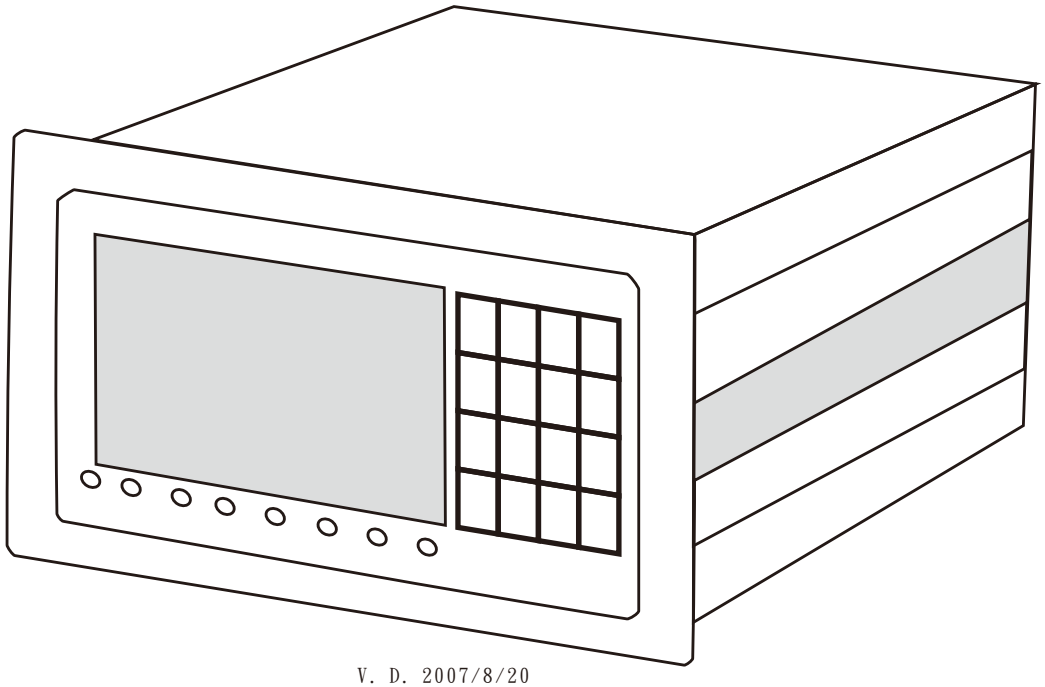
Benediction Enterprise Co., Ltd, Taiwan



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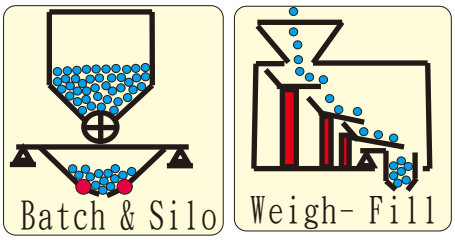


BDI-2006 Weighing Indicator & Controller

User's Manual

Contents

CHAPTER 1 INTRODUCTION

§ 1-1 Welcome

The **BDI-2006** weighing indicator is a model of breakthrough high resolution. The purpose of designing **BDI-2006** is to perform quick and accurate controls Please contact us immediately for further services if needed.

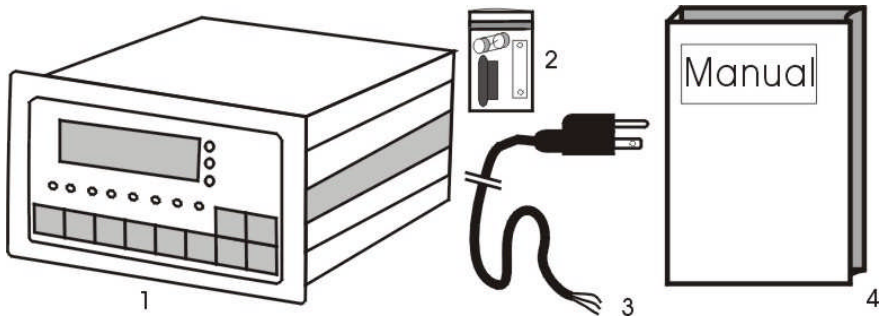
E-mail: bde.com@msa.hinet.net **Web Site:** http://www.bde.com.tw

§ 1-2 Features

BDI-2006 Weighing Indicator & Controller Features:

- 1/16,000 displayed resolution (Max. 1/ 60,000 depending on load cell quality & performance). Internal Resolution 1,000,000, A/D Conversion rate 120 times/ Sec.
- Watchdog virtually eliminates malfunctions that associated with computerized equipment or software failure.
- Full Digital Calibration makes setting ZERO and SPAN Calibration an easy task.
- Drives up to 8 parallel connecting load cells.
- 8k bytes SRAM with Li-battery backup. Information will not disappear even power failure.
- The settings of function and weighing parameters are all stored in the EEPROM, with storage duration over 40 years.
- Important values and parameters can have storage backup.
- Users can adjust the intensity of digits filter to avoid mechanical vibration that caused by external environments to achieve high-speed and accurate measurement.
- Set point codes can store up to 100 sets of: Final, SP1, SP2, Free Fall, HI, LO.
- Automatic Free Fall Compensation provides closer tolerance and precise weighing.
- 8 Set of control Input: ①ZERO Input, ②TARE Input, ③Tare reset, ④Start batch,⑤Abort batch, ⑥Print Accumulator, ⑦Print Input, ⑧ Clear, ACC. & COUNT.
- 8 Set of control Output: ①ZERO Band output, ②SP1 output, ③SP2 Output, ④(Final-Free Fall) output, ⑤HI output, ⑥LO output, ⑦Final Output, ⑧MD/Error output.
- Standard Serial Output (20mA Current Loop) for remote display.
- Optional printer interface can automatically print or output data includes: date, time, set point code, serial number, weight, and unit.

§ 1-3 Items In Carton



The carton in which the BDI-2002 is delivered contains: 1. Indicator. 2. Accessory pack (In bag). 3. Electric Cord. 4. This manual.

