



Approved for Digital
Weigh Indicator

Digital Weighing Indicator

Operating Manual

Model : DN510N



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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.



Caution

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

2. INTRODUCTION

2-1. Introduction

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

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 μ V / Digit
Load Cell Excitation	DC 10V (- 5V ~ + 5V)
Max. Signal Input Voltage	Max.32mV
Temperature Coefficient	[Zero] \pm 20PPM/ $^{\circ}$ C [Span] \pm 20PPM/ $^{\circ}$ C
Input Noise	\pm 0.6 μ V P.P
Input Impedance	Over 10M Ω
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) x13.0(W)mm
	Min. Division	x1, x2, x5, x10, x20, x50
	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)
Key	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).












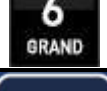


3-5-2. Key Pad Function.

	<p>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.</p>
	<p>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.</p>
	<p>TARE RESET 1. Remove the Set TARE function. - If you press this key, TARE set value will be removed and display gross weight.</p>
	<p>HOLD RESET 1. Remove the Set HOLD function. - If you press this key, HOLD set value will be removed.</p>
	<p>Start Weighing process, under Packer Mode, only.</p>
	<p>Stop weighing process, under Packer Mode, only.</p>
	<p>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</p>
	<p>Set the SP1 value or Check the current value. - Press key and enter new set value with keypad, and press enter to save.</p>
	<p>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.</p>
	<p>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.</p>
	<p>Set the SP2 value or Check the current value. - Press key and enter new set value with keypad, and press enter to save.</p>

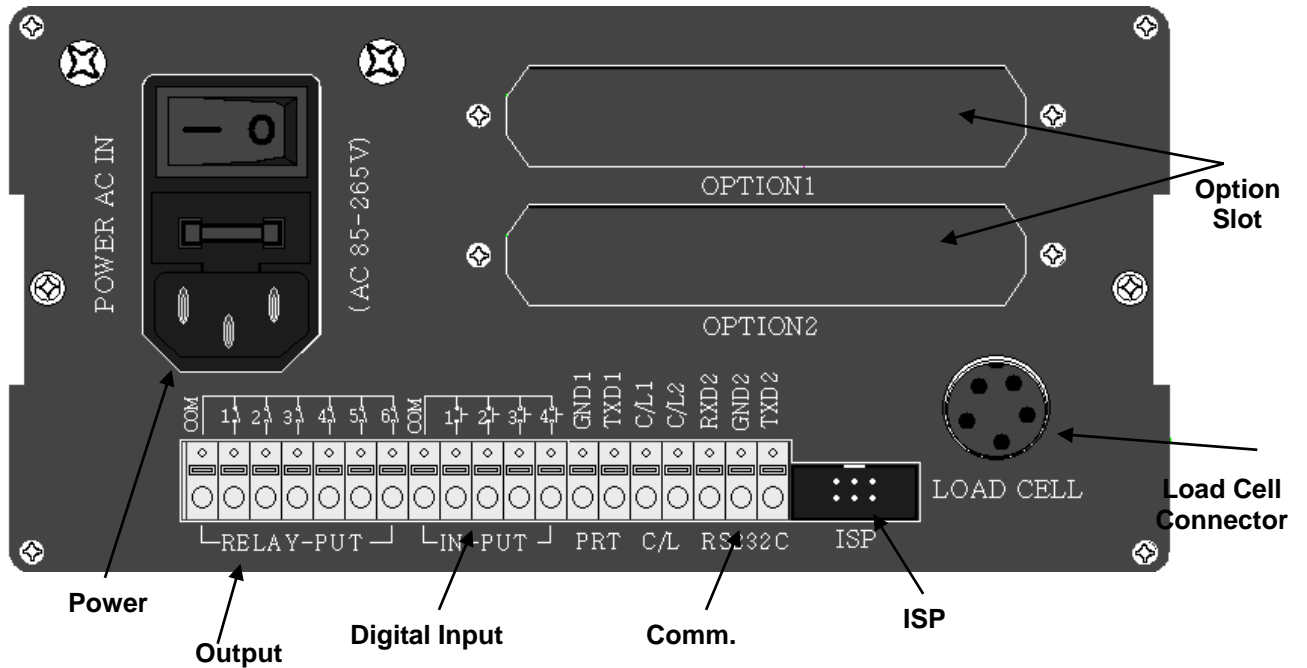
	Set the SP3 value or Check the current value. - Press key and enter new set value with keypad, and press enter to save.
	Set the SP4 value or Check the current value. - Press key and enter new set value with keypad, and press enter to save.
	Manual Printer - Key input, print output. Calibration mode - Digit setting Whenever pressing "0"key, digit will be change 1, 2, 5, 10, and 50.
	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
	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 :  key + other keys)

		Time set value check or Change
		Date set value check or Change
		Code value check or Change
		Serial No. check or change
		Sub-total Data Delete
		Grand-total Data Delete
		Key Tare function activated. (To Reset the key tare, press Tare Reset key.)

