CE

Approved for Digital Weigh Indicator

Digital Weighing Indicator

Operating Manual

Model : DN510N

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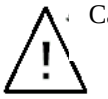
1. BEFORE INSTALLATION

1-1. Caution / Warning Marks

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



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

1-2. Other Marks

Warning for Electric Shock or Damage.
Please do not touch by hand

Protective Ground(Earth) terminal

Prohibition of Operation process

1-3. Copy Rights

1). All Right and Authority for this Manual is belonged to DACELL co.,Ltd.

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1-4. Inquiries

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2. INTRODUCTION

2-1. Introduction

Thank you for your choice, this “DN510N” Industrial Digital Weighing Indictor..

This “DN510N” model is control purpose application usage Digital Weighing Indicator, with powerful communication performance.

With 6pcs control relay outputs and High Speed A/D conversion performance will lead you to precise weighing process.

This “DN510N” Weighing Indicator is control purpose application model, and it can be used for most kinds of control applications.

Please review this instruction Manual and learn more about information about “DN510N”.

Enjoy your process efficiency with “DN510N” Weighing Indicator..

2-2. Cautions

1). Don’t drop on the ground or 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 prior notice or permission.

7). Item’s performance will be up-dated continuously base on previous version’s performance.

2-3. Features

1). All Modules and Option Cards are isolated to maximize accuracy and performance.

2). External input terminal inside.

3). By using “Photo-Coupler” on each module(Option, Analog board, In/Out), we improved “Impedance problem”, “Isolation ability among inputs”, “Leading power problem”, and “Noise covering function”.

4). Data back-up function, when the sudden power off

5). Polycarbonate film panel, strong against dust and water

6). RS-232C (Com. Port1) is standard installed.

8). Variable options(Order in advance)

2-4. Box Contents

1). Power Cable(1pcs) / Load cell Connector(1pcs) / Manual(1pcs)

3. SPECIFICATION

3-1. Analog Input & A/D Conversion

Input Sensitivity	0.2㎶ / Digit
Load Cell Excitation	DC 10V (- 5V ~ + 5V)
Max. Signal Input Voltage	Max.32mV
Temperature Coefficient	[Zero] ±20PPM/℃ [Span] ±20PPM/℃
Input Noise	±0.6㎶ P.P
Input Impedance	Over 10㏁
A/D Conversion Method	Sigma-Delta
A/D Resolution(Internal)	520,000 Count(19bit)
A/D Sampling Rate	Max. 200times / Sec
Non-Linearity	0.01% FS
Display Resolution(External)	**1/30,000**

3-2. Digital Part

Display	Parts	Specification
Display	Main Display	7Segments, 6digits Red color FND Size :20.0(H) ×13.0(W)mm
	Min. Division	×1, ×2, ×5, ×10, ×20, ×50
	Max. display value	+999,950
	Under Zero value	"-" (Minus display)
Status lamp	Steady, Zero, Tare, SP1, SP2, SP3, SP4, RTxD	Green color Condition display Lamp (8pcs)
K e y	Number, Function Key	Number Key, Function (16pcs)

3-3. General Specification

Power Supply	SMPS Free Voltage Power Supply(AC86~265V)
Operating Temperature Range	-5℃ ~ 40℃
Operating Humidity Range	Under 85% Rh (non-condensing)
External Dimension	193mm(W) x 100mm(H) x 140mm(L)
Net Weight(kg)	About 1.5kg
Gross Weight(kg)	About 2.0kg

3-4. Option Card

Option No.1	Analogue Output (0~10V)
Option No.2	Analogue Output (4~20mA)
Option No.3	Serial Interface : RS422 / RS485
Option No.4	BCD Input
Option No.5	BCD Output

※ Serial Interface (RS-232C) or Current Loop is Standard installed.

3-5. Front Panel (Display & Key pad)

3-5-1. Status Lamp (ANNUNCIATORS) : Green Color Lamp is “ON”.

Steady	When the weight is Steady, “▼” Lamp is turn on.
Zero	When the current weight is Zero, “▼” Lamp is turn on. (Displayed weight is Zero, “▼” Lamp is turn on.)
Tare	Tare function is set, “▼” Lamp is turn on. (Tare Reset → “▼” Lamp is turn off.)
SP1	SP1 Relay output Lamp
SP2	SP2 Relay output Lamp
SP3	SP3 Relay output Lamp
SP4	SP4 Relay output Lamp
RTxd	When indicator transfers or receives data from other devices, Lamp is turn on. (If the Lamp is off although there is some data transference, please check communication settings).

3-5-2. Key Pad Function.

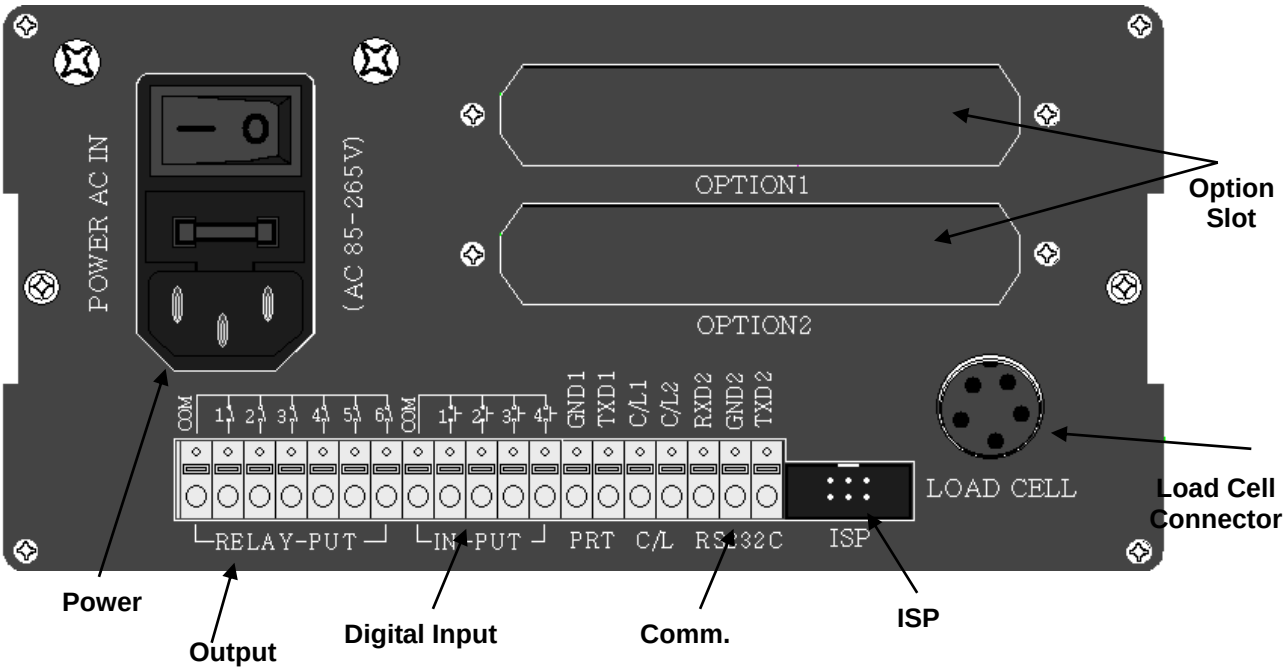
ZERO	Make Weight value as Zero. Under F08, you can set the Zero key operation range, as 2%, 5%, 10%, 20% or 100% of Max. Capacity. ※ Under “Tare” key input, Zero key will not be activate within operation range.
TARE	Make Weight value as Zero, including Tare Weight. Under F09, you can set the Tare key operation range, as 10%, 20%, 50%, or 100% of Max. Capacity. ※ Whenever pressing “Tare” key, you can set the Tare continuously.
TARE RESET	TARE RESET 1. Remove the Set TARE function. - If you press this key, TARE set value will be removed and display gross weight.
HOLD RESET	HOLD RESET 1. Remove the Set HOLD function. - If you press this key, HOLD set value will be removed.
1 RUN	Start Weighing process, under Packer Mode, only.
2 STOP	Stop weighing process, under Packer Mode, only.
3 P/N	You can set each weighing process as a certain P/N. And you can call certain P/N with pressing this key. **P/N save : Select P/N and Enter key input.** **P/N call : P/N + Number key + Enter**
4 SP1	Set the SP1 value or Check the current value. - Press key and enter new set value with keypad, and press enter to save.
5 SUB	Under Print installation, you can print out the “Sub-total data” of current P/N. Printed Data : Accumulated count and weight of All P/N.
6 GRAND	Under Print installation, you can print out the “Grand-total data” of all P/N. Printed Data : Accumulated count and weight of All P/N.
7 SP2	Set the SP2 value or Check the current value. - Press key and enter new set value with keypad, and press enter to save.

8 SP3	Set the SP3 value or Check the current value. - Press key and enter new set value with keypad, and press enter to save.
9 SP4	Set the SP4 value or Check the current value. - Press key and enter new set value with keypad, and press enter to save.
0 PRINT	**Manual Printer** - Key input, print output. **Calibration mode** - Digit setting Whenever pressing "0"key, digit will be change 1, 2, 5, 10, and 50.
CLEAR	1. Modify the set value during setting process. 2. Calibration mode - Move back to previous step. 3. F-function setting mode - Change F-function No. F-function no.(number key) + Clear → directly move
ENTER	1. Save set value during setting process. 2. Calibration mode - Save current setting and move to next step. 3. F-Function mode - Save current F-function setting, and move to next F-function

※ Function Keys (Combined Key functions : CLEAR key + other keys)

CLEAR	1 RUN	Time set value check or Change
CLEAR	2 STOP	Date set value check or Change
CLEAR	3 P/N	Code value check or Change
CLEAR	4 SP1	Serial No. check or change
CLEAR	5 SUB	Sub-total Data Delete
CLEAR	6 GRAND	Grand-total Data Delete
ENTER	TARE	Key Tare function activated. (To Reset the key tare, press Tare Reset key.)

3-6. Rear Panel

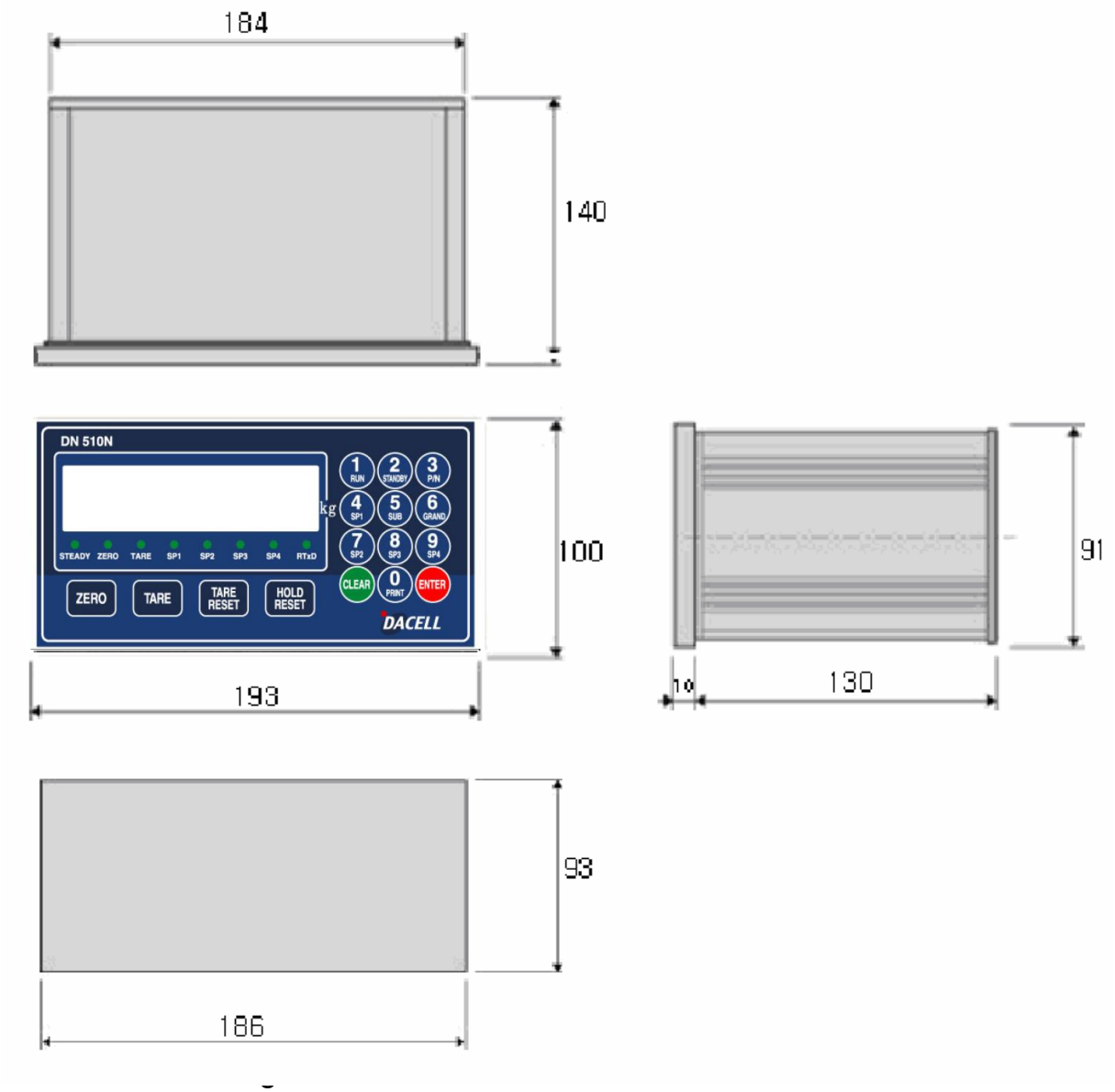


①POWER	-Power ON/OFF Switch -Fuse : AC 250V 10A -AC IN : AC86~265V Power In
②OPTION 1,2	- OPTION BOARD install slot. - ANALOG out, Serial I/F, etc
③LOAD CELL CONNECTOR (N-16)	-EXC + (+5V) PIN1 (RED) -EXC - (-5V) PIN2 (WHITE) -SIG+ PIN3 (Black, Blue) -SIG- PIN4 (Green) -SHIELD PIN5 (SHEILD)
④Digital Input	- Digital Input Signal terminal Refer to “F-function 11”.
⑤Output Terminal	-RS-232C/CURRENTLOOP (Standard Installed) (GND,TXD1,CL1,CL2,RXD,GND,TXD)
⑥ISP (Digital Lock Pin)	- Insert “Lock Pin Header”, to protect “F-function” data and other settings from Electric Noise effect. - To change the setting, please remove the “Lock Pin Header”.
⑦Relay Output	6pcs Relay output terminal - According to “F21-XX” setting, relay will be output.

