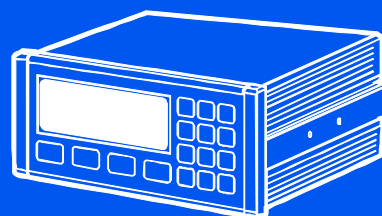


NT-302A

Weighing Indicator



CAS

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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 CAS co.,Ltd.
- 2). Any kinds of copy or distribution without CAS co.,Ltd.'s permission will be prohibited.

1-4. Inquiries

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

Head Office : CAS co.,Ltd.

Overseas Office : CAS Inc

Website : <http://www.cas.co.kr>

2. INTRODUCTION

2-1. Introduction

Thank you for your choice, this “NT-302A” Industrial Digital Weighing Indicator..

This “NT-302A” model is simple 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 “NT-302A” Weighing Indicator is simple application model, and it can be used for most kinds of control applications.

Please review this instruction Manual and learn more about information about “NT-302A”.

Enjoy your process efficiency with “NT-302A” 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) / Fuse(2pcs) / 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	0.005% FS
Display Resolution(External)	1/20,000

3-2. Digital Part

Display	Parts	Specification
Display	Main Display	7Segments, 7digits Red color LED 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

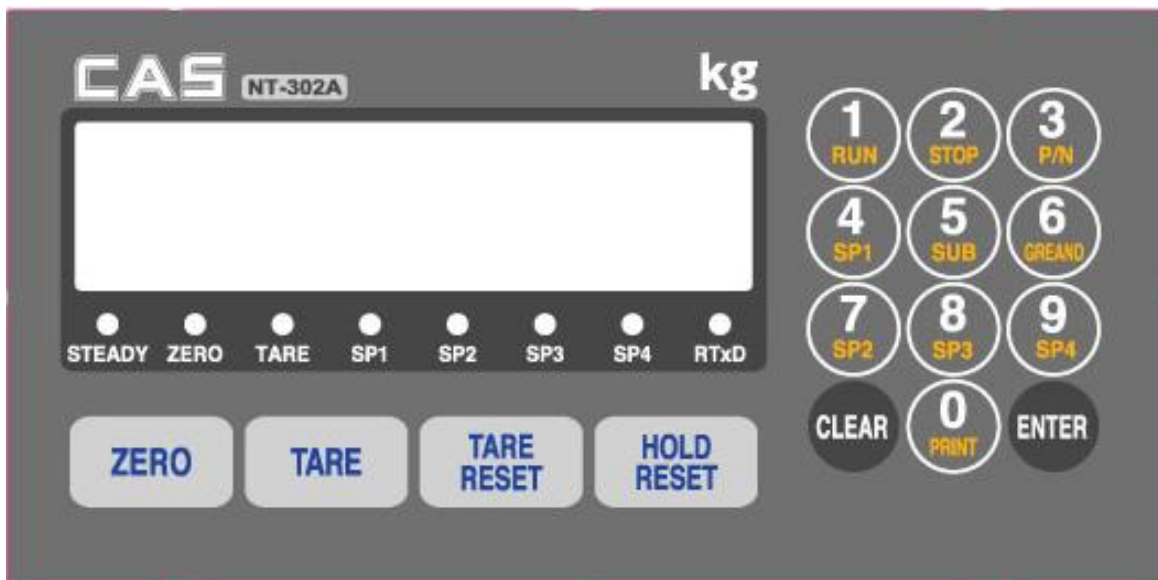
Power Supply	SMPS Free Voltage Power Supply(AC86~265V)
Operating Temperature Range	-10℃ ~ 40℃
Operating Humidity Range	Under 85% Rh (non-condensing)
External Dimension	193mm(W) x 100mm(H) x 140mm(L)
Net Weight(kg)	About 1.5kg
Gross Weight(kg)	About 2.0kg

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

	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.
	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 1. Remove the Set TARE function. - If you press this key, TARE set value will be removed and display gross weight.
	HOLD RESET 1. Remove the Set HOLD function. - If you press this key, HOLD set value will be removed.
	Start Weighing process, under Packer Mode, only.
	Stop weighing process, under Packer Mode, only.

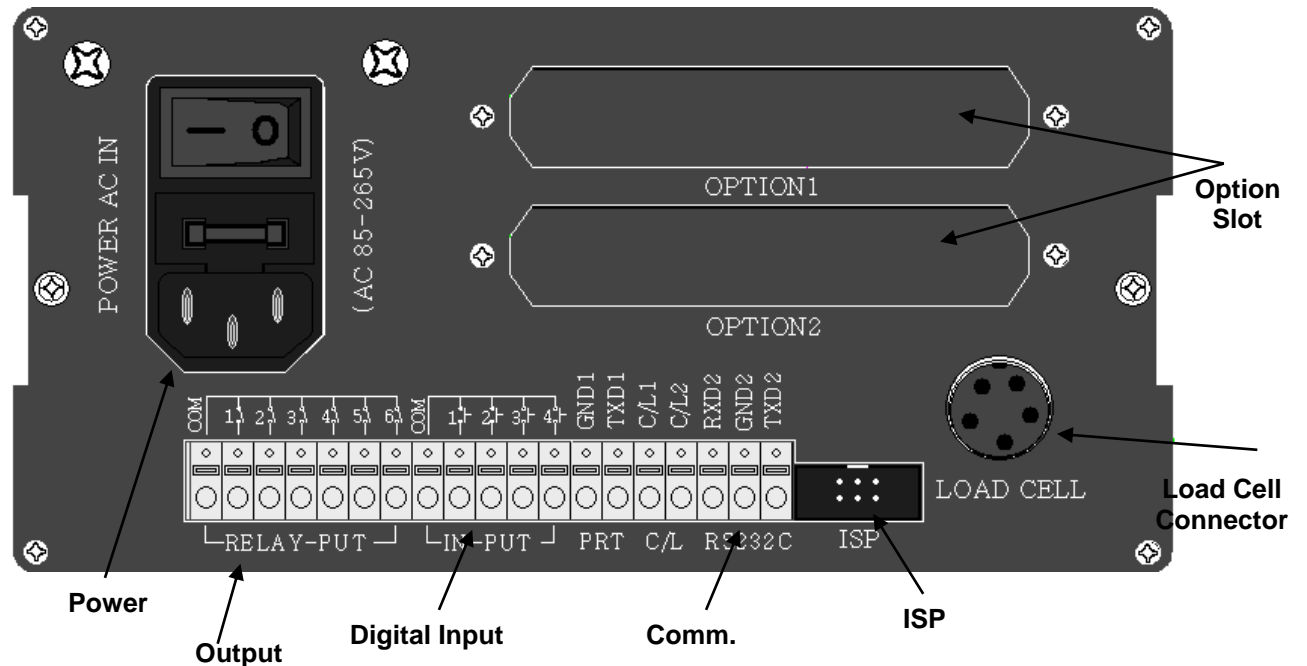
	<p>You can set each weighing process as a certain P/N. And you can call certain P/N with pressing this key.</p> <p>P/N save : Select P/N and Enter key input. P/N call : P/N + Number key + Enter</p>
	<p>Set the SP1 value or Check the current value.</p> <ul style="list-style-type: none"> - Press key and enter new set value with keypad, and press enter to save.
	<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.</p> <ul style="list-style-type: none"> - Press key and enter new set value with keypad, and press enter to save.
	<p>Set the SP3 value or Check the current value.</p> <ul style="list-style-type: none"> - Press key and enter new set value with keypad, and press enter to save.
	<p>Set the SP4 value or Check the current value.</p> <ul style="list-style-type: none"> - Press key and enter new set value with keypad, and press enter to save.
	<p>Manual Printer - Key input, print output.</p> <p>Calibration mode - Digit setting Whenever pressing “0”key, digit will be change 1, 2, 5, 10, and 50.</p>
	<ol style="list-style-type: none"> 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
	<ol style="list-style-type: none"> 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)

