



Benediction Enterprise Co., Ltd, Taiwan



BDI-9301B

Weighing Indicator & Controller

User's Manual

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Chapter 1 Introduction

§ 1-1 Welcome

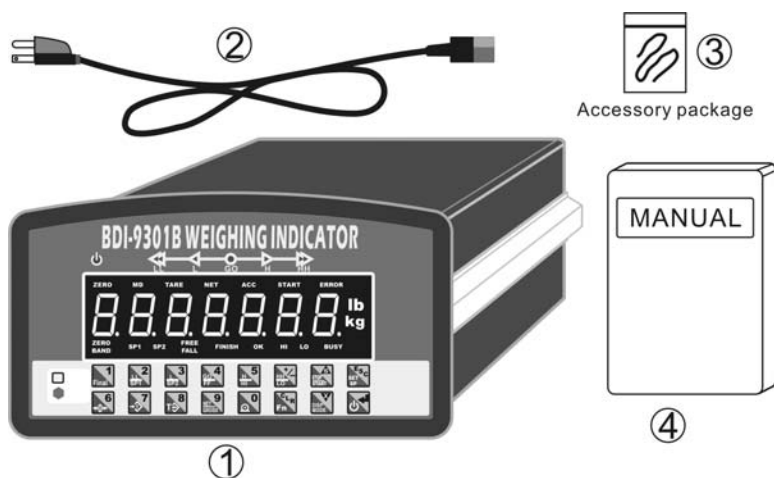
The **BDI-9301B** weighing indicator is a model of simple weighing controller. The purpose of designing **BDI-9301B** is to perform precise weighing / controls. Please contact us immediately for further services if needed.

E-mail : bde.com@msa.hinet.net Web Site : <http://www.bde.com.tw>

§ 1-2 Features

- ◎ Watchdog virtually eliminates malfunctions that associated with computerized equipment or software failure. Full Digital Calibration makes setting ZERO and SPAN Calibration an easy task.
- ◎ Fully digital calibration with adjustment, therefore improve the convenience of instrument installation.
- ◎ Drives up to 8 parallel connecting load cells, suitable for large truck scales.
- ◎ 1/15,000 displayed resolution, A/D conversion rate 40 times/ Sec.
- ◎ FLASH MEMORY will ensure data in case of power failure.
- ◎ The settings of function and weighing parameters are all stored in the EEPROM, with storage duration over 40 years.
- ◎ Users can adjust the intensity of digits filter to avoid mechanical that caused by external environments to achieve high-speed and accurate measurement.
- ◎ 8 modes of control applications.
- ◎ Standard RS232 Output.
- ◎ Standard Serial Output (20mA Current Loop) for remote display.
- ◎ The BDI-9301B can be automatically printed or transmit data via function settings without manual operation.
- ◎ Options : OP-01 Control I / O
 OP-02 Serial Input/Output (RS-485)
 OP-05 Analog Output 4~20mA
 OP-06 Analog Output 0~10V
 OP-08 Relay Control Interface

§ 1-3 Items In Carton



The carton in which the BDI-9301B is delivered contains :

1. Indicator. 2. Power Cord.. 3. Accessory (In bag) 4. User's manual.

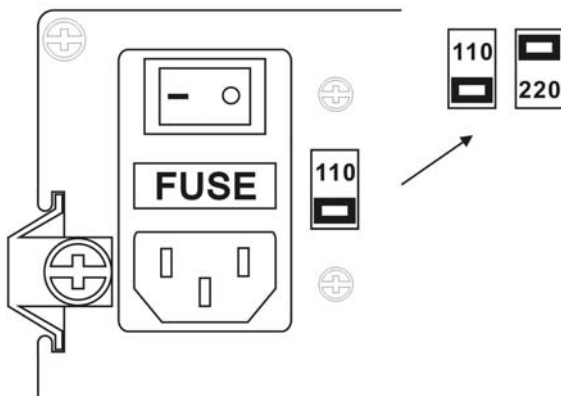
Chapter 2 Installation

§ 2-1 Best Condition For Use

When installing and wire connecting on BDI-9301B, please follow the guidelines below :

- ⊙ Before Connecting the Electric Power Supply, please identify the input Electric voltage type is AC 110V OR AC 220V.
- ⊙ The Grounding Wire shall be properly connected. The Operation Temperature shall range within 0°C~ 45°C, please DO not install in any place of direct sun-light. Due to the minute output signal from Load Cell, **please use isolated cables**. Also, separate the Load Cell cable from the power supply cable and control I/O cables.
- ⊙ The input power shall be AC 110V or AC 220V±10%, if the Electric Power Supply is not stable or interference signal exists, that may cause uncertain actuation or reaction, even damages. Therefore, please utilize Electric Power Supply Stabilizer of adequate capacity.

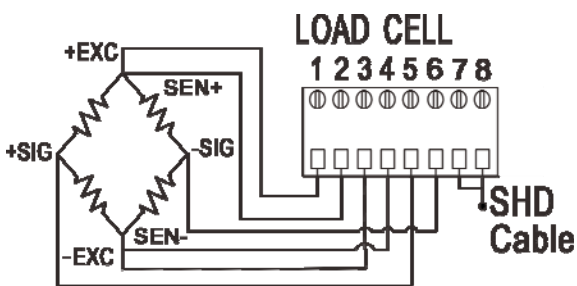
§ 2-2 Power Supply Connecting



※ Slide the switch between 110/220V. (Before connecting the Electric Power Supply)

§ 2-3 Connecting the Load Cell

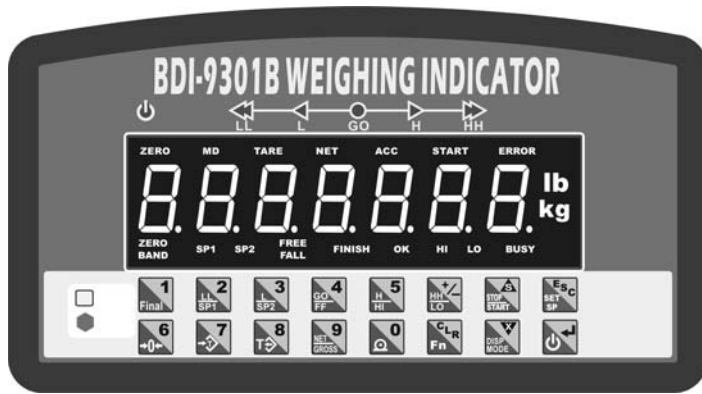
Do not plug in your power cable until you have completely connected the load cell(s).



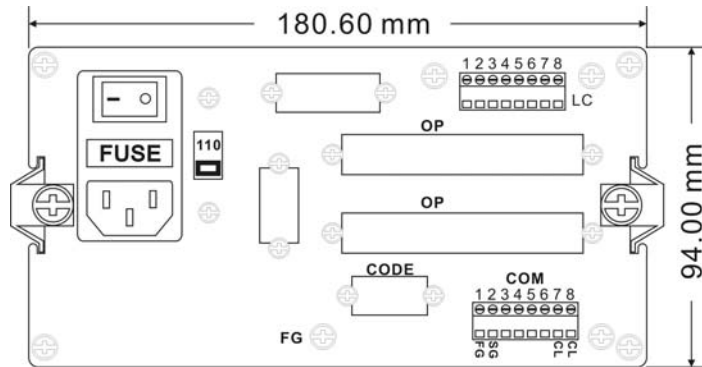
Screw	Signal
1	Positive Excitation Voltage, EXC+
2	Positive Sense Voltage, SEN+
3	Negative Sense Voltage, SEN-
4	Negative Excitation Voltage, EXC-
5	Positive Signal Voltage, SIG+
6	Negative Signal Voltage, SIG-
7	Shield, SHD
8	Shield, SHD

1. To connect your load cell to the weighing Indicator use a six-wire cable with shield – connect the wires as indicated above. If the BDI-9301B is located near the Load Cells (Within five meters or a few yards) you may use a 4-wire cable with shield, but first connect screws 1&2 and 3&4 with independent jumper leads.
2. The analogue output from the Load Cell and input/output signals are sensitive to electrical noise. Do not bind these cables together as it could result in cross-talk interface. Please also keep them away from AC power cables.

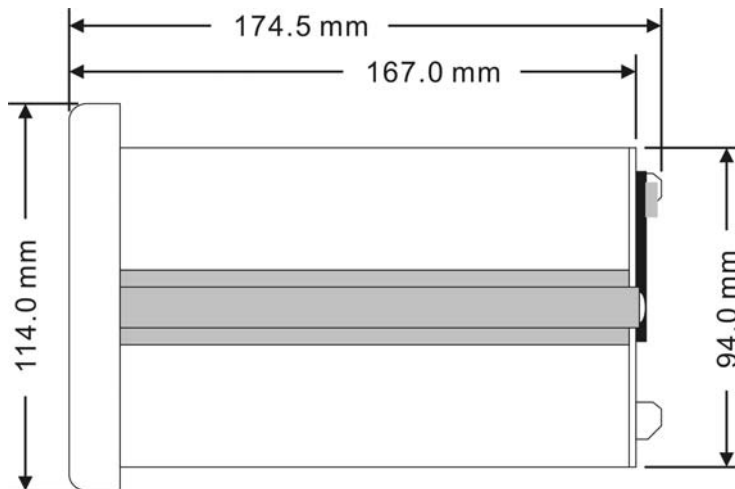
§ 2-4 Front and Rear Panel Dimensions



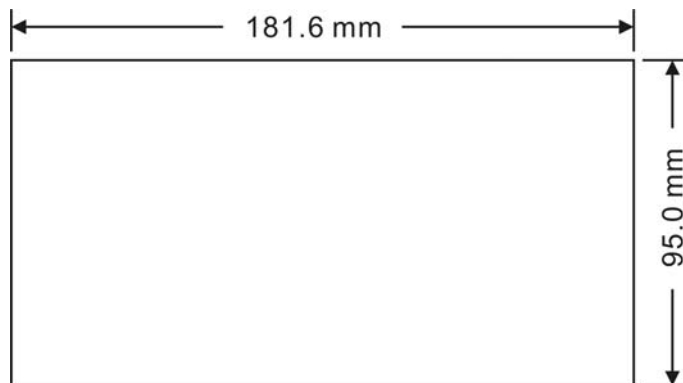
Front Panel



Rear Panel



Side View



Mounting Cut

Chapter 3 Specifications

§ 3-1 Analog Input and A/D Conversion

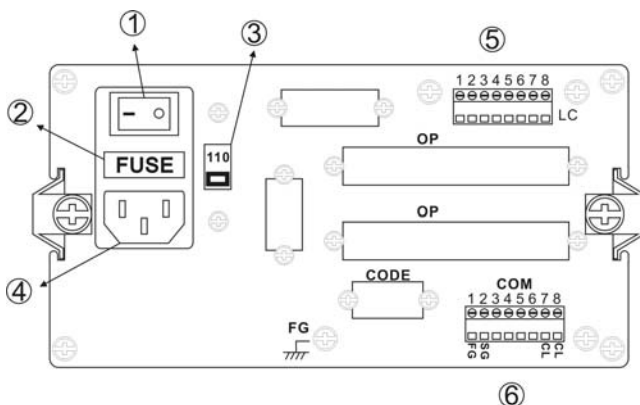
◎ Analog Input and A/D Conversion	
Type	BDI-9301B
Input Sensitivity	$\geq 0.4\mu\text{V/D}$
ZERO Adjustment Range	0 ~ 24mV
Load Cell Excitation	12V $\pm 5\%$, 280mA Remote Sensing. Can Be connected up to eight 350 Ω Load Cells.
Non-Linearity	$\pm 0.01\%$ F.S
A/D Conversion Method	$\Delta\Sigma$
A/D Resolution	$\div 1/1,000,000$
A/D Conversion Rate	40 times / Sec
Max Load Cell Input Voltage	39mV
ZERO Temperature Comp	$\pm(0.2\mu\text{V} + 0.001\% \text{ of Dead Load}) / ^\circ\text{C}$ typ
SPAN Temperature Comp	$\pm 0.001\% / ^\circ\text{C}$ typ
Max Resolution	1/15,000

§ 3-2 General

◎ General	
Type	BDI-9301B
Power Requirement	AC110V $\pm 10\%$ or AC220V $\pm 10\%$, 50 / 60Hz, Approx 17VA.
Net weight	Approx 2.45 kg (5.39lb)
Operation Temperature	-10 ~ 45 $^\circ\text{C}$
Max. Humidity	85% 【non-condensing】
Physical Dimensions	205 (W) \times 114 (H) \times 175 (D) mm

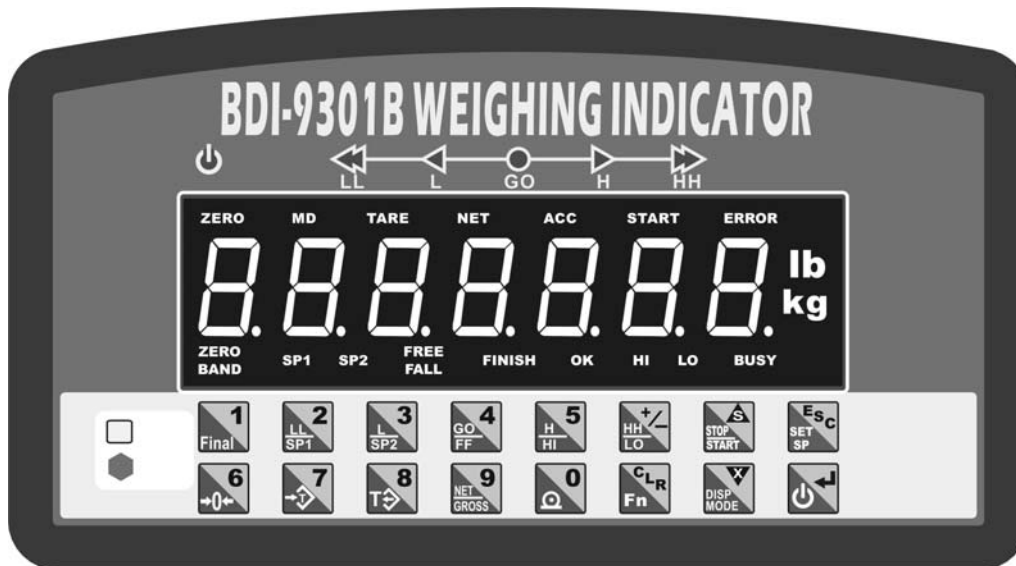
§ 3-3 Front Panel Description

§ 3-3-1 Rear Panel Description



Section	Description
1	Power Switch
2	Fuse (Set 0.5A/125V)
3	Input Power Switch
4	Power Cord Socket
5	Terminal Block for Load Cell
6	Terminal Block Serial Cards

§ 3-3-2 Front Panel Description



© Front Panel Description	
Main Display	7-segment , 7-digit display, LED 0.8" character size, displays weight.
Min. Division	×1 、×2 、×5 、×10 、×20 、×50
Max. Display	+750000
Under ZERO Indication	"—" Minus Sign
" ZERO " LED light	Center Of Zero
" MD " LED light	Motion Detected = Unstable
" NET " LED light	Net Weight Displayed
" TARE " LED light	Tare Has Been Entered
" START " LED light	Start/Stop Display During Automatic Control
" ERROR " LED light	ERROR Instruction
" ACC " LED light	Accumulator Mode
" Kg " LED light	Kilograms Displayed
" lb " LED light	Pound Displayed
" g " LED light	Gram Displayed
" ZERO BAND " LED light	Value within ZERO Range
" SP1 " LED light	SP1 Displayed
" SP2 " LED light	SP2 Displayed
" FREE FALL " LED light	Free fall Displayed
" FINISH " LED light	Finish Displayed
" OK " LED light	OK Displayed
" HI " LED light	HI Displayed
" LO " LED light	LO Displayed
" BUSY " LED light	Busy Displayed
" ►► " HH LED light	HH Displayed
" ► " H LED light	H Displayed
" ○ " GO LED light	Standard Displayed
" ◀ " L LED light	L Displayed
" ◀◀ " LL LED light	LL Displayed
" ⏻ " STANDBY LED light	Standby Displayed

◎ Key description :				
	Set mode	Operating	Function Set Point	
			F101=1/2/3/4	F101=5/6/7/8
" 1 / Final "	1		Set Final value.	
" 2 / SP1 / LL "	2		Set SP1 value.	Set LL value.
" 3 / SP2 / L "	3		Set SP2 value.	Set L value.
" 4 / FF / GO "	4		Set Free Fall value.	Set Standard value.
" 5 / HI / H "	5		Set Hi value.	Set Hi value.
" 6 / →0← "	6	Zero		
" 7 / →T "	7	Tare		
" 8 / T↔ "	8	Tare clear		
" 9 / NET / GROSS "	9	Net Weight mode		
" 0 / 0 "	0	Print		
" +/- / LO / HH "	± value		Set under value	Set HH value
" CLR / FN "	Clear	Assistant Mode		
" ▲ / START / STOP "	Increase value Option+1	Start/Stop		
" ▼ / DISP MODE "	Reduced value Option-1	Display Mode		
" ESC / SET SP "	ESC	Set up		
" ↵ / ⏻ "	Enter	Standby		

※ The small cover at the lower left corner of the panel is the set switch (calibration/function) and the lead seal hole.