3-6. Rear Panel

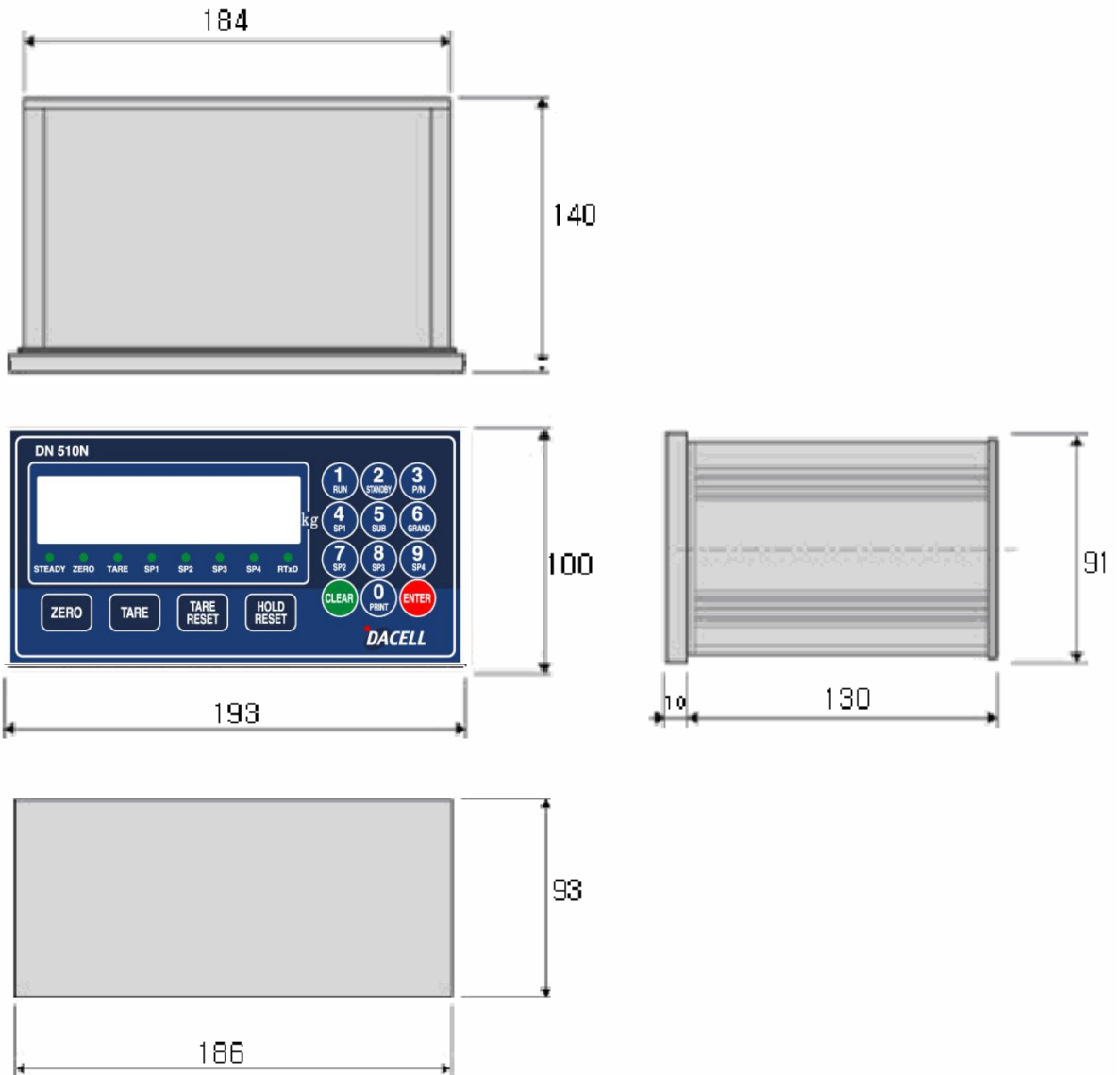


①POWER	-Power ON/OFF Switch -Fuse : AC 250V 10A -AC IN : AC86~265V Power In
②OPTION 1,2	- OPTION BOARD install slot. - ANALOG out, Serial I/F, etc
③LOAD CELL CONNECTOR (N-16)	-EXC + (+5V) PIN1 (RED) -EXC - (-5V) PIN2 (WHITE) -SIG+ PIN3 (Black, Blue) -SIG- PIN4 (Green) -SHIELD PIN5 (SHEILD)
④Digital Input	- 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  →  display


Press  key →  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 ( 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 ( →  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 ( 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 ( →  → )

Input prepared Test weight value with No. keys.

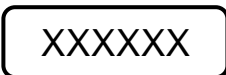
And press  key.

Then, display will show  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( → )

Check the Calculated Span value.


And after 3sec,  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  →  display


Press  key →  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 ( →  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 ( →  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 ( 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  →  display

Press  key →  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	1 st place under Zero (0.0)
		2	2 nd place under Zero (0.00)
	●	3	3 rd 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**

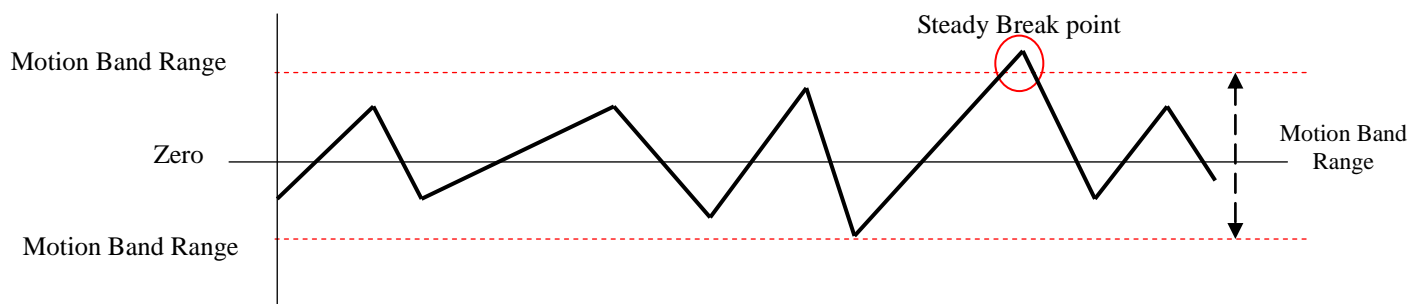
Under this mode, DN510N memories “Zero” value of weighing part. So, when the power is recovered DN510N can display material weight.

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

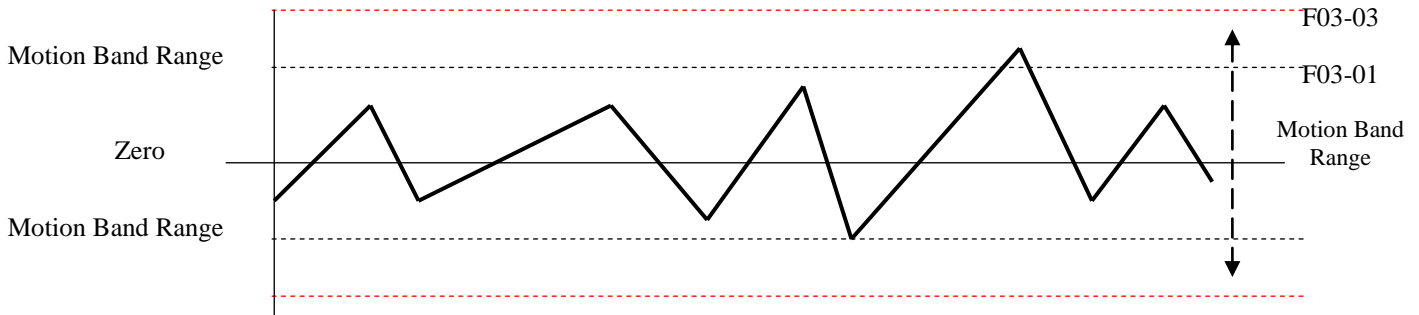
※ This function is compensate vibration effect on weighing part with acceptable range setting.

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)

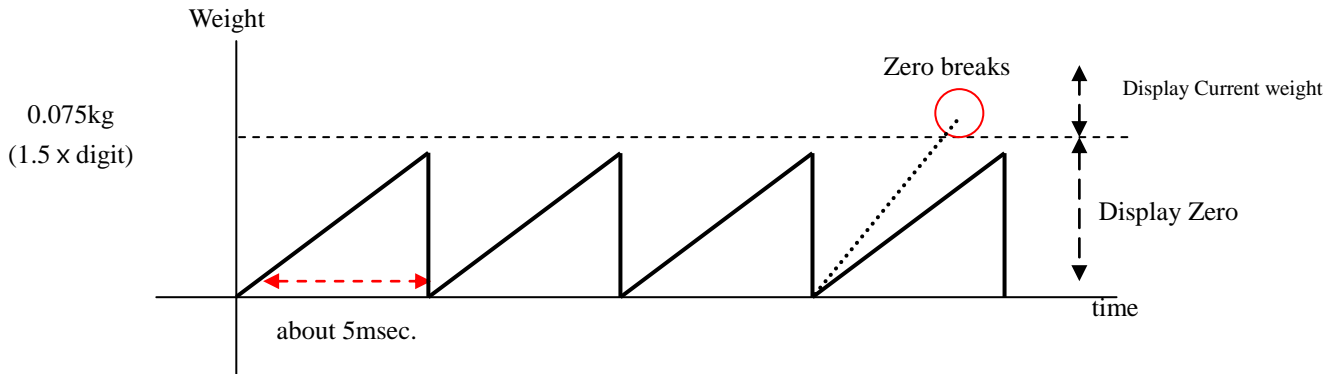


Zero Tracking Compensation Range setting			
F04	5	0 9	<p>Due to external causes(Temperature, wind, and dust), there are small weight difference, indicator will ignore the weight difference and display Zero.</p> <p>For this compensation function, indicator will estimate the weight difference is over the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

Example) Max. Capacity : 100.00kg, Digit : 0.05kg, F04-03 setting

Zero Tracking Compensation Range : $0.5 \times \text{digit} \times \text{F04 set value} = 0.0025 \times 3 = 0.075\text{kg}$

Fixed time period : about 5msec. (Fixed time period will be effected on F06(digital filter) setting)

