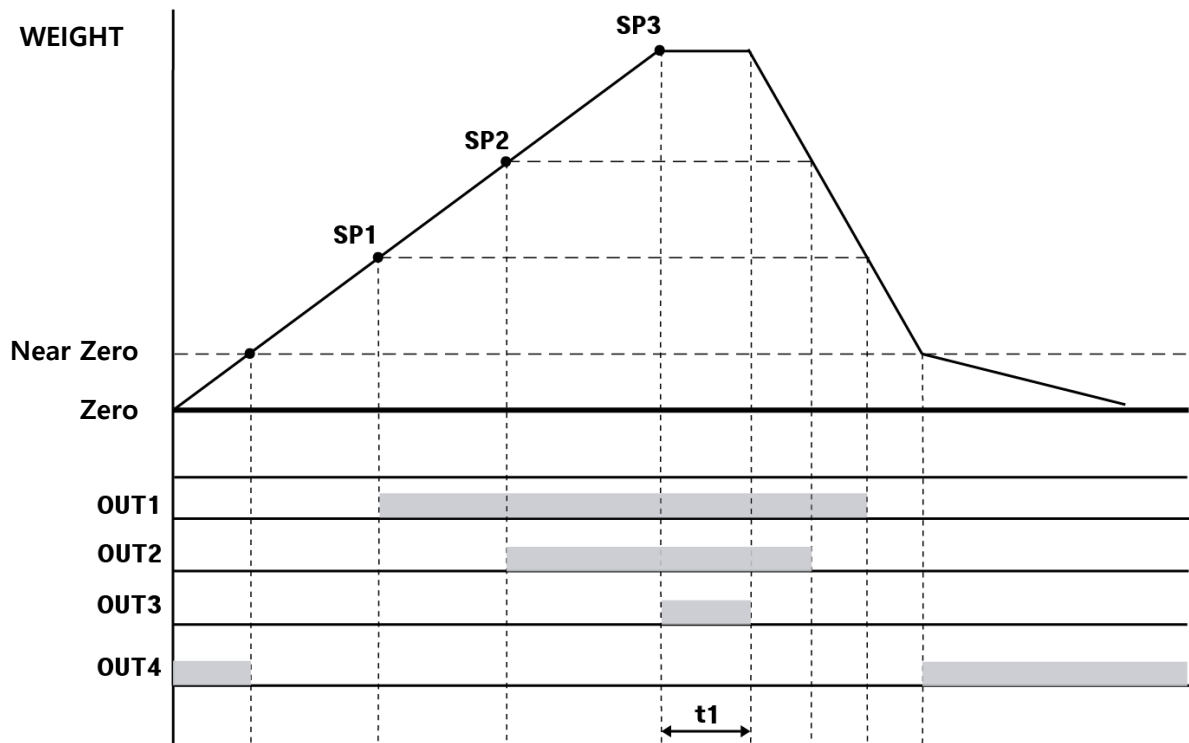
Time set

Time	Contents
t1	Finish Relay Output Delay Time (Function 239) 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) Current weight < SP1 (OFF)	OUT 2	Current weight ≥ SP2(ON) Current weight < SP2(OFF)
OUT 3	Current weight ≥ SP3(ON) Current weight < SP3(OFF)	OUT 4	Within near zero range (Function 201) (ON)

◆Weighing mode 2 – Checker mode (Function 223-02)
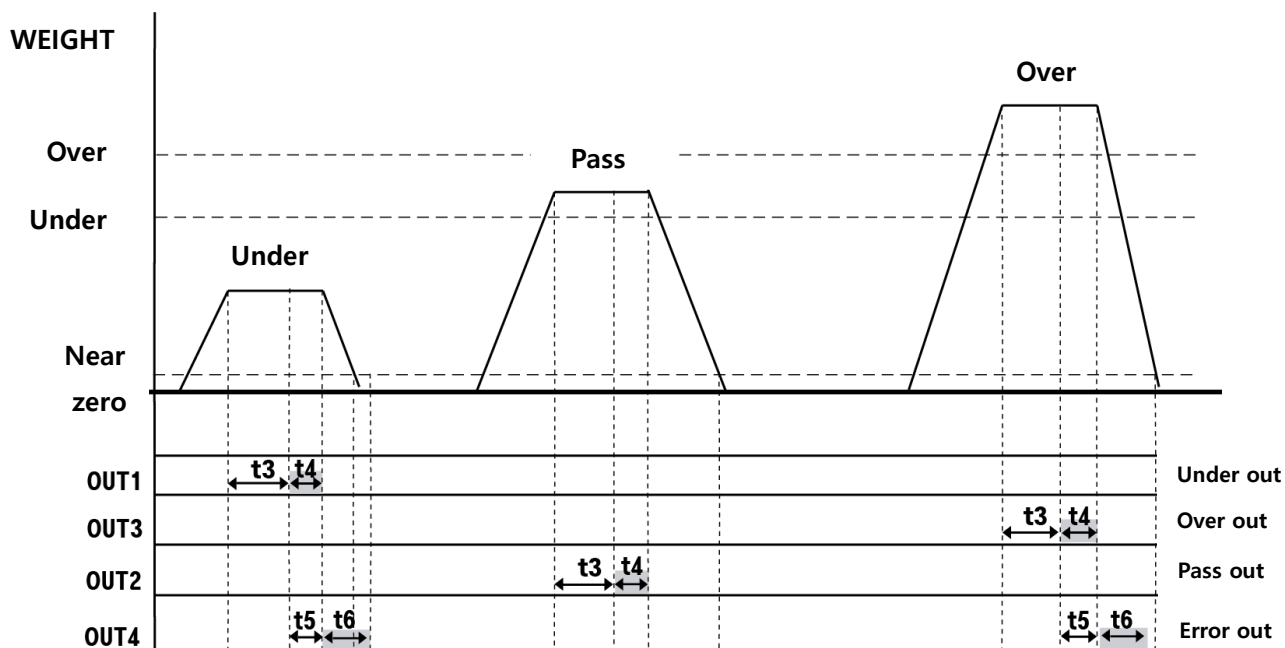
Weight set