§ 3-4 Quick Function Table

※**Bold** is the factory Initial

◎ WEIGHT FUNCTION TABLE		
F000	Decimal Point Adjustment	(0) No Decimal (1) 1 Decimal (2) 2 Decimal (3) 3 Decimal (4) 4 Decimal
F001	Weighing Unit Selection	(0) None (1) g (2) Kilogram (3) Pound
F002	Display Update rate	(5) 5 times/Sec (10) 10 times/Sec (20) 20 times/Sec
F003	Digital Filter	(0)~ (2) ~(5) step digital filter
F004	Set Zero Range (zero key activate range)	(5) ±5% (10) ±10% (20) ±20% (30) ±30% of Max. Capacity
F005	Motion Detection Time	(0) Stable (1) 1 Sec. ~ (2) 2 Sec. ~ (5) 5 Sec.
F006	Motion Detection Range	(0) Stable (1) 1 Div. ~ (2) 2 Div. ~ (9) 9 Div.
F007	Automatic ZERO Tracking Compensation Time	(0) OFF (1) 1 Sec ~ (2) 2 Sec ~ (5) 5 Sec
F008	Automatic ZERO Tracking Compensation Range	(0) OFF (1) 0.5 Div ~ (4) 2 Div ~ (9) 4.5 Div
F009	ZERO & TARE Keys Availability	(0) always work (1)only work when display is STABLE
F010	TARE Key Availability	(0) always work (1) If the GROSS is Negative (-),TARE key does not work
F011	Accumulation Availability	(0) OFF (1) Stable (2) Manual (3) Control Input Command Accumulation
F012	“SET”Switch PASSWORD	4 Digits, Factory Setting : 0000
F013	Power on auto zero	(0) OFF (1)Stable
F014	Display overload	(0) OFF (1) Display overload

◎ Control		
F100	Zero Band	6 digit Zero band value (Initial “ 000.000 ”)
F101	Batching Mode(one code)	(1)Customer Programmed Control Mode : Normal Batching (2) Customer Programmed Control Mode : Loss-in-Weight Batching (3) Built-in Automatic Program Mode : Normal Batching (4) Built-in Automatic Program Mode : Loss-in weight Batching (5) Selection Check Mode 1 (6) Selection Check Mode 2 (7) Selection Check Mode 3 (8) Selection Check Mode 4
F102	Stop judgment timer	Set between 0.0 to 2.0 Sec (Initial 0.0 Sec)
F103	Finish Signal timer	Set between 0.0 to 9.9 Sec (Initial 0.0 Sec)
F104	Pulse Width of Finish Signal	Set between 0.0 to 2.0 Sec (Initial 0.5 Sec)
F105	Output 8	(0)Unstable (1)Error
F106	Input Mode	(0)Panel Key (1)OP-01Input (2)OP-02 Serial Input
F107	Automatic Free Fall compensation	Please enter 6 digit free fall compensation value within effective range (Initial “ 000.000 ”---Free Fall compensation OFF)
F108	Automatic Free Fall compensation memory	(0) Not memory (1)Memory

◎ Serial 【RS-232、RS-485】		OP-02
F200	Baud Rate	(12) 1200bps (24) 2400bps (48) 4800bps (96) 9600bps
F201	Set Data Bit, Parity Bit, Stop bit. D8 : 8 Data bit D7 : 7 Data bit PN : Non-Parity PO : Odd Parity PE : Even Parity S1 : 1 Stop bit S2 : 2 Stop bit	(0)D8,PN,S1 (1)D8,PO,S1 (2)D8,PE,S1 (3)D8,PN,S2 (4)D8,PO,S2 (5)D8,PE,S2 (6)D7,PN,S1 (7)D7,PO,S1 (8)D7,PE,S1 (9)D7,PN,S2 (10)D7,PO,S2 (11)D7,PE,S2
F202	Output Data	(1) Same as display (2) Gross Weight (3) NET Weight (4) TARE Weight (5) Gross Weight, NET Weight, TARE Weight
F203	Output Mode	(1) Stream (2) Stable and auto print (3) Manual Print Mode (4) Accumulate and Print (5) ASCII Mode (6) MODBUS RTU
F204	Serial ID address	F203 = 0, Serial Code not used. (Initial is “ 000 “) F203 = 1~4, Serial Code used (001~099), add ID to the output format. F203 = 5, ASCII Mode : Serial Code used (001~099). F203 = 6, MODBUS RTU : Serial Code used.(001~247)

◎ BCD		OP-04
F400	Data type	① Same as display ② Gross data ③ NET data ④ TARE data
F401	Output Mode	① Stream ② Stable and print ③ Manual print mode ④ Accumulate and print
F402	Output Logic	① Positive Logic ② Negative Logic

◎ Analog Output		OP-05、06
F500	Analog Output Data	(1) Output 4~20 mA (2) Output 0~+10 V
F501	Output Mode	(1) Same as display (2) Gross data (3) NET data
F502	F500=1, Output 4mA weight value	-999999 through 999999 (Initial 0)
	F500=2, Output 0V weight value	-999999 through 999999
F503	F500=1, Output 20mA weight value	-999999 through 999999 (Initial 10000)
	F500=2, Output 10V weight value	-999999 through 999999

◎ Date/Time		
F800	Boot on to display Date/Time	(0) Do not display (1) Display

◎ Current Loop		
FC00	Baud Rate	(12) 1200BPS (24) 2400BPS
FC01	Parity	(0) Non-parity (1) Even Parity (2) Odd Parity
FC02	Output Data	(1) Same as display (2) Gross Weight (3) NET Weight (4) TARE Weight (5) Gross Weight, NET Weight, TARE Weight
FC03	Output Mode	(1) Stream (2) Stable and auto print (3) Manual Print Mode (4) Accumulate and Print

§ 3-5 Panel Key Function Table

Key	Accordance			Status
	Panel Key	OP-01 Control I/O	OP-02 Command Key	
ZERO →0←	→0←	✓	✓	BDI - 9301B returns to the center of ZERO if the weight value is within F004 range.
TARE →T	→T	✓	✓	BDI - 9301B switches to NET mode, ZERO's the display and stores the TARE weight in Memory.
TARE Clear T	T	✓	✓	Clear TARE Value
Gross Weight GROSS	NET/GROSS	✗	✓	Shift to GROSS Mode
NET Weight NET	NET/GROSS	✗	✓	Shift to NET mode
Print key 		✓	✗	Print or Output latest Data
Print Accumulation ACC	DISP MODE / 	✓	✗	Print Accumulation Value
Display Accumulation ACC	DISP MODE	✗	✗	Display Accumulation Value and Count Value
Clear Accumulation CLEAR	DISP MODE / CLR	✓	✗	Display Accumulation Value and Count Value
STANDBY		✗	✗	Stop BDI-9301B
OPERATE		✗	✗	Start BDI-9301B
ESC	ESC	✗	✗	Leave set up mode
▲	Panel Key	✗	✗	Add 1
▼	Panel Key	✗	✗	Minus 1
Fn	Panel Key	✗	✗	Accessibility Setting
ENTER		✗	✗	Confirm
START	START / STOP	✓	✓	START BATCH (F101=3,4)

STOP	START / STOP	✓	✓	STOP BATCH (F101 = 3,4)
CLEAR	CLR	✗	✗	Clear data when setting parameters
Key 0 ~ 9	0 ~ 9	✗	✗	key-in 0 ~ 9 When setup
Final	Final	✗	✓	Display/Set Final Weight (F101=1,2,3,4)
SP1	SP1	✗	✓	Display/Set SP1 Value (F101=1,2,3,4)
SP2	SP2	✗	✓	Display/Set SP2 Value (F101=1,2,3,4)
Key	Accordance			Status
	Panel Key	OP-01 Control I/O	OP-02 Command Key	
FF	FF	✗	✓	Display/ Set Free Fall Value (F101=1,2,3,4)
HI	HI	✗	✓	Display/ Set Hi Value (F101=1,2,3,4)
LO	LO	✗	✓	Display/ Set Lo Value (F101=1,2,3,4)
HH	HH	✗	✓	Display/ Set HH Value (F101=5,6,7,8)
H	H	✗	✓	Display/ Set H Value (F101=5,6,7,8)
GO	GO	✗	✓	Display/ Set Standard Value (F101=5,6,7,8)
L	L	✗	✓	Display/ Set L Value (F101=5,6,7,8)
LL	LL	✗	✓	Display/ Set LL Value (F101=5,6,7,8)

※OP-01 Please see § 4-2-2 / § 6-1

※OP-02 Please see § 4-2-3 / § 6-2

§ 3-6 Fn set-up.(Per-TARE)

Step 1 : Press **Fn** Key , display **SET A.Fn**

Step 2 : Press **1** Key , display **PrE-tArE**

Step 3 : Input Pre-Tare weight value.

Step 4 : Press **↵** Key to enter.

Step 5 : Displays **SET A.Fn**. Press **ESC** Key to display **End**

※ In normal mode, press 1 key to Pre-Tare value.

§ 3-7 Accumulation

§ 3-7-1 How to display accumulation value :

In normal mode. Press **DISP MODE** Key, screen Will display **AC.C.** -> **C 0**
count value, press **▲▼** Key to display the accumulated value **0.000**
Press **ESC** Key to leave the display accumulation mode.

§ 3-7-2 How to CLEAR accumulation value :

Press the **CLR** Key when the accumulated/count value is displayed, screen will display **CLRr AC.C**. Press **↵** Key, screen will display blinking **.....** . Therefore, accumulation and count is cleared.

Press **ESC** Key to leave without cleared.

§ 3-8 Enter the Lot Number

Step 1 : Press **Fn** Key, screen will display **SET A.Fn**

Step 2 : Press **2** Key, screen will display **Lot.no** -> **000000**

Step 3 : Enter the lot number (6 digits).

Step 4 : Press **↵** Key to confirm.

Step 5 : Display **SET A.Fn** , press **ESC** Key to display **End** and leave this function.

§ 3-9 Change Date/Time (must have custom card installed)

Step 1 : Press **⏻** Key, enter standby mode.

Step 2 : Hold down the **▲** Key for 2 second, press and hold the **7** Key,
until the screen displays **date** -> **yyy.mm.dd**

Step 3 : Press **↵** Key to modify the date **YYY.MM.DD**, at this time, press ESC to skip to step 4.


Step 4 : After the modification, press **↵** Key to display **time**-> **hh.mm.ss**


Step 5 : Press **↵** Key to modify the time **hh.mm.ss**. Press ESC to skip to step 6.

Step 6 : When finished, press **↵** Key to end date and time modification and enter standby mode.


※ Enter 000~099 for **B.C. year**, enter 100~199 for Taiwan year.

§ 3-10 Set key lock

Step 1 : Press  Key to enter standby mode.


Step 2 : Hold down the  Key for 2 seconds, then press and hold the **6** Key.
for 2 seconds until the display **Kr1.Lock**-> **UUUUUUU**

Step 3 : Start pressing the upper column key and press the Key you want to lock to display 'L' or 'U'.



Step 4 : Press  Key to enter the lower column lock.

Step 5 : Screen Displays **Kr2.Lock**-> **UUUUUUU**

Step 6 : Start pressing the lower column key and press the key you want to lock to display 'L' or 'U'.

Step 7 : Press the  key to end the setting of the key lock and enter the standby mode.

※ L = Lock, U = Unlock

※ The upper column  key and the lower column  key cannot be locked.

Chapter 4 System Functions



§ 4-1 System Check

Step 1 : There are two ways to enter system check.(**SET dip switch under lower left Lid)

a. Turn the [**POWER SWITCH**] OFF on the Rear Panel, slide the **SET** dip up. (then jump to step 2).

b. Press **⏻** key to enter standby mode, hold **▲** key for 2 seconds, and hold **3** for 2 seconds, then show [**CHECK**] (then jump to step 4).

Step 2 : Turn the [**POWER SWITCH**] ON located on the rear panel, [**SELECT**] will be displayed. (If password required screen will show [**PW**], input password to show [**SELECT**]).

Step 3 : Press **1** Key to display [**CHECK**], then start the system check.

Step 4 : Check the red 7-segment LED and buzzer sound.

The red 7-segment LED will start self-testing, and then the indicator LED test will be performed. User can clearly know whether the display is normal by the red 7-segment LED and the indication LED.

Step 5 : Check keypad [Self-Test], display [**KEY**] → [**||**]

Please press a keypad to display a value in the middle ; If the corresponding value does not appear when the keypad is pressed, the keypad may be damaged.

※ **↵** Key, please test again at last, otherwise it will jump to the next step.

Please refer to the following figure keypad position value comparison table.

01	02	03	04	05	10	11	12
06	07	08	09	00	13	14	15

Step 6 : Check MEMORY [EEPROM]

When the screen display [**EEPROM**], please press **Key** then appears [.....] indicates that testing, display [**PASS**], then the test is normal ; If displayed [**FAIL**], meaning the test failed.

Step 7 : Then test **OP-01 Input/Output**, when display [**OP01**] → [**I= O=**]

Ⓞ Input pins check, when display **I= 1~8** (Self-Test)

Short-circuit the rear panel **Control I/O 25 Pin D -type** with the **Com** (**P17 , 16**) with each input pins (**P18 ~ 25** one by one, if the relative value does not appear in the short circuit, the input pins may be abnormal.

Ⓞ Output contact check, when display **O= 1~8** [Self-Test]

Short-circuit **P6~ P13** with output shown one by one. It is abnormal to have two or more **ON** or **OFF** at the same time, it is not normal.

Ⓞ Press **↵** Key to skip to the next step.

Step 8 : If you use **OP-02** and then test **OP-02 Input/Output** (Please test in **RS-232 mode, Tx Rx Short circuit**), when display **t= r=**

Ⓞ Tx will output 0~9 in order.

Ⓞ Rx will receive 0~9 in order.

Ⓞ Press **↵** Key to skip to the next step.

Step 9 : Displays **End** to end system check, screen will show **SELECT**. Slide the **SET dip switch** down to end function setting.

※ If **FAiL** displays, there maybe system problem, please contact us immediately.

§ 4-2 Functions

Step 1 : Turn the [**POWER SWITCH**] OFF on the rear panel, open the SET Lid , slide the **SET** dip switch up.

Step 2 : Turn the [**POWER SWITCH**] ON located on the rear panel, screen will be display [**Select**] .
(If password required,it will be display [**PW**], please enter pass word to show [**Select**]).

Step 3 : Press **2** Key to enter function settings, screen will be display [**FUnC**] → [**F000**]

Step 4 : Please press **▲** or **▼** to move through the function. (F000, F001, F002,... FC02)

※Press **Fn** Key to jump directly to FX00 category (ex : F000->F100->F200->F500->F800->FC00)

Step 5 : Press **↵** Key to display function [**Fstr N**] , use **▲** or **▼** to select set value, or input number keys (0-9) if available. Press **↵** Key to confirm. Press the **ESC** key to escape. Repeat steps 4~5 for other parameters.

Step 6 : Press **ESC** key when screen shows [**Fnnn**] to finish when [**End**] appears.

Step 7 : Screen displays [**Select**], Slide set dip switch to finish.

§ 4-2-1 FOXX General Functions

F000	Decimal Point Adjustment		
	0	No Decimal	1234567
	1	1 Decimal	123456.7
	2	2 Decimal	12345.67
●	3	3 Decimal	1234.567
	4	4 Decimal	123.4567

F001	Weighing Unit Selection	
	0	None
	1	g
●	2	Kilogram
	3	Pound

F002	Display Value Update Speed	
	5	5 Times/Sec
●	10	10 Times/Sec
	15	20 Times/Sec

F003	Digital Filter				
		Filter	Environment Vibration	Response Speed	
	0	No stage	Weak	Bad	Fast
	1	1 st stage	▲	▲	▲
●	2	2 ^{ed} stage			
	3	3 rd stage			
	4	4 th stage	▼	▼	▼
	5	5 th stage	Strong	Good	Slow

F004	Set ZERO Range	
	5	±5% of weighing Platform Full Capacity
●	10	±10% of weighing Platform Full Capacity
	20	±20% of weighing Platform Full Capacity
	30	±30% of weighing Platform Full Capacity

F005	Unstable detection time	
	0	Stable
	1	1 SEC
●	2	2 SEC
	3	3 SEC
	4	4 SEC
	5	5 SEC

F006	Unstable Detection Range	
	0	OFF
	1	1 DIV
●	2	2 DIV
	3	3 DIV
	4	4 DIV
	5	5 DIV
	6	6 DIV
	7	7 DIV
	8	8 DIV
	9	9 DIV

F007	Automatic ZERO Tracking Compensation	
	0	OFF
	1	1 SEC
●	2	2 SEC
	3	3 SEC
	4	4 SEC
	5	5 SEC

F008	Automatic ZERO Tracking Rang	
	0	OFF
	1	0.5 DIV
	2	1 DIV
	3	1.5 DIV
●	4	2 DIV
	5	2.5 DIV
	6	3 DIV
	7	3.5 DIV
	8	4 DIV
	9	4.5 DIV

F009	ZERO & TARE keys Availability	
●	0	ZERO & TARE keys always work
	1	ZERO & TARE keys only work when display is STABLE

F010	TARE key Availability	
●	0	TARE key always work
	1	If the GROSS is negative, TARE key does not work

F011	Accumulation Availability	
●	0	OFF
	1	Stable
	2	Manual
	3	Control Input--Command Accumulation

F012	Set Switch PASSWORD	
Factory initial password : 000000. * When switch SET, please enter the password so that you can enter set modes.		

F013	Power on auto zero	
●	0	OFF
	1	STABLE
※ Power on auto zero must within 004 range. ※ If out of zero range, BDI 9301B will display without show zero. ※ If the weight is not stable to zero and display, press ESC to abort.		