4. INSTALLATION

4-1. External Dimension & Cutting Size

(External Dimension) (unit : mm)



Chapter 5. Set Up

5-1. 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 do Calibration process once again

5-2. Test Weight Calibration (span Calibration) – Mode 1.

- Applicable model : DN500N,510N,520N,530N,540N series

Prepare at least 10% of Max. capacity of your weighing scale.

Step 1. Enter Calibration Mode

Turn on the Power + with pressing 

→ TEST display

Press 

key → SET-CAL display

Press 

key to start “Calibration Mode”.

Remarks : Go to next step with save 

key / Back to previous step 

key

Step 2. Digit(Division)setting (d _1 **display)**

Press 

key and stop the optimal Digit value.

(Whenever pressing 

key, digit value will be changed, like 01-02-05-10-20-50)

Press 

key and save change and move to next step.

Step 3. Max. Capacity Setting (CAPA → XXXXXX **display)**

Input Max. Capacity of Scale with No. keys.

Input Capacity and press 

key, and move to next step.

※ Caution

(Max. capacity value / division value) can not be over **30,000**.(as Indicator resolution is 1/30,000).

Step 4. Zero Balance setting (CAL _0_ display)

Make empty the scale part, and press 

key.

Indicator check the current Zero balance and save the value and move next step.

Step 5. Span value calculation (SPAN → XXXXX → C_UP_)

Input prepared Test weight value with No. keys.

And press 

key.

Then, display will show C_UP_ and then, load prepared test weight unit on the scale.

After a few seconds(to remove the vibration effect), press 

key.

Then, indicator will calculate Span value and move the next step.

※ Caution

For the precise Span calibration, please prepare Test weight unit, at least 10% of Max. capacity of Scale.

Step 6. Check Span Value and Finish the Calibration(XXXXXX → C-END)

Check the Calculated Span value.

And after 3sec, C-END will displayed automatically and move to weighing Mode.

5-3. Simulation Calibration Mode (Without Test Weight) – Mode 2.

- This calibration Method will be useful to make calibration more than 10ton capacity setting.

- Guaranteed resolution will be 1/5,000 and if you need higher resolution, please make calibration with Test weight.

Step 1. Enter to the "SET-CAL" mode

Please turn on the Power + with pressing 

→ TEST display

Press 

key → SET-CAL display.

Press 

key to start "Simulation Calibration Mode".

Remarks : Go to next step with save 

key / Back to previous step 

key Step 2.

Step 2. Digit (Division)setting (CAL_ _2 → d _ 1 **display)**

Press 

key and stop the optimal Digit value.

(Whenever pressing 

key, digit value will be changed, like 01-02-05-10-20-50)

Press 

key and save change and move to next step.

Step 3. Max. Capacity of Load cell (CAPA → XXXXXX **display)**

Input Max. Capacity of Scale with No. keys.

- Under this step, input Total sum of each load cell's Max. Capacity. (Not weighing Scale)
- The Max. Capacity of load cell is stated on **"Test report"** or **"Label"**.
- If you installed 4 load cells, and each load cell's Max. Capacity is 500kg, then you have to input 2,000kg, as a Max. Capacity.

Input Capacity and press 

key, and move to next step.

Step 4. Measure/Adjustment optimal Zero balance of Scale (CAL _0_ display)

Make empty the scale part, and press 

key.

Indicator check the current Zero balance and save the value and move next step.

Step 5. Input the Rate Output (mV/V) value of load cell

Input Max. Output Rate(mV/V) value of load cell with No. keys.

- Under this step, input Max. Output rate(mV) of load cell.
- If you installed a few pieces of load cells, the connection will be parallel, so the rated output of a few load cells are as same as single load cell's rated output.
- The Output rate is stated on "Calibration certificate" or "Label"

And press 

key.

Step 6. End Calibration and Auto Reset

- Calculated Span value will be displayed and automatically reset and move the normal weight indicating mode.

5-4. Function Setting – Mode 1.

- Applicable model : MI – 1000/2000/3000/4000 series

To make more accuracy performance of Digital Weighing Indicator, through this Function setting.

Step 1. Enter to Function setting mode.

Turn on the Power + with pressing 

→ TEST display

Press 

key → SET-CAL display

Press 

key to start **"F-function Mode"**.

Step 2. Change the F-Function No.

To change the F-function No., press 

key. whenever pressing 

key, Function No. will be changed

If you want to move certain function No. directly, press function No. with keypad and press 

key.

Step 3. Change the Set value.

Input new set value with keypad, and press 

key to save new setting.

If you don't press 

key, after changing the set value, the new set value will not be saved.

Step 4. Exit from Function setting mode.

Press 

+ 

+ 

key to exit function mode.

5-5. Function List

Function No.	Contents	Remark
F01	Decimal point setting	Setting range : 0~3
F02	Back up mode selection	Setting range : 0, 1
F03	Motion Band setting	Setting range : 0~9
F04	Zero Tracking setting	Setting range : 0~9
F05	Auto Zero Range setting	Setting range : 00~99
F06	Digital Filter setting	Setting range : 00~49
F07	Zero / Tare key activating setting	Setting range : 0, 1
F08	Zero key operating range setting	Setting range : 0~4
F09	Tare key operating range setting	Setting range : 0~3
F10	Hold Function setting	Setting range : 0~4
F11	Digital Input setting	Setting range : 0~8
F12	Code No. Setting	Setting range : 0~2
F14	Hold Off time setting	Setting range : 0.0~9.9sec
F21	Weighing Mode Selection	Setting range : 1~7
F22	Weighing Finish Relay “ON” delay time setting	Setting range : 0.0~9.9sec
F23	Weighing Finish Relay “ON” Duration time setting	Setting range : 0.0~9.9sec
F24	Weighing Judge Relay “ON” delay time setting	Setting range : 0.0~9.9sec
F25	Weighing Judge Relay “ON” Duration time setting	Setting range : 0.0~9.9sec
F30	Serial I/F Parity Bit setting (Port No.1)	Setting range : 0~2
F31	Serial I/F Communication Speed setting Port No.1)	Setting range : 0~9
F32	Serial I/F Mode setting Port No.1)	Setting range : 0~2
F33	Serial I/F Transference Method setting Port No.1)	Setting range : 0~5
F34	ID Number setting	Setting range : 1~99
F35	Transferred Data Format Port No.1)	Setting range : 0~2
F36	BCC selection mode	Setting range : 0, 1
F37	Data Transferring count setting Port No.1)	Setting range : 0~6
F40	Serial I/F Parity Bit setting (Port No.2)	Setting range : 0~2
F41	Serial I/F Communication Speed setting (Port No.2)	Setting range : 0~9
F42	Serial I/F Mode setting (Port No.2)	Setting range : 0~2
F43	Serial I/F Transference Method setting (Port No.2)	Setting range : 0~5
F45	Transferred Data Format (Port No.2)	Setting range : 0~2
F47	Data Transference count setting (Port No.2)	Setting range : 0~6

Function No.	Contents	Remark
F50	Weight Unit Selection (Printer)	Setting range : 0~2
F51	When Automatically print, Data output selection	Setting range : 0, 1
F52	Print format selection	Setting range : 0, 1
F53	Sub-Total Data delete Selection	Setting range : 0, 1
F54	Paper withdraw rate Selection	Setting range : 0~9
F55	Print Line interval Selection	Setting range : 0~9
F56	Sub-Total Print Mode Selection	Setting range : 0, 1
F57	Print Language Selection	Setting range : 0~3
F58	Print Delay time selection	Setting range : 0.0~9.9sec
F59	Auto Print Setting	Setting range : 0, 1
F60	BCD output Selection	Setting range : 0, 1
F63	Average Display setting	Setting range : 00~99
F64	Steady LED Status Lamp Delay time setting	Setting range : 0.0~9.9sec
F65	Tension and Compression setting	Setting range : 0, 1
F80	Empty Range	Setting range : 0~Max. Capa
F81	Zero Range Setting	Setting range : 0~Max. Capa
F83	Analogue output setting	Under option installed
F89	Span Value check	
F90	Date check / change	
F91	Time check / change	

5-6. Function List detailed information.

Decimal Point Setting			
F01		0	No Decimal point (Only for MI-2020A)
		1	1st place under Zero (0.0)
		2	2nd place under Zero (0.00)
	●	3	3rd place under Zero (0.000)
Back up mode selection			
F02	●	0	Normal mode
		1	Back up mode

※ Normal Mode

When the power is off and will not be recovered within 1sec, weight memory will be out and display wrong weight value when power is recovered.

Also, if there is material over 10% of max. capacity weight in the hopper, the “Un-Pass” display will be appear and you can not process weighing job. Under this case, please remove material and turn on DN510N.

If there is material less than 10% of max. capacity weight in the hopper, indicator will initialize with ”Pass” display, and display “0” whatever the real weight. Under this case, remove the material and press “Zero” key and input new “Zero” value. Then, new Zero value will be memorized and you can process weighing job. For “Manual initialization”, press “0” key or enter “Calibration mode”.

※ Weight Back up Mode

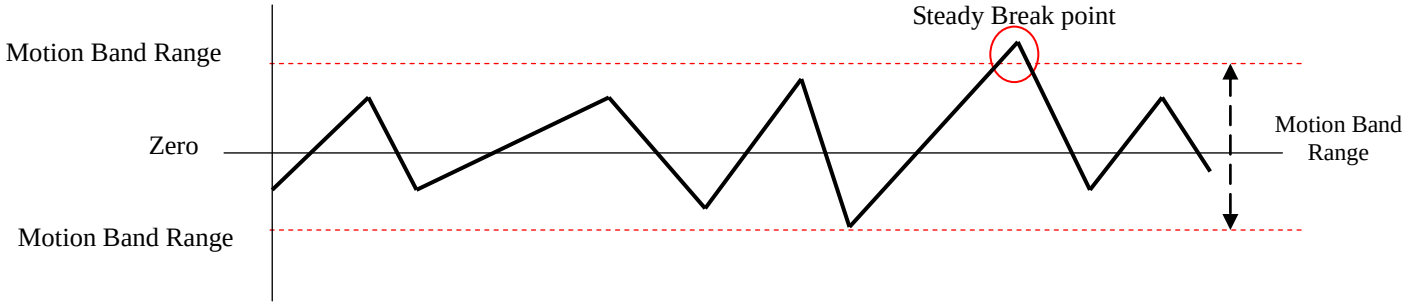
Under this mode, DN510N memories “Zero” value of weighing part. So, when the power is recovered DN510N can display material weight.

Motion Band Range setting			
F03	5	0 ∫ 9	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. 0 : Weak vibration ∫ 9 : Strong Vibration

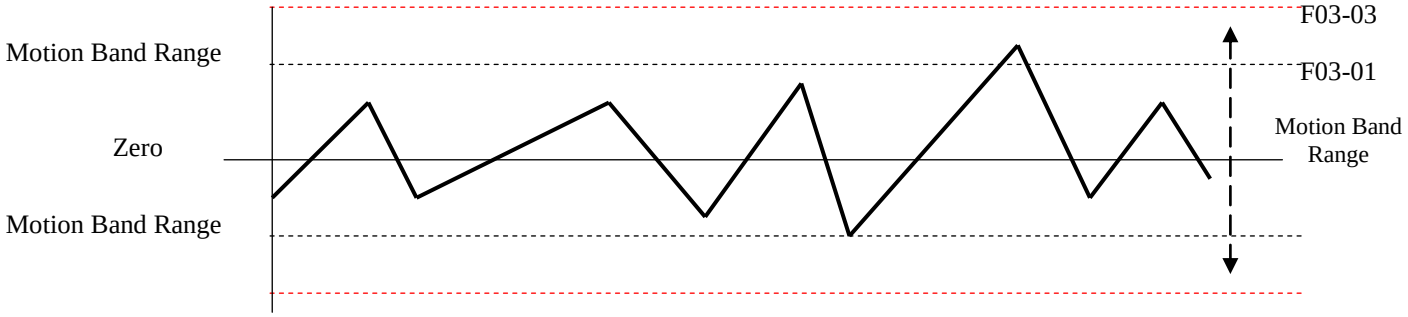
※ This function is compensate vibration effect on weighing part with acceptable range setting.