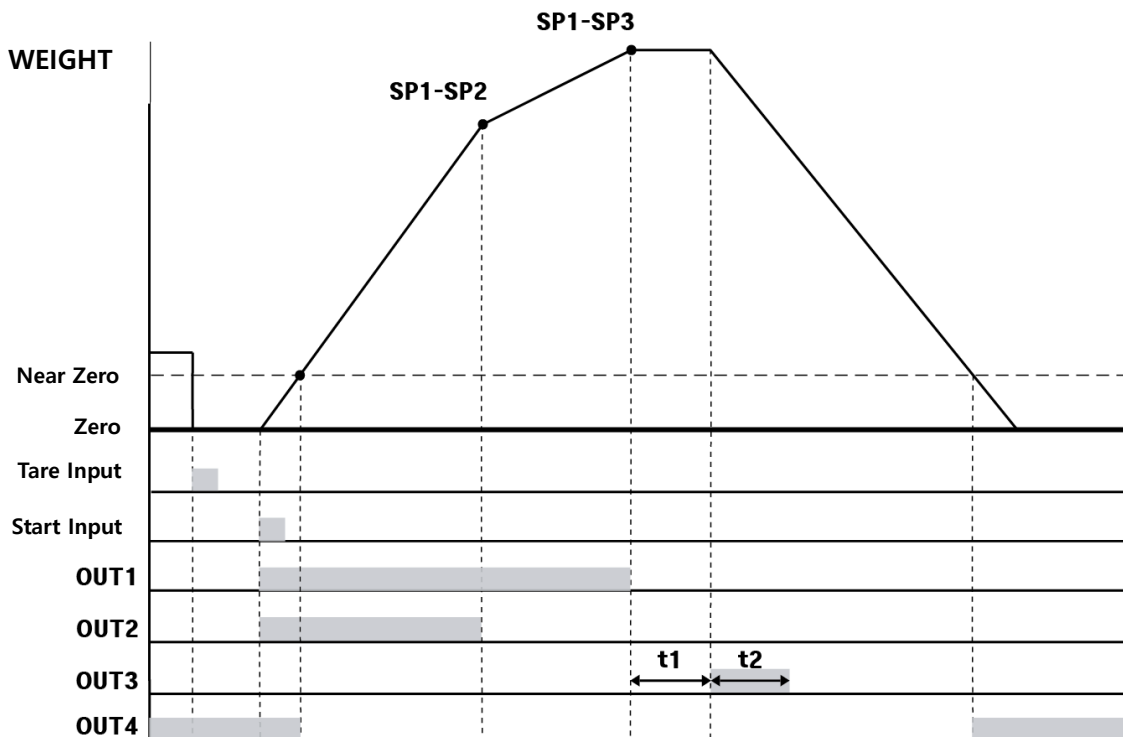| SP1	SP2
Under	Over

Time set

Time	Contents
t3	Weight Judge Delay Time (Function 241) When Function 103-3 or 103-6, save the date after t1 time.
t4	Weight Judge Time (Function 243)
t5	Error relay out delay Time (Function 244)
t6	Error relay out Time (Function 245)

Relay output

Relay	Condition	Relay	Condition
OUT 1	Near zero < Current weight < SP1 (ON)	OUT 2	SP1 ≤ Current weight ≤ SP2 (ON)
OUT 3	Current weight > SP2 (ON)	OUT 4	Under or Over (ON)

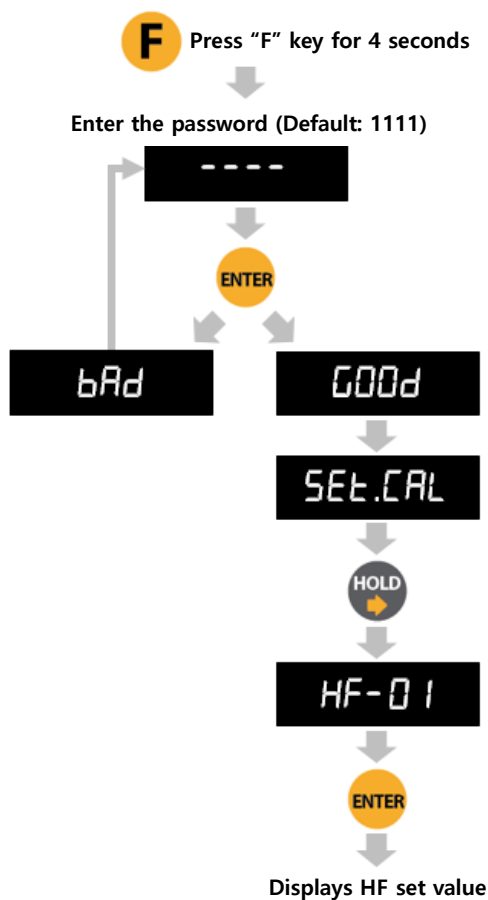## ◆Weighing mode 3 – Packer mode (Function 223 – 03)

Weight set

SP1	SP2	SP3
Set point	Drib	Free fall

Time set

Time	Contents
t1	Finish Relay Output Delay Time (Function 239) 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) Current weight ≥ SP1 - SP3 (OFF)	OUT 2	Start input (ON) Current weight ≥ SP1 – SP2 (OFF)
OUT 3	When current weight reaches SP1 set value, after t1 time, during t2 time (ON)	OUT 4	Within near zero range (Function 201) (ON)

5-3-3. Hidden function

※ **How to enter hidden function mode**

F Press "F" key for 4 seconds

Enter the password (Default: 1111)

`----`

ENTER

`bAd` `GOOd`

`SEt.CAL`

HOLD

`HF-01`

ENTER

Displays HF set value

<Password input key>

- **ZERO** : Number 1
- **TARE** : Number 2
- **HOLD** : Number 3
- **SP1** : Number 4
- **SP2** : Number 5

<Proceed and cancel key>

- **SP1** **SP2** : Increase the number
- **ENTER** : Move to function number
  Save function value
- **F** : Cancel and move to previous step
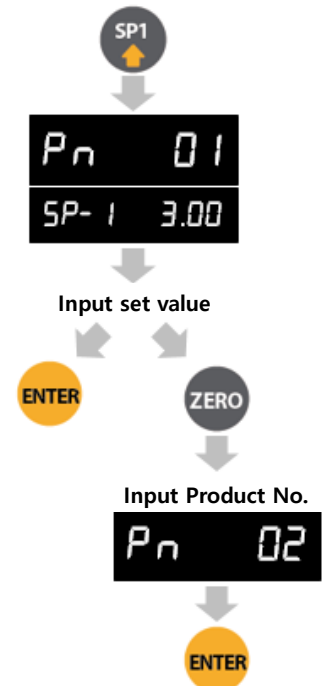
No.	Subject	Default	Content
HF01	Serial number check	xxxxx	Factory number
HF03	S/W version check	Ver 3.03	
HF04	H/W version check	Ver 3.00	
HF05	DATE(Y,M,D) check / modification	YY.MM.DD	Use the direction
HF06	TIME(H,M,S) check / modification	HH.MM.SS	Use the direction
HF07	Password setting - Password is required when you enter to hidden function. - Enter the password twice.	----	**ZERO TARE HOLD SP1 SP2** **1 2 3 4 5** Password combination 1~5
HF08	Maximum capacity weight check	15.000	When calibration, the value is changed
HF12	Span value check	x.xxxxx	Press **F** to back
HF13	Analog output check and setting	00	00 : I-out(4-20mA) 01 : V-out(0-10V)

HF14	Adjust Analog minimum output value	0.00	TARE ◄, HOLD ► (Move decimal point) SP1 ▲, SP2 ▼ (-, +) * Adjust ± value to correct error
HF15	Adjust Analog maximum output value revision	0.00	
HF16	Function list factory reset	FUNSET	Select the TARE ◄ or HOLD ► key, "NO(Cancel the reset)", "YES(Do the reset)" and press ENTER
HF17	Simulated calibration value enter	OrnU	Simulated calibration value enter
HF18	Check the simulated value	x.xxxxx	Back to use **F** key
HF19	Factory state reset	ALLSER	Select the TARE ◄ or HOLD ► key, "NO(Cancel the reset)", "YES(Do the reset)" and press ENTER
HF20	Program serial download		

