CE

Approved for Digital Weigh Indicator

Digital Weighing Indicator

SI 400

User Manual

Ver. 1.0 2014.08.25

SEWHACNM

주식회사 세화씨엔엠

CONTENTS

1. BEFORE INSTALLATION

Caution / Warning Marks

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

Copy Rights

Inquiries

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

Head Office : SEWHACNM CO., LTD.

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

Email : sales@sewhacnm.co.kr

2. INTRODUCTION

2-1. Introduction

Thank you for your choice of SI 400 Industrial Digital Weighing Indicator.

This "SI 400" model is high-control performance weighing Indicator.

This "SI 400" model has Output Interface, Serial Communication, Modbus, Analog Output and 232c Communication.

Please review and learn this instruction Manual and enjoy your process efficiency with "SI 400" Weighing Indicator.

2-2. Cautions

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

2-3. Features

1. SI 400 model is standard size indicator which is easy to install on the panel.
2. Front panel is covered with Polycarbonate film, strong against dust and water.
3. RS232 serial interface is standard installed
4. User can choose various options;

-Analog Output 4~20mA, 0~10V / RS232C / RS422, RS485 / ETHERNET CARD / BCD OUT / BIN IN / SD Card (More options in addition to basic option)

3. SPECIFICATION

3-1. Specification

Content			Specification
Analog Part	Display Resolution		1/20,000
	Internal Resolution		1/2,000,000 (±1,000,000)
	Input Sensitivity		Min 0.1μV/V
	Max Signal Input Voltage		Max 3.0mV/V
	Load cell Excitation		DC +5V
	A/D Conversion Method		Sigma-Delta
	Decimal Point		0, 0.0, 0.00, 0.000
	Drift	Offset	10PPM/℃
		Span	10PPM/℃
	Non Linearity		0.001% of Full Scale
	Analogue Sampling(sec)		60times / sec(MAX)
Environment	Operating Temperature Range		-10℃ ~ +40℃ [14℉ ~ 104℉]
	Operation Humidity Range		40% ~ 85% RH, Non-condensing
Function	Calibration Mode		Test Weight Calibration Mode Simulation Calibration Mode
	Display		6 digit, 25.4mm(1inch) Red FND for Numbers 7 digit, Red LED for Weight unit 8 digit, Green LED for State alarm 12 digit Greed LED for Arrow
	Key Pad		14pcs Standard Key pad
	Additional Digital Input		6pcs external input key
Communi-cation	Serial Port 1 (RS-232)		Data Transference, Command Mode, Serial Printer Mode, Modbus(RTU)
Power	AC : 110~240V, Maximum Power Consumption 14W		
Size	200mm(W) x 100mm(H) x 126.5mm(D)		Weight : 1230g

3-2. Option

Option1	Serial Interface(RS-422)
Option2	Serial Interface(RS-485)
Option3	Serial Interface(RS-232)
Option4	ETHERNET CARD
Option5	Analog Output(0~20mA)
Option6	Analog Output(0~10V)
Option7	BCD OUT
Option8	BIN IN
Option9	SD Memory card

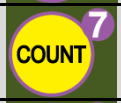
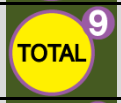
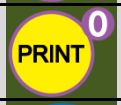
3-3. Front Panel

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

3-3-2. State Lamp

CONDITION MARK	CONTENT
STEADY	When the weight is stable, ON.
ZERO	When the current weight is zero, ON.
TARE	When the "TARE" function is set, ON.
HOLD	When the "HOLD" function is set, ON.
TxD	When indicator sends date out through serial communication.
RxD	When indicator receives date out through serial communication.
PRT	When the weighing data is printed, ON.
IN1	When external input 1 terminal is input, ON..
IN2	When external input 2 terminal is input, ON..
IN3	When external input 3 terminal is input, ON..
IN4	When external input 4 terminal is input, ON..
IN5	When external input 5 terminal is input, ON..
IN6	When external input 6 terminal is input, ON..
kg	Displayed weight unit under Function 110-00
g	Displayed weight unit under Function 110-01
t	Displayed weight unit under Function 110-02
%	Displayed weight unit under Function 110-03
pcs	Displayed weight unit under Function 110-04
oz	Displayed weight unit under Function 110-05
lb	Displayed weight unit under Function 110-06

3-3-3. Key Operation

	- Press 4 times within 3secs, to enter to Function setting mode.
	- Press 4 times within 3secs, to enter to "Hidden function" mode.
	- Make the weight value to Zero - Number 1
	- Set the TARE Function - Number 2
	- Set theTARE Reset - number 3
	- Set the "HOLD" Function - number 4
	- When "HOLD" function is set, HOLD Reset - number 5
	- Product No Setting - number 6
	- Display the weighing count of current P/N. - number 7
	- Display sub-total weight of current P/N. - number 8
	- Display Grand-total weight. - number 9
	- Print out - Number 0
	- Cancel or Move to previous step.
	- Save and Move to next step.

3-3-4. Hot key

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

Tip

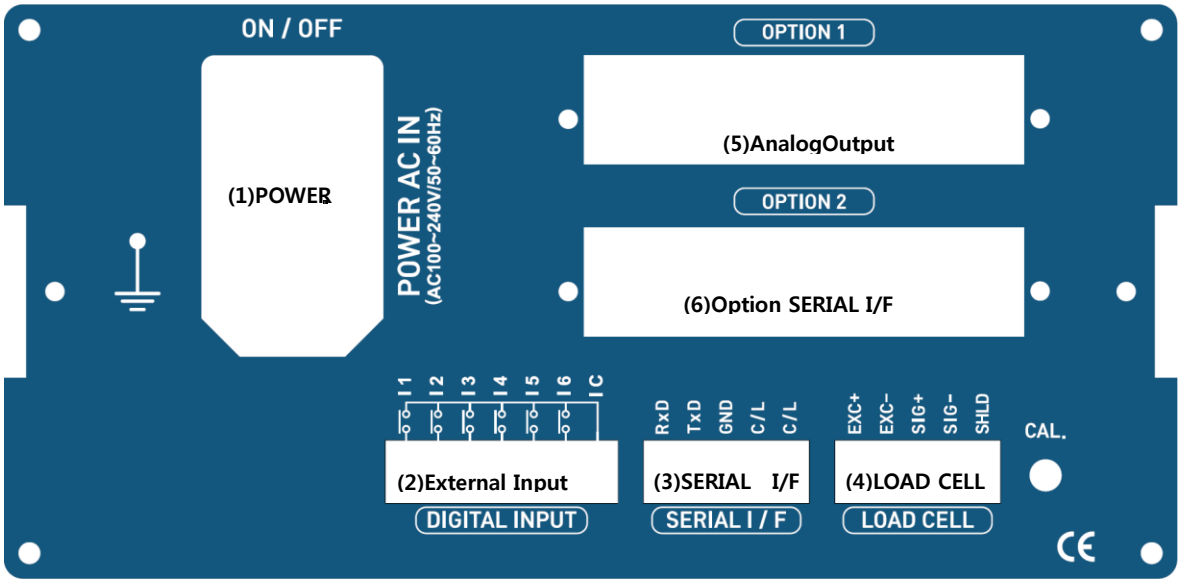
Max accumulated weighing count : 999,999times

Over 999,999times → return to "0" time

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

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

3-4. Real Panel



(1) AC Power input terminal

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

(3) Serial Interface terminal

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

(4) Loadcell Input terminal

Terminal	EXC+	EXC-	SIG+	SIG-	SHLD
Load cell	EXC+	EXC-	SIG+	SIG-	SHEILD

(5) Analogue Output terminal

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

(6) Option serial interface terminal

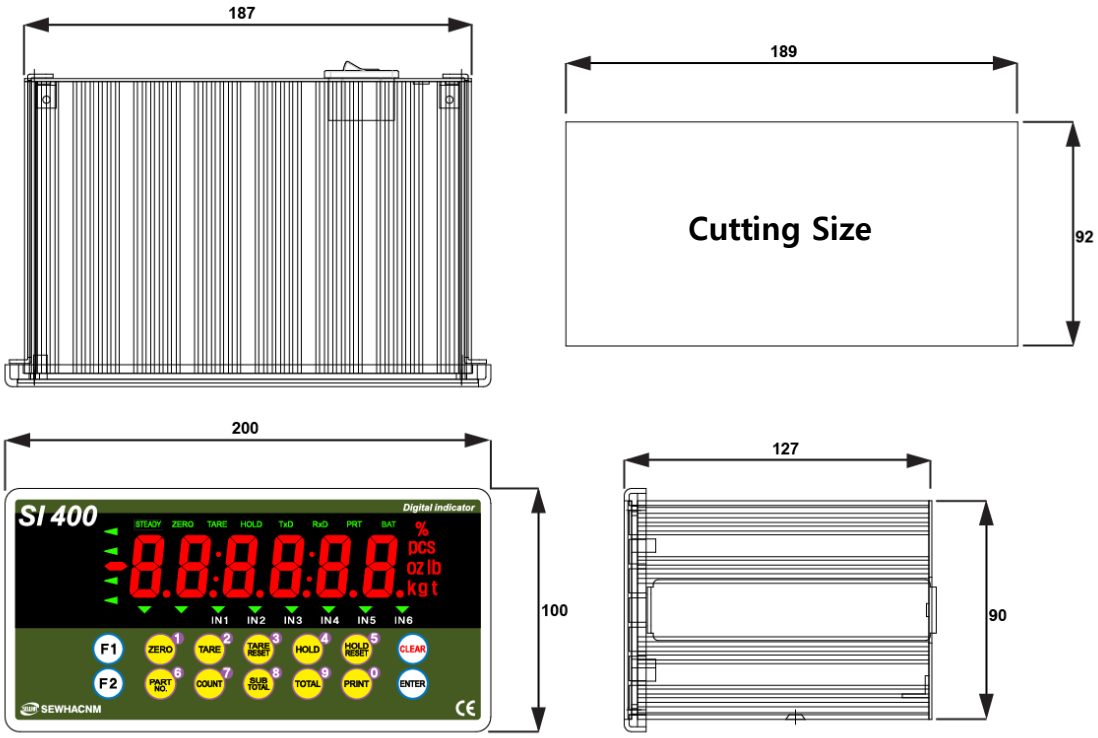
Terminal	1	2	3	4	
RS – 232C	GND	GND	Rx	Tx	Option
RS – 422	TxD-	TxD+	RxD-	RxD+	Option
RS - 485	Unused	Unused	D-	D+	Option

Caution

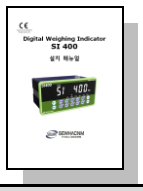
Please check the Comm. and other specification in the label, attached on the cover plate first, and make connection according to that information.