CHAPTER 2 INSTALLATION

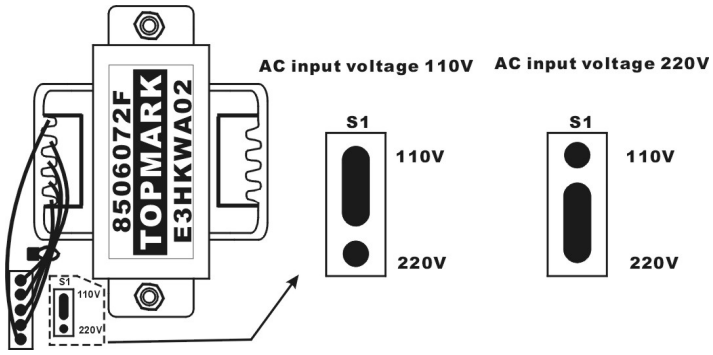
§ 2-1 Best Conditions For Use

When installing and wire connecting on **BDI-2006**, please follow the points and guide for preventing any abnormal situation occurred.

1. Before connecting the Electric Power Supply, please identify the input Electric voltage type is AC 110V or AC 220V.
2. The Grounding Wire shall be properly connected.
3. The Operation Temperature shall range within 0℃ ~ 45℃, please DO not install in any place of direct sun-light.
5. 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.
6. The input power shall be AC 110V or AC 220V±10%, if the Electric Power Supply is not stable or the interference signal exists, that may cause uncertain actuation or reaction, even damages.

Therefore, please utilize Electric Power Supply Stabilizer of adequate capacity.

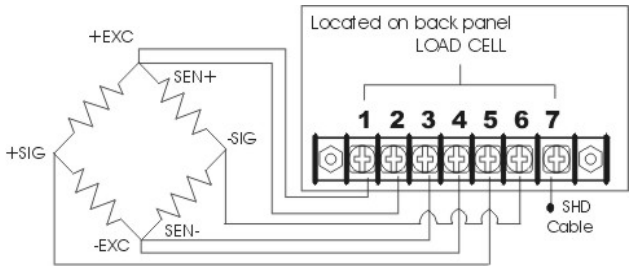
§ 2-2 Power Supply Connecting



Open the case, there is a jumper〔S1〕near the transformer, please insert a short-circuit pin to the available side.

§ 2-3 Connecting the Load Cell

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

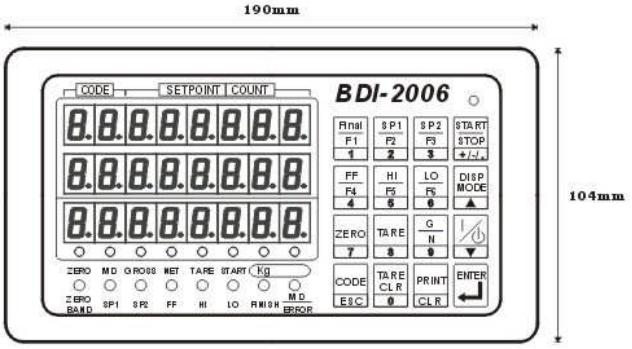


Screw	Signal
1	Positive Excitation Voltage, (EXC+)
2	Positive Sense Voltage, (SEN+)
3	Negative Sense Voltage, (SEN-)
4	Negative Excitation Voltage, (EXC-)
5	Positive Signal Voltage, (SIG+)
6	Negative Signal Voltage, (SIG-)
7	Shield, (SHD)

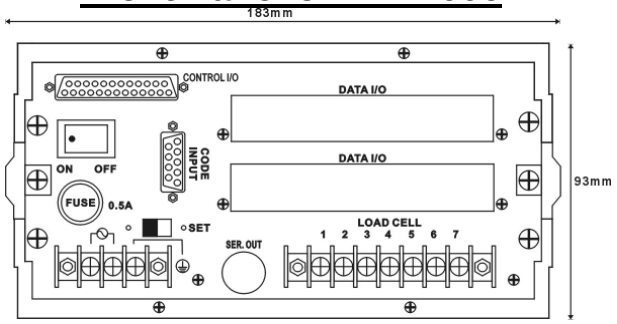
To connect your load cell to the weighing Indicator use a six-wire cable with shield-connect the wires as indicated above. If the BDI-2006 is located near the Load Cells (Within five meters or a few yards) you may use a 4-wire cable with shield, but first connect screws 1&2 and 3&4 with independent jumper leads.

ⓘ 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.