5-4. SET-POINT Setting

5-4-1. SP1 or Under

- TARE ◄ HOLD ► : Adjust decimal point
- SP1 ▲ SP2 ▼ : Adjust number
- ENTER : Save
- **F** : Cancel and move to previous step

※ **When weighing mode is set as checker mode, SP1 value is going to be the Under weight.**
※ **You cannot set this value more than Max. capacity.**
※ **SP1 Default: 0**

5-4-2. SP2 or Over
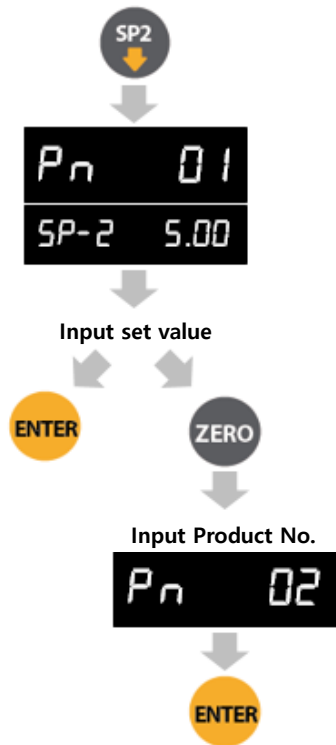
Input set value

Input Product No.

- TARE ← HOLD → : Adjust decimal point
- SP1 ↑ SP2 ↓ : Adjust number
- ENTER : Save
- F : Cancel and move to previous step

※ **When weighing mode is set as checker mode, SP1 value is going to be the Over weight.**
※ **You cannot set this value more than Max. capacity.**
※ **SP2 Default: 0**

5-4-3. SP3

Input set value

Input Product No.
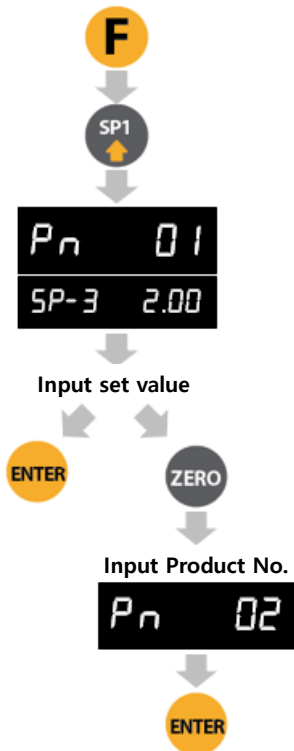
- TARE ← HOLD → : Adjust decimal point
- SP1 ↑ SP2 ↓ : Adjust number
- ENTER : Save
- F : Cancel and move to previous step

※ **SP3 is for Limit mode, Packer mode.**
※ **You cannot set this value more than Max. capacity.**
※ **SP3 Default: 0**

5-4-4. SP4

Input set value

Input Product No.
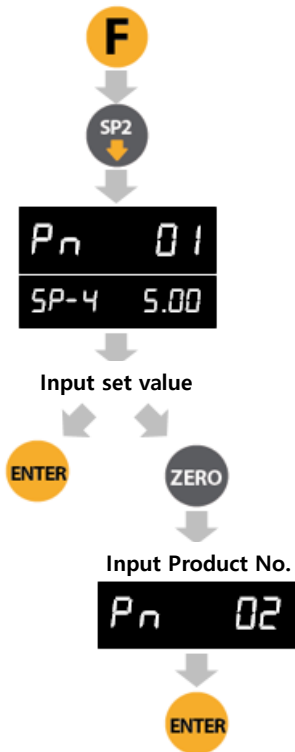
- 🔘🔘 (TARE / HOLD) : Adjust decimal point
- 🔘🔘 (SP1 / SP2) : Adjust number
- 🔘 (ENTER) : Save
- 🔘 (F) : Cancel and move to previous step

※ **SP4 is for Limit mode, Packer mode.**
※ **You cannot set this value more than Max. capacity.**
※ **SP4 Default: 0**

5-5. Delete Sub-total/Grand-total

5-5-1. Delete Sub-total

Press "F" key 4 times in 3 seconds

Cancel delete   Proceed delete

OR   OR
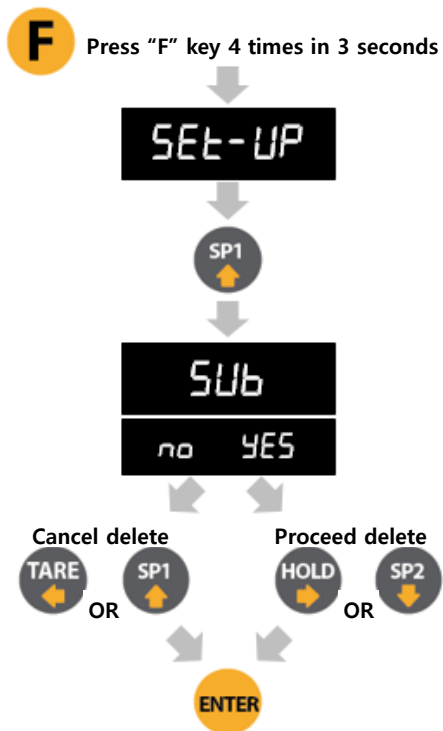
- 🔘 (ENTER) : Save
- 🔘 (F) : Cancel and move to previous step

※ **Sub-total is not displayed on display.**
※ **User can check sub-total through communication and print.**

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5-5-2. Delete Grand-total

F **Press "F" key 4 times in 3 seconds**

`SEt-UP`

SP2

`tOtAL`

`no    YES`

Cancel delete   Proceed delete

TARE   SP1   HOLD   SP2

OR   OR
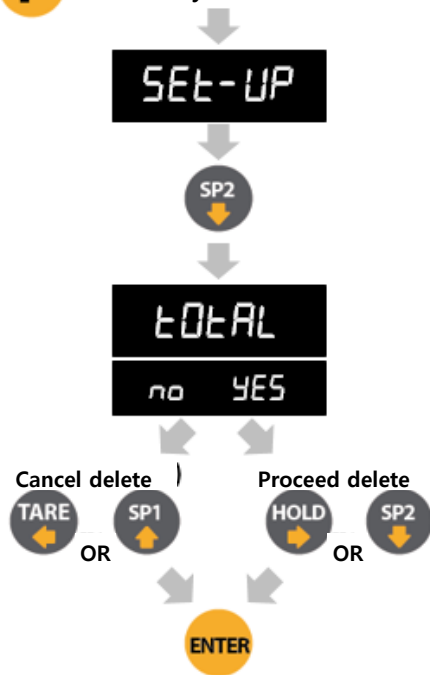
ENTER

- **ENTER** : Save

- **F** : Cancel and move to previous step

※ **Grand-total is not displayed on display.**

※ **User can check grand-total through communication and print.**

5-6. Test mode

Disconnected all indicator and equipment when do the test mode.

How to enter the test mode	

1) Press the **F** key 4 times sequentially.

2) Display shows `SEt-UP`.

3) Enter the test mode 1, press **TARE** key.

   Enter the test mode 2, press **HOLD** key.

4) Display shows `tESt` it entered test mode..

5) User can check indicators conditions use the below keys.

Key	Test mode 1	Test mode 2
ZERO	Analog Value	External Input
TARE	Analog Deviation Check	Relay Output
HOLD	Display Check	Analog Output (4~20mA/0~10V)
SP1	Key Input Check	Serial I/F (Standard)
SP2		Serial I/F (Additional)

6) Press **F** key to go back or cancel.

