

SI 400R

Digital indicator

User manual

Manual Ver 1.03

Program Ver 1.03



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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 SI400 Industrial Explosion proof indicator.

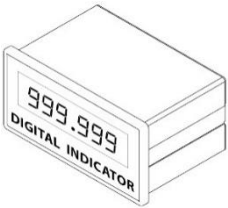


This "SI400R" model has various external interface: serial communication (Modbus available), analog output, BCD in/out to select option for user convince and environment.

Please review and learn this instruction manual and enjoy your process efficiency with "SI400" weighing indicator.

2-2. Feature

- 1) Pressure-resistant, dust, hydrogen gas explosion proof.
- 2) Easy to install and maintenance because of front opening structure.
- 3) RS232C and current loop interface is involved. (Modbus available)
- 4) User can select various interfaces.
 - Serial interface RS232C / RS422 / RS485
 - Ethernet interface (TCP/IP)
 - Analog output 4~20mA, 0~10V
 - Parallel interface BCD out / BCD in
 - Data storage (SD memory card)

2-3. Components

		
Indicator	Manual	Power cable

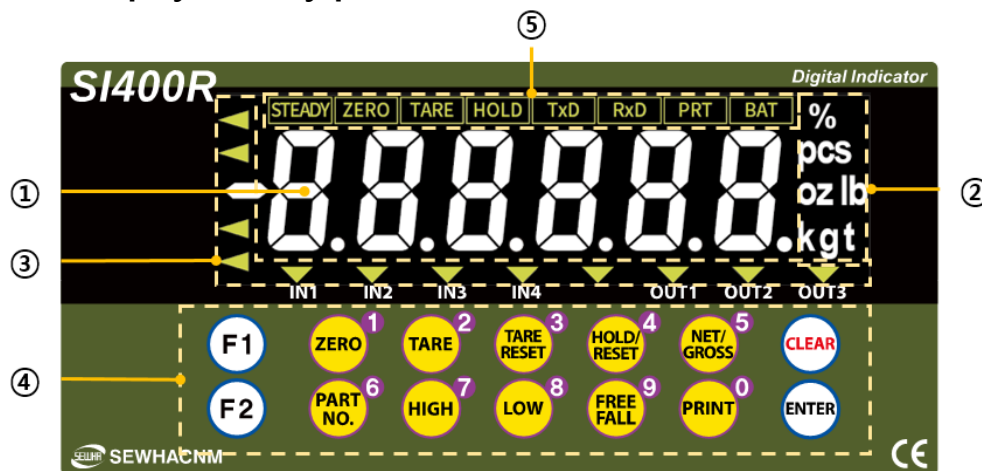
3. Specification

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 3.0mV/V	
	Load cell Excitation	DC +5V	
	A/D Conversion Method	Sigma-Delta	
	Decimal Point	0, 0.0, 0.00, 0.000	
	Drift	Zero	10PPM/°C
		Span	10PPM/°C
	Non Linearity	0.005% Max	
Analogue Sampling(second)	120times/second (Max)		
Operating environment	Operating Temperature Range	-10°C ~ +40°C [14°F ~ 104°F]	
	Operation Humidity Range	40% ~ 85% RH, (No condensation)	
Front	Display	1 inch(25.4mm), Red FND Status(word) 8 digit, Green LED Status(arrow) 12 digit, Green LED	
	Key	14EA	
Interface	Digital input	4EA, Zero voltage contact (Dry contact)	
	Relay Out	3EA Contact rate: 250V 5A AC / 30V 3A DC	
	Serial interface	RS232C	PC, PLC, Printer etc.
		Current loop	External display
Power	AC : 100~240V, 50~60Hz, 0.5A		
Size	Size : 200mm(W) x 100mm(H) x 140mm(D), Weight : 1.2Kg		
Option	OP-01	Serial interface	RS-422
	OP-02		RS-485
	OP-03		RS-232C
	OP-04	Ethernet interface	TCP/IP
	OP-05	Analog output	Iout (4~20mA)
	OP-06		Vout (0~10V)
	OP-07	Parallel interface	BCD OUT
	OP-08		BCD IN(Item number input)
	OP-09	Data storage	SD memory card

3-2. Front

3-2-1. Display and key pad



① Digital 6 digits

② Unit

③ Condition(Arrow)















- IN1 : Turn on when INCOM and IN1 are connected
- IN2 : Turn on when INCOM and IN2 are connected
- IN3 : Turn on when INCOM and IN3 are connected
- IN4 : Turn on when INCOM and IN4 are connected
- OUT1 : Turn on when OUT1(Relay) is connected
- OUT2 : Turn on when OUT1(Relay) is connected
- OUT3 : Turn on when OUT1(Relay) is connected

④ Keypad



















⑤ Status(word)

- 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 data through serial communication.
- RxD : When indicator receives data through serial communication.
- PRT : When the weighing data is being transferred, ON.

3-2-2. Key

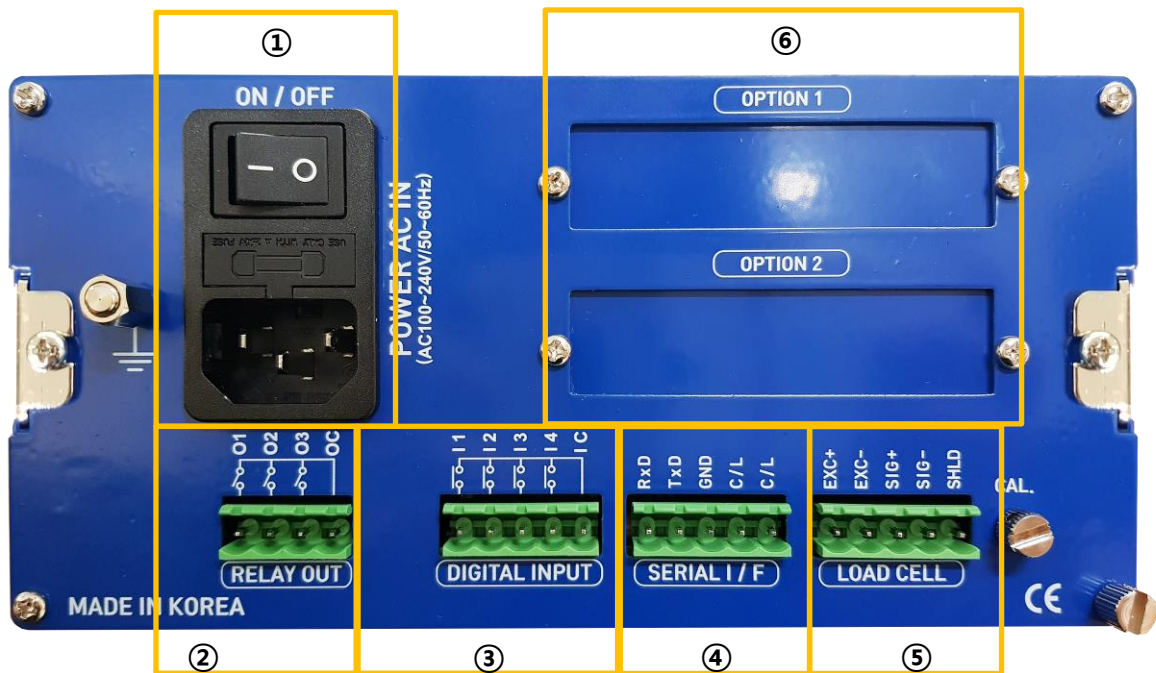
	<ul style="list-style-type: none"> - Set current weight to Zero (It doesn't work when hold state or weight is not within near zero range.) - Number 1
	<ul style="list-style-type: none"> - Set TARE - Number 2
	<ul style="list-style-type: none"> - Reset TARE - Number 3
	<ul style="list-style-type: none"> - Hold current weight / RESET - Number 4
	<ul style="list-style-type: none"> - Toggle weight Net/Gross on display - Number 5
	<ul style="list-style-type: none"> - Set product No. - Number 6
	<ul style="list-style-type: none"> - Set HIGH value - Number 7
	<ul style="list-style-type: none"> - Set LOW value - Number 8
	<ul style="list-style-type: none"> - Set Free-fall value - Number 9
	<ul style="list-style-type: none"> - Print out - Number 0
	<ul style="list-style-type: none"> - Enter "Function mode" (Press 4 times within 3secs)
	<ul style="list-style-type: none"> - Enter "Hidden function mode" (Press 4 times within 3secs)
	<ul style="list-style-type: none"> - Cancel or Move to previous step
	<ul style="list-style-type: none"> - Save and Move to next step

3-2-3. Key combination

 → 	Double tare setting (To set another tare weight when tare weight is already set.)
 → 	Print out sub-total
 → 	Display current weight for 5 seconds
 → 	Display sub-total weight for 5 seconds
 → 	Display grand-total weight for 5 seconds
 → 	Print out the total weight
 → 	Input tare value by number key (Must set function 530-01.)
 → 	Delete the sub-total out
 → 	Delete the grand-total out

- 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. Real Panel



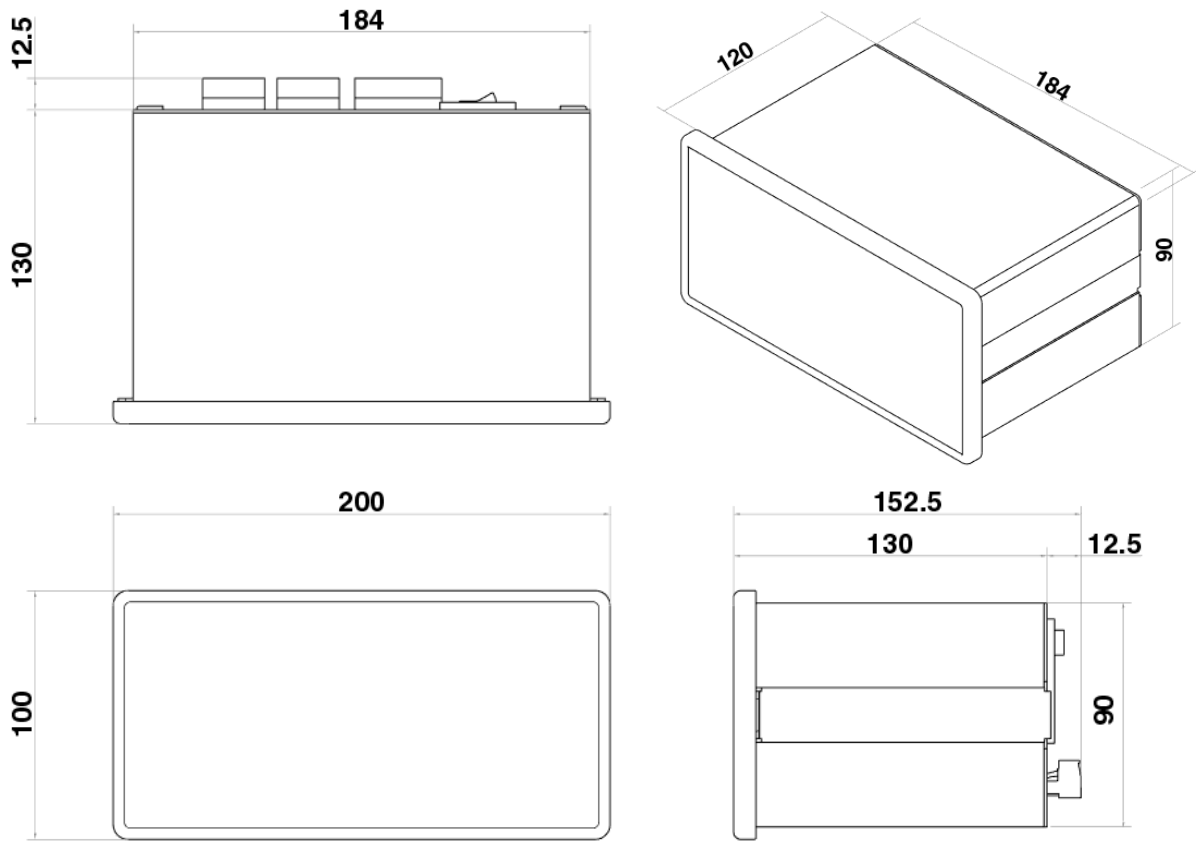
- ① AC Power input terminal
- ② Relay out terminal : You can set relay out mode on Function number 141~147.
Relay Com terminal is common terminal.
- ③ External input terminal : zero voltage point (dry contact)
- ④ Serial interface terminal : RS-232C and Current loop
- ⑤ Load cell terminal
- ⑥ Option port(Selectable)



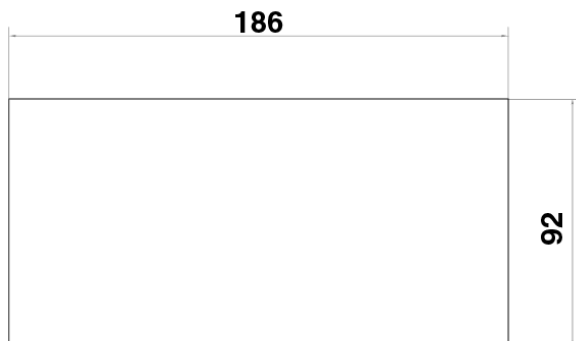
Please check the specification carefully before connect every terminal.

4. Installation

4-1. Size (Unit: mm)



4-2. Panel cutting size (Unit: mm)



4-3. Load cell installation

How to connect Load Cell (In case of SEWHACNM's Load cell)

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



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.

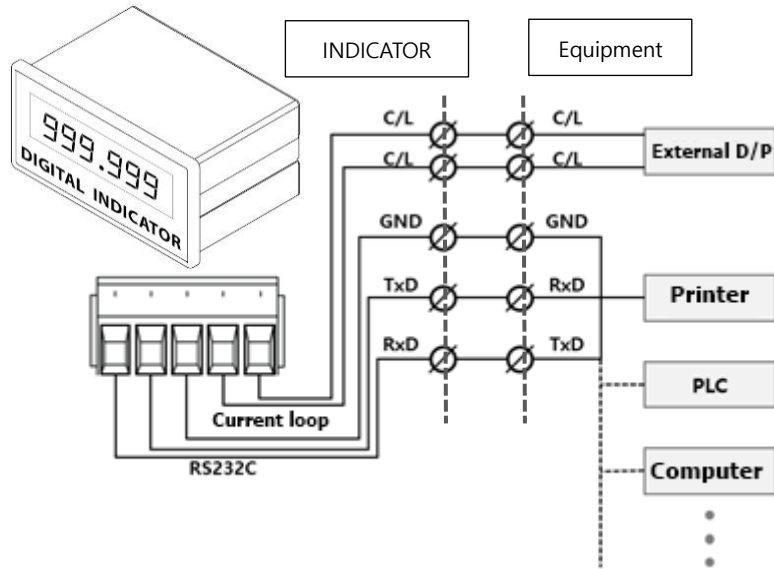


※ Load Cell Installation

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.

