Digital Weighing Indicator
SI 200
Instruction Manual

SEWHACNM
주식회사 세화씨엔엠

Ver. 1.24

CONTENTS

1. BEFORE INSTALLATION

1-1. Caution / Warning Marks

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

1-2. Copy Rights

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③ This manual may be changed as the version is upgraded, without previous notice. You can get the information at our website.

1-3. Inquiries

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

Head Office : SEWHA CNM CO., LTD.

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

Email : sales@sewhacnm.co.kr

2. INTRODUCTION

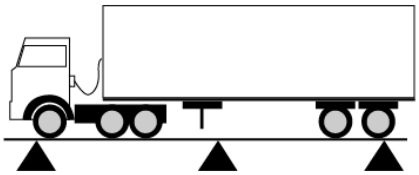
2-1. Features

- As a Wall / Rail Mounting type Indicator, it is convenient to set them at the narrow site because of the small size. Especially at the control panel it is very easy and gives you enough spaces.
- Polycarbonate film panel, strong for dust and water.
- RS-232/485 is standard for more serial interface.(Selectable)
- Data Back-up function for case of that when the power suddenly off.

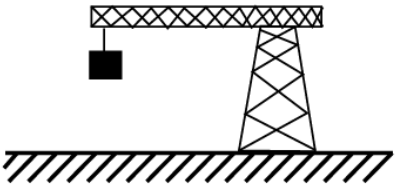
2-2. Specification

Content			Specification
Performance	External Resolution		1/20,000
	Internal Resolution		1/2,097,152 (±1,048,576)
	Input Sensitivity		Min 0.1μV/V
	Max. Signal Input Voltage		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	Test Weight Calibration Mode / Simulation Calibration Mode (Without Test Weight)		
	Display	6 digit, 7.6mm(0.3inch)Yellow green FND	
	4ea standard Key		
Comm.	Serial Interface (RS-232C/RS-485 selectable)		Data Transference Command Mode Serial Printer Mode
Power	Input Power DC 9 ~ 12VPower Consumption MAX 8W		
Size	49mm(W) x 96mm(H) x 41mm(D) -body , Weight : 140g		

