CE

Approved for Digital Weigh Indicator

Digital Weighing Indicator
SI 480

Instruction Manual

SEWHACNM
주식회사 세화씨엔엠

Ver. 1.16

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.

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

Email : info@sewhacnm.co.kr , sales@sewhacnm.co.kr

2. INTRODUCTION

2-1. Introduction

Thank you for your choice of this SI480 Industrial Digital Weighing Indicator.

This SI480 model is high-performance weighing Indicator.

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

with "SI 480" 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 480 model is the standard 1/8 DIN SIZE and compact enough, so it is easy to install.
2. It has wide range of DC Input.
3. Front panel is covered with Polycarbonate film, strong against dust and water.
4. RS-422/485 serial port standard installed,

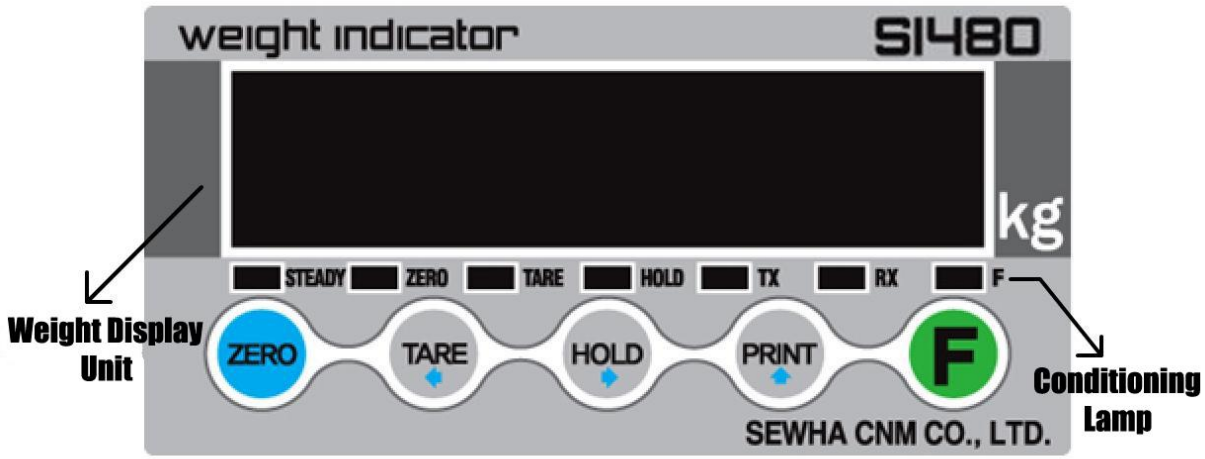
3. SPECIFICATION

3-1 Specification

Content			Specification
Performance	External Resolution		1/20,000
	Internal Resolution		1/2,097,152 (±1,048,576)
	Input Sensitivity		0.1μV/V
	Max. Signal Input Voltage		-3.00mV/V to +3.00mV/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/℃
	Linearity		0.001% of Full Scale
	Analogue Sampling(sec)		60times / sec
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 (Without Test Weight)
	Display		6 digit, 15mm(0.6inch) Red Color FND
	Key Pad		5EA Standard Key
	Additional Digital Input		2pcs addable
Communication	Serial Interface(RS-422/485)		Data Transference Command Mode Serial Printer Mode
Power	Input Power DC 24V Power Consumption MAX 8W		
Size	96mm(W) x 48mm(H) x 135mm(D) Including Connector		Weight : 300g

3-2. Front Panel

3-2-1 Front Panel (Display / Key Pad)



3-2-2. State Lamp

STEADY	When the weight is "STEADY", Lamp is ON.
ZERO	When the current weight is "ZERO", Lamp is ON.
TARE	"TARE" function is set, Lamp is ON.
HOLD	"HOLD" function is set, Lamp is ON.
TxD	When the Indicator transmits Serial communication data (Print data), Lamp is ON.
RxD	When the Indicator receives Serial communication data, Lamp is ON.

3-2-3. Key Operation

ZERO	1. Normal Mode : Make Weight value as Zero. (F07, F08 setting) 2. Calibration Mode : Cancel the value or move to previous step. 3. F-Function setting : Cancel 4. Set point setting : Cancel 5.Test Mode 1 : Cancel or move to previous step 6.Test Mode 2 : Cancel or move to previous step 7.Set up Mode : Cancel
TARE	1.Normal Mode : Set the TARE Function .(F09 setting) 1st input : "TARE", 2nd input : "TARE Reset" (When "HOLD" or weight value is ZERO, then this key doesn't work.) 2.Calibration Mode : Move to left 3.F-Function setting : Move to left 4.Test Mode 1 : Analog value check mode 5.Set up Mode : Enter F-FUNCTION Mode

	1. To set the "HOLD" Function (refer F10) [1st input : "HOLD", 2nd input : "HOLD Reset"] 2.Calibration Mode : Move to right 3.F-Function setting : Move to right 3. Under "SETUP" Mode, Enter into the "Calibration" Mode. 4.Test Mode 1 : Analog Variation value check mode 5.Set up Mode : Enter Calibration Mode. ※ Under HOLD setting first digit as "H"
	1. Normal Mode : Print out (refer F38, F32) 2.Calibration Mode :Increase set value 3.F-Function setting : Increase set value 4.Test Mode 1 : Key/Digital Input check mode 5. Set up Mode : Enter Test Mode. ※ If the printer is installed, under "F01-01 setting, when you press this key the current valued is increased. And the current weight is saved and print out, altogether. (Refer to CH.5-4)
	1.Normal Mode : Press this key 4times, within 2secs, enter "SET-UP" mode. 2.Calibration Mode : Enter 3.F-Function setting : Save the value go to next step 4.Test Mode 1 : Standard serial interface test mode 5.Set up Mode : Set point setting Mode.

●Setup Mode :It is a mode can SET UP the calibration, Function of SI480 .(refer to CH5. SET UP)

3-2-4. Hot key (with F key)

	Continuous "TARE" setting (From the second TARE setting, use this key)
	If the Printer is installed, You can print out the "Grand-total data". (GRAND-total data can be checked though Print output).

Tip

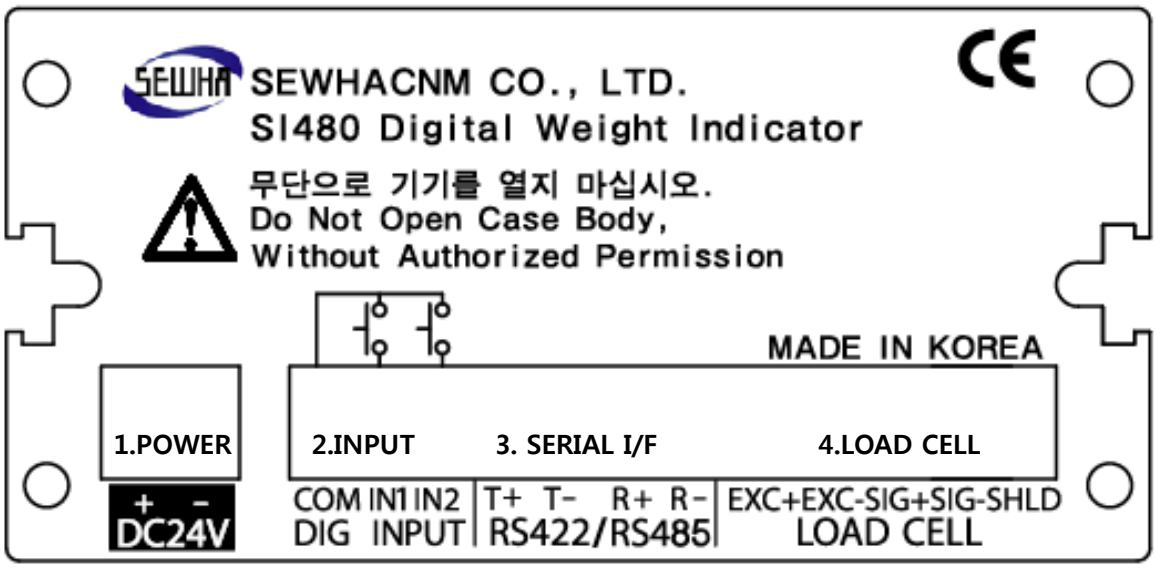
Max. accumulated weighing count : 999,999times

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)

3-3 Rear Panel



1. Power AC IN: 18V~24V (Power : 24V 1A recommended)

2. External Input terminal: Standard tow port (Refer to F-Function F14, F15 to select desired function of each input terminals)

3. Serial Interface terminal : Stand serial port is RS485

Communication Method	TX+ Terminal	TX- Terminal	RX+ Terminal	RX- Terminal
RS – 422(Standard)	TX+	TX-	RX+	RX-
RS – 485(Standard)	Not used	Not used	RTX +	RTX-
RS – 232(Optional)	Not used	Not used	TX	RX

4. Load cell Input

EXC+	EXC-	SIG+	SIG-	SHIELD

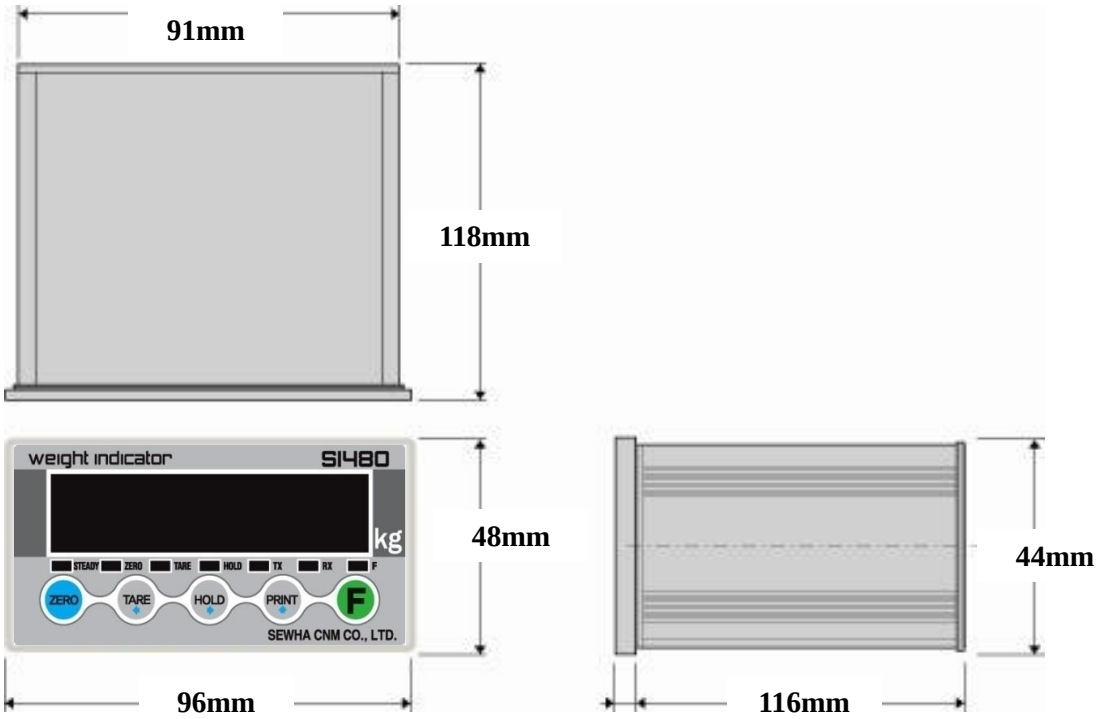
Please check the Comm. and other specification in the label, attached on the cover plate first, and make connection according to that information.