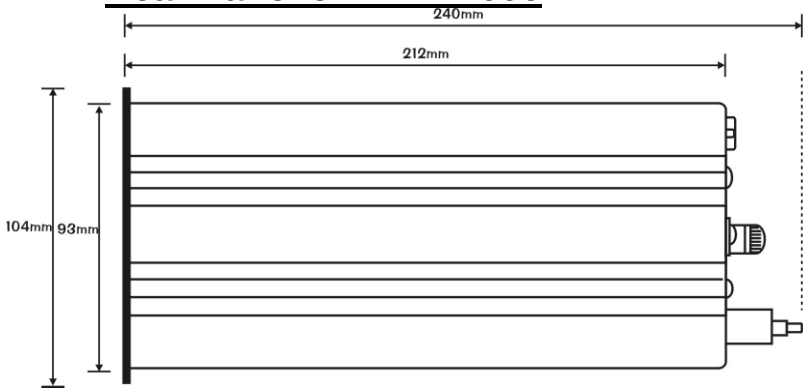
§ 2-4 Front and Rear Panel Dimensions



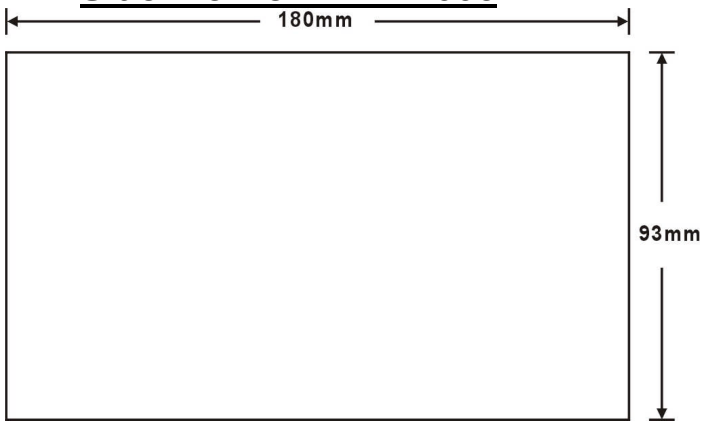
Front Panel of BDI-2006



Rear Panel of BDI-2006



Side View of BDI-2006



Mounting Cut for BDI-2006

CHAPTER 3 SPECIFICATIONS

§ 3-1 Analog Input and A/D Conversion

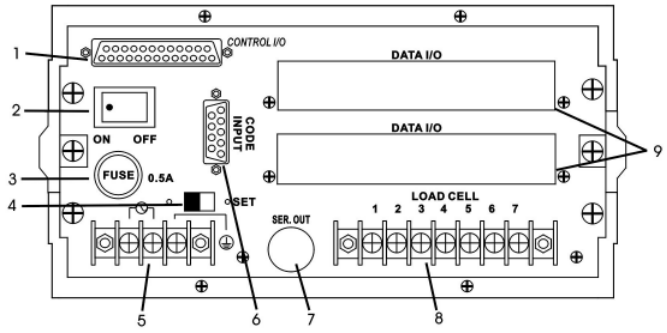
◎Analog Input and A/D Conversion	
Type	BDI-2006
Input Sensitivity	≧0.3uV/D
ZERO Adjustment Range	0 ~20mV
Load Cell Excitation	DC10V±1%，230mA, Remote Sensing. Can be connected up to 8 350Ω Load Cells.
Non-Linearity	0.01 % F.S.
A/D Conversion Method	△Σ
A/D Resolution	≒1/1,000,000
A/D Conversion Rate	Approx. 120 Times／Sec.
Max. Load Cell Input Voltage	**32mV**
ZERO Temperature Comp.	**±(0.2μV + 0.001% of Dead Load)/℃ TYP**
SPAN Temperature Comp.	**± 0.001% ℃ TYP**
Max. Resolution	**1/16,000 (BDI-2006 Resolution can reach 1/60,000 depending on load cell quality & performance).**

§ 3-2 General

◎ General	
Type	BDI-2006
Power Requirements	AC 110V or AC 220V ±10%，50／60Hz, Approx. 17VA
Net weight	Approx. 3.2 kg〔7.054 lb〕
Operation Temperature	－10℃～ 45℃
Maximum Humidity	85%〔non-condensing〕
Physical Dimensions	240 (D) ×190 (W) ×104(H) mm

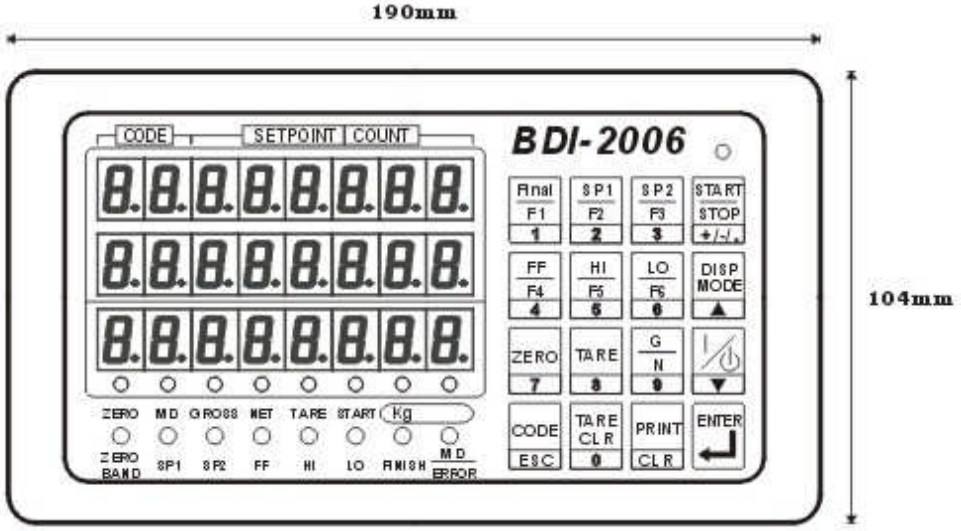
§ 3-3 Front Panel Description

＊ 3-3-1 Rear Panel of BDI-2006



Section	Description
1	I / O Input & Output
2	Power Switch
3	Fuse(Includes fuse set 0.5A/125V)
4	SET Switch
5	Power Supply Screw
6	Code Input (00-99)
7	20mA Current Loop
8	Screws for Load Cell
9	For Optional Interfaces

*3-3-2 BDI-2006 Front Panel Description



◎ **DIGIT / LED LIGHT SECTION**	**BDI-2006**
Main Display〔Green Tube〕	3 Column, 7-segment，8-digit displays the weight, with dots.
Minimum Division	x1、x2、x5、x10、x20、x50
Maximum Display	+800450
Under ZERO Indicator	〝—〞 minus sign
〝ZERO〞 ●LED Light	Center of Zero
〝MD〞 ●LED Light	Motion Detected = Unstable
〝GROSS〞 ●LED Light	Gross Weight displayed
〝NET〞 ●LED Light	Net Weight displayed
〝TARE〞 ●LED Light	TARE weight when stable-in Net, display ZERO
〝START〞 ●LED Light	Initial programmed control / STOP
〝 〞 ● LED Light	“ ” displays the custom weight unit.
〝 kg 〞 ● LED Light	Kilograms Displayed
〝ZERO BAND〞 ● LED Light	Zero band in which indicator will read as zero
〝 SP1 〞 ● LED Light	Set -point 1 output.
〝 SP2 〞 ● LED Light	Set -point 2 output.
〝 FF 〞 ● LED Light	Free Fall output.(Final minus Automatic Free Fall Value)
〝 HI 〞 ● LED Light	Hi limit output. (Over limit)
〝 LO 〞 ● LED Light	Lo limit output. (Under limit)
〝 FINISH 〞 ● LED Light	Final output.
〝 MD / ERROR 〞 ● LED Light	Motion Detected / Error occurred.