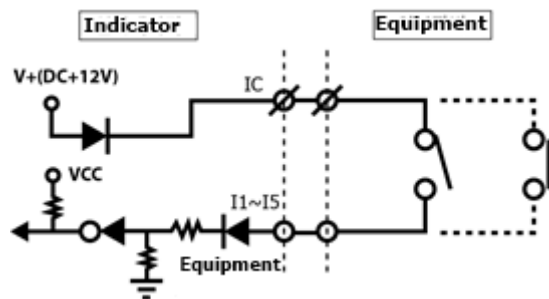
4-4. Peripheral Equipment

4-4-1. Serial Interface (Basic function) – RS232C and Current loop



4-4-2. External input (Basic function) – Input 4EA

- 1) Each output relay function can be changed on Function number 156~159.
- 2) Connect Input signal to Dry connect.



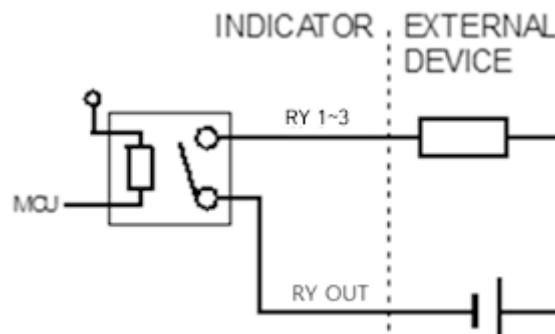
- 3) Terminal component
 - IC : Input common terminal(V+ : 12V DC)
 - I 1~ I 4 : Input signal(Output relay: zero voltage point –relay or switch signal)

4-4-3. External input (Basic function) – Output 3EA

- 1) Each output relay function can be changed on Function number 141~143.
- 2) Normal open (default), but you can change it to Normal close by changing function 148-01, 149, 150 and 151.

3)

Contact Ratings VDC	Contact Ratings VAC
30V 3A	250V 5A



- 1) Terminal component
 - RYCOM : Input common terminal
 - RY1~RY3 : Input signal(Output relay: zero voltage point –relay or switch signal)















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.

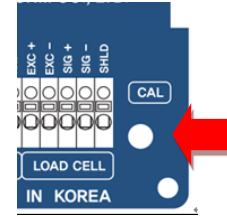


- Before start to the calibration mode,
- Please turn on the indicator and preheat about 15 min.

Calibration key function			
Key	Key	Key	Key
	Adjust decimal point		Adjust division value
	No. 1		No. 6
	No. 2		No. 7
	No. 3		No. 8
	No. 4		No. 9
	No. 5		No. 0
	Move back to previous step		Save data

STEP 1. Enter the calibration

- 1) Remove "CAL BOLT" on the rear panel, and press switch inside.
- 2) When **CAL 1br** is displayed, press **F1** key.
- 3) When **LD_CAL** is displayed, press **ENTER** key.



STEP 2. Unit setting





- 1) After **Unit** is displayed, then unit will be displayed.
- 2) Press **F1** key to select unit kg, g, ton, oz and lb.
- 3) Press **ENTER** key to save and move to next step.

STEP 3. Setting "Capacity of weighing Scale"

- 1) After **CAPA** is displayed,
- 2) Input max capacity with number key .
- 3) Press **ENTER** key to save and move to next step.

Ex) If you want to set Max capacity as 50.00kg (Division: 0.01kg), input 50 for step 5-2-4.

STEP 4. Decimal point and division setting




- 1) When  shows,
 - 2) Press  key to adjust decimal point.
 - 3) Press  key to change the decimal point .
 - 4) Press the  key to save.
-

- Max decimal point will be 0.001, and the you can change the digit to 1, 2, 5, 10, 20 and 50. The digit and decimal point must be fulfilled under the condition of below:

Division value / Max capacity value) shall not exceed 1/20,000.








- If this is not satisfied, " Err-1" will be displayed and move back to STEP 3.

STEP 5. Measuring the "DEAD" Weight of Weighing Scale

- 1) When  displays, there should be nothing on the scale part.
 - 2) Press  key and start the calibration.
 - 3) After display shows , the indicator will calculate dead weight of scale part automatically about 10 seconds.
-

When "Er-009" displays, remove the things on the scale part, external noise or vibration and re-calibration.

STEP 6. Span calibration

- 1) When calibration is done, the display shows .
 - 2) The maximum weight is shown.
 - 3) Use the number key(0~9), enter the balance weight that already prepared.
(※ Balance weight should bigger than 10% of maximum capacity or Er-005 displayed)
 - 4) Press the  key.
 - 5) When display shows , load the balance weight.
(※ Standard load has to be more than 10% weight of max capacity)
 - 6) Press the  key,  shows.
 - 7) Calculate span value during 10~20 seconds.
 - 8) Finish the calculate the  shows, it display the span value.
 - 9) Press the  key and calibration is finished.
-

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.

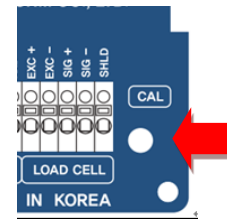
HF13 must be set with "01" to progress simulation calibration mode.

STEP 1. Enter the calibration

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

- 2) When **CAL 1br** is displayed, press **F2** key.

- 3) When **SCAL** is displayed, press **ENTER** key.

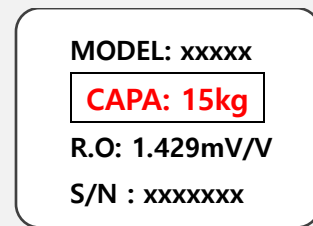


STEP 2. Unit setting

- 1) Display show **Unit**, then unit of weight is displayed
- 2) Select the unit (kg, g, ton) by press **F1** key.
- 3) Save the unit by press **ENTER** key.

STEP 3. Setting "Capacity of weighing Scale"

- 1) After displaying **CAPA**
- 2) Input max capacity as same as written on Loadcell label..
- 3) Save & move to next step by press **ENTER** key.







< Ex) Loadcell label >

The maximum capacity means that added all installed load cells.




(Number of Loadcell * Max capacity weight of each Loadcell)

STEP 4. Decimal point and division setting

- 1) When  shows
 - 2) Make the decimal point use the  key
 - 3) Use  key and move the decimal point .
 - 4) Push the  key and save it .
-



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

- 1) When  displays, there should be nothing on the scale part.
 - 2) Press  key and start the calibration.
 - 3) After display shows , the indicator will calculate dead weight of scale part automatically about 10 seconds.
-


When "Er-009" displays, remove the things on the scale part, external noise or vibration and re-calibration.

Step 6. Enter the Load cell R/O value(Rated Output Voltage/mV)

- 1)  display shows.
- 2) Enter the R/O value in load cell or certification
- 3) Put  key and save the value, the display shows



※ "Er-001" means user enter the wrong R/O value,
please check one more time on the load cell label.

- 4) If display shows numbers, push the  key and finish the span calibration.

MODEL: xxxxxx

CAPA: 15kg

R.O: 1.429mV/V

S/N : xxxxxxxx

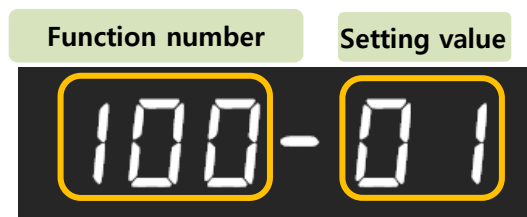
< Ex) Loadcell label >

5-3. Function setting

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

5-3-1. Starting F-FUNCTION Mode

- 1) Press the **F1** key 4times for 3seconds.
 - 2) Display shows **SEt-UP**, press **ZERO**¹ key
-



- ※ **F1** Function number, Setting value, change the position
 - F2** Select the function number
 - 3) Select the function number and enter the function number to use number key and press the **ENTER**.
 - 4) Enter the setting value and press **ENTER** key and save it.
 - 5) **SAVE** display and finish the save, it move to next function number.
-

5-3-2. F-Function List

No.	Subject	Default	Content
Function number 100~119 : Indicator system setting			
100	Equipment No. setting (ID No.)	01	01~99
101	Weight-back up mode	01	00 : Normal mode 01 : Weight back up mode(Zero) 02 : Weight back up mode(Zero & Tare)
102	Weighing data save method	03	00 : Manual: Whenever "Print" key input 01 : Auto: At every steady states 02 : Auto: At the first steady states 03 : Auto: After average hold is finished 04 : Manual&Auto: At every steady states 05 : Manual&Auto: At the first steady states 06 : Manual&Auto: After average hold 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	Main display setting	00	00 : Current Weight 01 : Sub-total weight 02 : Grand-total
106	Under UNPASS/OVERLOAD state, weight display	00	00 : Display 01 : No display
107	Minus (-) mark display	00	00 : Use 01 : No display
108	Buzzer sound (External input detection)	00	00 : Buzzer sound 01 : No Buzzer sound
109	Key input delay time	03	01 ~ 50 (Unit : 10miliseconds)
110	External input delay time	10	01 ~ 50 (Unit : 10miliseconds)
111	Key lock (Except "F" key)	00	00 : Disuse 01 : Use

No.	Subject	Default	Content
Function number 120~129 : Print Function			
120	Print format setting	00	00 : Korean 01 : English
121	Paper withdraw rate setting (After continuous/single print)	00	00 : Continuous print 01 : Continuous print(Print "Tare", "Net weight") 02 : Single print 03 : Single print(Print "Tare", "Net weight")
122	Paper withdraw rate setting (After sub/grand-total print)	00	00 ~ 09 (Unit : 1 line add)
123	Sub-total date delete after sub-total printing	00	00 ~ 09 (Unit : 1 line add)
124	Grand-total date delete after grand-total printing	00	00 : No delete 01 : Delete
125	Print format setting	00	00 : No delete 01 : Delete
Function number 130~139 : Indicator weight system setting			
130	Steady range	08	01 ~ 99 (Unit: 0.25 gradation)
131	Steady condition check time	10	01 ~ 99 (Unit: 0.1 seconds.)
132	Digital filter	25	01: Weak vibration ~ 99: Strong vibration
133	Auto zero range	00	00 ~ 99 (Unit: 0.25 gradation)
134	Zero key operation mode	00	00: Always active 01: Active under steady condition only
135	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

No.	Subject	Default	Content	
Function number 140~199 : Digital Input or Out setting				
140	External output Auto/Manual	00	00 : Auto setting 01 : Manual setting	
141	External output 1	02	00 : Disuse	
142	External output 2	01	01 : HIGH 02 : LOW	
143	External output 3	03	03 : Near zero 04 : Finish	
148	External output standard (A,B dry) Auto/Manual	00	00 : Auto setting 01 : Manual setting	
149	External output standard 1	00	00: A dry	
150	External output standard 2	00	01: B dry	
151	External output standard 3	00		
156	External input 1 setting	01	00 : Disuse	08 : Print
157	External input 2 setting	03	01 : Zero 02 : Tare	09 : Sub-total print 10 : Grand-total print
158	External input 3 setting	05	03 : Tare reset	11 : Run
159	External input 4 setting	06	04 : Tare/tare reset 05 : Hold 06 : Hold reset 07 : Hold/Hold reset	12 : Stop 13 : Run / Stop 14 : Manual Finish
Function number 200~209 : Basic option serial interface(RS232C/Current loop)				
Function number 210~219 : Option serial interface(RS232C, RS485, RS422) setting				
200	Parity / stop bit	00	00: Data bit8, stop bit1, parity bit Non	
210 (Option)			01: Data bit8, stop bit1, parity bit Odd	
			02: Data bit8, stop bit1, parity bit Even	
			03: Data bit7, stop bit1, parity bit Non	
			04: Data bit7, stop bit1, parity bit Even	

No.	Subject	Default	Content	
201	Communication speed	02	00 : 2,400bps	05 : 28,800bps
211 (option)			01 : 4,800bps	06 : 38,400bps
			02 : 9,600bps	07 : 57,600bps
			03 : 14,400bps	08 : 76,800bps
			04 : 19,200bps	09 : 115,200bps
202	Communication mode	00	00: Simplex / Stream mode	
212 (option)			01: Duplex / Command mode	
			02: Duplex / Command mode (Compatible with SI4000)	
			03: Print	
			04: Modbus(RTU)	
203	Format under stream mode (Under F- 202-00 / 212-00)	00	00 : Format 1 (18byte)	
213 (option)			01 : Format 2 (21byte)	
			02 : Format 3 (17byte)	
			03 : Format 4 (22byte)	
204	Transference under stream mode (Under F- 202-00 / 212-00)	00	00 : Continuously	
214 (option)			01 : Single time on every steady state	
			02 : Single time at the first steady point	
			03 : Single time output after HIGH signal	
			04 : When input Print key	
205	"Check-Sum" under command mode	00	00 : Disuse	
215 (option)			01 : Use	
Funtion number 250~259 : Option Ethernet interface setting				
252	Ethernet communication mode	00	00: Simplex / Stream mode	
			01: Duplex / Command mode	
			02: Duplex / Command mode (Compatible with SI4010R)	
			03: Modbus(TCP/IP)	
253	Ethernet format under stream mode (Under F-Number 252-00)	00	00 : Format 1 (18byte)	
			01 : Format 2 (21byte)	
			02 : Format 3 (17byte)	
			03 : Format 4 (22byte)	