Caution

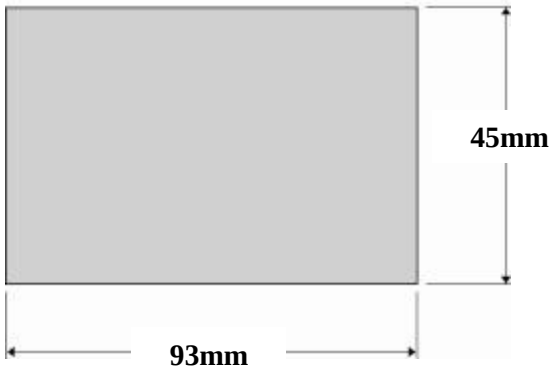
4. INSTALLATION

4-1. External Dimension & Cutting Size

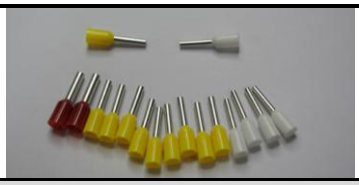
External Dimension (unit: mm)



Cutting Size (unit : mm)



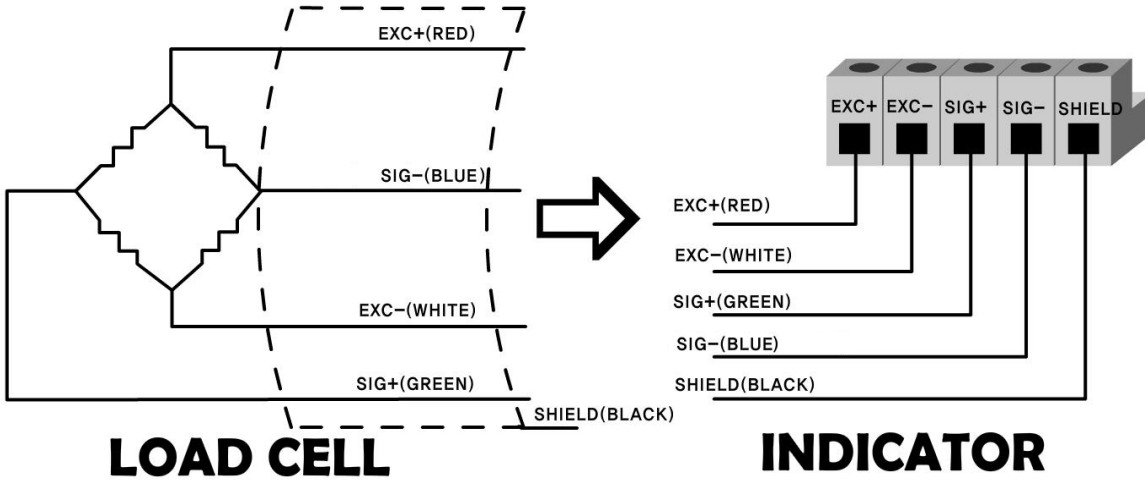
4-2. Installation Components

		
SI480	Open End Header Connector (2EA)	Isolated Pen hole terminal(14EA)

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.



※ Load cell wire color can be changed without prior notice.

Caution

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

Load Cell Installation

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

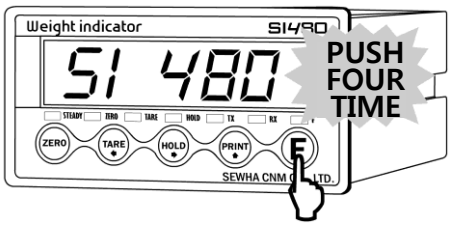
5. SET-UP

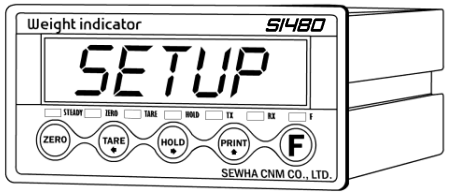
5-1. Set up mode

This is the Menu which can set the all of the functions.

There may be some display differences between real and on the manual.

5-1-1. Start "SET UP" Mode (Pass Word Not use)



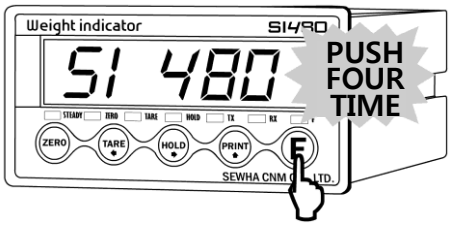


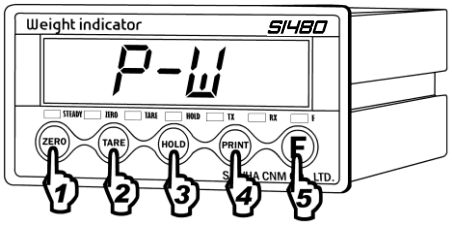
Press F key four times within 2sec

When "SET UP" is displayed, SETUP Mode is activated

5-1-2. Start "SET UP" Mode (Pass Word Use – Refer F-function 95)

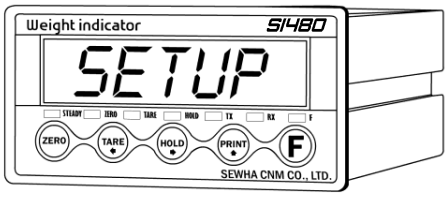
-SETUP모드 잠금키 설정 시(F95 참조)

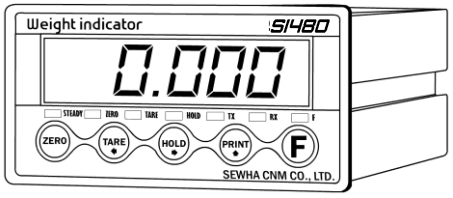




Press F key four times within 2sec

If "P-W" displays, input 4 chracters password.





If Password is right, "SETUP" Mode starts.

If Password is wrong, it is back to weighing display.

If you set password by "F95". "TEST" mode, you cannot start "SETUP" Mode without password.

Please don't forget the pass word.

After starting "Calibration" mode, and "Test" mode, serial I/F will be closed.

■ Adjusting “ZERO” Balance(Calibration)

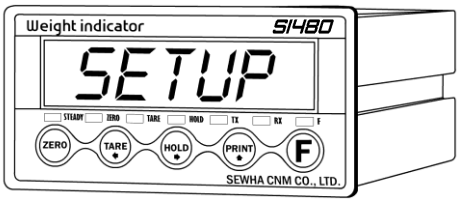
Adjust weight balance between “Real weight” on the load cell(Weight Part) and “Displayed weight of Indicator”. When you replace LOAD CELL or Indicator, you have to Calibrate process once again. (When you start calibration mode, TARE, HOLD & PRINT will be reset.)

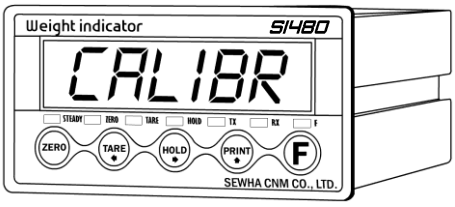
Before processing calibration, please warm up the indicator during 15 min to guarantee more preciseness.

Calibration Key				
ZERO	TARE	HOLD	PRINT	F
CANCLE / BACK	Move to left	Move to right	Increase set value	ENTER / SAVE

5-2 Test Weight Calibration Mode (Using test weight)

5-2-1. Start Test Weight Calibration Mode



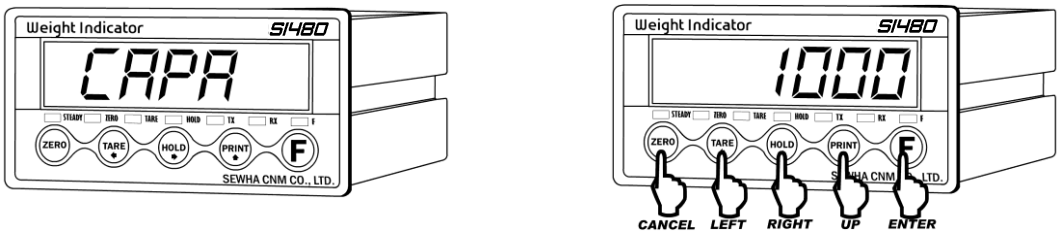


Under “SETUP” displays then Press HOLD key.

If **“CALIBR”** displays, press TARE key, Then Test Weight Calibration Mode starts.

※ If you set password through “F95”, you have to input the pass word.