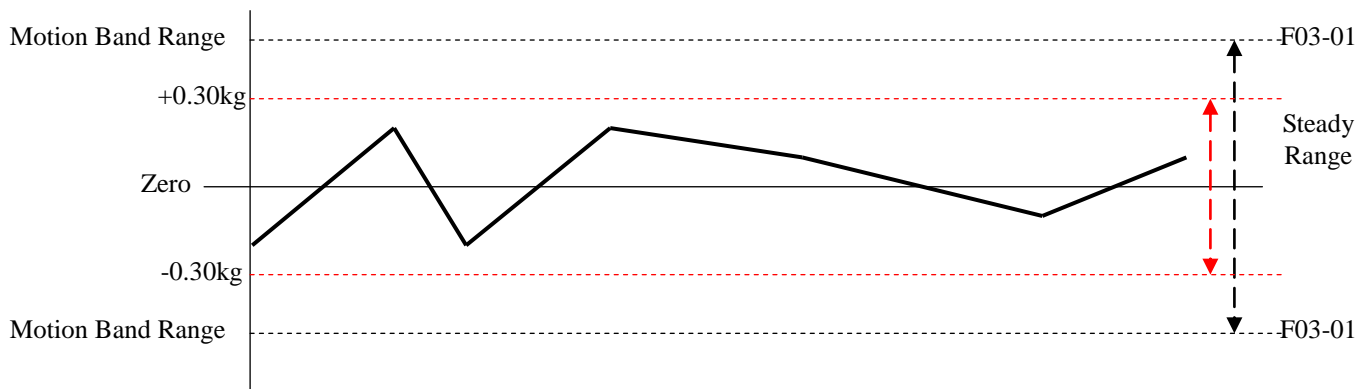


Auto Zero Range setting			
F05	00	00 99	<p>Within the “Auto Zero” range, weighing part is steady, indicator will display current weight as “Zero”</p> <p>If the weighing part is not “Steady”, indicator will display current weight.</p> <p>(Auto Zero Range : \pm Set value + weight unit)</p>

※ 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 $\pm 0.30\text{kg}$ (Set value + weight unit) and Steady.



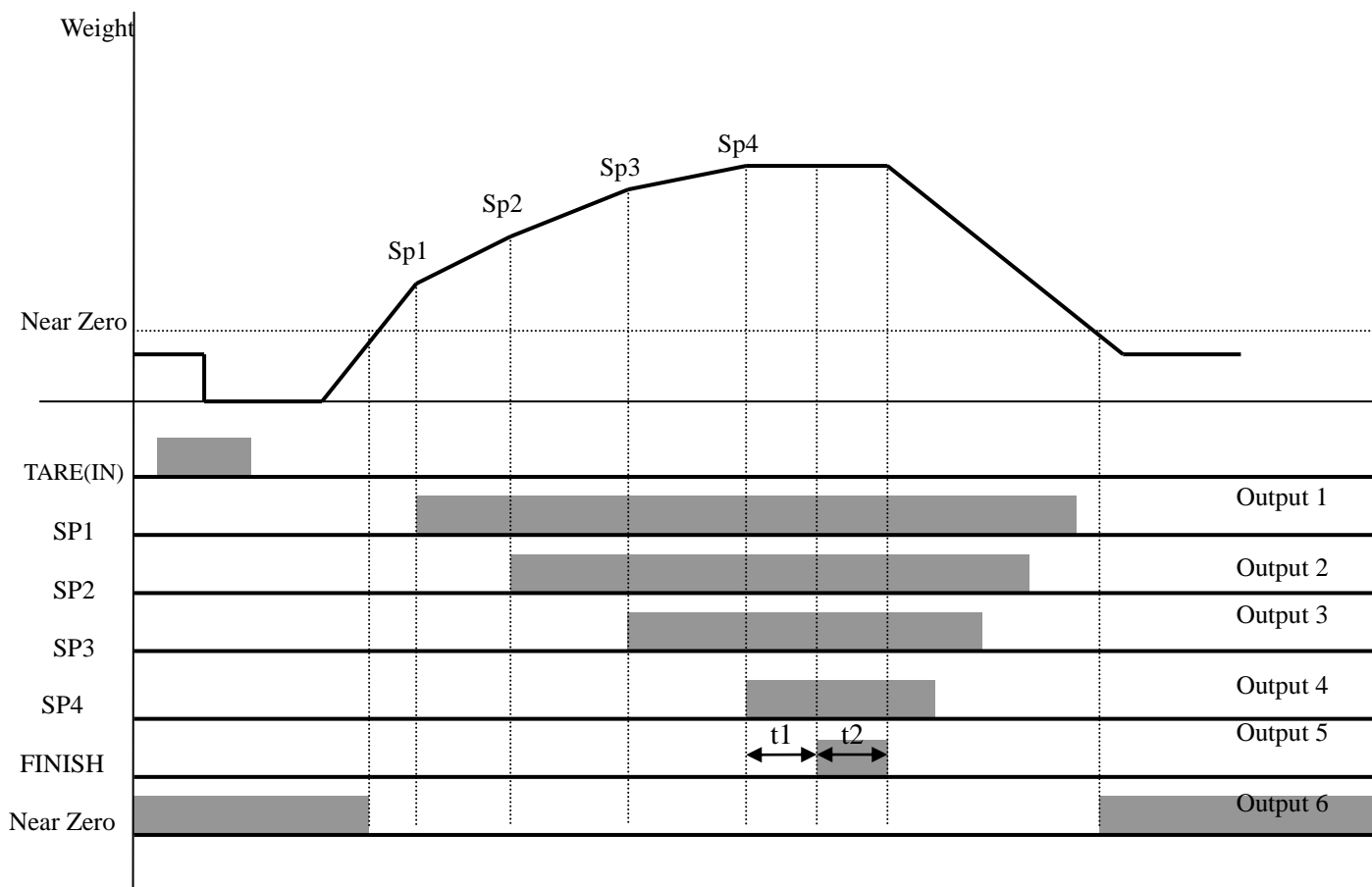
Digital Filter setting				
F06	15	00 ┆ 49	Small set value for weak vibration Large set value for strong vibration	Small set value more sensitive
Zero /Tare key Operation mode selection				
F07	<input checked="" type="radio"/>	0	Activate when "Steady" condition, only	
	<input type="radio"/>	1	Always activated	
Zero key Operation Range selection				
F08	<input type="radio"/>	0	Activated within 2% of Max. Capacity	
	<input type="radio"/>	1	Activated within 5% of Max. Capacity	
	<input type="radio"/>	2	Activated within 10% of Max. Capacity	
	<input checked="" type="radio"/>	3	Activated within 20% of Max. Capacity	
	<input type="radio"/>	4	Activated within 100% of Max. Capacity	
Tare key Operation Range selection				
F09	<input type="radio"/>	0	Activated within 10% of Max. Capacity	
	<input type="radio"/>	1	Activated within 20% of Max. Capacity	
	<input type="radio"/>	2	Activated within 50% of Max. Capacity	
	<input checked="" type="radio"/>	3	Activated within 100% of Max. Capacity	
"Hold" Mode selection				
F10	<input checked="" type="radio"/>	0	Peak Hold : Measure Max. weight value and hold on display.	
	<input type="radio"/>	1	Sample Hold : Hold current weight until "Hold Reset".	
	<input type="radio"/>	2	Average Hold : Make average during 3sec, and hold display	
	<input type="radio"/>	3	Average Hold : Make average during 5sec, and hold display	
	<input type="radio"/>	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