		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

3-6. Rear Panel

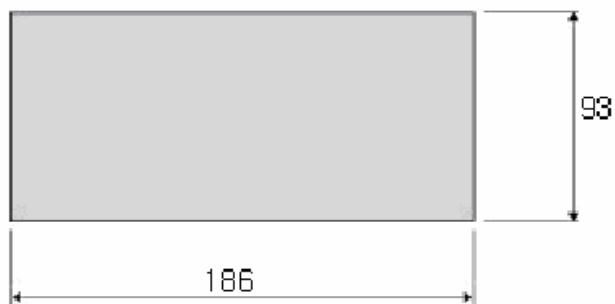
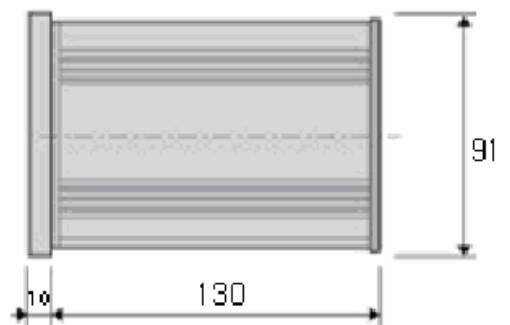
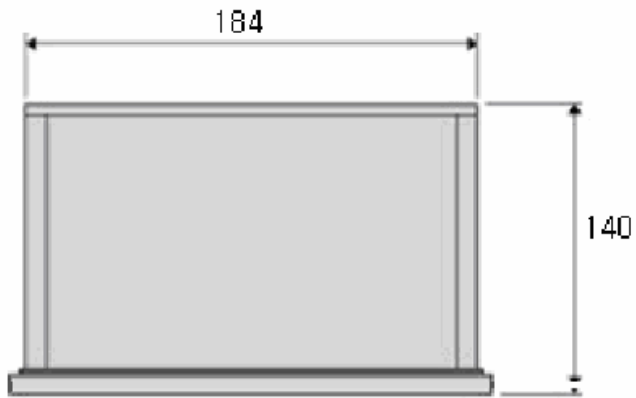


①POWER	-Power ON/OFF Switch -Fuse : AC 250V 10A -AC IN : AC86~265V Power In
②OPTION 1,2	- OPTION BOARD install slot. - ANALOG out, Serial I/F, etc
③LOAD CELL CONNECTOR (N-16)	-EXC + (+5V) PIN1 (RED) -EXC - (-5V) PIN2 (WHITE) -SIG+ PIN3 (GREEN) -SIG- PIN4 (BLUE) -SHIELD PIN5 (SHEILD)
④Digital Input	- 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".
⑦ Relay 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)



4-2. Formula to plan the precise weighing system

This "NT-302A" weighing controller's Max. input sensitivity is $0.45\mu V / \text{Digit}$.

And for precise weighing system, the following formula must be satisfied.

Caution : "Input sensitivity" means Min. output voltage variation of weighing part to change 1digit. So, please do not make large input voltage to make reliable weighing system.



Single Load cell use	$0.45\mu V \frac{\leq E \times B \times D}{A}$	A : Load cell capacity(kg) B : Load cell Voltage(mV) D : Digit
Plural Load cells use	$0.45\mu V \frac{\leq E \times B \times D}{A \times N}$	E : affirmation Voltage of Load cell N : Number of Load cell

Example1.)

Number of Load cell : 1pcs

Load cell capacity : 500kg

Load cell Voltage : 2mV/V

Digit : 0.05kg

Affirmation Voltage of Load cell : 5.0V

Max. Capacity of Weighing System : 300kg

Then, estimation result for this weighing system with formula,

$$\frac{5000 \times 2 \times 0.05}{500} = 1 \geq 0.45\mu V$$

The calculated value is larger than $0.45\mu V$, so this system has no problem.

Example2.)

Number of Load cell : 4pcs

Load cell capacity : 500kg

Load cell Voltage : 2mV/V

Digit : 0.10kg

Affirmation Voltage of Load cell : 5.0V

Max. Capacity of Weighing System : 1,000kg

Then, estimation result for this weighing system with formula,

$$\frac{5000 \times 2 \times 0.10}{500 \times 4} = 0.5 \geq 0.45\mu V$$

The calculated value is larger than $0.45\mu V$, so this system has no problem.

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

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

Step 1. Enter Calibration Mode

Turn on the Power + 3 KEY →  display

Press 3 KEY key →  display

Press ENTER key to start “Calibration Mode”.

Remarks : Go to next step with save ENTER key / Back to previous step CLEAR key

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

Press 0 KEY and stop the optimal Digit value.

(Whenever pressing 0 KEY, digit value will be changed, like 01-02-05-10-20-50)

Press ENTER 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 **ENTER KEY**, and move to next step.

※ **Caution**

(**Max. capacity value / division value**) can not be over **20,000**.(as Indicator resolution is 1/200,00).

Step 4. Zero Balance setting (**CAL_0_** display)

Make empty the scale part, and press **ENTER 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 **ENTER 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 **ENTER 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. Function Setting

To make more accuracy performance of NT-301A, through this Function setting.

Step 1. Enter to Function setting mode.

Turn on the Power + 3 KEY →  display

Press 3 KEY →  display

Press CLEAR KEY to start “**F-function Mode**”.

Step 2. Change the F-Function No.

To change the F-function No., press CLEAR KEY.

Whenever pressing CLEAR KEY, Function No. will be changed

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

Step 3. Change the Set value.

Input new set value with keypad, and press ENTER KEY to save new setting.

If you don't press ENTER KEY, after changing the set value, the new set value will not be saved.

Step 4. Exit from Function setting mode.

Press 0 KEY + CLEAR KEY + 0 KEY to exit function mode.