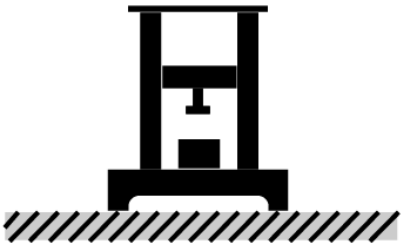
2-3. Application



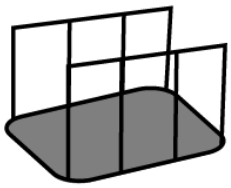
Truck Scale



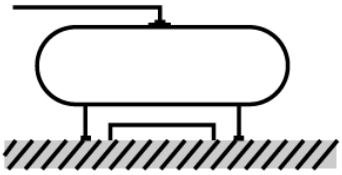
Crane Scale



Tester



Animal Scale



Tank Scale

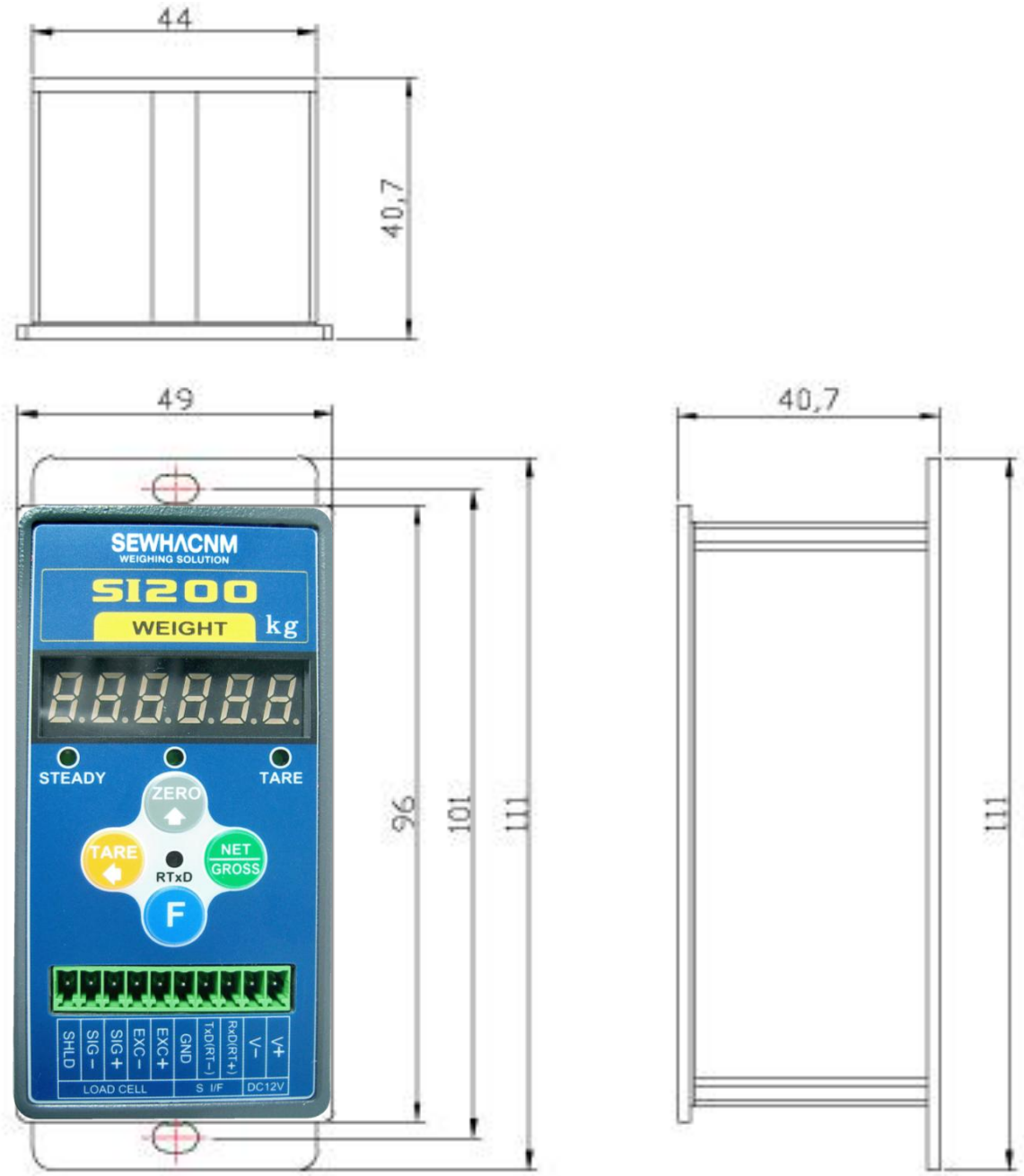
2-4. SEWHACNM 's other indicators

<table>
<tr><td rowspan="2">SI 4000series
  </td><td>SI 4000</td><td>SI 4010/R</td><td>SI 4100</td><td>SI 4200</td></tr>
<tr><td>Simple type</td><td>Simple /Controller</td><td>Universal Controller</td><td>Counter</td></tr>
<tr><td></td><td>SI 4300</td><td>SI 4400</td><td>SI 4410</td><td>SI 4500</td></tr>
<tr><td rowspan="3">SI 4630Simple/
Wall mounting
  </td><td>Checker</td><td>Packer</td><td>Filler</td><td>Accumulation Controller</td></tr>
<tr><td>SI 480</td><td>SI 580</td><td colspan="2" rowspan="2">SI 480/580 DIN Size
  </td></tr>
<tr><td>Simple Din size</td><td>Din size Controller</td></tr>
</table>

3. INSTALLATION

3-1. Dimension

(unit : mm)



3-2. Front Panel

3-2-1. Image

3-2-1. State Lamp

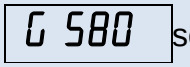
STEADY	When the weight is “STEADY”, Lamp is ON.
ZERO	When the current weight is ”ZERO”, Lamp is ON.
TARE	“TARE” function is set, Lamp is ON.
RTxD	RxD–Red, TxD-Green [F-39 setting]

3-2-2. Connectors

LOAD CELL					Serial Interface					POWER	
1	2	3	4	5	6	7		8		9	10
SHLD	SIG -	SIG +	EXC -	EXC +	GND	RS485	RS232C	RS485	RS232C	GND	DC +12V
						RTx -	TxD	RTx +	RxD		

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

3-2-3. Key Operation

ZERO	- Make Weight value as Zero. - Refer to F-07,F-08
TARE	- Set the TARE Function .(F09 setting) - Refer to F-14
F	- Press this key 4times, within 2secs, enter “SET-UP” mode. -Refer to F14, F15
NET GROSS	- Under “TARE” setting, you can select weight display mode. - First input, Gross Weight will be displayed, second input, Net weight will be displayed. ※ This key will be activated only under “TARE” set. In this case  set G(gross weight) will display in front of the value. -TARE RESET key (refer to F14)

- **HOT Key (with F key)**

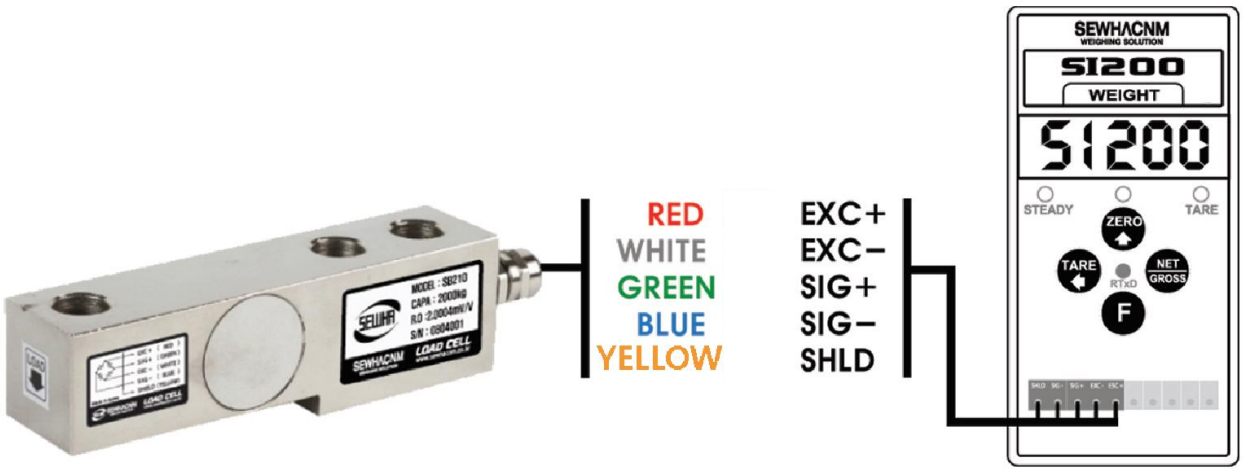
F + TARE	- TARE RESET (Refer to F 15) - PRINT (Refer to F15)
F + NET GROSS	If the Printer is installed, You can print out the “Grand-total data”. (GRAND-total data can be checked though Print output).

Max. accumulated weighing count : 999,999 times
Over 999,999times → return to “0” time
Max. accumulated weight display : 999,999,999
Over 999,999,999 → return to “0”

3-3. 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.

3-3-1. Load Cell Wiring



SI 200 wiring with SEWHACNM Load cell

When you use the load cell as tension type, you have to connect SIG+, SIG- crossed.
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.

Never do not weld near the load cells , Indicators or other devices.

3-3-2. Installation Cautions

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.

4. SET UP

● Entering each modes

Calibration	Test weight Calibration	CAL Switch → TARE
	Simulation Calibration	CAL Switch → ZERO → F
F-FUNCTION mode		F key 4times → TARE
TEST mode	Key TEST	F key 4times → ZERO → ZERO
	Analog board TEST	F key 4times → ZERO → TARE
	Communication TEST	F key 4times → ZERO → F

4-1. Calibration [Adjusting "ZERO" Balance]

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.