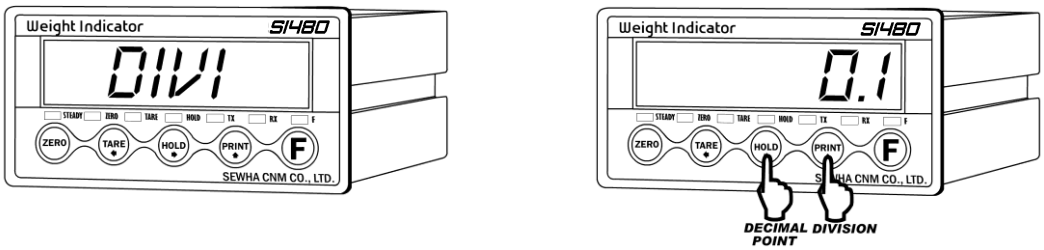
5-2-2. Setting “Capacity of weighing Scale”



After displaying “CAPA”, input max capacity with keys & Press F key to save & move to next step.

Tip If you want that set Max capa is 1,000kg, then just input “1000”.
You don’t need to consider Division value.

5-2-3. “Decimal Point” and “Digit / Division” Value



After “DIVI” displays, set Decimal point with HOLD key.

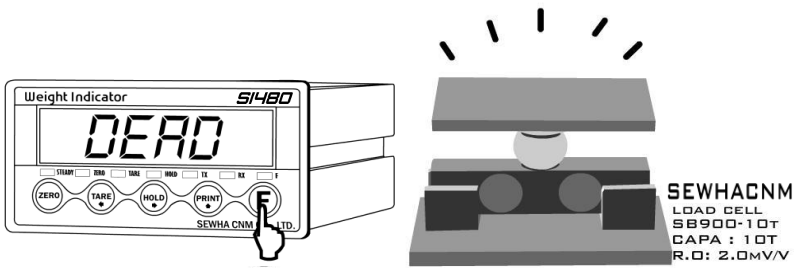
Whenever pressing HOLD, Decimal point will be changed. Please stop on optional position.

And set Division values with PRINT key, Finally press F key to save.

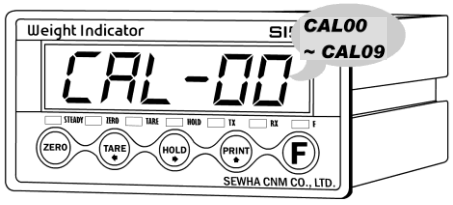
Tip Max. Decimal point will be 0.001, and division can be selectable among 1, 2, 5, 10, 20, 50.
Digit and Decimal point must be fulfill the below condition.
- (Max. capacity value / division value) cannot be more than 20,000.

If this condition is not fulfilled, “Err-1” will be displayed and the step moves back to Capacity setting mode.

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



When "DEAD" displays, press F key, then indicator will calculate Dead weight of scale part automatically.

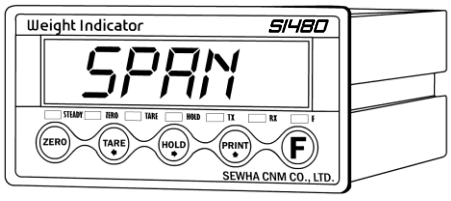


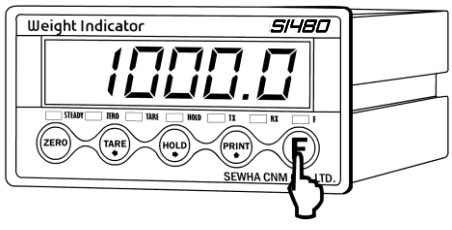
Indicator will search "DEAE weight" during 10~20 secs automatically to find the best condition.

※ Over than 1/10,000 resolution setting,
To guarantee the preciseness, DEAD weight calculation(CAL00~CAL09) will be operated twice.

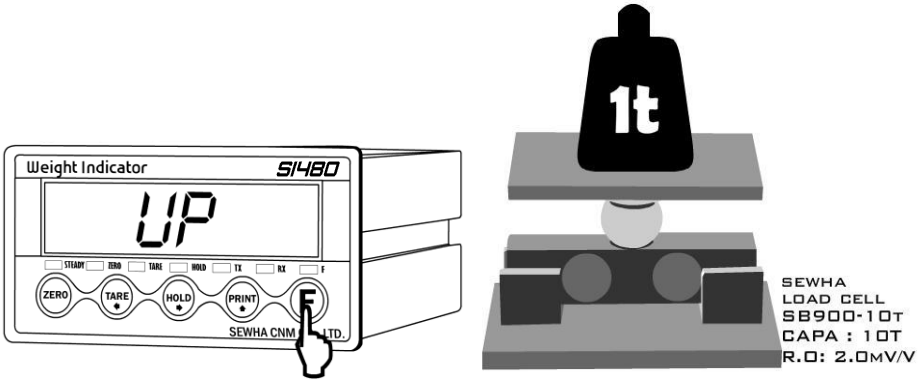
Tip In this step, if there is some force or Vibration on scale part, these unstable conditions will be continued, "ErrorA" will be displayed, and "DEAD value" will not be calculated. Under this condition, please remove the cause of force or vibration and process it again.

5-2-5. Input Test Weight value and Calculate SPAN value.

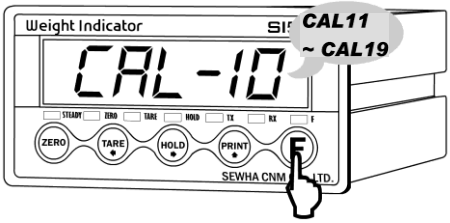




If "SPAN" is displayed, input "Test Weight" capacity and press F key.



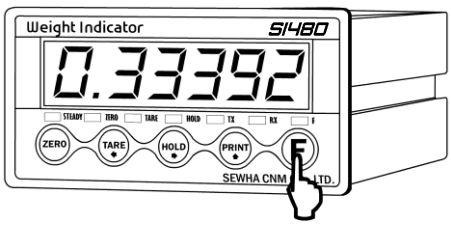
If "UP" is displayed, please load "Test Weight" on the scale part and press F key.

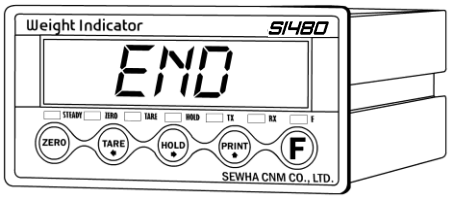


Calculate Span value during 10 ~20 secs, automatically.

※ Over than 1/10,000 resolution setting,

To guarantee the preciseness, Span calculation will be operated twice.





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

※This span value is not a weight value.

"END" is displayed and calibration is completed.

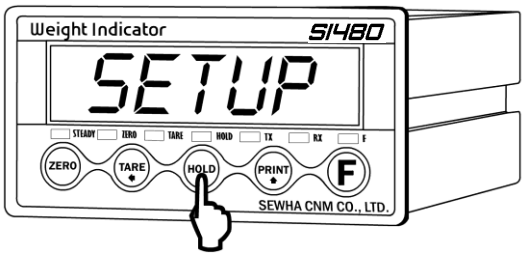
5-3. Simulation Calibration Mode(Calibrate without Test weight)

With this "Simulation Calibration Mode" you can make simple calibration without any "TEST weight"

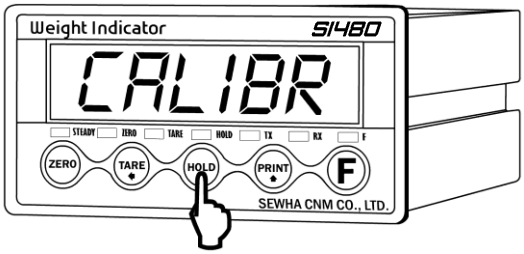
This calibration mode uses "Load cells' max capacity" and "Max. Output Rate(mV)", so the weight adjustment degree might be less than "Test weight Calibration".

The guaranteed resolution of this "Simulation Calibration" is 1/3,000.

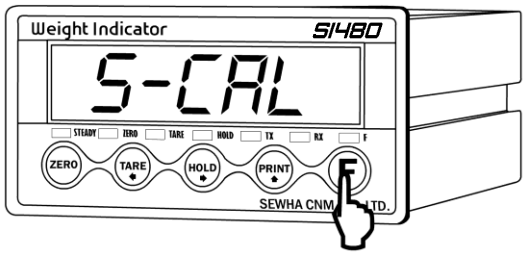
5-3-1. Simulation Calibration Mode Start



Under "SETUP" Mode, press HOLD key.

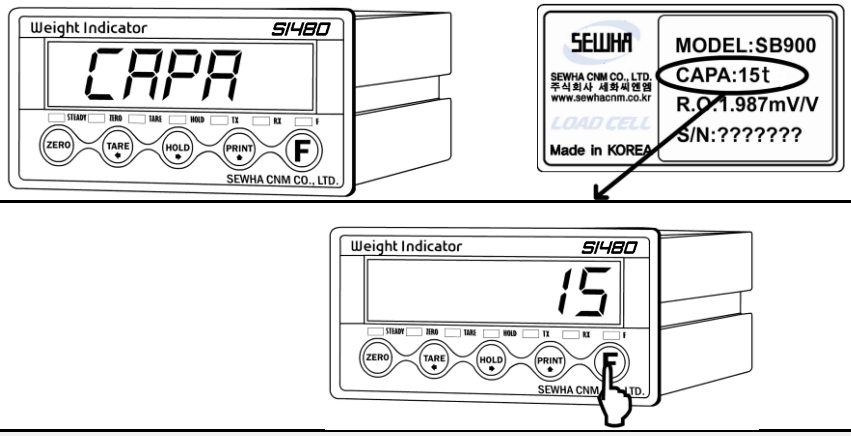


"CALIBR" displays, press HOLD key.



If "S-CAL" displays, press F key to start Simulation Calibration Mode.

5-3-2. Setting “Capacity of Load Cell”



After “CAPA” displayed, Check Max. Capacity of Load cell.