During the fixed time period(F06 setting), there is smaller weight variation than Motion band range, due to vibration, Indicator will display “Steady”, if there is larger weight variation than Motion band range, due to vibration, Indicator will its weight and “Steady” condition is broken and find new “Steady” point.

If there are much vibration effect, please set with large set value.

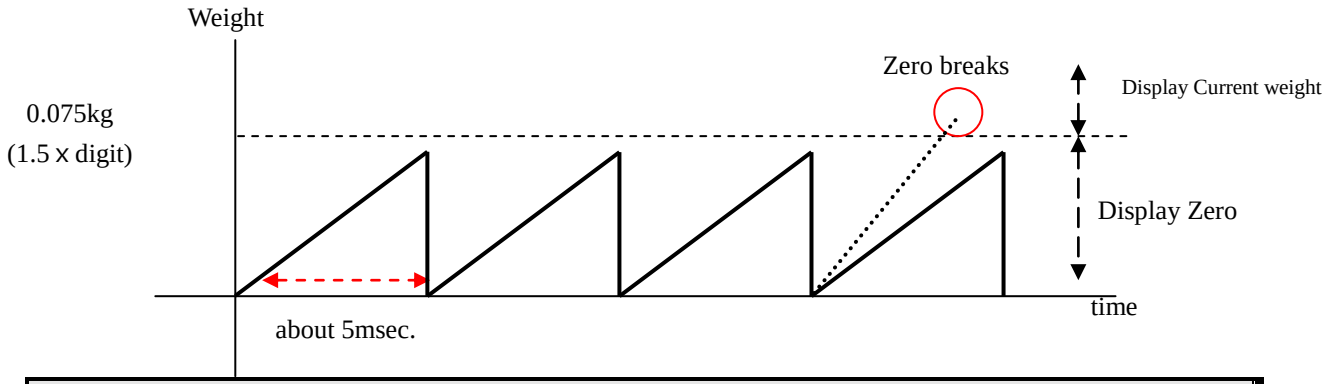


※ In this case, if you increase “Motion Band Range”(F03-03), the “Steady Break point” will be in the steady range, and indicator will display “Steady” condition. – **(Set value “1” means 50% of Digit)**



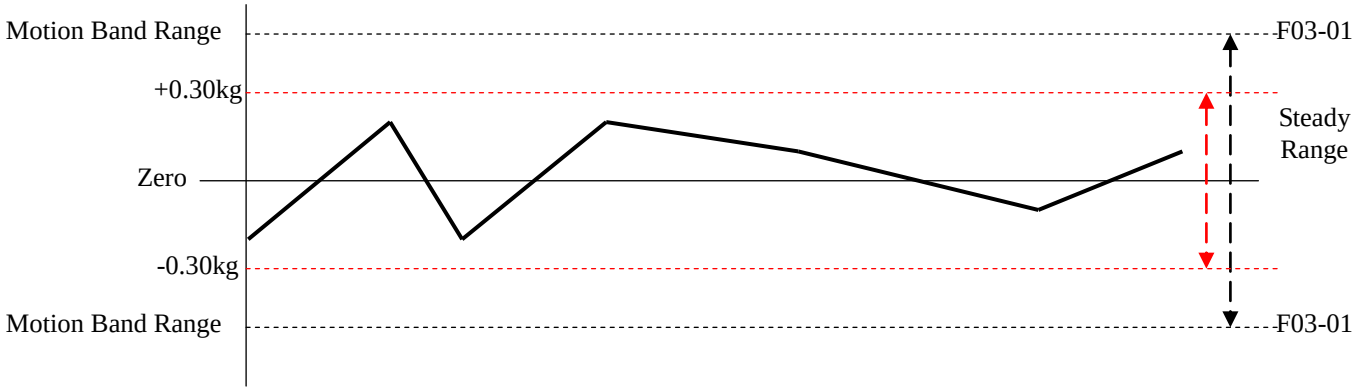
Zero Tracking Compensation Range setting			
F04	5	0 ∫ 9	Due to external causes(Temperature, wind, and dust), there are small weight difference, indicator will ignore the weight difference and display Zero. For this compensation function, indicator will estimate the weight difference is over the set range during fixed time period. If there is large weight difference over set range within fixed time period, the “Zero” is breaking and will find new zero point.

Example) Max. Capacity : 100.00kg, Digit : 0.05kg, F04-03 setting
Zero Tracking Compensation Range : 0.5 × digit × F04 set value = 0.0025 x 3 = **0.075kg**
Fixed time period : about 5msec. (Fixed time period will be effected on F06(digital filter) setting)



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)

※ Using this function, you can get the Zero value without pressing “Zero” key, when there is remained material in the hopper within Auto Zero Range.
Example) Max. Capacity : 10kg, Digit : 0.02kg, F005-30 setting,
Under this setting, Indicator will display “Zero” automatically, when the weight is within ± 0.30kg(Set value + weight unit) and Steady.



Digital Filter setting				
F06	15	00 ∫ 49	Small set value for weak vibration Large set value for strong vibration	Small set value more sensitive
Zero /Tare key Operation mode selection				
F07	●	0	Activate when “Steady” condition, only	
		1	Always activated	
Zero key Operation Range selection				
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 100% of Max. Capacity	
Tare key Operation Range selection				
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 : Make average during 3sec, and hold display	
		3	Average Hold : Make average during 5sec, and hold display	
		4	Average Hold : Make average during 8sec, and hold display	

External Input Selection						
F11	**Set Value**		**Input 1**	**Input 2**	**Input 3**	**Input 4**
	●	0	Zero	Tare/Reset	Hold/Reset	Print
		1	Run/Stop	Tare/Reset	Zero	Hold Reset
		2	Run	Stop	Sub-Total	Print
		3	Zero	Tare	Tare Reset	Print
		4	Run	Stop	Tare	Tare Reset
		5	Run	Stop	Zero	Print
		6	Zero	Tare/Reset	Sub-Total	Print
		7	Zero	Print	Sub-Total	Sub-Total Delete
		8	Zero	Print	Grand-Total	Grand-Total Delete
Code No. setting						
F12	●	0	Fixed Code No.			
		1	Increase Code No., whenever finish one weighing process			
		2	Decrease Code No., whenever finish one weighing process			
Hold “Off” time setting						
F14	00	00 ∫ 99	Time setting of the “Hold Off” After set time, Hold function will be off automatically.			

Weighing Mode Setting

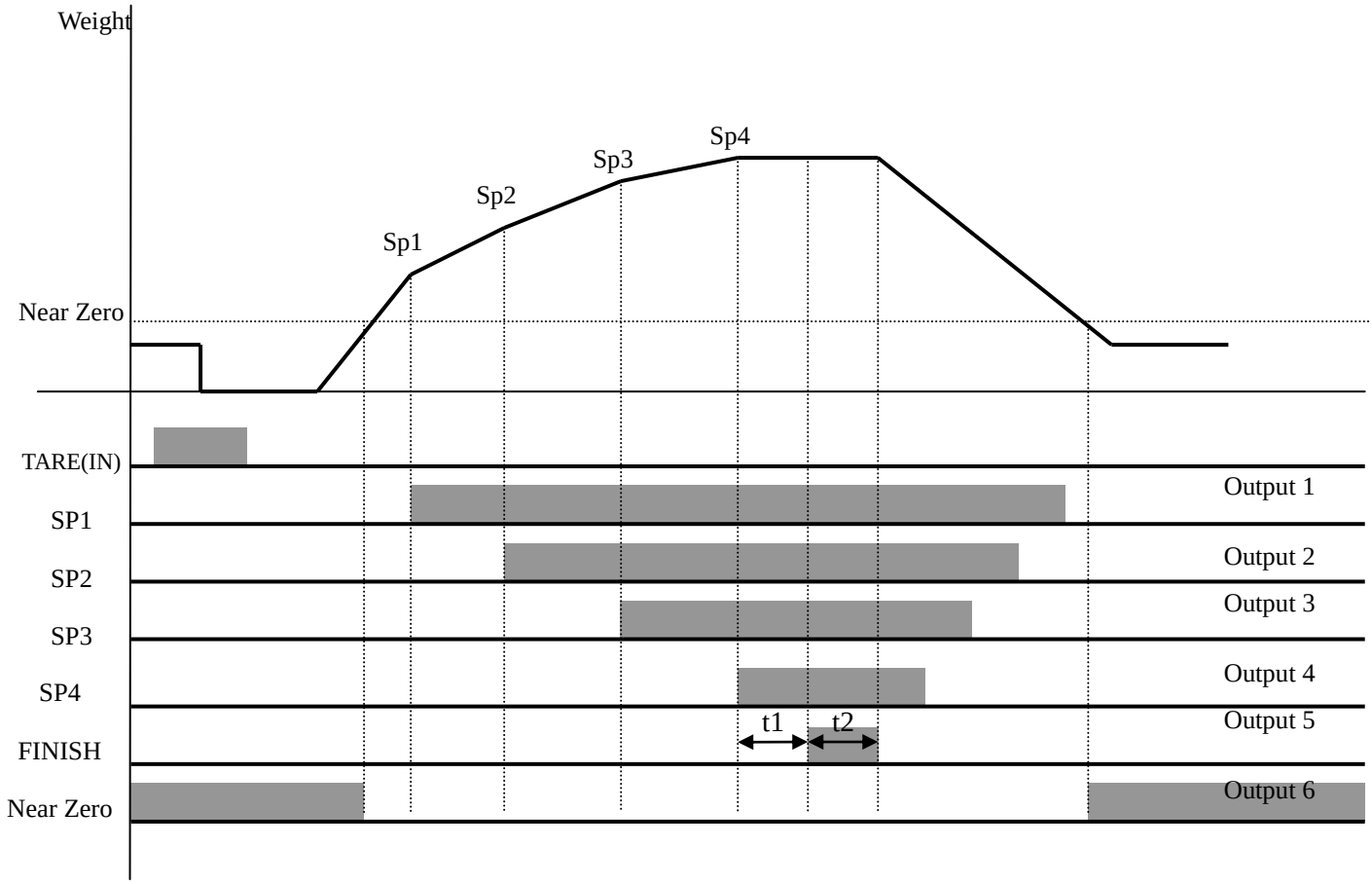
Weighing Mode Selection			
F21	●	1	Limit Mode (Weighing mode 1)- (4 step charge)
		2	Packer Mode (Weighing mode 2)- (4 step discharge)
		3	Checker 1 Mode (Weighing mode 3) – Stable Checker mode
		4	Checker 2 Mode (Weighing mode 4) – Level type Checker mode
		5	Checker 3 Mode (Weighing mode 5) – Hold type Checker mode
		6	Checker 4 Mode (Weighing mode 6) – After 1 second delay time, enter Checker mode
		7	Limit Mode 2 (Weighing mode 7)- (3 step charge 1step free fall) (Using free fall at SP3)

Relay output Mode(Each weighing Mode)

Relay Output		OUT 1	OUT 2	OUT 3	OUT 4	OUT 5	OUT 6
1	Limit	SP1	SP2	SP3	SP4	finish	zero
2	Packer	SP1	SP2	SP3	SP4	finish	zero
3	Checker1	SP1	SP2	SP3	SP4	SP5	zero
4	Checker2	SP1	SP2	SP3	SP4	SP5	zero
5	Checker3	SP1	SP2	SP3	SP4	SP5	zero
6	Checker4	SP1	SP2	SP3	SP4	SP5	zero
7	Limit 2	SP1	SP2	SP3	-	finish	zero

◆ Weighing Mode 1. Limit Mode 1. (F21-01 setting)

Relay "ON" when weight reaches to set value



1. Set value setting

Sp1(Bulk), Sp2(Bulk + Drib), Sp3(Bulk + Drib + Fall), Sp4(FINAL)