4. INSTALLATION

4-1. External Dimension & Cutting Size



4-2. Installation Components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4-3 Load cell Installation

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

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

Caution

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

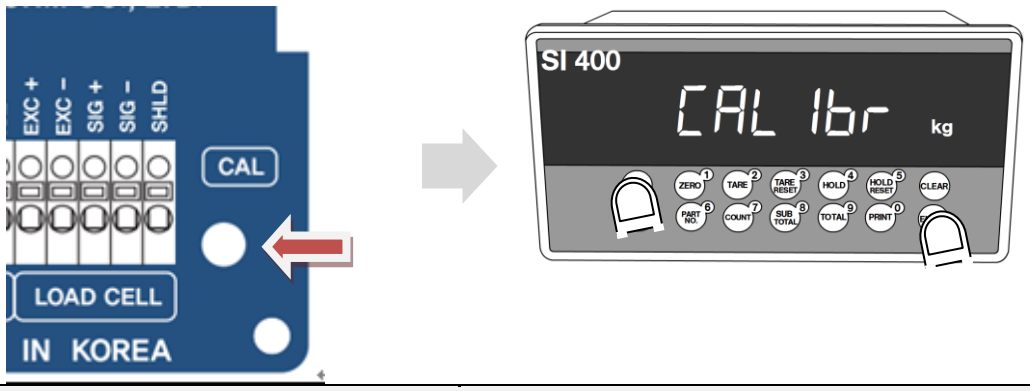
■ **Load Cell Installation**

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

5. SET-UP

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

5-1-1. Start Test Weight Callibration Mode

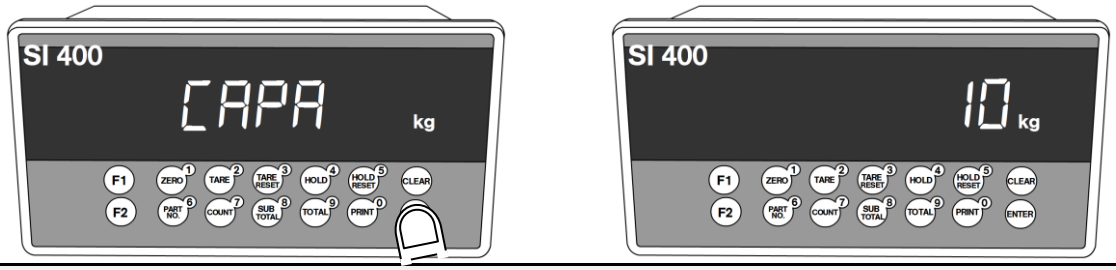


Remove "**CAL-BOLT**" on the Rear panel, . and press "**CAL - LOCK S/W**" inside.

When "**CALIBR**" displays, press F1 key.

select **"WCAL"** and press ENTER key.

5-1-2. Setting "Capacity of weighing Scale"

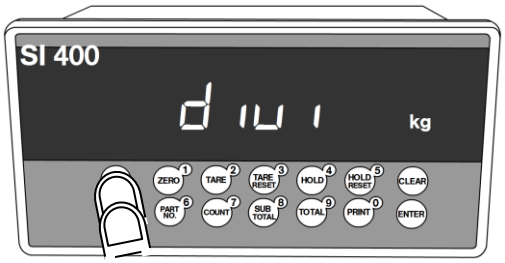


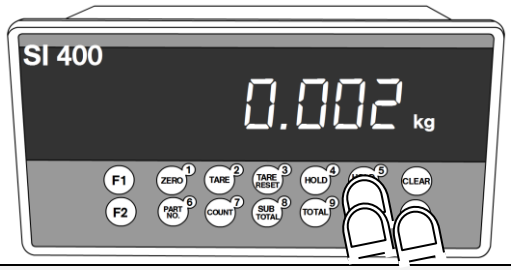
After displaying "**CAPA**", input max capacity with keys & Press ENTER key to save & move to next step.

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

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

5-1-3. Decimal point and division setting





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

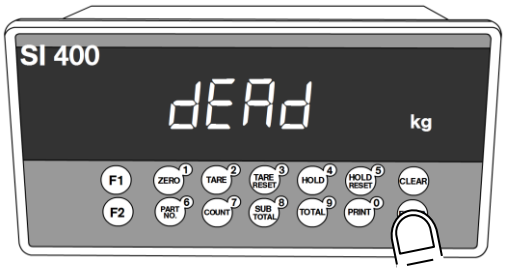
Tip

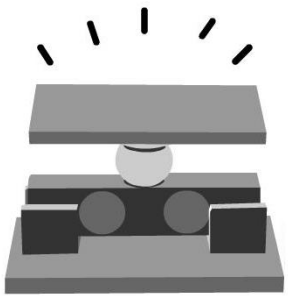
Max decimal point will be 0.001, and digit can be selected among 1, 2, 5, 10, 20, 50. Digit and decimal point must be fulfilled under the below condition.

- (division value / Max capacity value) cannot be over 1/20,000.

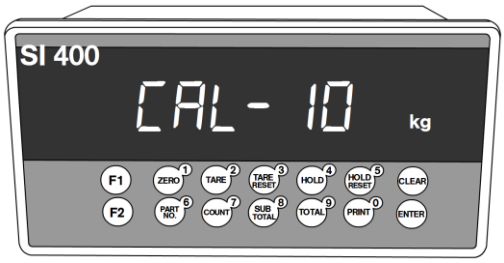
If this condition is not fulfilled, " **Err-1**" will be displayed and move back to capacity setting mode.

5-1-4. Measuring the "DEAD" Weight of Weighing Scale.





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

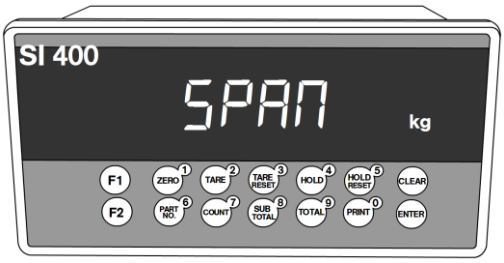


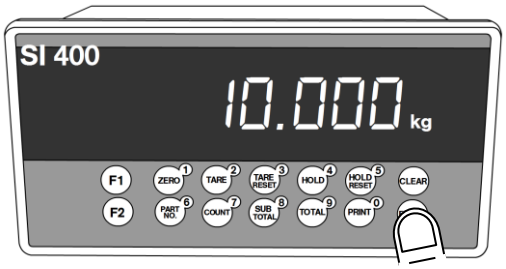
Indicator will search "DEAE weight" during 10secs automatically to find the best condition.

Tip In this step, if there is unstable condition such as some forces or Vibration on the scale part, "**ErrorA**" will be displayed, and **"DEAD value"** will not be calculated.

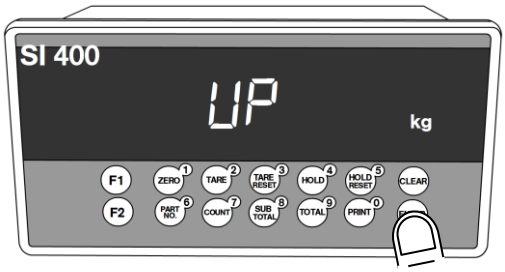
Please remove the cause of the force or vibration and process it again.

5-1-5. Calculating span value

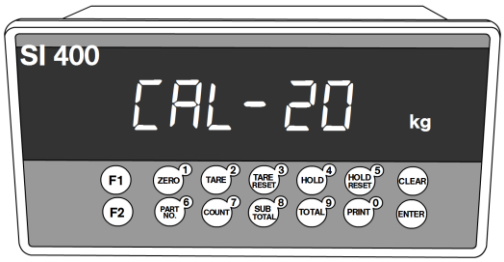




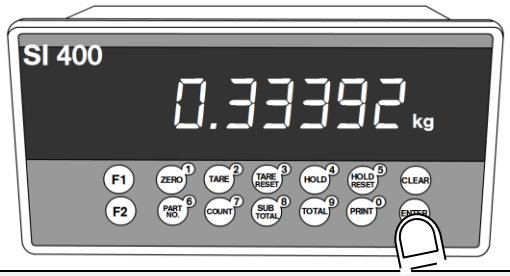
If the count is over, input the weight of your "Test Weight" and press ENTER key.