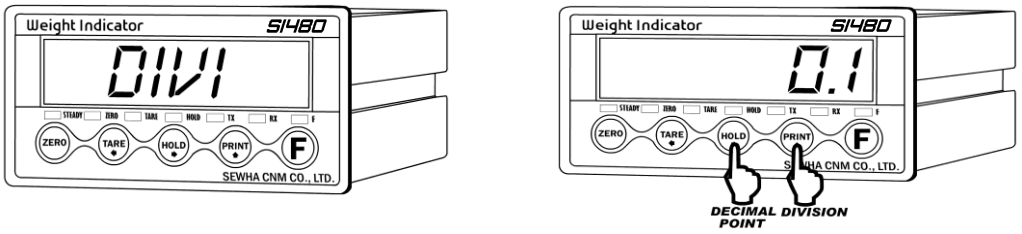
(refer the load cell label, or Test Report))

Input the Max. Capacity of Load cell. And press F key.

Tip In case of plural piece 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. capa is 1,000kg. Then, total Max. Capacity will be 4x1,000kg and you have to input 4,000kg.

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

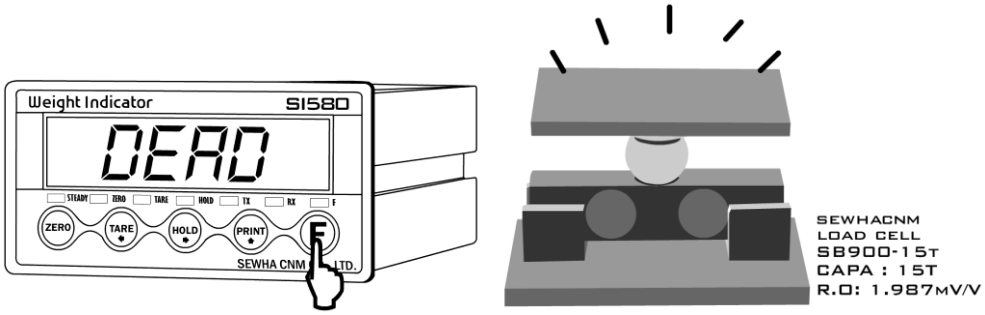


After “DIVI” is displayed select Decimal point with HOLD key.

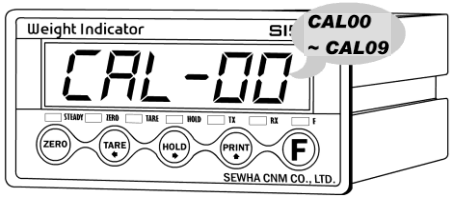
Please stop at the optimal position. And select optimal division with PRINT key.

Finally press F key to save and move to next step.

5-3-4. Measure the “DEAD Weight” of Weighing Scale.



“DEAD” is displayed. Please press F key with empty scale. Then the indicator starts to measure and find optimal “Dead weight value of Scale” automatically.

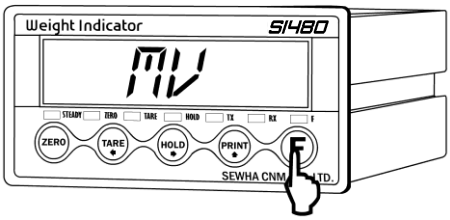


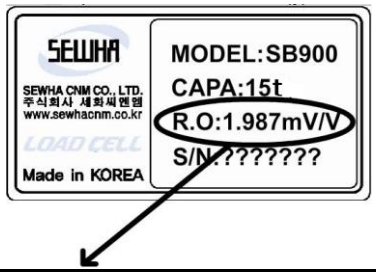
Over than 1/10,000 resolution setting,

To guarantee the preciseness, dead weight calculation will be operated twice.

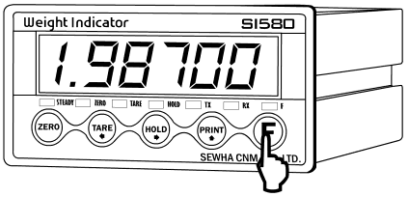
It takes 10sec or 20sec to get the best situation.

5-3-5. Input Max. Output (Rated Output Voltage / mV)

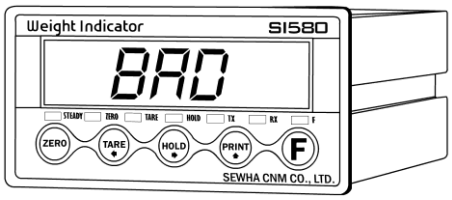




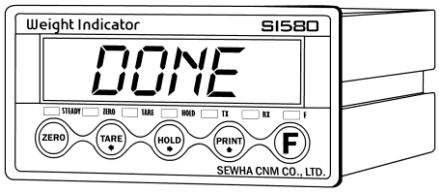
Input the output value load cell following fixed decimal point.



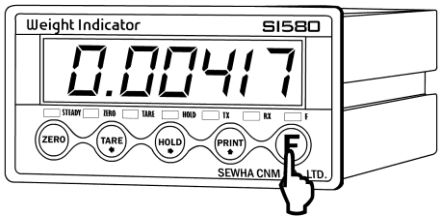
After displaying “**MV**”, input Load cell Output Rate(mV), referring the load cell label. And press F key to save



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



After finishing calculation, calculated "Span value" will be display with "DONE"



Now, the Simulation Calibration is done, press F key to complete the calibration process.

Tip

In case of plural piece 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 difference between **"State output rate"** and **"Real Output rate"** of load cell, there might be some weight difference after finishing calibration.

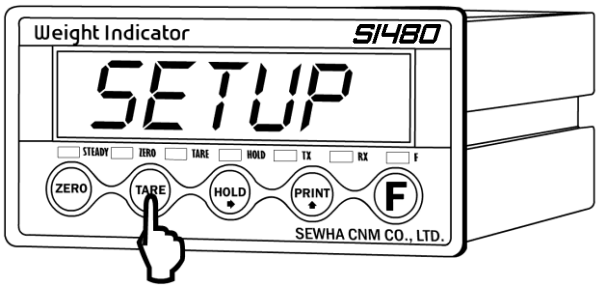
If you want to make more precise weighing process, please measure real output rate of load cell and input the measured value.

Then the weight measurement will be more precise than before.

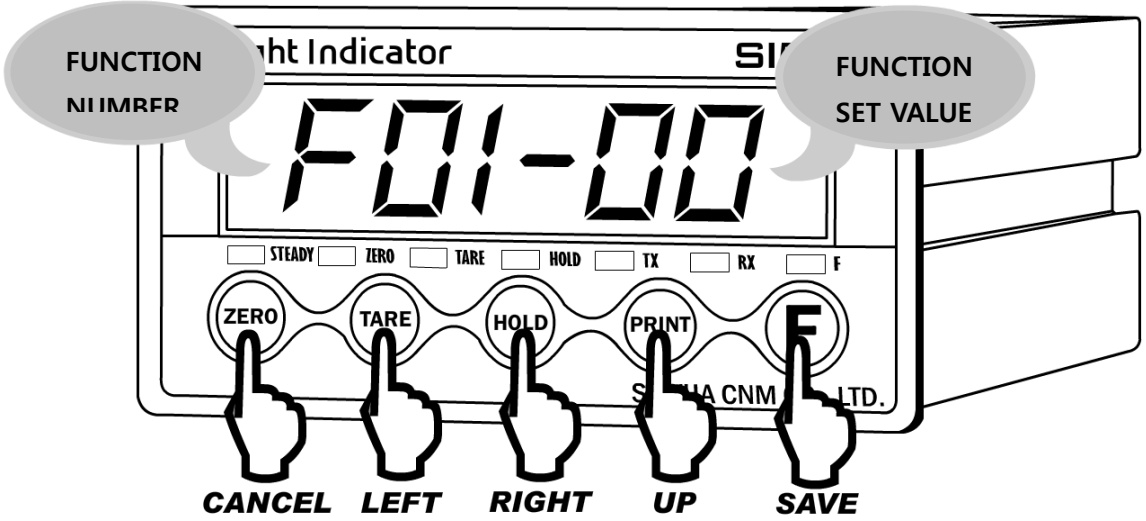
5-4. F-FUNCTION Setting

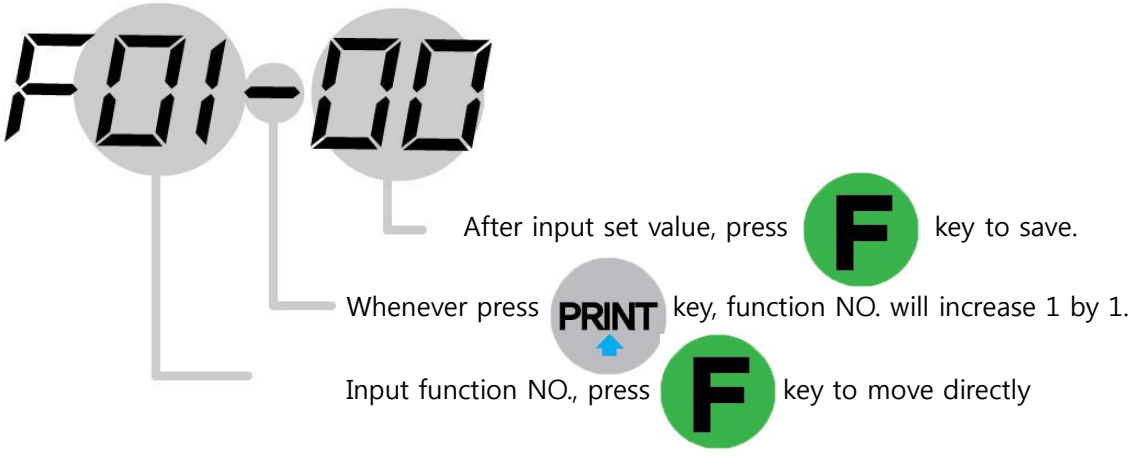
Set-up means set the F-function and make optimal operation of SI 480 Indicator.

Starting F-FUNCTION Mode



After Michael Yen "SETUP" press TARE key.