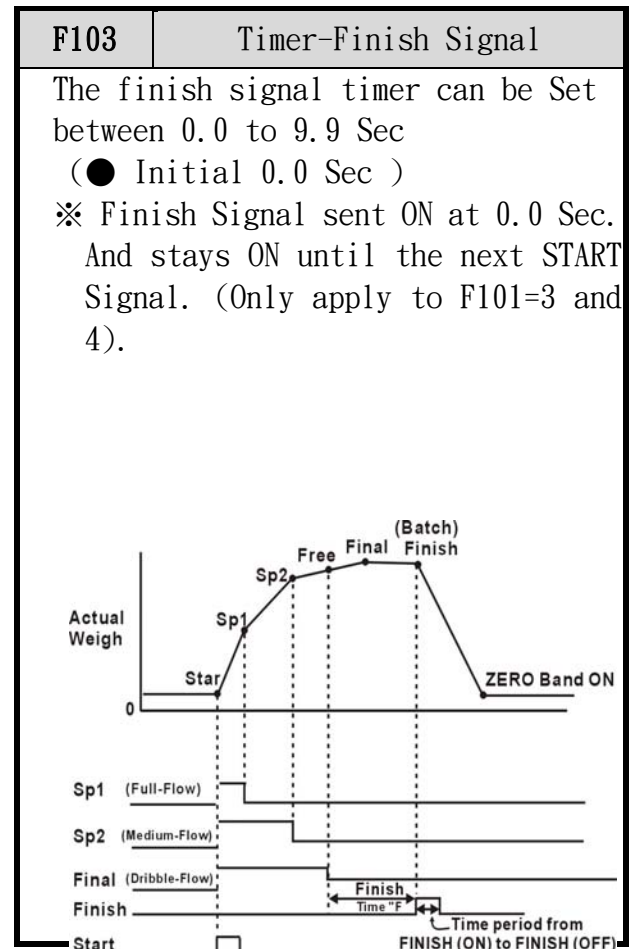
F014	Display overload	
	0	OFF
●	1	Display overload
※ <u>Load cell maybe damaged due to overload readings.</u> ※ If overload, screen will show “ OL “.		

§ 4-2-2 F1XX Control Functions 【OP-01】

F100	Set ZERO Band
6 digit Zero band value (● Initial " 000.000")	

F101	Batching Mode	
●	1	Customer Programmed Control Mode : Normal Batching
	2	Customer Programmed Control Mode : Loss-in-Weight Batching
	3	Built-in Automatic Program Mode : Normal Batching
	4	Built-in Automatic Program Mode : Loss-in weight Batching
	5	Selection Check Mode 1
	6	Selection Check Mode 2
	7	Selection Check Mode 3
	8	Selection Check Mode 4

F102	Stop Judgement Time
Please enter 0.0 seconds to 2.0 seconds For stop judgement. For F101 mode 3 or 4. (● Initial " 0.0" Sec)	



F104	Pulse Width of Finish Signal	
Set between 0.0 to 2.0 Sec (● Initial 0.5 Sec)		
※ Stable at 0.0 Sec. which is apply to F101 setting at 3 or 4.		

F105	Output 8	
●	0	Unstable
	1	Error

F106	Input Mode (Code Input)	
	1	Panel key
●	2	OP-01 Input
	3	OP-02 Input

F107	Automatic Free Fall Compensation	
Please enter 6 digit free fall compensation value within effective range (● Initial : 0.000)		

F108	Automatic Free Fall Memory	
●	0	Not Memory
	1	Memory

§ 4-2-3 F2XX Serial Input/Output 【OP-02】

F200	Baud Rate	
	12	1200bps
●	24	2400bps
	48	4800bps
	96	9600bps

F201	Set Data Bit, Parity Bit, Stop Bit		
●	0	D8, PN, S1	D8 : 8 Data Bit D7 : 7 Data Bit PN : Non - Parity P0 : Odd - Parity PE : Even - Parity S1 : 1 Stop Bit S2 : 2 Stop Bit ※F203=6 Modbus RTU Please select 0~5
	1	D8, P0, S1	
	2	D8, PE, S1	
	3	D8, PN, S2	
	4	D8, P0, S2	
	5	D8, PE, S2	
	6	D7, PN, S1	
	7	D7, P0, S1	
	8	D7, PE, S1	
	9	D7, PN, S2	
	10	D7, P0, S2	
	11	D7, PE, S2	

F202	Output Data	
●	1	Same as display
	2	GROSS Weight
	3	NET Weight
	4	TARE Weight
	5	GROSS Weight, NET Weight, TARE Weight

F203	Output Mode	
●	1	Stream
	2	Stable and auto print
	3	Manual Print Mode
	4	Accumulate and Print
	5	ASCII Mode
	6	Modbus RTU

F204	Serial ID Address
F203 = 0,	Not use serial addresses. (● Initial is 000)
F203 = 1~4,	Apply serial address (001~099), add ID to the output format.
F203 = 5,	ASCII Mode : apply serial address. (001~099)
F203 = 6,	MODBUS RTU : apply serial address. (001~247)

◎ BCD F4XX BCD OUTPUT 【OP-04】

F400	Data Type	
●	1	Same as display
	2	GROSS Weight
	3	NET Weight
	4	TARE Weight

F401	Output Mode	
●	1	Stream
	2	Stable and auto print
	3	Manual Print Mode
	4	Accumulate and Print

F402	Output Logic	
●	1	Positive Logic
	2	Negative Logic

§ 4-2-4 F5XX Analog Output 【OP-05】

F500	Analog Output Data	
●	1	Output 4~20 mA
	2	Output 0~+10 V

F502	F500=1, Output 4mA weight value F500=2, Output 0V weight value	
Setting Range : -999999 ~ 999999 (● Initial F500=1, 0)		

F501	Output Mode	
●	1	Same as display
	2	GROSS Weight
	3	NET Weight

F503	F500=1, Output 20mA weight value F500=2, Output 10V weight value	
Setting Range : -999999 ~ 999999 (● Initial F500=1, 10000)		

§ 4-2-5 F8XX Date/Time

F800	Boot on display Date/Time	
●	0	Not Display
	1	Display

§ 4-2-6 FCXX 20mA Current Loop

FC00	Band Rate	
●	12	1200bps
	24	2400bps

FC01	Parity	
	0	Non-Parity
●	1	Even- Parity
	2	Odd- Parity

FC02	Output data	
●	1	Same as display
	2	GROSS Weight
	3	NET Weight
	4	TARE Weight
	5	GROSS Weight, NET Weight, TARE Weight

FC03	Output Mode	
●	1	Stream
	2	Stable and auto print
	3	Manual Print Mode
	4	Accumulate and Print

§ 4-3 Calibration

Step 1 : Turn the [POWER SWITCH] OFF on the rear panel, Slide the SET dip switch up.

Step 2 : Turn the [POWER SWITCH] On, screen will show [select].

(If display [PW] , enter the password and display [select] after entering the correct password.)

Step 3 : Press 3 Key to display [CAL] → [F.CAL].

Step 4 : Press ▲ or ▼ to move through other calibration type, select [F.CAL] to select full calibration method.(Division-Decimal point-zero-span).

Step 5 : Press ↵ Key to enter the following calibration procedure.

§ 4-3-1 Select Full calibration [F.CAL]

Step 1 : Display [div 1] , press ▲ or ▼ select the Division 1/2/5/10/20/50, press ↵ Key to proceed to the next step.

Step 2: Display [dP 3] , press ▲ or ▼ select to set the decimal point places(0/1/2/3/4) and press ↵ Key to proceed to the next step.

Step 3 : Display [CAP] → [010.000] enter the Max. capacity with the number keys, press ↵ Key to proceed to the next step.

Step 4 : Display [CAL.0] zero calibration, please empty weighing platform and make sure no vibration and wind,press ↵ Key to display [.....] , indicates finished zero calibration. If there are no errors pop-up, proceed to the next step.

Step 5 : Display [CAL.SPAn] → [010.000], place the weight on the weighing platform and enter the value of the weight, make sure the weighing platform is no vibration and wind, press ↵ Key to display [.....] ,finish span calibration.

Step 6 : Display [SAvE] → [End] . Slide set dip switch down to finish.

§ 4-3-1< 2 > Select Trimming calibration

Step 1 : Display [div 1] , use ▲ ▼ key to choose division, Key to proceed to the next step.

Step 2: Display [dP 3] , press ▲ or ▼ select to set the decimal point places(0/1/2/3/4) and press ↵ Key to proceed to the next step.

Step 3 : Display [CAP] → [010.000] enter the Max. capacity with the number keys, press ↵ Key to proceed to the next step.

Step 4 : Display [CAL.0] zero calibration, please empty weighing platform and make sure no vibration and wind, press ↵ Key to display [.....] , indicates finished zero calibration. If there are no errors pop-up, proceed to the next step.

Step 5 : Display [CAL.SPAn] → Press ▼ key → [CAL.ADJ] → Press ↵ key to show current weight, make sure no vibration and wind, input number 1~5 to increase(1=min. → 5=Max.), Press 6~0 to decrease(6=Min → 0=Max), Press ↵ key to finish.

Step 6: Displays [SAvE] → [End] , Slide dip switch down to finish.

※ When BDI 9301B can not go on calibration procedure due to unstable,there are two choices.

① Press ESC Key to abort the calibration.

② Press ↵ Key to force measure calibration. (Not guarantee accuracy)

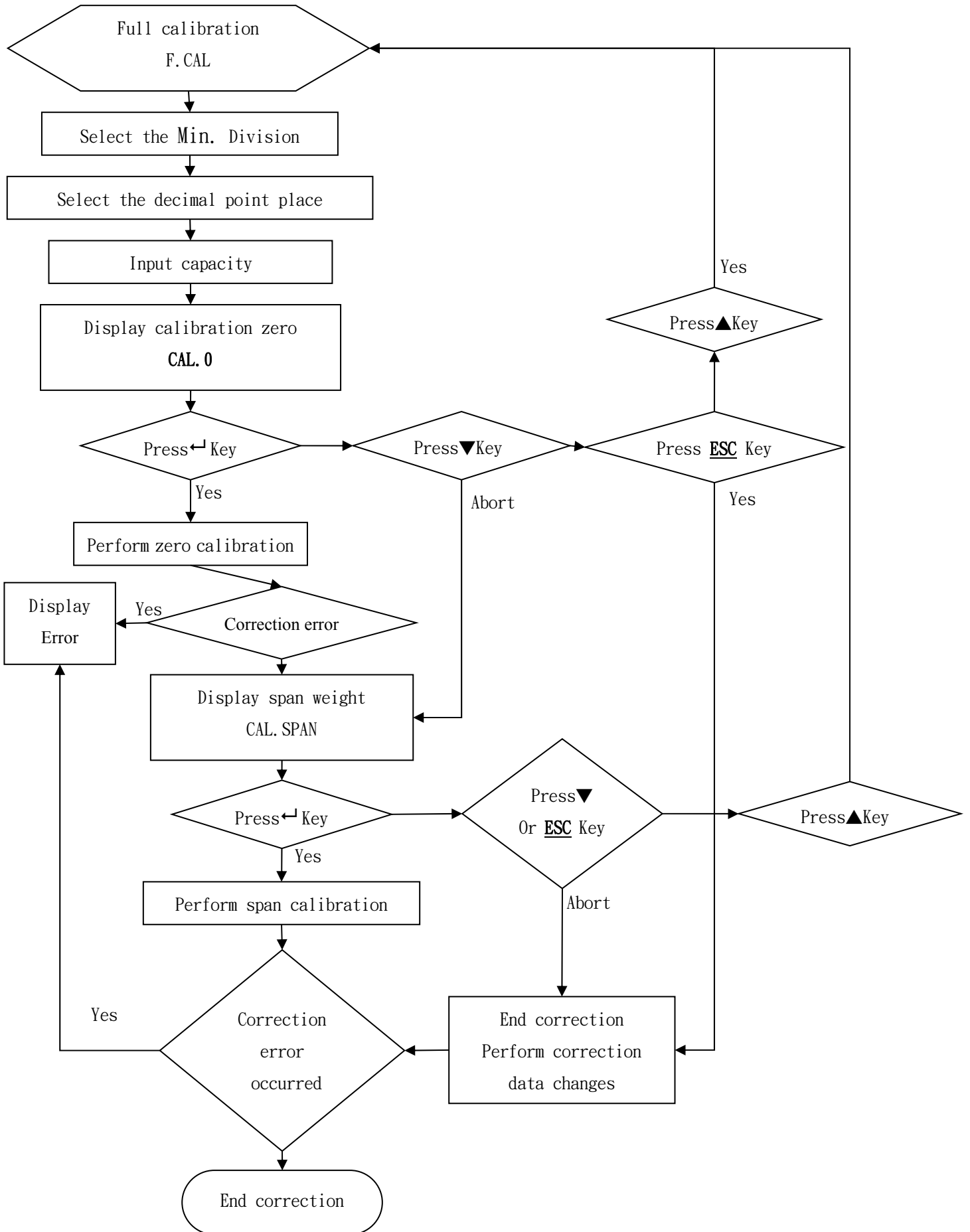
※ Please refer to the flowchart below, calibration can be made separately for division/zero/weight

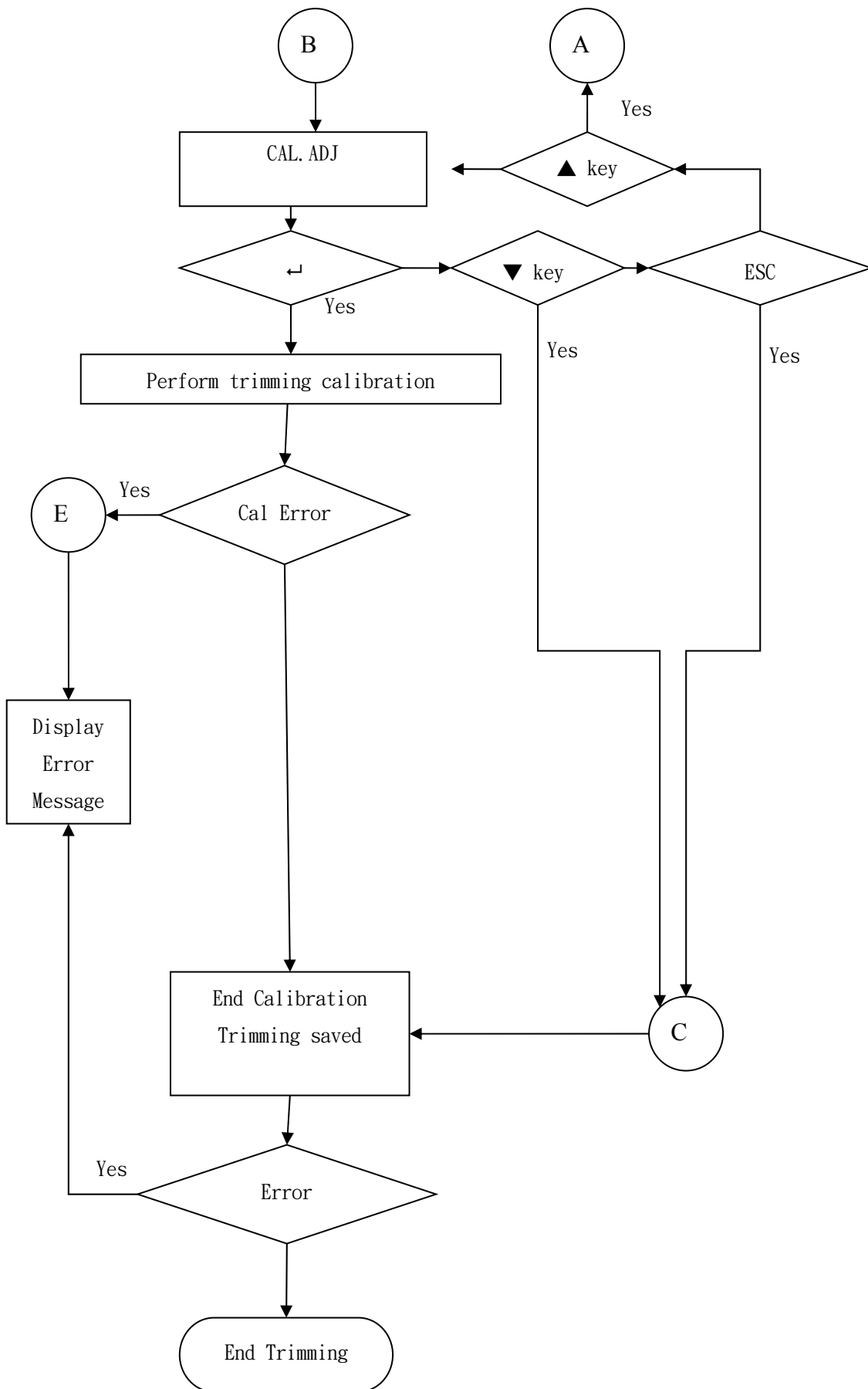
※ Correct the value separately can not reflect side balance if you have more than one load cell connected.

※ If there is an error, please refer to the error message.

.

© Full calibration F.CAL flow chart





§ 4-3-2 Calibration Errors

C.Err. 1 : The resolution exceeds 1 : 15,000.

Change the Min. division and Max. capacity within 1/15,000.
Resolution ratio= Min. division/Max. capacity

C.Err. 2 : The load cell output is too large at ZERO calibration

Add an additional resistor (50kΩ~500KΩ) between
EXC+ and SIG-. ※ Refer to the Right Figure

C.Err. 3 : The load cell output is too small at ZERO calibration.

Add an additional resistor (50kΩ~500KΩ) between
EXC+ and SIG+. ※ Refer to the Right Figure

C.Err. 4 : The calibration mass has been mistakenly entered as a value greater than the Max. capacity.

Please reduce the weight of calibration mass, and re-enter the weight value.

C.Err. 5 : The calibration mass has been mistakenly entered zero or it is smaller than the Min. capacity.

Please increase the weight of calibration mass, and re-enter the weight value.
※Recommended Min. input weight value \geq Min. div *100

C.Err. 6 : The load cell output is too low.

Replace your load cell with greater output or adjust the Min. division.

C.Err. 7 : The load cell signal pins are reversed, or the load cell output voltage is too low.

Check the load cell connections if reversed or load cell failure.

C.Err. 8 : The load cell output voltage (mV) at Max. capacity is too high.

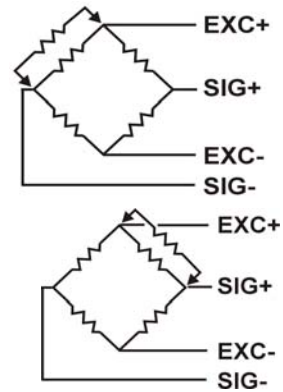
Check the load cell specification or load cell failure.