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

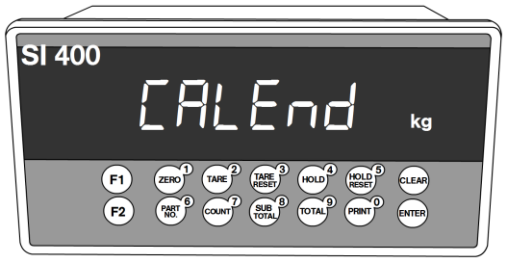


Calculate Span value during 10~20 secs.



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

※This span value is not a weight value.



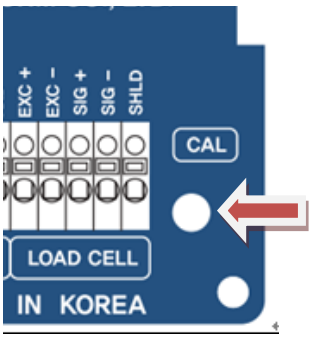
When "CALEND" is displayed and calibration is completed.

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

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

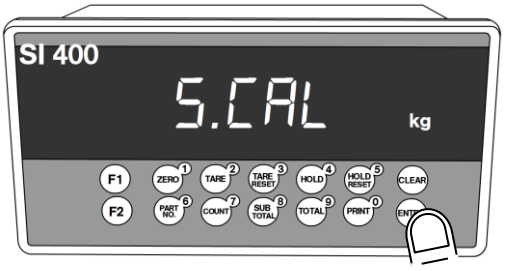
With this "Simulation Calibration Mode" you can make simple calibration without any "TEST weight" This calibration mode uses "Load cells' max capacity" and "Max Output Rate(mV)", so the weight adjustment degree might be less than "Test weight Calibration". The guaranteed resolution of this "Simulation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

5-2-1. Simulation Calibration Mode Start



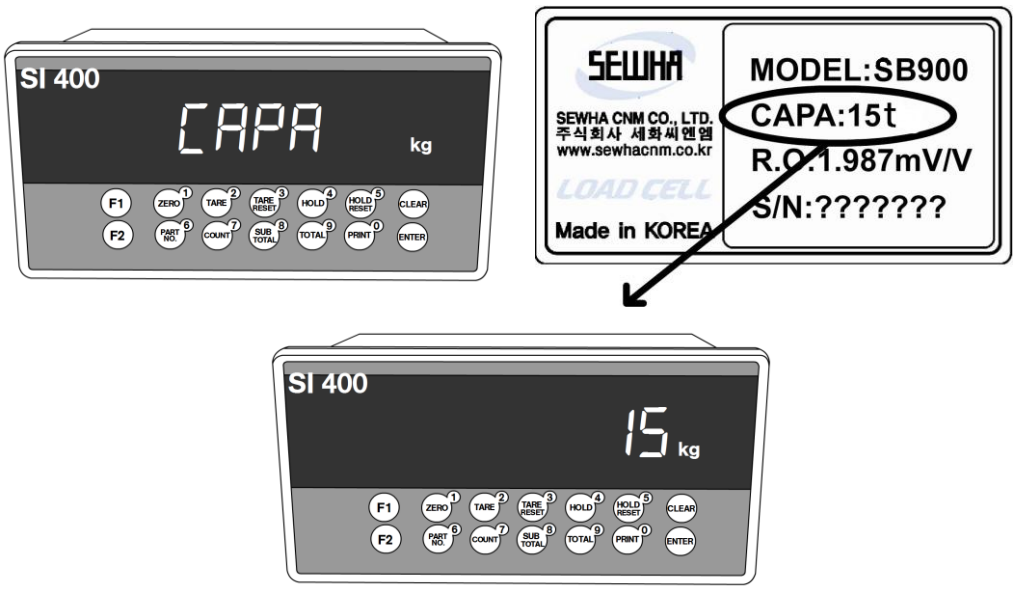
Remove "CAL-BOLT" on the rear panel, and press "CAL - LOCK S/W" inside.

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



Press ENTER key to start.

5-2-2. Setting “Capacity of Load Cell”



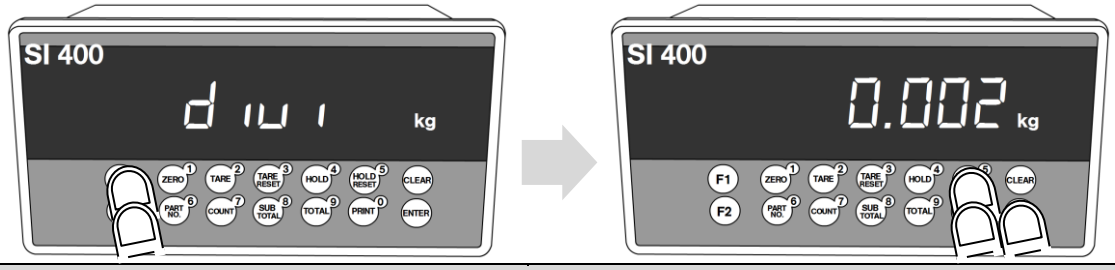
After “CAPA” displayed, Check Max Capacity of Load cell, Input the Max Capacity of Load cell. (refer the load cell label, or Test Report.) And press ENTER key.

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

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

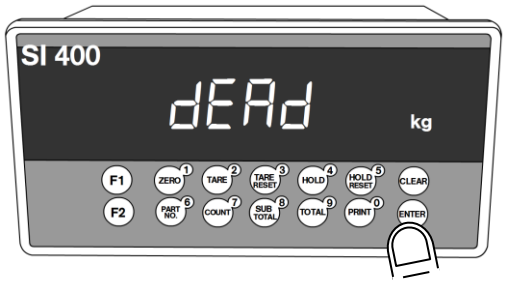
Then, total Max Capacity will be 4,000kg(1,000 x 4) and you have to input 4,000.

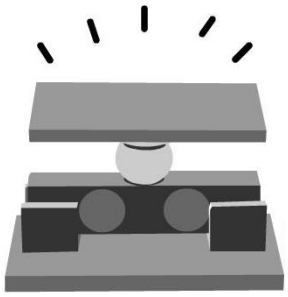
5-2-3. Setting “Digit / Division” value



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

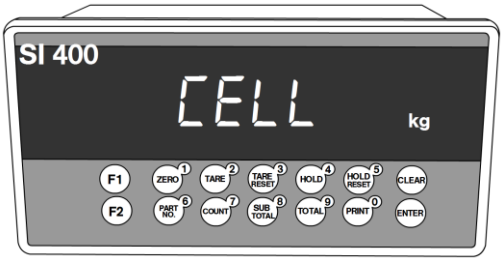
5-2-4. Measuring the "DEAD Weight" of Weighing Scale.

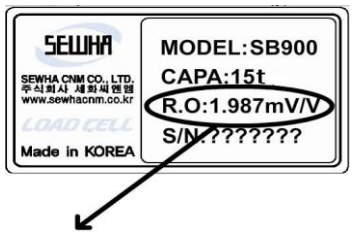


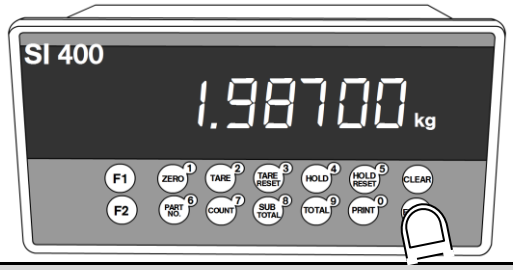


When **"DEAD"** displays, Press ENTER key, then indicator will calculate dead weight of scale part automatically.
(While this process, there should be nothing on the scale part.)

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

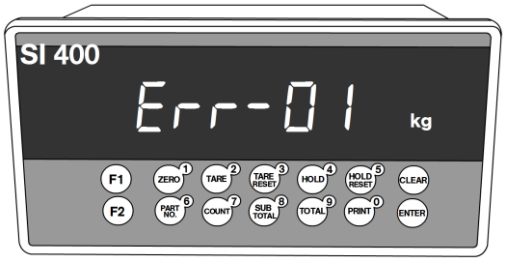






After **"mV/V"** is displayed, Check the Rated output value of Load cell.