◎ **KEY SECTION**

BDI-2006

KEY	SET MODE	Accumulation Mode	WEIGHT MODE	WHEN SETTING
Final / F1 / 1	Set Finish Weight	Set pre-tare	Unused	Number “1”
SP1 / F2 / 2	Set set-point one value	Print Accumulated Value	Unused	Number “2”
SP2 / F3 / 3	Set set-point two value	Unused	Unused	Number “3”
FF/ F4 / 4	Set Free Fall Value	Unused	Unused	Number “4”
HI / F5 / 5	Set Hi limit	Unused	Unused	Number “5”
LO / F6 / 6	Set Lo limit	Unused	Unused	Number “6”
ZERO / 7	Display center of Ze0ro	Display center of Zero	Display center of Zero	Number “7”
TARE / 8	Zero display & stores the TARE weight.	Zero display & stores the TARE weight.	Zero display & stores the TARE weight.	Number “8”
G/N / 9	Gross/Net	Gross/Net	Gross/Net	Number “9”
TARE CLR / 0	Tare Cleared	Tare Cleared	Tare Cleared	Number “0”
CODE / ESC	CODE Setup (00-99)	CODE Setup (00-99)	Unused	Cancel
PRINT / CLR	Print once	Print Once	Print Once	Clear Weight
START／STOP／+/−/.	Start Setup / Stop operate	Start Setup / Stop operate	Start Setup / Stop operate	± key
DISP MODE / ▲	Display Mode	Display Mode	Display Mode	Increase 1
I／⏻／θ	Standby / Operate	Standby / Operate	Standby / Operate	Minus 1
〝 **ENTER** ↵ 〞 **KEY**	Confirm	Confirm	Unused	Confirm

§ 3-4 Quick Function Table

◎ **WEIGHT FUNCTION TABLE**		
F 000	Decimal Point Adjustment	No Decimal, 1 Decimal, 2 Decimal, 3 Decimal , 4 Decimal
F 001	Weighing Unit Selection	None, Kilogram, Pound, gram, ton, Oz
F 002	Display Update rate	10 times/Sec, 20 times/Sec, 40 times/Sec
F 003	Digital Filter	0 ～ 7 step digital filter
F 004	Set Zero Range	±5% , ±10% , ±20% , or ±30% of Max. Capacity
F 005	Motion Detection	0.5 SEC 1 DIV～1 SEC 18 DIV 16 Steps (00 Stable)
F 006	Automatic ZERO Tracking Compensation	1 SEC 0.5 DIV～2 SEC 4.0 DIV 16 Steps (00 OFF)
F 007	ZERO & TARE keys Availability	ZERO & TARE keys always work or, only work when display is STABLE
F 008	TARE Key Availability	TARE key always work / If the GROSS is Negative (-), TARE key does not work
F 009	Accumulation Availability	OFF, Stable, Manual , or Control Input Command then Accumulated.

◎ **20 mA Current Loop**		**STANDARD**
F C00	Data type	Same as display / Gross Weight / NET Weight / TARE Weight / Gross Weight, NET Weight, TARE Weight
F C01	Output Mode	Stream / Stable and auto print / Manual print mode / Accumulate and print
F C02	Output Format	Sending without set point Code / Sending with set point Code

◎ **Batch & Loss-in weight Weighing**		
F 100	Zero Band	6 digit Zero band value (Initial ”000.000”)
F 101	Batching Mode	Customer Programmed Control Mode : Normal Batching, Loss-in-Weight Batching Built-in Automatic Program Mode : Normal Batching , Built-in Automatic Program Mode :Loss-in-Weight Batching
F 102	Timer-Comparator Inhibitor	Set between 0.0 to 2.0 Sec (Initial 0.0 Sec)
F 103	Timer-Finish Signal	Set between 0.0 to 9.9 Sec (Initial 0.0 Sec)
F 104	Pulse Width of Finish Signal	Set between 0.0 to 2.0 Sec (Initial 0.5 Sec)
F 105	COM 8	Unstable, Error
F 106	Input Mode	By Panel key, BCD Input, or Serial Input
F 107	Free Fall compensation	Please enter 6 digit free fall compensation value within effective range (Initial “000.000”---Free Fall OFF)
F108	Memory of Automatic Free Fall Compensation value	Not memory / memory

◎ **SERIAL** 〔**RS-232**〕		**OP- 02**
F 200	Baud Rate	1200 BPS / 2400 BPS / 4800 BPS,/ 9600 BPS / 19200BPS
F 201	Parity	Non-parity / Even Parity / Odd Parity
F 202	Output Data	Same as display / Gross Weight / NET Weight / TARE Weight / Gross Weight, NET Weight, TARE Weight
F 203	Output Mode	Stream / Stable and auto print / Manual Print Mode / Accumulate and Print / Command Mode
F 204	Output Format	Sending without Set point Code / Sending with set point Code

◎PRINTER			OP-03
F 300	Setting Date, Time	Setting Year. Month, day, hour, minute, second	
F 301	Data Format		
	Date	Not print / Only print above the latest data / Print on all	
	Time	Not print / Only print above the latest data / Print on all	
	Set	Not print / Only print above the latest data / Print on all	
	Serial Number	Not print / Print	
	Weight	Same as display / Gross Weight / NET Weight / TARE Weight / Gross Weight, NET Weight, TARE Weight / Gross Weight, TARE Weight, NET Weight	
	Unit	Not print / Only print above the latest data according to F001/ Only print the latest data “g” / Only print above the latest data ”t” / Print on all according to F001/ Print on all “g” / Print on all “t”	
F302	Accumulation		
	Date	Not print / Print once	
	Time	Not print / Print once	
	Count	Not print / Print once	
F 303	Output Mode	Stable and auto print / Manual Print Mode / Accumulate and Print	
F 304	Select Printer	MINI Printer / Normal Printer	
◎ **BCD**			**OP-04**
F 400	Data type	Same as display / Gross data / NET data / TARE data	
F 401	Output Mode	Stream / Stable and print / Manual print mode / Accumulate and print	
F 402	Output Logic	Positive Logic / Negative Logic	
◎ **Analog Output**			**OP-05**
F 500	Analog Output Data	Output 4~20 mA / Output 0~+10 V	
F 501	Output Mode	Same as display / Gross data / NET data	
F 502	Loss-in-weight Absolute Value	Not read Absolute Value / BDI-2006 reads Absolute Value	
F 503	Output current when display ZERO	0.0mA through 9.99mA (Initial 0.40mA)	
F 504	Output current at Full Capacity	0.0mA through 9.99mA (Initial 20.0mA)	
F 505	Output Volt when display ZERO	-2.5V through +59.9V (Initial 00.0 V)	
F 506	Output Volt at Full Capacity	-2.5V through +59.9V (Initial 10.0 V)	