2. Finish relay output delay time(t1) setting : F-Function 22

3. Finish relay output "ON" time(t2) setting : F-Function 23

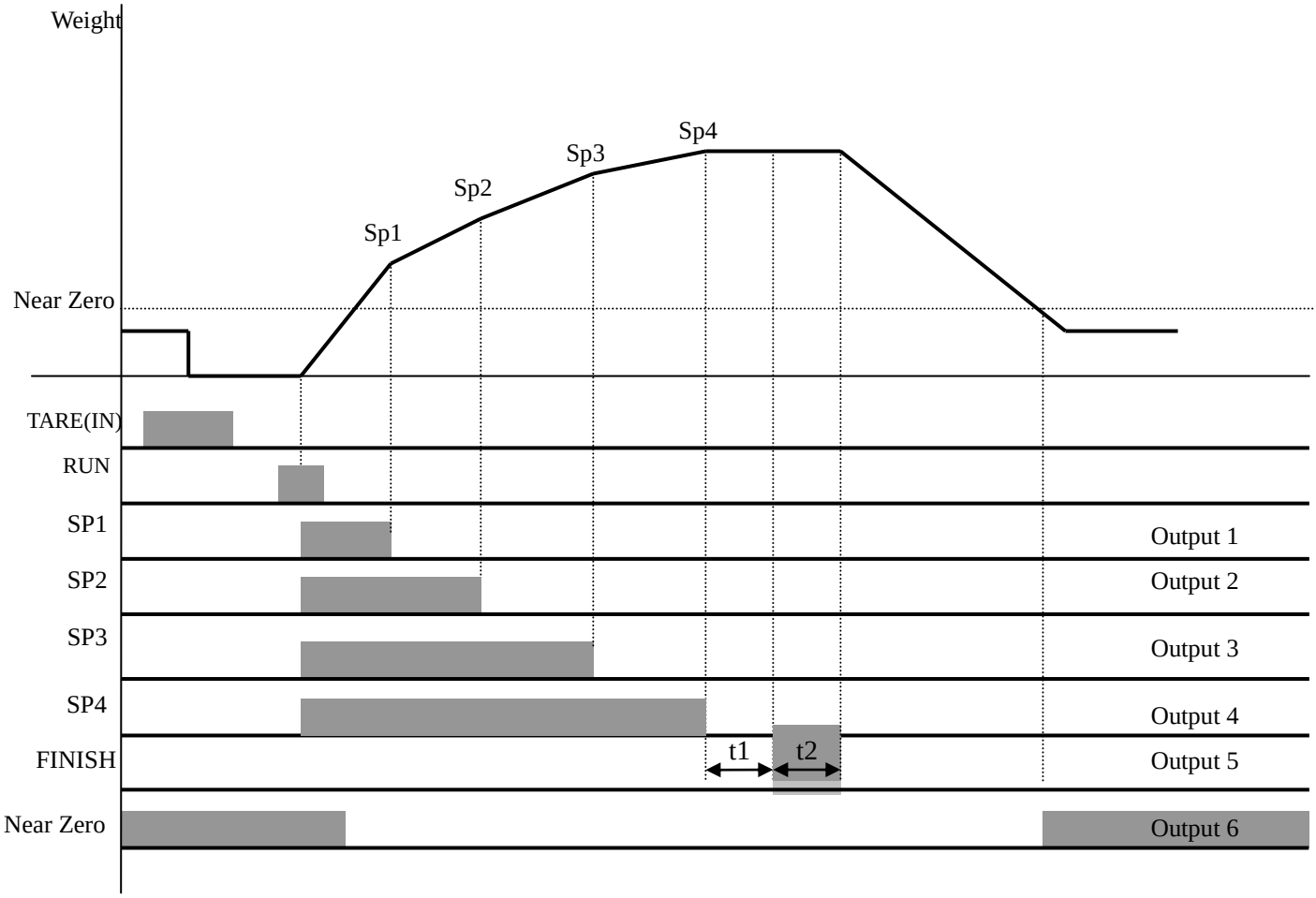
※ Finish Relay will be "OFF", after "t2" time set or weight is under "Empty Range".

4. Output Relay

Relay	Contents	Relay	Contents
SP 1	Current weight ≥ SP1(ON) Current weight < SP1(OFF)	**SP4**	Current weight ≥ SP4(ON) Current weight < SP4(OFF)
SP 2	Current weight ≥ SP2(ON) Current weight < SP2(OFF)	**FINISH**	After "t1" time, "On" during "t2" time
SP3	Current weight ≥ SP3(ON) Current weight < SP3(OFF)	**Near Zero**	Within "EMPTY" range (ON)

◆ Weighing Mode 2. Packer Mode (F21-02 setting)

Relay “ON” when “Run” input, “OFF” when the weight reaches to set value.



1. Set value setting

Sp1(Bulk), Sp2(Bulk + Drib), Sp3(Bulk + Drib + Fall), Sp4(FINAL)

2. Finish relay output delay time(t1) setting : F-Function 22

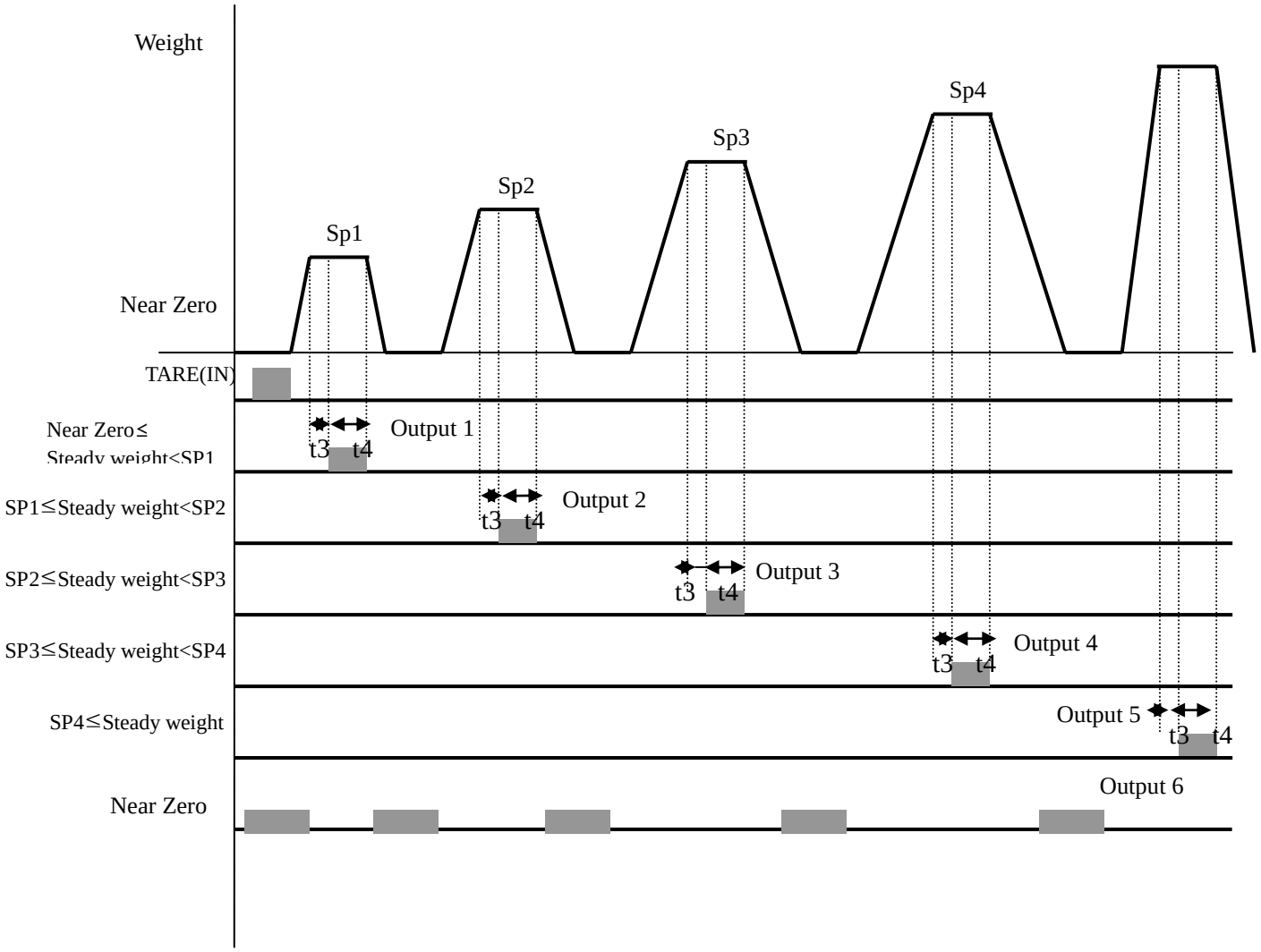
3. Finish relay output “ON” time(t2) setting : F-Function 23

4. Relay Output

Relay	Contents	Relay	Contents
SP 1	RUN input : ON Current weight=SP1(OFF)	**SP4**	RUN input : ON Current weight=SP4(OFF)
SP 2	RUN input : ON Current weight=SP2(OFF)	**FINISH**	After “t1” time, “On” during “t2” time
SP3	RUN input : ON Current weight=SP3(OFF)	**NEAR ZERO**	Within “EMPTY” range (ON)

◆ Weighing Mode 3. Comparison Mode (F21-03 setting) - Checker Mode 1.

Weight Judge, when weight value is stable over than Empty range.



1. Set value setting

Sp1(Acceptable Range), Sp2 (Acceptable Range), Sp3(Acceptable Range), Sp4(Acceptable Range)

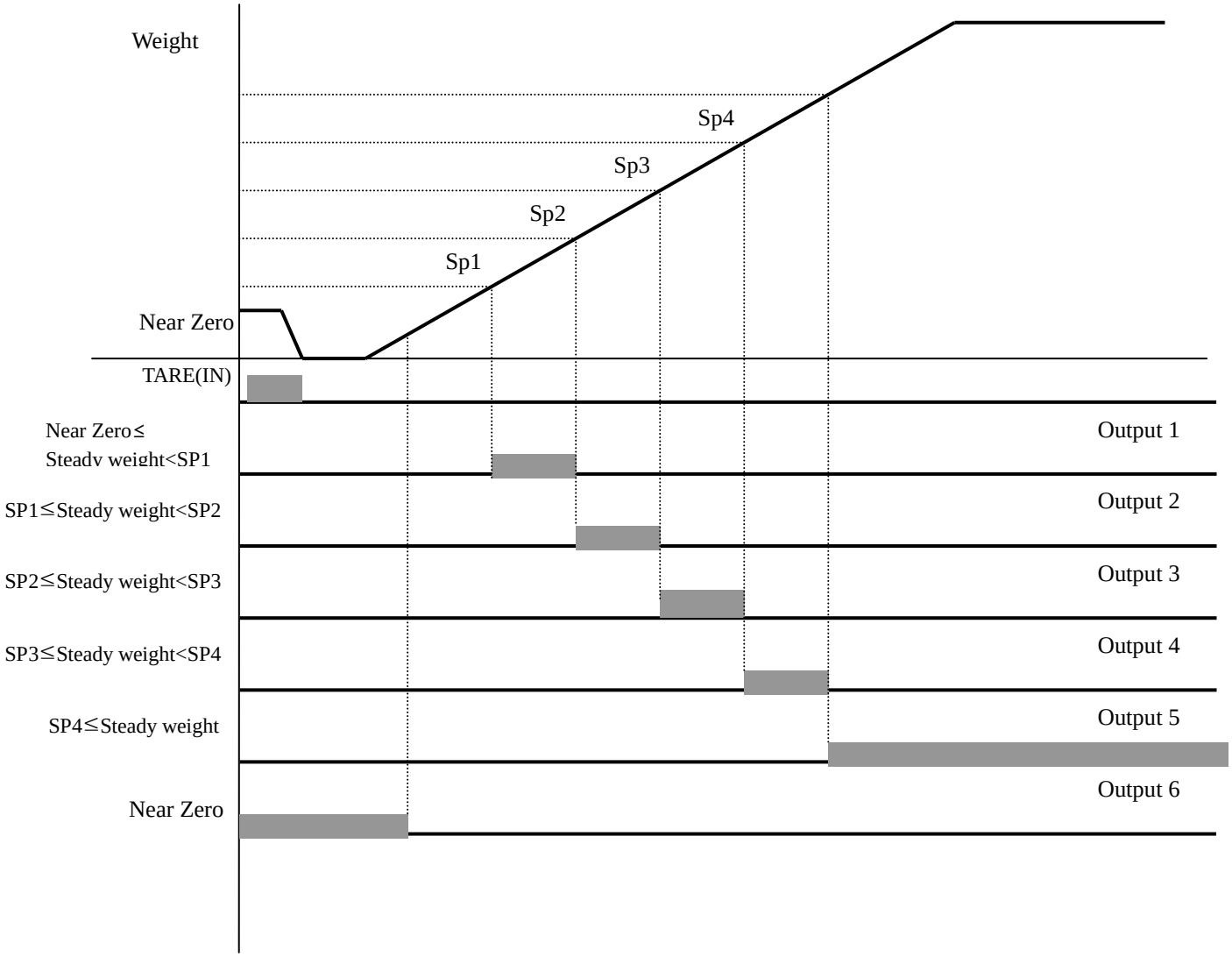
2. When the weight value is “Stable”, Each relay will be “ON” within its own acceptable range after “t3”time, during “t4” time.

3. Relay Output

Relay	Contents	Relay	Contents
SP 1	Near Zero< Steady weight≤SP1 (ON)	**SP4**	SP3<Steady weight≤SP4 (ON)
SP 2	SP1<Steady weight≤SP2 (ON)	**OVER**	SP4<Steady weight (ON)
SP3	SP2<Steady weight≤SP3 (ON)	**NEAR ZERO**	Within “EMPTY” range (ON)

◆ Weighing Mode 4. Packer Mode (F21-04 setting) - Checker mode 2.