5-6-1. Checking load cell input number

1) In test mode 1, press [ZERO] the value shows.
   ※ You can check the load cell analog value. (Display range : -1,048,575 ~ 1,048,575)
   ※ If analog value is changing even though there are nothing on the weighbridge, or If analog value is not changing when you load some weight on weighbridge, It might be malfunction of load cell or analog board inside indicator.

2) [TARE] Display from 100 thousand unit, [HOLD] Display from 1 million unit, [SP1] Display from ten million unit .

3) Press [F] key, back to `tESt_1` .

5-6-2. Deviation of Load cell input value check mode

1) Press the [TARE] key in the test mode, then displayed actual converted digital value.

2) In this condition, press [ZERO] key then adjusted the digital value as `0` If put some load on the loadcell, loaded value is displayed.
   This test mode is that check deviation of actual converted digital value.

3) [TARE] Display from 100 thounsand unit, [HOLD] Display from 1 million unit, [SP1] Display from ten million unit .

4) Press [F] key, back to `tESt_1` .

5-6-3. Display check mode

1) When test mode, press the [HOLD] key all display switches on and off.
2) User can check by eyes.
3) Press [F] key, back to `tESt_1` step.

5-6-4. Key pad check mode

You can check the key condition when enter the key.

1) In test mode press the SP1 key, display shows `HEY__0`.

2) Except F key, showing every numbers with same keys.

3) Press F key, back to `tESt_1` display.

KEY	DISPLAY	KEY	DISPLAY	KEY	DISPLAY
ZERO	1	TARE	2	HOLD	3
SP1	4	SP2	5	ENTER	6

5-6-5. External Input Check Mode

1) In test mode 2, press ZERO, display shows `In    0`.

2) Connected with external input terminal(Ⅰ1~Ⅰ4) and common terminal(ⅠC), the correct external input value shows.

3) Press F, back to `tESt_2`.

5-6-6. Relay Output Check Mode

1) In test mode 2, press TARE, display shows `OUt    0`

2) You can activate the relay output sequentially or particular relay you choose.

   ※ **Don't connect any device with relay output terminal.**

ZERO	TARE	HOLD	SP1	SP2
OUT 1~4 In order	OUT1 ON/OFF	OUT2 ON/OFF	OUT3 ON/OFF	OUT4 ON/OFF

3) Press F, back to `tESt_2`.

5-6-7. Analog value check (Analog Output) 4~20mA, 0~10V

1) In test mode 2, press [HOLD] key [A 4.00] display shows.

2) Can be simulated by virtually printing a value on the indicator from 0 (4 mV, 0 V) to 100 (20 mV, 10 V).

3) If the analog output is between 4 and 20 mA, the display shows A and the analog output, If 0 to 10 V, the display shows V.

4) Press [F] key, back to [tESt_2] display.

※ The output can be checked by entering the output value in 0.1 units using the direction key. If the input value exceeds the maximum allowable value, the actual analog output is output at 100 %.

ex)
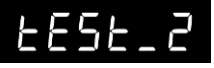
If the analog output mode is between 0 and 24 mA, when user enter 4.0, 4 mA is output.

If the analog output mode is between 0 and 24 mA, when user enter -4.0, 20mA is output.

If the analog output mode is between 0 and 10V, when user enter 4.7, 4.7V is output.

If the analog output mode is between 0 and 10V, when user enter 10.0, 10V is output.

5-6-8. Serial port 1 interface check mode

1) In test mode 2, press **SP1** key, display `Conn_ 1` shows.

2) Connect with PC or other devices through serial interface and check the transference and receipt.(Except **F**)

3) At the normal operation, LED will blink one time.

4) Press **F** key, back to `tESt_2` display.

5-6-9. Serial port2 interface check mode

1) In test mode 2, press **SP1** key, display `Conn_2` shows.

2) Connect with PC or other devices through serial interface and check the transference and receipt.(Except **F**)

3) At the normal operation, LED will blink one time.

4) Press **F** key, back to `tESt_2` display.

※ **Test protocol**

ID number

STX	0	1	T	E	S	T	ETX
02h	30h	31h	54h	45h	53h	54h	03h
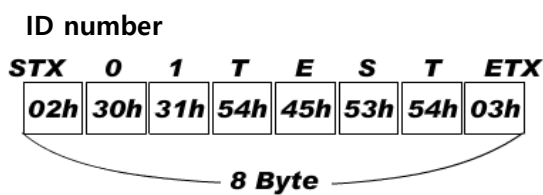
──────── 8 Byte ────────

⚠ **Serial port 1, 2 interface test can't be simulated.**
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6. Communication Data Format

6-1. Simplex (Stream mode)

6-1-1. Format 1 (Excluding ID number) – 18 byte

Classification	Contents
Header1 (2Byte)	OL : Current weight is over than max capacity weight. ST : Stable weight US : Unstable weight
Header2 (2Byte)	NT : NET-WEIGHT(Real weight which is excluded tare weight) GS : GROSS-WEIGHT (If tare is set, it is included real weight and tare weight.)
Sign (1Btye)	Sign
Weight Data (7Byte)	Current weight
UNIT (2Byte)	kg - [k] [g] g - [ ] [g] ton- [ ] [t]
CR (1byte)	Carriage Return
LF (1byte)	Line Feed
Example	ASCII : ST,NT,+0000.00kg CR LF HEX : 53h 54h 2Ch 4Eh 54h 2Ch 2Bh 30h 30h 30h 30h 2Eh 30h 30h 6Bh 67h 0Dh 0Ah

6-1-2. Format 2 (Including ID number) – 21 byte

Classification	Contents
ID Number (2Byte)	ID Number
Header1 (2Byte)	OL : Current weight is over than max capacity weight. ST : Stable weight US : Unstable weight
Header2 (2Byte)	NT : NET-WEIGHT(Real weight which is excluded tare weight) GS : GROSS-WEIGHT (If tare is set, it is included real weight and tare weight.)
Sign (1Btye)	Sign
Weight Data (7Byte)	Current weight
UNIT (2Byte)	kg - k g g - g ton- t
CR (1byte)	Carriage Return
LF (1byte)	Line Feed
Example	ASCII : 01,ST,NT,+0000.00kg CR LF HEX : 30h 31h 2Ch 53h 54h 2Ch 4Eh 54h 2Ch 2Bh 30h 30h 30h 30h 2Eh 30h 30h 6Bh 67h 0Dh 0Ah