5-4. Function List

Function No.	Contents	Remark
F00	Set-up / Calibration Mode Selection	Set-up : Clear key Calibration : Enter key
F01	Decimal point setting	Setting range : 0, 1, 2, 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 : 0~99
F06	Digital Filter setting	Setting range : 1~49
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 : 0~4
F10	Hold Function setting	Setting range : 0~2
F11	Digital Input setting	Setting range : 0~4
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 : 1~4
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 : 0~2
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 Transference count setting (Port No.1)	Setting range : 0~6
F40	Serial I/F Parity Bit setting (Port No.2-Option)	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 : 0~2
F45	Transferred Data Format (Port No.2)	Setting range : 0~2

Function No.	Contents	Remark
F47	Data Transference count setting (Port No.2)	Setting range : 0~6
F50	Weight Unit Selection (Printer)	Setting range : 0~2
F51	Auto print 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 : 0~1
F58	Print Delay time selection	Setting range : 0.0 ~ 9.9
F59	Auto Print Setting	Setting range : 0~1
F60	BCD output Selection	Setting range : 0~1
F63	Average Display setting	Setting range : 0.0 ~ 9.9
F64	Steady LED Status Lamp Delay time setting	Setting range : 0.0 ~ 9.9
F65	Tension and Compression setting	Setting range : 0~1
F77	All function Initialize	
F80	Empty Range	Setting range : 0~Max. Capa
F81	Zero Range Setting	Setting range : 0~Max. Capa
F82	Zero Value Deduction 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	

5-5. Function List detailed information.

Set-Up / Calibration Mode Selection				
F00		Clear	Set-Up mode	
		Enter	Calibration Mode	
Decimal Point Setting				
F01	●	0	No Decimal point	
		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	
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 ┆ 3 : Strong Vibration	
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.	
Auto Zero Range setting				
F05	00	00 ┆ 99	Within the "Auto Zero" range, weighing part is steady, indicator will display current weight as "Zero" If the weighing part is not "Steady", indicator will display current weight. (Auto Zero Range : ± Set value + weight unit)	
Digital Filter setting				
F06	11	1 ┆ 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 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	Print
		2	Run	Stop	Sub-Total	Grand-Total
		3	Zero	Tare	Tare Reset	Print
		4	Run	Stop	Tare	Tare Reset
	5	Run	Stop	Zero	Print	
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			

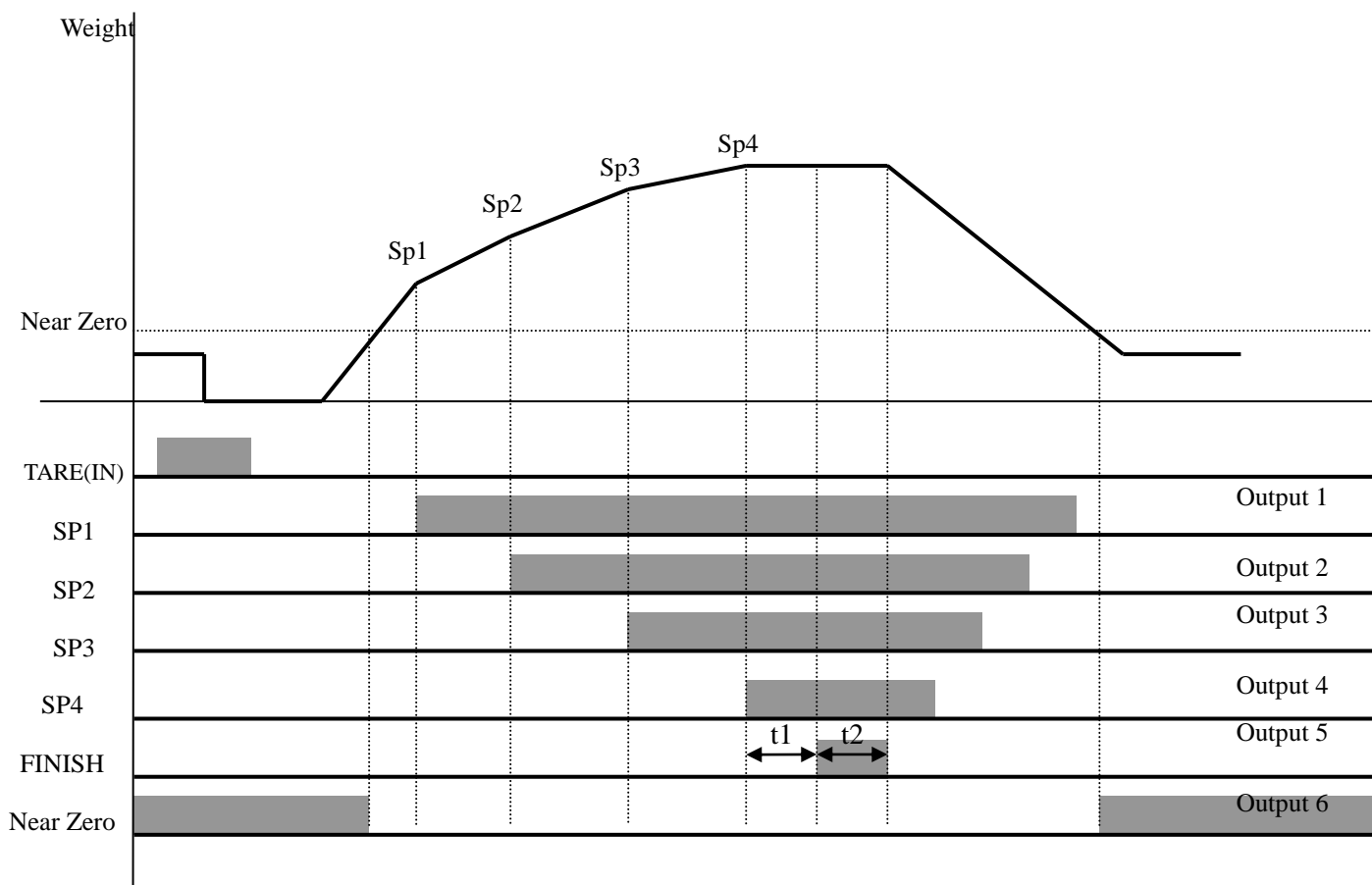
Hold "Off" time setting			
F14	00	00 ┆ 99	Time setting of the "Hold Off" After set time, Hold function will be off automatically.