Level meter type Check weighing Mode



1. Set value setting

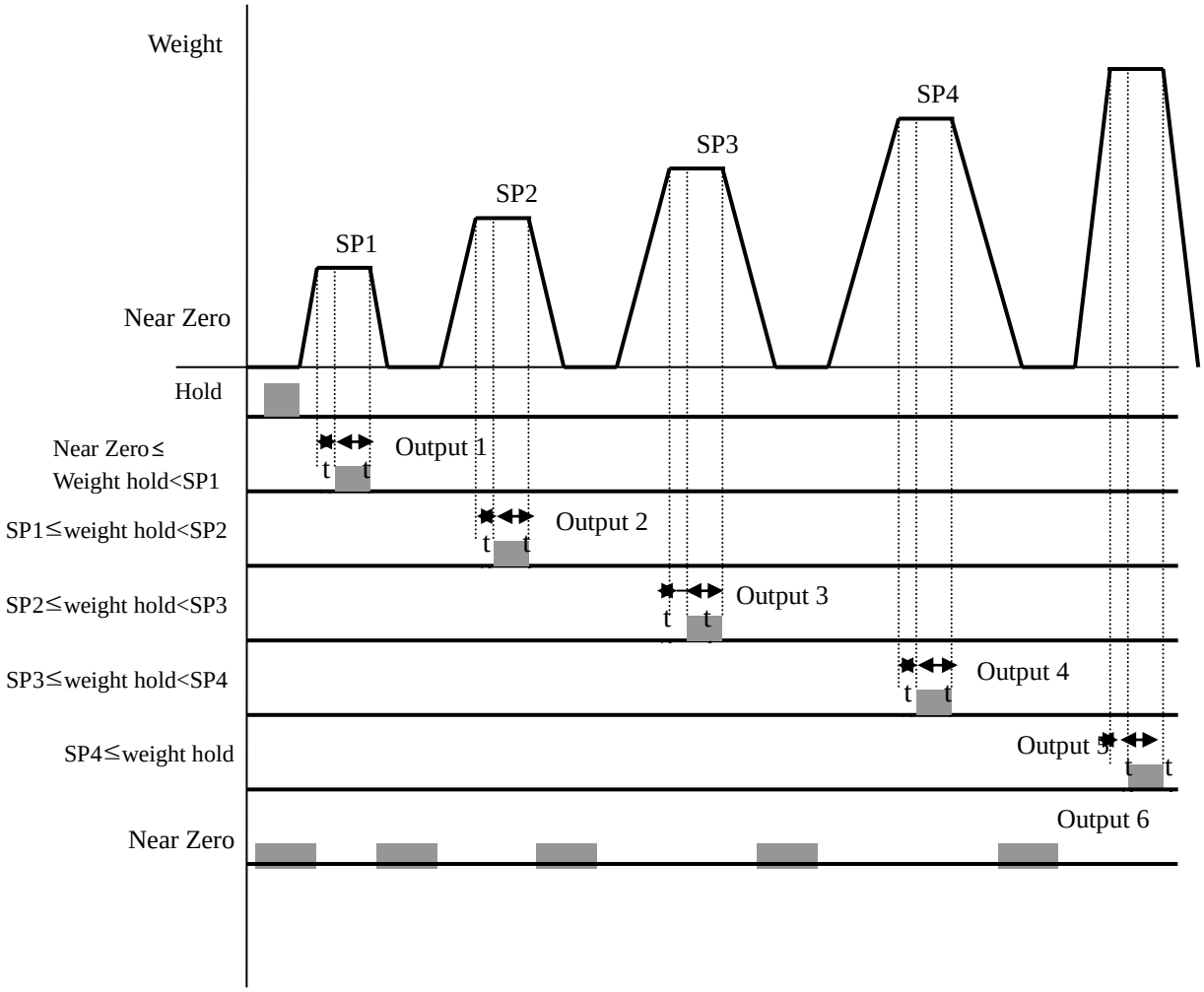
Sp1(Acceptable Range), Sp2 (Acceptable Range), Sp3(Acceptable Range), Sp4(Acceptable Range)

2. Each relay will be “ON” within its own acceptable range after “t3”time, during “t4” time.

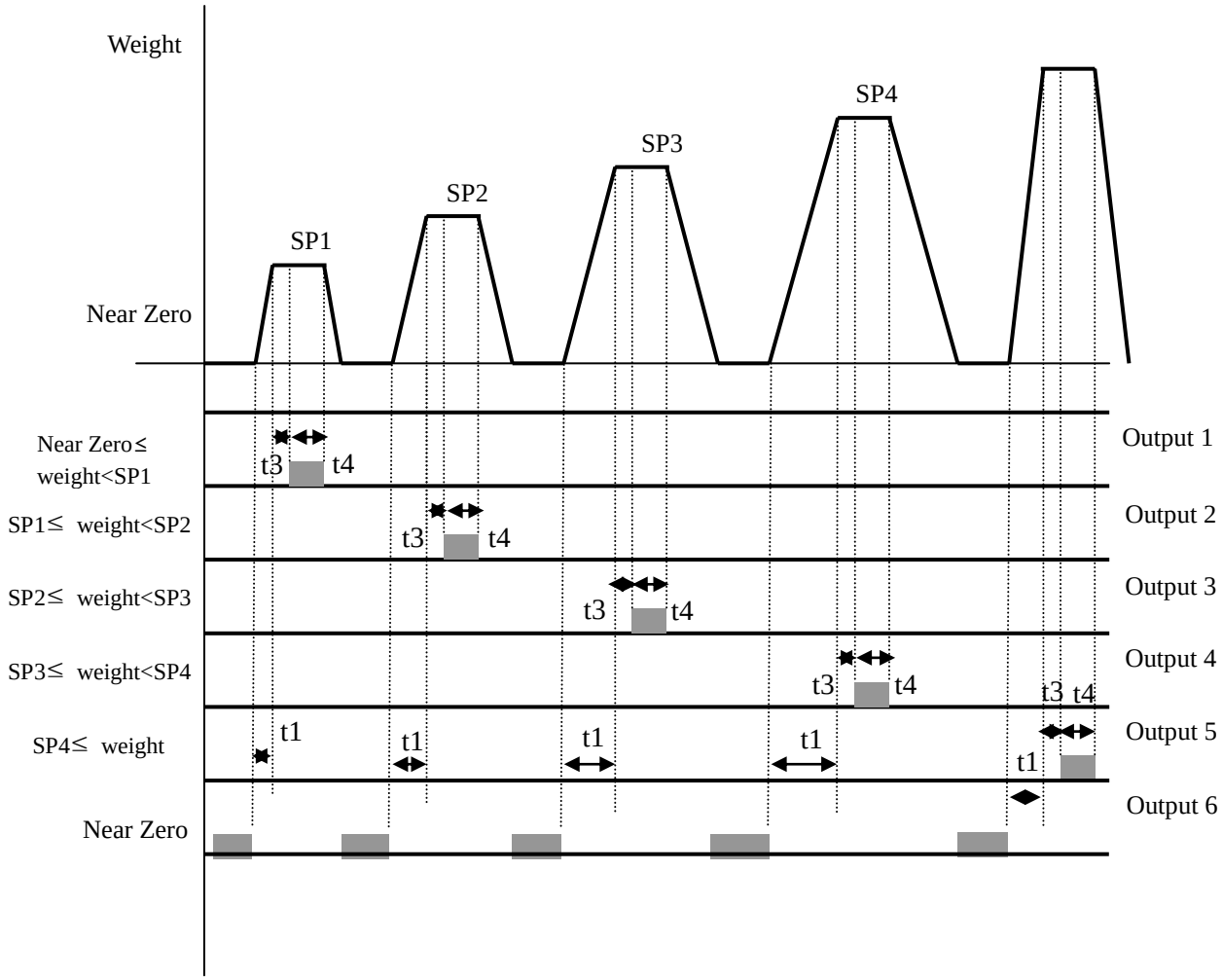
3. Relay Output

Relay	Contents	Relay	Contents
SP 1	Near Zero< Steady weight≤SP1 (ON)	**SP4**	SP3<Steady weight≤SP4 (ON)
SP 2	SP1<Steady weight≤SP2 (ON)	**OVER**	SP4<Steady weight (ON)
SP3	SP2<Steady weight≤SP3 (ON)	**NEAR ZERO**	Within “EMPTY” range (ON)

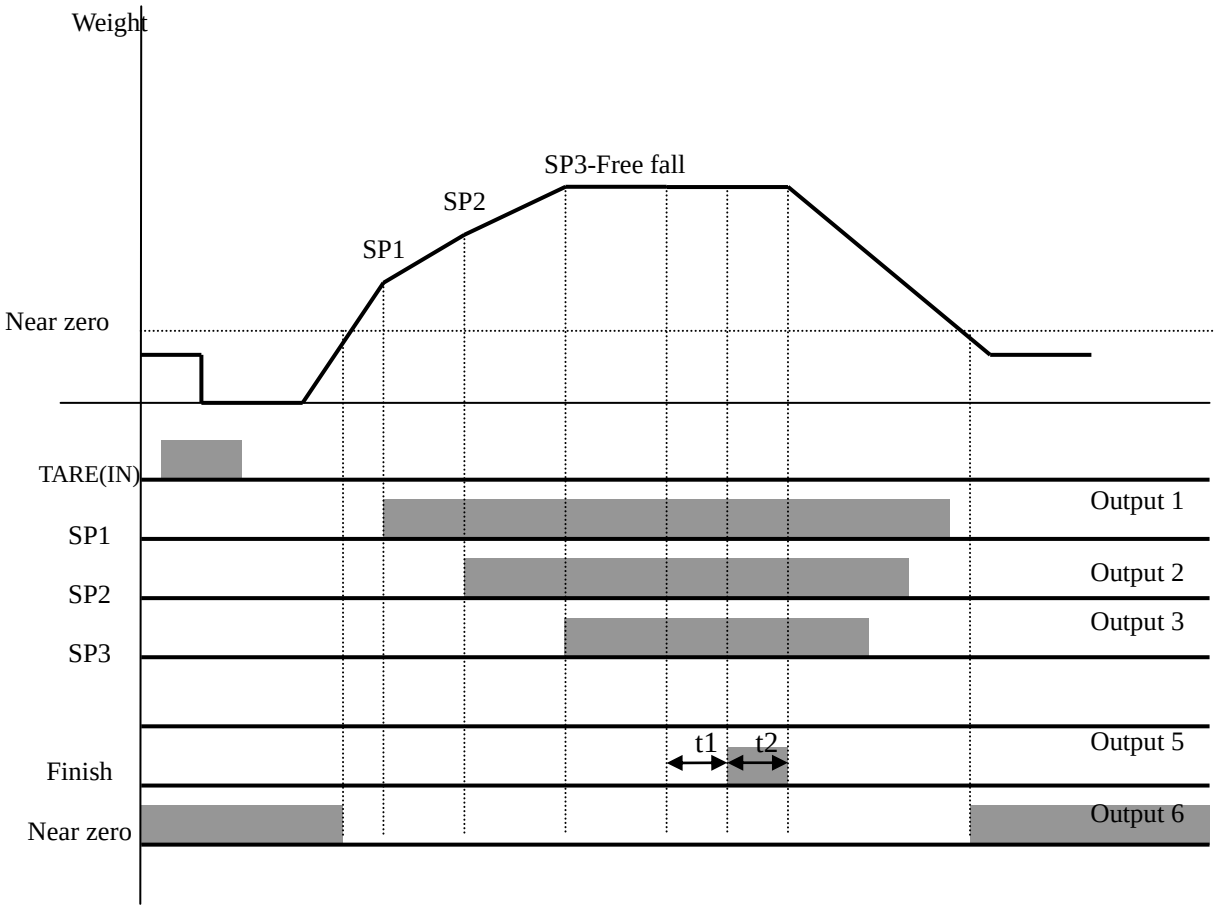
◆ Weighing Mode 5. Packer Mode (F21-05 setting) - Checker mode 3- Hold type Checker mode

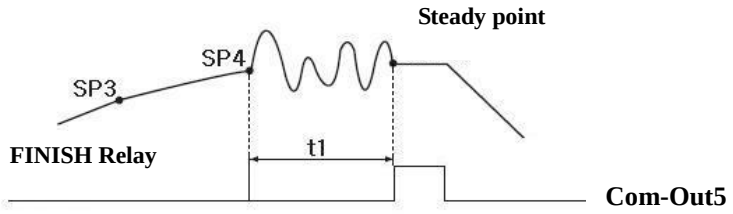
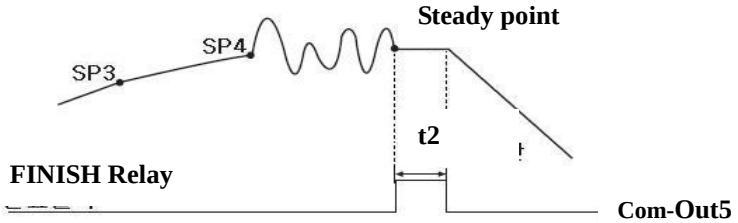
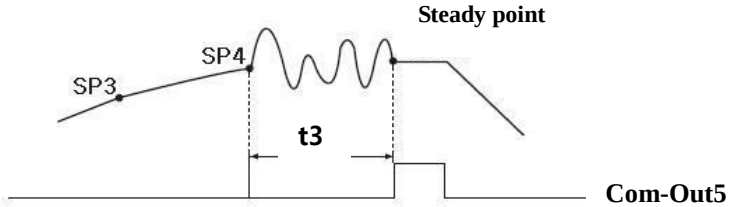
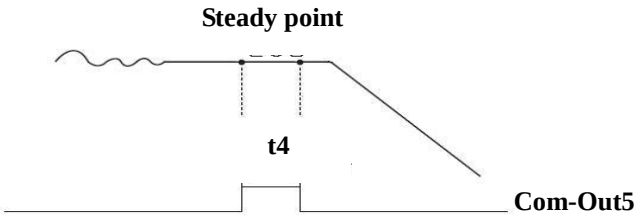


◆ Weighing Mode 6. Packer Mode (F21-06 setting) - Checker mode 4.- After 1 second delay time, enter Checker mode



◆ Weighing Mode 7. Limit Mode 2. (F21-07 setting) -3 step charge 1step free fall



"FINISH Relay" delay time(t1) setting (Under F21- 01, 02 setting) – MI-2000A/2020A			
F22	10	00 ∫ 99	After current weight is reached to FINAL, you can set some delay time of "FINISH relay ON time.  "00" setting : At Steady point, FINISH relay output "20" setting : After 2.0sec from Steady point, FINISH relay output "99" setting : After 9.9sec from Steady point, FINISH relay output
FINISH Relay "ON" time(t2) setting (Under F21-01, 02setting) – MI-2000A/2020A			
F23	10	00 ∫ 99	You can set duration time for FINISH relay.  "01" setting : FINISH relay will be "ON during 0.1sec. "20" setting : FINISH relay will be "ON" during 2.0sec.
"STEADY" Judging delay time(t3) setting (Only for F21-03, Check mode1.)			
F24	10	00 ∫ 99	After current weight is reached to each set point, you can set some delay time of "STEADY".  "00" setting : At Steady point, FINISH relay output "20" setting : During 2.0sec, hold "Steady" relay "99" setting : During 9.9sec, hold "Steady" relay
"STEADY" Judging "ON" time(t4) setting (Only for F21-03, Check mode1.)			
F25	10	00 ∫ 99	After current weight is reached to each set point, you can set some delay time of "STEADY".  "00" setting : During the weight reaches to "Empty Range".. "20" setting : During 2.0sec, Relay will be on. "99" setting : During 9.9sec, Relay will be on.