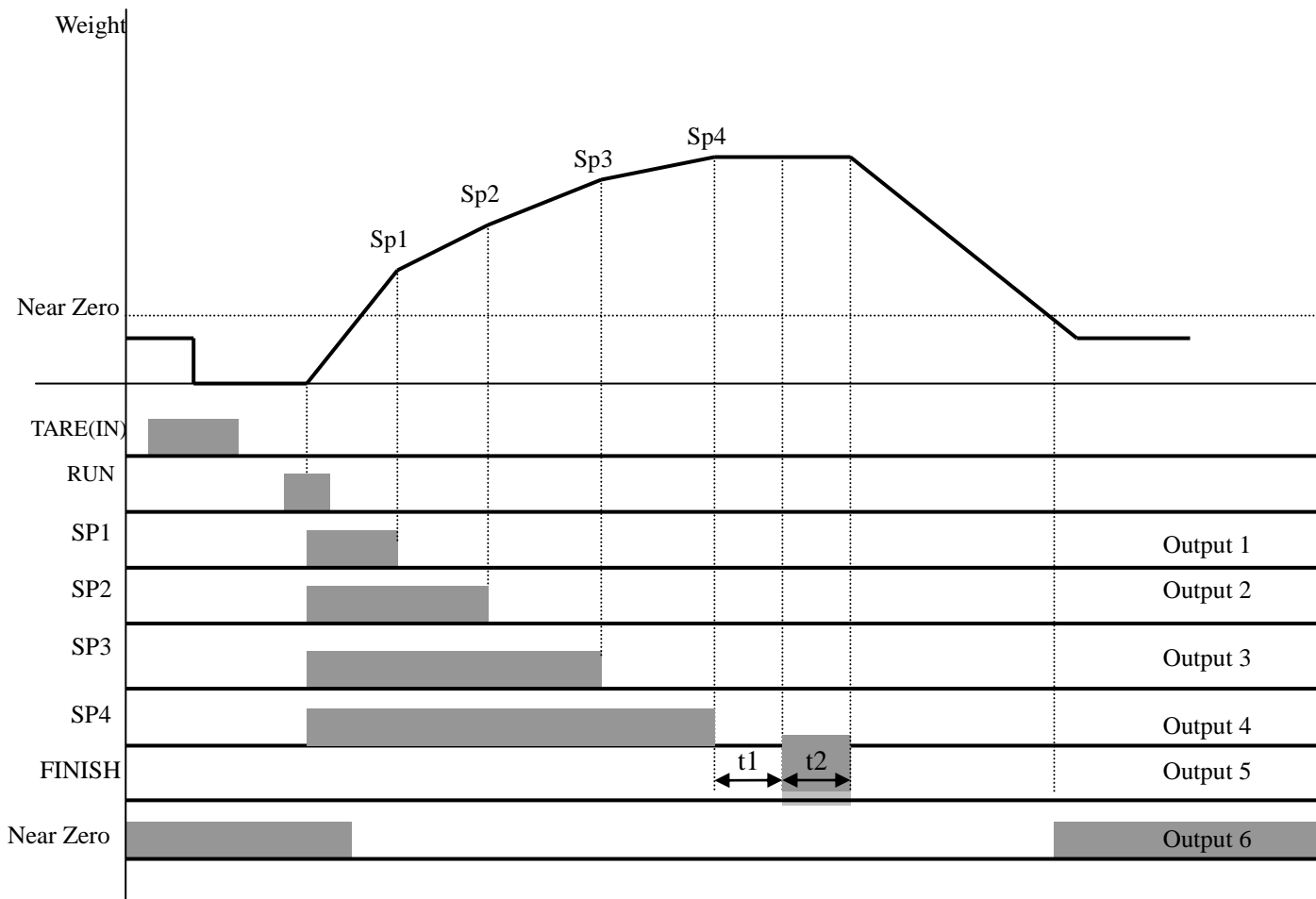
※ Finish Relay will be “OFF”, after “t2” time set or weight is under “Empty Range”.

4. Output Relay

Relay	Contents	Relay	Contents
SP 1	Current weight \geq SP1(ON) Current weight $<$ SP1(OFF)	SP4	Current weight \geq SP4(ON) Current weight $<$ SP4(OFF)
SP 2	Current weight \geq SP2(ON) Current weight $<$ SP2(OFF)	FINISH	After “t1” time, “On” during “t2” time
SP3	Current weight \geq 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

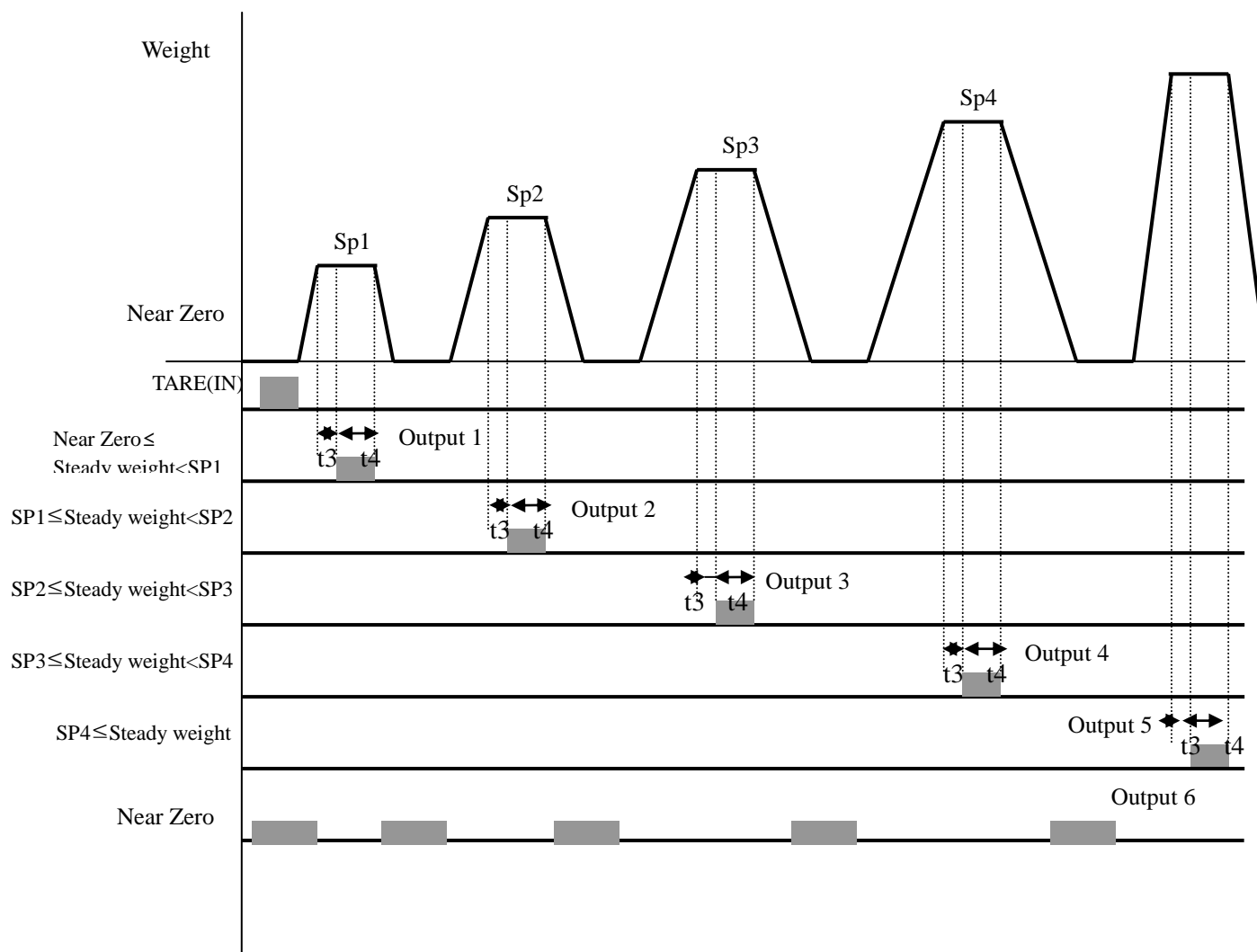
3. Finish relay output “ON” time(t2) setting : F-Function 23

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)