6-1-3. Format 3 (Including ID number) – 17 byte

STX	ID Number	Header 1	Header 2	"W"	+/-	Data Byte 7 byte	"P"	Decimal Point	ETX
02h				"W"	+/-	/ /	"P"		03h
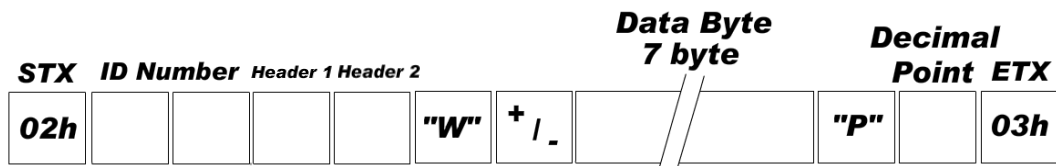
Classification	Contents
STX (1Byte)	Start of Text
ID Number (2Byte)	ID Number
Header1 (1Byte)	OL : Current weight is over than max capacity weight. ST : Stable weight US : Unstable weight
Header2 (1Byte)	NT : NET-WEIGHT(Real weight which is excluded tare weight) GS : GROSS-WEIGHT (If tare is set, it is included real weight and tare weight.)
"W" (1Byte)	Weight display separator
Sign (1Btye)	Sign
Weight Data (7Byte)	Current weight
"P" (1Byte)	Decimal point display seperator
Decimal Point (1Byte)	Decimal point
ETX (1Byte)	End of Text
Example	ASCII : STX 01SNW+0000000P2 ETX HEX : 02h 30h 31h 53h 4Eh 57h 2Bh 30h 30h 30h 30h 30h 30h 30h 50h 32h 03h

6-1-4. Format 4 (Including ID number) – 22 byte

Classification	Contents
Header1 (2Byte)	OL : Current weight is over than max capacity weight. ST : Stable weight US : Unstable weight
Header2 (2Byte)	NT : NET-WEIGHT(Real weight which is excluded tare weight) GS : GROSS-WEIGHT (If tare is set, it is included real weight and tare weight)
ID Number (1Byte)	ID Number
Lamp Display (1Byte)	Lamp status display
Weight Data (8Byte)	Current weight including Sign (When weight is negative number, sign '-' is displayed, otherwise sign '+' is not displayed when weight is positive number))
UNIT (2Byte)	kg : kg g : g t : ton
CR (1byte)	Carriage Return
LF (1byte)	Line Feed
Example	ASCII : ST,NT,.?␣␣␣␣0.12 kg CR LF HEX : 53h 54h 2Ch 4Eh 54h 2Ch 01h E1h 2Ch 20h 20h 20h 20h 30h 2Eh 31h 32h 20h 6Bh 67h 0Dh 0Ah

※ **Lamp Display**

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
1	Steady	1	Hold	Print	Gross weight	Tare	Zero

6-1-5. Format 5 (P/N, Judgement weight, Weight transmission, For checker mode) – 15 byte
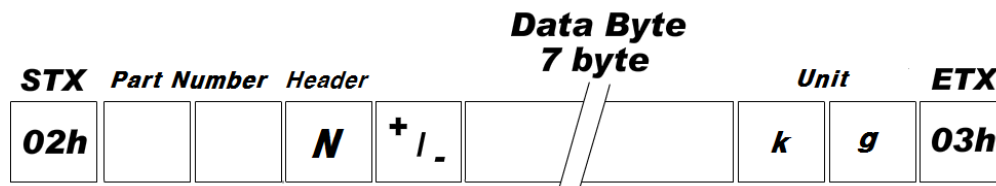
Classification	Contents
STX (1Byte)	Start of Text
Part Number (2Byte)	P/N
Header1 (1Byte)	N : No judgement U : Under P : Pass O : Over
Sign (1Btye)	Sign
Weight Data (7Byte)	Weight data
UNIT (2Byte)	kg : kg g : g t : ton
ETX (1Byte)	End of Text
EX	ASCII : STX 01N+0000.00kg ETX HEX : 02h 30h 31h 4Eh 2Bh 30h 30h 30h 30h 2Eh 30h 30h 6Bh 67h 03h

6-2. Command Mode

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

6-2-1. Read command

Subject	Command	Length of transmission data
Current Weight	STX ID RCWT ETX	22 byte
Current data	STX ID RCWD ETX	46 byte
Grand total data	STX ID RGRD ETX	28 byte
Sub-total date	STX ID RSUB ETX	30 byte
Weighing completion value	STX ID RFIN ETX	18 byte
Current date data	STX ID RDAT ETX	14 byte
Current time data	STX ID RTIM ETX	14 byte
Tare weight	STX ID RTAR ETX	18 byte
SP1	STX ID RSP1 ETX	17 byte
SP2	STX ID RSP2 ETX	17 byte
SP3	STX ID RSP3 ETX	17 byte
SP4	STX ID RSP4 ETX	17 byte
SP1, SP2, SP3, SP4	STX ID RSPA ETX	38 byte
Current weight, Input, Output state	STX ID RWRS ETX	26 byte
Current P/N transmission	STX ID RPNO ETX	10 byte

6-2-2. Write Command

Subject	Command	Length of transmission data
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
Delete Sub-total	STX ID WSTC ETX	8 byte
Grand total Print	STX ID WGPR 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
Date setting	STX ID WDAT DATE (YYMMDD) ETX	14 byte
Time setting	STX ID WTIM TIME (HHMMSS) ETX	14 byte
SP1	STX ID WSP1 SP1 value ETX	15 byte
SP2	STX ID WSP2 SP2 value ETX	15 byte
SP3	STX ID WSP3 SP3 value ETX	15 byte
SP4	STX ID WSP4 SP4 value ETX	15 byte
SP1, SP2, SP3, SP4	STX ID WSPA SP1, SP2, SP3, SP4 value ETX	36 byte
P/N change	STX ID WPNO P/N ETX	10 byte
P/N, SP1, SP2, SP3, SP4	STX ID WFTD P/N SP1, SP2, SP3, SP4 value ETX	38 byte

6-2-3. Read Command Detail

Current Weight	
ASCII : STX ID(2byte) RCWT ETX	**HEX :** 02 30 31 52 43 57 54 03

Response	STX ID RCWT **State1(1byte) State2(1byte)** P **decimal point(1byte) +/-(1byte)**
	Current weight(7byte) Weight unit(2byte) ETX
	State1 : O(Over Load) , S(Steady), U(Unsteady)
	State2 : N(Net weight), G(Gross weight)

Ex) Steady(S), TARE not used(N), 0.000kg

STX	ID		R	C	W	T	S	N	P	3	+	0	0	0
02h	30h	31h	52h	43h	57h	54h	53h	4Eh	50h	33h	2Bh	30h	30h	30h

0	0	0	0	k	g	ETX
30h	30h	30h	30h	6Bh	67h	03h

Indicator memory data	
ASCII : STX ID(2byte) RCWD ETX	**HEX :** 02 30 31 52 43 57 44 03

Response	STX ID RCWD P **decimal point(1byte) date(6byte) Time(6byte)**
	No. of weighing(6byte) +/-(1byte) Tare(7byte) +/-(1byte)
	weight(7byte) weight unit(2byte) ETX

Ex) DATE : Aug 12th,2014, TIME : 12:00:00, the no. of weighing : 10, TARE : 2.000kg, current weight : 3.000kg

STX	ID		R	C	W	D	P	3	1	4	0	1	0	1
02h	30h	31h	52h	43h	57h	44h	50h	33h	31h	34h	30h	31h	30h	31h

1	2	0	0	0	0	3	4	0	0	0	0	1	0	+
31h	32h	30h	30h	30h	30h	33h	34h	30h	30h	30h	30h	31h	30h	2Bh