4-2. Test weight Calibration Mode

4-2-1. Step

Step		How to
1	Enter Calibration mode	Push CAL switch(top of the indicator)
2	Enter test weight Calibration mode	Input TARE key
3	Input the Rated Capacity (Rated.Capa or Max Capa)	Ex) 20kg
4	Input division (Minimum unit)	Ex) 0.001
5	ZERO Calibration	Without anything on the Load cell
6	SPAN Calibration	With the test weight over Max capa's 10% Ex) When R.C is 20kg, test weight must be over 2kg

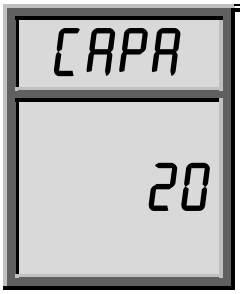
4-2-2. Test weight calibration Mode

1. Calibration Mode

Push CAL switch in normal mode.

When it displays press TARE key to enter test weight calibration mode.

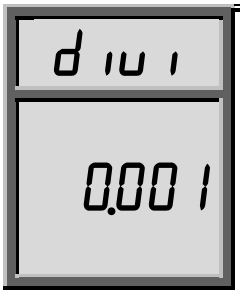
2. Rated Capacity[Max Capa]



It is step to set rated capacity or max capa.

Input the max capa(or rated capacity) with ZERO key & TARE. Then press F key to save it & move to next step. Ex) Max capa : 20kg

3. Division[Min unit)



It is step to set division[min unit].

Input the decimal point, digit, division(min unit) with ZERO key & TARE. Then press F key to save .. Ex) Division(min unit) 0.001kg.

4. ZERO Calibration

It is step to set ZERO(Dead) calibration, without anything on the load cell. and press F key.

ZERO calibration is processing for 10 seconds.

5. SPAN Calibration

It is step to set test weight information.

Input the weight of test weight (over 10% of Rated capa or Max capa), and press F key to save.

Load the test weight & input F key.

CAL-1	SPAN Calibration is processing for about 10 seconds.
0.4260 7	After calculation, when span value shows input F key to save.
End	All of the calibration step is over.

- **Pressing NET GROSS key means calcel, pressing F key means saving or going next.**

4-2-3. Test weight calibration cause & treatment

Err-1	It shows in case of $\frac{\text{Rated capa [Max Capa]}}{\text{Division[Min unit]}} > 20{,}000$. Ex) When Rated capa[Max capa] is 20,000kg , division[Min unit] cannot be under 1kg
Err-4	It shows when the Test weight > Rated capa[Max capa] →Then please re-input right value again. The more heavy test weight makes the more accurate measurement.
Err-5	It shows when the Test weight < 10% of Rated capa[Max capa] → Then Please re-input right value agian.
Err-6	Amp. Gain is too big Sig+/- wiring is connected wrongly. The test weight is not loaded.
Err-7	Amp. Gain is too small Sig+/- wiring is connected wrongly. The test weight is not loaded.
Err-A	there is vibration on the load cell or load cell wire, the indicator cannot calculate calibration anymore.

4-3. 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 $\frac{1}{3{,}000}$.

4-3-1. Simulation Calibration Step

	Step	How to
1	Enter Calibration Mode	Push CAL Switch
2	Enter Simulation Calibration mode	Input ZERO key & F key.
3	Input the Rated Capacity [Max Capa]	Ex) 150kg
4	Input division [Min unit)	Ex) 0.05
5	ZERO Calibration	Without anything on the Load cell
6	SPAN Calibration	Input the Rated Output value (mV/V) 예)1.987mv/V → input 1.98700

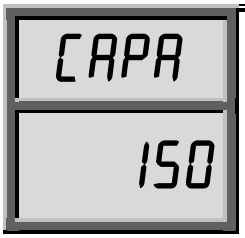
4-3-2. Simulation Calibration Mode

1. Calibration Mode

Push CAL switch in normal mode.

Press ZERO key & F key to enter simulation calibration mode.

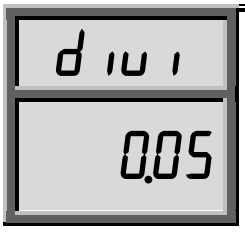
2. Rated Capacity(Max Capa)



It is step to set rated capacity(written on the load cell label)

Input the rated capacity with ZERO key & TARE. Then press F key to save it & move to next step. Ex) Max capa : 150kg

3. Division[Min unit)



It is step to set division[min unit].

Input the decimal point, digit, division(min unit) with ZERO key &

	TARE key. Then press F key to save .. Ex) Division(min unit) 0.05kg.

4. ZERO Calibration

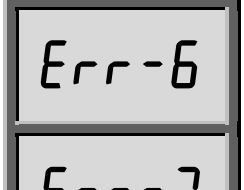
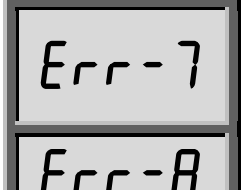
	It is step to set ZERO(Dead) calibration, without anything on the load cell and press F key.
	ZERO calibration is processing for 10 seconds.

5. SPAN Calibration

	It is step to input load cell's Rated Output voltage(R.O mV/V) written on the load cell label.
	Input load cell Rated Output(mV/V) with ZERO key & TARE key. Ex)In case of R.O is 1.987mV/V Input 1.98700
	SPAN calibration is processing for 10 seconds.
	After calculation, when span value shows, please input F key to save.
	All of the calibration step is over.

● **Pressing NET GROSS key means calcel, pressing F key means saving or going next.**

4-2-3. Simulation calibration cause & treatment

	It shows in case of $\frac{\text{load cell Rated Capa}}{\text{Division [Min unit]}} > 3{,}000$. Ex) When Rated capa[Max capa] is 150kg , division[Min unit] cannot be under 0.05kg.
	Amp. Gain is too big Sig+/- wiring is connected wrongly. The test weight is not loaded.
	Amp. Gain is too small Sig+/- wiring is connected wrongly. The test weight is not loaded.
	there is vibration on the load cell or load cell wire, the indicator cannot calculate calibration anymore.
	It shows when you input wrong R.O → then please input again right R.O value, after recheck the label of load cell and retry the process.