Weighing Mode Setting

Weighing Mode Selection			
F21	•	1	Limit Mode (Weighing mode 1)
		2	Packer Mode (Weighing mode 2)
		3	Checker 1 Mode (Weighing mode 3)
		4	Checker 2 Mode (Weighing mode 4)

Weighing Mode Selection							
Relay Output		Out 1	Out 2	Out 3	Out 4	Out 5	Out 6
1	Limit	SP1	SP2	SP3	SP4	Finish	Empty
2	Packer	SP1	SP2	SP3	SP4	Finish	Empty
3	Checker 1	Empty≤SP1	SP1≤SP2	SP2≤SP3	SP3≤SP4	SP4≤	Empty
4	Checker 2	Empty≤SP1	SP1≤SP2	SP2≤SP3	SP3≤SP4	SP4≤	Empty

◆ 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

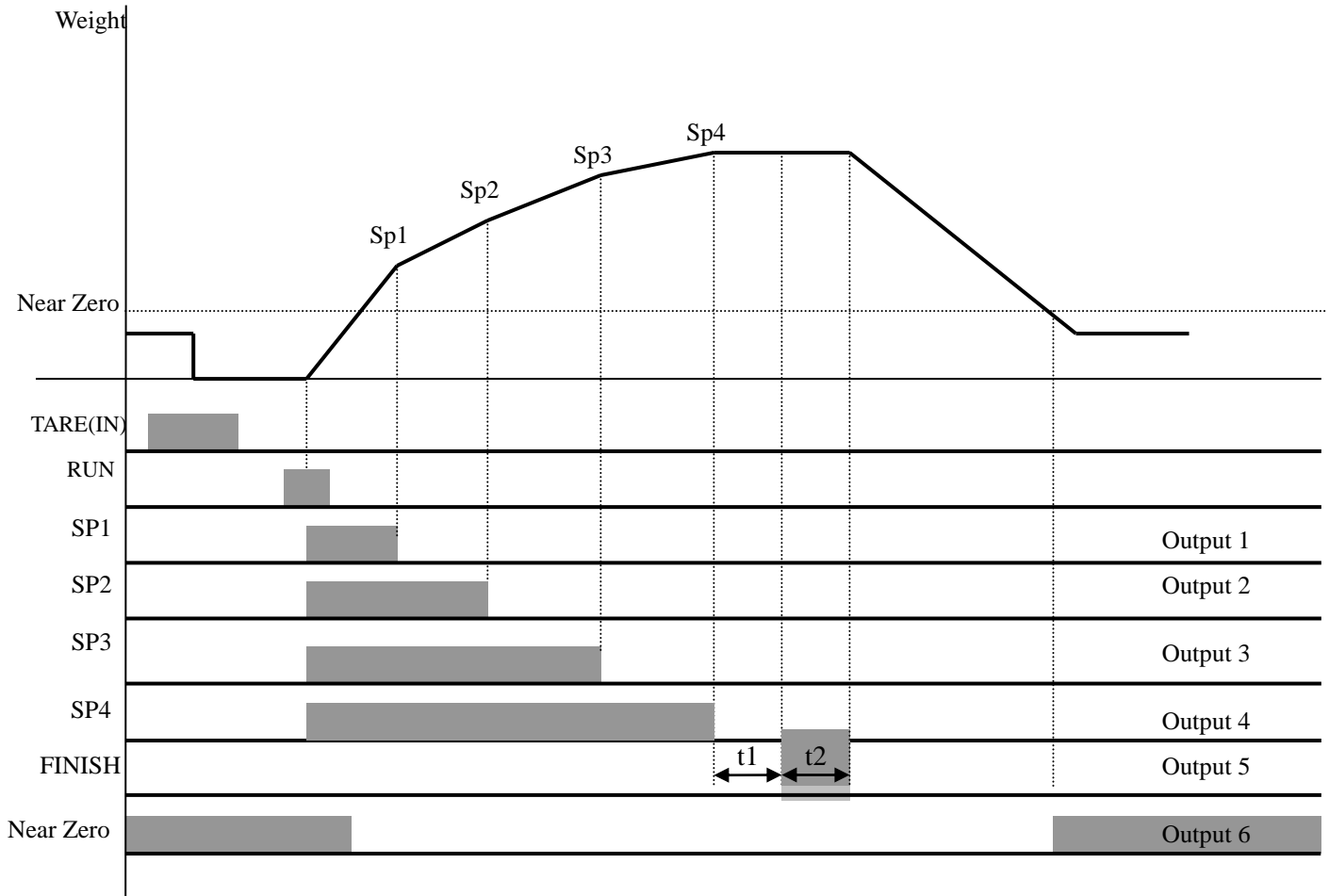
3. Finish relay output "ON" time(t2) setting : F-Function 23

※ 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)



1. Set value setting

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

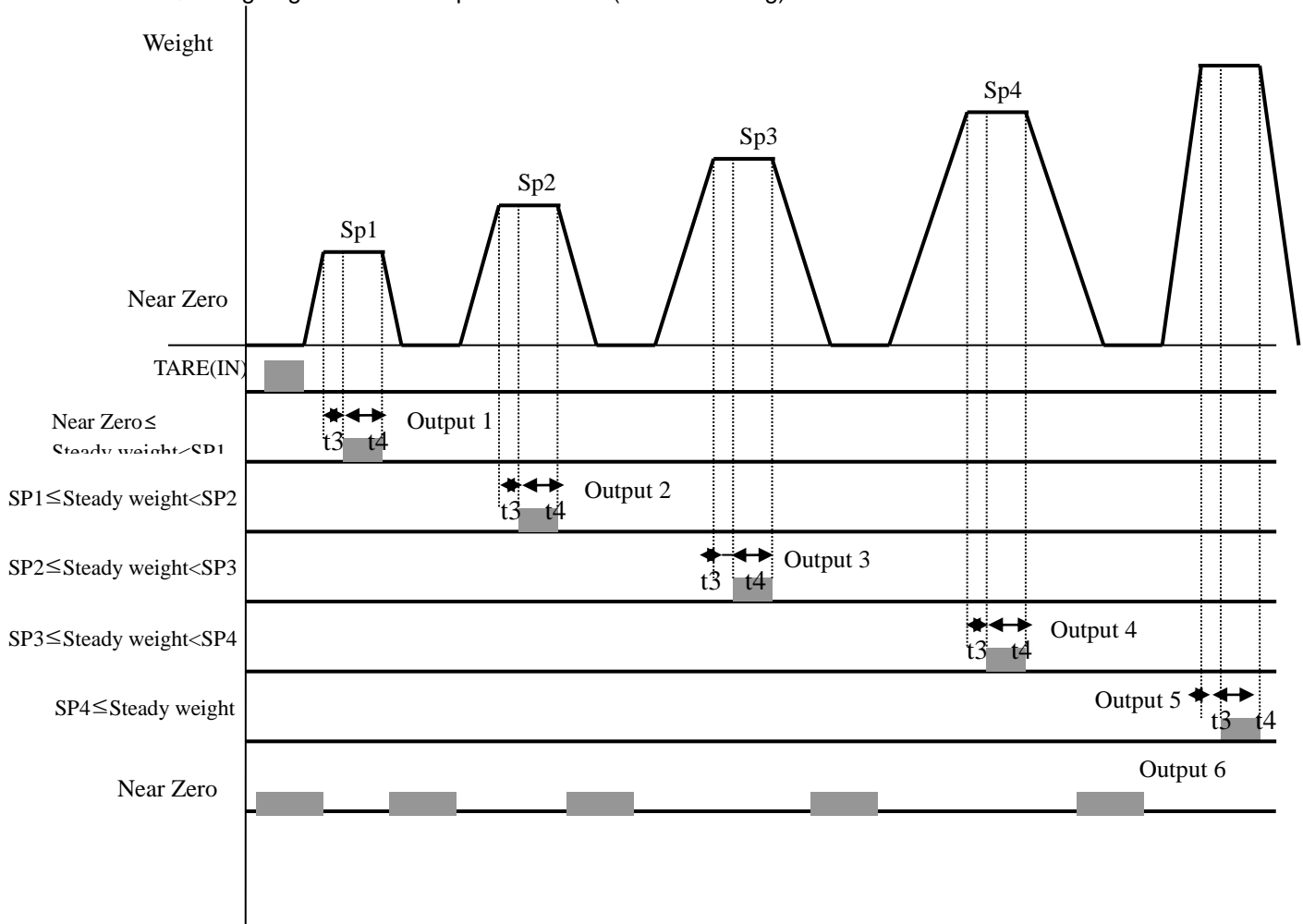
2. Finish relay output delay time(t1) setting : F-Function 22

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.