C.Err. 9 : The Max. capacity has been wrongly entered as a value smaller than 100.

Check Resolution Table.

C.Err. 10 : The Max. , capacity has been wrongly entered as a value greater than 750,000

Check Resolution Table.



§ 4-3-3 Display Resolution Table

Resolution						
Min. Div. / Max. Capacity	1	2	5	10	20	50
300	1/300	-----	-----	-----	-----	-----
400	1/400	-----	-----	-----	-----	-----
500	1/500	-----	-----	-----	-----	-----
600	1/600	1/300	-----	-----	-----	-----
800	1/800	1/400	-----	-----	-----	-----
1,000	1/1,000	1/500	-----	-----	-----	-----
1,200	1/1,200	1/600	-----	-----	-----	-----
1,500	1/1,500	1/750	1/300	-----	-----	-----
2,000	1/2,000	1/1,000	1/400	-----	-----	-----
2,500	1/2,500	1/1,250	1/500	-----	-----	-----
3,000	1/3,000	1/1,500	1/600	1/300	-----	-----
4,000	1/4,000	1/2,000	1/800	1/400	-----	-----
5,000	1/5,000	1/2,500	1/1,000	1/500	-----	-----
6,000	1/6,000	1/3,000	1/1,200	1/600	1/300	-----
8,000	1/8,000	1/4,000	1/1,600	1/800	1/400	-----
10,000	1/10,000	1/5,000	1/2,000	1/1,000	1/500	-----
12,000	1/12,000	1/6,000	1/2,400	1/1,200	1/600	-----
15,000	1/15,000	1/7,500	1/3,000	1/1,500	1/750	1/300
20,000	-----	1/10,000	1/4,000	1/2,000	1/1,000	1/400
25,000	-----	1/12,000	1/5,000	1/2,500	1/1,250	1/500
30,000	-----	1/15,000	1/6,000	1/3,000	1/1,500	1/600
40,000	-----	-----	1/8,000	1/4,000	1/2,000	1/800
50,000	-----	-----	1/10,000	1/5,000	1/2,500	1/1,000
60,000	-----	-----	1/12,000	1/6,000	1/3,000	1/1,200
80,000	-----	-----	-----	1/8,000	1/4,000	1/1,600
100,000	-----	-----	-----	1/10,000	1/5,000	1/2,000
120,000	-----	-----	-----	1/12,000	1/6,000	1/2,400
150,000	-----	-----	-----	1/15,000	1/7,500	1/3,000
200,000	-----	-----	-----	-----	1/10,000	1/4,000
250,000	-----	-----	-----	-----	1/12,500	1/5,000
300,000	-----	-----	-----	-----	1/15,000	1/6,000
400,000	-----	-----	-----	-----	-----	1/8,000
500,000	-----	-----	-----	-----	-----	1/10,000
600,000	-----	-----	-----	-----	-----	1/12,000
700,000	-----	-----	-----	-----	-----	1/14,000
750,000	-----	-----	-----	-----	-----	1/15,000

§ 4-4 System Initialize

Initialize resets the BDI-9301b to the initial factory settings. Use Initialize only if you want to return Function, Set Point or Calibration to their initial settings.

Step 1 : Turn the (**POWER SWITCH**) OFF on the rear panel, slide the **SET** dip switch up..

Turn the (**POWER SWITCH**) ON located on the rear panel, screen will be display **Select** .

(If password required, it will be display **PW** , please enter pass word to show **Select**).

Step 3 : Press **0** Key, when display **init** → **no**

Step 4 : Press **▲** or **▼** to select, **no** or **yES**

Select **no** to skip to step 5.

Select **yES** then appears **.....** indicates that the initial value setting is executed, and when it is finished, skip to step 5.

Step 5 : Display **End** then end system check→**Select** . Slide the **SET** dip switch down.

Chapter 5 Modes/Set Point Description

§ 5-1 Set Point

1. Press **SET SP** Key, displays **SET SP**

2. Mode F101 = 1 / 2 / 3 / 4 (Batching mode)

Final	-	Final Weight	6 Digit
SP1	-	Set point 1	6 Digit
SP2	-	Set point 2	6 Digit
FF	-	Free Fall	4 Digit
Hi	-	Hi limit	4 Digit
Lo	-	Lo limit	4 Digit

Mode F101 = 5 / 6 / 7 / 8 (Selection check mode)

LL	-	Low Low Limit	6 Digit
L	-	Low Limit	6 Digit
GO	-	Standard Value	6 Digit
H	-	Hi Limit	6 Digit
HH	-	High High Limit	6 Digit

3. Use the numeric keys to input the set value.

▲ Key : Add 1.

▼ Key : Decrease 1.

CLR Key : Clear the value to zero.

Number keys 0~9 : Enter the set value (Initial 0)

↵ Key : Enter or confirm.

ESC Key : Escape without saving parameter.

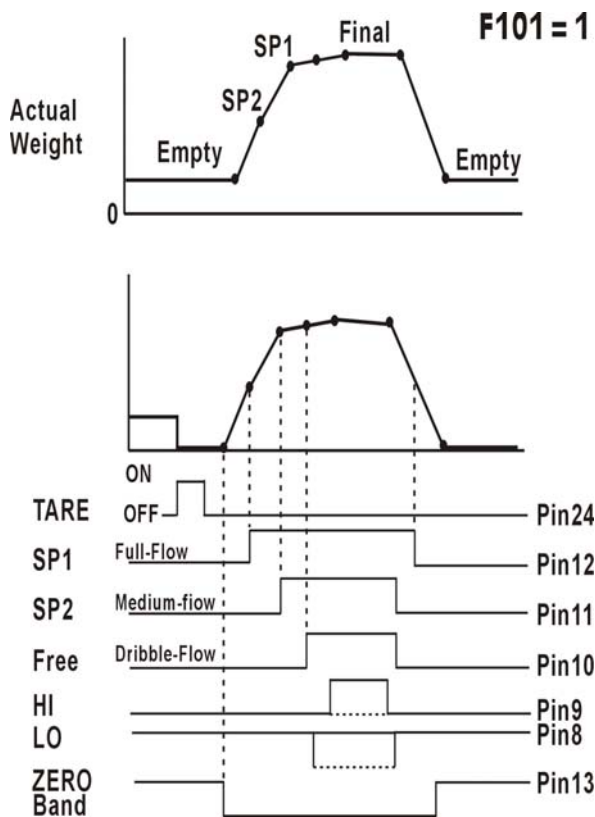
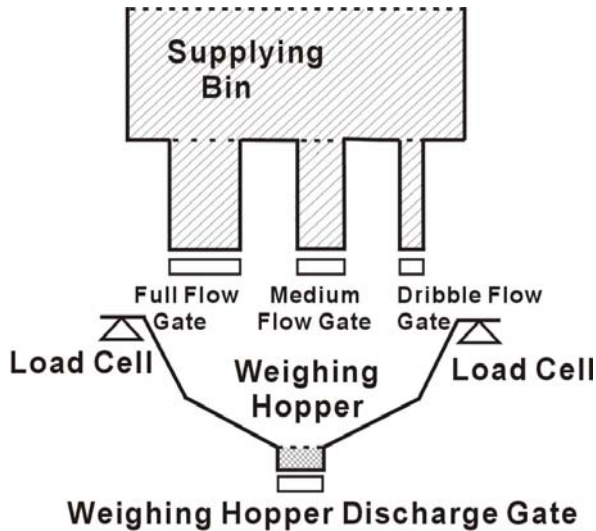
4. If display **SEt SP** , press **ESC** Key to escape.

****Vales will accord to your divisions 1,2,5,10.**

§ 5-2 Batching Modes

§ 5-2-1 Normal Batching (F101=1)

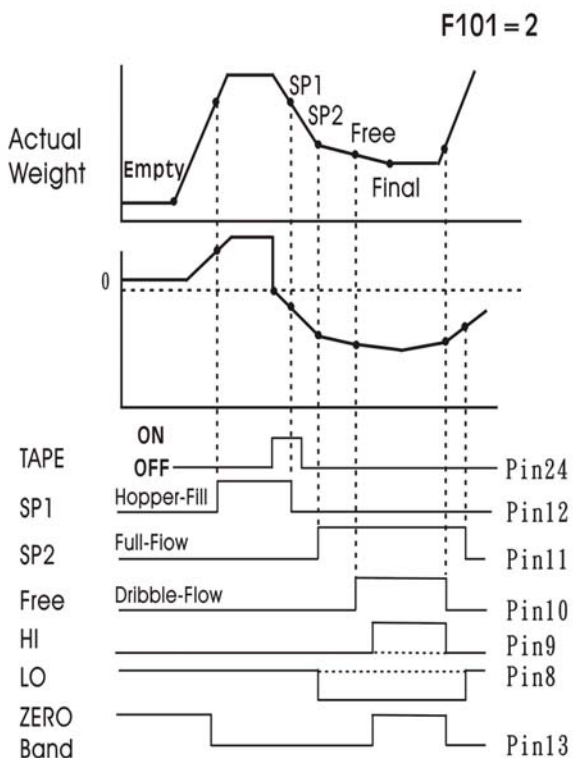
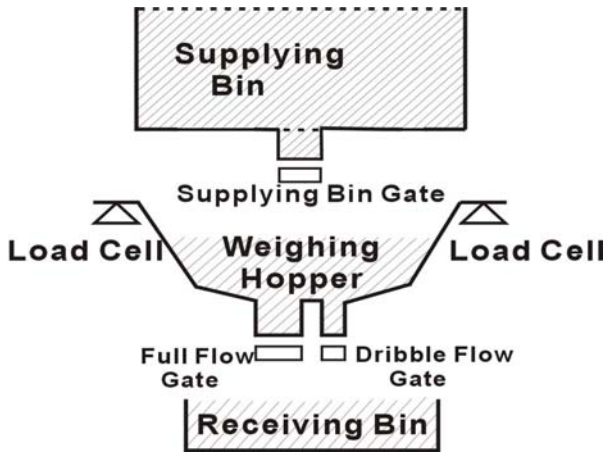
SP1 – Full Flow Gate
 SP2 – Medium Flow Gate
 Free – Dribble Flow Gate



1. The Weighing Hopper is empty, the display shows "0", and all Gates are closed. If the display is not at ZERO, **input a TARE** signal (Pin 24) to **re-ZERO the display**.
2. Open the Supply Bin's: Full-Flow Gate, Medium-Flow Gate, and Dribble-Flow Gate.
3. When the display reaches "**Final - SP 1**", the **SP 1** Output (Pin 12) signal will come **ON**. Closed the Full-Flow Gate by using the **SP 1** Output ON signal.
4. When the display reaches "**Final - SP 2**", the **SP 2** Output (Pin 11) signal will come **ON**. Closed the Medium-Flow Gate by using the **SP 2** Output ON signal.
5. When the display reaches "**Final - FREE**", the **FREE** Output (Pin 10) signal will come **ON**. Closed the Dribble-Flow Gate by using the **FREE** Output ON signal.
6. After Free Fall has stopped - check if the HI and LO (Pin 9, 8) signals are OFF. If both outputs are OFF then the batch is completed correctly.
7. An Automatic Free Fall Compensation Command (Min. 200ms pulse to Pin 21) may be given at this time. If you change the Free Fall Set Point value either from the Front Panel or the RS-232C, RS-422/485 — the learned Free Fall value will be cleared.
8. Use the **FREE** (Pin 10) signal to delay a time period as the control signal is processing empty the Weighing Hopper.
9. When the GROSS weight is below the ZERO band, the ZERO Band Output will come ON -signifying the Weighing Hopper is empty. Closed the Weighing Hopper Discharge Gate by using the ZERO Band (Pin 13) Output ON signal.
10. You are now ready for your next batching event.

§ 5-2-2 Loss-in-Weight Batching (F101=2)

SP1 – Full Flow Gate
 SP2 – Medium Flow Gate
 Free – Dribble Flow Gate



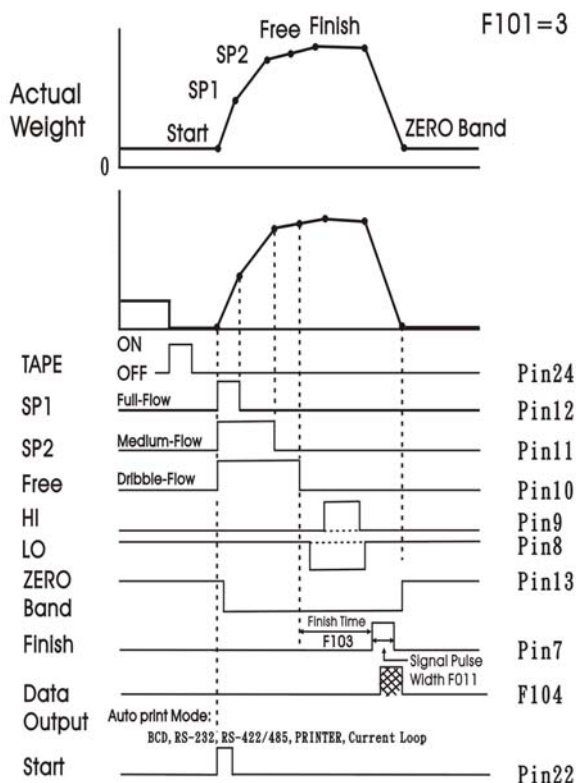
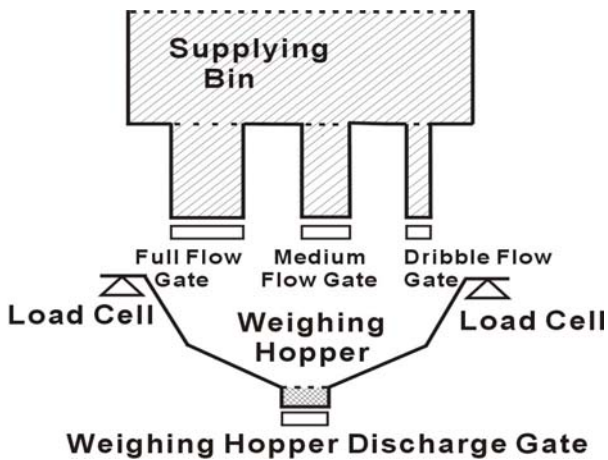
1. The Weighing Hopper is empty as is the Receiving Bin. The display shows "0", and all Gates are closed.
2. Open the Supplying Bin Gate.
3. When the GROSS Weight reaches "SP 1", the SP 1 Output (Pin 12) signal will come ON. Closed the Supplying Bin Gate by using the SP 1 Output ON signal.
4. The displayed weight will exceed the SP 1 value by the Free Fall value. This weight is not necessarily accurate - but accuracy is not needed at this moment since the purpose of this event is to fill up the Weighing Hopper. The SP 1 value is always compared to GROSS weight.
5. Input a TARE signal (Pin 24) to ZERO the display.
6. Open the Full-Flow Gate and the Dribble-Flow Gate for Full-Flow filling into the Receiving Bin.
7. When the display reaches "Final - SP 2", the SP 2 Output (Pin 11) signal will come ON. Closed the Full-Flow Gate by using the SP 2 Output ON signal.
8. When the display reaches "Final - FREE", the FREE Output (Pin 10) signal will come ON. Closed the Dribble-Flow Gate by using the FREE Output ON signal.
9. After Free Fall has stopped - check to see if the HI and LO (Pin 9, Pin 8) signals are OFF. If both outputs are OFF then the batch is completed correctly.
10. An Automatic Free Fall Compensation Command (Min. 200ms pulse to Pin 21) may be given at this time.
11. If the GROSS weight of the Weighing Hopper is below the ZERO Band (Pin 13), the ZERO Band Output will be ON. The ZERO Band Output will refill Weighing Hopper if needed.
12. Ready for next batching event.

§ 5-2-3 Built-in Automatic Program Normal Batching (F101=3)

SP1 - Full Flow Gate
 SP2 - Medium Flow Gate
 Free - Dribble Flow Gate
 Start signal - Pin22

★Start signal can be obtain from
OP-01 or OP-02

※ Please refer to
§ 4-2 § 6-1 § 6-2



1. The Weighing Hopper is empty, the display shows "0", and all Gates are closed. If the display is not at ZERO, **input a TARE signal (Pin 24) to re-ZERO the display.**
2. Check if the Weighing Hopper is empty using the ZERO Band Output.
3. Input the Start signal via the Control I/O Interface connector (Pin 22). When the Start signal is received, then **SP 1, SP 2, and Free Output** signals will turn "ON".

Note: When the Final Weight is 0, the Pin 12, 11 and 10 are kept OFF.

4. Open the Supply Bin's: Full-Flow Gate, Medium-Flow Gate, and Dribble-Flow Gate.
5. When the display reaches "Final - SP 1", the **SP 1** Output (Pin 12) signal will come OFF. Closed the Full-Flow Gate by using the **SP 1** Output OFF signal.
6. When the display reaches "Final - SP 2", the **SP 2** Output (Pin 11) signal will come OFF. Closed the Medium-Flow Gate by using the **SP 2** Output OFF signal.
7. When the display reaches "Final - Free", the **Free** Output (Pin 10) signal will come OFF. Closed the Dribble-Flow Gate by using the Free Output OFF signal.
8. Batch Finish signal is sent after the set time period (F103) or when the display is stable.
9. After Free Fall has stopped - check to see if the HI and LO (Pin 9, 8) signals are OFF. If both outputs are OFF then the batch is completed correctly.
10. Automatic Free Fall is now re-calculated for the next event.
11. The Weighing Hopper Discharge Gate will be opened using the Finish Output (Pin 7) ON signal.
12. Data Output is sent. The NET Weight data will be accumulated.
13. Ready for the next batching event.
14. If an Abort signal is sent (Pin 21) anytime after the Start signal is received, then:
 - (1) SP 1, SP 2 and Free signals will go OFF, and Gates will be closed.
 - (2) Batch Finish and Data Output signals will be sent.
 - (3) NET Weight data will be accumulated.