How to change max capacity after finishing simulation calibration

After push CAL switch, "SEt-CAL" shows then press ZERO key.
When "CAPA" displays input Max Capacity (which you need to use) and press F key to save it. Finally press NET GROSS key until normal mode comes.

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.

Load cell ‘s Rated Capacity [R.C] in Simulation Calibration mode

Rated Capacity means the value written on the load cell label. It doesn’t mean Max capa. Max capa & Rated Capa is not always same.
If you use 6 load cells and each Rated capa is 1tf.
→ Then the total Rated Capa is [6 x 1tf] → 6tf

SEWHACNM CO.,LTD. LOAD CELL SB210 type & LABEL

Load cell Rated Output voltage (R.O) mV/V

In case of that you use plural of load cells, input the average of all the load cells.

Ex) $\frac{\text{R.O1+R.O.2+R.O3+R.O4}}{\text{Total No.of load cells}} = \frac{1.987+2.023+1.993+2.120}{4} \fallingdotseq 2.030$ = average R.O.

Due to some variation between “State Rated Output” and “Real Rated Output” of load cell, there might be some weight difference after finishing calibration.
If you want to make more precise weighing process, please measure real Rated output of load cell and input the measured value. Then the weighing result will be more precise .

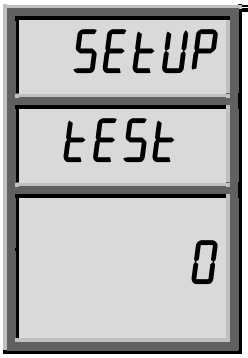
4-4. TEST Mode

TEST Mode can be used to test the basic state of the Keys, Analog board, Communication interface.

Before starting the TEST mode, please remove operating devices.

TEST mode	Key TEST	F key 4times in 2seconds → ZERO → ZERO
	Analog TEST	F key 4times in 2seconds → ZERO → TARE
	Comm TEST	F key 4times in 2seconds → ZERO → F

4-4-1. Key TEST



In normal mode press F key four times in 2seconds.

Input ZERO key to enter TEST mode, input ZERO key .

Whenever you push each keys, you the matched No. will show.

TARE: 1	ZERO: 2	F: 3,	CA Switch: 4	NET GROSS: Esc

If there is a key doesn't show any digit, it needs to be repaired

4-4-2. Analog Board TEST

In normal mode press F key four times in 2seconds.

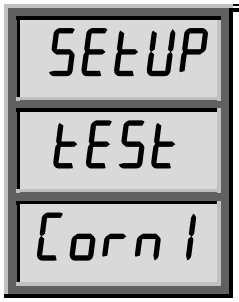
Input ZERO key to enter TEST mode, input TARE key .

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

TARE key is used to set ZERO, ZERO key is used to hide the cipher or to see he hidden cipher. Check the analog value by loading something on the plate.

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
This Analog test mode can be used to keep the balance at the wide platform.

4-4-3. Communication interface



In normal mode press F key four times in 2seconds.

Input ZERO key to enter TEST mode,

Input F key to enter Communication interface TEST mode.

Connect with PC or other devices through serial interface and check the transmit and receive. At the normal operation, display will be blinked.

To test this mode, please use following "TESTING Protocol".

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

8 Byte

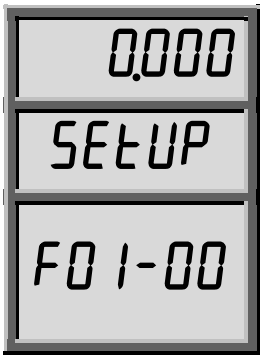
4-5. F-FUNCTION Mode

Set-up means set the F-function and make optimal operation of SI 200 Indicator.

4-5-1. Key operation in F-FUNCTION Mode

ZERO	TARE	F	NET GROSS
UP	LEFT	SAVE / ENTER / NEXT	ESC / CALCEL

4-5-2. F-FUNCTION Mode



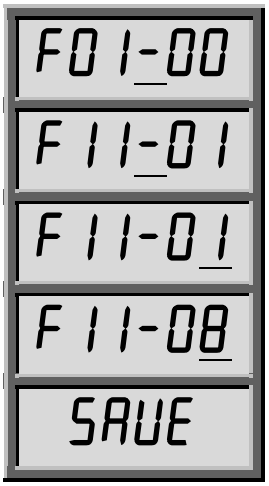
In normal mode press F key four times in 2seconds.

Input TARE key

When "Func" displays, F-Function mode starts from 01 .

Whenever you input ZERO key ,Function increases 1 by 1.

- **F11-01→ F11-08**



Press ZERO key to increase F- value.

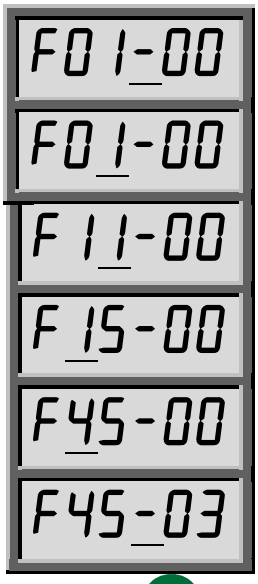
Press ZERO key 10 times until 11 shows up like left display.

Press TARE key until the cursor is under 1 .

Press ZERO key to make 8.

Press F key to save the value.

- **F01 → F45 directly**



Press ZERO key to increase F- value.

Press TARE key one time so that the cursor is under 1 .

Press ZERO key until 5 shows.

Press TARE key one time so that the cursor is under 1 .

Press ZERO key when " 1" is displays.

When F45 shows, input F key then F45-03 shows.