Communication setting

Parity Bit selection Mode – Port No.1(Standard)			
F30	●	0	No Parity
		1	Odd Parity
		2	Even Parity
Serial Communication Speed selection – Port No.1(Standard)			
F31		0	115,200bps
		1	76,800bps
		2	57,600bps
		3	38,400bps
		4	28,800bps
		5	19,200bps
		6	14,400bps
	●	7	9,600bps
		8	4,800bps
		9	2,400bps
Serial I/F Mode setting (Under F33-00 setting, only) – Port No.1(Standard)			
F32	●	0	Steam Mode : Continuous Data transfer
		1	Steady Mode : Single time data transfer, when the weight is steady - When Finish Relay output, Data will be output.
		2	Print Mode : Single time data transfer, when print key input
Serial I/F Transference method setting – Port No.1(Standard)			
F33	●	0	Simplex Mode
		1	Duplex Mode / Command Mode
		2	LCD Mode
		3	Not Use
		4	External Display Mode
		5	Not Use

ID No. setting			
F34	01	01 ∫ 99	ID No. setting with No. key. (01 ~99 settable)
Transferred Data Format – Port No.1(Standard)			
F35	●	0	Format 1.
		1	Format 2. (Format 1 + time)
		2	Format 3.
BCC Selection Mode			
F36	●	0	BCC not use
		1	BCC Use
Data Transference count setting – Port 1(Standard)			
F37		0	About 40times/sec
		1	About 30times/sec
		2	About 20times/sec
	●	3	About 15times/sec
		4	About 10times/sec
		5	About 5times/sec
		6	About 3times/sec
Parity Bit selection Mode – Port 2(Option)			
F40	●	0	No Parity
		1	Odd Parity
		2	Even Parity
Serial Communication Speed selection – Port 2(Option)			
F41		0	115,200bps
		1	76,800bps
		2	57,600bps
		3	38,400bps
		4	28,800bps
		5	19,200bps

		6	14,400bps
	●	7	9,600bps
		8	4,800bps
		9	2,400bps
Serial I/F Mode setting (Under F43-00 setting, only) – Port 2(Option)			
F42	●	0	Steam Mode : Continuous Data transfer
		1	Steady Mode : Single time data transfer, when the weight is steady
		2	Print Mode : Single time data transfer, when print key input
Serial I/F Transference method setting – Port 2(Option)			
F43	●	0	Simplex Mode
		1	Duplex Mode / Command Mode
		2	Not Use
		3	LCD Mode
		4	Not Use
		5	Not Use
Transferred Data Format– Port 2(Option)			
F45	●	0	Format 1.
		1	None use
		2	None use
Data Transference count setting – Port 2(Option)			
F47		0	About 40times/sec
		1	About 30times/sec
		2	About 20times/sec
	●	3	About 15times/sec
		4	About 10times/sec
		5	About 5times/sec
		6	About 3times/sec

Serial Printer Setting

Weight Unit selection (Printer)			
F50	●	0	kg
		1	g
		2	t
When Automatically print, Data output selection			
F51	●	0	When weight reached Empty Range(F80 set value), Automatically print. - Check Empty Range
		1	Over than Empty Range, Steady Lamp is “ON”, Automatically Print. - Will not check Empty Range
Print Format selection			
F52	●	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			
F53	●	0	**Manual Delete Mode** SUN Total Delete : “Clear” key + “SUB” key GRAND Total Delete : “Clear” key + “GRAND” key
		1	**Automatic Delete Mode** After SUB/GRAND Total Print, Automatically Deleted.
Paper Withdraw Rate setting (After Finish Printing process)			
F54	4	0 ∫ 9	Whenever set value increased, 1line will be added.
Printer Line Interval Selection (Only for Continuous Printer format)			
F55	1	0 ∫ 9	Whenever set value increased, 1line will be added.
SUB Total Print Mode Selection			
F56	●	0	Normal Mode
		1	Normal Mode + Average total value print

Printing Language Selection			
F57	●	0	KOREAN
		1	ENGLISH
Print Delay time Setting			
F58	00	00 ∫ 99	00 : No Delay time 99 : 9.9sec later, print output
Auto Print Setting			
F59	●	0	Manual Mode : Print output, when 0 PRINT key input.
		1	Auto Mode : Print Output, when Finish Relay output.
BCD output Selection			
F60	●	0	Positive output
		1	Negative output
Average Display setting			
F63	00	00 ∫ 99	00 setting : Average Display mode not use 99 setting : make average every 99pcs display data and display
Steady LED Status Lamp Delay time setting			
F64	00	00 ∫ 99	00 setting : No delay for the Steady LED lamp 99 setting : Delay during 9.9sec, and LED lamp will be ON.
Tension and Compression setting			
F65	●	0	Not Use (JP1 switch OFF at main board)
		1	Use (JP1 switch ON at main board and then must be re-calibration)

Other Setting

EMPTY Range setting		
F80	X.X.X.X.X.X. (0.0.0.0.1.0)	You can set “EMPTY” Range. Within set range, indicator will not display current weight and just display “Zero”. “0.000” setting : When Net Zero, “Zero” status lamp and Near Zero relay will be output. “0.190” setting : Within 190, “Zero” Status lamp and Near Zero relay will be output.
Zero Range setting		
F81	XXXXXX	Within this “Zero Range setting”, all the weight value will be displayed, As “0”
Zero Value Deduction Setting		
F82	XXXXXX	Display value with deduction, as much as set value. Ex.)Set 1000, actual weight 3000, then display 2000, only.
Analogue Output Setting (only for the analogue option installation)		
F83	XXXXXX	At the set weight value, analogue output will be maximized. Ex.) Set 5000, then a weight reached 5000 → 20mA or 10V will be output But if you need just 3000 of Max. capa, you can input 3000 through this function, then the weight reached 3000 → 20mA or 10V will be output
Span Value Check		
F89	XXXXXX	At this function, you can check the Calculated Span value. ※ If you have difficulty to process Calibration again, the best way to matching the net weight and display weight is doing Calibration process once again.
DATE Check / Change		
F90	Check Current DATE data or you can Change to new date	
TIME **Check / Change**		
F91	Check Current TIME data or you can Change to new TIME	

Chapter 6. Interface

1. Rs-232C (Standard Installed)

RS-232C Serial Interface is sensitive/weak for electric Noise.

So, please isolate with AC power cable and use shield cable to reduce the electric noise effect.

1-1. Connection

DN510N-Series Indicator

RXD2 ---------- Pin3 TXD

TXD2 ---------- Pin2 RXD

GND2---------- Pin5 GND

PC(D-Sub 9Pin)

DN510N-Series Indicator

TXD2 ---------- RXD

GND2 ---------- GND

Remote Display

1-2. Signal Format

① Type : EIA-RS-232C

② Communication Method : Half-Duplex, Full Duplex, Asynchronous

③ Serial Baud Rate : Selectable

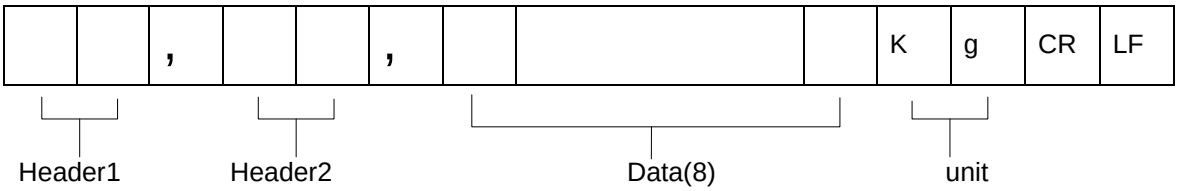
④ Data Bit : 8(No Parity mode, only)Bit.

⑤ Stop Bit : 1

⑥ Parity Bit : Non, Even, Odd (Selectable)

⑦ Code : ASCII

1-3. Data Protocol (Data Format 1. – Total 18byte)



▶ Header 1
- OL : OVER LOAD or UNDER LOAD
- ST : Weight Stable
- US : Weight Unstable

▶ Header 2
- NT : Net Weight (Without TARE Weight)
- GS : Gross Weight (With TARE Weight)

▶ DATA(8) Symbol(1) , Decimal Point(1) , Weight (6) = total 8BYTE, like +000.190
- 2B(H): "+"PLUS
- 2D(H): "-"MINUS
- 2O(H): " "SPACE
- 2E(H): "."Decimal point

▶ **UNIT**
- Kg , g

2. Current Loop Interface (Standard installed)

“Current Loop” Interface is stronger for Electric Noise than “RS-232C” interface.

So, it can be used for long distance communication.(About 100m long distance).

2-1. Connection

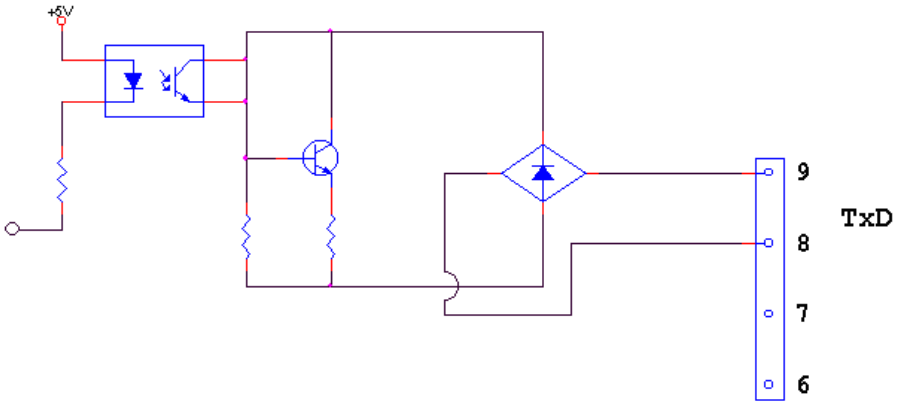
DN510N Series Indicator

C/L ---------- RXD

C/L ---------- GND

Remote Display

2-2. Current Loop Circuit Diagram.



3. Rs-422 Serial Interface (Option)

RS-422/485 serial interface is more stable for electric noise effect compare with other communication method, using electric current difference.

But, install isolated place from Power cable or other electric cables and wires, and please use shielded cable for better performance.

Recommendable communication distance is about 1.2km.

3-1. Connection

DN510N-Series Indicator

Pin6 RXD+ ---------- TXD+

Pin7 RXD- ---------- TXD-

Pin8 TXD+ ---------- RXD+

Pin9 RXD- ---------- RXD-

PC(D-Sub 9Pin)

3-2. Signal Format **(As Same as "Rs-232C Serial interface)**

①. Type : EIA-RS-232C

②. Communication Method : Half-Duplex, Full Duplex, Asynchronous

③. Serial Baud Rate : Selectable

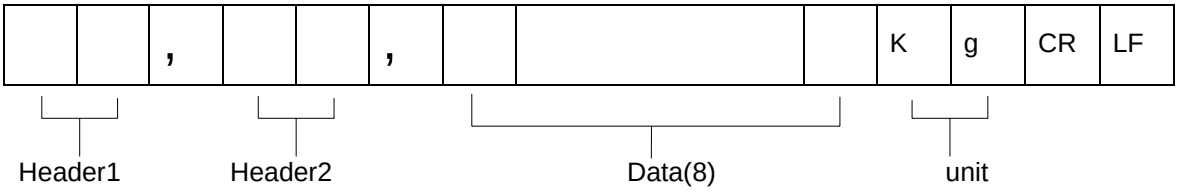
④. Data Bit : 8(No Parity mode, only)Bit.