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



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

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

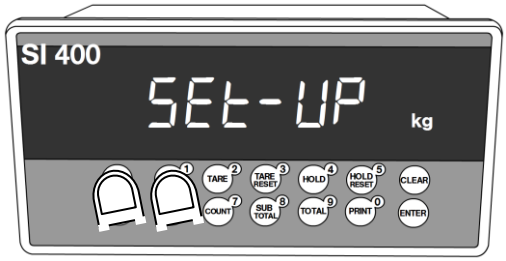
Tip In case of multiple pieces of load cells are connected, the rated output will be same as single load cell's. (Because plural load cells are connected with parallel connection, the sum of rated output voltage is same as single load cell's rated output)

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

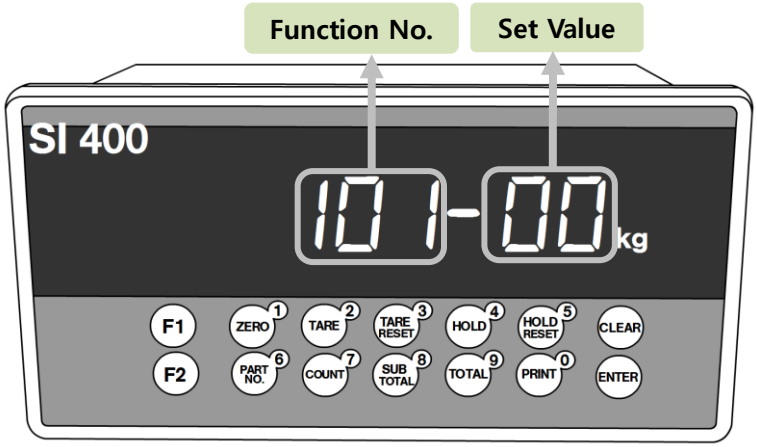
If you want to make more precise weighing process, please measure real output rate of load cell and input the measured value. Then the weight measurement will be more precise than before.

5-3. F-FUNCTION Setting

5-3-1. Starting F-FUNCTION Mode



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



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

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

(3) ENTER key for saving data..

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

5-3-2. F-Function List

F-LIST	Subject	Default	Contents
101	Equipment No. setting – ID No.setting	01	01~99
102	Weight–Back up Mode	02	00:Normal mode 01: Weight Back up Mode(Zero) 02: Weight Back up Mode(Zero&Tare)
103	Weighing Data Save Method	00	00: Manual: Whenever "Print" key input 01: Auto: At every steady states 02: Auto: At the first steady states 04: Manual& Auto: At every steady states 05:Manual& Auto: At the first steady states
104	Display Up-Date Speed	09	01:Slow(1time per 1sec) ~ 09:Fast(60times per 1sec)
105	Main Display setting	00	00 : Weight 01 : Sub-total Weight 02 : Grand-total
108	Buzzer sound (External input detection)	00	00:Buzzer sound, 01:No Buzzer sound
109	Function / Clear key Activation display selection	00	00 : F or C key press show on the screen. 01 : F or C key press not show on the screen
110	Weight Unit`	00	00 : kg 01 : g 02 : ton 03 : % 04 : PCS 05 : OZ 06 : lb
111	Language	00	00:Korean, 01:English
201	EMPTY Range	100	00~999999
202	Auto Zero Range	00	00~99 (Unit:0.25gradation)
203	Steady Range	08	01~99 (Unit:0.25gradation)
204	Steady condition check time	10	01~99 (Unit:0.1sec.)
205	Digital Filter	20	01:Weak vibration ~ 99:Strong vibration
206	Zero key operation mode	00	00:Always active 01:Active under steady condition only
207	Tare Key operation mode	00	00:Always active 01:Active under steady condition only
208	Tare key Setting	00	00 : Tare Key 01 : Tare Weight

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 function under Tare state	00	00:Disuse 01:Use
212	Tare Delay Time	00	00:Disuse, 01 ~ 10:Use (Unit:1sec.)
214	Tare reset Time	00	00:Manual (Tare key) 01:Auto (Under near zero range) 02:Auto (At the steady condition)
215	Auto Tare reset Time	00	00 : Disuse 01 ~ 09 : Use (Unit : 1 sec)
216	Hold Mode	00	00:Sample Hold, 01:Peak Hold, 02:Average Hold
217	Hold Delay Time	00	00:Disuse, 01~10:Use (Unit:1sec.)
218	Hold reset at the near zero	00	00:Disuse, 01:Use
219	Auto Hold reset Time	00	00:Disuse, 01~10:Use (Unit:1sec.)
220	Average Hold Time	10	01 ~ 99 (Unit:0.1sec.)
221	Minus (-) Mark Display	00	00:USe 01:Disuse
222	Under UNPASS/OVERLOAD state, Weight display	00	00:Display, 01:No display
233	External Input 1 Setting	01	00:Disuse, 01:Zero, 02:Tare, 03:Tare reset, 04:Tare/Tare reset 05:Hold, 06:Hold reset, 07:Hold/Hold reset, 08:Print 09:Sub-total print, 10:Grand-total print
234	External Input 2 Setting	04	00:Disuse, 01:Zero, 02:Tare, 03:Tare reset, 04:Tare/Tare reset 05:Hold, 06:Hold reset, 07:Hold/Hold reset, 08:Print 09:Sub-total print, 10:Grand-total print

235	External Input 3 Setting	07	00:Disuse, 01:Zero, 02:Tare, 03:Tare reset, 04:Tare/Tare reset 05:Hold, 06:Hold reset, 07:Hold/Hold reset, 08:Print 09:Sub-total print, 10:Grand-total print
236	External Input 4 Setting	08	00:Disuse, 01:Zero, 02:Tare, 03:Tare reset, 04:Tare/Tare reset 05:Hold, 06:Hold reset, 07:Hold/Hold reset, 08:Print 09:Sub-total print, 10:Grand-total print
237	External Input 5 Setting	08	00:Disuse, 01:Zero, 02:Tare, 03:Tare reset, 04:Tare/Tare reset 05:Hold, 06:Hold reset, 07:Hold/Hold reset, 08:Print 09:Sub-total print, 10:Grand-total print
238	External Input 6 Setting	10	00:Disuse, 01:Zero, 02:Tare, 03:Tare reset, 04:Tare/Tare reset 05:Hold, 06:Hold reset, 07:Hold/Hold reset, 08:Print 09:Sub-total print, 10:Grand-total print
251	Zero LED output standard	00	00 : Near Zero 01 : Zero
253	Near zero output Setting Under tare ON state	00	00:Zero Output 01:Actual zero output except Tare weight
301	Parity / Stop bit	00	00:Databit 8, Stopbit 1, Paritybit Non 01:Databit 8, Stopbit 1, Paritybit Odd 02:Databit 8, Stopbit 1, Paritybit Even 03:Databit 7, Stopbit 1, Paritybit Odd 04:Databit 7, Stopbit 1, Paritybit Even
302	Serial Communication Speed	02	00: 2,400bps 01: 4,800bps 02: 9,600bps 03: 14,400bps 04: 19,200bps 05: 28,800bps 06: 38,400bps 07: 57,600bps 08: 76,800bps 09: 1115,200bps
303	Data transmission mode	00	00:Simplex / Stream Mode 01:Duplex / Command Mode 02:Print Mode 03:Modbus(RTU)
304	"Check-Sum" detection selection under command mode	00	00:Disuse, 01:Use
305	Data Format under Stream Mode	00	00:Format1, 01:Format2, 02:Format3 03:Format4

306	Date transference under stream mode	00	00:Countinuously 01:Single time on every steady state 02:At the first steady point 03:When input print key
307	Modbus Transmit Data MSB/LSB location	00	00:Standard, 01:Change
308	Parity / Stop bit (Option Port)	00	00: Data bit8, Stop bit1, Parity bit Non 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 bit, Parity bit Even
309	Serial Communication Speed (Option Port)	02	00: 2,400bps 01: 4,800bps 02: 9,600bps 03: 14,400bps 04: 19,200bps 05: 28,800bps 06: 38,400bps 07: 57,600bps 08: 76,800bps 09: 1115,200bps
310	Data transmission mode (Option Port)	02	00:Simplex / Stream Mode 01:Duplex / Command Mode 02:Print Mode
311	"Check-Sum" detection selection under command mode (Option Port)	00	00: Disuse, 01: Use
312	Data Format under Stream Mode (Option Port)	00	00 : Format 1 (19byte) 01 : Format 2 (22byte) 02 : Format 3 (17byte) 03 : Format 4 (22byte) 05 : Format 5 (15byte)
313	Date transference under stream mode (Option Port)	00	00 : Continuously 01 : Single time on every steady state 02 : At the first steady point 03 : When input print key 04 : When input print key
316	Ethernet transference Method selection (Option Port)	00	00 : Simplex Mode / Stream Mode 01 : Duplex Mode / Command Mode 02 : MODBUS (RTU)
317	Ethernet Command mode "Check Sum" detection selection (Option Port)	00	00 : Not Used 01 : Used

318	Ethernet Stream mode DATA Transference Format selection (Option Port)	00	00 : Format 1 (19byte) 01 : Format 2 (22byte) 02 : Format 3 (17byte) 03 : Format 4 (22byte) 05 : Format 5 (15byte)
319	Ethernet Stream mode Data transference (Option Port)	00	00 : Countinuously 01 : Single time on every steady state 02 : At the first steady point 03 : When Finish Relay output 1time output 04 : When input print key
352	Print Format Setting	00	00: Continuous Print, 01: Single Print
354	Print Output Delay Time Setting	00	00~10 (Unit:1sec.)
355	Paper Withdraw after printing out (Continuous print or single print)	00	00~10 (Unit:1line add)
356	Paper Withdraw after Grand-total printing out	00	00~10 (Unit:1line add)
357	After Sub Print, Sub data Deleted	00	00 : Not Delete 01 : Delete
358	Deleting Grand-total data after printing out	00	00:Delete 01:No delete
401	Analog Output Applying Weight Range Setting	00	00: Absolute number(-&+) 01: Positive number(only +)
402	Analog Output Direction Setting	00	00:Forward 01:Reverse
403	Analog Output Standard Setting	00	00 : CAPACITY 01 : CAPACITY(Gross weight under Tare)
404	BIN IN (Product number change)	00	00 : Disuse 01 : Units digit, tenth digit separation 02 : Units digit, tenth digit No separation
405	IP Setting 1	-	0~255
406	IP Setting 2	-	0~255
407	IP Setting 3	-	0~255
408	IP Setting 4	-	0~255
409	Subnet Mask Setting 1	-	0~255
410	Subnet Mask Setting 2	-	0~255
411	Subnet Mask Setting 3	-	0~255
412	Subnet Mask Setting 4	-	0~255
413	Gate Way Setting 1	-	0~255