- **Pressing NET GROSS key means cancel, pressing F key means saving or going next.**

4-6. F-FUNCTION list

■ Function setting

F-NO	SETTING	Select	Default
F01	Weighing Data Save Method selection	0~1	1
F02	Weight-Back up Mode selection	0~1	0
F03	Motion Band Range setting	1~99	5
F04	Zero Tracking Compensation Range setting	5~99	5
F05	Auto Zero Range setting	0~99	0
F06	Digital Filter setting	0~40	4
F07	Zero key Operation mode selection	0~1	1
F08	Zero key Operation Range selection : (-) value is same to (+)	0~6	2
F09	Zero key Operation Range selection : (-) value is same to (+)	0~3	2
F10	“Hold” Mode selection	0~2	0
F11	“STEADY” condition check time setting	0~99	3
F12	Display Up-Date speed setting	1~9	1
F13	Weight Display selection under “Unpass / OverLoad”condition	0~1	1
F14	TARE key & NET GROSS key ‘s operation	0~2	0
F15	F key + TARE key Function	0~1	0
F18	Equipment No. setting – ID No. setting	1~99	1

■ Comm. Mode

F30	Parity Bit selection Mode	0~9	0
F31	Serial Communication Speed selection	0~9	2
F32	DATA Transference Method	0~2	1
F34	“Check-Sum” detection selection (Under F32-01 setting, only)	0~1	0
F35	Under Stream Mode select the way transmit data protocol/frame (basic port)	0~1	0
F36	DATA Transference Mode (Under F32-00 setting, only)	0~3	0
F37	DATA Transference Format (Under F32-00 setting, only)	0~3	0
F38	PRINT Mode selection (Under F32-02 setting, only)	0~2	0
F39	SERIAL Interface selection	0~1	0

■ Print Mode

F41	Weight Unit	0~2	0
F42	Print Format	0~1	0
F44	SUB/GRAND Total Data Delete selection	0~1	0
F45	Paper Withdraw Rate setting (After SUB/GRAND Total Print)	0~9	3
F46	Paper Withdraw Rate setting (After Continuous/Single Print)	0~9	3
F47	Printing Language	0~1	0
F49	Minus(-) symbol Print selection	0~1	0

■ Others

F80	EMPTY Range	0.010
F90	TIME(H,M,S) Check / Change (every 24Hours)	
F91	DATE Check / Change	
F95	SETUP Mode Password Key Setting / Change / Cancel	
F98	Program & Hard ware Version Check	

4-7. F-FUNCTION LIST

4-7-1. 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 Mode selection			
F02	●	0	Normal Mode
		1	Weight Back up Mode (ZERO, TARE value)
Motion Band Range setting			
F03	5	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	5	0 ∫ 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	4	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.

! If setting over than 10%, The display weight could be over than Load cell input signal or Max. Capacity and it may display "Cel-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	Sample Hold : Hold current weight until "Hold Reset"			
		1	Peak Hold : Display Max. weight until inputting HOLDRESET			
		2	Average Hold : Hold average value for 5 seconds			
"STEADY" condition check time setting						
F11	3	0 ∫ 99	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" slowly.(0.5sec per set value)			
Display Up-Date speed setting						
F12	●	1	60/sec		6	6/sec
		2	30/sec		7	3/sec
		3	20/sec		8	2/sec
		3	15/sec		9	1/sec
		5	10/sec			
Weight Display selection under "Unpass / OverLoad"condition						
F13		0	Not Display Weight only UNPASS / -OL- / OUEr is displayed.			
	●	1	Display Weight with UNPASS / -OL- / OUEr with a flash			
TARE key & NET GROSS key 's operation						
F14	KEY		**TARE key**	**NET GROSS key**		
	●	0	TARE/TARE RESET	HOLD/HOLD RESET		
		1	TARE	TARE RESET		
		2	HOLD	HOLD RESET		
F key + TARE key Function						
F15	●	0	PRINT			
		1	TARE RESET			
Equipment No. setting – ID No. setting						
F18	01	1~99	ID No. setting with No. key. (01~99 settable)			

4-7-1. 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			
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)
In case of “Transmit by frame” & under 14,400bps setting(F31), the speed of system will be slow.			

DATA Transference Mode (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 INPUT “Print” key input		
DATA Transference Format (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	When inputting F Key + TARE Key	
		1	Auto PRINT	When inputting F Key + TARE Key	At the first Steady point over “EMPTY” range
		2			Every Steady state at over “EMPTY” range
SERIAL Interface selection					
F39	●	0	RS-232C. (Side Switch UP)		
		1	RS-485 (Side Switch DOWN)		

● **Print Mode Setting**

Weight Unit			
F41	●	0	Kg
		1	g
		2	t
Print Format			
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.

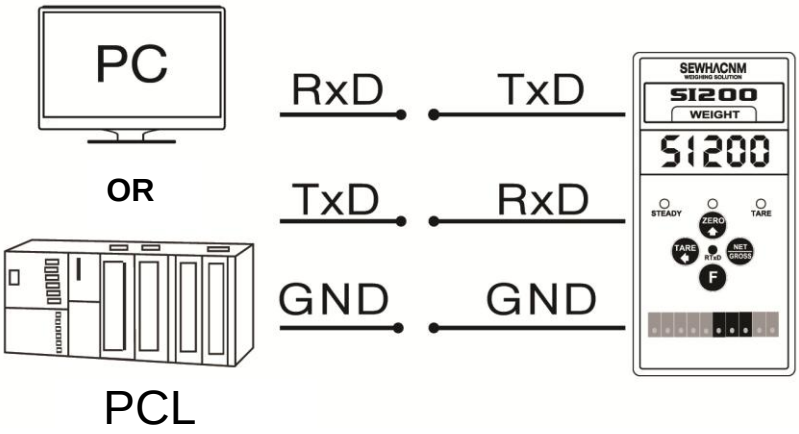
Paper Withdraw Rate setting (After Continuous/Single Print)			
F46	3	0~9	Whenever set value increased as 1, then will be added.
Printing Language			
F47	●	0	KOREAN
		1	ENGLISH
Minus(-) symbol Print selection			
F49	●	0	Print minus(-) symbol, if the weight is minus(-).
		1	Ignore minus(-) symbol