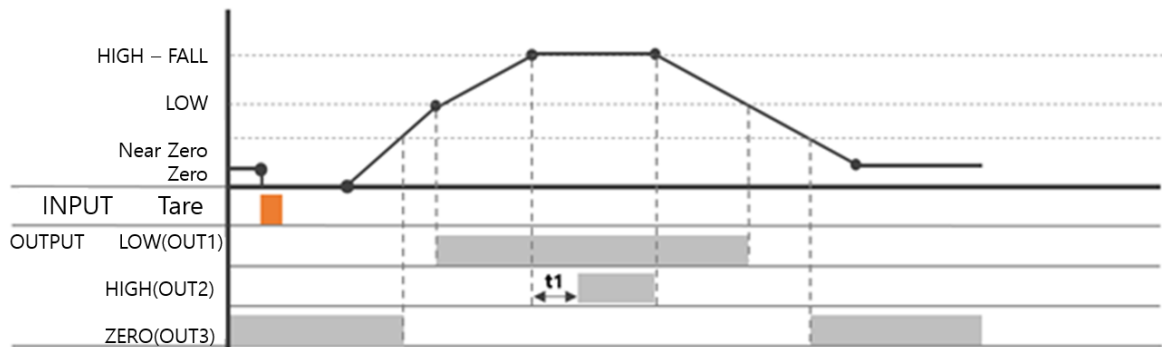
No.	Subject	Default	Content
254	Ethernet transference under stream mode (Under F-number 252-00)	00	00 : Continuously 01 : Single time on every steady state 02 : Single time at the first steady point 03 : Single time output after HIGH signal 04 : When input Print key
255	Ethernet "Check-Sum" under command mode	00	00 : Disuse 01 : Use
256	Ethernet Modbus LCB/MSB setting	00	00 : MSB -> LSB 01 : LSB -> MSB
260	Weight data transmission Data Byte (Under F-Number 252-02)	00	00 : 7 byte (including decimal point) 01 : 8 byte (including decimal point)
<p>※ Remark: If BCD-OUT option is needed, it must be set as F252-00.</p> <p>※ Unable to use Ethernet and BCD OUT simultaneously.</p>			
Function number 300~309 : Analog output interface option			
300	Analog output direction	00	00 : Forward(4~20mA, 0→10V) 01 : Reverse(20~4mA, 10→0V)
301	Analog output applying weight Range	00	00 : Absolute weight (Output analog value according to absolute weight) 01 : Positive weight (Output analog value according to positive weight)
302	Analog output standard	00	00 : Max capacity 01 : LOW 02 : HIGH 03 : Max capacity (Standard gross weight)
Function number 310~319 : BCD IN option(Part number input)			
310	BCD IN enter method (Part number)	00	00: Disuse 01: Input unit digit(4bit) and tenth digit(4bit) separately 02: Input part number value by binary (8bit) 03: Absolue value (IN1=1~IN8=8)
Function number 330~339 : Data storage option (SD memory card)			
330	SD memory card	00	00 : Disuse 01 : Use (Sd err means SD memory card is not inserted)

No.	Subject	Default	Content
331	Automatic save data in SD memory card	01	00 : Disuse 01 : Use

No.	Subject	Default	Content
Function number 501~599 : Indicator weighing process			
500	Weighing mode	01	00: Disuse 01: Limit mode 1 02: Limit mode 2 03: Limit mode 3 04: Supply mode
501	Relay control type	00	00 : Absolute value 01 : Positive value
502	Zero relay output	00	00 : Near Zero (absolute value) 01 : Zero 02 : Nezzr Zero (positive value)
503	LOW value auto calculation	00	00: Manual 01: 1% of HIGH value 02: 2% of HIGH value 03: 5% of HIGH value 04: 10% of HIGH value 05: 20% of HIGH value 06: 50% of HIGH value 07: 100% of HIGH value
510	High Relay output delay time	01	00 : Finish Relay Output under steady state 20 : Finish Relay output after 2.0 seconds 99 : Finish Relay output after 9.9 seconds
520	Finish Output Time	10	01 : Output for 0.1 sec 20 : Output for 2.0 sec
530	Tare operation condition	00	00 : Tare key 01 : When input combination key, input tare value 02 : When input Tare key, input tare value
531	Tare key operation mode	00	00 : Always active 01 : Active under steady condition only
532	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

No.	Subject	Default	Content
533	Tare delay time	00	00 : Disuse (key input or external input) 01~10 : Use (Unit : 1 second) (Activates after set delay time)
534	Auto zero function under tare state	00	00 : Disuse 01 : Use
535	Near zero output setting under tare on state	00	00 : Zero lamp is on when current value is "0" on tare state 01 : Zero lamp is on when current value is "0" excluding tare state
537	Auto tare reset	00	00 : Manual 01 : on Near zero state 02 : on Steady state 03 : HIGH output (supply mode : Finish mode)
538	Auto tare reset time	00	00 : Disuse 00 ~ 09 : use (Unit : 1second)
540	Hold mode	00	00: Sample hold 01: Peak hold 02: Average hold
542	Hold delay time	00	00 : Disuse (key input or external input) 01 ~ 10 : Use (Unit : 1second)
543	Hold reset at the near zero	00	00: Disuse 01: Use
544	Hold reset delay time	00	00 : Disuse 01 ~ 10 : Use (Unit : 1second)
545	Average hold time	10	Hold average weight during set time 01~99 (Unit: 01second)

◆ Weighing mode 1. – Limit mode (Function F500-1)



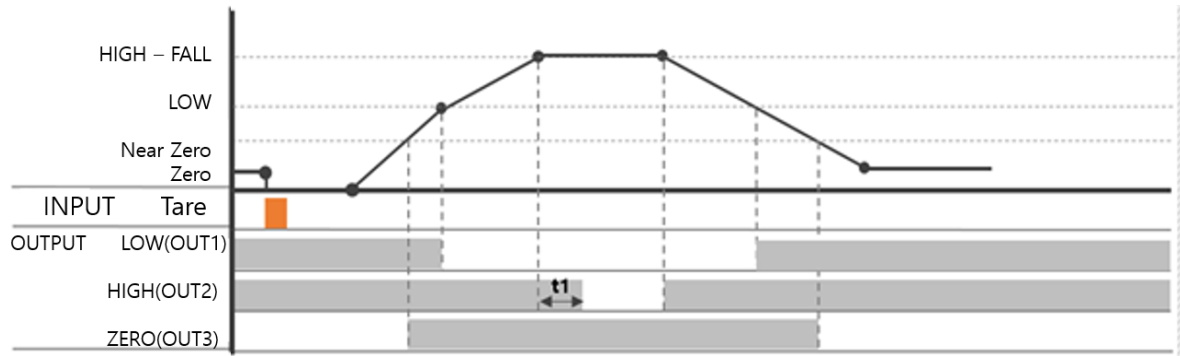
Time

Time	Contents
t1	High Relay out delay time (F510) Function 102-3 or 102-6, after t1, save the weight Set "0", HIGH value will be out without delay time

Relay output

Relay	Condition	Relay	Condition
OUT 1	Current weight \geq LOW (ON) Current weight $<$ LOW (OFF)	OUT 3	Current weight \geq HIGH-FALL (ON) Current weight $<$ HIGH-FALL (OFF)
OUT 2	Current weight $<$ Near zero (ON) Current weight \geq Near zero (OFF)		

◆ Weighing mode 2. – Limit mode (F500-02)



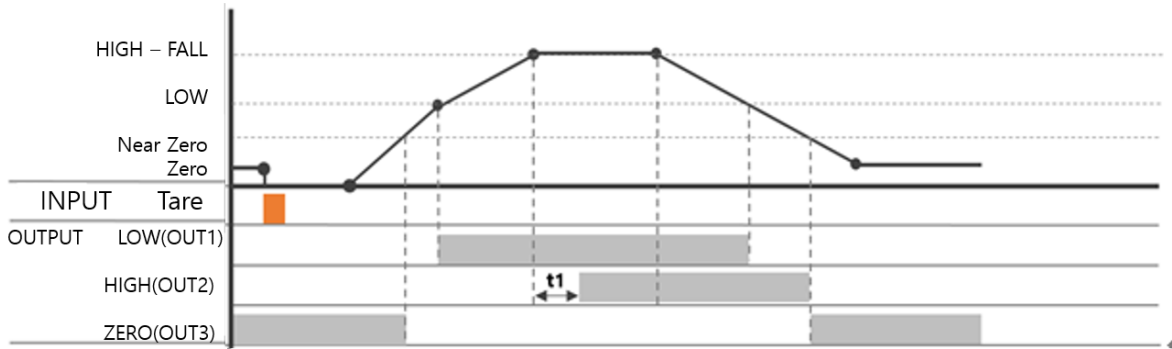
Time

Time	Contents
t1	High Relay output delay time (F510) Function 102-3 or 102-6, after t1, save the weight Set "0", HIGH value will be out without delay time

Relay output

Relay	Condition	Relay	Condition
OUT 1	Current weight < LOW (ON) Current weight ≥ LOW (OFF)	OUT 3	Current weight < HIGH-FALL (ON) Current weight ≥ HIGH-FALL (OFF)
OUT 2	Current weight ≥ Near zero (ON) Current weight < Near zero (OFF)		

◆ Weighing mode 3. – Limit mode (F500-03)



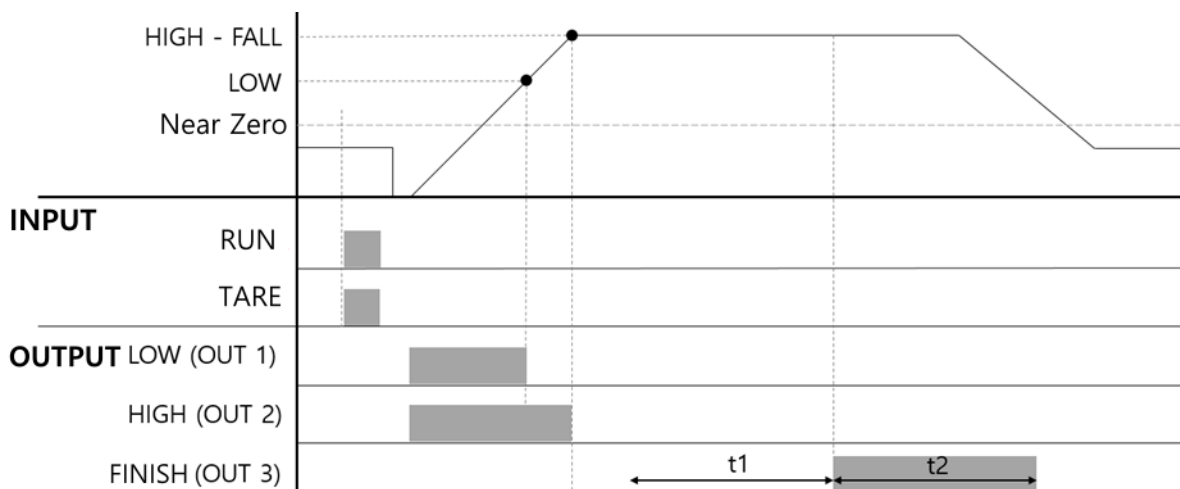
Time

Time	Contents
t1	High Relay output delay time (F 510) Function 102-3 or 102-6, after t1, save the weight Set "0", HIGH value will be out without delay time

Relay output

Relay	Condition	Relay	Condition
OUT 1	Current weight \geq LOW (ON) Current weight $<$ LOW (OFF)	OUT 3	Current weight \geq HIGH-FALL (ON) Current weight $<$ Near zero (OFF)
OUT 2	Current weight $<$ Near zero (ON) Current weight \geq Near zero (OFF)		

◆ Weighing mode 4. – Supply mode (F500-04)



Time




Time	Contents
t1	Finish output delay time (F510) If set "0", Finish signal would be out without delay time.
t2	Finish output time (F520) If set "F102-3" or "F102-6", weight value would be saved after t2





Relay Out


Relay	Condition	Relay	Condition
OUT 1	Current weight \geq LOW (OFF) Current weight $<$ LOW (ON)	OUT 3	ON during t2 after t1
OUT 2	Current weight $<$ HIGH-FALL (ON) Current weight \geq HIGH-FALL (OFF)		


5-3-3. Hidden Function

※ **How to enter hidden function mode**

- 1) Press **F2** key for 4times, display shows  ..
- 2) Enter the password that setting on HF06 (Master password: 0060)
- 3) After  is displayed, press **ENTER** key.
- 4) When  shows, press **ENTER** key and user check the hidden function's contents
- 5) **F1** key is to Increase HF number and **F2** key is to Decrease HF number.
- 6) **CLEAR**: Cancel or previous step

No.	Subject	Default	Remarks
HF01	Serial number check	xxxxx	Factory release number
HF02	S/W version check	Ver 3.00	
HF03	H/W version check	Ver 1.00	
HF04	DATE(Y,M,D) check / modification	YY.MM.DD	Setting it by number key
HF05	TIME(H,M,S) check / modification	HH.MM.SS	Setting it by number key
HF06	Password setting - Password is required when you enter to hidden function. (4words) - Enter the password twice.	----	Setting it by number key
HF07	Function list factory reset	FUNSET	 ¹ key -> "YES"-> Press  , then reset.
HF08	Factory reset	ALLSET	 ² Key -> "NO"-> Press  , then keep the current data
HF10	Maximum capacity weight check	15.000	When calibration, the value is changed

No.	Subject	Default	Remarks
HF11	Span value check	x.xxxxx	cancel key to previous step
HF12	Zero range check and modification	0.000	Use the number key and save it to use enter key
HF13	Simulation calibration Setting	00	00 : Disuse 01 : Use
HF14	Simulated calibration value enter	OrnU	Simulated calibration value enter
HF15	Check the simulated value	x.xxxxx	Back to use cancel key
Option analog output interface setting (HF20-HF22)			
HF20	Analog output check and setting	00	00 : Iout(4-20mA) 01 : Vout(0-10V)
HF21	Analog minimum output value revision	0.00	Input compensation value as much as error value. Enable to set "-" sign with F1 key
HF22	Analog maximum output value revision	0.00	
Option Ethernet interface setting (HF30~HF49)			
HF30 ~ HF33	IP ADDRESS 1 ~ 4 check and modified	192.168.0.101	Change value by number key, and press  key to save it.
HF34 ~ HF37	GateWay 1 ~ 4 check and modified	192.168.0.1	
HF38 ~ HF41	SubNet mask 1 ~ 4 check and modified	255.255.255.0	





No.	Subject	Default	Remarks
HF42	Port Number check and modified	5000	Change value by number key, and press  key to save it.
HF43 ~ HF46	SERVER IP ADDRESS 1 ~ 4 check and modified	192.168.0.100	
HF47	Communication 0 : Server mode - Stream mode (F252-00) - Command mode (F252-01) Sending the date to IP 1 : Client mode Transfer the data to IP that setting on HF43~46 or HF42 Port	0	








5-4. Test mode




Disconnected all indicator and equipment when do the test mode.


How to enter test mode

- 1) Press  key 4times for 3seconds.
- 2) When display shows , press  key..
- 3) Display shows , enter the test mode.
- 4) Enter the various test mode with below key.




Key	Test	Key	Test
	Checking load cell input value		External input check mode
	Checking deviation of load cell input value		Relay output check mode
	Key check mode		Analog Output (4~20mA / 0~10V) check mode
	Display check mode		

- 5)  move to cancel or previous step.

5-4-1. Load cell input value check mode






- 1) Press the  in the test mode, then value is displayed.
 - ※ This is the mode in which analog input values are displayed as the actual converted digital values
(-1,048,575~1,048,575 can be displayed)
 - ※ Despite there is nothing on the scale part, the value is unstable or no respond when push the scale part by hand it will be load cell defect, load cell cable problem or indicator A/D converter defect















5-4-2. Deviation of Load cell input value check mode

- 1) Press the  key in the test mode, then displayed actual converted digital value.
- 2) In this condition, press  key then adjusted the digital value as  If put some load on the loadcell, loaded value is displayed.
This test mode is that check deviation of actual converted digital value.