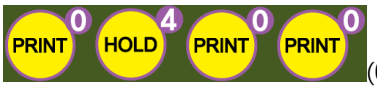
414	Gate Way Setting 2	-	0~255
415	Gate Way Setting 3	-	0~255
416	Gate Way Setting 4	-	0~255
417	Port Setting	-	0~65000

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

Weighing Data Save Method (F-function 103)		**Print input (Key, Communication, External input)**	**Printing out data**	**Saving Data**
00	Manual	○	Current weight	Current weight
		X	X	X
01	Auto: At every steady states	○	Recent stable weight	X
		X	Steady weight	Steady weight
02	Auto: At the first steady states	○	Recent stable weight	X
		X	Steady weight	Steady weight
04	Manual& Auto: At every steady states	○	Current weight	Current weight
		X	Steady weight	Steady weight
05	Manual& Auto: At the first steady states	○	Current weight	Current weight
		X	Steady weight	Steady weight

5-3-4. Hidden Function

How to enter Hidden function setting mode : Press 

Key during 4sec and input your password. Default password is 

(0400). Press 

key after input your password.

Serial Number Check	
HF01	Check your device's serial number
Operation time check	
HF02	Check how long hours it has been operated. (Power ON) Unit : 1hour
S/W Version Check	
HF03	Check the currently applied program version
H/W Version Check	
HF04	Check the currently applied hardware version

<table>
<tr><th colspan="4">DATE(Y,M,D) Check / Modification</th></tr>
<tr><td>HF05</td><td colspan="3">Check the date or adjust when it is wrong.</td></tr>
<tr><th colspan="4">TIME(H,M,S) Check / Modification (24Hours)</th></tr>
<tr><td>HF06</td><td colspan="3">Check the time or adjust when it is wrong.</td></tr>
<tr><th colspan="4">Password Setting (4digit)</th></tr>
<tr><td>HF07</td><td colspan="3">Password is required when you enter to hidden function.
Enter the password twice.
 

1 2 3 4 5 6 7 8 9 0
Password combination within 0~9</td></tr>
<tr><th colspan="4">Maximum Capacity Weight Check and Modification</th></tr>
<tr><td>HF08</td><td colspan="3">Check the max capacity which is set under calibration mode.</td></tr>
<tr><th colspan="4">Division</th></tr>
<tr><td>HF09</td><td colspan="3">Check the division which is set under calibration mode.</td></tr>
<tr><th colspan="4">span value</th></tr>
<tr><td>HF10</td><td colspan="3">Check the weight of test weight which is used for your last calibration.</td></tr>
<tr><th colspan="4">Zero Analog</th></tr>
<tr><td>HF11</td><td colspan="3">Check the analog value of ZERO.</td></tr>
<tr><th colspan="4">Analog Output Use Setting</th></tr>
<tr><td rowspan="2">HF13</td><td>●</td><td>00</td><td>4-20mA Output</td></tr>
<tr><td></td><td>01</td><td>0-10V Output</td></tr>
<tr><th colspan="4">Minimum Analog Output Setting</th></tr>
<tr><td>HF14</td><td colspan="3">Minimum Analog Output (Analog out 4~20mA / 0~10V).
 

key press (–) Setting. Input range : -20 ~ +20 , basic value : 0</td></tr>
<tr><th colspan="4">Maximum Analog Output Setting</th></tr>
<tr><td>HF15</td><td colspan="3">Maximum Analog Output (Analog out 4~20mA / 0~10V).
 

key press (–) Setting. Input range : -20 ~ +20 , basic value : 0</td></tr>
<tr><th colspan="4">Function List Factory Reset</th></tr>
<tr><td>HF16</td><td colspan="3">Change to default F-setting</td></tr>
<tr><th colspan="4">Simulation calibration Setting</th></tr>
<tr><td>HF30</td><td colspan="3">00 : Discuse, 01: Use</td></tr>
</table>

5-4. Test Mode

Before starting the TEST mode, please remove operating devices.

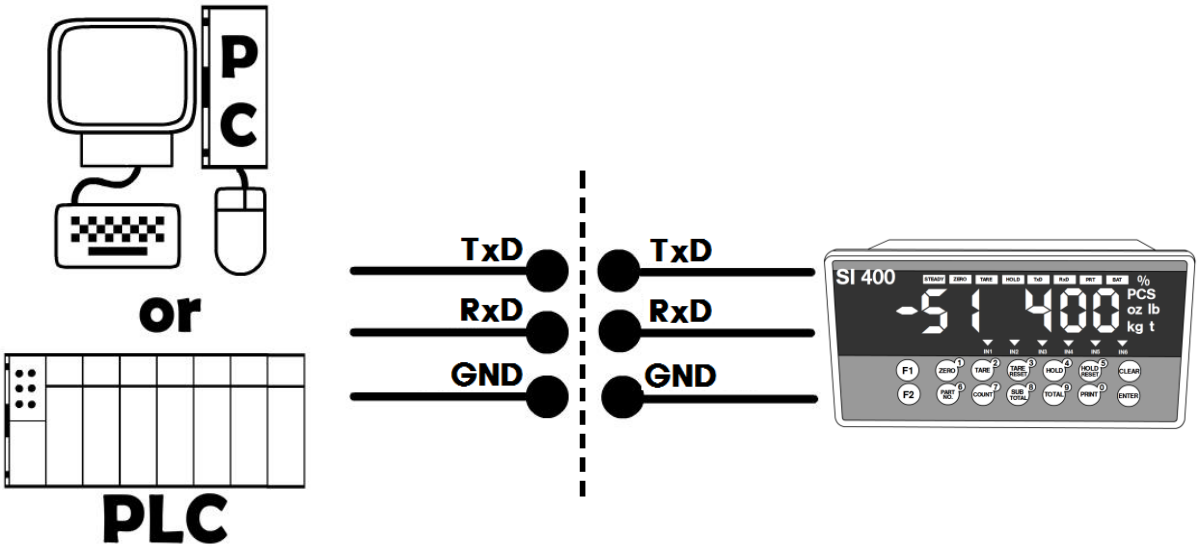
Test Mode	Analog Value	F1 **key 4times →** TARE(2) → ZERO(1)
	Analog Deviation Check	F1 **key 4times →** TARE(2) → TARE(2)
	Key Input Check	F1 **key 4times →** TARE(2) → TARE RESET(3)
	Display Check	F1 **key 4times →** TARE(2) → HOLD(4)
	External Input	F1 **key 4times →** TARE(2) → HOLD RESET(5)
	Analog Output	F1 **key 4times →** TARE(2) → COUNT(7)
	Serial I/F	F1 **key 4times →** TARE(2) → SUB TOTAL(8)
	Option serial I/F	F1 **key 4times →** TARE(2) → TOTAL(9)

6. INTERFACE

6-1. Serial Interface

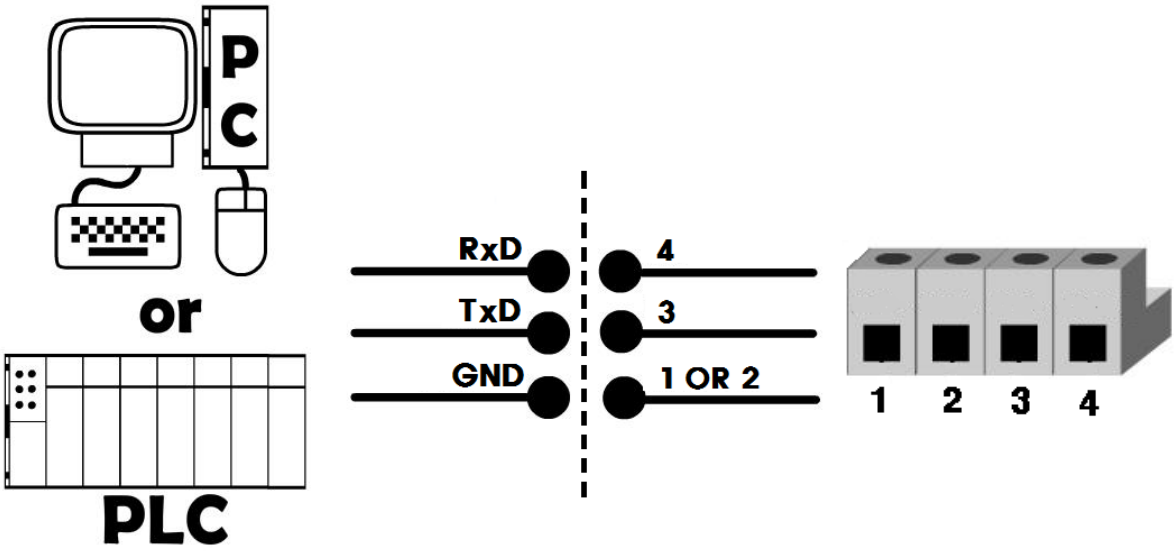
6-1-1. Standard serial interface terminal