4-7-2. Other Setting Mode

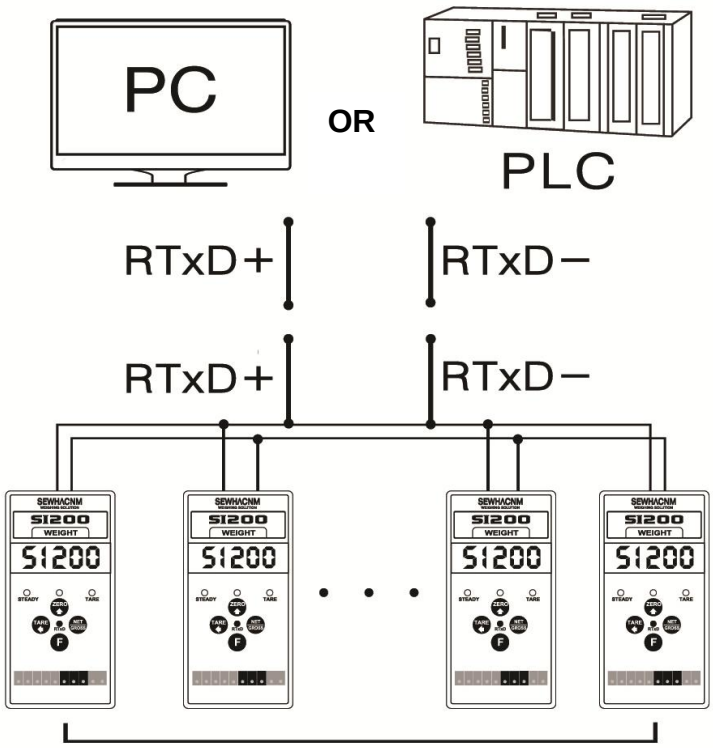
EMPTY Range		
F80	0.010	You can set "EMPTY" Range. Ex) 00 10 setting : When Net Zero, "Zero" status lamp is ON. 200 setting : Under "200", "Zero" Status lamp is ON.
Simulation Calibration Setting		
F87	00 : Disuse, 01 : Use	
TIME(H,M,S) Check / Change (every 24Hours)		
F90	Check Current time data or you can Change to new time	
DATE Check / Change		
F91	Check Current Date data or you can Change to new date	
SETUP Mode Password Key Setting / Change / Cancel		
F95	Setting Password	When " 1"dispays input password you want to use with ZERO key & TARE as four digit. When "2" displays input the 4-digit password again to confirm it as your password.
	Change Password	When " P-LJ" shows input your password. When " 1"dispays input password you want to use with ZERO key & TARE as four digit. When "2" displays input the 4-digit password again to confirm it as your password.
	Delete Password	If you set password with F key, the password is canceled.
You cannot enter SETUP & Calibration mode without password. Memorize it. Password is set with only ZERO key & TARE key. If F key is used password is canceled.		
Program & Hard ware Version Check		
F98	Check the Program & Hard ware version Ex) "100 1.04" means H/W : ver.1.00 & S/W : ver.1.04	

5. INTERFACE

5-1. Serial Interface RS – 232C (F39-00 setting – Side switch up - standard)



5-2. Serial Interface RS-485 (F39-01 setting – Side switch down)

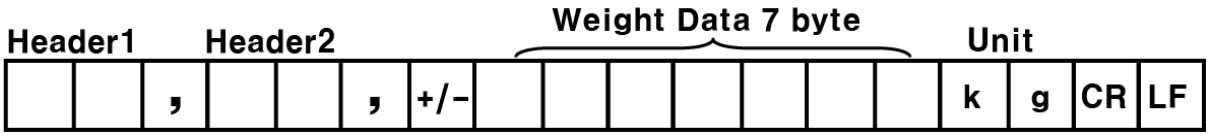


MAX 32 pcs of Indicators are connectable

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.

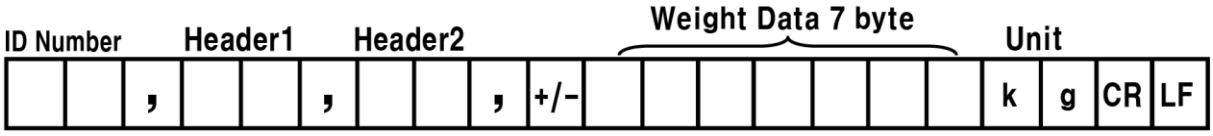
5-3. Data Format

5-3-1. Data Format1 : without ID No. (Refer F-37)



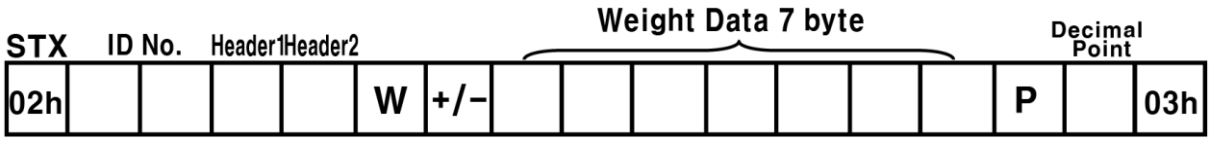
Header1	Header2
OL : OVER LOAD	NT : NET-WEIGHT(Tare is not set)
ST : STEADY	GS : when setting TARE
US : UNSTEADY	

5-3-2. Data Format2 (With ID No. Refer F- 18, F37-01)



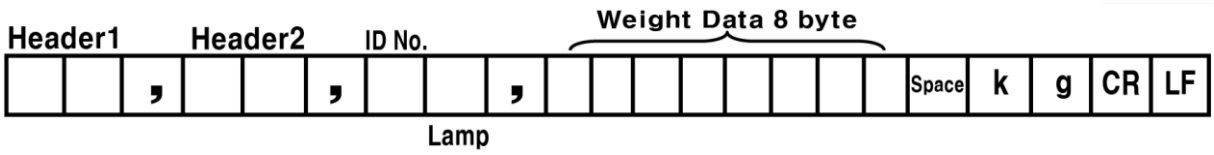
Header1	Header2
OL : OVER LOAD	NT : NET-WEIGHT(Tare is not set)
ST : STEADY	GS : when setting TARE
US : UNSTEADY	

5-3-3. Data Format3 : ID No. + State(Refer F-18, F37-02)



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

5-3-4. CAS Format (22byte)