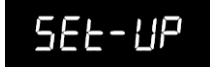
5-4-3. Key pad check mode

ㄷ You can check the key condition when enter the key



- 1) Press  key in the test mode, then  is displayed.
- 2) All key number is shown when press the each keys, except  key.
- 3) When press  key, back to 

KEY	DISPLAY	KEY	DISPLAY	KEY	DISPLAY
	1		6		10
	2		7		11
	3		8		12
	4		9		Back to "Set-up"
	5		0		


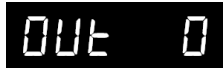
5-4-4. Display check mode

- 1) Press  key in the test mode, then all display switches on and off.
 - 2) User can check by eyes.
 - 3) Press the  key, back to .
-

5-4-5. External input check mode


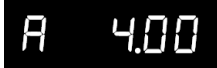
- 1) Press  key in the test mode, then display .
 - 2) If it is shorted between external input terminal I1~I6 and input common terminal IC, it shows which external input is shorted.
-

5-4-6. Relay output check mode

- 1) Press  key in the test mode, then display .
- 2) This test mode is that checks activation of selected relay.
 ※ **Before the test, must disconnect between relay and external equipment.**

						
OUT1 ON/OFF	OUT2 ON/OFF	OUT3 ON/OFF	OUT4 ON/OFF	OUT5 ON/OFF	OUT6 ON/OFF	OUT7 ON/OFF

5-4-7. Analog output (4~20mA / 0~10V) check mode

- 1) Press  key in to the test mode then display .
- 2) It simulates analog output value from 0(4mV, 0V) to 100(20mV, 10V).
- 3) If it is selected analog output as 4 ~ 20mA, "A" is shown on the display. Otherwise, "V" is shown on the display under select analog output 0~10V.

※ It can be checked output value in 0.1 unit by input value by number key.

100% value is output over max input value..

EX) Analog output 4~20mA: Input value **4.0**, then output **4mA**

Analog output 4~20mA: Input value **20.0**, then output **20mA**.

Analog output 0~10V: Input value **4.7**, then output **4.7V**.

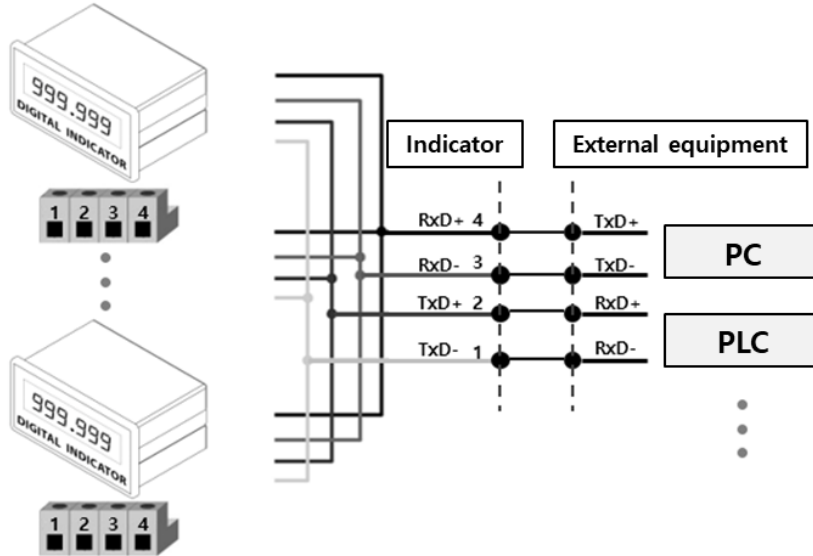
Analog output 0~10V: Input value **10.0**, then output **10V**.

6. Option card

6-1. Serial interface

6-1-1. Serial interface OP-01 : RS422

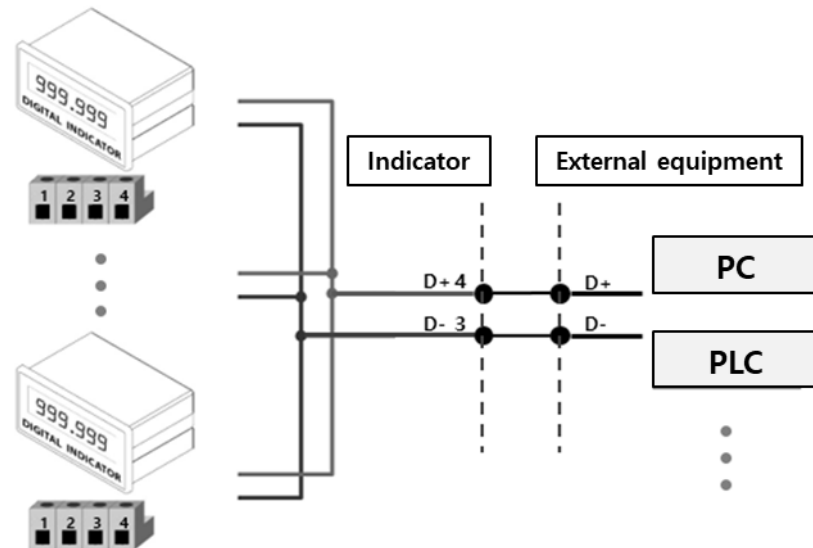
RS422 interface is strong for electrical noise, and it is available for below 1km distance. The RS422 is full-duplex communication, it can connect to external equipment such as PC, PLC, printer or etc with fast speed and multiple use. (Max 32ea indicator)



6-1-2. Serial interface OP-02 : RS485

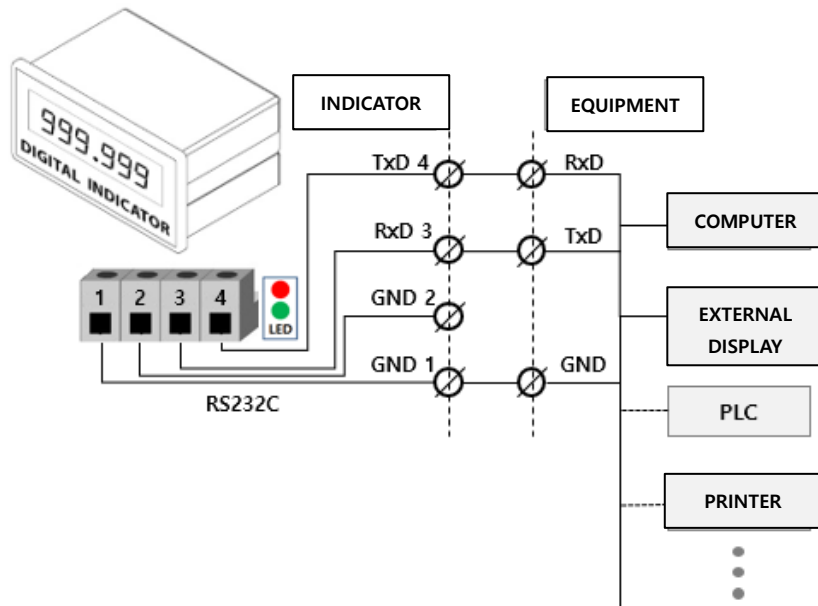
RS485 interface is strong for electrical noise, and it is available for below 1km distance. The RS485 is half-duplex communication, it has slower speed than RS422.

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



6-1-3. Serial interface OP-03 : 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.



Serial interface is sensitive by electrical noise, so recommend to install AC power cable or electrical cabling far from noisy place. And please choosing twisted shield cable to prevent communication error.

6-2. Ethernet interface

6-2-1. Ethernet interface : OP-04

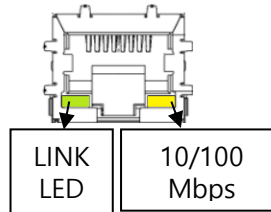
Using Ethernet communication, indicator and other external devices can be communicate.

(Communication speed: 10/100Mbps)

Function 252-00 (Stream mode)

Function 252-01 (Command mode)

Function 252-03 (Modbus TCP/IP)



6-3. Analog output

6-3-1. Analog current output interface (4~20mA) : OP-05

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

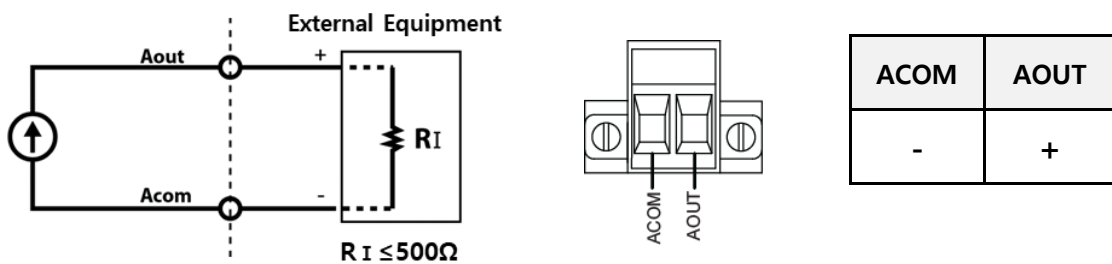
Current output	Resolution	Temperature coefficient	Max load impedance
4mA ~ 20mA	1/1,000	0.01%/°C	500Ω MAX.



- Under 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

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



2) Analog current output adjustment (HF20-00)

- ① When displayed weight is 0 on factory released state, current output is 4mA. If Displayed weight is maximum, current output is 20mA.
- ② If there is an error caused from distance or environment, the solution to adjust the gap is as ③
- ③ Way to adjust
 - If weight is 0, but current output is 0mA, you can correct the difference value in hidden function HF21.
 - If weight is max, but current output is 24mA, you can correct the difference value in hidden function HF22.

6-3-2. Analog voltage output interface (0~10V) : OP-06

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.

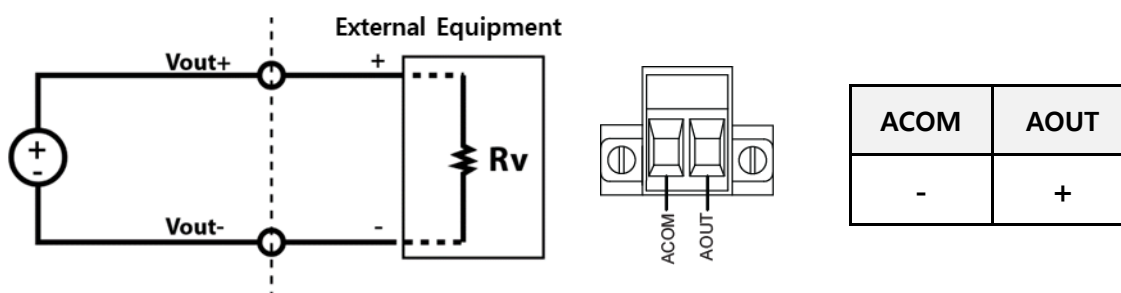
Output voltage	0~10VDC output
Accuracy	1/1,000



- Under 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 adjustment (HF20-01)

- ① When displayed weight is 0 on factory released state, current output is 0V. If Displayed weight is maximum, current output is 10V.
- ② If there is an error caused from distance or environment, the solution to adjust the gap is as ③
- ③ Way to adjust
 - If weight is 0, but current output is 0V, you can correct the difference value in hidden function HF21.
 - If weight is max, but current output is 24mA, you can correct the difference value in hidden function HF22

※ Way to select Analog output (IOUT or VOUT)

- (1) You can choose to use IOUT or VOUT through the deep switch inside of indicator.
- (2) Set HF20 as your choice and save the setting. .

6-4. Parallel interface

6-4-1. BCD IN interface (Part number external input card) : OP-07

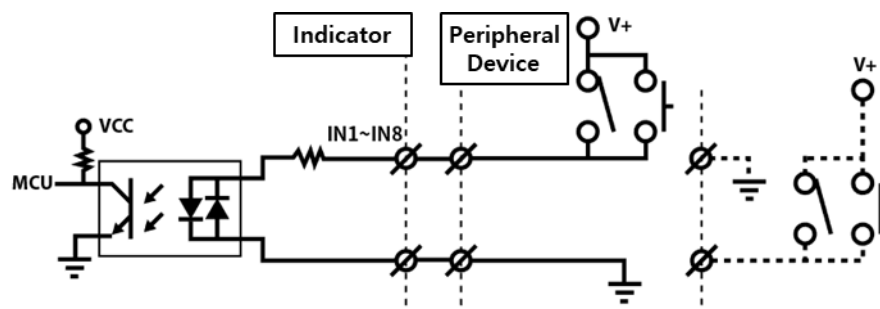
BCD IN interface is to enter part number of indicator from external equipment such as PC, PLC or ETC.

1) Connector Pin

Pin No.	Contents	Pin No	Contents
1	IN 1	14	IN 2
2	IN 3	15	IN 4
3	IN 5	16	IN 6
4	IN 7	17	IN 8
5	IN COM	18	
6		19	GND
7	DC12V 50mA	20	
8		21	
9		22	
10		23	
11		24	
12		25	
13			

2) Connector specification : D-type 25p(Female)

3) Input signal has to be contacted as dry contact.



- PCL Connection : Power No.7 (DC12V) and No.19(GND)
- Switch Connection : Short-circuit No.5 and No.19 , Use No.7 for INCOM.

6-4-2. BCD OUT interface : OP-08

BCD OUT parallel interface is output current weight in BCD code. This interface can be connected with PC, PL, external display or ETC.

1) Connector pin

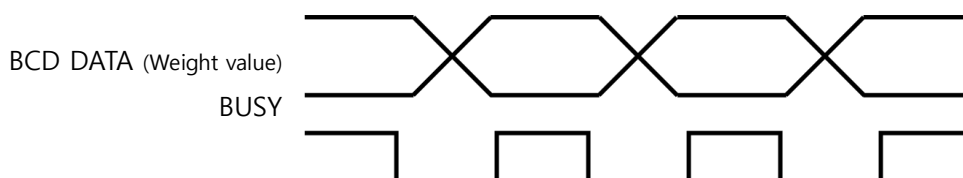
Pin No.	Contents	Pin No	Contents
1	GND	19	1×10^0
2	2×10^0	20	4×10^0
3	8×10^0	21	1×10^0
4	2×10^1	22	4×10^0
5	8×10^1	23	1×10^0
6	2×10^2	24	4×10^0
7	8×10^2	25	1×10^0
8	2×10^3	26	4×10^0
9	8×10^3	27	1×10^0
10	2×10^4	28	4×10^0
11	8×10^4	29	1×10^0
12	2×10^5	30	4×10^0
13	8×10^5	31	Net/gross
14	GND	32	GND
15	Hold	33	Decimal 0.000
16	Decimal 0.00	34	Decimal 0.0
17	Polarity	35	BUSY
18	-	36	O.L

2) Connector specification : Champ 36(FEMALE)

3) BCD OUT output specification : Open-collector output

4) Hold input has to be connected as open collector and dry contact output. When Hold is input, BCD-OUT value will be hold.