1. Set value setting

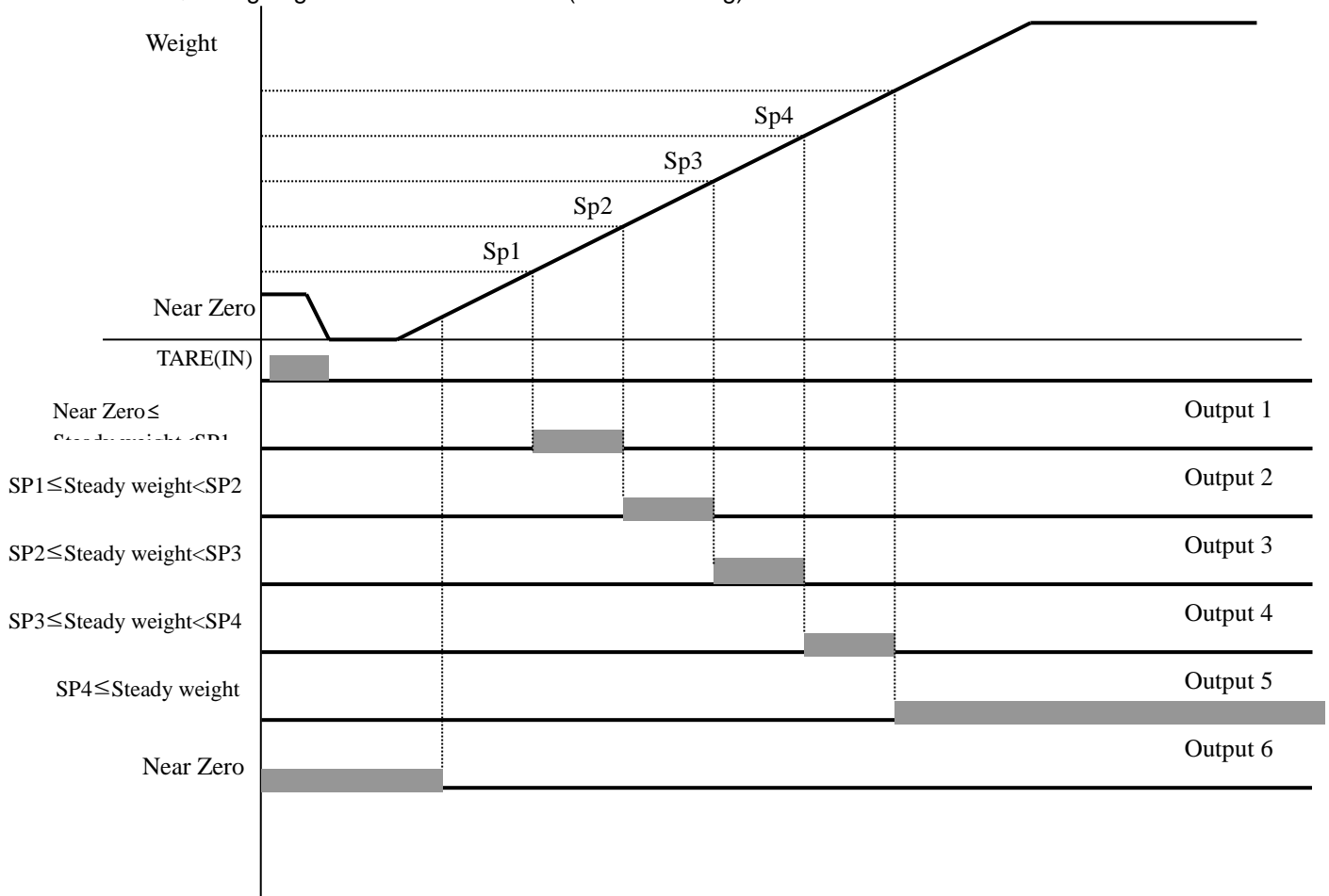
Sp1(Acceptable Range), Sp2 (Acceptable Range), Sp3(Acceptable Range), Sp4(Acceptable Range)

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



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)

“FINISH Relay” delay time(t1) setting (Under F21- 01, 02 setting)			
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)			
F23	10	01 ┆ 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	•	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	Stream Mode : Continuous Data transfer
		1	Finish Mode : Single time data transfer, after Finish relay “ON” - 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
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	CAS Format
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(Optional)			
F42	•	0	Stream Mode : Continuous Data transfer
		1	Finish Mode : Single time data transfer, after Finish relay “ON” - 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 2(Optional)			
F43	•	0	Simplex Mode
		1	Duplex Mode / Command Mode
		2	LCD Mode
Transferred Data Format– Port 2(Optional)			
F45	•	0	Format 1.
		1	Format 2. (Format 1 + time)
		2	Format 3.
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	•	0	kg
		1	g
		2	t
AUTO Print Selection			
F51	•	0	When Weight is steady over than Empty Range, 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	3	1 ┆ 9	Whenever set value increased, 1line will be added.
Printer Line Interval Selection (Only for Continuous Printer format)			
F55	3	1 ┆ 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 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
		1	Use
All function Initialize (Only for authorized personnel)			
F77	Press ENTER KEY → all function will be initialized		

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.</p> <p>"0.190" setting : Within 190, "Zero" Status lamp and Near Zero relay will be output.</p>
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	<p>Display value with deduction, as much as set value.</p> <p>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.</p> <p>Ex.) Set 5000, then weight 5000 → 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	