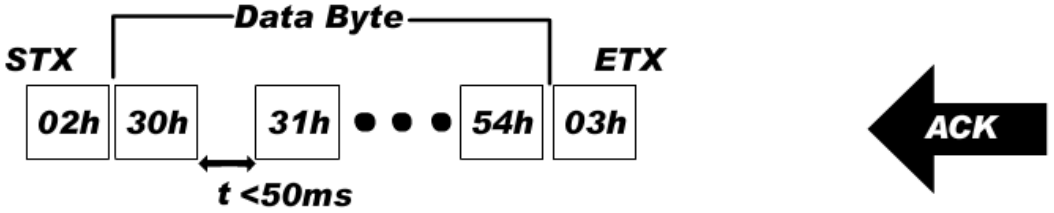
LAMP DISPLAY

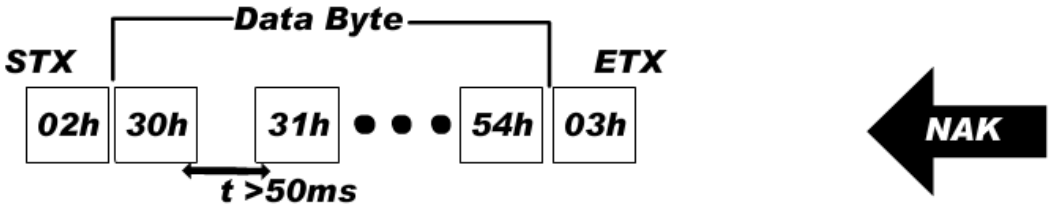
Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
1	0	1	1	1	1	1	1
1	STEADY	1	Hold	Print	Gross Weight	TARE	ZERO

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

5-4. 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).
The command to send the Indicator must be HEX.
In case of ASCII code, it has to be converted to HEX to transmit.





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

5-4-1. Read Command

The min. interval of read command is 100ms. (In case of check-sum 150ms)

Current Weight data		
PC → SI200 Read	**ASCII**	STX ID(2Byte) RCWT ETX
	HEX	02 30 31 52 43 57 54 03
SI 200 → PC Respond		STX ID RCWT State1(1byte) State2(1byte) P decimal point(1byte) +/- (1byte) Current weight(7byte) Weight unit(2byte) ETX
		State1 : O(Over load) , S(Steady), U(Unsteady) State2 : N(Net weight), G(Gross weight)

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

STX	ID		R	C	W	T	S	N	P	3	+	0	0	0	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

Indicator memory data		
PC → SI200 Read	**ASCII**	STX ID(2Byte) RCWD ETX
	HEX	02 30 31 52 43 57 44 03
SI 200 → PC Respond		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

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

Grand Total		
PC → SI200 Read	**ASCII**	STX ID(2Byte) RGRD ETX
	HEX	02 30 31 52 43 57 44 03
SI 200 → PC Respond		STX ID RGRD P decimal point(1byte)Accumulated S/N count (6byte) Accumulated weight(10byte) weight unit(2byte) ETX

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

STX	ID		R	G	R	D	P	3	0	0	0	0	1	0	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

Current Time		
PC → SI200 Read	**ASCII**	STX ID(2Byte) RTIM ETX
	HEX	02 30 31 52 54 49 4D 03
SI 200 → PC Respond		STX ID RDAT Current Date(6byte) ETX

Ex) Time : 12:00:00

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

Current Date		
PC → SI200 Read	**ASCII**	STX ID(2Byte) RDAT ETX
	HEX	02 30 31 52 44 41 54 03
SI 200 → PC Respond		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

TARE data		
PC → SI200 Read	**ASCII**	STX ID(2Byte) RTAR ETX
	HEX	02 30 31 52 54 41 52 03
SI 200 → PC Respond		STX ID RTAR P decimal point(1byte) +/-(1byte) TARE value(7byte) ETX

Ex) TARE : 2.000kg

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

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)

5-4-2. Write Command

Recommended Comm. Interval of WRITE COMMAND is 150ms You have to guarantee Min. 200ms interval between two different commands.(In case of Check-Sum, 250ms)

Zero (same as ZEROkey)			
PC→ SI200 Write		**SI 200 → PC Respond**	
ASCII	**HEX**	**OK**	**Error**
STX ID(2Byte) WZER ETX	02 30 31 57 5A 45 52 03	STX ID ACK ETX	STX ID NAK ETX
TARE			
PC→ SI200 Write		**SI 200 → PC Respond**	
ASCII	**HEX**	**OK**	**Error**
STX ID(2Byte) WTAR ETX	02 30 31 57 54 41 52 03	STX ID ACK ETX	STX ID NAK ETX
TARE reset			
PC→ SI200 Write		**SI 200 → PC Respond**	
ASCII	**HEX**	**OK**	**Error**
STX ID(2Byte) WTRS ETX	02 30 31 57 54 52 53 03	STX ID ACK ETX	STX ID NAK ETX

HOLD			
PC→ SI200 Write		SI 200 → PC Respond	
ASCII	HEX	OK	Error
STX ID(2Byte) WHOL ETX	02 30 31 57 48 4F 4C 03	STX ID ACK ETX	STX ID NAK ETX

HOLD reset			
PC→ SI200 Write		SI 200 → PC Respond	
ASCII	HEX	OK	Error
STX ID(2Byte) WHRS ETX	02 30 31 57 48 52 53 03	STX ID ACK ETX	STX ID NAK ETX

PRINT When transfer format, "F46 : plus line" and "F34 : checksums are not applied."			
PC→ SI200 Write		SI 200 → PC Respond	
ASCII	HEX	OK	Error
STX ID(2Byte) WPRT ETX	02 30 31 57 50 52 54 03	STX ID ACK ETX	STX ID NAK ETX

Delete grand total			
PC→ SI200 Write		SI 200 → PC Respond	
ASCII	HEX	OK	Error
STX ID(2Byte) WGTC ETX	02 30 31 57 47 54 43 03	STX ID ACK ETX	STX ID NAK ETX

Date setting		
PC→ SI200 Write	SI 200 → PC Respond	
STX ID(2Byte) WDAT date (6byte) ETX	OK	Error
	STX ID ACK ETX	STX ID NAK ETX

Ex) 12th August

STX	ID	W	D	A	T	0	9	0	8	1	2	ETX
02h	30h	31h	57h	44h	41h	54h	30h	39h	30h	38h	31h	32h	03h

Time setting		
PC→ SI200 Write	SI 200 → PC Respond	
STX ID(2Byte) WTIM time (6byte)ETX	OK	Error
	STX ID ACK ETX	STX ID NAK ETX

Ex)time : 12:00:00

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

The interval of Print command is min 100ms, the min interval of Print total weighing data is min 300ms, When you use both command, you 'd better enough interval between them.