■ F-Function List

General Function Setting ("●" Factory default set value)

Weighing Data Save Method selection			
F01	●	0	Non-Save Mode (Weight Data & weighing counter)
		1	Save Mode (Weight Data & weighing counter)
Weight –Back up selection			
F02		0	Normal Mode
	●	1	Weight Back up Mode
Motion Band Range setting			
F03	05	01 ∫ 99	This is set "Steady" acceptable range of weighing part. If there is vibration on weighing part, you can set this function and reduce the vibration effect on weighing process. 1 : Weak vibration ~~ 99 : Strong Vibration
Zero Tracking Compensation Range setting			
F04	05	00 ∫ 99	Due to external causes (Temperature, wind, and dust), there will be small weight difference, the Indicator will ignore the weight difference and display as Zero.
Auto Zero Range setting			
F05	00	00 ∫ 99	Within the "Auto Zero" range, weighing part is steady, indicator will display current weight as "Zero" If the weighing part is not "Steady", indicator will display current weight. (Auto Zero Range : ± Set value + weight unit)
Digital Filter setting			
F06	04	0~40	0 (Weak vibration) ~ 40 (Strong Vibration)
Zero key Operation mode selection			
F07		0	Activate only under "Steady" condition
	●	1	Always activate
Zero key Operation Range selection : (-) value is same to (+)			
F08		0	Activated within 2% of Max. Capacity
		1	Activated within 5% of Max. Capacity
	●	2	Activated within 10% of Max. Capacity
		3	Activated within 20% of Max. Capacity

		4	Activated within 50% of Max. Capacity
		5	Activated within 100% of Max. Capacity
		6	There is no limit of Zero key operation range.
※ CAUTION : If setting over than 10%, The display weight could be over than Load cell input signal or Max. Capacity and it may display "CELL-Err" or incorrect weight value.			
Tare key Operation Range selection : (-) value is same to (+)			
F09		0	Activated within 10% of Max. Capacity
		1	Activated within 20% of Max. Capacity
	●	2	Activated within 50% of Max. Capacity
		3	Activated within 100% of Max. Capacity
"Hold" Mode selection			
F10	●	0	Peak Hold : Measure Max. weight value and hold on display.
		1	Sample Hold : Hold current weight until "Hold Reset"
		2	Average Hold : Hold average value (Refer F-F50)
"STEADY" condition check time setting			
F11	3	0 ∫ 9	During the set time period, estimate weighing part's "STEADY" condition and display. If you set small value, indicator will take "STEADY" fast, if you set value, indicator will take "STEADY" slow. (0.5sec per set value)
Display Up-Date speed setting			
F12	●	1	60/sec
		2	30/sec
		3	20/sec
		4	15/sec
		5	10/sec
		6	6/sec
		7	3/sec
		8	2/sec
		9	1/sec
Weight Display selection under "Unpass / OverLoad"condition			
F13		0	Not Display Weight (just "UNPASS" or "–OL-" is displayed)
	●	1	Display Weight (with a flash)

External Input Selection 1 (IN1) – Input Terminal No.1			
F14	●	0	ZERO
		1	TARE
		2	TARE RESET
		3	TARE / TARE RESET
		4	HOLD
		5	HOLD RESET
		6	HOLD/HOLD RESET
		7	PRINT
		8	PRINT the amount
External Input Selection 2 (IN2) – Input terminal No.2			
F15		0	ZERO
		1	TARE
		2	TARE RESET
	●	3	TARE / TARE RESET
		4	HOLD
		5	HOLD RESET
		6	HOLD/HOLD RESET
		7	PRINT
		8	PRINT Grand total
Equipment No. setting – ID No.setting			
F18	01	01~99	ID No. setting with No. key. (01~99 settable)

■ Communication Mode Setting

Parity Bit selection Mode					
F30	●	0	DATA Bit (8 Bit)	STOP Bit (1 Bit)	Parity Bit (Non)
		1	DATA Bit (8 Bit)	STOP Bit (1 Bit)	Parity Bit (Odd)
		2	DATA Bit (8 Bit)	STOP Bit (1 Bit)	Parity Bit (Even)
		3	DATA Bit (8 Bit)	STOP Bit (2 Bit)	Parity Bit (Non)
		4	DATA Bit (8 Bit)	STOP Bit (2 Bit)	Parity Bit (Odd)
		5	DATA Bit (8 Bit)	STOP Bit (2 Bit)	Parity Bit (Even)
		6	DATA Bit (7 Bit)	STOP Bit (1 Bit)	Parity Bit (Odd)
		7	DATA Bit (7 Bit)	STOP Bit (1 Bit)	Parity Bit (Even)
		8	DATA Bit (7 Bit)	STOP Bit (2 Bit)	Parity Bit (Odd)
		9	DATA Bit (7 Bit)	STOP Bit (2 Bit)	Parity Bit (Even)

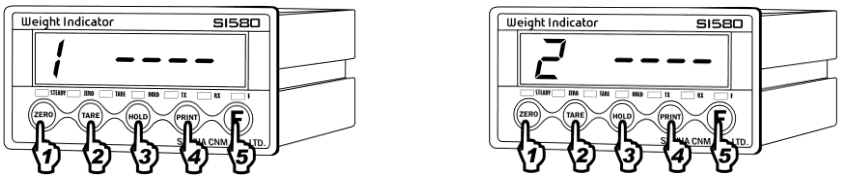
Serial Communication Speed selection			
F31		0	2,400bps
		1	4,800bps
	●	2	9,600bps
		3	14,400bps
		4	19,200bps
		5	28,800bps
		6	38,400bps
		7	57,600bps
		8	76,800bps
		9	115,200bps
DATA Transference Method selection			
F32		0	Simplex Mode / Stream Mode
	●	1	Duplex Mode / Command Mode
		2	Print Mode
"Check-Sum" detection selection (Under F32-01 setting, only)			
F34	●	0	Check-Sum Not Use
		1	Check-Sum Use
Under Stream Mode select the way transmit data protocol/frame (basic port)			
F35	●	0	Transmit by Protocol
		1	Transmit by frame (in case of using specific utility)
Caution : In case of "Transmit by frame" & under 14,400bps setting(F31), the speed of system will be slow.			
DATA Transference Mode selection (Under F32-00 setting, only)			
F36	●	0	Always
		1	Single time data transference, Whenever the weight is steady over Empty range.
		2	Single time data transference, at first steady point, over Empty range.
		3	Data transference, Whenever "Print" key input
DATA Transference Format selection (Under F32-00 setting, only)			
F37	●	0	Format 1 (recommended when use external display)
		1	Format 2. (Format 1 + ID No.)

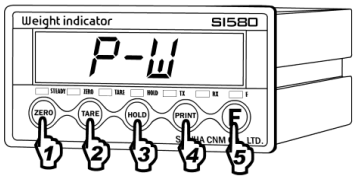
		2	Format 3. (recommended when connecting to PLC or PC)
		3	CAS Format
Print Mode selection (Under F32-02 setting, only)			
F38	●	0	Manual Print : Whenever "Print" key input.
		1	Auto print (at the first Steady point over "EMPTY" range or Whenever "Print" key input.)
		2	Auto print (Whenever Steady status at over "EMPTY" range or Whenever "Print" key input.)

■ Print Mode Setting

Weight Unit selection			
F41	●	0	Kg
		1	g
		2	t
Print Format selection			
F42	●	0	**Continuous Print -** Serial No. and Weight will be printed continuously.
		1	**Single Print -** Date, Time, S/N, ID No. Weighing Data will be print
SUB/GRAND Total Data Delete selection			
F44	●	0	Not deleted (= manual Delete mode)
		1	Automatically Deleted.-After print out SBU/GRAND Total.
Paper Withdraw Rate setting (After SUB/GRAND Total Print)			
F45	3	0~9	Whenever set value increased as 1, then 1 line will be added.
Paper Withdraw Rate setting (After Continuous/Single Print)			
F46	3	0~9	Whenever set value increased as 1, then will be added.
Printing Language Selection			
F47	●	0	KOREAN
		1	ENGLISH
Minus(-) symbol Print selection			
F49	●	0	Print minus(-) symbol, if the weight is minus(-).
		1	Ignore minus(-) symbol
Set time of "Average Hold"			
F50	3	0~9	When setting "Average Hold", set the time. (unit : sec) ※Automatic Hold Rest , After set time.

■ Other Setting Mode

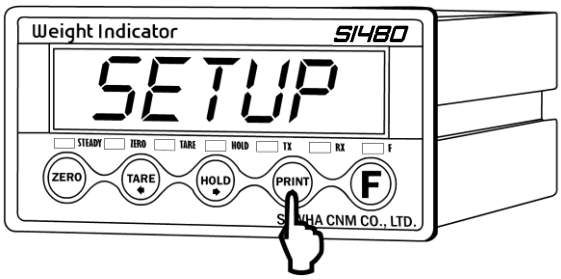
<table>
<tr><td colspan="3">EMPTY Range setting</td></tr>
<tr><td>F80</td><td>10</td><td>You can set “EMPTY” Range.
Ex) “0” setting : When Net Zero, “Zero” status lamp is ON.
“200” setting : Under “200”, “Zero” Status lamp is ON.</td></tr>
<tr><td colspan="3">TIME(H,M,S) Check / Change (every 24Hours)</td></tr>
<tr><td>F90</td><td colspan="2">Check Current DATE data or you can Change to new date</td></tr>
<tr><td colspan="3">TIME Check / Change</td></tr>
<tr><td>F91</td><td colspan="2">Check Current TIME data or you can Change to new time</td></tr>
<tr><td colspan="3">SETUP Mode Password Key Setting / Change</td></tr>
<tr><td>F95</td><td colspan="2">- Setting the password
 

1. When “1” displays, input 4 numbers
2. When “2” displays, input the 4 numbers once more. (recheck the password)
- Change the password
 

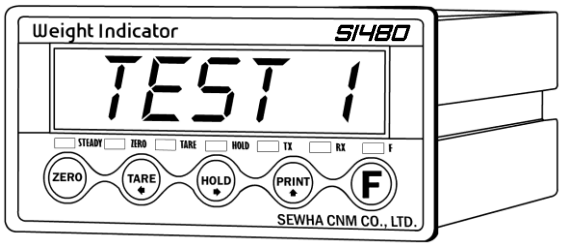
When “P-W” displays, input the previous pass word .
After this step is same to “setting password” step.
. Deactivate Lock setting
If you set password four times of F, it is unlocked.
When setting password you cannot start “SETUP” mode without password, do not forget your password.</td></tr>
<tr><td colspan="3">Program & Hard ware Version Check</td></tr>
<tr><td>F98</td><td colspan="2">Check the Program & Hard ware version
Ex) “100 1.04” means H/W : ver.1.00 & S/W : ver.1.04</td></tr>
</table>

5-5. Test Mode

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



Under "SETUP" mode, press PRINT key.