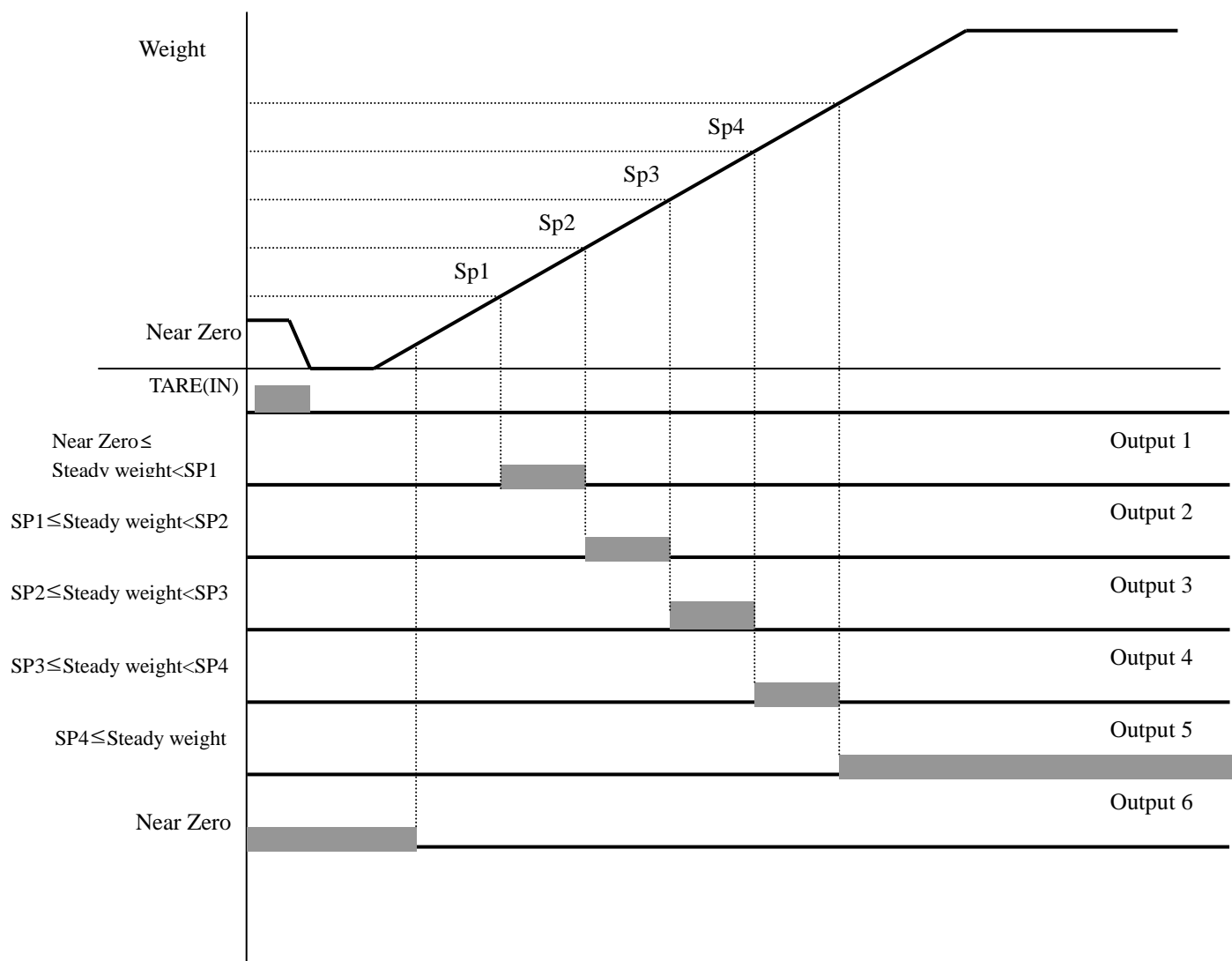
2. When the weight value is “Stable”, Each relay will be “ON” within its own acceptable range after “t3”time, during “t4” time.

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

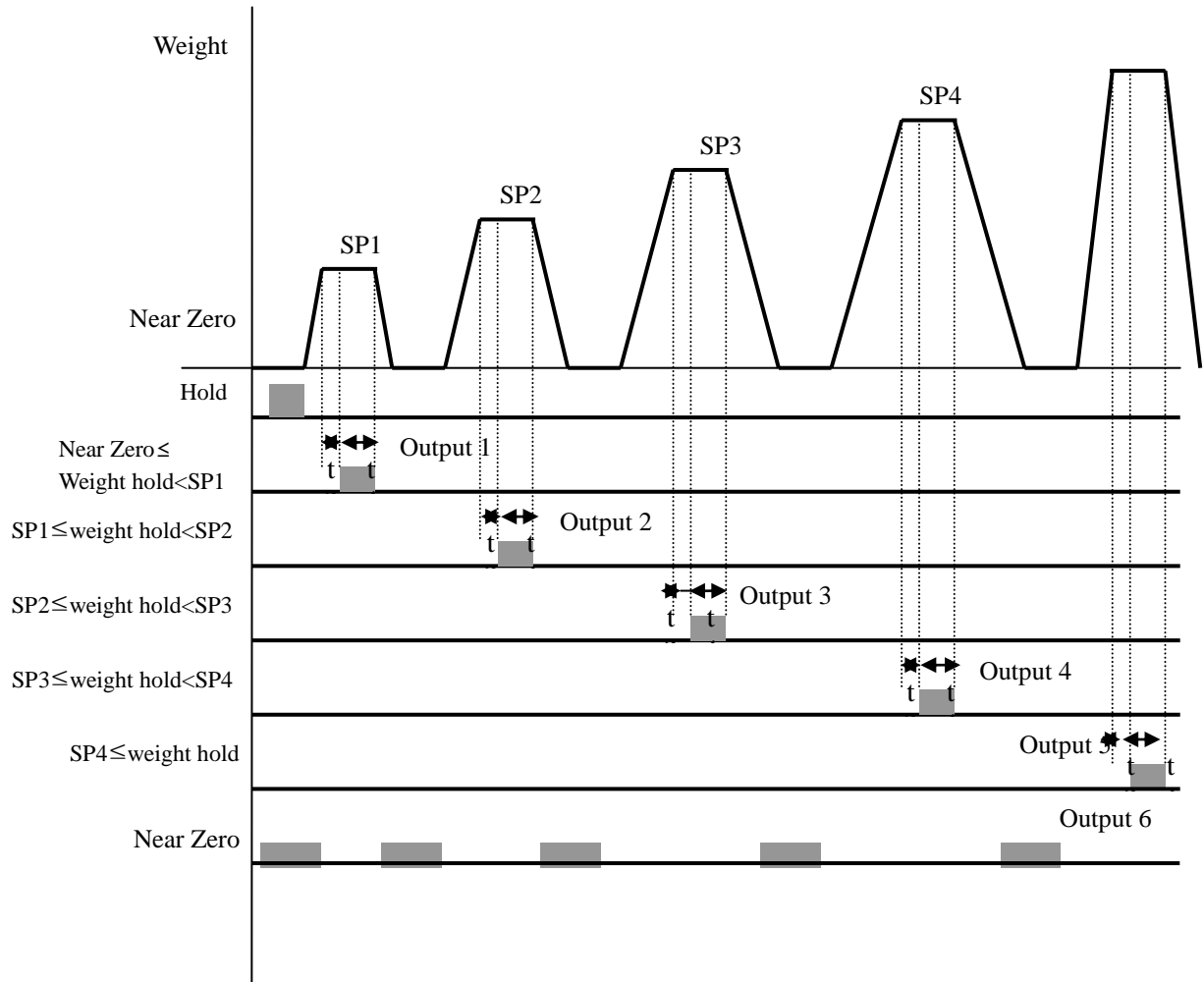
Sp1(Acceptable Range), Sp2 (Acceptable Range), Sp3(Acceptable Range), Sp4(Acceptable Range)