§ 5-2-4 Built-in Automatic Program Loss-in-Weight Batching (F101=4)

SP1 – Supplying Bin Gate

SP2 – Full Flow Gate

Free – Dribble Flow Gate

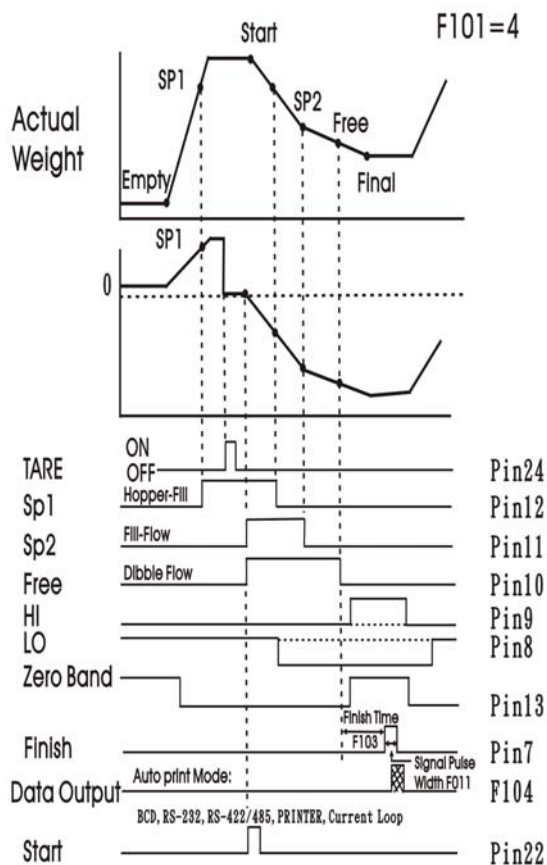
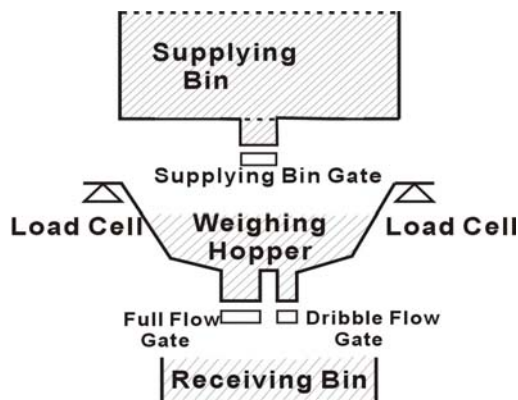
Start signal – Pin22

★Start signal can be obtain from

OP-01 or OP-02

※ **Please refer to**

§ 4-2 § 6-1 § 6-2



1. The Weighing Hopper/ Supply Bin is empty .The display shows "0", and all Gates are closed.
2. Open the Supplying Bin Gate.
3. When the GROSS Weight reaches "SP 1", the SP 1 Output (Pin 12) signal will turn ON. Closed the Supplying Bin Gate by using the SP 1 Output ON signal.
4. The displayed weight will exceed the SP 1 value by the Free Fall value. This weight is not necessarily accurate - but accuracy is not needed at this moment since the purpose of this event is to fill up the Weighing Hopper. The SP 1 value is always compared to GROSS weight.
5. Input a TARE signal (Pin 24) to ZERO display.
6. Input the Start signal via the Control I/O interface connector (Pin 22). When the Start signal is received, the SP 2 and Free Outputs "turn ON".

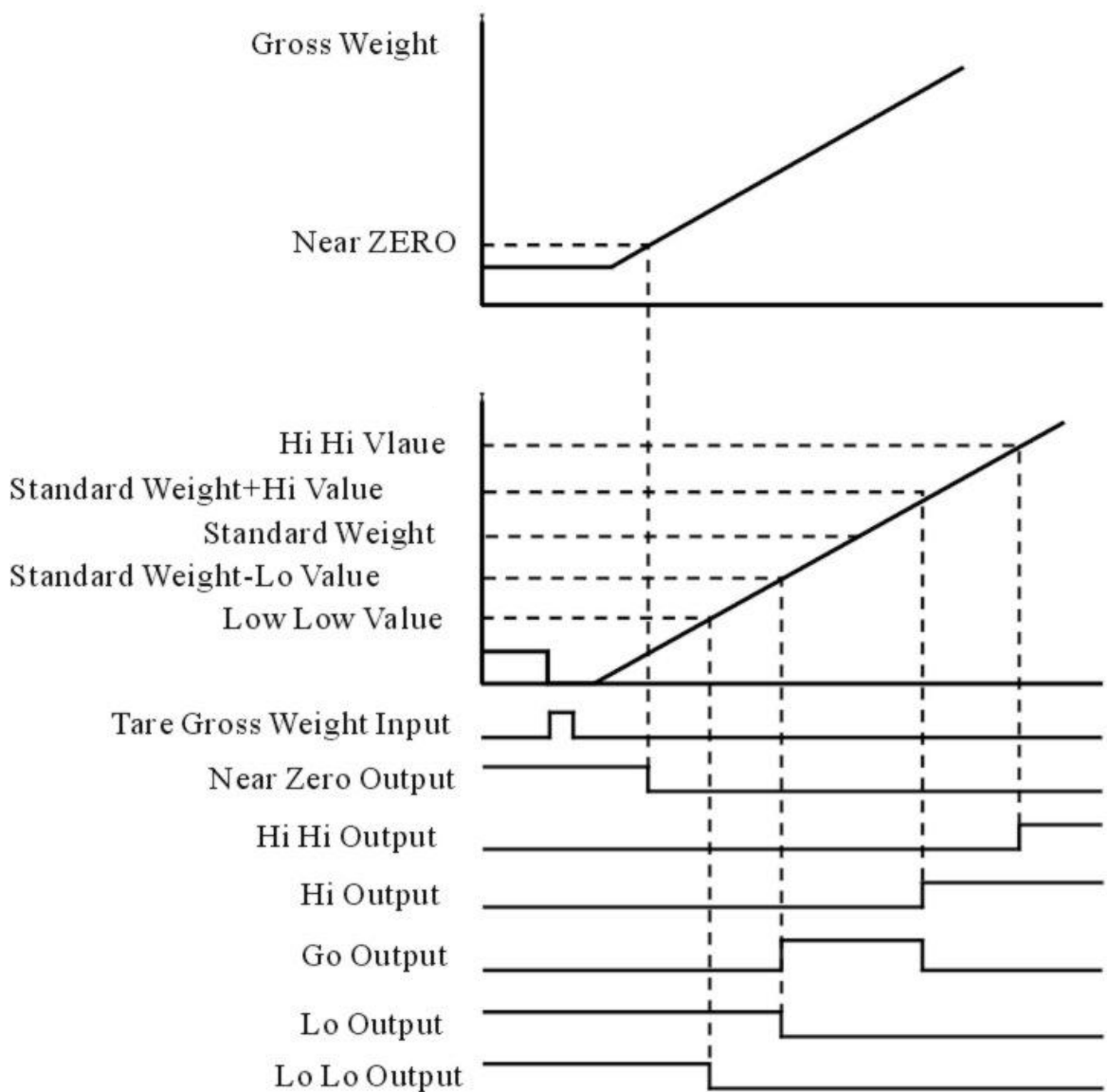
Note : When the Final Weight is 0, the Pin 11 and 10 are kept OFF .

7. Open the Full-Flow Gate and the Dribble-Flow Gate for Full-Flow filling into the Receiving Bin.
8. When the display reaches "Final - SP 2", the SP2 Output (Pin 11) signal will come OFF. Closed the Full-Flow Gate by using the SP2 Output OFF signal.
9. When the display reaches "Final - FREE", the FREE Output (Pin 10) signal will come OFF. Closed the Dribble-Flow Gate by using the FREE Output OFF signal.
10. Batch Finish signal is sent after the set time period (F103) or when the display is stable.
11. After Free Fall has stopped - check if the HI and LO (Pin 9, 8) signals are OFF. If both outputs are OFF then the batch is completed correctly.
12. Automatic Free Fall is now recalculated for the next event.
13. The Weighing Hopper Discharge Gate will be opened using the Finish Output (Pin 7) ON signal.
14. Data Output is sent. The NET Weight data will be accumulated.
15. Signal (Pin 13) will refill using ZERO Band Output if needed. Ready for next batching event.
16. Ready for the next batching event.
17. If an Abort signal is sent (Pin 21) anytime after the Start signal is received, then:
 - (1) SP 1, SP 2 and Free signals will go OFF, and Gates will be closed.
 - (2) Batch Finish and Data Output signals will be sent.
 - (3) NET Weight data will be accumulated.

§ 5-2-5 Selection Check Mode 1 (F101=5)

Output	Value
Near ZERO	Gross Weight \leq Near ZERO
Hi - Hi	Net Weight $>$ HH Limit
Hi	Net Weight $>$ Standard Weight + Hi value
Go	Standard Weight + Hi value \geq Net Weight \geq Standard value - Low value
Lo	Net Weight $<$ Standard Weight - Low value
Lo - Lo	Net Weight $<$ Low Low value

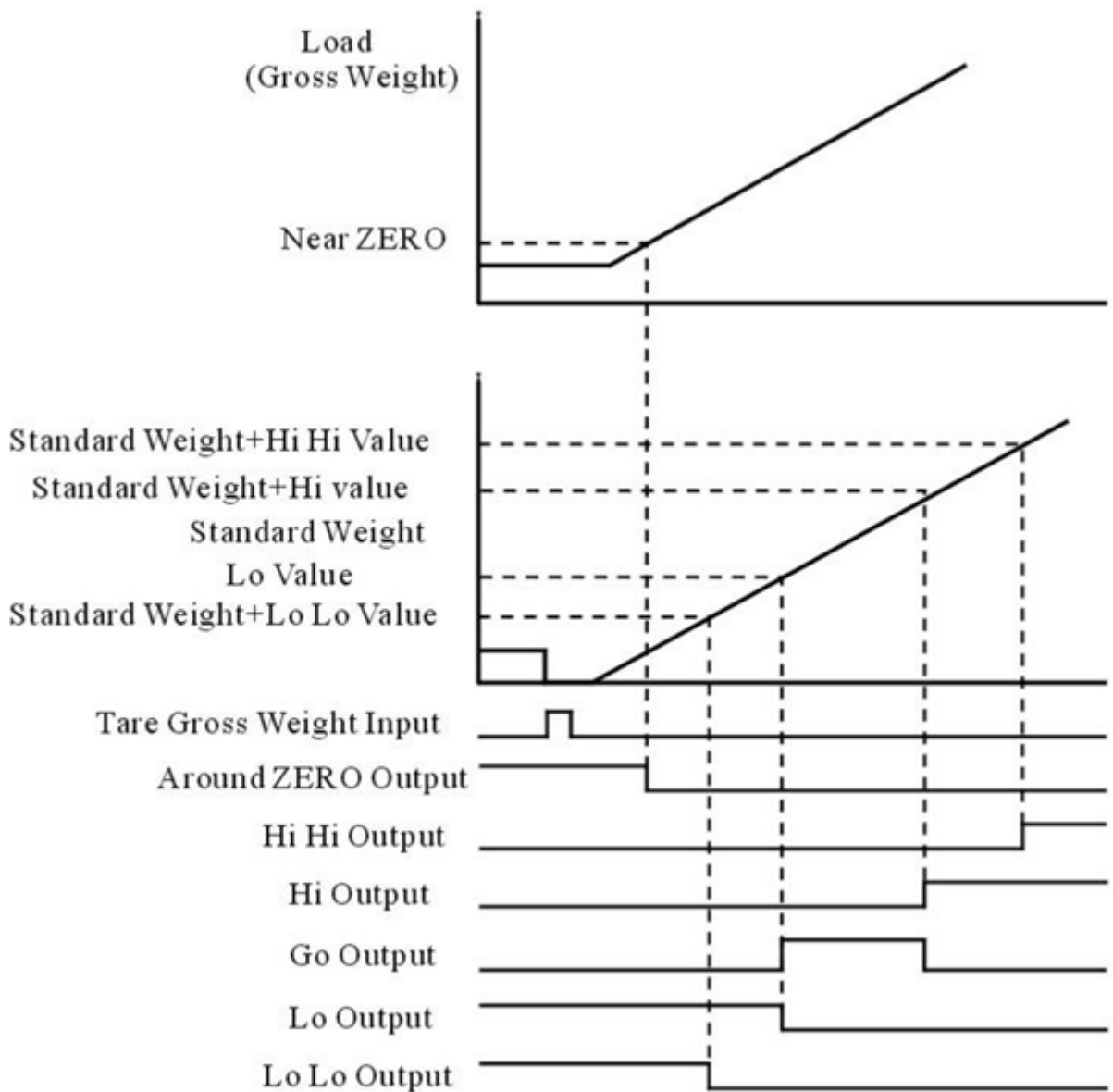
- If 0 output status, output will ON, and short-circuit Comm port.



§ 5-2-6 Selection Check Mode 2 (F101=6)

Output	Value
Near ZERO	Gross Weight \leq Near ZERO
Hi - Hi	Net Weight $>$ Standard Weight + Hi Hi Value
Hi	Standard Weight + Hi Hi Value \geq Net Weight $>$ Standard Weight + Hi Value
Go	Standard Weight + Hi Value \geq Net Weight \geq Standard Weight - Lo Value
Lo	Standard Weight - Lo Lo Value \leq Net Weight $<$ Standard Weight - Lo Value
Lo - Lo	Net Weight $<$ Standard Weight - Lo Lo Value

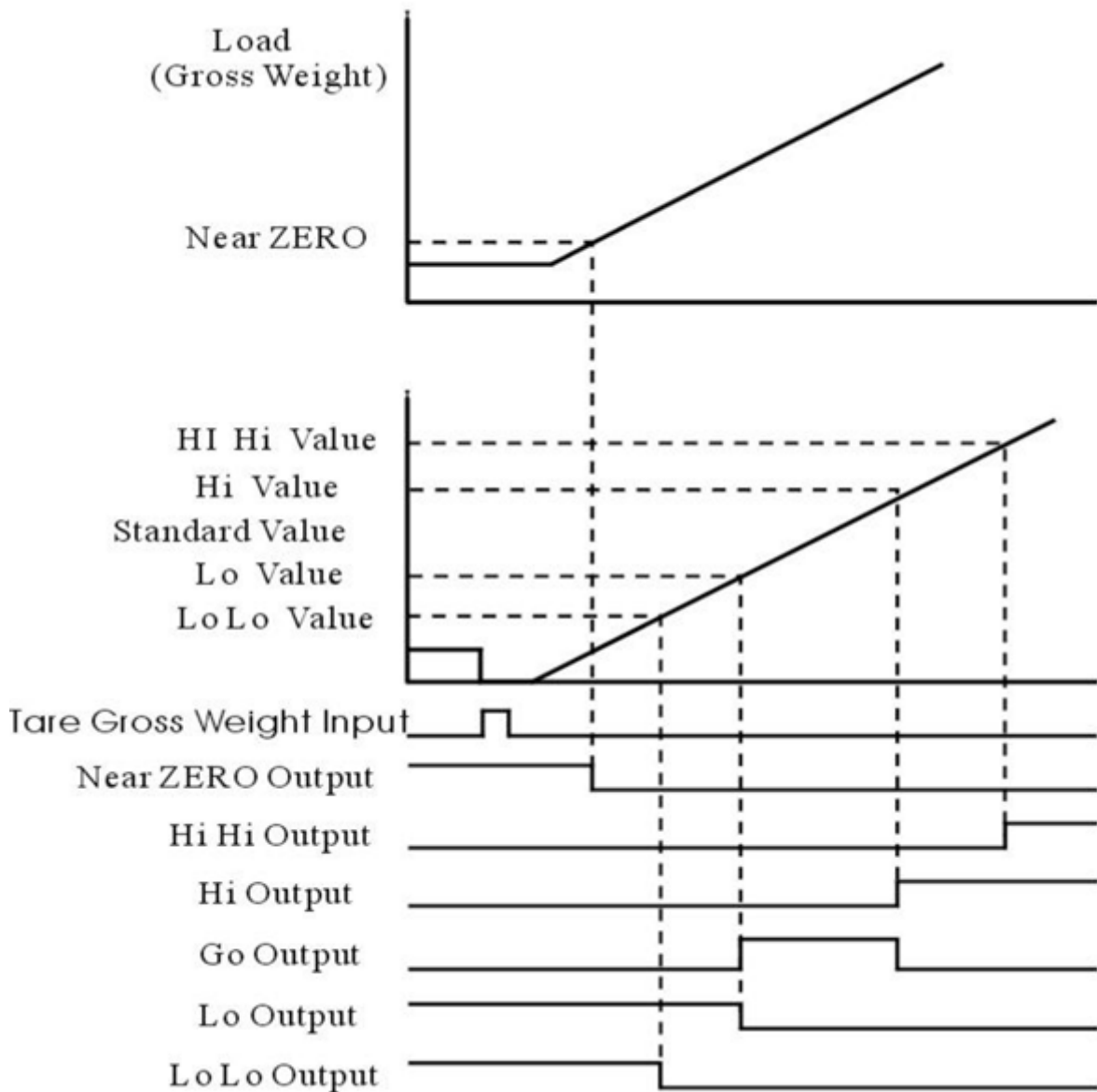
- If 0 output status, output will ON, and short-circuit Comm. port.