§ 3-5 Panel Key Function Table

Act	Accordance		Status
ZERO	Panel Key	ZERO	BDI - 2002 returns to the center of ZERO if the weight value within F004 range.
	Control I / O	Pin 25 +(Pin 16 /17)	
	OP-02（Command Mode）	Z Cr Lf	
TARE	Panel Key	TARE	BDI – 2002 switches to NET mode, ZERO's the display and **stores the TARE weight in Memory.**
	Control I / O	Pin 24+ (Pin 16/ 17)	
	OP-02（Command Mode）	T Cr Lf	
TARE CLEAR	Panel Key	TARE CLEAR	Clear TARE Value
	Control I / O	Pin23 + (Pin 16/ 17)	
GROSS	Panel Key	GROSS / NET	Shift to GROSS Mode
	OP-02（Command Mode）	G Cr Lf	
NET	Panel Key	GROSS / NET	Shift to NET mode
	OP-02（Command Key）	N Cr Lf	
PRINT	Panel Key	PRINT	Print or Output latest Data
	Control I / O	Pin19 + (Pin 16/ 17)	
ACC	Panel Key	PRINT / ACC	Print Accumulator Value
	Control I / O	Pin20 + (Pin 16/ 17)	
ACC	Panel Key	DISPLAY MODE KEY	Display accumulator and Count
CLEAR	Panel Key	Clear Accumulator and Count (5-2-1)	Clear Accumulator and Count
	Control I / O	Pin18 + (Pin 16/ 17)	
CODE	Panel Key	SET POINT/CODE	Display current Code number
	Code Input	CODE INPUT	
	OP-02（Command Key）	CCXX Cr Lf	
Standby	Panel Key	I／⏻	Terminate operation
Operate	Panel Key	I／⏻	Start operation
Set Point	Panel Key	SET POINT/CODE	Setting Final, SP1, SP2, Free Fall, Hi, Lo
	OP-02	S Cr Lf, SS Cr Lf	
CANCEL	Panel Key	ESC	Quit current mode
MODE	Panel key	DISP MODE / ▲	CHANGE MODE

Act	Accordance		Status
Key 0 to 9	Panel Key	Key 0 to 9	Input Number
Display Finish weight	Panel Key	Finial	Display Finish weight
Display Set-Point 1	Panel Key	SP1	Display Set-Point 1
Display Set-Point 2	Panel Key	SP2	Display Set-Point 2
Display Free Fall Value	Panel Key	FF	Display Free Fall Value
Display Hi limit Value	Panel Key	**HI**	Display Hi limit Value
Display Lo limit Value	Panel Key	**LO**	Display Lo limit Value

※Please refer to chapter 7 about Control I/O and OP-02

CHAPTER 4 SYSTEM FUNCTIONS

§ 4-1 System Check

A system check should be run: after initial installation, after moving your BDI-2006, after connecting or disconnecting an attachment from the Rear Panel and as means of locating any unexplained system error. An occasional self-check to make sure everything is working properly is a good maintenance practice as well.

STEP 1: Turn the Power Switch OFF on the Rear Panel. Slide the **SET** switch to the set side**.**

STEP 2: Turn the power supply ON, the display will show blinking **SELECT**.

STEP 3: Press the **Final/F1/1** key and screen will show blinking **CHEC**, and press ↵ key to start system check.

STEP 4: The system will check Green Tube and LED in sequence.

STEP 5: Check MEMORY〔**EEPROM**、**SRAM**〕
When the screen shows **SRAN**, please press ↵ key. The screen will subsequently show a series blinking dots **……** indicating system checking in process. If the screen shows **PASS**, it means checking passed. If the screen shows **FAIL**, it means system error.

STEP 6: **EEPRON 1** checking. The screen will show **EE-1.** Please press ↵ key and the screen will subsequently show a series blinking dots **……** indicating system checking in process. If the screen shows **PASS**, it means checking passed. If the screen shows **FAIL**, it means system error.

STEP 7: **EEPRON 2** checking. The screen will show **EE-2.** Please press ↵ key and the screen will subsequently show a series blinking dots **……** indicating system checking in process. If the screen shows **PASS**, it means checking passed. If the screen shows **FAIL**, it means system error.

STEP 8: 1.**BCD** checking. The screen will show **CODE ----.** Please make SHORT-CIRCUIT test on 9-Pin **D** shape Code Input on the rear panel. When short-circuiting COM9 with other pins, the short-circuit pin will show the accordance value on the screen. If not, there suggests an error occurred.
2. **Input/Output** checking. When the screen show **I-O ,** please enter ↵ key. Subsequently, the screen will show **INPUT 0** with the 0 blinking. Please make SHORT-CIRCUIT test on 25-Pin **D** shape Code Input on the rear panel. When short-circuiting COM17 or COM16 with pin25～pin18, the short-circuit pin will light up a specific LED on the screen. If not, there suggests an error occurred.
3.When short-circuiting COM17.COM16 with pin13～pin16 , the short-circuit pin will light up a specific LED on the front panel. If two or more LED light up or turned off at the same time, there suggests an error occurred.

STEP 9: When press a key, the key number will show in the middle of the screen.

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

If the key number does not match, it suggests an error occurred. Please contact us.

STEP 10: Finish checking, display **END .**Slide the **SET** switch to the original side.