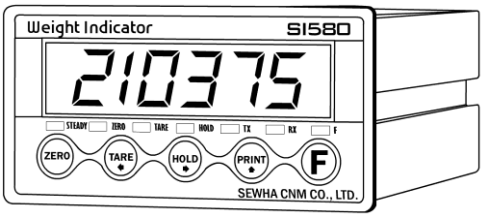
TEST MODE 1

TEST MODE 1				
ZERO	TARE	HOLD	PRINT	F
ESC / BACK	Analog value Check Mode	Analog Variation Value Check Mode	Key/Digital Input Check Mode	Standard serial port test mode

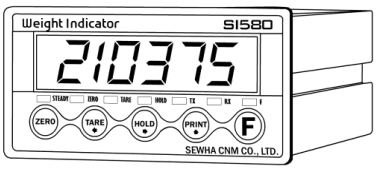
Tip **Caution** If there is no change although pressing keys or loading some force on/in weighing part , it may something wrong with load cell, cable, connector or A/D board

Test Mode 1

1) Analog Check Mode

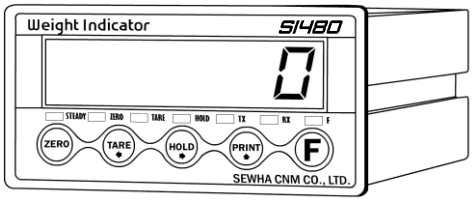


Under this mode, you can check analogue value to real digital value through Display. The last digital value can be fluctuated

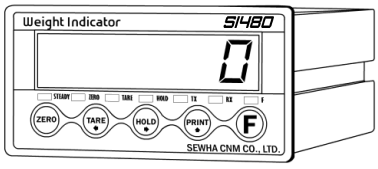


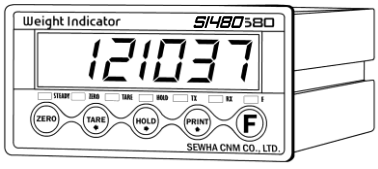
TARE **Displaying 1~100,000** HOLD **Displaying 10~1,000,000** PRINT **Displaying 100~10,000,000**

2) Analogue Value Check Mode



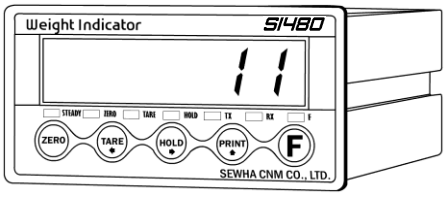
Under this mode, you can check the variation degree of analogue value .





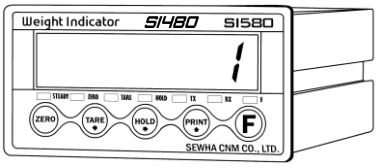
TARE **Zero Key** HOLD **Displaying 10~1,000,000** PRINT **Displaying 100~10,000,000**

3) Key / Digital input Test Mode

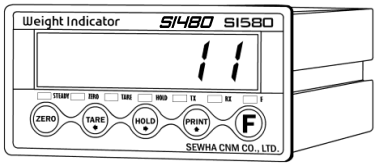


Under this mode, you can test Key input and Digital Key input test

Whenever pressing key pad or plus to digital input terminal, the matched No. will be displayed on the each position.

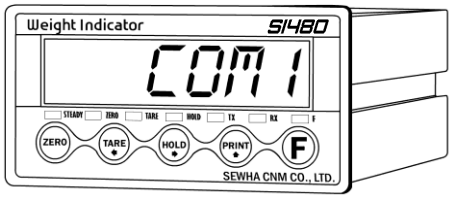


First display position is for key pad input



Second display position is for digital input

4) Standard Serial Interface Test Mode.



Connect with PC or other devices through serial interface and check the transference and receipt.
At the normal operation, display will be blinked.
To test this mode, please use "TESTING Protocol".

※ TESTING PROTOCOL.

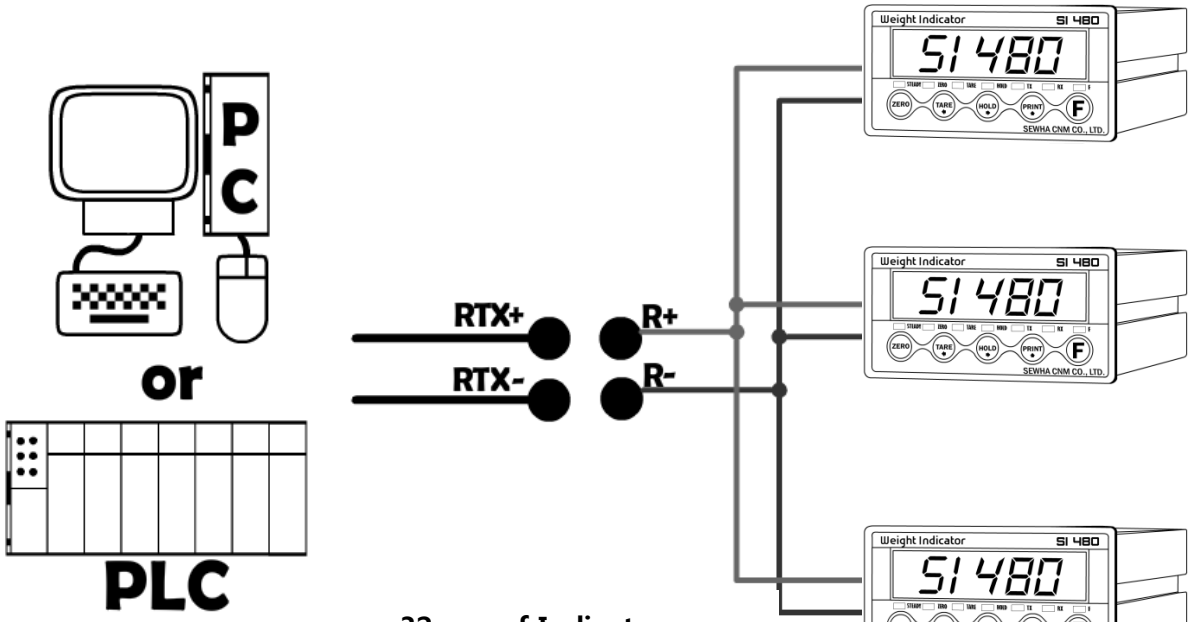
STX	0	1	T	E	S	T	ETX
02h	30h	31h	54h	45h	53h	54h	03h

8 Byte

※ If you send "Testing protocol" from PC to Indicator, at the normal operation Display will blink.

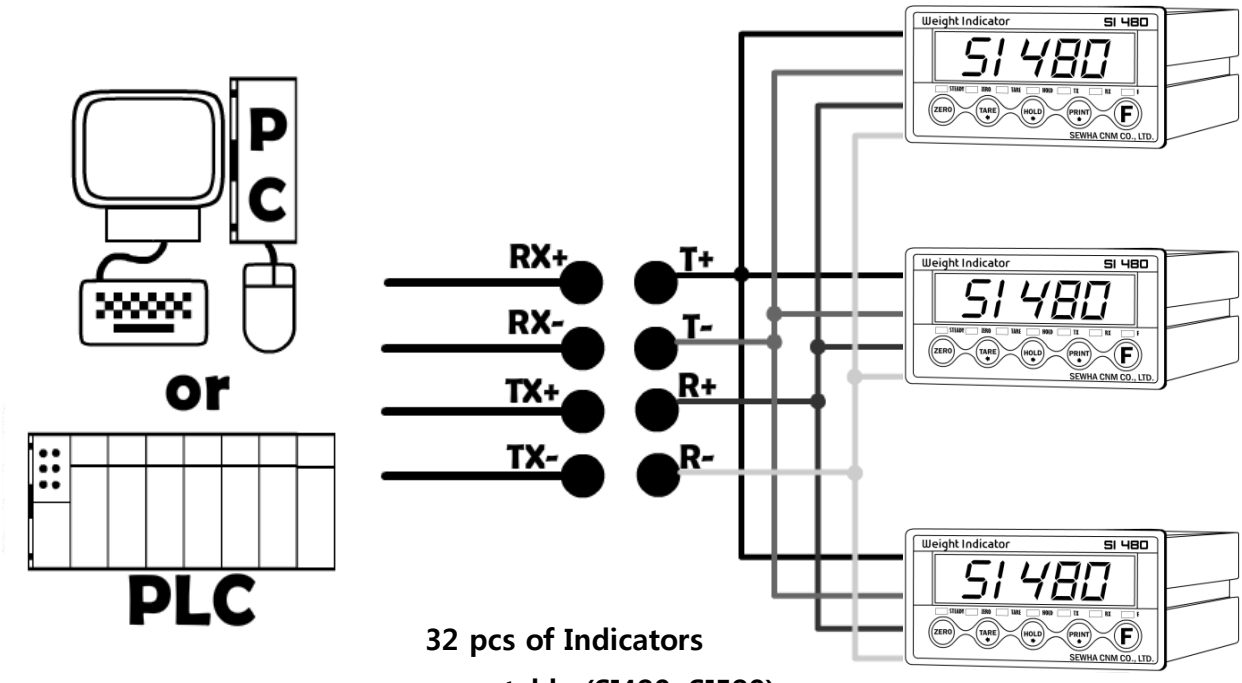
6. INTERFACE

6-1-1. Serial Interface (RS – 485 : Standard installed , Selectable)