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

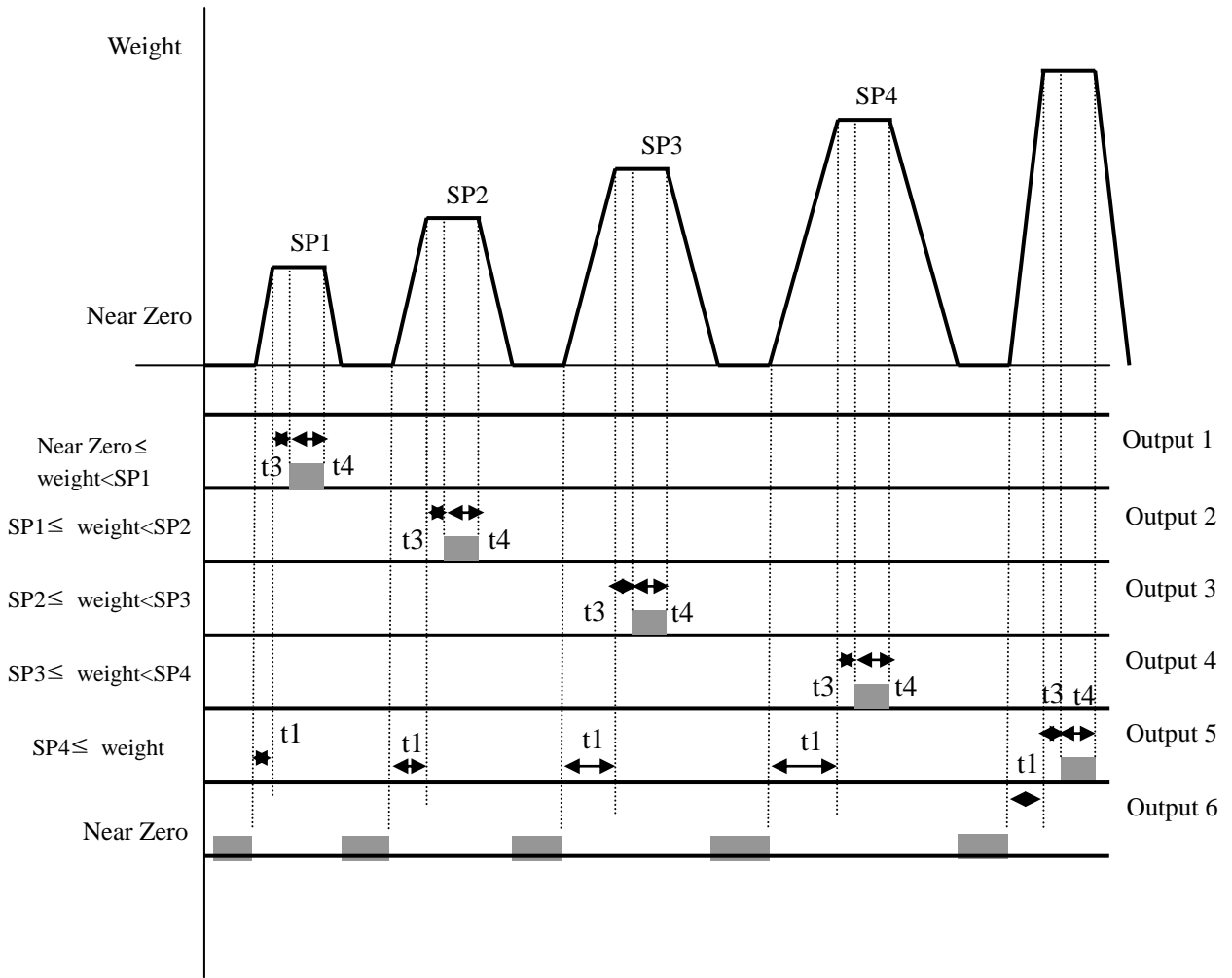
3. Relay Output

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)
SP 3	SP2 < Steady weight ≤ SP3 (ON)	NEAR ZERO	Within "EMPTY" range (ON)

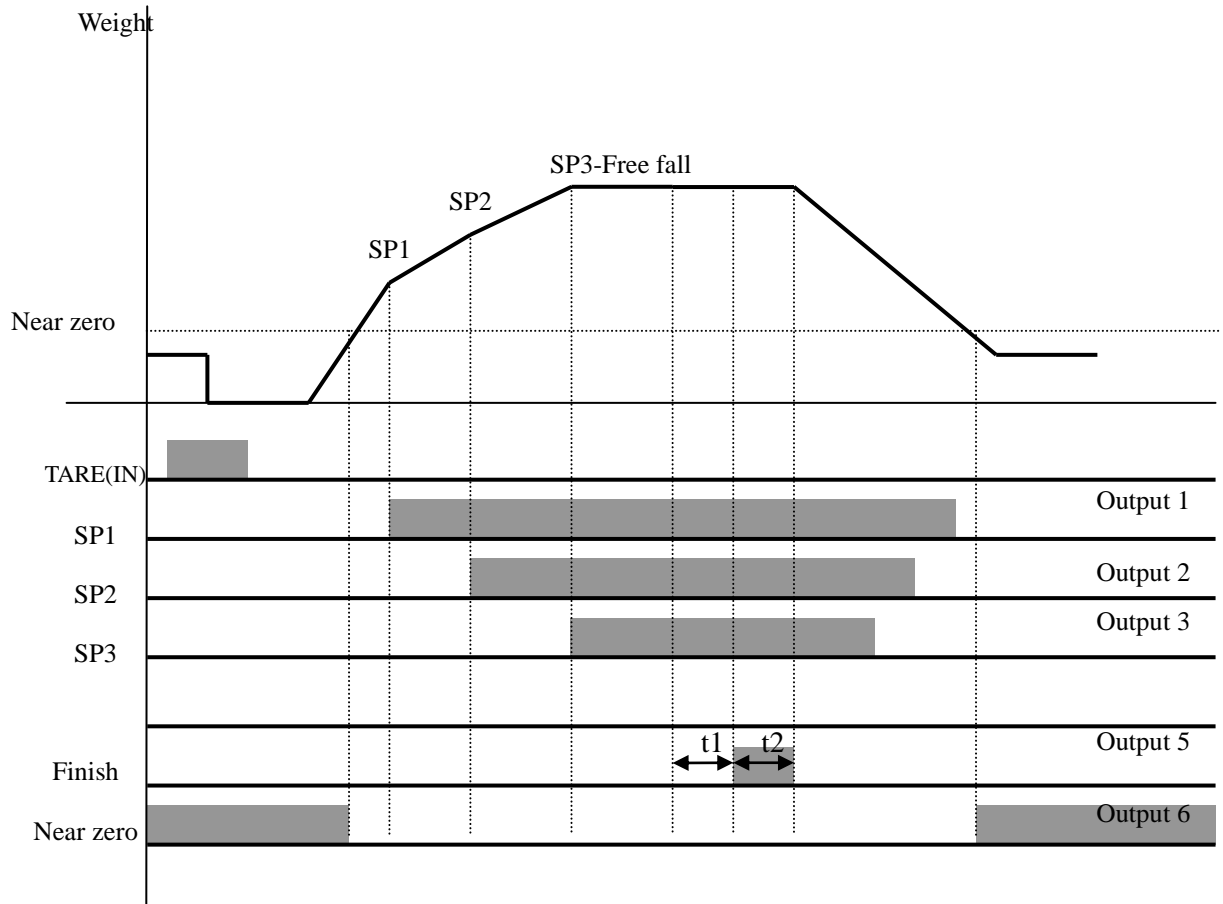
◆ Weighing Mode 5. Packer Mode (F21-05 setting) - Checker mode 3- Hold type Checker mode