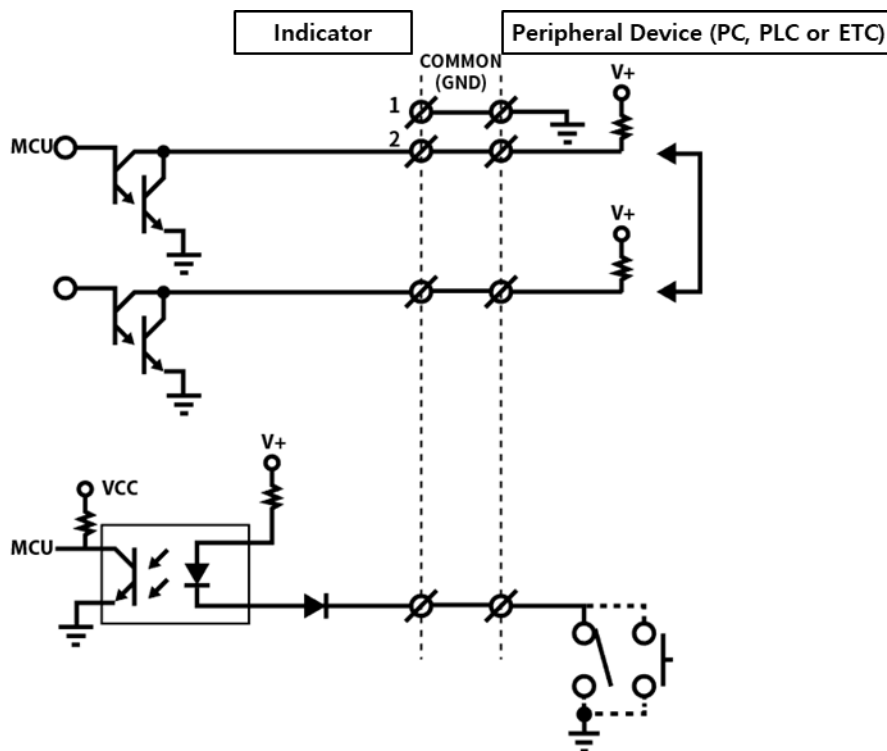
5) BCD out time chart



6) Signal logic

	Factory default	Contents	Remark
BDC data	Positive	Positive Negative	Select it by switch which is located on BCD OUT PCB.
Polarity	When it is "-", "H" is output	When "-" is output, open "H" will be output.	
O.L output	When it is "OL", "H" is output.	When it is Over-load, open "H" will be output.	
Busy	When it is "Busy", "H" is output.	If converting of BCD OUT value is completed, "busy" signal is keeping as H. Then it is changed to "L" before starting BCD converting.	
Hold	When it is BCD data "hold", "L" is output.	If you want BCD data to be "hold", input signal will be input. (Contact close)	

7) If you want TTL LEVEL output or voltage source type of output, please contact the headquarter of SEWHA CNM Co., Ltd for Customized product.



6-5. Data storing device (SD memory card)

6-5-1. Data storing device (SD memory card) : OP-09

SD memory card is a device that saves required weight data according to function 102 setting.



SD memory card has to be installed in OP 2 location.

1) Weighing data format (File name: N + Creation date)(ex : N160114)

Save weighing data into SD memory card according to function 102 setting.

DATE	TIME	ID	PART	SERIAL	HIGH	LOW	GROSS WEIGHT	TARE WEIGHT	NET WEIGHT	UNIT
2016-01-01	12:18:04	1	1	1	100	200	200	20	180	kg
2016-01-01	12:18:10	1	1	2	100	200	100	10	90	kg
2016-01-01	12:18:10	1	1	3	100	200	300	5	295	kg

2) Sub-total weighing data format (File name: S + Creation date)(ex : S160114)

Save sub-total weighing data into SD memory card when press sub-total print

DATE	TIME	ID	PART	SUB TOTAL COUNT	SUB TOTAL WEIGHT	UNIT
2016-01-01	12:00:30	1	1	10	6000	kg
2016-01-01	12:00:30	1	2	10	5000	kg

3) Grand-total weighing data format (File name: T + Creation date)(ex : T160114)

It is saving grand-total weighing data into SD memory card when press grand-total print

DATE	TIME	TOTAL COUNT	TOTAL WEIGHT	UNIT
2016-01-01	12:27:30	17	4620	kg

ID	PART No.	SERIAL	WEIGHT	UNIT
1	1	5	1207	kg
1	2	8	2383	kg
1	3	2	506	kg
1	4	2	524	kg

4) SD memory specification

Memory	Model	Form factor	Class
8G	SanDisk SDHC memory card 8G	SDHC	4



- Recommend to use specified SD memory card.
- SD memory card has limited memory. Please back up SD card data periodically.

When SD memory card is inserted to PC, removable disc drive would be created. Run the format on the removable disk and select FAT32 from file system, click the start button.

6-6. Option card combination

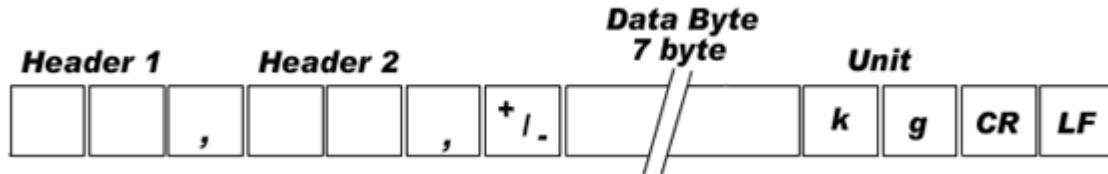
Maximum 2EA of option card can be installed. Below combination is available.

Classification	OP-01	OP-02 OP-03	OP-04	OP-05 OP-06	OP-07	OP-08	OP-09
	Serial (RS232)	Serial (RS422, RS485)	Ether- net	Analog out	BCD IN	BCD OUT	SD memory card
Serial RS232	X	X	○	○	○	○	○
Serial RS422, RS485	X	X	○	○	○	○	○
Ethernet	○	○	X	○	○	X	○
Analog out	○	○	○	X	○	○	○
BCD IN	○	○	○	○	X	○	○
BCD OUT	○	○	X	○	○	X	○
SD memory card	○	○	○	○	○	○	X

7. Communication data format

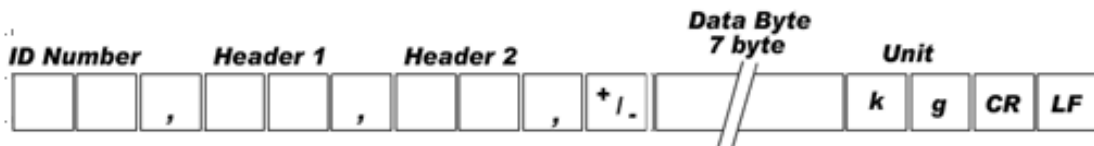
7-1. Simplex (Stream mode)

7-1-1. Format 1 (Excluding ID number) – 18 byte



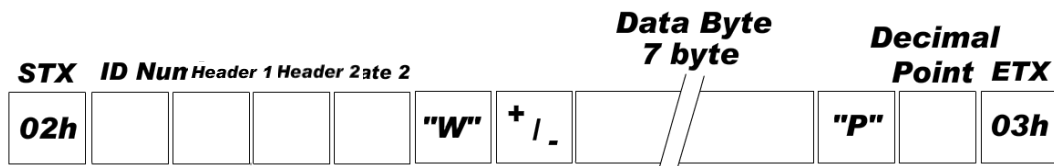
Classification	Contents						
Header1 (2Byte)	OL : Current weight is over than max capacity weight. ST : Stable weight US : Unstable weight						
Header2 (2Byte)	NT : NET-WEIGHT(Real weight which is excluded tare weight) GS : GROSS-WEIGHT (Under tare set, it is included real weight and tare weight.)						
Sign (1Byte)	Sign						
Weight Data (7Byte)	Current weight						
UNIT (2Byte)	kg - <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td>k</td><td>g</td></tr></table> g - <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td></td><td>g</td></tr></table> ton- <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td></td><td>t</td></tr></table>	k	g		g		t
k	g						
	g						
	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						

7-1-2. Format 2 (Including ID number) – 21 byte



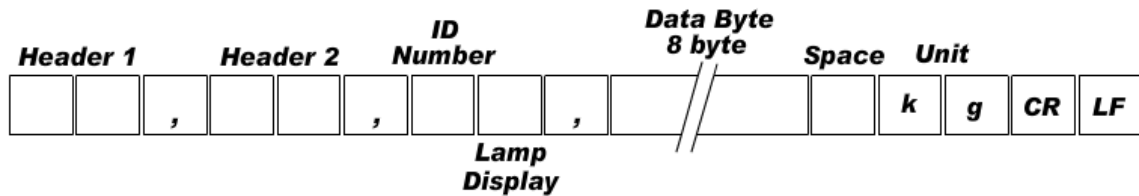
Classification	Contents						
ID Number (2Byte)	ID Number						
Header1 (2Byte)	OL : Current weight is over than max capacity weight. ST : Stable weight US : Unstable weight						
Header2 (2Byte)	NT : NET-WEIGHT(Real weight which is excluded tare weight) GS : GROSS-WEIGHT (Under tare set, it is included real weight and tare weight.)						
Sign (1Byte)	Sign						
Weight Data (7Byte)	Current weight						
UNIT (2Byte)	kg - <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td>k</td><td>g</td></tr></table> g - <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td></td><td>g</td></tr></table> ton- <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td></td><td>t</td></tr></table>	k	g		g		t
k	g						
	g						
	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						

7-1-3. Format 3 (Including ID number) – 17 byte



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 (Under tare set, it is included real weight and tare weight.)
"W" (1Byte)	Weight display separator
Sign (1Byte)	Sign
Weight Data (7Byte)	Current weight
"P" (1Byte)	Decimal point display separator
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

7-1-4. 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 (Under tare 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

7-2. 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).

7-2-1. Read mode

Current weight(Displayed weight)		
Transfer	Format : STX(1) ID(2) RCWT(4) ETX(1) ASCII : STX 01RCWT ETX HEX : 02h 30h 31h 52h 43h 57h 54h 03h	8 Byte
Respond	Format : STX(1) ID(2) RCWT(4) State1(1) State 2(1) P(1) Decimal point(1) Sign(1) Current weight(6) Unit(2) ETX(1) ASCII : STX 01RCWTSNP2+001234kg ETX HEX : 02h 30h 31h 52h 43h 57h 54h 53h 4Eh 50h 32h 2Bh 30h 30h 31h 32h 33h 34h 6Bh 67h 03h	21 Byte
	State 1: O(Current weight is over than max capacity weight), S(Stable weight), U(Unstable weight) State 2: N(Net weight), G(Gross weight)	

Current weight(Memorized weight)		
Transfer	Format : STX(1) ID(2) RCWD(4) ETX(1) ASCII : STX 01RCWD ETX HEX : 02h 30h 31h 52h 43h 57h 44h 03h	8 Byte
Respond	Format : STX(1) ID(2) RCWD(4) P(1) Decimal point(1) date(6) Time(6) Part number(2) Weighing count(6) Sign(1) Tare weight(6) Sign(1) Current weight(6) Unit(2) ETX(1) ASCII : STX 01RCWDP217110112303501012345+012345+012345kg ETX HEX : 02h 30h 31h 52h 43h 57h 44h 50h 32h 31h 37h 31h 31h 30h 31h 31h 32h 33h 30h 33h 35h 30h 31h 30h 31h 32h 33h 34h 35h 2Bh 30h 31h 32h 33h 34h 35h 2Bh 30h 31h 32h 33h 34h 35h 6Bh 67h 03h	46 Byte

Sub-total		
Transfer	Format : STX(1) ID(2) RSUB(4) ETX(1) ASCII : STX 01RSUB ETX HEX : 02h 30h 31h 52h 53h 55h 42h 03h	8 Byte
Respond	Format : STX(1) ID(2) RSUB(4) P(1) Decimal point(1) Part number(2) Sub-total weighing count(6) Sub-total weight(10) Unit(2) ETX(1) ASCII : STX 01RSUBP2010123450123456789kg ETX HEX : 02h 30h 31h 52h 53h 55h 42h 50h 32h 30h 31h 30h 31h 32h 33h 34h 35h 30h 31h 32h 33h 34h 35h 36h 37h 38h 39h 6Bh 67h 03h	30 Byte

Grand-total		
Transfer	Format : STX(1) ID(2) RGRD(4) ETX(1) ASCII : STX 01RGRD ETX HEX : 02h 30h 31h 52h 47h 52h 44h 03h	8 byte
Respond	Format : STX(1) ID(2) RGRD(4) P(1) Decimal point(1) Grand-total weighing count(6) Grand-total accumulated weight (10) Unit(2) ETX(1) ASCII : STX 01RGRDP20123450123456789kg ETX HEX : 02h 30h 31h 52h 47h 52h 44h 50h 32h 30h 31h 32h 33h 34h 35h 30h 31h 32h 33h 34h 35h 36h 37h 38h 39h 6Bh 67h 03h	28 byte

Sub-total weighing count		
Transfer	Format : STX(1) ID(2) RSNO(4) ETX(1) ASCII : STX 01RSNO ETX HEX : 02h 30h 31h 52h 53h 4Eh 4Fh 03h	8 Byte
Respond	Format : STX(1) ID(2) RSNO(4) Sub-total weighing count(6) ETX(1) ASCII : STX 01RSNO012345 ETX HEX : 02h 30h 31h 52h 53h 4Eh 4Fh 30h 31h 32h 33h 34h 35h 03h	14 Byte

Current time		
Transfer	Format : STX(1) ID(2) RTIM(4) ETX(1) ASCII : STX 01RTIM ETX HEX : 02h 30h 31h 52h 54h 49h 4Dh 03h	8 Byte
Respond	Format : STX(1) ID(2) RTIM(4) Current time(6) ETX(1) ASCII : STX 01RTIM123035 ETX HEX : 02h 30h 31h 52h 54h 49h 4Dh 31h 32h 33h 30h 33h 35h 03h	14 Byte

Current date		
Transfer	Format : STX(1) ID(2) RDAT(4) ETX(1) ASCII : STX 01RDAT ETX HEX : 02h 30h 31h 52h 44h 41h 54h 03h	8 Byte
Respond	Format : STX(1) ID(2) RDAT(4) Current date(6) ETX(1) ASCII : STX 01RDAT171101 ETX HEX : 02h 30h 31h 52h 44h 41h 54h 31h 37h 31h 31h 30h 31h 03h	14 Byte