0	0	0	2	0	0	0	+	0	0	0	3	0	0	0
30h	30h	30h	32h	30h	30h	30h	2Bh	30h	30h	30h	33h	30h	30h	30h

k	g	ETX
6Bh	67h	03h

Grand Total data

ASCII : STX ID(2byte) RGRD ETX	**HEX :** 02 30 31 52 47 52 44 03

Response : STX ID RGRD P decimal point**(1byte) the no. of weighing (6byte) Accumulated weight(10byte) unit(2byte)** ETX

Ex) the no. of weighing : 10 , Accumulated Weight : 10.000kg

STX	ID		R	G	R	D	P	3	0	0	0	0	1	0
02h	30h	31h	52h	47h	52h	44h	50h	33h	30h	30h	30h	30h	31h	30h

0	0	0	0	0	1	0	0	0	0	k	g	ETX
30h	30h	30h	30h	30h	31h	30h	30h	30h	30h	6Bh	67h	03h

Sub-total data

ASCII : STX ID(2byte) RSUB ETX	**HEX :** 02 30 31 52 53 55 42 03

Response : STX ID RSUB P decimal point**(1byte) P/N(2byte) the no. of weighing (6byte) Accumulated weight(10byte) unit(2byte)**

Ex) the no. of weighing : 10, Accumulated Weight : 10.000Kg

STX	ID		R	S	U	B	P	3	0	1	0	0	0	0
02h	30h	31h	52h	53h	55h	42h	50h	33h	30h	31h	30h	30h	30h	30h

1	0	0	0	0	0	0	1	0	0	0	0	k	g	ETX
31h	30h	30h	30h	30h	30h	30h	31h	30h	30h	30h	30h	6Bh	67h	03h

Finished Weight data

ASCII : STX ID(2byte) RFIN ETX	**HEX :** 02 30 31 52 46 49 4E 03

Response : STX ID RFIN P **decimal point(1byte) +/- Finished weight(7byte)** ETX

EX) Finished weight : 2.000kg

STX	ID		R	F	I	N	P	3	+	0	0	0	2	0
02h	30h	31h	52h	46h	49h	4Eh	50h	33h	2Bh	30h	30h	30h	32h	30h

0	0	ETX
30h	30h	03h

Current Time data

ASCII : STX ID(2byte) RTIM ETX	**HEX :** 02 30 31 52 54 49 4D 03

Response : STX ID RTIM **Current Time(6byte)** ETX

EX) Time : 12:00:00

STX	ID		R	T	I	M	1	2	0	0	0	0	ETX
02h	30h	31h	52h	54h	49h	4Dh	31h	32h	30h	30h	30h	30h	03h

Current date data

ASCII : STX ID(2byte) RDAT ETX	HEX : 02 30 31 52 44 41 54 03

Response	STX ID RDAT **Current Date(6byte)** ETX

EX) Date : Aug 12th ,2014

STX	ID		R	D	A	T	1	4	0	1	0	1	ETX
02h	30h	31h	52h	44h	41h	54h	31h	34h	30h	31h	30h	31h	03h

Tare data

ASCII :STX ID(2byte) RTAR ETX	HEX : 02 30 31 52 54 41 52 03

Response	STX ID RTAR P **decimal point(1byte) +/-(1byte) TARE value(7byte)** ETX

EX) TARE : 2.000kg

STX	ID		R	T	A	R	P	3	+	0	0	0	2	0
02h	30h	31h	52h	54h	41h	52h	50h	33h	2Bh	30h	30h	30h	32h	30h

0	0	ETX
30h	30h	03h

SP 1 data

ASCII : STX ID(2byte)RSP1 ETX	HEX : 02 30 31 52 53 50 31 03

Response	STX ID RSP1 P1 **decimal point(1byte) SP 1 value(7byte)** ETX

EX) SP1 value : 5.000kg

STX	ID		R	S	P	1	P	3	0	0	0	5	0	0
02h	30h	31h	52h	53h	50h	31h	50h	33h	30h	30h	30h	35h	30h	30h

0	ETX
30h	03h

SP 2 data

ASCII : STX ID(2byte)RSP2 ETX	HEX : 02 30 31 52 53 50 32 03

Response	STX ID RSP2 P **decimal point(1byte) SP 2 value (7byte)** ETX

예) SP2 value : 6.000kg

STX	ID		R	S	P	2	P	3	0	0	0	6	0	0
02h	30h	31h	52h	53h	50h	32h	50h	33h	30h	30h	30h	36h	30h	30h

0	ETX
30h	03h

SP 3 data	
ASCII : STX ID(2byte) RSP3 ETX	**HEX :** 02 30 31 52 53 50 33 03

Response	STX ID RSP3 P **decimal point(1byte) SP 3 value (7byte)** ETX

Ex) SP3 value: 7.000kg

STX		ID	R	S	P	3	P	3	0	0	0	7	0	0
02h	30h	31h	52h	53h	50h	33h	50h	33h	30h	30h	30h	37h	30h	30h

0	ETX
30h	03h

SP 4 data	
ASCII : STX ID(2byte) RSP4 ETX	**HEX :** 02 30 31 52 53 50 34 03

Response	STX ID RSP4 P **decimal point(1byte) SP 4 value (7byte)** ETX

Ex) SP4 value: 8.000kg

STX		ID	R	S	P	4	P	3	0	0	0	8	0	0
02h	30h	31h	52h	53h	50h	34h	50h	33h	30h	30h	30h	38h	30h	30h

0	ETX
30h	03h

SP 1,2,3,4, data	
ASCII : STX ID(2byte) RSPA ETX	**HEX :** 02 30 31 52 53 50 41 03

Response	STX ID RSPA P **decimal point(1byte) SP 1 value (7byte) SP 2 value (7byte) SP 3 value (7byte) SP 4 value (7byte)** ETX

Ex) SP1 value: 5.000, SP2 value: 6.000, SP3 value: 7.000, SP4 value: 8.000

STX		ID	R	S	P	A	P	3	0	0	0	5	0	0
02h	30h	31h	52h	53h	50h	41h	50h	33h	30h	30h	30h	35h	30h	30h

0	0	0	0	6	0	0	0	0	0	0	7	0	0	0
30h	30h	30h	30h	36h	30h	30h	30h	30h	30h	30h	37h	30h	30h	30h

0	0	0	8	0	0	0	ETX
30h	30h	30h	38h	30h	30h	30h	03h

Current weight, Input, Output state														

ASCII :STX ID(2byte) RWRS ETX	HEX :02 30 31 52 57 52 53 03

Response	STX ID RWRS P **decimal point(1byte) +/-(1byte) current weight(7byte)** **INPUT1,2,3,4(4byte) OUTPUT1,2,3,4(4byte)** ETX (ON : 1 OF : 0)

Ex) Weight : 7.000kg, INPUT : IN1,IN3, OUTPUT : OUT2,OUT4

STX	ID	R	W	R	S	P	3	+	0	0	0	7	0
02h	30h	31h	52h	57h	52h	53h	50h	33h	2Bh	30h	30h	30h	37h	30h