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

Communication setting


Parity Bit selection Mode – Port No.1(Standard)			
F30	<input checked="" type="radio"/>	0	No Parity
	<input type="radio"/>	1	Odd Parity
	<input type="radio"/>	2	Even Parity
Serial Communication Speed selection – Port No.1(Standard)			
F31	<input type="radio"/>	0	115,200bps
	<input type="radio"/>	1	76,800bps
	<input type="radio"/>	2	57,600bps
	<input type="radio"/>	3	38,400bps
	<input type="radio"/>	4	28,800bps
	<input type="radio"/>	5	19,200bps
	<input type="radio"/>	6	14,400bps
	<input checked="" type="radio"/>	7	9,600bps
	<input type="radio"/>	8	4,800bps
	<input type="radio"/>	9	2,400bps
Serial I/F Mode setting (Under F33-00 setting, only) – Port No.1(Standard)			
F32	<input checked="" type="radio"/>	0	Stream Mode : Continuous Data transfer
	<input type="radio"/>	1	Steady Mode : Single time data transfer, when the weight is steady - When Finish Relay output, Data will be output.
	<input type="radio"/>	2	Print Mode : Single time data transfer, when print key input
Serial I/F Transference method setting – Port No.1(Standard)			
F33	<input checked="" type="radio"/>	0	Simplex Mode
	<input type="radio"/>	1	Duplex Mode / Command Mode
	<input type="radio"/>	2	LCD Mode
	<input type="radio"/>	3	Not Use
	<input type="radio"/>	4	External Display Mode
	<input type="radio"/>	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	<input checked="" type="radio"/>	0	Format 1.
	<input type="radio"/>	1	Format 2. (Format 1 + time)
	<input type="radio"/>	2	Format 3.
BCC Selection Mode			
F36	<input checked="" type="radio"/>	0	BCC not use
	<input type="radio"/>	1	BCC Use
Data Transference count setting – Port 1(Standard)			
F37	<input type="radio"/>	0	About 40times/sec
	<input type="radio"/>	1	About 30times/sec
	<input type="radio"/>	2	About 20times/sec
	<input checked="" type="radio"/>	3	About 15times/sec
	<input type="radio"/>	4	About 10times/sec
	<input type="radio"/>	5	About 5times/sec
	<input type="radio"/>	6	About 3times/sec
Parity Bit selection Mode – Port 2(OPTION)			
F40	<input checked="" type="radio"/>	0	No Parity
	<input type="radio"/>	1	Odd Parity
	<input type="radio"/>	2	Even Parity
Serial Communication Speed selection – Port 2(OPTION)			
F41	<input type="radio"/>	0	115,200bps
	<input type="radio"/>	1	76,800bps
	<input type="radio"/>	2	57,600bps
	<input type="radio"/>	3	38,400bps
	<input type="radio"/>	4	28,800bps
	<input type="radio"/>	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(Optional)				
F42	●	0	Stream 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(Optional)				
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(Optional)				
F45	●	0	Format 1.	
		1	None use	
		2	None use	
Data Transference count setting – Port 2(Optional)				
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	<input checked="" type="radio"/>	0	kg
	<input type="radio"/>	1	g
	<input type="radio"/>	2	t
When Automatically print, Data output selection			
F51	<input checked="" type="radio"/>	0	When weight reached Empty Range(F80 set value), Automatically print. - Check Empty Range
	<input type="radio"/>	1	Over than Empty Range, Steady Lamp is "ON", Automatically Print. - Will not check Empty Range
Print Format selection			
F52	<input checked="" type="radio"/>	0	Continuous Print Serial No. and Weight will be printed continuously.
	<input type="radio"/>	1	Single Print Date, Time, S/N, ID No. Weighing Data will be print
SUB/GRAND Total Data Delete selection			
F53	<input checked="" type="radio"/>	0	Manual Delete Mode SUN Total Delete : "Clear" key + "SUB" key GRAND Total Delete : "Clear" key + "GRAND" key
	<input type="radio"/>	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	<input checked="" type="radio"/>	0	Normal Mode
	<input type="radio"/>	1	Normal Mode + Average total value print

Printing Language Selection			
F57	<input checked="" type="radio"/>	0	KOREAN
	<input type="radio"/>	1	ENGLISH
Print Delay time Setting			
F58	00	00 ┆ 99	00 : No Delay time 99 : 9.9sec later, print output
Auto Print Setting			
F59	<input checked="" type="radio"/>	0	Manual Mode : Print output, when  key input.
	<input type="radio"/>	1	Auto Mode : Print Output, when Finish Relay output.
BCD output Selection			
F60	<input checked="" type="radio"/>	0	Positive output
	<input type="radio"/>	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	<input checked="" type="radio"/>	0	Not Use (JP1 switch OFF at main board)
	<input type="radio"/>	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)	<p>You can set "EMPTY" Range. Within set range, indicator will not display current weight and just display "Zero".</p> <p>"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.</p>
Zero Range setting		
F81	XXXXXX	<p>Within this "Zero Range setting", all the weight value will be displayed, As "0"</p>
Zero Value Deduction Setting		
F82	XXXXXX	<p>Display value with deduction, as much as set value. Ex.)Set 1000, actual weight 3000, then display 2000, only.</p>
Analogue Output Setting (only for the analogue option installation)		
F83	XXXXXX	<p>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</p>
Span Value Check		
F89	XXXXXX	<p>At this function, you can check the Calculated Span value.</p> <p>※ 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.</p>
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



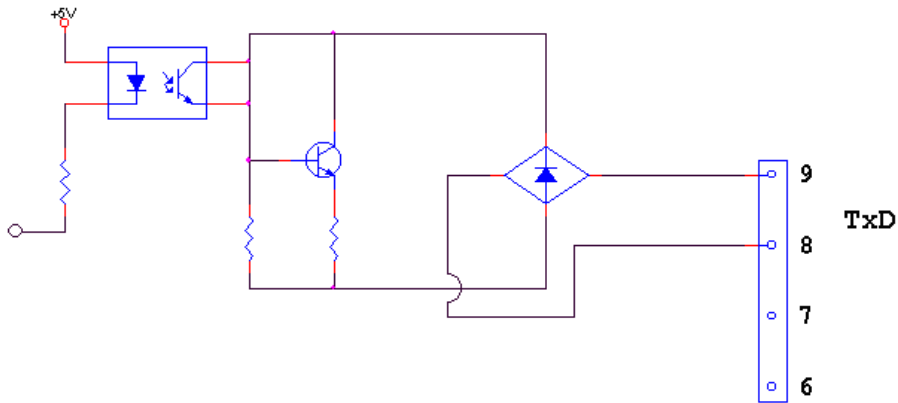
DN510N Series Indicator

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)







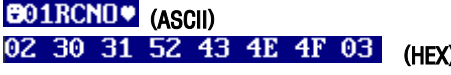
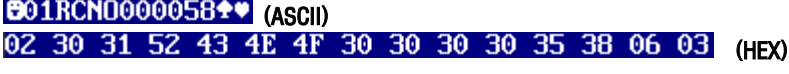


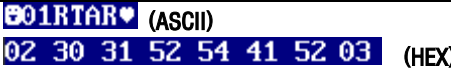

















- ①. Type : EIA-RS-232C
- ②. Communication Method : Half-Duplex, Full Duplex, Asynchronous
- ③. Serial Baud Rate : Selectable
- ④. Data Bit : 8(No Parity mode, only)Bit.
- ⑤. Stop Bit : 1
- ⑥. Parity Bit : Non, Even, Odd (Selectable)
- ⑦ Code : ASCII