Tare weight		
Transfer	Format : STX(1) ID(2) RTAR(4) ETX(1) ASCII : STX 01RTAR ETX HEX : 02h 30h 31h 52h 54h 41h 52h 03h	8 Byte
Respond	Format : STX(1) ID(2) RTAR(4) P(1) Decimal point(1) Sign(1) Tare weight(6) ETX(1) ASCII : STX 01RTARP2+012345 ETX HEX : 02h 30h 31h 52h 54h 41h 52h 50h 32h 2Bh 30h 31h 32h 33h 34h 35h 03h	17 Byte

Current part number		
Transfer	Format : STX(1) ID(2) RPNO(4) ETX(1) ASCII : STX 01RPNO ETX HEX : 02h 30h 31h 52h 50h 4Eh 4Fh 03h	8 Byte
Respond	Format : STX(1) ID(2) RPNO(4) Part number(2) ETX(1) ASCII : STX 01RPNO01 ETX HEX : 02h 30h 31h 52h 50h 4Eh 4Fh 30h 31h 03h	10 Byte

Finish weight		
Transfer	Format : STX(1) ID(2) RFIN(4) ETX(1) ASCII : STX 01RFIN ETX HEX : 02h 30h 31h 52h 46h 49h 4Eh 03h	8 Byte
Respond	Format : STX(1) ID(2) RFIN(4) P(1) Decimal point(1) Sign(1) finish weight(6) ETX(1) ASCII : STX 01RFINP2+012345 ETX HEX : 02h 30h 31h 52h 46h 49h 4Eh 50h 32h 2Bh 30h 31h 32h 33h 34h 35h 03h	17 Byte

SP1 (LOW)		
Transfer	Format : STX(1) ID(2) RSP1(4) ETX(1) ASCII : STX 01RSP1 ETX HEX : 02h 30h 31h 52h 53h 50h 31h 03h	8 Byte
Respond	Format : STX(1) ID(2) RSP1(4) P(1) Decimal point(1) SP1(6) ETX(1) ASCII : STX 01RSP1P2012345 ETX HEX : 02h 30h 31h 52h 53h 50h 31h 50h 32h 30h 31h 32h 33h 34h 35h 03h	16 Byte

SP2 (HIGH)		
Transfer	Format : STX(1) ID(2) RSP2(4) ETX(1) ASCII : STX 01RSP2 ETX HEX : 02h 30h 31h 52h 53h 50h 32h 03h	8 Byte
Respond	Format : STX(1) ID(2) RSP2(4) P(1) Decimal point(1) SP2(6) ETX(1) ASCII : STX 01RSP2P2012345 ETX HEX : 02h 30h 31h 52h 53h 50h 32h 50h 32h 30h 31h 32h 33h 34h 35h 03h	16 Byte

Current weight, INPUT, OUTPUT		
Transfer	Format : STX(1) ID(2) RWRS(4) ETX(1) ASCII : STX 01RWRS ETX HEX : 02h 30h 31h 52h 57h 52h 53h 03h	8 Byte
Respond	Format : STX(1) ID(2) RWRS(4) P(1) Decimal point(1) Sign(1) Current weight(6) External input(6) Relay output(7) ETX(1) ASCII : STX 01RWRS P2+012345000001111010 ETX HEX : 02h 30h 31h 52h 57h 52h 53h 50h 32h 2Bh 30h 31h 32h 33h 34h 35h 30h 30h 30h 30h 30h 30h 31h 31h 31h 31h 30h 31h 30h 03h	30 Byte

SP1, SP2 (LOW, HIGH)		
Transfer	Format : STX(1) ID(2) RSPA(4) ETX(1) ASCII : STX 01RSPA ETX HEX : 02h 30h 31h 52h 53h 50h 41h 03h	8 Byte
Respond	Format : STX(1) ID(2) RSPA(4) P(1) Decimal point(1) SP1(6) SP2(6) SP3 value(6) SP4 value(6) ETX(1) ASCII : STX 01RSPAP2012345012345012345012345 ETX HEX : 02h 30h 31h 52h 53h 50h 41h 50h 32h 30h 31h 32h 33h 34h 35h 30h 31h 32h 33h 34h 35h 30h 31h 32h 33h 34h 35h 30h 31h 32h 33h 34h 35h 03h	34 Byte

7-2-2. Write mode

Error code	
0 : Normality	1 : Check-Sum Error
2 : Received Data length Error	3 : Received Data range Error
4 : Write prohibit error (It is not allowed during run process)	

Zero set			
Transfer	Format : STX(1) ID(2) WZER(4) ETX(1) ASCII : STX 01WZER ETX HEX : 02h 30h 31h 57h 5Ah 45h 52h 03h		8 Byte
Respond	Normal	Format : STX(1) ID(2) ACK(1) ERROR(1) ETX(1) ASCII : STX 01 ACK 0 ETX HEX : 02h 30h 31h 06h 30h 03h	6 Byte
	Error	Format : STX(1) ID(2) NAK(1) ERROR(1) ETX(1) ASCII : STX 01 NAK 2 ETX HEX : 02h 30h 31h 15h 32h 03h	

Tare set			
Transfer	Format : STX(1) ID(2) WTAR(4) ETX(1) ASCII : STX 01WTAR ETX HEX : 02h 30h 31h 57h 54h 41h 52h 03h		8 Byte
Respond	Normal	Format : STX(1) ID(2) ACK(1) ERROR(1) ETX(1) ASCII : STX 01 ACK 0 ETX HEX : 02h 30h 31h 06h 30h 03h	6 Byte
	Error	Format : STX(1) ID(2) NAK(1) ERROR(1) ETX(1) ASCII : STX 01 NAK 2 ETX HEX : 02h 30h 31h 15h 32h 03h	

Tare reset			
Transfer	Format : STX(1) ID(2) WTRS(4) ETX(1) ASCII : STX 01WTRS ETX HEX : 02h 30h 31h 57h 54h 52h 53h 03h		8 Byte
Respond	Normal	Format : STX(1) ID(2) ACK(1) ERROR(1) ETX(1) ASCII : STX 01 ACK 0 ETX HEX : 02h 30h 31h 06h 30h 03h	6 Byte
	Error	Format : STX(1) ID(2) NAK(1) ERROR(1) ETX(1) ASCII : STX 01 NAK 2 ETX HEX : 02h 30h 31h 15h 32h 03h	

Hold set			
Transfer	Format : STX(1) ID(2) WHOL(4) ETX(1) ASCII : STX 01WHOL ETX HEX : 02h 30h 31h 57h 48h 4Fh 4Ch 03h		8 Byte
Respond	Normal	Format : STX(1) ID(2) ACK(1) ERROR(1) ETX(1) ASCII : STX 01 ACK 0 ETX HEX : 02h 30h 31h 06h 30h 03h	6 Byte
	Error	Format : STX(1) ID(2) NAK(1) ERROR(1) ETX(1) ASCII : STX 01 NAK 2 ETX HEX : 02h 30h 31h 15h 32h 03h	

Hold reset			
Transfer	Format : STX(1) ID(2) WHRS(4) Part number(2) ETX(1) ASCII : STX 01WHRS ETX HEX : 02h 30h 31h 57h 48h 52h 53h 03h		8 Byte
Respond	Normal	Format : STX(1) ID(2) ACK(1) ERROR(1) ETX(1) ASCII : STX 01 ACK 0 ETX HEX : 02h 30h 31h 06h 30h 03h	6 Byte
	Error	Format : STX(1) ID(2) NAK(1) ERROR(1) ETX(1) ASCII : STX 01 NAK 2 ETX HEX : 02h 30h 31h 15h 32h 03h	

Print			
Transfer	Format : STX(1) ID(2) WPRT(4) ETX(1) ASCII : STX 01WPRT ETX HEX : 02h 30h 31h 57h 50h 52h 54h 03h		8 Byte
Respond	Normal	Format : STX(1) ID(2) ACK(1) ERROR(1) ETX(1) ASCII : STX 01 ACK 0 ETX HEX : 02h 30h 31h 06h 30h 03h	6 Byte
	Error	Format : STX(1) ID(2) NAK(1) ERROR(1) ETX(1) ASCII : STX 01 NAK 2 ETX HEX : 02h 30h 31h 15h 32h 03h	

Sub-total print			
Transfer	Format : STX(1) ID(2) WSPR(4) ETX(1) ASCII : STX 01WSPR ETX HEX : 02h 30h 31h 57h 53h 50h 52h 03h		8 Byte
Respond	Normal	Format : STX(1) ID(2) ACK(1) ERROR(1) ETX(1) ASCII : STX 01 ACK 0 ETX HEX : 02h 30h 31h 06h 30h 03h	6 Byte
	Error	Format : STX(1) ID(2) NAK(1) ERROR(1) ETX(1) ASCII : STX 01 NAK 2 ETX HEX : 02h 30h 31h 15h 32h 03h	

Sub-total delete			
Transfer	Format : STX(1) ID(2) WSTC(4) ETX(1) ASCII : STX 01WSTC ETX HEX : 02h 30h 31h 57h 53h 54h 43h 03h		8 Byte
Respond	Normal	Format : STX(1) ID(2) ACK(1) ERROR(1) ETX(1) ASCII : STX 01 ACK 0 ETX HEX : 02h 30h 31h 06h 30h 03h	6 Byte
	Error	Format : STX(1) ID(2) NAK(1) ERROR(1) ETX(1) ASCII : STX 01 NAK 2 ETX HEX : 02h 30h 31h 15h 32h 03h	

Grand-total print			
Transfer	Format : STX(1) ID(2) WGPR(4) ETX(1) ASCII : STX 01WGPR ETX HEX : 02h 30h 31h 57h 47h 50h 52h 03h		8 Byte
Respond	Normal	Format : STX(1) ID(2) ACK(1) ERROR(1) ETX(1) ASCII : STX 01 ACK 0 ETX HEX : 02h 30h 31h 06h 30h 03h	6 Byte
	Error	Format : STX(1) ID(2) NAK(1) ERROR(1) ETX(1) ASCII : STX 01 NAK 2 ETX HEX : 02h 30h 31h 15h 32h 03h	

Grand-total delete			
Transfer	Format : STX(1) ID(2) WGTC(4) ETX(1) ASCII : STX 01WGTC ETX HEX : 02h 30h 31h 57h 47h 54h 43h 03h		8 Byte
Respond	Normal	Format : STX(1) ID(2) ACK(1) ERROR(1) ETX(1) ASCII : STX 01 ACK 0 ETX HEX : 02h 30h 31h 06h 30h 03h	6 Byte
	Error	Format : STX(1) ID(2) NAK(1) ERROR(1) ETX(1) ASCII : STX 01 NAK 2 ETX HEX : 02h 30h 31h 15h 32h 03h	

Time set			
Transfer	Format : STX(1) ID(2) WTIM(4) TIME(6) ETX(1) ASCII : STX 01WTIM123035 ETX HEX : 02h 30h 31h 57h 54h 49h 4Dh 31h 32h 33h 30h 33h 35h 03h		14 Byte
Respond	Normal	Format : STX(1) ID(2) ACK(1) ERROR(1) ETX(1) ASCII : STX 01 ACK 0 ETX HEX : 02h 30h 31h 06h 30h 03h	6 Byte
	Error	Format : STX(1) ID(2) NAK(1) ERROR(1) ETX(1) ASCII : STX 01 NAK 2 ETX HEX : 02h 30h 31h 15h 32h 03h	

Date set			
Transfer	Format : STX(1) ID(2) WDAT(4) DATE(6) ETX(1) ASCII : STX 01WDAT171101 ETX HEX : 02h 30h 31h 57h 44h 41h 54h 31h 37h 31h 31h 30h 31h 03h		14 Byte
Respond	Normal	Format : STX(1) ID(2) ACK(1) ERROR(1) ETX(1) ASCII : STX 01 ACK 0 ETX HEX : 02h 30h 31h 06h 30h 03h	6 Byte
	Error	Format : STX(1) ID(2) NAK(1) ERROR(1) ETX(1) ASCII : STX 01 NAK 2 ETX HEX : 02h 30h 31h 15h 32h 03h	

Part number set			
Transfer	Format : STX(1) ID(2) WPNO(4) Part number(2) ETX(1) ASCII : STX 01WPNO10 ETX HEX : 02h 30h 31h 57h 50h 4Eh 4Fh 31h 30h 03h		10 Byte
Respond	Normal	Format : STX(1) ID(2) ACK(1) ERROR(1) ETX(1) ASCII : STX 01 ACK 0 ETX HEX : 02h 30h 31h 06h 30h 03h	6 Byte
	Error	Format : STX(1) ID(2) NAK(1) ERROR(1) ETX(1) ASCII : STX 01 NAK 2 ETX HEX : 02h 30h 31h 15h 32h 03h	

SP1 (LOW)			
Transfer	Format : STX(1) ID(2) WSP1(4) SP1(6) ETX(1) ASCII : STX 01WSP1012345 ETX HEX : 02h 30h 31h 57h 53h 50h 31h 30h 31h 32h 33h 34h 35h 03h		14 Byte
Respond	Normal	Format : STX(1) ID(2) ACK(1) ERROR(1) ETX(1) ASCII : STX 01 ACK 0 ETX HEX : 02h 30h 31h 06h 30h 03h	6 Byte
	Error	Format : STX(1) ID(2) NAK(1) ERROR(1) ETX(1) ASCII : STX 01 NAK 2 ETX HEX : 02h 30h 31h 15h 32h 03h	

SP2 (HIGH)			
Transfer	Format : STX(1) ID(2) WSP2(4) SP2 (6) ETX(1) ASCII : STX 01WSP2012345 ETX HEX : 02h 30h 31h 57h 53h 50h 32h 30h 31h 32h 33h 34h 35h 03h		14 Byte
Respond	Normal	Format : STX(1) ID(2) ACK(1) ERROR(1) ETX(1) ASCII : STX 01 ACK 0 ETX HEX : 02h 30h 31h 06h 30h 03h	6 Byte
	Error	Format : STX(1) ID(2) NAK(1) ERROR(1) ETX(1) ASCII : STX 01 NAK 2 ETX HEX : 02h 30h 31h 15h 32h 03h	

SP1, SP2 (LOW, HIGH)			
Transfer	Format : STX(1) ID(2) WSPA(4) SP1(6) SP2(6) ETX(1) ASCII : STX 01WSPA012345012345 ETX HEX : 02h 30h 31h 57h 53h 50h 41h 30h 31h 32h 33h 34h 35h 30h 31h 32h 33h 34h 35h 03h		20 Byte
Respond	Normal	Format : STX(1) ID(2) ACK(1) ERROR(1) ETX(1) ASCII : STX 01 ACK 0 ETX HEX : 02h 30h 31h 06h 30h 03h	6 Byte
	Error	Format : STX(1) ID(2) NAK(1) ERROR(1) ETX(1) ASCII : STX 01 NAK 2 ETX HEX : 02h 30h 31h 15h 32h 03h	