(1) RS - 232

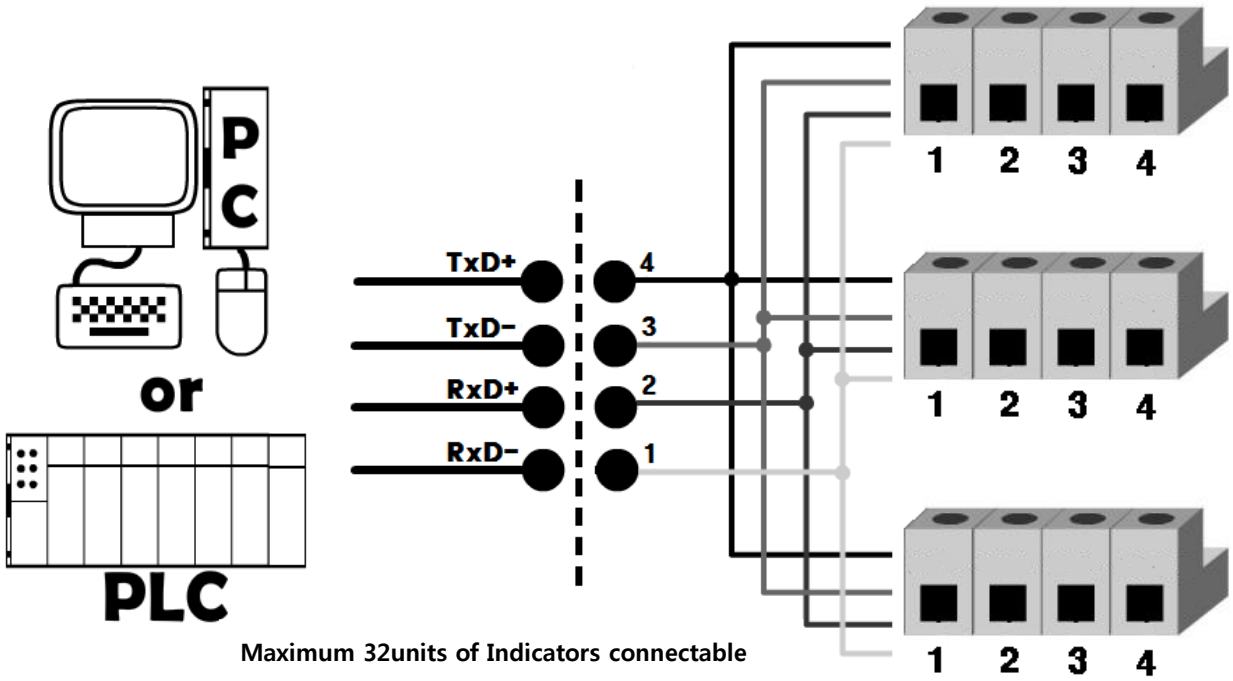


6-1-2. Option serial interface terminal

(1) RS – 232

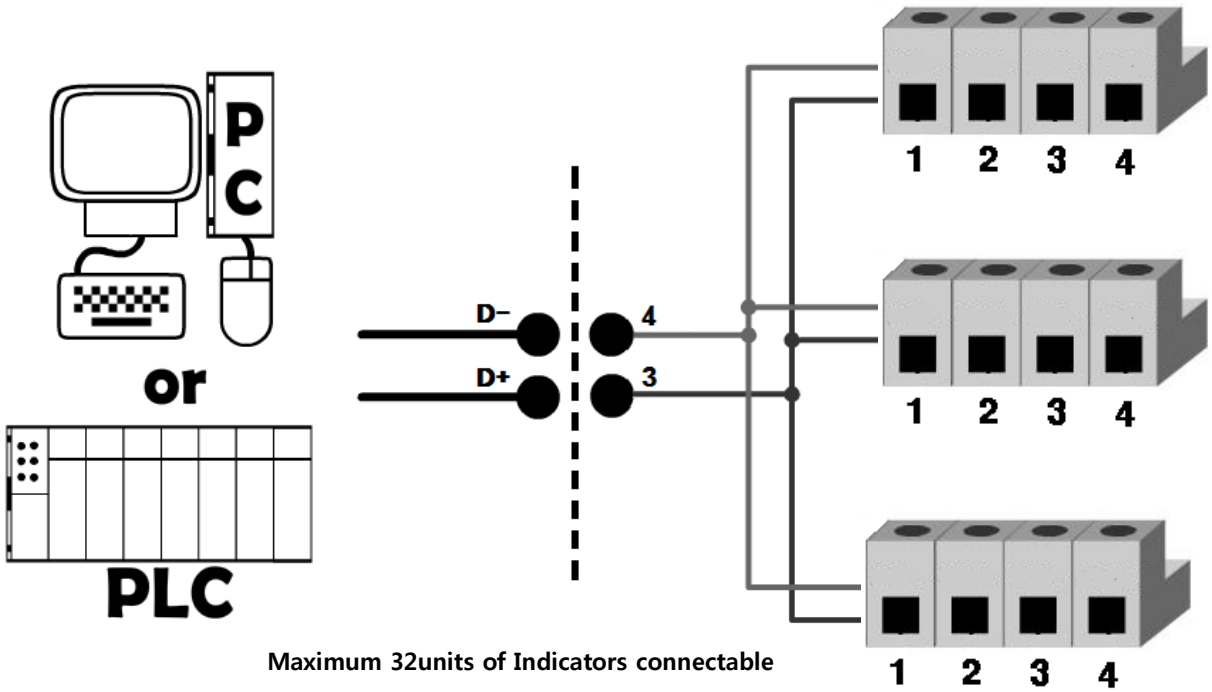


(2) RS – 422



Maximum 32units of Indicators connectable

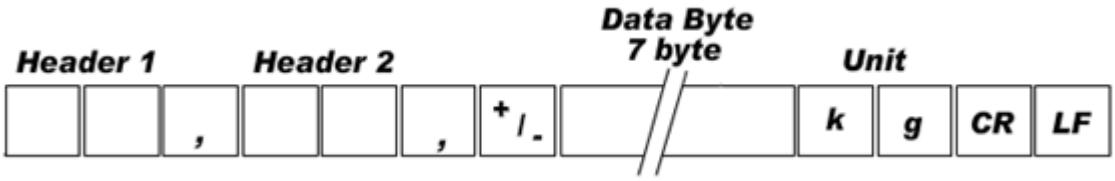
(3) RS – 485



Maximum 32units of Indicators connectable

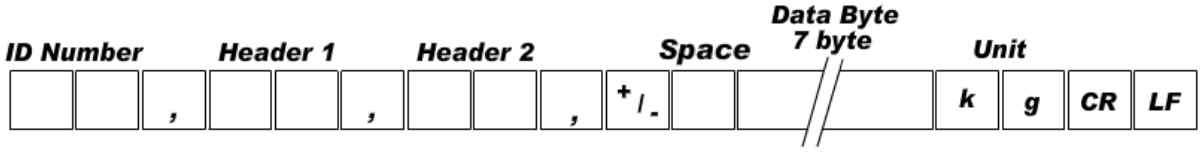
6-1-1. Data Format

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



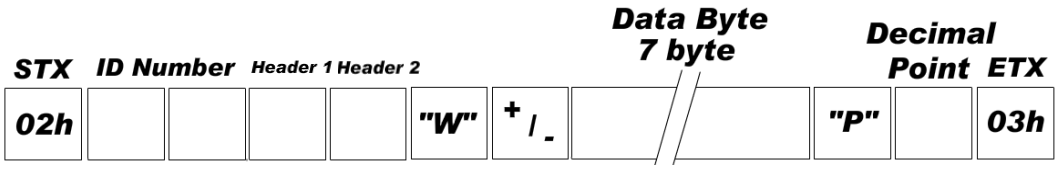
Header1	Header2
OL : OVER LOAD	NT : NET-WEIGHT(Tare is not set)
ST : STEADY	GS : when setting TARE
US : UNSTEADY	

(2) Data Format2 : ID Number + Data Transference (Refer F-function 101, 305-01) -22byte



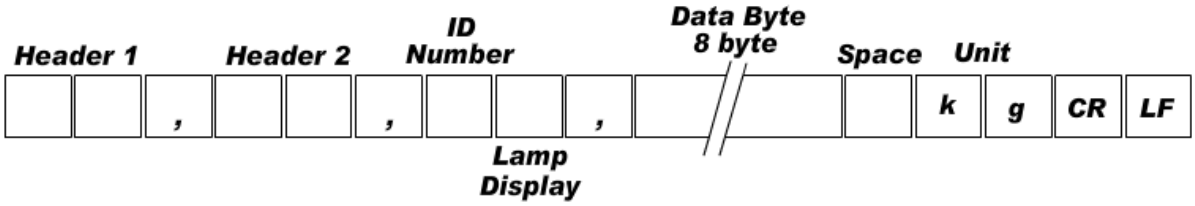
Header1	Header2
OL : OVER LOAD	NT : NET-WEIGHT(Tare is not set)
ST : STEADY	GS : when setting TARE
US : UNSTEADY	