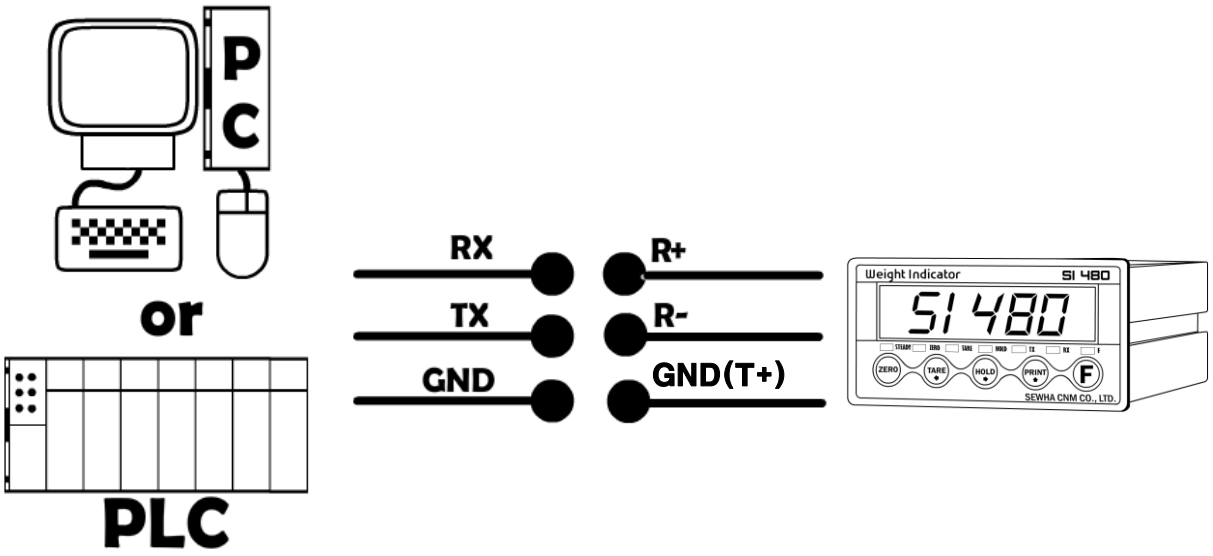
32 pcs of Indicators
are connectable (SI480, SI580)

6-1-2. Serial Interface (RS – 422 : Standard ,Selectable)



32 pcs of Indicators
are connectable (SI480, SI580)

6-1-3. Serial Interface (RS – 232 : optional)

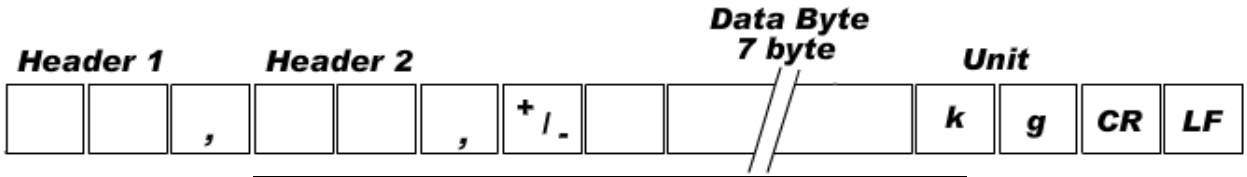


Caution

Serial communication interface is sensitive to electric noise.
Install isolated place from Power cable or other electric cables and wires, and please use shielded cable for better performance.

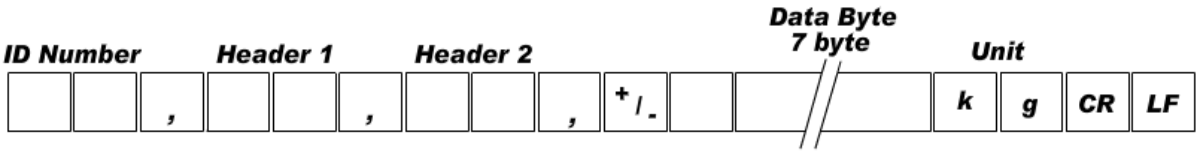
6-1-4. Data Format

1. Data Format1 : ID Number is not be transferred.(Refer "FUNCTION 37/F67-00" setting)



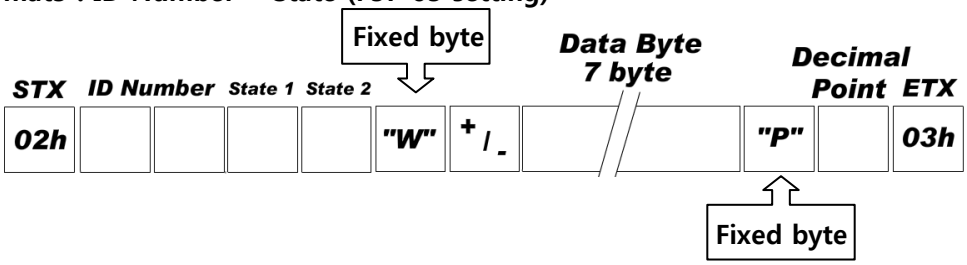
Header1	Header2
OL : OVER LOAD	NT : NET-WEIGHT(Tare is not set)
ST : STEADY	GS : when setting TARE
US : UNSTEADY	

2. Data Format2 : ID Number + Data Transference (Refer F-function 37-01, F18)



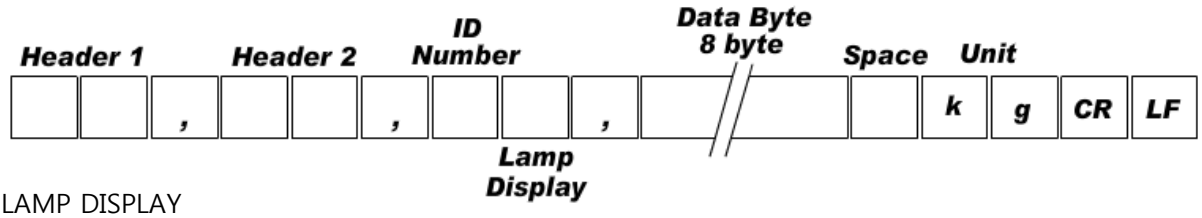
Header1	Header2
OL : OVER LOAD	NT : NET-WEIGHT(Tare is not set)
ST : STEADY	GS : when setting TARE
US : UNSTEADY	

3. Data Format3 : ID Number + State (F37-03 setting)



Header1	Header2
O : OVER	G : Gross weight
S : STEADY	N : Net weight
U : UNSTABLE	

4. CAS Format (22byte)



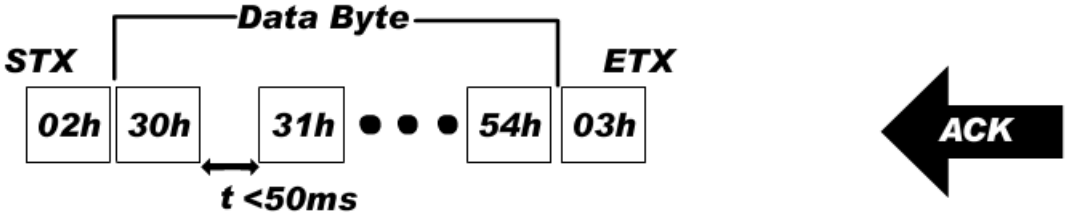
LAMP DISPLAY

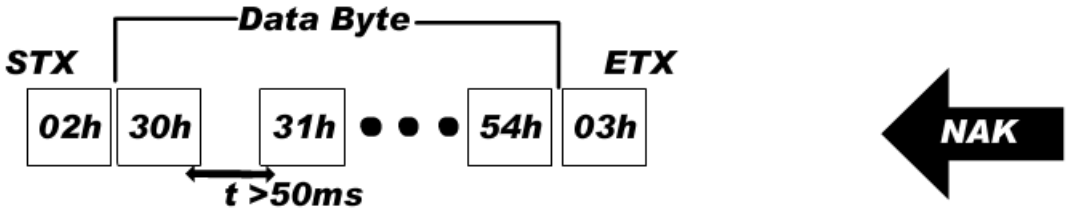
Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
1	0	1	1	1	1	1	1
1	STEADY	1	Hold	Print	Gross Weight	TARE	ZERO

Header1	Header2
OL : OVER LOAD	NT : GROSS weight
ST : STEADY	GS : Net weight
US : UNSTEADY	

6-1-5. Command Mode (F32-01 setting)

Under "Command Mode", Indicator will recognize the receipt of Order based on 02h(Header) and 03h(END) signal, and transfers ACK/ NAK).





※Although wrong value is transmitted, the communication format is matched, then ACK is transmitted.

Read Command

1.Current Weight data

ASCII : STX ID(2Byte) RCWT ETX	**HEX :** 02 30 31 52 43 57 54 03
SI 480 response	STX ID RCWT **State1(1byte) State2(1byte)** P **decimal point(1byte) +/-(1byte) Current weight(7byte) unit(2byte)** ETX
	State1 : O(Over load) , S(Steady), U(Unsteady) **State2 : N(Net weight), G(Gross weight), P+No. : decimal point number**

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

State1, State2, Decimal point

STX	ID		R	C	W	T	S	N	P	3	+	0	0	0	0	0	0	0	k	g	ETX
02h	30h	31h	52h	43h	57h	54h	53h	4Eh	50h	33h	2Bh	30h	30h	30h	30h	30h	30h	30h	6Bh	67h	03h

2. Indicator memory data

ASCII : STX ID(2Byte) RCWD ETX	**HEX :** 02 30 31 52 43 57 44 03
SI 480 response	STX ID RCWD P decimal point**(1byte)DATE(6byte) TIME(6byte) the no. of weighing (6byte) +/- TARE(7Byte) +/- current weight(7byte) unit(2byte)** ETX

Ex) DATE : Aug 12th,2009, TIME : 12:00:00, the no. of weighing : 10, TARE : 2.000kg, current weight : 3.000kg

decimal point

STX	ID		R	C	W	D	P	3	0	9	0	8	1	2	1	2	0	0	0	0
02h	30h	31h	52h	43h	57h	44h	50h	33h	30h	39h	30h	38h	31h	32h	31h	31h	30h	30h	30h	30h

0	0	0	0	1	0	+	0	0	0	2	0	0	0	+	0	0	0	3	0	0	0	ETX
30h	30h	30h	30h	31h	30h	2Bh	30h	30h	30h	32h	30h	30h	30h	2Bh	32h	30h	30h	33h	30h	30h	30h	03h