Total part number set value			
Transfer	Format : STX(1) ID(2) WFTD(4) part number(2) SP1(6) SP2(6) ETX(1) ASCII : STX 01WFTD01012345012345 ETX HEX : 02h 30h 31h 57h 46h 54h 44h 30h 31h 30h 31h 32h 33h 34h 35h 30h 31h 32h 33h 34h 35h 30h 31h 32h 33h 34h 35h 30h 31h 32h 33h 34h 35h 03h		22 Byte
Respond	Normal	Format : STX(1) ID(2) ACK(1) ERROR(1) ETX(1) ASCII : STX 01 ACK 0 ETX HEX : 02h 30h 31h 06h 30h 03h	6 Byte
	Error	Format : STX(1) ID(2) NAK(1) ERROR(1) ETX(1) ASCII : STX 01 NAK 2 ETX HEX : 02h 30h 31h 15h 32h 03h	

Free fall set			
Transfer	Format : STX(1) ID(2) WS1F(4) free fall(6) ETX(1) ASCII : STX 01WS1F012345 ETX HEX : 02h 30h 31h 57h 53h 31h 46h 30h 31h 32h 33h 34h 35h 03h		14 Byte
Respond	Normal	Format : STX(1) ID(2) ACK(1) ERROR(1) ETX(1) ASCII : STX 01 ACK 0 ETX HEX : 02h 30h 31h 06h 30h 03h	6 Byte
	Error	Format : STX(1) ID(2) NAK(1) ERROR(1) ETX(1) ASCII : STX 01 NAK 2 ETX HEX : 02h 30h 31h 15h 32h 03h	

7-3. Command mode (SI4010R compatibility mode)

7-3-1. Read Command

Current weight(Displayed weight)		
Transfer	Format : STX(1) ID(2) RCWT(4) ETX(1) ASCII : STX 01RCWT ETX HEX : 02h 30h 31h 52h 43h 57h 54h 03h	8 Byte
Respond	Format : STX(1) ID(2) RCWT(4) State1(2) State2(2) Sign(1) Current weight(7) Unit(2) ETX(1) ASCII : STX 01RCWTST,NT,+0123.45kg ETX HEX : 02h 30h 31h 52h 43h 57h 54h 53h 54h 2Ch 4Eh 54h 2Ch 2Bh 30h 31h 32h 33h 2Eh 34h 35h 6Bh 67h 03h	24 Byte
	State 1: OL(Current weight is over than max capacity weight), ST(Stable weight), US(Unstable weight) State 2: NT(Net weight), GS(Gross weight)	

Current weight(Memorized weight)		
Transfer	Format : STX(1) ID(2) RCWD(4) ETX(1) ASCII : STX 01RCWD ETX HEX : 02h 30h 31h 52h 43h 57h 44h 03h	8 Byte
Respond	Format : STX(1) ID(2) RCWD(4)) Date(6) Time(6) Part number(2) Weighing count(6) Tare weight(7/8) Unit(2) ETX(1) ASCII : STX 01RCWD19043009043101000021000.000000.000kg ETX HEX : 02h 30h 31h 52h 43h 57h 44h 31h 39h 30h 34h 33h 30h 30h 39h 30h 34h 33h 31h 30h 31h 30h 30h 30h 32h 31h 30h 30h 30h 2eh 30h 30h 30h 30h 30h 30h 2eh 30h 30h 30h 6bh 67h 03h	44 Byte 46 Byte

Sub-total		
Transfer	Format : STX(1) ID(2) RSUB(4) ETX(1) ASCII : STX 01RSUB ETX HEX : 02h 30h 31h 52h 53h 55h 42h 03h	8 Byte
Respond	Format : STX(1) ID(2) RSUB(4) Part number(2) Sub-total weighing count(6) Sub-total weight(11) Unit(2) ETX(1) ASCII : STX 01RSUB0101234501234567.89kg ETX HEX : 02h 30h 31h 52h 53h 55h 42h 30h 31h 30h 31h 32h 33h 34h 35h 30h 31h 32h 33h 34h 35h 36h 37h 2Eh 38h 39h 6Bh 67h 03h	29 Byte

Sub-total weighing count		
Transfer	Format : STX(1) ID(2) RSNO(4) ETX(1) ASCII : STX 01RSNO ETX HEX : 02h 30h 31h 52h 53h 4Eh 4Fh 03h	8 Byte
Respond	Format : STX(1) ID(2) RSNO(4) Sub-total weighing count(6) ETX(1) ASCII : STX 01RSNO012345 ETX HEX : 02h 30h 31h 52h 53h 4Eh 4Fh 30h 31h 32h 33h 34h 35h 03h	14 Byte

Grand-total		
Transfer	Format : STX(1) ID(2) RGRD(4) ETX(1) ASCII : STX 01RGRD ETX HEX : 02h 30h 31h 52h 47h 52h 44h 03h	8 byte
Respond	Format : STX(1) ID(2) RGRD(4) Part number(2) Grand-total weighing count(6) Grand-total accumulated weight (11) Unit(2) ETX(1) ASCII : STX 01RGRD0101234501234567.89kg ETX HEX : 02h 30h 31h 52h 47h 52h 44h 30h 31h 30h 31h 32h 33h 34h 35h 30h 31h 32h 33h 34h 35h 36h 37h 2Eh 38h 39h 6Bh 67h 03h	29 byte

Current time		
Transfer	Format : STX(1) ID(2) RTIM(4) ETX(1) ASCII : STX 01RTIM ETX HEX : 02h 30h 31h 52h 54h 49h 4Dh 03h	8 Byte
Respond	Format : STX(1) ID(2) RTIM(4) Current time(6) ETX(1) ASCII : STX 01RTIM123035 ETX HEX : 02h 30h 31h 52h 54h 49h 4Dh 31h 32h 33h 30h 33h 35h 03h	14 Byte

Current date		
Transfer	Format : STX(1) ID(2) RDAT(4) ETX(1) ASCII : STX 01RDAT ETX HEX : 02h 30h 31h 52h 44h 41h 54h 03h	8 Byte
Respond	Format : STX(1) ID(2) RDAT(4) Current date(6) ETX(1) ASCII : STX 01RDAT171101 ETX HEX : 02h 30h 31h 52h 44h 41h 54h 31h 37h 31h 31h 30h 31h 03h	14 Byte

Tare value		
Transfer	Format : STX(1) ID(2) RTAR(4) ETX(1) ASCII : STX 01RTAR ETX HEX : 02h 30h 31h 52h 54h 41h 52h 03h	8 Byte
Respond	Format : STX(1) ID(2) RTAR(4) Tare weight(7) ETX(1) ASCII : STX 01RTAR0123.45 ETX HEX : 02h 30h 31h 52h 54h 41h 52h 30h 31h 32h 33h 2Eh 34h 35h 03h	15 Byte

Current part number		
Transfer	Format : STX(1) ID(2) RPNO(4) ETX(1) ASCII : STX 01RPNO ETX HEX : 02h 30h 31h 52h 50h 4Eh 4Fh 03h	8 Byte
Respond	Format : STX(1) ID(2) RPNO(4) Part number(2) ETX(1) ASCII : STX 01RPNO01 ETX HEX : 02h 30h 31h 52h 50h 4Eh 4Fh 30h 31h 03h	10 Byte

LOW value		
Transfer	Format : STX(1) ID(2) RLRV(4) ETX(1) ASCII : STX 01RLRV ETX HEX : 02h 30h 31h 52h 4Ch 52h 59h 03h	8 Byte
Respond	Format : STX(1) ID(2) RLRV(4) LOW value(6) ETX(1) ASCII : STX 01RLRV012345 ETX HEX : 02h 30h 31h 52h 4Ch 52h 59h 30h 31h 32h 33h 34h 35h 03h	14 Byte

HIGH value		
Transfer	Format : STX(1) ID(2) RHRY(4) ETX(1) ASCII : STX 01RHRY ETX HEX : 02h 30h 31h 52h 48h 52h 59h 03h	8 Byte
Respond	Format : STX(1) ID(2) RHRY (4) HIGH value(6) ETX(1) ASCII : STX 01RSP2012345 ETX HEX : 02h 30h 31h 52h 53h 50h 32h 30h 31h 32h 33h 34h 35h 03h	14 Byte

Free fall value		
Transfer	Format : STX(1) ID(2) RFAL(4) ETX(1) ASCII : STX 01RFAL ETX HEX : 02h 30h 31h 52h 46h 41h 4Ch 03h	8 Byte
Respond	Format : STX(1) ID(2) RFAL (4) FALL value(6) ETX(1) ASCII : STX 01RFAL012345 ETX HEX : 02h 30h 31h 52h 46h 41h 4Ch 30h 31h 32h 33h 34h 35h 03h	14 Byte

Current weight, INPUT, OUTPUT		
Transfer	Format : STX(1) ID(2) RWRS(4) ETX(1) ASCII : STX 01RWRS ETX HEX : 02h 30h 31h 52h 57h 52h 53h 03h	8 Byte
Respond	Format : STX(1) ID(2) RWRS(4) Current weight(7/8) External input1~4(4) Relay output1~3(3) ETX(1) ASCII : STX 01RWRS0123450000111 ETX HEX : 02h 30h 31h 52h 57h 52h 53h 30h 31h 32h 33h 34h 35h 30h 30h 30h 30h 31h 31h 31h 03h	22 Byte 23 Bytes

7-3-2. Write command

Zero set					
Transfer	Format : STX(1) ID(2) WZER(4) ETX(1) ASCII : STX 01WZER ETX HEX : 02h 30h 31h 57h 5Ah 45h 52h 03h				8 Byte
Respond	Normal	Format : STX(1) ID(2) ACK(1) ETX(1) ASCII : STX 01 ACK ETX HEX : 02h 30h 31h 06h 03h	Error	Format : STX(1) ID(2) NAK(1) ETX(1) ASCII : STX 01 NAK ETX HEX : 02h 30h 31h 15h 03h	5 Byte

Tare set					
Transfer	Format : STX(1) ID(2) WTAR(4) ETX(1) ASCII : STX 01WTAR ETX HEX : 02h 30h 31h 57h 54h 41h 52h 03h				8 Byte
Respond	Normal	Format : STX(1) ID(2) ACK(1) ETX(1) ASCII : STX 01 ACK ETX HEX : 02h 30h 31h 06h 03h	Error	Format : STX(1) ID(2) NAK(1) ETX(1) ASCII : STX 01 NAK ETX HEX : 02h 30h 31h 15h 03h	5 Byte

Tare reset					
Transfer	Format : STX(1) ID(2) WTRS(4) ETX(1) ASCII : STX 01WTRS ETX HEX : 02h 30h 31h 57h 54h 52h 53h 03h				8 Byte
Respond	Normal	Format : STX(1) ID(2) ACK(1) ETX(1) ASCII : STX 01 ACK ETX HEX : 02h 30h 31h 06h 03h	Error	Format : STX(1) ID(2) NAK(1) ETX(1) ASCII : STX 01 NAK ETX HEX : 02h 30h 31h 15h 03h	5 Byte

Print					
Transfer	Format : STX(1) ID(2) WPRT(4) ETX(1) ASCII : STX 01WPRT ETX HEX : 02h 30h 31h 57h 50h 52h 54h 03h				8 Byte
Respond	Normal	Format : STX(1) ID(2) ACK(1) ETX(1) ASCII : STX 01 ACK ETX HEX : 02h 30h 31h 06h 03h	Error	Format : STX(1) ID(2) NAK(1) ETX(1) ASCII : STX 01 NAK ETX HEX : 02h 30h 31h 15h 03h	5 Byte

Hold					
Transfer	Format : STX(1) ID(2) WHOL(4) ETX(1) ASCII : STX 01WHOL ETX HEX : 02h 30h 31h 57h 48h 4Fh 4Ch 03h			8 Byte	
Respond	Normal	Format : STX(1) ID(2) ACK(1) ETX(1) ASCII : STX 01 ACK ETX HEX : 02h 30h 31h 06h 03h	Error	Format : STX(1) ID(2) NAK(1) ETX(1) ASCII : STX 01 NAK ETX HEX : 02h 30h 31h 15h 03h	5 Byte

Hold Reset					
Transfer	Format : STX(1) ID(2) WHRS(4) ETX(1) ASCII : STX 01WHRS ETX HEX : 02h 30h 31h 57h 48h 52h 53h 03h			8 Byte	
Respond	Normal	Format : STX(1) ID(2) ACK(1) ETX(1) ASCII : STX 01 ACK ETX HEX : 02h 30h 31h 06h 03h	Error	Format : STX(1) ID(2) NAK(1) ETX(1) ASCII : STX 01 NAK ETX HEX : 02h 30h 31h 15h 03h	5 Byte

Check GROSS / NET (Only tare states)					
Transfer	Format : STX(1) ID(2) WPRT(4) ETX(1) ASCII : STX 01WGRO ETX HEX : 02h 30h 31h 57h 47h 52h 4Fh 03h			8 Byte	
Respond	Normal	Format : STX(1) ID(2) ACK(1) ETX(1) ASCII : STX 01 ACK ETX HEX : 02h 30h 31h 06h 03h	Error	Format : STX(1) ID(2) NAK(1) ETX(1) ASCII : STX 01 NAK ETX HEX : 02h 30h 31h 15h 03h	5 Byte

Sub-total print					
Transfer	Format : STX(1) ID(2) WSPR(4) ETX(1) ASCII : STX 01WSPR ETX HEX : 02h 30h 31h 57h 53h 50h 52h 03h			8 Byte	
Respond	Normal	Format : STX(1) ID(2) ACK(1) ETX(1) ASCII : STX 01 ACK ETX HEX : 02h 30h 31h 06h 03h	Error	Format : STX(1) ID(2) NAK(1) ETX(1) ASCII : STX 01 NAK ETX HEX : 02h 30h 31h 15h 03h	5 Byte

Sub-total delete					
Transfer	Format : STX(1) ID(2) WSTC(4) ETX(1) ASCII : STX 01WSTC ETX HEX : 02h 30h 31h 57h 53h 54h 43h 03h				8 Byte
Respond	Normal	Format : STX(1) ID(2) ACK(1) ETX(1) ASCII : STX 01 ACK ETX HEX : 02h 30h 31h 06h 03h	Error	Format : STX(1) ID(2) NAK(1) ETX(1) ASCII : STX 01 NAK ETX HEX : 02h 30h 31h 15h 03h	5 Byte