6. InterFace

1. Serial Interface

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. Signal Format

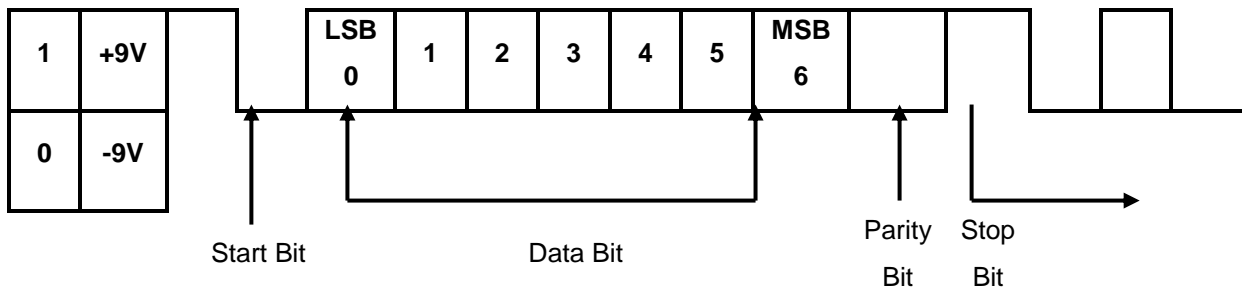
- ①. Type : EIA-RS-232C
- ②. Communication Method : Half-Duplex, Full Duplex, Asynchronous
- ③. Serial Baud Rate : Selectable on “F-function31”
- ④. Data Bit : 8(No Parity mode, only)Bit – Refer “F30”.
- ⑤. Stop Bit : 1
- ⑥. Parity Bit : Non, Even, Odd (Selectable on “F-function 30”) - Refer “F30”
- ⑦. Code : ASCII

STX 02H

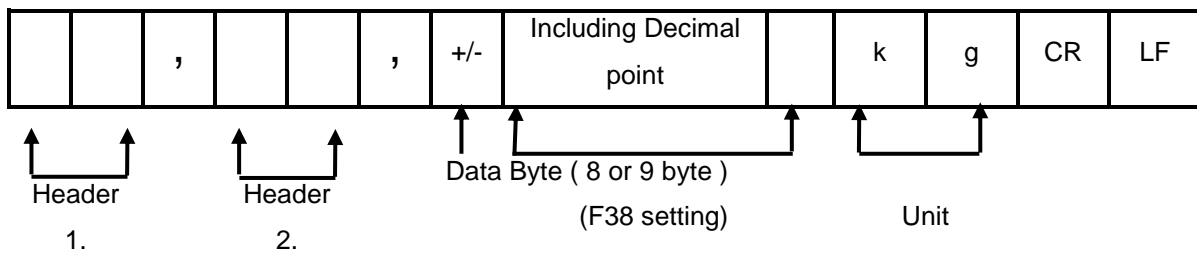
ETX 03H

CR 0DH

LF 0AH



1.2. Standard Data Format(1) : ID Number will not be transferred. (Refer “F-function 35”)

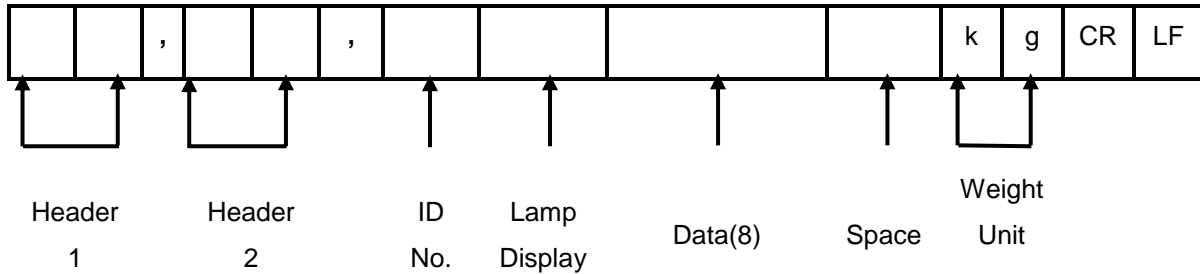


- ①. Header 1. : OL : Over Load, Under Load
ST : Display weight “Steady”
US : Display “Un-Steady”
- ②. Header 2. : NT : Net-Weight
GS : Net-Weight, under TARE
- ③. Data Bit(Number) 2B(H) : “+” Plus
2D(H) : “-“ Minus

2D(H) : “ ” Space
 2E(H) : “.” Decimal Point

④. Unit : kg, g, t

1-3. Standard Data Format(2) : 22byte Format



- ①. Header 1. : OL : Over Load, Under Load
 ST : Display “Steady”
 US : Display “Un-Steady”

- ②. Header 2. : NT : Net-Weight
 GS : Net-Weight, under TARE.

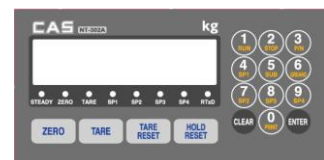
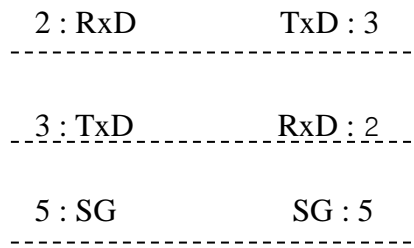
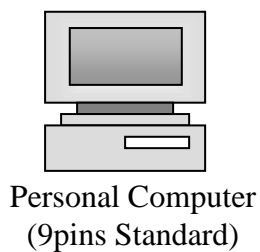
③. Lamp Display : Current Lamp Condition (ON/Off Data)

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
1	Steady	1	Hold	Print	Gross Weight	Tare	Zero

- ④. Data Bit(Number) 2B(H) : “+” Plus
 2D(H) : “-“ Minus
 2D(H) : “ ” Space
 2E(H) : “.” Decimal Point

⑤. Unit : kg, g, t

1-4 Communication with PC(Personal Computer) or Other devices



NT-302A

2. Serial Interface (option :RS- 422)

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.

2-1. Signal Format

①. Type : RS-422/485

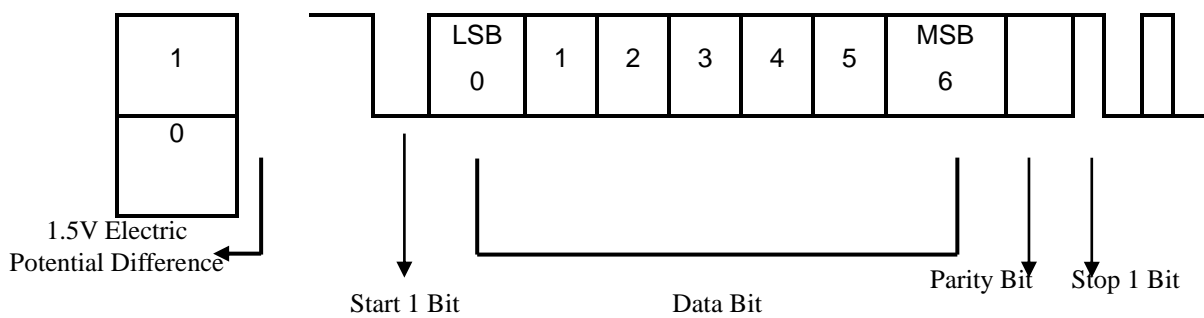
②. Format : Baud Rate : Refer "F-function 31".