⑤. Stop Bit : 1

⑥. Parity Bit : Non, Even, Odd (Selectable)

⑦ Code : ASCII

3-3. Data Protocol (Data Format 1. – Total 18byte) **- As same as "Rs-232c Serial Interface**



▶ COMMAND MODE

1. READ COMMAND [Start(STX ☺), End(ETX ♥), Succeed(ACK ♠), Failed(NAK §)]

RxD & TxD	Transfer & Response display	Command
PC→Indicator Format	☺01RDAT♥ (ASCII) 02 30 31 52 44 41 54 03 (HEX)	Date Data
Response from Indicator	☺01RDAT100619♠♥ (ASCII) 02 30 31 52 44 41 54 31 30 30 36 31 39 06 03 (HEX)	
PC→Indicator Format	☺01RTIM♥ (ASCII) 02 30 31 52 54 49 4D 03 (HEX)	Time Data
Response from Indicator	☺01RTIM122146♠♥ (ASCII) 02 30 31 52 54 49 4D 31 32 32 31 34 36 06 03 (HEX)	
PC→Indicator Format	☺01RSNO♥ (ASCII) 02 30 31 52 53 4E 4F 03 (HEX)	Serial No.
Response from Indicator	☺01RSNO0000000♠♥ (ASCII) 02 30 31 52 53 4E 4F 30 30 30 30 30 30 06 03 (HEX)	
PC→Indicator Format	☺01RCNO♥ (ASCII) 02 30 31 52 43 4E 4F 03 (HEX)	Code No.
Response from Indicator	☺01RCNO0000058♠♥ (ASCII) 02 30 31 52 43 4E 4F 30 30 30 30 35 38 06 03 (HEX)	
PC→Indicator Format	☺01RPNO♥ (ASCII) 02 30 31 52 50 4E 4F 03 (HEX)	Part No.
Response from Indicator	☺01RPNO19♠♥ (ASCII) 02 30 31 52 50 4E 4F 31 39 06 03 (HEX)	
PC→Indicator Format	☺01RTAR♥ (ASCII) 02 30 31 52 54 41 52 03 (HEX)	TARE weight value
Response from Indicator	☺01RTAR000758♠♥ (ASCII) 02 30 31 52 54 41 52 30 30 30 37 35 38 06 03 (HEX)	
PC→Indicator Format	☺01RCWT♥ (ASCII) 02 30 31 52 43 57 54 03 (HEX)	Current Weight value
Response from Indicator	☺01RCWTSTNT+00027.6kg♠♥ (ASCII) 02 30 31 52 43 57 54 53 54 4E 54 2B 30 30 30 32 37 2E 36 6B 67 06 03 (HEX)	

Remark	STX(1) ID(2) Command(4) Status1(2) Status2(2) Symbol(1) Weight (Include decimal point)(7) Unit(2) ACK(1) ETX(1) = Total 23 BYTE	

PC→Indicator Format	☻01RSUB♥ (ASCII) 02 30 31 52 53 55 42 03 (HEX)	Sub-Total Data
Response from Indicator	☻01RSUB0100000100000300004473♠♥ (ASCII) 02 30 31 52 53 55 42 30 31 30 30 30 30 30 31 30 30 30 30 30 33 30 30 30 30 34 34 37 33 06 03 (HEX)	
Remark	STX(1) ID(2) Command(4) P/N(2) Code(6) Sub-Total times(6) Sub-Total Weight(8) ACK(1) ETX(1) = Total 31 BYTE	

PC→Indicator Format	☻01RGRD♥ (ASCII) 02 30 31 52 53 55 42 03 (HEX)	Grand-Total Data
Response from Indicator	☻01RGRD0100000100000300000004473♠♥ (ASCII) 02 30 31 52 53 55 42 30 31 30 30 30 30 30 31 30 30 30 30 30 33 30 30 30 30 30 30 34 34 37 33 06 03 (HEX)	
Remark	STX(1) ID(2) Command(4) P/N(2) Code(6) Grand-Total times(6) Grand-Total Weight(10) ACK(1) ETX(1) = Total 33 BYTE	

PC→Indicator Format	☻01RFIN♥ (ASCII) 02 30 31 52 46 49 4E 03 (HEX)	Weighing Condition
Response from Indicator	☻01RFIN001568♠♥ (ASCII) 02 30 31 52 46 49 4E 30 30 31 35 36 38 06 03 (HEX)	

PC→Indicator Format	☻01RCWD♥ (ASCII) 02 30 31 52 46 49 4E 03 (HEX)	Memorized Data
Response from Indicator	☻01RCWD1006201020000100000100000400013B000276000414♠♥ 02 30 31 52 43 57 44 31 30 30 36 32 30 31 30 32 30 30 30 30 31 30 30 30 30 30 31 30 30 30 30 30 34 30 30 30 31 33 38 30 30 30 32 37 36 30 30 30 34 31 34 06 03 (HEX)	
Remark	STX(1) ID(2) Command(4) Date(6) Time(6) P/N(2) Code(6) Sub-Total times(6) Tare(6) Current Weight(6) Grand-Total Weight(6) ACK(1) ETX(1) = Total 53 BYTE	

PC→Indicator Format	☻01RSP1♥ (ASCII) 02 30 31 52 53 50 03 (HEX)	SP1 DATA
Response from Indicator	☻01RSP1001000♠♥ (ASCII) 02 30 31 52 53 50 31 30 30 31 30 30 30 06 03 (HEX)	

PC→Indicator Format	☻01RSP2♥ (ASCII) 02 30 31 52 53 50 03 (HEX)	SP2 DATA
Response from Indicator	☻01RSP2002000↕♥ (ASCII) 02 30 31 52 53 50 32 30 30 32 30 30 30 06 03 (HEX)	

PC→Indicator Format	☻01RSP3♥ (ASCII) 02 30 31 52 53 50 33 03 (HEX)	SP3 DATA
Response from Indicator	☻01RSP3000050↕♥ (ASCII) 02 30 31 52 53 50 33 30 30 30 30 35 30 06 03 (HEX)	

PC→Indicator Format	☻01RSP4♥ (ASCII) 02 30 31 52 53 50 34 03 (HEX)	SP4 DATA
Response from Indicator	☻01RSP4004000↕♥ (ASCII) 02 30 31 52 53 50 34 30 30 34 30 30 30 06 03 (HEX)	

2. WRITE COMMAND [Start(STX), End(ETX), Succeed(ACK), Failed(NAK)]

RxD & TxD	Transfer & Response display	Command
PC→Indicator Format	☻01WTAR♥ (ASCII) 02 30 31 57 54 41 52 03 (HEX)	TARE input
Response from Indicator	☻01WTAR↕♥ (ASCII) 02 30 31 57 54 41 52 06 03 (HEX)	

PC→Indicator Format	☻01WTRS♥ (ASCII) 02 30 31 57 54 52 53 03 (HEX)	TARE RESET
Response from Indicator	☻01WTRS↕♥ (ASCII) 02 30 31 57 54 52 53 06 03 (HEX)	

PC→Indicator Format	☻01WZER♥ (ASCII) 02 30 31 57 5A 45 52 03 (HEX)	ZERO input
Response from Indicator	☻01WZER↕♥ (ASCII) 02 30 31 57 5A 45 52 06 03 (HEX)	

PC→Indicator Format	☻01WPRT♥ (ASCII) 02 30 31 57 50 52 54 03 (HEX)	Print input
Response from Indicator	☻01WPRT↕♥ (ASCII) 02 30 31 57 50 52 54 06 03 (HEX)	

PC→Indicator Format	☻01WSPR♥ (ASCII) 02 30 31 57 50 52 54 03 (HEX)	Sub-Total Print
Response from Indicator	☻01WSPR↕♥ (ASCII) 02 30 31 57 53 50 52 06 03 (HEX)	

PC→Indicator Format	☻01WGPR♥ (ASCII) 02 30 31 57 47 50 52 03 (HEX)	Grand-Total Print
Response from Indicator	☻01WGPR↕♥ (ASCII) 02 30 31 57 47 50 52 06 03 (HEX)	

PC→Indicator Format	☻01WDAT100619♥ (ASCII) 02 30 31 57 44 41 54 31 30 30 36 31 39 03 (HEX)	Date setting
Remark	STX(1) ID(2) **Command**(4) Date(6) ETX(1)	
Response from Indicator	☻01WDAT↕♥ (ASCII) 02 30 31 57 44 41 54 06 03 (HEX)	
PC→Indicator Format	☻01WTIM122146♥ (ASCII) 02 30 31 57 54 49 4D 31 32 32 31 34 36 03 (HEX)	Time setting
Remark	STX(1) ID(2) **Command**(4) Time(6) ETX(1)	
Response from Indicator	☻01WTIM↕♥ (ASCII) 02 30 31 57 54 49 4D 06 03 (HEX)	

PC→Indicator Format	☻01WSNO0000058♥ (ASCII) 02 30 31 57 43 4E 4F 30 30 30 30 35 38 03 (HEX)	Serial No. Change
Remark	STX(1) ID(2) **Command**(4) S/N(6) ETX(1)	
Response from Indicator	☻01WSNO↕♥ (ASCII) 02 30 31 57 53 4E 4F 06 03 (HEX)	

PC→Indicator Format	☻01WPNO19♥ (ASCII) 02 30 31 57 50 4E 4F 31 39 03 (HEX)	Part No. Change
Remark	STX(1) ID(2) **Command**(4) **P/N** (2) ETX(1)	
Response from Indicator	☻01WPNO↕♥ (ASCII) 02 30 31 57 50 4E 4F 06 03 (HEX)	

PC→Indicator Format	☻01WCN0000058♥ (ASCII) 02 30 31 57 43 4E 4F 30 30 30 30 35 38 03 (HEX)	Code No. Change
Remark	STX(1) ID(2) **Command**(4) Code(6) ETX(1)	
Response from Indicator	☻01WCNO♠♥ (ASCII) 02 30 31 57 43 4E 4F 06 03 (HEX)	

PC→Indicator Format	☻01WHOL♥ (ASCII) 02 30 31 57 48 4F 4C 03 (HEX)	Hold input
Response from Indicator	☻01WHOL♠♥ (ASCII) 02 30 31 57 48 4F 4C 06 03 (HEX)	

PC→Indicator Format	☻01WHRS♥ (ASCII) 02 30 31 57 48 52 53 03 (HEX)	Hold RESET
Response from Indicator	☻01WHRS♠♥ (ASCII) 02 30 31 57 48 52 53 06 03 (HEX)	

PC→Indicator Format	☻01WSTC♥ (ASCII) 02 30 31 57 53 54 43 03 (HEX)	Sub-Total Data Clear
Response from Indicator	☻01WSTC♠♥ (ASCII) 02 30 31 57 53 54 43 06 03 (HEX)	

PC→Indicator Format	☻01WGTC♥ (ASCII) 02 30 31 57 47 54 43 03 (HEX)	Grand-Total Data Clear
Response from Indicator	☻01WGTC♠♥ (ASCII) 02 30 31 57 47 54 43 06 03 (HEX)	

PC→Indicator Format	☻01WSTR♥ (ASCII) 02 30 31 57 53 54 52 03 (HEX)	Start(Run) Input (F21 – 02) (PACK MODE)
Response from Indicator	☻01WSTR♠♥ (ASCII) 02 30 31 57 53 54 52 06 03 (HEX)	

PC→Indicator Format	☻01WSTO♥ (ASCII) 02 30 31 57 53 54 4F 03 (HEX)	STOP Input (F21 – 02) (PACK MODE)
Response from Indicator	☻01WSTO♠♥ (ASCII) 02 30 31 57 53 54 4F 06 03 (HEX)	

PC→Indicator Format	☻01WSP1000200♥ (ASCII) 02 30 31 57 53 50 31 30 30 30 32 30 30 03 (HEX)	SP1 set value change
Remark	STX(1) ID(2) **Command**(4) SP1(6) ETX(1)	
Response from Indicator	☻01WSP1↕♥ (ASCII) 02 30 31 57 53 50 31 06 03 (HEX)	

PC→Indicator Format	☻01WSP2000400♥ (ASCII) 02 30 31 57 53 50 32 30 30 30 34 30 30 03 (HEX)	SP2 set value change
Remark	STX(1) ID(2) **Command**(4) SP2(6) ETX(1)	
Response from Indicator	☻01WSP2↕♥ (ASCII) 02 30 31 57 53 50 32 06 03 (HEX)	

PC→Indicator Format	☻01WSP3000600♥ (ASCII) 02 30 31 57 53 50 33 30 30 30 36 30 30 03 (HEX)	SP3 set value change
Remark	STX(1) ID(2) **Command**(4) SP3(6) ETX(1)	
Response from Indicator	☻01WSP3↕♥ (ASCII) 02 30 31 57 53 50 33 06 03 (HEX)	

PC→Indicator Format	☻01WSP4000900♥ (ASCII) 02 30 31 57 53 50 34 30 30 30 39 30 30 03 (HEX)	SP4 set value change
Remark	STX(1) ID(2) **Command**(4) SP4(6) ETX(1)	
Response from Indicator	☻01WSP4↕♥ (ASCII) 02 30 31 57 53 50 34 06 03 (HEX)	

4. Analogue Output (0~10V / Option)

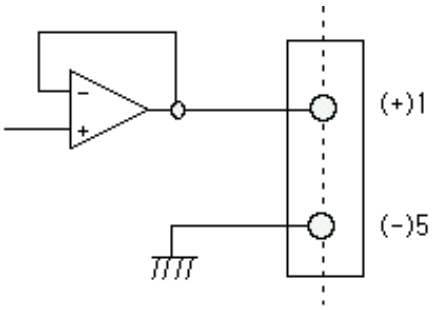
This Option card converts weight value to Analog Voltage output(0~10V) and transfers to external devices(Recorder, P.L.C), controlled by voltage output.