0	0	1	0	1	0	0	1	0	1	ETX
30h	30h	31h	30h	31h	30h	30h	31h	30h	31h	03h

Current P/N transmit									

ASCII : STX ID(2byte) RPNO ETX	HEX : 02 30 31 52 50 4E 4F 03

Response	STX ID RPNO **P/N(2byte)** ETX

Ex) P/N : 01

STX	ID	R	P	N	O	0	1	ETX
02h	30h	31h	52h	50h	4Eh	4Fh	30h	31h	03h

6-2-4. Write Command Detail

Zero (same as "ZERO" key)	
ASCII : STX ID(2byte) WZER ETX	**HEX :** 02 30 31 57 5A 45 52 03
Response Normal : STX ID ACK ETX Error : STX ID NAK ETX	

Tare	
ASCII : STX ID(2byte) WTAR ETX	**HEX :** 02 30 31 57 54 41 52 03
Response Normal : STX ID ACK ETX Error : STX ID NAK ETX	

Tare reset	
ASCII : STX ID(2byte) WTRS ETX	**HEX :** 02 30 31 57 54 52 53 03
Response Normal : STX ID ACK ETX Error : STX ID NAK ETX	

Hold	
ASCII : STX ID(2byte) WHOL ETX	**HEX :** 02 30 31 57 48 4F 4C 03
Response Normal : STX ID ACK ETX Error : STX ID NAK ETX	

Hold reset	
ASCII : STX ID(2byte) WHRS ETX	**HEX :** 02 30 31 57 48 52 53 03
Response Normal : STX ID ACK ETX Error : STX ID NAK ETX	

PRINT (Data will be transferred to the port which is set as print mode -Function 303,310 - 02)	
ASCII : STX ID(2byte) WPRT ETX	**HEX :** 02 30 31 57 50 52 54 03
Response Normal : STX ID ACK ETX Error : STX ID NAK ETX	

Sub-total Print	
ASCII : STX ID(2byte) WSPR ETX	**HEX :** 02 30 31 57 53 50 52 03
Response Normal : STX ID ACK ETX Error : STX ID NAK ETX	

Sub-total Delete	
ASCII : STX ID(2byte) WSTC ETX	**HEX :** 02 30 31 57 53 54 43 03
Response Normal : STX ID ACK ETX Error : STX ID NAK ETX	

Grand Total Print (Data will be transferred to the port which is set as print mode -Function 303,310 - 02)	
ASCII : STX ID(2byte) WGPR ETX	**HEX :** 02 30 31 57 47 50 52 03
Response Normal : STX ID ACK ETX Error : STX ID NAK ETX	

Grand Total Delete	
ASCII : STX ID(2byte) WGTC ETX	**HEX :** 02 30 31 57 47 54 43 03
Response Normal : STX ID ACK ETX Error : STX ID NAK ETX	

Run	
ASCII : STX ID(2byte) WSTR ETX	**HEX :** 02 30 31 57 53 54 52 03
Response Normal : STX ID ACK ETX Error : STX ID NAK ETX	

Stop	

ASCII : STX ID(2byte) WSTP ETX	HEX : 02 30 31 57 53 54 50 03
Response	Normal : STX ID ACK ETX Error : STX ID NAK ETX

Date Setting
ASCII : STX ID(2byte) WDAT data(6byte) ETX

Ex) Date : Aug 12th ,2014

STX	ID		W	D	A	T	1	4	0	1	0	2	ETX
02h	30h	31h	57h	44h	41h	54h	31h	34h	30h	31h	30h	32h	03h

Response	Normal : STX ID ACK ETX Error : STX ID NAK ETX

Time Setting
ASCII : STX ID(2byte) WTIM time(6byte) ETX

Ex)12:00:00 setting

STX	ID		W	T	I	M	1	2	0	0	0	0	ETX
02h	30h	31h	57h	54h	49h	4Dh	31h	32h	30h	30h	30h	30h	03h

Response	Normal : STX ID ACK ETX Error : STX ID NAK ETX

SP 1 setting
ASCII : STX ID(2byte) WSP1 SP1 value(7byte) ETX

Ex) SP1 : 5.000kg (decimal point 0.000)

STX	ID		W	S	P	1	0	0	0	5	0	0	0	ETX
02h	30h	31h	57h	53h	50h	31h	30h	30h	30h	35h	30h	30h	30h	03h

Response	Normal : STX ID ACK ETX Error : STX ID NAK ETX

SP 2 setting
ASCII : STX ID(2byte) WSP2 SP2 value(7byte) ETX

Ex) SP2 6.000kg (decimal point 0.000)

STX	ID		W	S	P	2	0	0	0	6	0	0	0	ETX
02h	30h	31h	57h	53h	50h	32h	30h	30h	30h	36h	30h	30h	30h	03h

Response	Normal : STX ID ACK ETX Error : STX ID NAK ETX

SP 3 setting
ASCII : STX ID(2byte) WSP3 SP3 value(7byte) ETX

Ex) SP3 : 7.000kg (decimal point 0.000)

STX	ID		W	S	P	3	0	0	0	7	0	0	0	ETX
02h	30h	31h	57h	53h	50h	33h	30h	30h	30h	37h	30h	30h	30h	03h

Response	Normal : STX ID ACK ETX Error : STX ID NAK ETX

SP 4 setting													
ASCII : STX ID(2byte) WSP4 SP4 value(7byte) ETX													
Ex) SP4 : 8.000kg (decimal point 0.000)													

STX	ID		W	S	P	4	0	0	0	8	0	0	0	ETX
02h	30h	31h	57h	53h	50h	34h	30h	30h	30h	38h	30h	30h	30h	03h

Response	정상 : STX ID ACK ETX, 오류 : STX ID NAK ETX

SP 1,2,3,4 setting
ASCII : STX ID(2byte) WSPA SP1 value (7byte) SP2 value (7byte) SP3 value (7byte) SP4 value (7byte) ETX
Ex) SP1 5.000kg SP2 6.000kg SP3 7.000kg SP4 8.000kg

STX	ID		W	S	P	A	0	0	0	5	0	0	0	0
02h	30h	31h	57h	53h	50h	41h	30h	30h	30h	35h	30h	30h	30h	30h
0	**0**	**6**	**0**	**0**	**0**	**0**	**0**	**0**	**7**	**0**	**0**	**0**	**0**	**0**
30h	30h	36h	30h	30h	30h	30h	30h	30h	37h	30h	30h	30h	30h	30h
0	**8**	**0**	**0**	**0**	**ETX**									
30h	38h	30h	30h	30h	03h									

Response	Normal : STX ID ACK ETX Error : STX ID NAK ETX

Change P/N
ASCII : STX ID(2byte) WPNO P/N(2byte) ETX
Ex) Change P/N to 17

STX	ID		W	P	N	O	1	7	ETX
02h	30h	31h	57h	50h	4Eh	4Fh	31h	37h	03h

Response	Normal : STX ID ACK ETX Error : STX ID NAK ETX

Change SP1,2,3,4 set point of entire P/N													
ASCII : STX ID(2byte) WFTD P/N(2byte) SP1 value(7byte) SP2 value (7byte) SP3 value (7byte) SP4 value (7byte) ETX													

Ex)SP1 5.000kg, SP2 6.000kg, SP3 7.000kg, SP4 8.000kg, P/N 17 (Random number)

STX		ID	W	F	T	D	1	7	0	0	0	5	0	0
02h	30h	31h	57h	46h	54h	44h	31h	37h	30h	30h	30h	35h	30h	30h

0	0	0	0	6	0	0	0	0	0	0	7	0	0	0
30h	30h	30h	30h	36h	30h	30h	30h	30h	30h	30h	37h	30h	30h	30h

0	0	0	8	0	0	0	ETX
30h	30h	30h	38h	30h	30h	30h	03h

Response	Normal : STX ID ACK ETX Error : STX ID NAK ETX

How to Calculate Check Sum.