(3) Data Format3 : ID Number + State (Refer F-function 101, 305-02) -17byte



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

(4) CAS Format (22byte) : ID Number (Refer F-function 305-03) -22byte

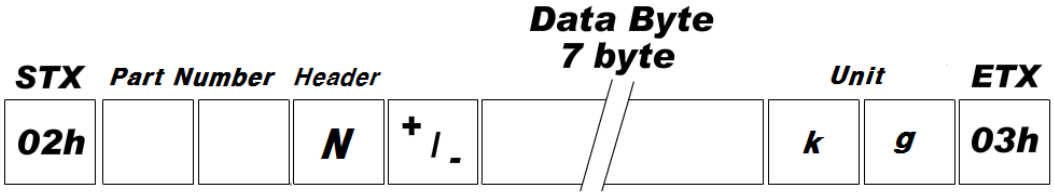


Header1	Header2
OL : OVER LOAD	NT : NET-WEIGHT(Tare is not set)
ST : STEADY	GS : when setting TARE
US : UNSTEADY	

LAMP DISPLAY

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

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



6-1-2. Command Mode

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

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

6-1-3. Read Command

Subject	Command	Length of transmission data	
		305/312 - 00,01,03,04	305/312 - 02
Current Weight	**STX ID RCWT ETX**	**22 byte**	**22 byte**
Current data	**STX ID RCWD ETX**	**44 byte**	**48 byte**
Sub-total date	**STX ID RSUB ETX**	**29 byte**	**30 byte**
Sub-Weighing times	**STX ID RSNO ETX**	**14 byte**	**14 byte**
Grand-total Data	**STX ID RGRD ETX**	**29 byte**	**28 byte**
Current Time Data	**STX ID RTIM ETX**	**14 byte**	
Current Date Data	**STX ID RDAT ETX**	**14 byte**	
Tare Data	**STX ID RTAR ETX**	**15 byte**	**18 byte**
Current P/N transmission	**STX ID RPNO ETX**	**10 byte**	

6-1-4. Write Command

Subject	Command	Length of reception data	
		305/312 - 00,01,03,04	305/312 - 02
Zero	STX ID WZER ETX	8 byte	
Tare	STX ID WTAR ETX	8 byte	
Tare Reset	STX ID WTRS ETX	8 byte	
Hold	STX ID WHOL ETX	-	8 byte
Hold Reset	STX ID WHRS ETX	-	8 byte
Print	STX ID WPRT ETX	8 byte	
Sub-total Print	STX ID WSPR ETX	8 byte	
Grand-total Print	STX ID WGPR ETX	8 byte	
Sub-total Delete	STX ID WSTC ETX	8 byte	
Grand-total Delete	STX ID WGTC ETX	8 byte	
Time Setting	STX ID WTIM TIME (HHMMSS) ETX	14 byte	
DATE Setting	STX ID WDAT DATE (YYMMDD) ETX	14 byte	
P/N change	STX ID WPNO Product No. ETX	10 byte	

6-1-5. Modbus Memory Map

Tip

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

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

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

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

Address	Length	Feature	Description
1	2	RO	Capacity
3	2	RO	Real weight
5	2	RO	Analog raw data
7	2	RO	Span value
9	1	RO	Division
10	1	RO	Decimal
11	2	RO	Current weight
13	2	RO	Tare weight
15	2	RO	Estimated weight
17	2	RO	Digital input
19	2	RO	Lamp
21	2	RO	Error
25	2	RO	Current Product No Sub times
27	2	RO	Current Product No Sub weight
33	2	RO	Current P/N Grand-total count
35	2	RO	Current P/N Grand-total weight
437	2	RW	Date
439	2	RW	Time
441	1	RW	Basic key
444	1	RW	Current Product No.

6-1-6. Modbus Memory Register

(1) Digital Input Register (Address : 17, Length : 2)

Digital input data is indicated by 16bit.

0	1	2	3	4	5
INPUT_1	INPUT_2	INPUT_3	INPUT_4	INPUT_5	INPUT_6

(2) Lamp Register (Address : 19, Length : 2)

Lamp data is indicated by 32bit.

0	1	2	3	4	5	4	7
Steady	Zero	Tare	Hold	TxD	RxD	Printer	Dead Battery
8	**9**	**10**	**11**	**12**	**13**	**14**	**15**
-	-	IN1	IN2	IN3	IN4	IN5	IN6

(3) Error Register (Address : 21, Length : 2)

Error data is indicated by 32bit.

0	1	2
Loadcell Error	Over Load	-

(4) Standard Key Register (Address : 441, Length : 1)

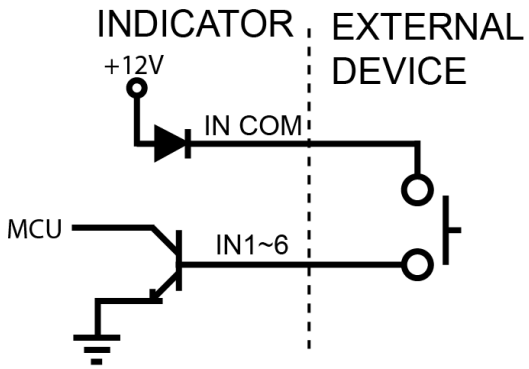
Standard Key input data is indicated by 16bit

0	1	2	3	4	5	6	7	8	9	10	11
-	-	Zero	Tare	Tare Removal	Hold	Hold Removal	Print	Sub Print	Sub Delete	Grand-total Print	Grand Total Delete

6-2. External Input

Each External Input funtion setting is F-Funtion 233~238 possible.

6-2-1. External Input configuration



6-2-2. External Input connector connection

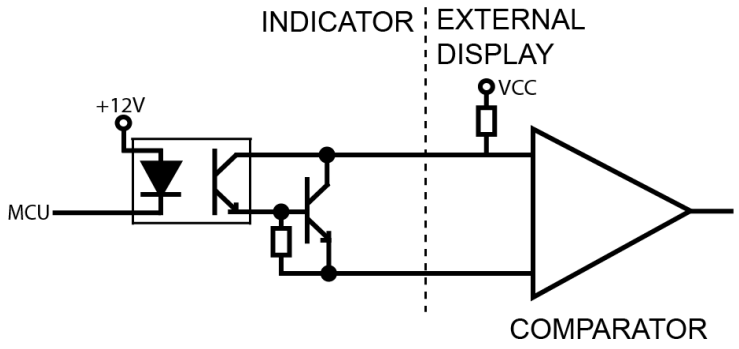
TERMINAL	I1	I2	I3	I4	I5	I6	IC
INPUT	IN1	IN2	IN3	IN4	IN5	IN6	IN COM

6-3. Current loop

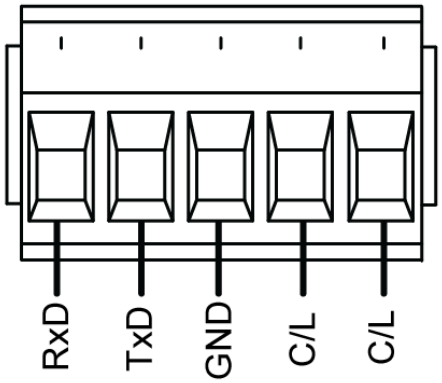
Current loop is suitable for middle distance transmission because stronger than RS-232C against electric noise. (About 100M)

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

6-4-1. Current loop circuit composition



6-4-2. Connection



RxD	TxD	GND	C/L	C/L
RS232	RS232	RS232	TxD	TxD

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

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

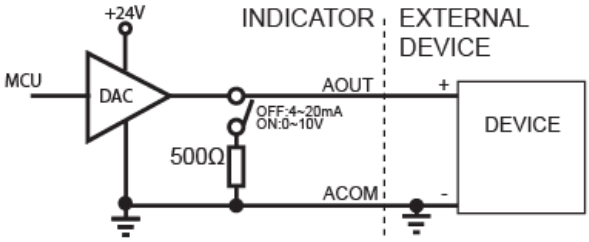
6-5-1. Specification

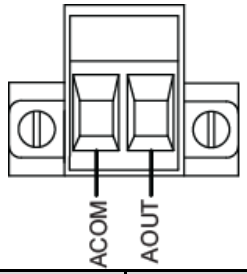
Output current	Accuracy	Temperature compensation	Max Loaded Impedance
0㎃ ~ 22㎃	1/5,000	0.01%℃	500Ω MAX.

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

6-5-1. Circuit composition and connector

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





ACOM	AOUT
-	+

6-5-3. Output Adjustment

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

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

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

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

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

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

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

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

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

6-5. Analog V-Output Interface :0~10V

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

6-6-1. Specification

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

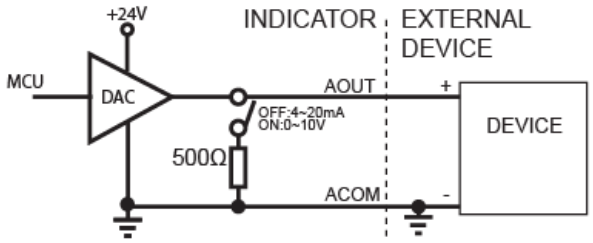
Under Calibration mode or "CELL-ERR" condition, Analogue output will not activated.

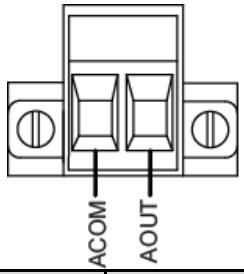
If the output is deactivated, the last output signal value will be hold until next activation.