Above testing if any **FAIL** or error shows on the screen, please contact us.

§ 4-2 Functions

STEP 1: Turn the Power Switch OFF, Slide the **SET** switch to the set side.
STEP 2: Turn the power supply ON, the display will show blinking **SELECT**.
STEP 3: Press **SP1/F2/2** key and screen will show as follows:

Func
F000

STEP 4: Please press ▲ or ▼ key to move through the function category (F000, FC00, F200, F300, F400 or F500). Then press the ↵ Key to enter the category. Use the ▲ or ▼ key to choose specific function (F000 ~ FC02, F100 ~ F107, F200 ~ 204, F400 ~ F402 or F500 ~ F506). In each function, please use number key to set function value. If you want to return to previous function category, please press **ESC** key, or press ↵ key to enter.

ⓘ If any errors occurred, please check if each setting value within effective range.

ⓘ note：● Indicates initial factory setting.

STEP 5: When you finished changing the Function setting, slide **SET** Switch to the original side. The screen will show **END**.

◎ **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	Kilogram
	2	Pound
	3	Gram
	4	Ton
	5	Oz

F002	Display Update Rate	
	10	10 Times/Sec
●	20	20 Times/Sec
	40	40 Times/Sec

F003	Digital Filter				
			Filter	Environ-mental Vibration	Response Speed
	0	No stage	Weak	Bad	Fast
	1	1st stage			
	2	2ed stage			
	3	3rd stage	▲	▲	▲
●	4	4th stage	▼	▼	▼
	5	5th stage			
	6	6th stage			
	7	7th 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	Motion Detection	
	00	Stable
	01	0.5 SEC 1 DIV
	02	0.5 SEC 2 DIV
	03	0.5 SEC 3 DIV
	04	0.5 SEC 4 DIV
	05	0.5 SEC 5 DIV
	06	0.5 SEC 6 DIV
	07	0.5 SEC 7 DIV
	08	0.5 SEC 8 DIV
	11	1 SEC 1 DIV
●	12	1 SEC 2 DIV
	13	1 SEC 3 DIV
	14	1 SEC 4 DIV
	15	1 SEC 5 DIV
	16	1 SEC 6 DIV
	17	1 SEC 7 DIV
	18	1 SEC 8 DIV

F006	Automatic ZERO Tracking Compensation	
	00	OFF
	11	1 SEC 0.5 DIV
	12	1 SEC 1.0 DIV
	13	1 SEC 1.5 DIV
●	14	1 SEC 2.0 DIV
	15	1 SEC 2.5 DIV
	16	1 SEC 3.0 DIV
	17	1 SEC 3.5 DIV
	18	1 SEC 4.0 DIV
	21	2 SEC 0.5 DIV
	22	2 SEC 1.0 DIV
	23	2 SEC 1.5 DIV
	24	2 SEC 2.0 DIV
	25	2 SEC 2.5 DIV
	26	2 SEC 3.0 DIV
	27	2 SEC 3.5 DIV
	28	2 SEC 4.0 DIV

F007	ZERO & TARE keys Availability	
●	0	ZERO & TARE keys always work
	1	ZERO & TARE keys only work when display is STABLE

F008	TARE key Availability	
●	0	TARE key always work
	1	If the GROSS is negative, TARE key does not work

F009	Accumulation Availability	
	0	OFF
	1	Stable
	2	Manual
●	3	Control Input--Command Accumulation

◎ Standard 20 mA Current Loop

FC00	Output Data	
●	1	Same as display
	2	GROSS Weight
	3	NET Weight
	4	TARE Weight
	5	GROSS Weight, NET Weight, TARE Weight

FC02	Output Format	
●	0	Sending without set point Code
	1	Sending with set point Code

FC01	Output Mode	
●	1	Stream
	2	Stable and auto print
	3	Manual Print Mode
	4	Accumulate and Print

◎Batching Weighing

F000	Set ZERO Range
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	Built-in Automatic Program Mode: Normal Batching(Auto TARE)
	6	Built-in Automatic Program Mode: Loss-in weight Batching (Auto TARE)

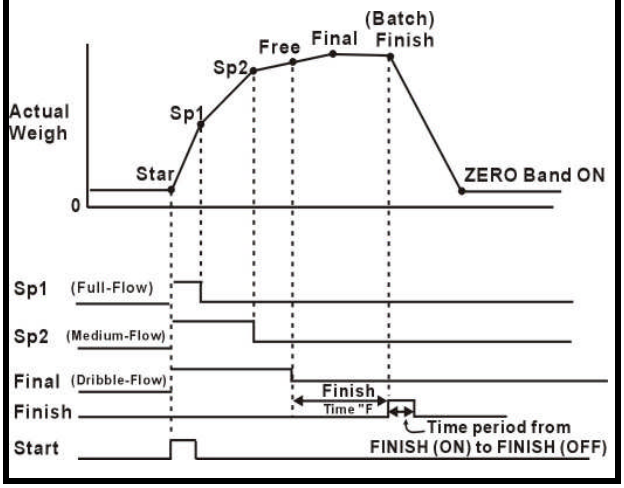
F102	Timer-Comparator Inhibitor
Set between 0.0 to 2.0 Sec (● Initial 0.0 Sec)	

F103 Timer-Finish Signal

The finish signal timer can be Set between 0.0 to 9.9 Sec

※● Factory Initial 0.0 Sec

※Finish Signal sent ON at 0.0 Sec. And stays ON until the next START Signal

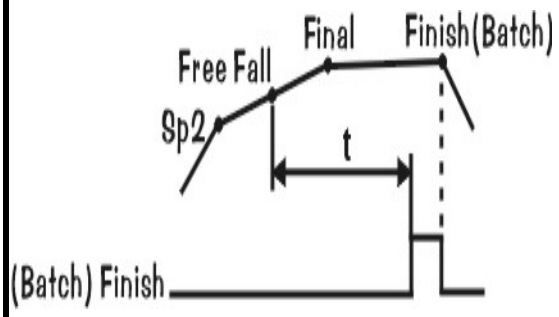


F104 Pulse Width of Finish Signal

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		COM 8
✯	0	Unstable
	1	Error