Grand-total print					
Transfer	Format : STX(1) ID(2) WGPR(4) ETX(1) ASCII : STX 01WGPR ETX HEX : 02h 30h 31h 57h 47h 50h 52h 03h				8 Byte
Respond	Normal	Format : STX(1) ID(2) ACK(1) ETX(1) ASCII : STX 01 ACK ETX HEX : 02h 30h 31h 06h 03h	Error	Format : STX(1) ID(2) NAK(1) ETX(1) ASCII : STX 01 NAK ETX HEX : 02h 30h 31h 15h 03h	5 Byte

Grand-total delete					
Transfer	Format : STX(1) ID(2) WGTC(4) ETX(1) ASCII : STX 01WGTC ETX HEX : 02h 30h 31h 57h 47h 54h 43h 03h				8 Byte
Respond	Normal	Format : STX(1) ID(2) ACK(1) ETX(1) ASCII : STX 01 ACK ETX HEX : 02h 30h 31h 06h 03h	Error	Format : STX(1) ID(2) NAK(1) ETX(1) ASCII : STX 01 NAK ETX HEX : 02h 30h 31h 15h 03h	5 Byte

Time set					
Transfer	Format : STX(1) ID(2) WTIM(4) TIME(6) ETX(1) ASCII : STX 01WTIM123035 ETX HEX : 02h 30h 31h 57h 54h 49h 4Dh 31h 32h 33h 30h 33h 35h 03h				14 Byte
Respond	Normal	Format : STX(1) ID(2) ACK(1) ETX(1) ASCII : STX 01 ACK ETX HEX : 02h 30h 31h 06h 03h	Error	Format : STX(1) ID(2) NAK(1) ETX(1) ASCII : STX 01 NAK ETX HEX : 02h 30h 31h 15h 03h	5 Byte

Date set					
Transfer	Format : STX(1) ID(2) WDAT(4) DATE(6) ETX(1) ASCII : STX 01WDAT171101 ETX HEX : 02h 30h 31h 57h 44h 41h 54h 31h 37h 31h 31h 30h 31h 03h			14 Byte	
Respond	Normal	Format : STX(1) ID(2) ACK(1) ETX(1) ASCII : STX 01 ACK ETX HEX : 02h 30h 31h 06h 03h	Error	Format : STX(1) ID(2) NAK(1) ETX(1) ASCII : STX 01 NAK ETX HEX : 02h 30h 31h 15h 03h	5 Byte

LOW set					
Transfer	Format : STX(1) ID(2) WLRY(4) LOW value(6) ETX(1) ASCII : STX 01WLRY1012345 ETX HEX : 02h 30h 31h 57h 4ch 52h 59h 31h 30h 31h 32h 33h 34h 35h 03h			14 Byte	
Respond	Normal	Format : STX(1) ID(2) ACK(1) ETX(1) ASCII : STX 01 ACK ETX HEX : 02h 30h 31h 06h 03h	Error	Format : STX(1) ID(2) NAK(1) ETX(1) ASCII : STX 01 NAK ETX HEX : 02h 30h 31h 15h 03h	5 Byte

HIGH set					
Transfer	Format : STX(1) ID(2) WHRY(4) HIGH value(6) ETX(1) ASCII : STX 01WHRY012345 ETX HEX : 02h 30h 31h 57h 48h 52h 59h 30h 31h 32h 33h 34h 35h 03h			14 Byte	
Respond	Normal	Format : STX(1) ID(2) ACK(1) ETX(1) ASCII : STX 01 ACK ETX HEX : 02h 30h 31h 06h 03h	Error	Format : STX(1) ID(2) NAK(1) ETX(1) ASCII : STX 01 NAK ETX HEX : 02h 30h 31h 15h 03h	5 Byte

FALL set					
Transfer	Format : STX(1) ID(2) WFAL(4) FALL value(6) ETX(1) ASCII : STX 01WFAL012345 ETX HEX : 02h 30h 31h 57h 46h 41h 4ch 30h 31h 32h 33h 34h 35h 03h			14 Byte	
Respond	Normal	Format : STX(1) ID(2) ACK(1) ETX(1) ASCII : STX 01 ACK ETX HEX : 02h 30h 31h 06h 03h	Error	Format : STX(1) ID(2) NAK(1) ETX(1) ASCII : STX 01 NAK ETX HEX : 02h 30h 31h 15h 03h	5 Byte

<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**

7-4. Modbus

- 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.

7-4-1. Major Address Map list

Contents	Address		Length	Feature
Decimal point	159	0x9F	2	R
Current Weight	160	0xA0	2	R
Tare weight	162	0xA2	2	R
Key input tare weight	164	0xA4	2	R
Hold weight	168	0xA8	2	R
Digital input	170	0xAA	2	R
Lamp	172	0xAC	2	R
Current Part Number Count	180	0xB4	2	R
Current Part Number Accumulated Weight	182	0xB6	2	R
Grand total count	184	0xB8	2	R
Grand total weight	186	0xBA	2	R
Part Number 1 Count	188	0xBC	2	R
Part Number 1 Accumulated Weight	190	0xBE	2	R
Part Number 2 Count	192	0xC0	2	R

Contents	Address		Length	Feature
Part Number 2 Accumulated Weight	194	0xC2	2	R
~	~		~	~
Part Number 50 Count	384	0x180	2	R
Part Number 50 Accumulated Weight	386	0x182	2	R
Date	388	0x184	2	R/W
Time	390	0x186	2	R/W
Key	392	0x188	1	R/W
Part Number	395	0x18B	1	R/W
Current part number LOW	396	0x18C	2	R
Current part number HIGH	398	0x18E	2	R
Current part number HIGH free fall	404	0x194	2	R/W
Part number 1 LOW	412	0x19C	2	R/W
Part number 1 HIGH	414	0x19E	2	R/W
Part number 2 LOW	420	0x1A4	2	R/W
Part number 2 HIGH	422	0x1A6	2	R/W
~	~	~	~	
Part number 50 LOW	1204	0x4B4	2	R/W
Part number 50 HIGH	1206	0x4B6	2	R/W

7-4-2. External input data map

1bit	2bit	3bit	4bit	5bit	6bit	7bit	8bit
		IN 1	IN 2	IN 3	IN 4		
9bit	10bit	11bit	12bit	13bit	14bit	15bit	16bit

7-4-3. Lamp data map

1bit	2bit	3bit	4bit	5bit	6bit	7bit	8bit
Stable	Zero	Tare	Hold	TXD	RXD	PRT	BAT
9bit	10bit	11bit	12bit	13bit	14bit	15bit	16bit
SD_CAD	RUN	(-) Sign	HI	LO	OUT1	OUT2	OUT3
17bit	18bit	19bit	20bit	21bit	22bit	23bit	24bit
OUT4	OUT5	OUT6	OUT7	FIN			
25bit	26bit	27bit	28bit	29bit	30bit	31bit	32bit
	Unit 'k'	Unit 'g'	Unit 't'				

7-4-4. Key data map

0x01	0x02	0x03	0x04	0x05	0x06	0x07	0x08
Zero	Tare	Tare reset	Hold/ Hold reset	Tare weight / Total weight			
0x09	0x10	0x11	0x12	0x13	0x14	0x15	0x16
	Print	Tare/ Tare reset		Hold	Hold reset		

7-5. Print format

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

	Korean(120-00)	English (120-01)
Continuous Print 121-00	<pre> ===== 날짜 : 2011-05-10 시간 : 18:00:10 장비번호 : 1 장비 품번 순번 중량 1 10 1 1.330kg 1 10 2 5.350kg 1 10 3 2.358kg </pre>	<pre> ===== DATE : 2011-05-10 TIME : 18:00:10 ID No : 1 ID PART SERIAL WEIGHT 1 10 1 1.330kg 1 10 2 5.350kg 1 10 3 2.358kg </pre>
Single Print 121-02	<pre> ===== 날짜 : 2011-05-10 시간 : 18:00:10 장비 품번 순번 총중량 용기값 순중량 01 01 1 3.000 kg 1.501 kg 1.499 kg 01 01 2 3.024 kg 1.501 kg 1.523 kg 01 01 3 3.039 kg 1.501 kg 1.538 kg </pre>	<pre> ===== DATE : 2011-05-10 TIME : 18:00:10 ID PART SERIAL GROSS WEIGHT TARE WEIGHT NET WEIGHT 01 01 1 3.000 kg 1.501 kg 1.499 kg 01 01 2 3.024 kg 1.501 kg 1.523 kg 01 01 3 3.039 kg 1.501 kg 1.538 kg </pre>
Grand-total Print	<pre> ===== 날짜 : 2011-05-10 시간 : 18:00:10 장비번호 : 1 장비 품번 순번 중량 1 10 1 1.330kg ===== 날짜 : 2011-05-10 시간 : 18:00:10 장비번호 : 1 장비 품번 순번 중량 1 10 2 5.350kg </pre>	<pre> ===== DATE : 2011-05-10 TIME : 18:00:10 ID No : 1 ID PART SERIAL WEIGHT 1 10 1 1.330kg ===== DATE : 2011-05-10 TIME : 18:00:10 ID No : 1 ID PART SERIAL WEIGHT 1 10 2 5.350kg </pre>

<p>Single print (Tare, Net weight) 121-03</p>	<pre> ===== 날짜 : 2011-05-10 시간 : 18:00:10 장비 품번 순번 총중량 용기값 순중량 01 01 1 3.000 kg 1.501 kg 1.499 kg </pre>	<pre> ===== DATE : 2011-05-10 TIME : 18:00:10 ID PART SERIAL GROSS WEIGHT TARE WEIGHT NET WEIGHT 01 01 1 3.000 kg 1.501 kg 1.499 kg </pre>
<p>Single print (Tare, Gross weight) 121-04</p>	<pre> ===== 날짜 : 2018-07-16 시간 : 15:40:16 장비 : 1 품번 : 1 순번 : 1 총중량 : 2.99 kg 용기중량 : 1.00 kg 순중량 : 1.99 kg </pre>	<pre> ===== DATE : 2018-07-16 TIME : 15:40:16 ID : 1 PART : 1 SERIAL : 1 GROSS WEIGHT : 2.99 kg TARE WEIGHT : 1.00 kg NET WEIGHT : 1.99 kg </pre>
<p>Grand-total Print</p>	<pre> ===== 총 계 날짜 : 2011-05-10 시간 : 18:00:10 장비번호 : 1 품번 순번 중량 1 15 105.21kg 2 21 172.92kg : 49 13 105.21kg 50 27 172.92kg 중계량횟수 : 143 중계중량 : 700.35kg </pre>	<pre> ===== TOTAL DATE : 2011-05-10 TIME : 18:00:10 ID No : 1 PART SERIAL WEIGHT 1 15 105.21kg 2 27 172.92kg : 49 13 105.21kg 50 21 172.92kg TOTAL COUNT : 143 TOTAL WEIGHT : 700.35kg </pre>

If it is the first printing in continuous print mode, Date and Time data is like single print mode.

8. Error & treatment

8-1. Load cell installation error

Display	Cause	Treatment	Display
Unstable weight value	<ol style="list-style-type: none"> 1. Load cell broken 2. Load cell insulation resistance problem 3. Foreign substances contact with Scale part 4. Summing Board broken 	<ol style="list-style-type: none"> 1. Measure input, output resistance of the load cell 2. Measure insulation resistance of the load cell 3. Replace Summing Board 4. Check contact on the scale 	<ol style="list-style-type: none"> 1 The value of input resistance EXC- and EXC+ is $400 \pm 30\Omega$ 2 The value of output resistance SIG+ and SIG- is $350 \pm 3.5\Omega$ approximately 3 insulation resistance is over $1G\Omega$.
Weight Value is increased on a regular rate, but not return to "Zero"	<ol style="list-style-type: none"> 1. Load cell broken 2. Load cell connection Error 	<ol style="list-style-type: none"> 1. Check Load cell connection 2. Measure Load cell Resistance 	
Minus weight value(-)	<ol style="list-style-type: none"> 1. SIG+ and SIG- are connected reversely 	<ol style="list-style-type: none"> 1. Check Load cell connection 	
"UnPASS" Display	<ol style="list-style-type: none"> 1. Load cell broken or Controller connection problem 	<ol style="list-style-type: none"> 1. Check Load cell broken 2. Check Load cell connection 	
	<ol style="list-style-type: none"> 1. Powered when scale is not empty 	<ol style="list-style-type: none"> 1. Remove weight on the load cell 	
"OL" display (OVER LOAD)	<ol style="list-style-type: none"> 1. Load cell broken or Controller connection problem 2. Loaded over Max. capacity 	<ol style="list-style-type: none"> 1. Check Load cell broken 2. Check Load cell connection 3. Remove over loaded weight 	

8-2. ERROR code

Display	Cause
Er-001	When Max capacity/digit value is over 20,000
Er-004	Standard weight value is over than Max Capacity
Er-005	Standard weight value is less than 10% of Max Capacity
Er-006	When Calibration, it is excess than maximum A/D converting value
Er-007	When Calibration, it is less than minimum A/D converting value
Er-009	There is continuous vibration on the weighing part during calibration.
Er-010	Under "F-function" model, set value is "N.A"
Er-011	Tare range error
Er-012	Empty range error

8-3. Error and treatment

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	Treatment
<p>"Ad-Err"</p> <p>or</p> <p>"OL"</p>	<p>1. Load cell Error</p> <p>2. Load cell cable Error</p> <p>3. Load cell connection Error</p> <p>4. A/D Board Error</p> <p>5.If Analogue value is over 1,040,000.</p> <p>※ When weigh "-" value, If it is over set max capa, "OVER" is displayed.</p> <p>Ex) Even though set max capa is "100" and it is over "-100", "OVER" is displayed.</p>	<p>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.</p> <p>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.</p> <p>3. Try to connect the indicator's A/D with the other indicator.</p> <p>4. Check the power and connection of terminal.</p>
<p>"UnPass"</p>	<p>1. Power is ON, when some materials are on weighing part.</p> <p>※ Under "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.</p> <p>※Under "Function 101-01", it can memory empty value, and it becomes set value without displaying" Un-pass")</p>	<p>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.</p> <p>2. Please try to set F-function 101-01(Back-up) mode so that the indicator can remember first empty value.</p>
<p>"HAlt"</p>	<p>H/W has some problem.</p>	<p>Please contact the distributor or Head Office.</p>

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. #504, 302dong, 397, Seokcheon-ro, Ojeong-gu, Bucheon-si, Gyeonggi-do, Korea Tel : +82 32-624-0060 Fax : +82 32-624-0065 E-mail : sales@sewhacnm.co.kr Homepage : http://www.sewhacnm.co.kr Made in KOREA	Product	Digital Weighing Indicator
	Model	SI 400R
	Serial No.	
	AUTHORIZED STAMP	