4-1. Specification

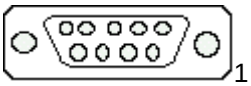
- Output Valtage : 0~10V DC output
- Accuracy : More than 1/1,000

※As we convert Digital signal(1/30,000 accuracy) to Analogue, so the accuracy will be lower than Digital signal

4-2. Circuit Diagram and Pint Connection



9pin D-sub Female connector



1 : HI(+), 5 : (-)

※ This Voltage output is proportioned on weight calibration and outputs 0~10V.

4-3. Adjustment

This output is adjusted as when the weight is “Zero”, output is 0V and When the weight is “Full capacity”, output is 10V.

If you need additional adjustment, please adjust with “VR1(Zero)”, “VR2(Span) on the Analog Output PCB.

※ Remark

This Analog option card converts Displayed weight value(Micro-process data) to analog value on D/A Converter(Digital to Analog converter)

This D/A Converter has Max. 1/4,000 accuracy, so this output is not suitable for high accuracy application, like more than 1/3,000.

For 0~5VDC or 1~5VDC analog output, please inform when you inquiry.

4-4. Output Test

Enter to “TEST” mode and select TEST mode 2(key test).

If you press No.1(0V) / No.2(2.5V) / No.3(5V) / No.4(7.5V) / No.5(10V) will be output.

5. Analogue Output (4~20mA / Option)

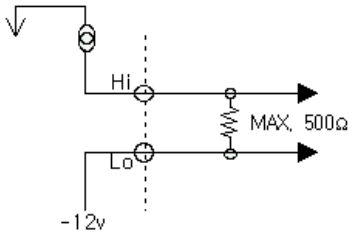
This Option card converts weight value to Analog Voltage output(4~20mA) and transfers to external devices(Recorder, P.L.C), controlled by voltage output.

5-1. Specification

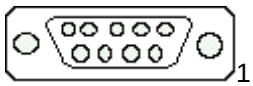
- Output Voltage : 4~20mA output (Max.2~22mA)
- Accuracy : More than 1/1,000
- Temperature Coefficient : 0.01%/℃
- Max. Loading Impedance : Max. 500Ω

※As we convert Digital signal(1/30,000 accuracy) to Analogue, so the accuracy will be lower than Digital signal

5-2. Circuit Diagram and Pint Connection



9pin D-sub Female connector


1 : HI(+), 5 : (-)

※ “LO” terminal is not a “GND”, so this “LO” terminal do not be connected with other “GND” terminal on other devices.

※ This output is proportioned on weight calibration and outputs 4~20mA.

5-3. Output Adjustment

①. This output is adjusted as when the weight is “Zero”, output is “4mA” and When the weight is “Full capacity”, output is “20mA”.

②. If you need additional adjustment, please adjust with “VR1(Zero)”, “VR2(Span) on the Analog Output PCB.

※ Remark

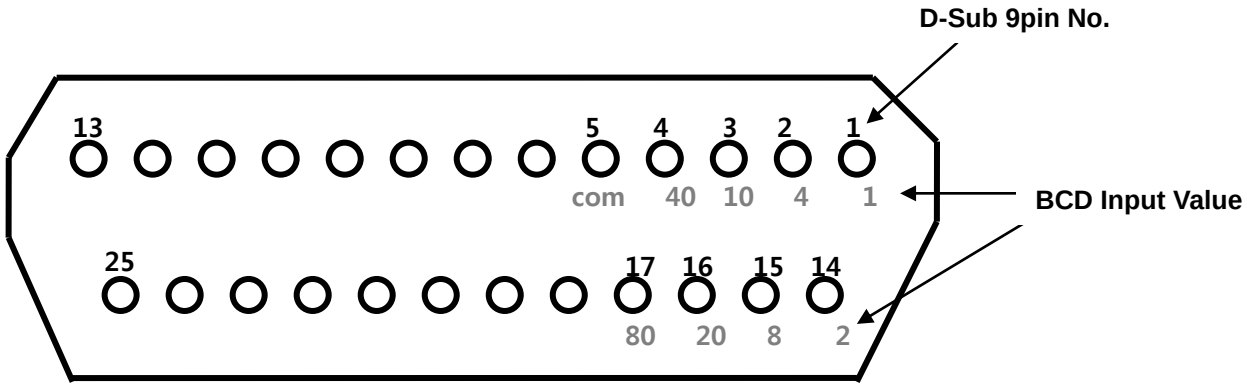
This Analog option card converts Displayed weight value(Micro-process data) to analog value on D/A Converter(Digital to Analog converter)

This D/A Converter has Max. 1/4,000 accuracy, so this output is not suitable for high accuracy application, like more than 1/3,000.

6. BCD Input (Option)

This “BCD interface” option card can be applied on PLC (Programmable Logic Controller), or Score Board applications.
Each Input circuit is isolated with “Photo-Coupler”, from external devices electrically.

6-1. Circuit Diagram



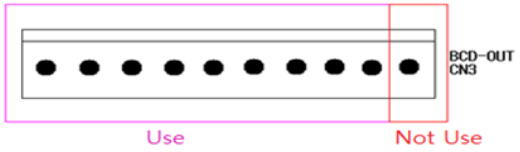
This Option card can be used for changing Part No. setting from external devices.

7. BCD Output (Option)

This “BCD interface” option card can be applied on PLC (Programmable Logic Controller), or Score Board applications.
Each Input circuit is isolated with “Photo-Coupler”, from external devices electrically.

PIN NO.		SIGNAL	PIN NO.		SIGNAL
1		GROUND(GND)	26		HI : NET, LOW : Gross
2		1 × 10^0	27		NC
3		2 × 10^0	28		NC
4		4 × 10^0	29		NC
5		8 × 10^0	30		NC
6		1 × 10^1	31		EX INPUT3 (Part Number)
7		2 × 10^1	32		EX INPUT2 (Part Number)
8		4 × 10^1	33		NC
9		8 × 10^1	34		NC
10		1 × 10^2	35		NC
11		2 × 10^2	36		NC
12		4 × 10^2	37		NC
13		8 × 10^2	38		NC
14		1× 10^3	39		NC
15		2 × 10^3	40		NC
16		4 × 10^3	41		NC
17		8 × 10^3	42		Hi : Positive Polarity (+)
18		1 × 10^4	43		HI : Decimal Point 10^1
19		2 × 10^4	44		HI : Decimal Point 10^2
20		4 × 10^4	45		HI : Decimal Point 10^3
21		8 × 10^4	46		HI : OVER LOAD
22		1 × 10^5	47		Positive, Negative output (F-50)
23		2 × 10^5	48		EX INPUT1 (Part Number)
24		4 × 10^5	49		BUSY
25		8 × 10^5	50		EX INPUT0 (Part Number)
* F60 , 0→ Positive output, 1→ Negative output					

***** Please donot connect + Polarity at No.1PIN1. Only connect GND Polarity**



The 9 Pin connector is connected at CN3 of main board.

8. Serial Printer Interface (Standard).

This interface can be connected all kinds of serial interface installed printer devices.

But, programmed print format is specialized with our serial printer only.

So, if you use different model, the format can be changed or not printed.

8-1. Printer Specification

1. Interface : Rs-232
2. Protocol : 9600 bps, No Parity, Data(8), Stop(1)
3. Column : 30 Column
4. Printing type : Combination type

8-2. Pin Connection

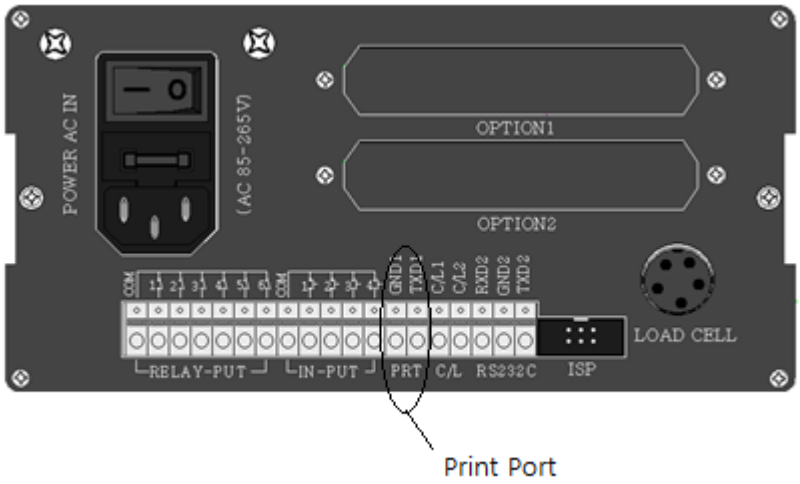
DN510N Series Indicator

GND ---------- GND

TXD ---------- RXD

Serial Printer

8-3. Print Port



9. Serial Print Format

Single Print Format

```
==============================
   DATE   :    2006/12/14 THU
   TIME   :       15:26:32
 PART  CODE   SERIAL    WEIGHT
   1       1       1   50.00 kg
==============================
   DATE   :    2006/12/14 THU
   TIME   :       15:26:38
 PART  CODE   SERIAL    WEIGHT
   1       1       2   50.00 kg
==============================
   DATE   :    2006/12/14 THU
   TIME   :       15:26:43
 PART  CODE   SERIAL    WEIGHT
   1       1       3    2.24 kg
==============================
   DATE   :    2006/12/14 THU
   TIME   :       15:26:50
 PART  CODE   SERIAL    WEIGHT
   1       1       4    3.02 kg
==============================
```

Continuous Print Format

```
==============================
   DATE   :    2006/12/14 THU
   TIME   :       15:28:55
 PART  CODE   SERIAL    WEIGHT
   1       1       1   50.00 kg
   1       1       2   50.00 kg
   1       1       3   50.01 kg
   1       1       4   50.00 kg
   1       1       5   20.62 kg
```

Sub-Total Print Format

```
==============================
          SUB-TOTAL
   DATE   :    2006/12/14 THU
   TIME   :       15:29:30
   PART   :              1
   CODE   :              1
    MIN   :       20.62 kg
    MAX   :       50.01 kg
    AVG   :       44.12 kg
 T-COUNT  :              5
 T-WEIGHT :      220.63 kg
==============================
```

Grand Total Print Format

```
==============================
          GRD-TOTAL
   DATE   :    2006/12/14 THU
   TIME   :       15:29:31
 PART  CODE  SERIAL  WEIGHT
  1      1      5    220.63 kg

 T-PART   :              1
 T-COUNT  :              5
 T-WEIGHT :      220.63 kg
==============================
```

Chapter 7. Error and Treatment

1. TEST Mode

TEST Mode No.	Contents	Detail information
TEST 1.	Analogue TEST mode	This mode is Analogue testing
TEST 2.	Keypad TEST mode	This mode is Keypad testing or Analogue Option Card Test (4~20mA or 0~10v) - No.1 key : 4mA / 0V output - No.2 key : 8mA / 2.5V output - No.3 key : 12mA / 5V output - No.4 key : 16mA / 7.5V output - No.5 key : 20mA / 10V output
TEST 3.	SET.CAL Mode	This mode is F-Function setting or Calibration setting
TEST 4.	Display TEST Mode	Check that display is normal or not
TEST 5.	Relay output TEST Mode	If have a relay, check the relay output
TEST 6.	External input(Digital Input)TEST Mode	Check that external input is normal or not
TEST 7.	Un-Calibrated Analogue TEST Mode	Check the pure analogue value when not calibration

※If you installed Analogue Option card, you can test Analogue output test with "TEST 2" mode. (Please check detailed information)

1.1 Enter to TEST Mode

Turn on the power with pressing 

key.

Then, display will show TEST, then press No. key and move to the certain TEST mode.

1.2 Exit from TEST Mode

Press 

key to exit from each TEST mode.

Then, display will show TEST

※ Under TEST 3. SET-CAL mode, press 

key to exit TEST.

2. Error and Treatment

2-1. Load Cell Installation

Error	Cause	Treatment	Remark
Weight Value is unstable	1). Load cell broken 2). Load cell isolation resistance error 3). Weighing part touches other devices or some weight is on the weighing part 4). Summing Board Error	1). Measure input/output resistance of Load cell. 2). Measure Load cell isolation resistance 3) Check attach point with other devices.	1).Input Resistance of “EX+” and “EX-“ is about 350Ω~450Ω. 2). Output Resistance of “EX-“ and “EX+” is about 350Ω. 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	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	

2-2. Calibration Process

Error	Cause	Treatment
Err 01	When Max.capacity/digit value is over 20.00	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 09	When Y.Y has the value between 3.9 ~ 9.9 at Y.YXXXX as Span value, If standard weight value is less than 10% of Max. Capacity	Change the Max.capacity/digit value (Ex: digit 01 → 05)
Err A	When there is continuous vibration on the weighing part,, indicator can not process calibration any more.	- Find vibration cause and remove - Load cell check - Load cell cable and connecting condition check