§ 5-2-7 Selection Check Mode 3 (F101=7)

Output	Value
Near ZERO	Gross Weight \leq Near ZERO
Hi - Hi	Net Weight $>$ Hi Hi Value
Hi	Net Weight $>$ Hi Value
Go	Hi Value \geq Net Value \geq Lo Value
Lo	Net Weight $<$ LO Value
Lo - Lo	Net Weight $<$ Lo Lo Value

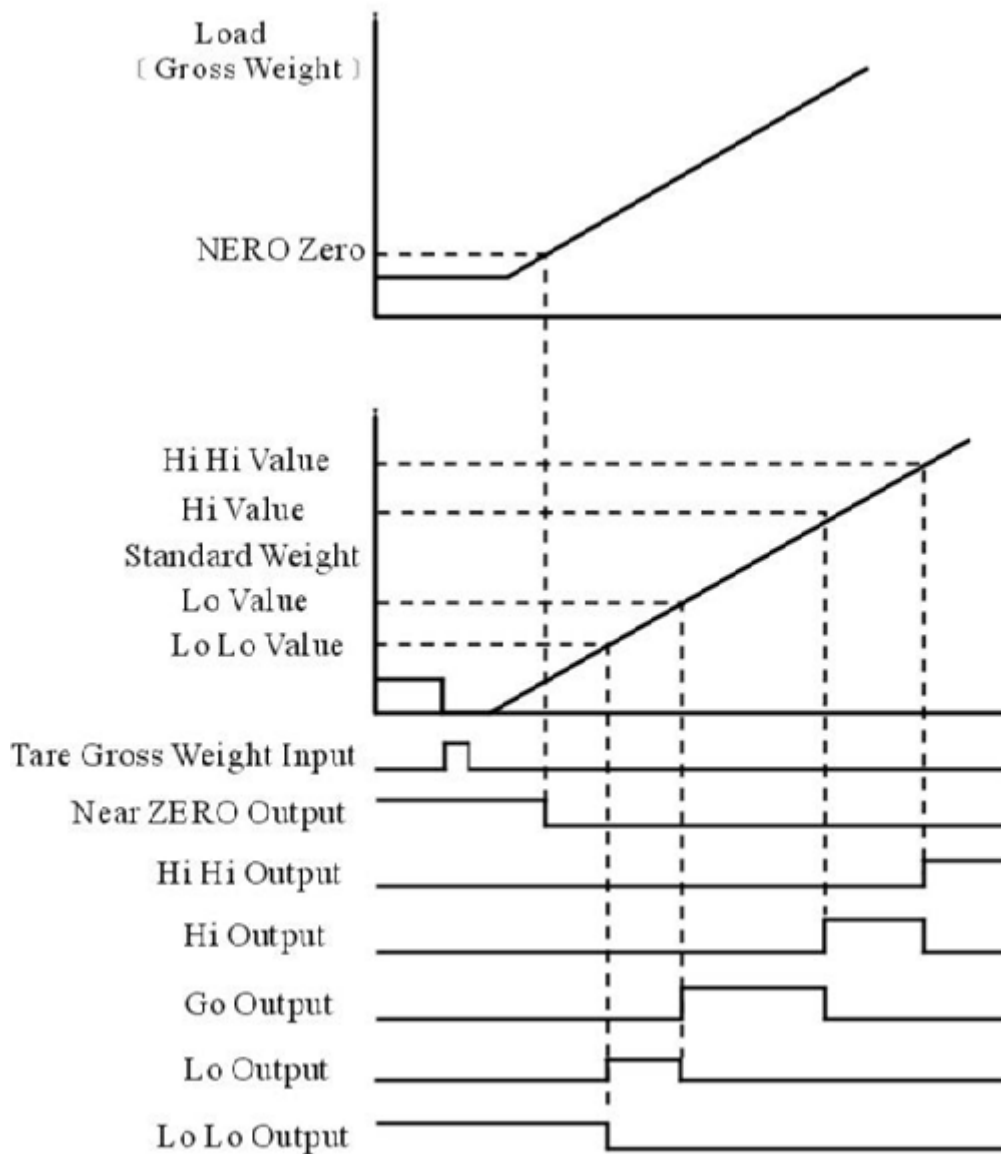
- If 0 output status, output will ON, and short-circuit Comm. port.



§ 5-2-8 Selection Check Mode 4 (F101=8)

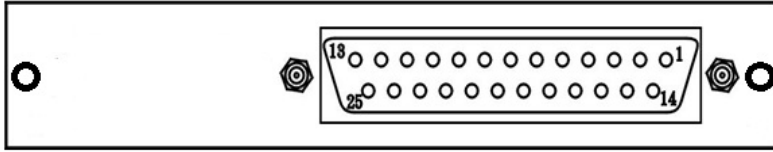
Output	Value
Near ZERO	Gross Weight \leq Near Zero
Hi - Hi	Net Weight $>$ Hi Hi Value
Hi	Hi Hi Value $>$ Net Weight \geq Hi Value
Go	Hi Value $>$ Net Weight \geq Lo Value
Lo	Lo Value $>$ Net Weight \geq Lo Lo Weight
Lo - Lo	Net Weight $<$ Lo Lo Weight

- If 0 output status, output will ON, and short-circuit Comm. port.

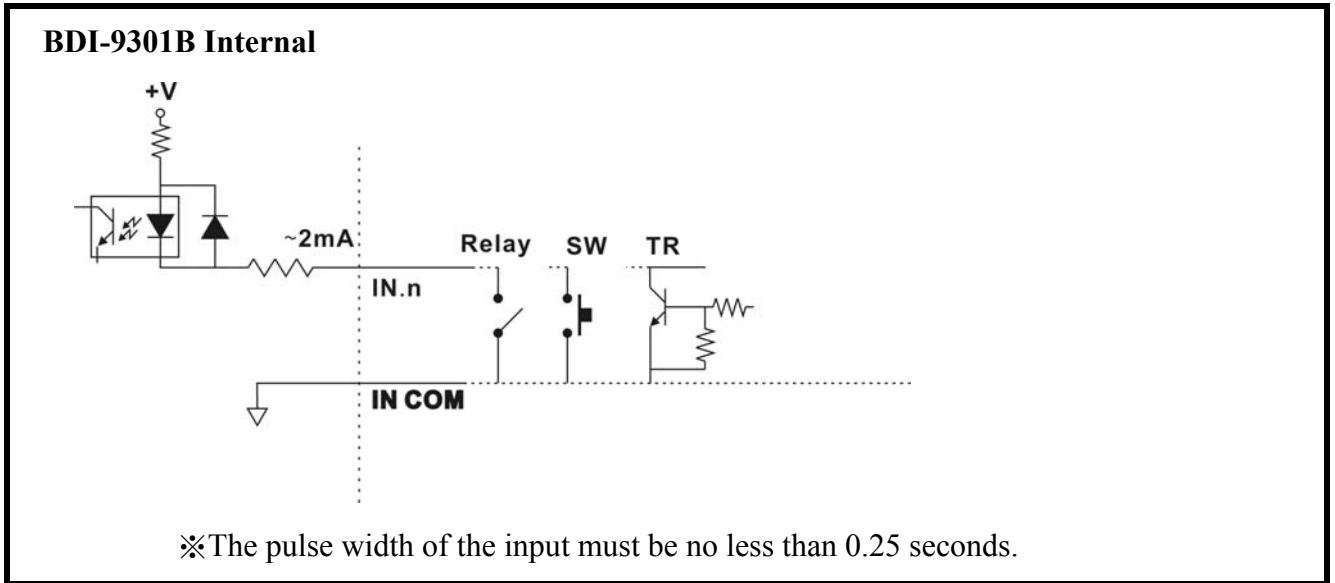


Chapter 6 Optional Equipment

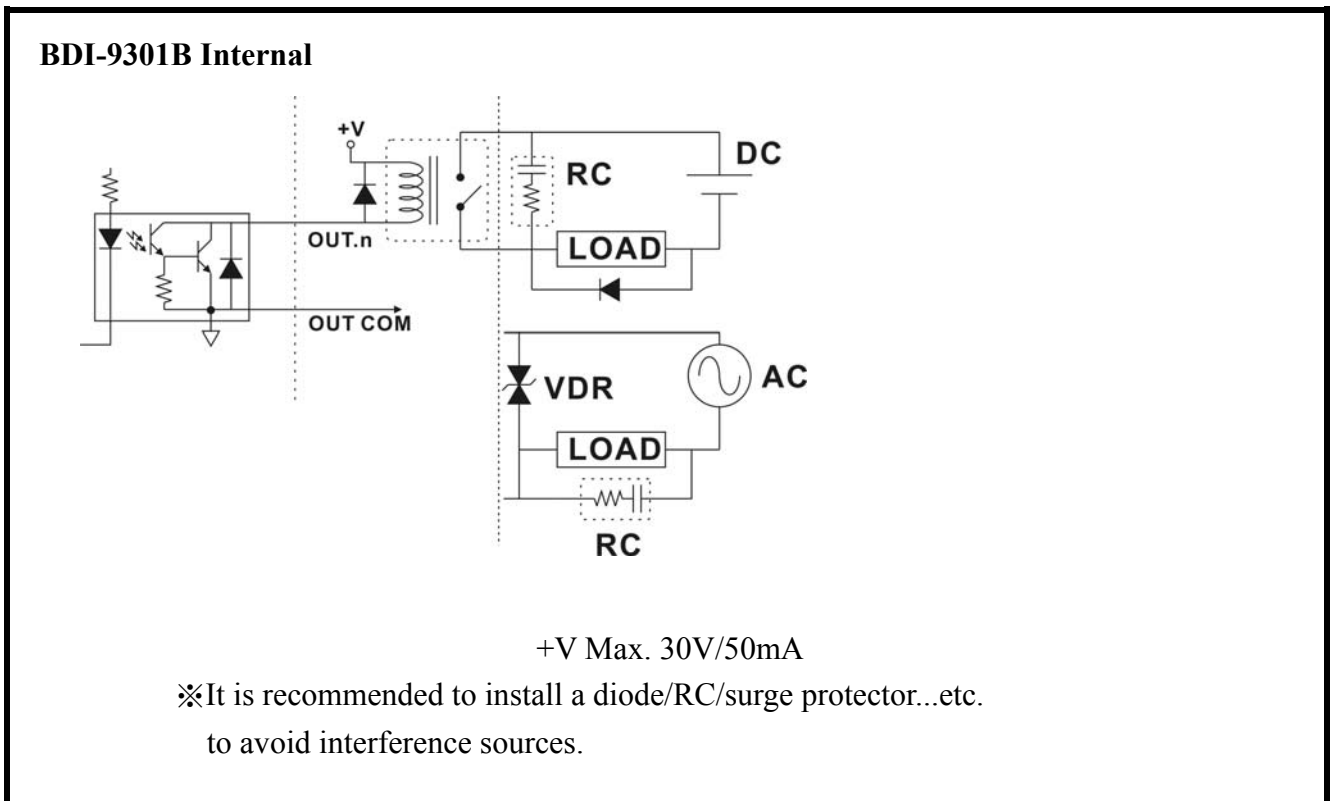
§ 6-1 I / O Interface 【OP-01】



◎Input Wiring :



◎Output Wiring :



§ 6-1-1 F101=1、2、3、4 Input Pins Description :

◎ Input contact description when F101=1, 2

Contact	Contact Name	Signal	Description
Pin25	ZERO Input	pulse	BDI-9301B returns to the center of ZERO when the weighing device is empty
Pin24	TARE Input	pulse	BDI-9301B switches to TARE mode, Zero's the display and stores the TARE weight in memory.
Pin23	TARE Reset Input	pulse	TARE value is cleared to "0".
Pin22	Unused		
Pin21	Batch/Loss in Weight Automatic Free Fall compensation	pulse	When Pin 21 is short-circuit to COM1, the batch is aborted and FINISH signal is sent, and the NET weight will be accumulated.
Pin20	Print Accumulator	pulse	Accumulator will be printed when P20 short-circuited with COM1.
Pin19	PRINT Input	pulse	When FC01, F203=3, F401=3, F302=2 shorted with COM1, Data will be sent one time.
Pin18	Clear Accumulated Value and Count	pulse	If this command is accepted, all the accumulated weight and accumulated count will be cleared.
Pin17、16	Input Common (COM1)		

◎ Input contact description when F101=3, 4

Contact	Contact Name	Signal	Description
Pin25	ZERO Input	pulse	BDI-9301B returns to the center of ZERO when the weighing device is empty
Pin24	TARE Input	pulse	BDI-9301B switches to TARE mode, ZERO's the display and stores the TARE weight in memory.
Pin23	TARE Reset Input	pulse	TARE value is cleared to "0".
Pin22	Batch/Loss in Weight Start batch	pulse	Start Batch
Pin21	Batch/Loss in Weight Stop batch	pulse	Stop Batch Signal send and accumulate net weight.
Pin20	Print Accumulator	pulse	Accumulator will be printed when Pin 20 short-circuited with COM1.
Pin19	PRINT Input	pulse	Data will be sent one time.
Pin18	Clear Accumulated Value and Count	pulse	If this command is accepted, all the accumulated weight and accumulated count will be cleared.
Pin17、16	Input Common (COM1)		

§ 6-1-2 F101=1、2、3、4 Output Pins Description :

Contact	Contact Name	F101	Description
Pin13	ZERO Band		Gross Weight \leq ZERO Band
Pin12	SP1	1,3	Batch : Net Weight \geq Final - SP1
		2,4	Loss in Weight : Gross Weight $>$ SP1
Pin11	SP2		Net Weight \geq Gross - SP2
Pin10	FF		Net Weight \geq Final - FF
Pin9	HI		Net Weight $>$ Final + Hi value
Pin8	LO		Net Weight $<$ Final - Lo Value
Pin7	FINISH	3,4	Batch/ Loss-in Weight : Final Output - Finsh Signal
Pin6	Unstable / Error		F105=0 : Stable : Open , Unstable : Short. F105=1 : Error Output , ZERO exceed valid Range, Overload, or Printer Error.
Pin3、4			
Pin1、2	COM2		

§ 6-1-3 F101=5、6、7、8 Input pins Description :

Contact	Contact Name	Signal	Description
Pin25	ZERO Input	pulse	BDI-9301B returns to the center of ZERO when the weighing device is empty.
Pin24	TARE Input	pulse	BDI-9301B switches to TARE mode, ZERO's the display and stores the TARE weight in memory.
Pin23	TARE Reset	pulse	TARE value is cleared to "0".
Pin22	Unused		
Pin21	Unused		
Pin20	Print Accumulator	pulse	Accumulator will be printed when Pin 20 short-circuited with COM1.
Pin19	PRINT	pulse	Data will be sent one time.
Pin18	Clear Accumulated Value and Count	pulse	If this command is accepted, all the accumulated weight and accumulated count will be cleared.
Pin17、16	COM1		

§ 6-1-4 F101=5、6、7、8 Output Pins Description :

Contact	Contact Name	F101	Description
Pin13	Zero Range		Gross Weight \leq ZERO Range
Pin12	LO-LO	5	Net Weight < Lo Lo Value
		6	Net Weight < Standard Weight - Lo Lo Value
		7	Net Weight < Lo Lo Value
		8	Net Weight < Lo Lo Weight
Pin11	LO	5	Net Weight < Standard Weight -Lo Value
		6	Standard Weight - Lo Lo Value \leq Net Weight < Standard Weight - Lo Value
		7	Net Weight < Lo Value
		8	Lo Value > Net Weight \geq Lo Lo Value
Pin10	GO	5	Standard Weight + Hi Value \geq Net Weight \geq Standard Weight - Lo Value
		6	Standard Weight + Hi Value \geq Net Weight \geq Standard Weight - Lo Value
		7	Hi Value \geq Net Weight \geq Lo Value
		8	Hi Value > Net Weight \geq Lo Value
Pin9	HI	5	Net Weight > Standard Weight + Hi Hi Value
		6	Standard Weight + Hi Hi Value \geq Net Weight > Standard Weight + Hi Hi Value
		7	Net Weight > Hi Value
		8	Hi Hi Value > Net Weight \geq Hi Value
Pin8	HI-HI	5	Net Weight > Hi Hi Value
		6	Net Weight > Standard Weight + Hi Hi Value
		7	Net Weight > Hi Hi Value
		8	Net Weight > Hi Hi Value
Pin7	Unused		
Pin6	Unstale / Error		F105=0 : Stable : Open , Unstable : Short. F105=1 : Error Output , ZERO exceed valid Range, Overload, or Printer Error.
Pin3、4			
Pin1、2	COM2		

§ 6-2 Chapter 6 Options

§ 6-2-1 OP-02

☒ For the serial output setting, please refer to § 4-2 Function Setting Serial Output F200 ~ F205

- ◎ OP-02 RS-232 (Standard built in)
- ◎ OP-02 RS-485 (Optional)

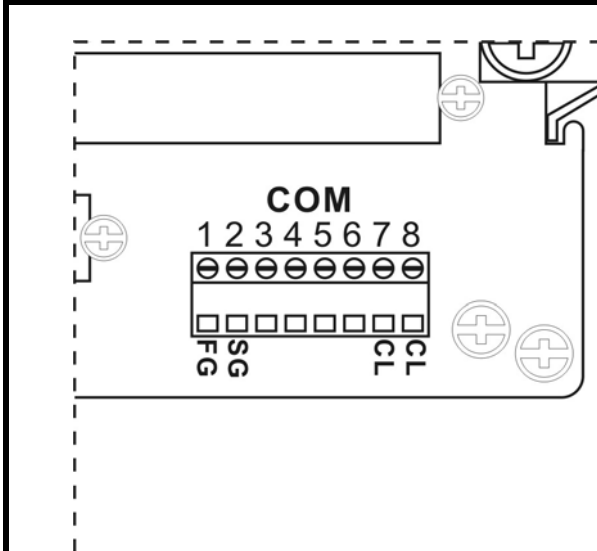
RS-232 & RS-485 were in the same slot, choose one option at a time.