Data Bit : 7 or 8(No Parity)

Stop : 1

Parity Bit : Even, Odd, No Parity (Selectable)

Code : ASCII (STX 02H, ETX 03H, CR 0DH, LF 0AH)



2-2. Data Format

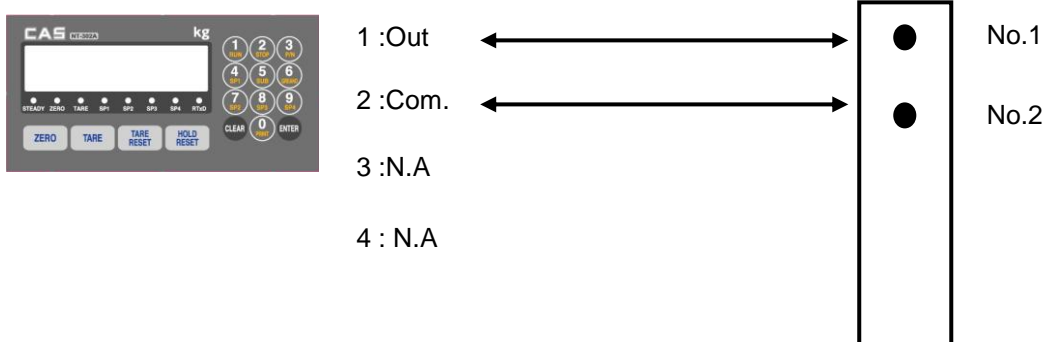
Same as RS-232C (Refer "6-1. Serial Interface")

2-3. RS-422 Circuit Connection



3. Analogue Output (option : 4~20mA or 0~10V)

3-1. Analogue Output Connection

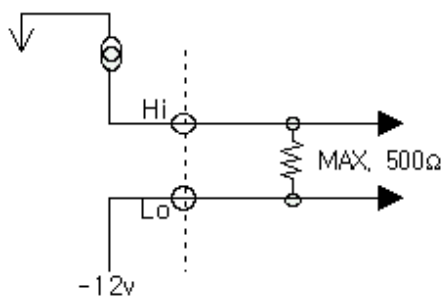


3-2. Specification

- ①. Output Current : 4~20mA (Output Range : 2~22mA)
- ②. Accuracy : More than 1/1,000
- ③. Temperature Co-efficiency : 0.01% °C
- ④. Max. Loaded Impedance : Max. 500Ω

※ When Weight display is “Zero”, 4mA current will be output, when Weight display is “Full Capacity”, 20mA current will be output.

3-3. Circuit



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

4. Current Loop Interface

“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).

※ **Current Loop Interface supports, up to 9,600 Communication Speed, only.**

1. Signal Format

As same as “RS-232C” Interface

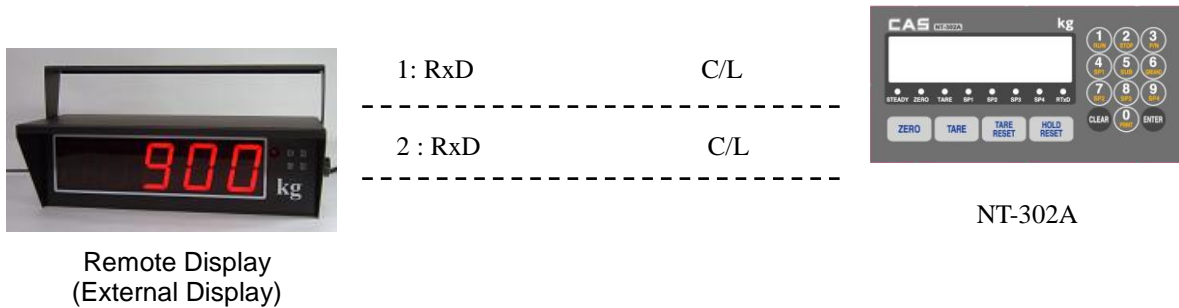
1	20mA
0	0mA

※ Only this power part is different.

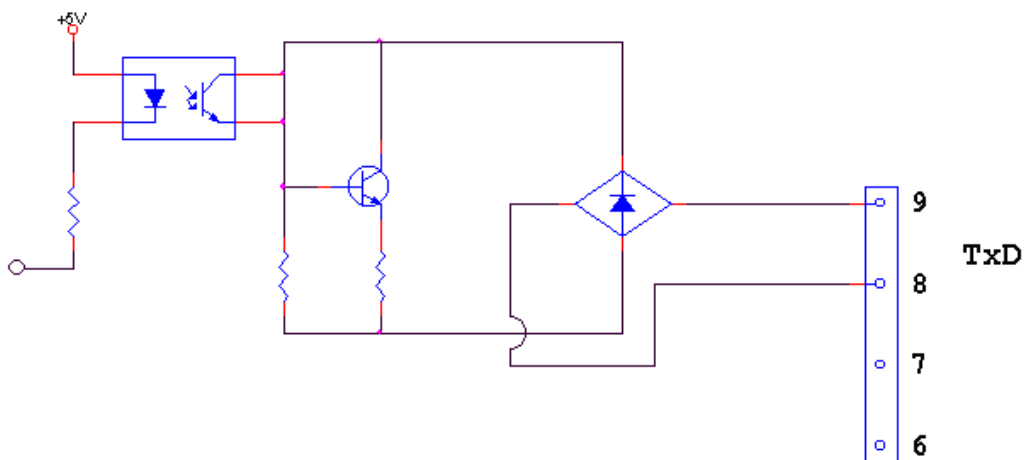
2. Data Format

As same as “RS-232C” Interface

3. Communication with Other Devices (Remote Display / External Display)



4. Current Loop Circuit



5. Command Mode

1. READ Command

PC → Indicator Format	Command	Response from Indicator
STX ID. NO. RTIM BCC ETX	Time Data	STX ID.NO. RTIM 000000 BCC ETX
STX ID. NO. RDAT BCC ETX	Date Data	STX ID. NO. RDAT 00000000 BCC ETX
STX ID. NO. RSNO BCC ETX	Serial No.	STX ID. NO. RSNO 000000 BCC ETX
STX ID. NO. RCNO BCC ETX	Code No.	STX ID. NO. RCNO 000000 BCC ETX
STX ID. NO. RPNO BCC ETX	Part No.	STX ID. NO. RPNO 00 BCC ETX
STX ID. NO. RTAR BCC ETX	TARE weight value	STX ID. NO. RTAR 000000 BCC ETX
STX ID. NO. RCWT BCC ETX	Current Weight value	STX ID. NO. RCWT <u>DATA1</u> BCC ETX
STX ID. NO. RSUB BCC ETX	Sub-Total Data	STX ID. NO. RSUB P/N(2) CODE_BUF(6) COOUNT(6) <u>S.T.W(8)</u> UNIT BCC ETX
STX ID. NO. RGRD BCC ETX	Grand-Total Data	STX ID.NO. RGRD P/N(2) CODE(6) <u>G.T.W(8)</u> UNIT BCC ETX
STX ID. NO. RFIN BCC ETX	Weighing Condition	STX ID. NO. RFIN FN (Finished weight 6byte) BCC ETX STX ID. NO. RFIN RN(Under processing) BCC ETX
STX ID. NO. RCWD BCC ETX	Memorized Data	STX ID. NO. RCWD <u>DATA2</u> BCC ETX
STX ID. NO. RSP1 BCC ETX	SP1 DATA	- STX ID.NO. RSP1 000000 BCC ETX
STX ID. NO. RSP2 BCC ETX	SP2 DAT	- STX ID.NO. RSP2 000000 BCC ETX
STX ID. NO. RSP3 BCC ETX	SP3 DATA	- STX ID.NO. RSP3 000000 BCC ETX
STX ID. NO. RSP4 BCC ETX	SP4 DATA	- STX ID.NO. RSP4 000000 BCC ETX