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	 (ASCII)  (HEX)	Date Data
Response from Indicator	 (ASCII)  (HEX)	
PC→Indicator Format	 (ASCII)  (HEX)	Time Data
Response from Indicator	 (ASCII)  (HEX)	
PC→Indicator Format	 (ASCII)  (HEX)	Serial No.
Response from Indicator	 (ASCII)  (HEX)	
PC→Indicator Format	 (ASCII)  (HEX)	Code No.
Response from Indicator	 (ASCII)  (HEX)	
PC→Indicator Format	 (ASCII)  (HEX)	Part No.
Response from Indicator	 (ASCII)  (HEX)	
PC→Indicator Format	 (ASCII)  (HEX)	TARE weight value
Response from Indicator	 (ASCII)  (HEX)	
PC→Indicator Format	 (ASCII)  (HEX)	Current Weight value
Response from Indicator	 (ASCII)  (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	01RSUB01000001000003000004473 (ASCII) 02 30 31 52 53 55 42 30 31 30 30 30 30 31 (HEX) 30 30 30 30 30 33 30 30 30 30 34 34 37 33 06 03	
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 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	01RCWD10062010200001000001000004000138000276000414 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	001RSP2 (ASCII) 02 30 31 52 53 50 03 (HEX)	SP2 DATA
Response from Indicator	001RSP2002000 (ASCII) 02 30 31 52 53 50 32 30 30 32 30 30 06 03 (HEX)	
PC→Indicator Format	001RSP3 (ASCII) 02 30 31 52 53 50 33 03 (HEX)	SP3 DATA
Response from Indicator	001RSP3000050 (ASCII) 02 30 31 52 53 50 33 30 30 30 30 35 30 06 03 (HEX)	
PC→Indicator Format	001RSP4 (ASCII) 02 30 31 52 53 50 34 03 (HEX)	SP4 DATA
Response from Indicator	001RSP4004000 (ASCII) 02 30 31 52 53 50 34 30 30 34 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	001WTAR (ASCII) 02 30 31 57 54 41 52 03 (HEX)	TARE input
Response from Indicator	001WTAR (ASCII) 02 30 31 57 54 41 52 06 03 (HEX)	
PC→Indicator Format	001WTRS (ASCII) 02 30 31 57 54 52 53 03 (HEX)	TARE RESET
Response from Indicator	001WTRS (ASCII) 02 30 31 57 54 52 53 06 03 (HEX)	
PC→Indicator Format	001WZER (ASCII) 02 30 31 57 5A 45 52 03 (HEX)	ZERO input
Response from Indicator	001WZER (ASCII) 02 30 31 57 5A 45 52 06 03 (HEX)	
PC→Indicator Format	001WPRT (ASCII) 02 30 31 57 50 52 54 03 (HEX)	Print input
Response from Indicator	001WPRT (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	01WSNO000058 (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	001WCND0000058 (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	001WCND (ASCII) 02 30 31 57 43 4E 4F 06 03 (HEX)	
PC→Indicator Format	001WHOL (ASCII) 02 30 31 57 48 4F 4C 03 (HEX)	Hold input
Response from Indicator	001WHOL (ASCII) 02 30 31 57 48 4F 4C 06 03 (HEX)	
PC→Indicator Format	001WHRS (ASCII) 02 30 31 57 48 52 53 03 (HEX)	Hold RESET
Response from Indicator	001WHRS (ASCII) 02 30 31 57 48 52 53 06 03 (HEX)	
PC→Indicator Format	001WSTC (ASCII) 02 30 31 57 53 54 43 03 (HEX)	Sub-Total Data Clear
Response from Indicator	001WSTC (ASCII) 02 30 31 57 53 54 43 06 03 (HEX)	
PC→Indicator Format	001WGTC (ASCII) 02 30 31 57 47 54 43 03 (HEX)	Grand-Total Data Clear
Response from Indicator	001WGTC (ASCII) 02 30 31 57 47 54 43 06 03 (HEX)	
PC→Indicator Format	001WSTR (ASCII) 02 30 31 57 53 54 52 03 (HEX)	Start(Run) Input (F21 – 02) (PACK MODE)
Response from Indicator	001WSTR (ASCII) 02 30 31 57 53 54 52 06 03 (HEX)	
PC→Indicator Format	001WSTO (ASCII) 02 30 31 57 53 54 4F 03 (HEX)	STOP Input (F21 – 02) (PACK MODE)
Response from Indicator	001WSTO (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)

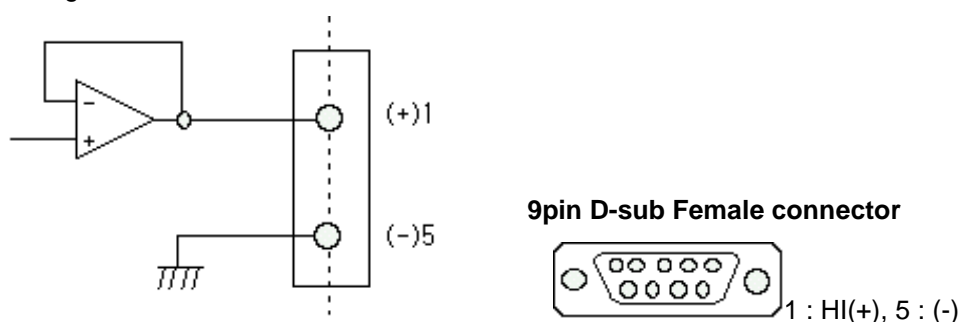
This Option card converts weight value to Analog Voltage output(0~10V) and transfers to external devices(Recorder, P.L.C), controlled by voltage output.

4-1. Specification

- Output Voltage : 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



※ 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)

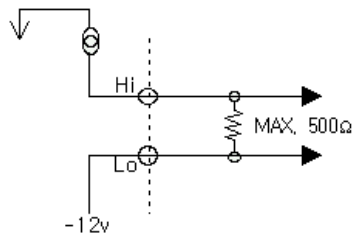
This Option card converts weight value to Analog Voltage output(4~20mA) and transfers to external devices(Recorder, P.L.C), controlled by voltage output.

5-1. Specification

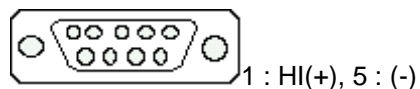
- Output Voltage : 4~20mA output (Max.2~22mA)
- Accuracy : More than 1/1,000
- Temperature Coefficient : 0.01%/°C
- Max. Loading Impedance : Max. 500Ω

※ 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



※ “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)

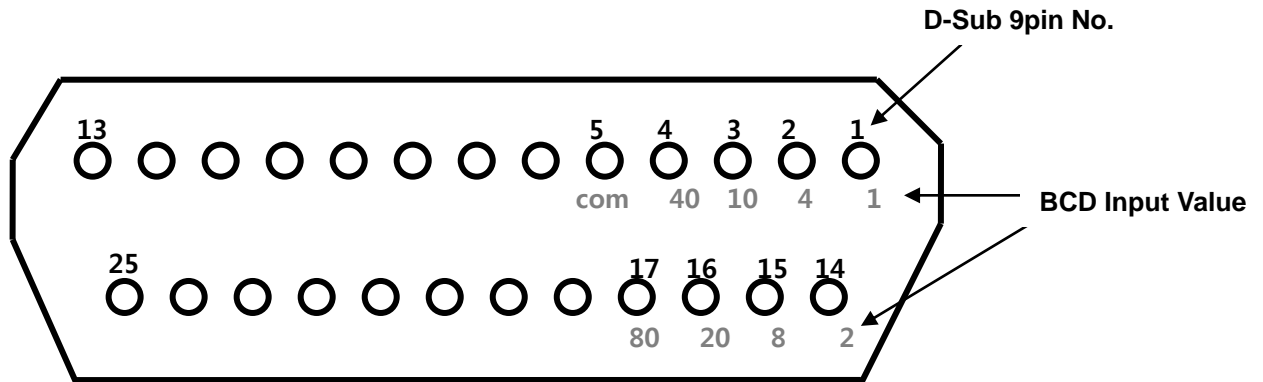
This D/A Converter has Max. 1/4,000 accuracy, so this output is not suitable for high accuracy application, like more than 1/3,000.

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)

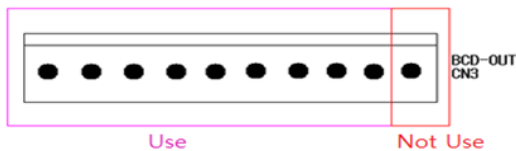
This “BCD interface” option card can be applied on PLC (Programmable Logic Controller), or Score Board applications.

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

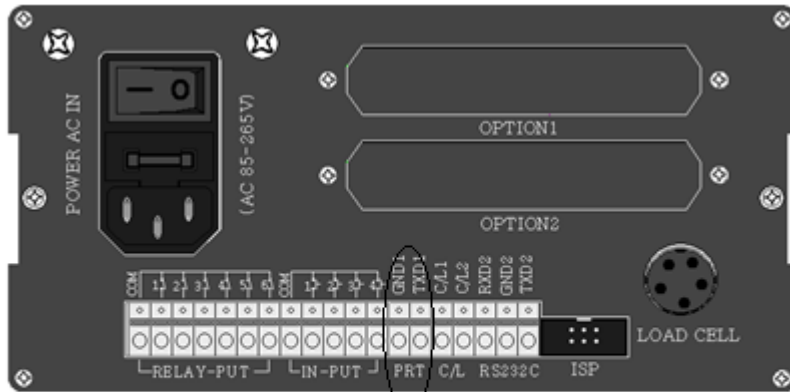


DN510N Series Indicator



Serial Printer

8-3. Print Port



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 , 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 .

※ Under TEST 3.  mode, press  key to exit .

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