★ Specification :		
Type	RS-232	RS-485
Connections	peer to peer	Up to 32 points
Transfer Method	Half duplex mode	
Bow Rate	1200bps 、 2400bps 、 4800bps 、 9600bps	
Data Bit	8 bit	7 bit
parity Bit	Non-parity	Odd parity 、 Even parity
Stop Bit	1bit 、 2bit	
Protocol	ASCII COMMAND, MODBUS RTU	

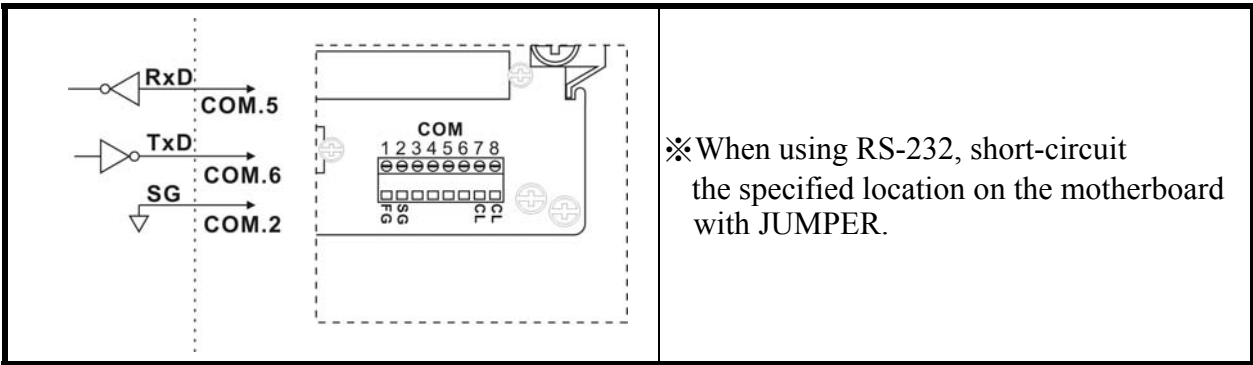
◎ ASCII data format (See serial output data format)

◆ Terminal Socket Pin Description :

Pin	Name		
	RS-232	2 wire RS-485	4 wire RS-485
Pin 1	FG (Frame Ground)		
Pin 2	SG (Signal Ground)		
Pin 3	N.C.	N.C.	T+(B)
Pin 4	N.C.	N.C.	T-(A)
Pin 5	R×D	D+(B)	R+(B)
Pin 6	T×D	D-(A)	R-(A)
Pin 7	Current Loop		
Pin 8	Current Loop		

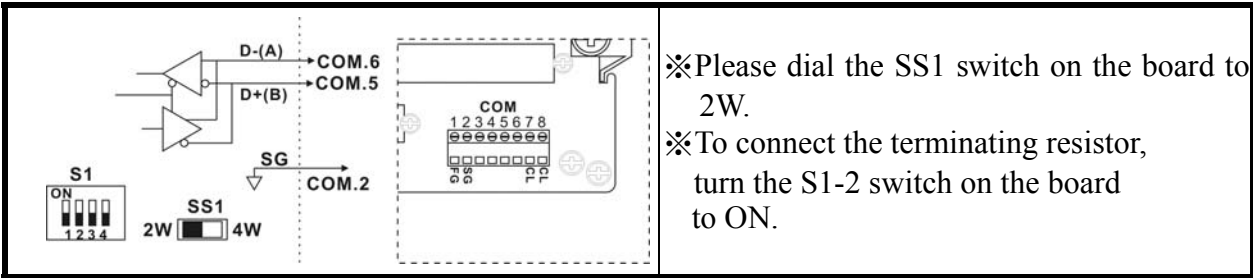


◎ RS-232 Pin Map :



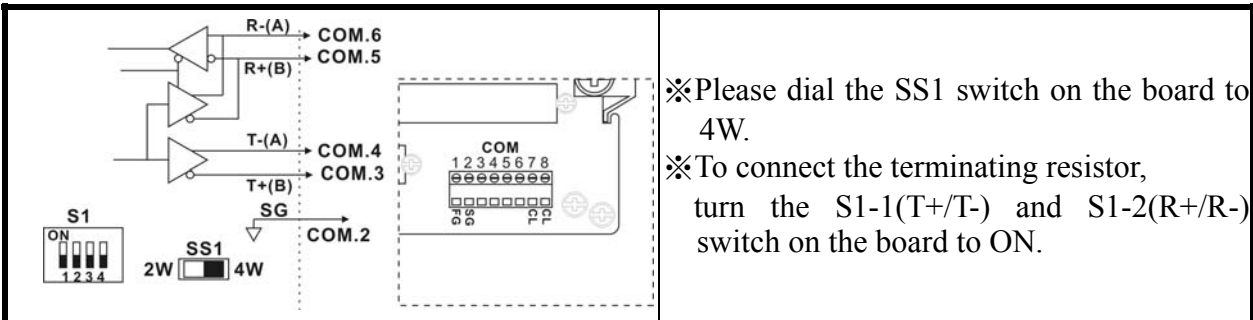
※When using RS-232, short-circuit the specified location on the motherboard with JUMPER.

◎ RS-485 2 wire Pin Map :



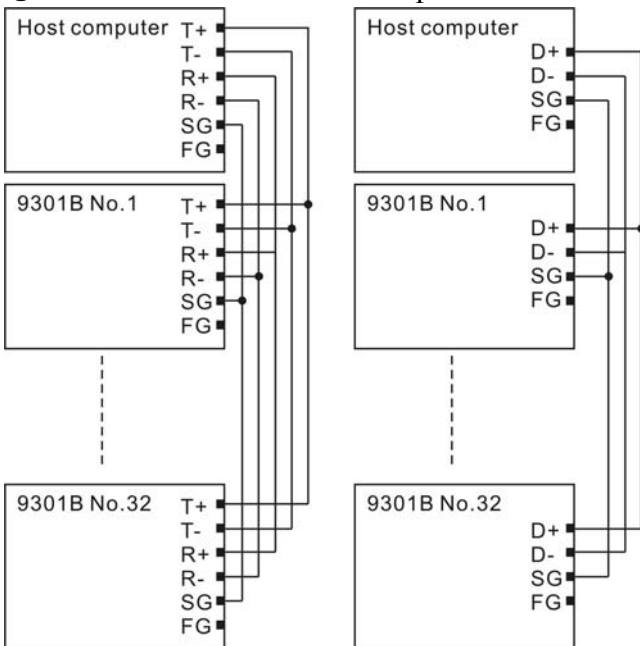
※Please dial the SS1 switch on the board to 2W.
 ※To connect the terminating resistor, turn the S1-2 switch on the board to ON.

◎ RS-485 4 wire Pin Map :



※Please dial the SS1 switch on the board to 4W.
 ※To connect the terminating resistor, turn the S1-1(T+/T-) and S1-2(R+/R-) switch on the board to ON.

◎ RS-485 2 wire /4 wire multi-point communication wiring reference diagram :



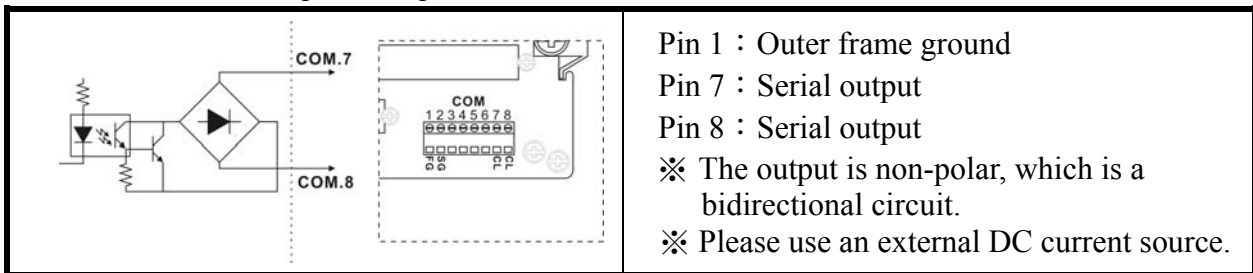
§ 6-2-2 20mA Standard Serial Output (*Built in*)

※ Please refer to 4-2 FC00 ~ FC03 for function settings.

◎ Specification :		
Type	20mA current loop	
Transfer	One-way output, 1=20 mA, 0=0 mA	
Bow Rate	1200bps 、 2400bps	
Data Bit	8 bit	7 bit
Parity Bit	Non-parity	Odd parity 、 Even parity
Stop Bit	1bit	
Protocol	ASCII	

◎ ASCII data format, please refer to the serial output data format.

◎ 20mA Current Loop Pin Map :



§ 6-2-3 Serial Output ASCII Data Format

Format 1 (F204=00)

S	T	,	N	T	,	-		5	1	6	8	.	8	k	g	Cr	Lf
HEADER 1			HEADER 2			Data (8 digits in length)						UNIT		Terminal			

Format 2 (F204=1~99)

@	0	1	:	S	T	,	N	T	,	-		5	1	6	8	.	8	k	g	Cr	Lf
F204 ID			HEADER 1		HEADER 2		Data (8 digits in length)						UNIT		Terminal						

HEADER 1		
O	L	Exceeding the Max. or Min. load
S	T	STABLE
U	S	UNSTABLE

HEADER 2		
N	T	NET
G	S	GROSS
T	R	TARE

UNIT		
		None
k	g	Kilogram
l	b	Pound
	g	Gram

The weight data is ASCII and can have the following text

- “ 0 ” ~ “ 9 ”
- “ ” : Space (20H)
- “ . ” : Decimal Point (2EH)
- “ - ” : Minus (2DH)
- “ + ” : Plus (2BH)
- “ : ” : Colon (3AH)

Cr : Reset (0DH)

Lf : Wrap (0AH)

§ 6-2-4 ASCII Command Table 【OP-02】 (F203=5)

Sending Command to BDI-9301B	BDI-9301B Response Command
R Cr Lf <READ>	Sending latest data once (Data format depends on F202)
Z Cr Lf <ZERO>	BDI-9301B display will ZERO. Z Cr Lf will be sent by BDI-2001B.
T Cr Lf <TARE>	BDI-9301B will go to NET Mode and display will TARE. T Cr Lf will be sent by BDI-2001B.
TC Cr Lf <TARE CLEAR>	BDI-9301B will go to TARE CLEAR Mode. TC Cr Lf will be sent by BDI-2001B.
N Cr Lf <NET>	BDI-9301B will go to NET Mode. N Cr Lf will be sent by BDI-2001B.
G Cr Lf <GROSS>	BDI-9301B will go to GROSS Mode. G Cr Lf will be sent by BDI-2001B.

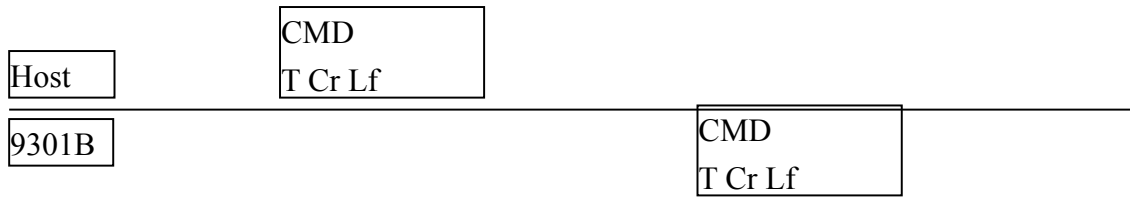
Sending Command to BDI-9301B	F101	BDI-9301B Response Command
BB Cr Lf <BEGIN BATCHING>	2,3	Send back signal BB Cr Lf Start of batch. (automatically discharge metering action)
		Send back signal E3 Cr Lf Indicates that the batch has not started. Select F101 MODE does not support this Command.
HB Cr Lf <HALT BATCHING>	2,3	Send back signal HB Cr Lf Stop of batch. (automatically discharge metering action)
		Send back signal E3 Cr Lf Indicates that the batch has not started. Select F101 MODE does not support this Command.
RF Cr Lf <READS FINAL NET>	2,3	Send out the net weight value.
		If send back signal E3 Cr Lf indicates that the measurement has not yet been completed.
S Cr Lf <SETPOINT>		S Cr Lf will send back by BDI-9301B. BDI-9301B will send back SET POINT values until totally receive SET POINT values.
RS Cr Lf <READ SET POINTS>		BDI-9301B receives signal“RS xx Cr Lf”.
SA Cr Lf <SET ZERO BAND>		BDI-9301B will send back signal “SA Cr Lf”. BDI-9301B will send back ZERO band data until totally receive Zero Band Value.
RA Cr Lf <READ ZERO BAND>		BDI-9301B receives signal “RS Cr Lf”.

※To use RS-485 please set the F204 address first and add @XX before the command. (XX=F204)

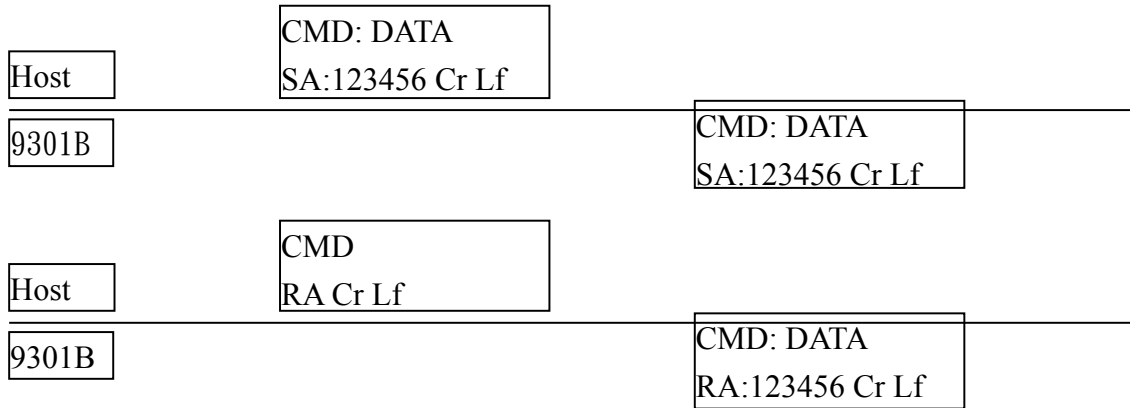
Ex : @XX R Cr Lf @XX T Cr Lf

※ **Command program :**

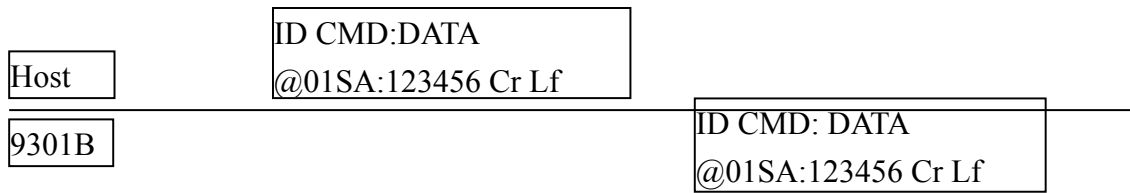
1 : COMMAND



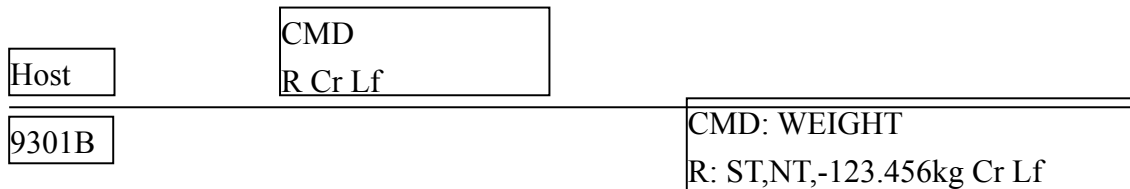
2 : COMMAND : DATA



3 : ID COMMAND : DATA



4 : COMMAND : WEIGHT



※ **Command format example :**

No data response command format F204=0

T	Cr	Lf
CMD	Terminal	

No data response command format F204=1~99

@	0	1	T	Cr	Lf
F204 ID	CM	D	Terminal		

Contains data response command format F204=0

R	:	S	T	,	N	T	,	-		5	1	6	8	.	8	k	g	Cr	Lf
CMD	H1		H2		Data (8 digits in length)						UNIT	Terminal							

Contains data response command format F204=1~99

@	0	1	R	:	S	T	,	N	T	,	-		5	1	6	8	.	8	k	g	Cr	Lf
F204 ID	CMD	H1		H2		Data (8 digits in length)						UNIT	Terminal									

※ F101=1, 2, 3, 4, Command S Cr Lf format

S	:	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	1	2	3	4	1	2	3	4	Cr	Lf
CMD	Final				Sp1				SP2				FF				Hi				Lo				Terminal		

※ F101=5, 6, 7, 8, Command S Cr Lf format

S	:	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	Cr	Lf
CMD	Hi - Hi				Hi				Go				Lo				Lo - Lo				Terminal						

※ Command SA Cr Lf format, Zero range setting

S	A	:	1	2	3	4	5	6	Cr	Lf
CMD	Zero range setting						Terminal			

※ Error message

F204=0

E	1	Cr	Lf
Error		Terminal	

F204=1~99

@	0	1	E	1	Cr	Lf
F204 ID		Error			Terminal	

- E1 -> Instruction/Format error**
- E2 -> value error**
- E3 -> Action cannot be executed**
- E4 -> Action executed**

§ 6-2-5 ModBus RTU 【OP-02】 (F203=6)

⊙ RTU in half Duplex Communication.

ModBus RTU Basic command structure (Hexadecimal)

START OF FRAME	ID FIELD	FUNCTION CODE	DATA FIELD	ERROR CHECK	END OF FRAME
-------------------	-------------	------------------	---------------	----------------	-----------------

- START OF FRAME : At least 4 data interval were not transmitted.
- ID FIELD : Display address (1~247). (0 for broadcast messages t, not apply to BDI-9301B)
- FUNCTION CODE : Code (01,02,03,04,05,16).
- DATA FIELD : Register address and number of words read.
- ERROR CHECK : 16bit CRC.
- END OF FRAME : At least 4 data interval were not transmitted.