F106		Input Mode
✯	1	Panel key
	2	BCD Input
	3	Serial Input

F107 Automatic Free Fall Compensation

Please enter 6 digit free fall compensation value within effective range

● Initial “000.000”--- Free Fall OFF

F108		Memory of Automatic Free Fall Compensation value
✯	0	Not memory
	1	Memory

◎ SERIAL (RS-232)

F200	Band Rate	
	12	1200BPS
✯	24	2400BPS
	48	4800BPS
	96	9600BPS
	19	19200Bps

F203	Output Mode	
✯	1	Stream
	2	Stable and auto print
	3	Manual Print Mode
	4	Accumulate and Print
	5	Command Mode

F201	Parity	
	0	Non-parity
✯	1	Even- Parity
	2	Odd- Parity

F202	Parity	
✯	1	Same as display
	2	GROSS Weight
	3	NET Weight
	4	TARE Weight
	5	GROSS Weight, NET Weight, TARE Weight

F204	Output Format	
●	0	Sending without set point Code
	1	Sending with set point Code

◎ Printer

F300	Setting Date, Time
YY / MM / DD	HH：MM：SS

F301	Data Format				*At initial setting, the screen shows: 1 2 1 0 1 1	
	Date	Time	Set point code	Serial Number	Weight	Unit
	Not Print	Not Print	Not Print	Not Print		Not Print
1	Only Print above the Latest data	Only Print above the Latest data	Only Print above the Latest data	Print	Same as display	Only print above the latest data according to F101
2	Print on all	Print on all	Print on all		GROSS Weight	Only Print above the Latest data ” g “
3					NET Weight	Only Print above the Latest data “ t “
4					TARE Weight	Print on all , according to F001
5					GROSS Weight, NET Weight, TARE Weight	Print on all “ g “
6					GROSS Weight, NET Weight, TARE Weight	Print on all “ t “
Initial	1	2	1	0	1	1

F302	Accumulation		
	Date	Time	Count
0	Not print	Not print	Not print
1	Print once	Print once	Print once
Initial	0	0	0

F304	Select Printer	
✯	1	MINI Printer
	2	Normal Printer

F303	Output Mode	
	1	Stable and auto print
✯	2	Manual print mode
	3	Accumulate and print

◎BCD

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

F402	Output Logic	
✯	1	Positive Logic
	2	Negative Logic

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

◎ Analog Output

F 500	Analog Output Data	
✯	1	Output 4~20 mA
	2	Output 0~+10 V

F 504	Output current at Full Capacity
0.0mA through 9.99mA ●Initial 20.0mA	

F 501	Output Mode	
✯	1	Same as display
	2	GROSS Weight
	3	NET Weight

F 505	Output Volt when display ZERO
-2.5V through +59.9V ●Initial 00.0 V	

F 502	Loss-in-weight Absolute Value	
✯	0	Not read Absolute Value
	1	BDI-2006 reads Absolute Value

F 506	Output Volt at Full Capacity
-2.5V through +59.9V ●Initial 10.0 V	

F 503	Output current when display ZERO
0.0mA through 9.99mA ●Initial 4.0mA	

§ 4-3 CALIBRATION

1. ENTER CALIBRATION MODE:

STEP 1: Turn the Power Switch OFF. Slide the **SET** switch to the set side.
STEP 2: Turn the power switch ON. The screen will show blinking **SELECT**.
STEP 3: Please press **SP2/F3/3** key and blinking **F-A-CAL** displayed.
STEP 4: Use ▲or▼key to choose either **F-A-CAL** **or** **d-cal**. Please press the ↵ key.

4-3-1 FULL CALIBRATION (Normal)

〔1〕***Setting Minimum Division***

The display of **di** **and** **01** shows the smallest division. Use the ▲ or▼ key to move through the available divisions.〔1、2、5、10、20、50〕. Press the ↵ key to set the minimum division.

〔2〕***Setting Decimal （F000 will change---see §4-2）***

The screen will show dp. A blinking decimal point will show on the screen. Use the 1,2,3,or4 key to move through the available position of decimal **Point**. Press the ↵ key to set the decimal position.

〔3〕***Setting Maximum Capacity***

When setting maximum capacity, the screen will show **CAP** → C000.000. Use the ▲,▼, or number keys to set numeric value. Press the ↵ to finish the step.

〔4〕***ZERO Adjust***

The Screen will display **ZERO**. Please move the calibration mass and objects away on the Weighing device then press ↵ key. **. . . . . .** means finishing of the Adjustment.

〔5〕***SPAN Calibration***

The screen will show **SPAN**. Press ↵ key and place your calibration mass on the weighing device and input weight value. Use the ▲,▼, or number keys to set the available value. Please press the ↵ key to finish the calibration. The screen will show **. . . . . .**.

STEP 5 : The screen will show **END**.
Slide the **SET** switch to the original side.

2. Select Digital Calibration (Use load cell parameter.(An easy way to make calibration by inputting Load Cell's Full Scale Output voltage).

STEP 1: Turn the Power Switch OFF on the rear panel. Slide the **SET** switch to the set side.
STEP 2: Turn the power switch ON. The screen will show blinking **SELECT**.
STEP 3: Please press **SP2/F3/3** key and a blinking **F-A-CAL** will show on the screen. Then press the ↵ key.
STEP 4: Use the ▲or▼key to choose **d-CAL**. Please press the ↵ key.

〔1〕***Setting Minimum Division***

The display of **di 1** shows the smallest division. Use the ▲ or ▼ key to move through the available divisions.〔1、2、5、10、20、50〕. Press the ↵ key to set the minimum division.

〔2〕***Setting Decimal （F000 will change---see §4-2）***

The screen will show dp. A blinking decimal will show on the screen. Use the 1,2,3 or 4 key to move through the available position of decimal **Point**. Press the ↵ key to set the decimal position.

〔3〕***Setting Maximum Capacity***

When setting maximum capacity, the screen will show **CAP**.

Use the ▲,▼, or number keys to input value. Press the ↵ key to finish the step.