5-5. Command Mode Example

5-5-1. Read Command Example

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

1) **STX ID NO. RCWT ETX Without CHECK SUM (F34-00)**

- PC → SI200 Read command

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

- SI200 → PC Respond

STX	ID No.	R	C	W	T	S	N	P	3	+	0	0	0	7	0	0	0	ETX
02h	30h	31h	52h	57h	52h	54h	53h	4Eh	50h	33h	2Bh	30h	30h	30h	37h	30h	30h	30h	03h

2) **STX ID RCWT ETX With CHCEK SUM (F34-01)**

- PC → SI200 Read command

STX	ID No.	R	C	W	T	Check Sum		ETX
02h	30h	31h	52h	43h	57h	54h	41H	36H	03H

- SI200 → PC Respond

																	Check Sum		
STX	ID No.	R	C	W	T	S	N	P	3	+	0	0	0	7	0	0	0	5	A	ETX
02h	30h	31h	52h	57h	52h	54h	53h	4Eh	50h	33h	2Bh	30h	30h	30h	37h	30h	30h	35h	41h	03h

5-5-2. Write Command Example

Ex) Set the time as 12:00:00, ID number :1

1) STX ID WTIM 120000 ETX Without CHECK SUM(F34-00)

- PC → SI200 Write Command

STX	ID No.	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

- SI200 to PC Respond

STX	ID No.	ACK	ETX
02h	30h	31h	06h	03h

Normal operation

STX	ID No.	NAK	ETX
02h	30h	31h	15h	05h

Incorrect operation

2) STX ID WTIM 120000 ETX With CHECK SUM(F34-01)

- PC → SI200 Write Command

												Check Sum		
STX	ID No.	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

- SI200 to PC Respond

				Check Sum		
STX	ID No.	ACK	6	C	ETX
02h	30h	31h	06h	36h	43h	03h

Normal operation

				Check Sum		
STX	ID No.	NAK	7	B	ETX
02h	30h	31h	15h	37h	42h	03h

Incorrect operation

How to get CHECK SUM

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.

5-6. Print interface

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

Printing Format (F32-02 under setting)

	KOREAN (F47-00)	ENGLISH (F47-01)
Continuous Print Format F42-00	========== 날짜 : 2011-05-10 시간 : 18:00:10 순번 중량 1 + 1.330kg 2 + 5.350kg 3 + 1.380kg 4 + 2.330kg	========== DATE : 2011-05-10 TIME : 18:00:10 COUNT WEIGHT 1 + 1.330kg 2 + 5.350kg 3 + 1.380kg 4 + 2.330kg
Single Print Format F42-01	========== 날짜 : 2011-05-10 시간 : 18:00:10 순번 중량 3 + 1.380kg ========== 날짜 : 2009-05-10 시간 : 18:00:10 순번 중량 4 + 6.230kg	========== DATE : 2011-05-10 TIME : 18:00:10 COUNT WEIGHT 2 + 5.350kg ========== DATE : 2009-05-10 TIME : 18:00:10 COUNT WEIGHT 3 + 1.280kg
Grand Total Print F44-00	========== 총 계 날짜 : 2011-05-10 시간 : 18:00:10 계량횟수 : 10 누적중량 : 258.145kg ========== 총계 삭제 ==========	========== TOTAL DATE : 2011-05-10 TIME : 18:00:10 COUNT : 10 TOTAL WEIGHT : 258.145kg ========== TOTAL DELETE ==========

6. Error & Treatment

6-1. Load Cell Installation

Error	Cause	Treatment	Remark
Unstable display	1) Load cell problem 2)Load cell isolation resistance error 3)Contact, touch problem 4) Summing box problem	1) Measure input or 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 doesn’t return to “Zero”	1) Load cell problem 2) Load cell wiring contact problem	1) Check Load cell connection 2) Measure Load cell Resistance	
Display under(-) zero although you load something	the switched Load cell output wires (SIG+,SIG-)		Load cell Check Load cell connection Check Calibrate weight again
right after calibration display “UNPASS”	Load cell broken or Indicator connection Error		
	Power was “ON” when some weight is on the load cell.		
display “-OL-”“OVEr” (OVER LOAD)	1) Load cell broken or Indicator connection Error 2) Loading over than Max. Capacity.	1) Load cell or connection Check 3) Remove the loaded weight 4) Calibrate again	Double TARE(F key+ TARE key) is applied too many. (over limit capa)

6-2. Calibration Process

Display	Cause
Err-1	It shows in case of $\frac{\text{Rated capa [Max Capa]}}{\text{Division[Min unit]}} > 20{,}000$. Ex) Rated capa[Max capa] is 20,000 , division[Min unit] cannot be under 1
Err-4	It shows when the Test weight > Rated capa[Max capa] →Then please re-input right value again. The more heavy test weight makes the more accurate measurement.
Err-5	It shows when the Test weight < 10% of Rated capa[Max capa] → Then Please re-input right value agian.
Err-6	Amp. Gain is too big / Sig+/- wiring is connected wrongly. / The test weight is not loaded.
Err-7	Amp. Gain is too small / Sig+/- wiring is connected wrongly. / The test weight is not loaded.
Err-8	Under “F-function” model, set value is appropriate.
Err-A	there is vibration on the load cell or load cell wire, the indicator cannot calibrate anymore.

6-3. 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 load cell connection of terminal. ※ In this situation ZERO key & PRINT key are not activated.
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, "UNPASS" 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	EEPROM problem	Please contact the distributor or Head Office.
HALt	H/W Problem	
St-Err	The Error about Time	

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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Product	Digital Weighing Indicator
Model	SI 200
Serial No.	
AUTHORIZING STAMP