Remarks

1. DATA 1

HEADE1 (2)	HEADE2 (2)	+/-, Weight value with Decimal point (14)	UNIT (kg or t)(2)
------------	------------	--	-------------------

2. DATA 2

DATE (8)	TIME (6)	P/N (2)	CODE (6)	S/N (6)	TARE (6)	NET.W (8) Current Weight	GROSS.W (8)	UNIT (2)
----------	----------	---------	----------	---------	----------	-----------------------------	-------------	----------

3. Sub-Total, Grand-Total, SP1, SP2, SP3, Sp4 data don't have decimal point

2. Write Command

PC → Indicator Format	Command	Response from Indicator
STX ID. NO. WTAR BCC ETX	TARE input	STX ID. NO. WTAR ACK BCC ETX or STX ID. NO. WTAR NAK BCC ETX
STX ID. NO. WTRS BCC ETX	TARE RESET	STX ID. NO. WTRS ACK BCC ETX or STX ID. NO. WTRS NAK BCC ETX
STX ID. NO. WZER BCC ETX	ZERO input	STX ID. NO. WZER ACK BCC ETX or STX ID. NO. WZER NAK BCC ETX
STX ID. NO. WPRT BCC ETX	Print input	STX ID. NO. WPRT ACK BCC ETX or STX ID. NO. WPRT NAK BCC ETX
STX ID. NO. WSPR BCC ETX	Sub-Total Print	STX ID. NO. WSPR ACK BCC ETX or STX ID. NO. WSPR NAK BCC ETX
STX ID. NO. WGPR BCC ETX	Grand-Total Print	STX ID. NO. WGPR ACK BCC ETX or STX ID. NO. WGPR NAK BCC ETX
STX ID. NO. WDAT DATE BCC ETX ex) STX ID.NO WDAT 00000000 BCC ETX	Date setting	STX ID. NO. WDAT ACK BCC ETX or STX ID. NO. WDAT NAK BCC ETX
STX ID. NO. WTIM TIME BCC ETX ex) STX ID.NO WTIM 000000 BCC ETX	Time setting	STX ID. NO. WTIM ACK BCC ETX or STX ID. NO. WTIM NAK BCC ETX
STX ID. NO. WSNO S/N(6) BCC ETX ex) STX ID.NO WSNO 000000 BCC ETX	Serial No. Change	STX ID. NO. WSNO ACK BCC ETX or STX ID. NO. WSNO NAK BCC ETX
STX ID. NO. WPNO P/N(2) BCC ETX ex) STX ID.NO WPNO 00 BCC ETX	Part No. Change	STX ID. NO. WPNO ACK BCC ETX or STX ID. NO. WPNO NAK BCC ETX
STX ID. NO. WCNO C/N(6) BCC ETX ex) STX ID.NO WCNO 000000 BCC ETX	Code No. Change	STX ID. NO. WCNO ACK BCC ETX or STX ID. NO. WCNO NAK BCC ETX
STX ID. NO. WHOL BCC ETX	Hold input	STX ID. NO. WHOL ACK BCC ETX or STX ID. NO. WHOL NAK BCC ETX
STX ID. NO. WHRS BCC ETX	Hold RESET	STX ID. NO. WHRS ACK BCC ETX or STX ID. NO. WHRS NAK BCC ETX

PC → Indicator Format	Command	Response from Indicator
STX ID. NO. WSTC BCC ETX	Sub-Total Data Clear	STX ID. NO. WSTC ACK BCC ETX or STX ID. NO. WSTC NAK BCC ETX
STX ID. NO. WGTC BCC ETX	Grand-Total Data Clear	STX ID. NO. WGTC ACK BCC ETX or STX ID. NO. WGTC NAK BCC ETX
STX ID. NO. WSTR BCC ETX	Start(Run) Input	STX ID. NO. WSTR ACK BCC ETX or STX ID. NO. WSTR NAK BCC ETX
STX ID. NO. WSTO BCC ETX	STOP Input	STX ID. NO. WSTO ACK BCC ETX or STX ID. NO. WSTO NAK BCC ETX
STX ID. NO. WSP1 SP1(6) BCC ETX ex) STX ID.NO WSP1 000000 BCC ETX	SP1 set value change	STX ID. NO. WSP1 ACK BCC ETX or STX ID. NO. WSP1 NAK BCC ETX
STX ID. NO. WSP2 SP2(6) BCC ETX ex) STX ID.NO WSP2 000000 BCC ETX	SP2 set value change	STX ID. NO. WSP2 ACK BCC ETX or STX ID. NO. WSP2 NAK BCC ETX
STX ID. NO. WSP3 SP3(6) BCC ETX ex) STX ID.NO WSP3 000000 BCC ETX	SP3 set value change	STX ID. NO. WSP3 ACK BCC ETX or STX ID. NO. WSP3 NAK BCC ETX
STX ID. NO. WSP4 SP4(6) BCC ETX ex) STX ID.NO WSP4 000000 BCC ETX	SP4 set value change	STX ID. NO. WSP4 ACK BCC ETX or STX ID. NO. WSP4 NAK BCC ETX

6. 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
=====

```



7. Error and Treatment

1. TEST Mode

TEST Mode No.	Contents	Detail information
TEST 1.	Analogue TEST mode	
TEST 2.	Keypad TEST mode	
TEST 3.	SET.CAL Mode	
TEST 4.	Display TEST Mode	
TEST 5.	Relay output TEST Mode	
TEST 6.	External input(Digital Input)TEST Mode	
TEST 7.	Un-Calibrated Analogue TEST Mode	
TEST 8	Function DATA setting Print Mode	

Enter to TEST Mode



Turn on the power with pressing 3 KEY.

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

Exit from TEST Mode

Press CLEAR KEY to exit from each TEST mode.

Then, display will show 

Under TEST 3.  mode, press 3 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 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

WARRANTEE CERTIFICATION

This product is passed “ CAS ”s strict quality test.

If there is defect of manufacturing or abnormal detection within warrantee period, please contact our Agent or Distributor with this Warrantee certificate.

Then, we will repair or replace free of charge.

WARRANTEE CLAUSE

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

2. Warrantee Exception Clause

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

3. Other

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

	Product	Digital Weighing Indicator
	Model	NT-302A
	Serial No.	
	AUTHORIZED STAMP	