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

6-6-2. Circuit composition and connector

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





ACOM	AOUT
-	+

6-6-3. Output Adjustment

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

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

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

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

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

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

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

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

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

6-6. Analog output selection

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

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

6-7. Print Interface

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

6-7-1. English Format

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

Continuous Print Format(Function 352-00)

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


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

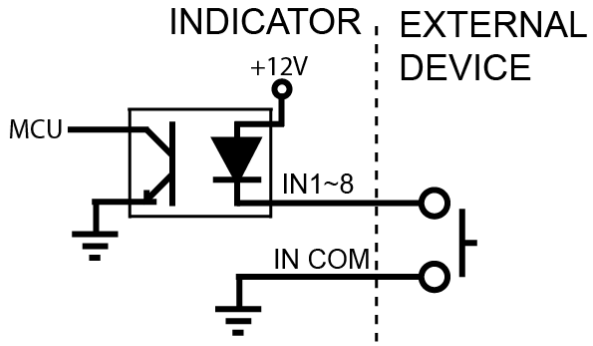
Single Print Format(Function 352-01)

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

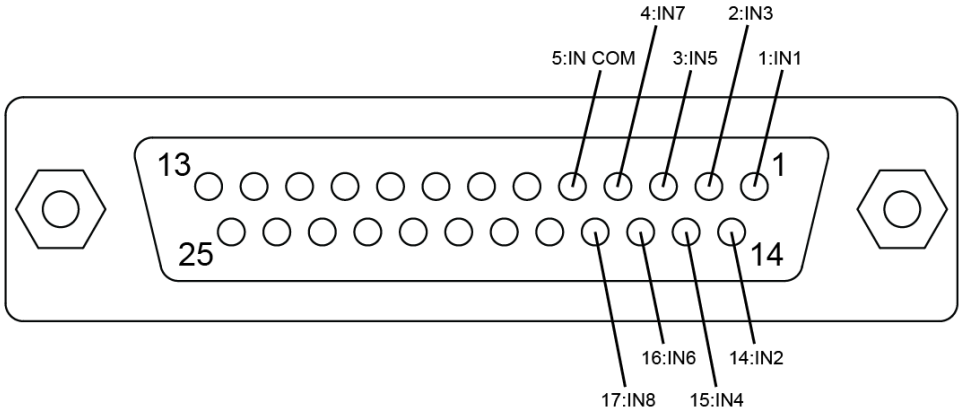
Grand-total Print

6-8. BIN IN card (Changing Product number)

6-8-1. BIN IN card circuit composition



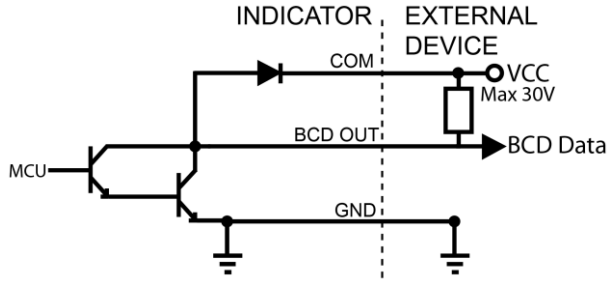
6-8-2. BIN IN card connection



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

6-9. BCD OUT Card (Weight data out) (Function 310-00)

6-9-1. Circuit composition



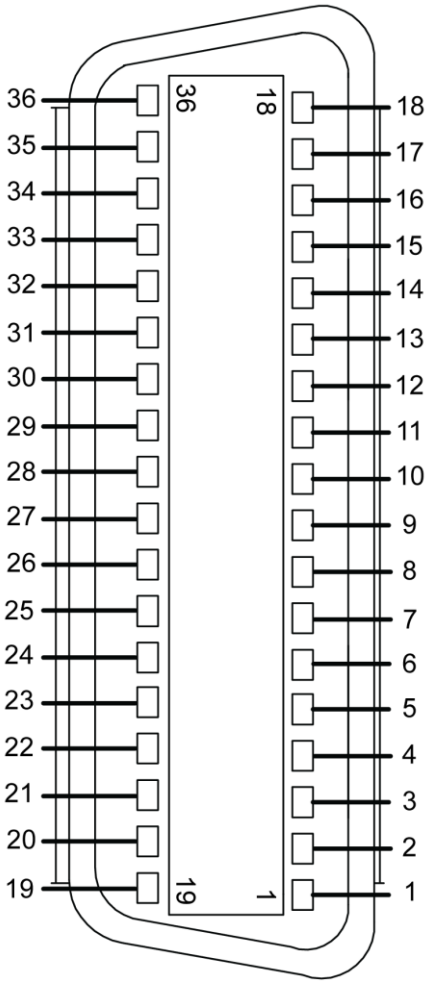
6-9-2. Card switch setting

SWITCH	BASIC	MOTION
NON-INVERT	HIGH	LOW
INVERT	LOW	HIGH

6-9-3. BCD OUT card specification

MAX Input Voltage	30V 500mA

6-9-4. BCD OUT card connection



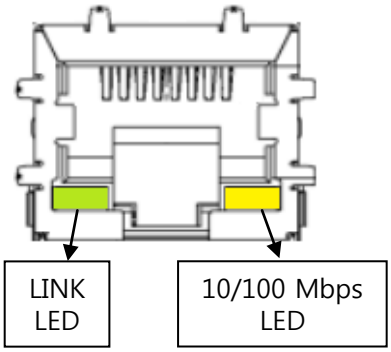
Role	Pin No.	Role	Pin No.
1X1	19	4X10000	28
2X1	2	8X10000	11
4X1	20	1X100000	29
8X1	3	2X100000	12
1X10	21	4X100000	30
2X10	4	8X100000	13
4X10	22	COM	32
8X10	5	Net-weight (HIGH)	31
1X100	23	Total weight (LOW)	31
2X100	6	GND	1, 14
4X100	24	Disuse	15
8X100	7	Decimal point 0.000	33
1X1000	25	Decimal point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

6-10. Ethernet card

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

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

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



6-11. SD memory card

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

.

6-11-1. . Saving format (File name: YYMMDD.CSV (Ex: 140728.CSV))

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

6-11-2. Grand-total weight format (파일명: TYYMMDD.CSV (Ex: T140728.CSV))

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

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

6-11-3. Recommanded model

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

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

6-12. Option card combination

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

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

7. Error & Treatment

7-1. Load Cell Installation

Error	Cause	Treatment	Remarks
Weight Value is unstable	1) Load cell broken 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	Load cell Output wire (SIG+, SIG-) is switched	Make wire correction	
"UN PASS" display	Load cell broken or Indicator connection Error	Load cell Check Load cell connection Check	
	Power was "ON" when some weight is on the load cell.	Remove weight on the Load cell	
"OL" or "UL" display(Over Load)	1) Load cell broken or Indicator connection Error 2) Loading over than Max Capacity	1) Load cell Check 2) Load cell connection Check 3) Remove over loaded weight	

7-2. Calibration Process

Display	Cause	Treatment
Err01	When Max capacity/digit value is over 20,000	Re-input the Max Capacity, less than 20.00 (Max Capacity / Digit)
Err04	Standard weight value is over than Max Capacity	Re-input Standard weight value with Number keys, under Max Capacity
Err05	Standard weight value is less than 10% of Max Capacity	Re-input Standard weight value with Number keys, more than 10% of Max Capacity
Err06	Amp. Gain is too big	Check standard weight's weight with set value. If there is difference between set value and real weight, please re-input the value (set value is too small)
Err07	Amp. Gain is too small	Check standard weight's weight with set value. If there is difference between set value and real weight, please re-input the value (set value is too big)
Err08	Under "F-function" model, set value is "N.A"	Check the correct value and re-input
Err-A	When there is continuous vibration on the weighing part,, indicator cannot process calibration any more.	- Find vibration cause and remove - Load cell check - Load cell cable and connecting condition check

7-3. Digital Weighing Indicator

Display	Cause	Treatment
"CELL-Er" or "OVEr"	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. 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. 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. ※ Under "Normal Mode", if there are more than 20% loading of Max capacity, "**Un-Pass**" display will be appeared and indicator will stay until removing the load. ※Setting Back-up mode it can memory empty value, and it becomes set value without displaying" Un-pass")	1. If you set "Normal Mode", please check weighing part empty or not before turn on the power. If there are some materials in/on weighing part, please remove those materials and turn on the power. 2. Please try to set F-function 102-02(Back-up) mode so that the indicator can remember first empty value.
"SEt"	When Power is on, "SET" displays. It means EEPROM has some problem.	Please contact the distributor or Head Office.
"HALt"	H/W has some problem.	
"t-Err"	The dead Battery	

※ Under "CELL-Er", Zero key, Tare key, Hold key and print key will not be activated.

WARRANTEE CETIFICATION

This product is passed "Sewhacnm's strict quality test.
If there is defect of manufacturing or abnormal detection within warrantee period, please contact our Agent or Distributor with this Warrantee certificate.
Then, we will repair or replace free of charge.

WARRANTEE CLAUSE

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

2. Warrantee Exception Clause

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

3. Other

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

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Bucheon-si, Gyeonggi-do, Korea
Made in KOREA
Website : http://www.sewhacnm.co.kr ,
Email : sales@sewhacnm.co.kr

Product	Digital Weighing Indicator
Model	SI 400
Serial No.	
AUTHORIZED STAMP