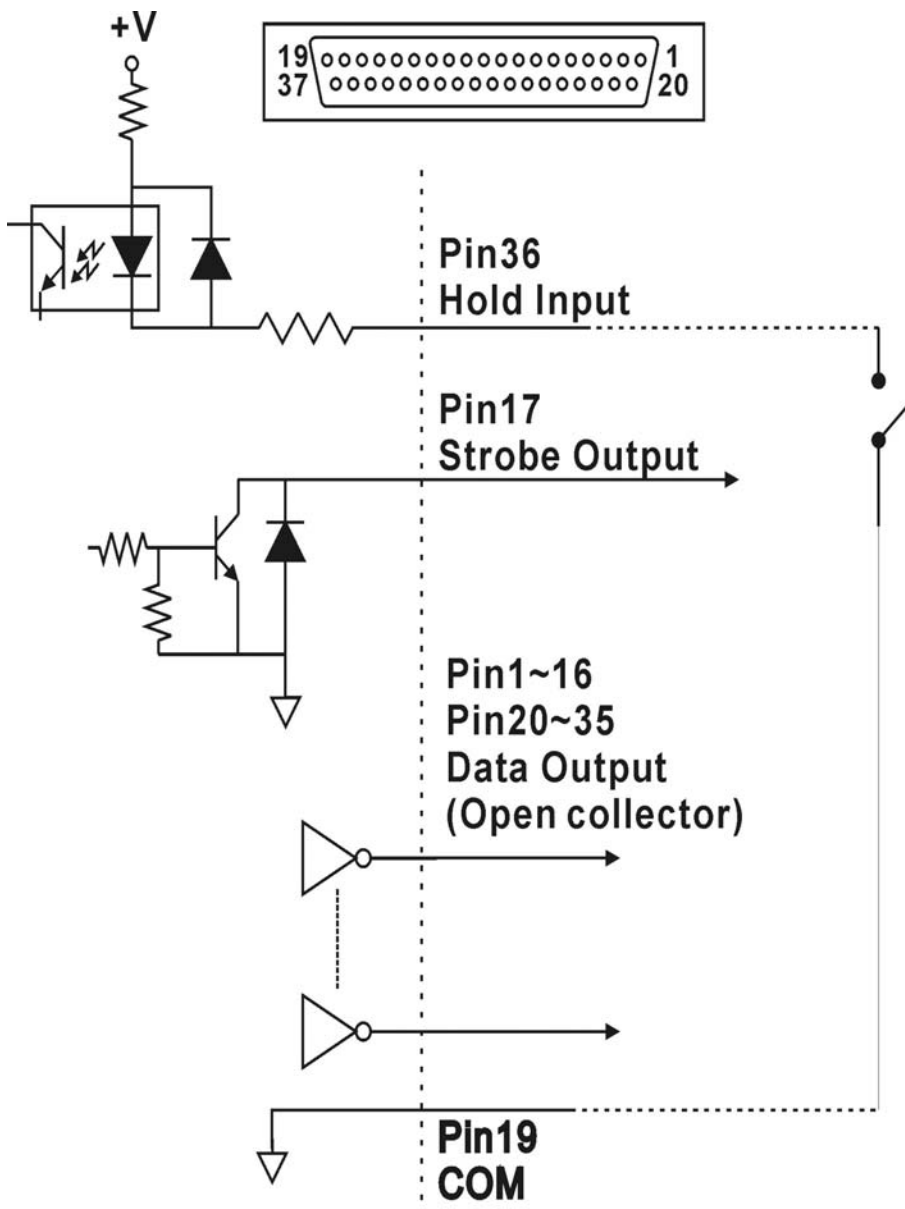
INPUT STATUS (TYPE : BIT)				
R/W	Code	Modbus Address	Description	
R	02	100001	ZERO	
R	02	100002	MD	
R	02	100003	NET	
R	02	100004	TARE ENTER	
R	02	100005	WT OL	
			F101=MODE 1/2/3/4	F101=MODE 4/5/6/7
R	02	100006	O1 : ZERO BAND	O1 : ZERO BAND
R	02	100007	O2 : SP1/LOSS	O2 : HH
R	02	100008	O3 : SP2	O3 : H
R	02	100009	O4 : FF	O4 : GO
R	02	100010	O5 : HI	O5 : L
R	02	100011	O6 : LO	O6 : LL
R	02	100012	O7 : FINISH	O7 : Unused
R	02	100013	O8 : MOTION/ERROR	O8 : MOTION/ERROR

COIL I/O STATUS (TYPE : BIT)			
R/W	Code	Modbus Address	Description
R/W	01/05	000001	ZERO
R/W	01/05	000002	TARE
R/W	01/05	000003	TARE CLR
R/W	01/05	000004	GROSS
R/W	01/05	000005	NET
R/W	01/05	000006	PRINT
R/W	01/05	000007	ACC/COUNT CLR
R/W	01/05	000008	START
R/W	01/05	000009	STOP

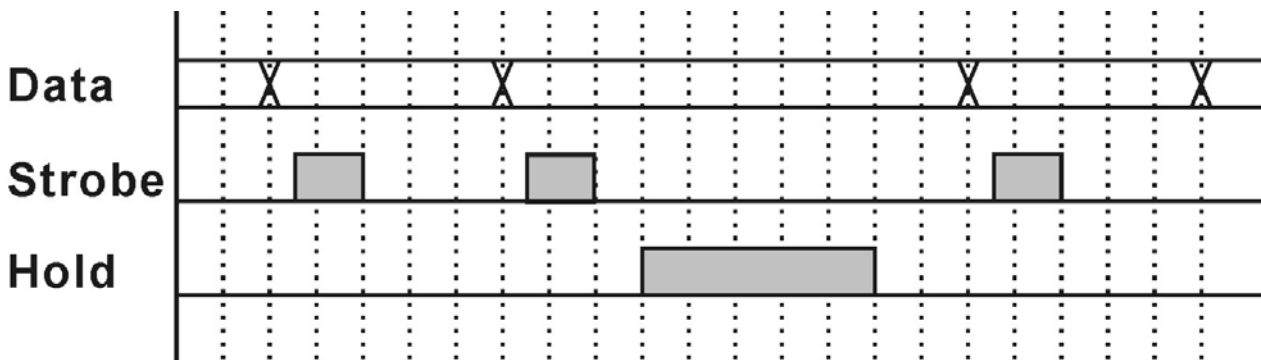
INPUT REGISTER (TYPE : WORD)			
R/W	Code	Modbus Address	Description
R	04	300001~300002	GROSS WEIGHT
R	04	300003~300004	NET
R	04	300005~300006	TARE
R	04	300007	COUNT
R	04	300008~300009	ACCUM

HOLD REGISTER (TYPE : WORD)				
R/W	Code	Modbus Address	Description	
R/W	03/16	400001~400002	ZERO BAND	
			F101=MODE 1,2,3,4	F101=MODE 5,6,7,8
R/W	03/16	400003~400004	FINAL	LL
R/W	03/16	400005~400006	SP1/LOSS	L
R/W	03/16	400007~400008	SP2	GO
R/W	03/16	400009~400010	FF	H
R/W	03/16	400011~400012	HI	HH
R/W	03/16	400012~400013	LO	Unused

§ 6-3 PARALLEL BCD OUTPUT 【OP-04】



Timing



Specifications

Output circuit Open collector transistor

Output voltage 40 V DC max.

Output saturation voltage 0.8 V at 25 mA

Input control Contact to common

Input open voltage 5 V DC $\pm 5\%$

Input current 2 mA max.

Threshold voltage 1.5 V max.

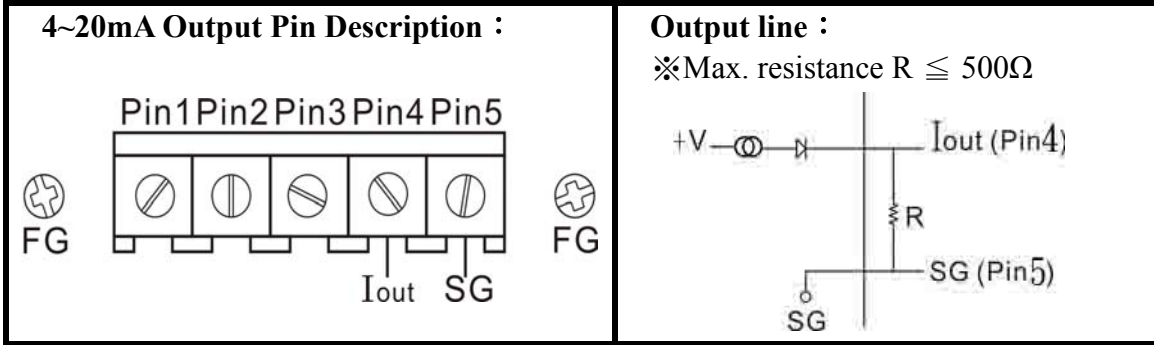
PIN		PIN	
1	1 x 1	20	2 x 1
2	4 x 1	21	8 x 1
3	1 x 10	22	2 x 10
4	4 x 10	23	8 x 10
5	1 x 100	24	2 x 100
6	4 x 100	25	8 x 100
7	1 x 1000	26	2 x 1000
8	4 x 1000	27	8 x 1000
9	1 x 10000	28	2 x 10000
10	4 x 10000	29	8 x 10000
11	1 x 100000	30	2 x 100000
12	4 x 100000	31	8 x 100000
13	Negative	32	Motion Detect
14	Overload	33	Net
15	Decimal Point 1	34	Decimal Point 2
16	Decimal Point 3	35	Decimal Point 4
17	Strobe	36	Hold Input
18	N. C	37	FG
19	COMMON		

※ Strobe output can be chosen by J2(Low or Hi)

§ 6-4 Analog Output Interface 【OP-05】

Analog output can be set in function setting F500 current/voltage output.
Please refer to 4-2-4 Function setting analog output F500 ~ F503.

§ 6-4-1 Analog Output 4 ~ 20mA



Range	Effective range : 4 ~ 20mA, Output range : 0 ~ 24mA
Resolution	1 / 4000
Temp. coefficient	$\pm(0.015\% / ^\circ\text{C of rdg} + 0.01\text{mA}) / ^\circ\text{C}$
Max. resistance load	Max. 250 Ω

※If you add a 250 Ω resistor, the output will be 1V to 5V (4~20mA)

(1) This resistor must be large enough for proper power consumption.

Use the following formula : $W = I^2 \times R$ where

【W : Power I : Output Current R : Resistor】

If a 500 Ω resistor is used, power consumption will be :

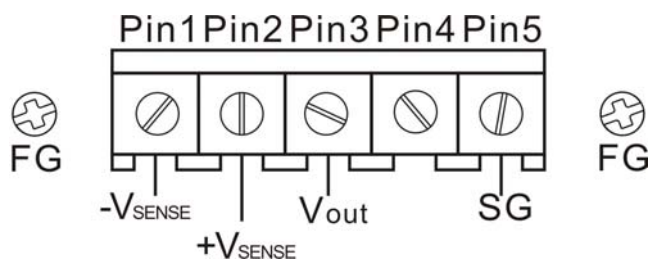
$$W = I^2 \times R = (0.02)^2 \times 250 = 0.1$$

when the Output Current is set to 0.1mA.

The resistor should have a power greater than "0.5" ($w = 0.5$) and have a very low temperature coefficient. In this example power consumption is "0.1" and thus, the 250 Ω resistor is adequate.

§ 6-4-2 OP-05 Analog Output 0 ~ 10V

0-10V Output Pin Description :



※ When 0-10V is selected, the V+V-compensation signal must be connected before it can be used.

Range	Effective range : 0 ~ +10V, Output range : 0 ~ 10V
Resolution	1 / 4000
Temp. coefficient	$\pm(0.015\% / ^\circ\text{C of rdg} + 0.01\text{mA}) / ^\circ\text{C}$
Min. resistance load	Min. 10K Ω

※ If you add a 10 K Ω resistor, the output will be 0mA to 1mA (0~10 V)

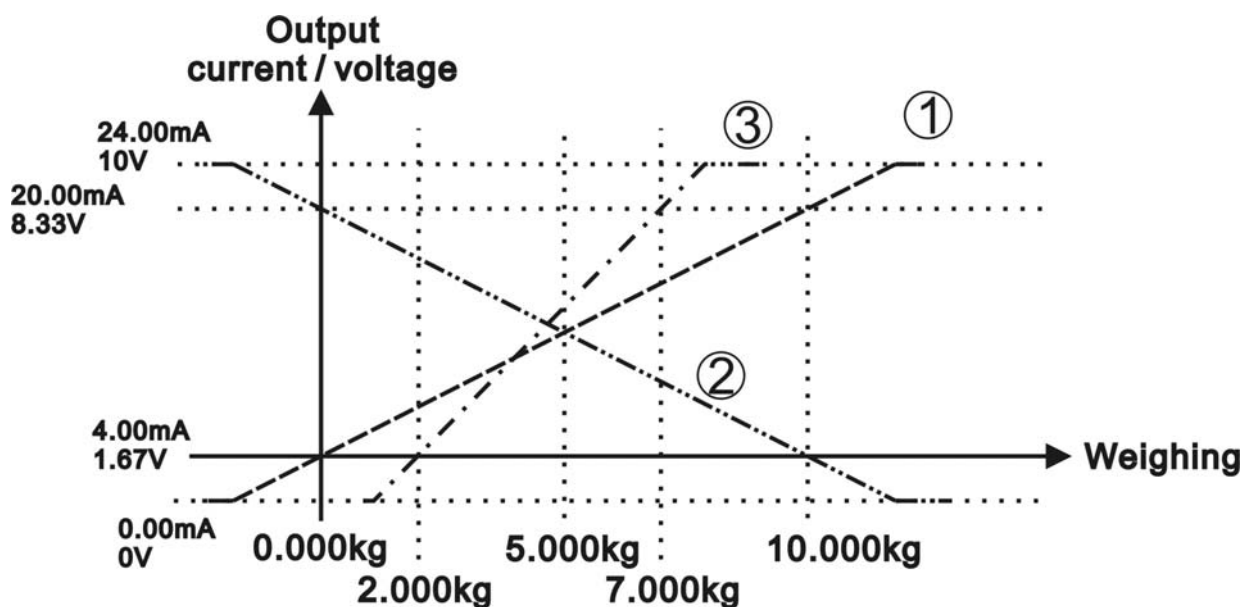
This resistor must be large enough for proper power consumption.

Use the following formula : $W = V^2 / R$

【W : Power V : Output Voltage R : Resistor】

◎ **Output Setting Example :**

- ① F504 (4mA) = 0.000kg F505 (20mA) = 10.000kg
- ② F504 (4mA) = 10.000kg F505 (20mA) = 0.000kg
- ③ F504 (4mA) = 2.000kg F505 (20mA) = 7.000kg



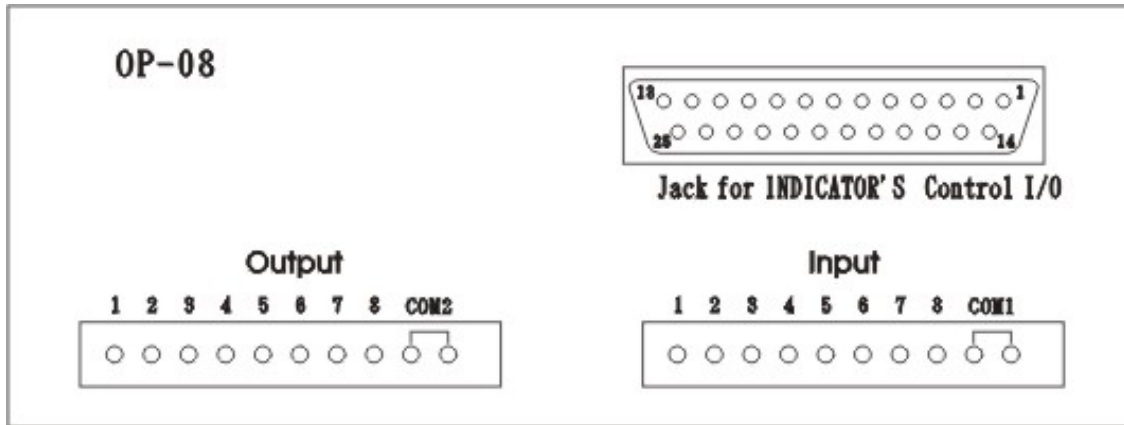
§ 6-5 Relay Control Interface **【OP-08】**

(Apply to BDI- 20XX series OP-01)

Specifications :

Power source : AC 15V or DC 15V from the outside.

Pin Description :



Accessory :

- (1) 25 PIN Male to Female Wire 1.8 Meter with connector Jack.

(A) RELAY TYPE

Input (IN) :

Number of Pins : 8
Input Common COM1

Output (OUT) :

Number of Pins : 8
Pin Type : Dry Contact
Max. load : 250VAC, 30VDC, 3A
Output Common : COM2
RELAY Durance : About 100,000 times
(LED light will ON when work.)

(B) SSR TYPE

Input (IN) :

Number of Pins : 8
Input Common Pin : COM1

Output (OUT) :

Number of Pins : 8
Pin Type : Electronic Contact
Max. load : 24~280VAC, 3A
Output Common Pin : COM2
(LED light will ON when work.)

CONTROL I/O Pins		
	OP-08 I/O	20 series Control I/O
Input	1	PIN 25
	2	PIN 24
	3	PIN 23
	4	PIN 22
	5	PIN 21
	6	PIN 20
	7	PIN 19
	8	PIN 18
Output	1	PIN 13
	2	PIN 12
	3	PIN 11
	4	PIN 10
	5	PIN 9
	6	PIN 8
	7	PIN 7
	8	PIN 6

Appendix

【Screen Characters】

0 1 2 3 4 5 6 7 8 9

0 1 2 3 4 5 6 7 8 9

A B C D E F G H I J K L M

A b C d E F G H I J K L ñ

N O P Q R S T U V W X Y Z

n o P q r s t U u y y z