3. Grand Total data

ASCII : STX ID(2Byte) RGRD ETX	**HEX :** 02 30 31 52 43 57 44 03
SI 480 response	STX ID RGRD P decimal point**(1byte) the no. of weighing (6byte) Accumulated weight(10byte) unit(2byte)** ETX

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

decimal point

STX	ID		R	G	R	D	P	3	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	ETX
02h	30h	31h	52h	47h	52h	44h	50h	33h	30h	30h	30h	30h	31h	30h	30h	30h	30h	30h	31h	30h	30h	30h	30h	03h

4.Finished Weight data

ASCII : STX ID(2Byte) RFIN ETX	**HEX:** 02 30 31 52 46 49 4E 03
SI 480 response	STX ID RFIN P **decimal point(1byte) +/- Finished weight(7byte)** ETX

Ex) Finished weight : 2.000kg decimal point

STX	ID		R	F	I	N	P	3	+	0	0	0	2	0	0	0	ETX
02h	30h	31h	52h	46h	49h	4Eh	50h	33h	2Bh	30h	30h	30h	32h	30h	30h	30h	03h

5. Current time Data	
ASCII : STX ID(2Byte) RTIM ETX	**HEX:** 02 30 31 52 54 49 4D 03
SI 480 response	STX ID RTIM Current Time**(6byte)** ETX

Ex) Time : 12:00:00

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

6. Current date Data	
ASCII : STX ID(2Byte) RDAT ETX	**HEX :** 02 30 31 52 44 41 54 03
SI 480 response	STX ID RDAT Current Date**(6byte)** ETX

Ex) Date : Aug 12th ,2009

STX	ID		R	D	A	T	0	9	0	8	1	2	ETX
02h	30h	31h	52h	41h	41h	54h	30h	39h	30h	38h	31h	32h	03h

7. Tare data	
ASCII : STX ID(2Byte) RTAR ETX	**HEX :** 02 30 31 52 54 41 52 03
SI 480 response	STX ID RTAR P **decimal point(1byte) +/-(1byte) TARE value(7byte)** ETX

Ex) TARE : 2.000kg decimal point

STX	ID		R	T	A	R	P	3	+	0	0	0	2	0	0	0	ETX
02h	30h	31h	52h	54h	41h	52h	50h	33h	2Bh	30h	30h	30h	32h	30h	30h	30h	03h

Tip

Recommended Interval of READ COMMAND is min.60ms, 70ms is recommended, under 9600bps setting.

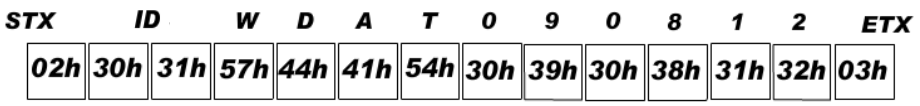
Min.60ms is required between each Read Command(under RCWD)

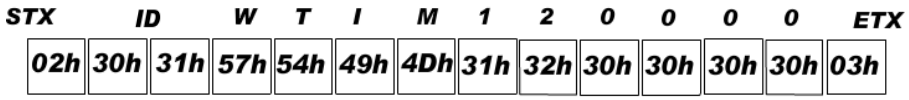
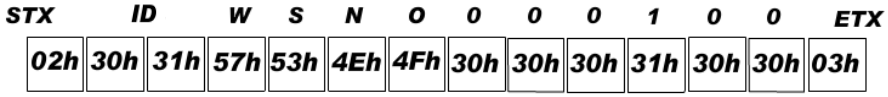
Min. interval is changed when data's length & speed are changed.

Min Interval : 20ms under 2400bps(RCWD)

Min Interval : 40ms under 115200bps (RCWD)

■Write Command

Zero (same as “ZERO” key)	
ASCII : STX ID(2Byte) WZER ETX	**HEX:** 02 30 31 57 5A 45 52 03
SI 480 response	normal: STX ID ACK ETX error: STX ID NAK ETX
TARE	
ASCII : STX ID(2Byte) WTAR ETX	**HEX:** 02 30 31 57 54 41 52 03
SI 480 response	normal: STX ID ACK ETX error: STX ID NAK ETX
TARE reset	
ASCII : STX ID(2Byte) WTRS ETX	**HEX:** 02 30 31 57 54 52 53 03
SI 480 response	normal: STX ID ACK ETX error: STX ID NAK ETX
HOLD	
ASCII : STX ID(2Byte) WHOL ETX	**HEX:** 02 30 31 57 48 4F 4C 03
SI 480 response	normal: STX ID ACK ETX error: STX ID NAK ETX
HOLD reset	
ASCII : STX ID(2Byte) WHRS ETX	**HEX:** 02 30 31 57 48 52 53 03
SI 480 response	normal: STX ID ACK ETX error: STX ID NAK ETX
PRINT **When transfer format, “F46 : plus line” and “F34 : checksums are not applied.**	
ASCII : STX ID(2Byte) WPRT ETX	**HEX:** 02 30 31 57 50 52 54 03
SI 480 response	normal: STX ID ACK ETX error: STX ID NAK ETX
PRINT grand total	
ASCII : STX ID(2Byte) WGPR ETX	**HEX:** 02 30 31 57 47 50 52 03
SI 480 response	normal: STX ID ACK ETX error: STX ID NAK ETX
Delete grand total	
ASCII : STX ID(2Byte) WGTC ETX	**HEX:** 02 30 31 57 47 54 43 03
SI 480 response	normal: STX ID ACK ETX error: STX ID NAK ETX
Date setting	
ASCII : STX ID(2Byte) WDAT current DATE (6byte) ETX	
Ex) Date : Aug 12th ,2009	
	
SI 480 response	normal: STX ID ACK ETX error: STX ID NAK ETX

Time setting	
ASCII : STX ID(2Byte) WTIM Time (6byte)ETX	
Ex) Time : 12:00:00  	
SI 480 response	normal: STX ID ACK ETX error: STX ID NAK ETX
Change S/N	
ASCII : STX ID(2Byte) WSNO S/N(6byte)ETX	
Ex) S/N is changed to 100  	
SI 480 response	normal: STX ID ACK ETX error: STX ID NAK ETX

Tip

Recommended Comm. Interval of WRITE COMMAND is Min. 100ms.

Comm. Interval of WPRT is Min.300ms

You have to guarantee Min. 100ms interval between two different commands.

Response for WPRT will be output through Print Port, set by F32-0.

■ Command Mode Example

READ COMMAND

Ex.) Current Weight Command(RCWT), ID No. : 01, Current Weight : 7,000kg

1) P.C Read Command Format (STX ID NO. RCWT ETX) **"Check-sum" not used.**

PC transmits to SI480

STX	ID No.	R	C	W	T	ETX
02h	30h	31h	52h	43h	57h	54h	03h

SI480 Response to PC

STX	ID	R	C	W	T	S	N	P	3	+	0	0	0	7	0	0	0	ETX
02h	30h	31h	52h	57h	52h	53h	53h	4Eh	50h	33h	2Bh	30h	30h	30h	37h	30h	30h	30h	03h

2) When PC requests to Indicator, Format(STX ID RCWT ETX) CHCEK SUM is used.

PC transmits to SI480

STX	ID	R	C	W	T	Check Sum	ETX
02h	30h	31h	52h	43h	57h	54h	41h	36h	03h

SI480 Response to PC

																	Check Sum			
STX	ID	R	C	W	T	S	N	P	3	+	0	0	0	7	0	0	0	5	A	ETX
02h	30h	31h	52h	57h	52h	53h	53h	4Eh	50h	33h	2Bh	30h	30h	30h	37h	30h	30h	30h	35h	41h	03h

WRITE COMMAND

Ex) SP1 Setting Command, ID No : 01, New SP1 Set value : 0.600kg

1) PC Write command format (STX ID WPR1 000.600 ETX) "**CHECK SUM" not use.**

PC transmits to SI480

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

SI480 Response to PC

STX	ID	ACK	ETX
02h	30h	31h	06h	03h

Normal operation

STX	ID	NAK	ETX
02h	30h	31h	15h	03h

Incorrect operation

1) PC Write command format (STX ID WPR1 000.600 ETX) **"CHECK SUM" use.**

PC transmits to SI480

STX	ID	W	T	I	M	1	2	0	0	0	0	C	A	ETX
02h	30h	31h	57h	54h	49h	4Dh	31h	32h	30h	30h	30h	30h	43h	41h	03h

SI480 Response to PC

			Check Sum			
STX	ID	ACK	6	C	ETX
02h	30h	31h	06h	36h	43h	03h

Normal operation

			Check Sum			
STX	ID	NAK	7	B	ETX
02h	30h	31h	15h	37h	42h	03h

Incorrect operation

Tip

All Read/Write command must be use "HEX CODE"..

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.

6-2 Serial Print (F32-02 setting) – RS-232 Serial 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.

Printing Format

Using the RS-485 or 422 interface, please use convertor and converts to RS-232 and connect with Serial printer.

If you use RS-232 serial interface, connect directly without any convertor.

English Format (F47-01)

```
============================
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(F42-00)

```
============================
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(F42-01)

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

Grand Total Print

(Grand Total Print delete setting, F44-01)

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. ±3 2. Output Resistance of "SIG+" and "SIG-" is about 350Ω. ±3.5 3. Isolate Resistance is more than 100Ω
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

Error	Cause	Treatment
Err 01	When Max.capacity/digit value is over 20,000	Re-input the Max. Capacity, less than 20.00 (Max. Capacity / Digit)
Err 04	Standard weight value is over than Max. Capacity	Re-input Standard weight value with Number keys, under Max. Capacity
Err 05	Standard weight value is less than 10% of Max. Capacity	Re-input Standard weight value with Number keys, more than 10% of Max. Capacity
Err 06	1. Amp. Gain is too big 2. Sig+ and Sig- wire connection error 3. Test weight is not loaded	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)
Err 07	1. Amp. Gain is too small 2. Sig+ and Sig- wire connection error 3. Test weight is not loaded	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)
Err 08	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 F02-01(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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Email : info@sewhacnm.co.kr

sales@sewhacnm.co.kr

Product	Digital Weighing Indicator
Model	SI 480
Serial No.	
AUTHORIZED STAMP