- Sum the value from "STX" to "ETX" and converts to ASCII(2byte) and transfer.

Convert the Sum value(HEX) to ASCII and transmit(28byte).

   Ex) The sum HEX value from STX to ETX(02,30,31,52,43,57,54,03) is 1A6h.

   Then, divide 1A6h by 100h(1A6h/100h). The rest of result is A6h.

   Calculated remainder value is A6h, then convert A6h to ASCII, 41(A), 36(6), and transfer. In command mode, Command judgement output based on the command starts from 02h(STX), ended in 03h(ETX). 06h (ACK) 15h (NAK) and the Error Code as well.

6-3. Modbus memory map

- 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

6-3-1. Data map

Address	Length	Feature	Description	Address	Length	Feature	Description
				28	1	RO	Current P/N Under Count
0	2	RO	Capacity	29	1	RO	Current P/N Pass Count
2	2	RO	None(0x00)	30	1	RO	Current P/N Over Count
4	2	RO	Analog Value	31	1	RO	Current P/N Error Count
6	2	RO	Span Value	32	2	RO	Grand total Count
8	1	RO	Division	34	2	RO	Grand total Weight
9	1	RO	Decimal point	436	2	RW	Date
10	2	RO	Current Weight	438	2	RW	Time
12	2	RO	Tare Weight	440	1	RW	Key value
14	2	RO	Measured Weight	442	1	RW	Relay output
16	2	RO	Digital input	443	1	RW	P/M
18	2	RO	Lamp	444	2	RW	Current P/N Set point 1
20	2	RO	Error	446	2	RW	Current P/N Set point 2
22	1	RO	Weighing Mode	448	2	RW	Current P/N Set point 3
23	1	RO	Weighing Step	450	2	RW	Current P/N Set point 4
24	2	RO	Current P/N Sub-total count				
26	2	RO	Current P/N Sub-total wt.				

6-3-2. Digital input register

1bit	2bit	3bit	4bit	5bit	6bit	7bit	8bit
IN 1	IN 2	IN 3	IN 4				

6-3-3. Lamp register

1bit	2bit	3bit	4bit	5bit	6bit	7bit	8bit
Steady	Zero	Tare	OUT1	OUT2	OUT3	OUT4	Hold

6-3-4. Error register

1bit	2bit	3bit	4bit	5bit	6bit	7bit	8bit
Load cell Error	Over Load	Set point Error					

6-3-5. Key register

1bit	2bit	3bit	4bit	5bit	6bit	7bit	8bit
Start	Stop	Zero	Tare	Tare reset	Hold	Hold reset	Print
9bit	10bit	11bit	12bit	13bit	14bit	15bit	16bit
Sub-total print	Sub-total delete	Grand total Print	Grand total delete				

6-3-6. Relay output register

1bit	2bit	3bit	4bit	5bit	6bit	7bit	8bit
OUT1	OUT2	OUT3	OUT4				

6-4. Print format

It can be connected with all kinds of Serial interface printer, but the print format is already programed and fixed with SE7200/7300 model (30column). So, you can get the right print form by connecting and using that printer.

	Korean (111-00)	English (111-01)
Continuous Print 352-00	```============================
날짜 :   2011-05-10
시간 :   18:00:10
장비번호 :   1
품번 :   10
순번   중량
1   1.330kg
2 5.350kg```	```============================
DATE :   2011-05-10
TIME :   18:00:10
SERIAL No :   1
PART No :   20
COUNT   WEIGHT
1   1.330kg
2   5.350kg```
Single Print 352-01	```============================
날짜 :   2011-05-10
시간 :   18:00:10
장비번호 :   1
품번 :   20
순번   중량
1   1.330kg
============================
날짜 :   2011-05-10
시간 :   18:00:10
장비번호 :   1
품번 :   20
순번   중량
2 5.350kg```	```============================
DATE :   2011-05-10
TIME :   18:00:10
SERIAL No :   1
PART No :   20
COUNT   WEIGHT
1   1.330kg
============================
DATE :   2011-05-10
TIME :   18:00:10
SERIAL No :   1
PART No :   20
COUNT   WEIGHT
2   5.350kg```
Grand-total Print	```============================
총   계
날짜 :   2011-05-10
시간 :   18:00:10
장비번호 :   1
계량횟수 :   20
누적중량 : 258.145kg```	```============================
TOTAL
DATE :   2011-05-10
TIME :   18:00:10
SERIAL No :   1
TOTAL COUNT :   20
TOTAL WEIGHT : 258.145kg```

Date and Time data is printed in Continuous Print mode such as Single Print Mode, if it is first print out

7. ERROR & TROUBLESHOOTING

7-1. Error & troubleshooting during Load cell installation

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

7-2. Error code

Display	Cause
Err-001	When Max capacity/digit value is over 20,000
Err-004	Standard balance weight value is over than Max Capacity
Err-005	Standard balance weight value is less than 10% of Max Capacity
Err-006	Amp/Gain is too high, connect opposite polarity load cell SIG+/SIG-, no balance weight in calibration
Err-007	Amp/Gain is too low, connect opposite polarity load cell SIG+/SIG-, no balance weight in calibration
Err-08	When you input wrong value for F-Function
Err-A	The calibration cannot be completed due to waver/wobble environment

※ **Err-06/07 display because the calculated span value after calibration cannot calculate weight exactly. Please carry out calibration in stable environment.**

7-3. Error and troubleshooting

Below error table show causing of error and treatment, when weighing process is not working or it cannot measure weighing due to indicator error.

Display	Cause	Troubleshooting

"Ad-Err
 	
 or
 	
 "0L"
	1. Load cell Error
	 2. Load cell cable Error
	 3. Load cell connection Error
	 4. A/D Board Error
	 5.If Analogue value
	   is over 1,040,000.
	 ※ When weigh "-" value,
	   If it is over set max capa, "OVER" is displayed.
	   Ex) Even though set max capa is
	       "100" and it is over "-100",
	       "OVER" is displayed.
		1. In "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.
		 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.
		 3. Try to connect the indicator's A/D with the other indicator.
		 4. Check the power and connection of terminal.

"UnPAss"	1. Power is ON, when some materials are on weighing part. ※ If you set Function 101-00, if there are more than 10% loading of Max capacity, "**Un-Pass**" display will be appeared and indicator will stay until removing the load. ※ Set Function 101-01, 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. 2. Please try to set F-function 101-01(Back-up) mode so that the indicator can remember first empty value.
"HAlt"	H/W has some problem.	Please contact the distributor or Head Office.

Warranty certification

This product is passed "SEWHACNM Co., Ltd.'s strict quality test.

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

Then, we will repair or replace free of charge.

Warranty clause

1. The Warranty period, we can guaranty, is one(1) year from your purchasing date

2. Warranty Exception Clause

   - Warranty 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 **"Warranty Certification".**

3. Other

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

Main office: **SEWHACNM Co.,Ltd.**		
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