〔4〕***Setting Full Scale Output Voltage of the Load Cell Sensors***

When setting full scale output voltage of the load cell sensors, the screen will show **LC-CAP**. Please use the ▲,▼, or number keys to input value. Press the ↵ key to finish the step.

〔5〕***ZERO Adjust***

The Screen will display **ZERO**. Please move the calibration mass and objects away on the Weighing device then press ↵ key. A display of **. . . . . .** means finishing the Adjustment.

〔6〕***d-SPAN Calibration***

The screen will show **d-SPAN**. Press ↵ key and place your calibration mass on the weighing device and input weight value. Use the ▲,▼, or number keys to enter Load Cell O/P Volt. Please press the ↵ key to finish d-SPAN. The screen will show **. . . . . .**.

STEP 5: The screen will show **END**. Please slide the **SET** switch to the original side.

※Example of selecting **FULL CALIBRATION (Div 2, 3 decimal, Max cap.20)**

Key	Screen will display
Turn the Power Switch OFF	
Slide Set switch to the ON side	
Turn the power ON.	Blinking **SECECT**
Press **SP2/F3/3.**	Blinking **F-A-CAL**
Press ↵ key	Blinking **di-CAP**
Press ↵ key	di 01(Blinking at 01)
Press ▲ key	di 02(Blinking at 02)
Press ↵ key	dp→ 000.000(Blinking at the Decimal **Point**----F000 will subject to change if 1,2,3,or 4 key been pressed)
Press ↵ key	CAP →010.000(Blinking)
Press 2,0,0,0,0 key	020.000(Blinking)
Press ↵ key	ZERO
Press ↵ key	- - - - - - → SPAN
Press ↵ key	000.000(Blinking at the latest decimal)
Place 20kg Calibration Mass,	020.000
Press ↵ key	- - - - - - → End

◎**Calibration Errors**

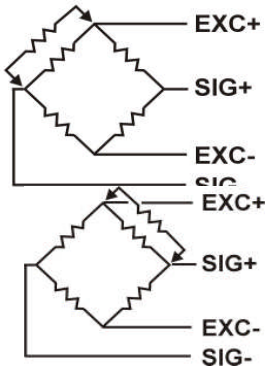
C.Err 1：The resolution exceeds 1：16,000.

⇨Change the minimum division and maximum capacity within 1／16,000.

Resolution ratio= Minimum division／maximum 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 maximum capacity.

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

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

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

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

⇨Replace your load cell with a more sensitive one or adjust the minimum 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 at maximum capacity is too high.

⇨ Check the load cell specification or load cell failure.

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

⇨Check Resolution Table.

C.Err 10 The maximum, capacity has been wrongly entered as a value greater than 800,000.

⇨ Check the load cell specification or load cell failure.

◎Display Resolution Table

Maximum Capacity	Resolution					
	1 Min. Div.	2 Min. Div.	5 Min. Div.	10 Min. Div.	20 Min. Div.	50 Min. Div.
300	1 / 300	----------	----------	----------	----------	----------
400	1 / 400	----------	----------	----------	----------	----------
500	1 / 500	----------	----------	----------	----------	----------
600	1 / 600	1 / 300	----------	----------	----------	----------
800	1 / 800	1 / 400	----------	----------	----------	----------
1,000	1 / 1000	1 / 500	----------	----------	----------	----------
1,200	1 / 1200	1 / 600	----------	----------	----------	----------
1,500	1 / 1500	1 / 800	1 / 300	----------	----------	----------
2,000	1 / 2000	1 / 1000	1 / 400	----------	----------	----------
2,500	1 / 2500	1 / 1200	1 / 500	----------	----------	----------
3,000	1 / 3000	1 / 1500	1 / 600	1 / 300	----------	----------
4,000	1 / 4000	1 / 2000	1 / 800	1 / 400	----------	----------
5,000	1 / 5000	1 / 2500	1 / 1000	1 / 500	----------	----------
6,000	1 / 6000	1 / 3000	1 / 1200	1 / 600	1 / 300	----------
8,000	1 / 8000	1 / 4000	1 / 1500	1 / 800	1 / 400	----------
10,000	1 / 10000	1 / 5000	1 / 2000	1 / 1000	1 / 500	----------
12,000	1 / 12000	1 / 6000	1 / 2500	1 / 1200	1 / 600	----------
15,000	1 / 15000	1 / 8000	1 / 3000	1 / 1500	1 / 800	1 / 300
20,000	----------	1 / 10000	1 / 4000	1 / 2000	1 / 1000	1 / 400
25,000	----------	1 / 12500	1 / 5000	1 / 2500	1 / 1200	1 / 500
30,000	----------	1 / 15000	1 / 6000	1 / 3000	1 / 1500	1 / 600
40,000	----------	----------	1 / 8000	1 / 4000	1 / 2000	1 / 800
50,000	----------	----------	1 / 10000	1 / 5000	1 / 2500	1 / 1000
60,000	----------	----------	1 / 12000	1 / 6000	1 / 3000	1 / 1200
80,000	----------	----------	1 / 16,000	1 / 8000	1 / 4000	1 / 1500
100,000	----------	----------	----------	1 / 10000	1 / 5000	1 / 2000
120,000	----------	----------	----------	1 / 12000	1 / 6000	1 / 2500
150,000	----------	----------	----------	1 / 15000	1 / 8000	1 / 3000
200,000	----------	----------	----------	----------	1 / 10000	1 / 4000
250,000	----------	----------	----------	----------	1 / 12500	1 / 5000
300,000	----------	----------	----------	----------	1 / 15000	1 / 6000
400,000	----------	----------	----------	----------	----------	1 / 8000
500,000	----------	----------	----------	----------	----------	1 / 10000
600,000	----------	----------	----------	----------	----------	1 / 12000
700,000	----------	----------	----------	----------	----------	1 / 14000
750,000	----------	----------	----------	----------	----------	1 / 15000
800,000	----------	----------	----------	----------	----------	1 / 16,000

☆ BDI-2006 Display Resolution may reach 1/60,000. (Depends on load cell quality and performance).

§ 4-4 PANEL KEY DISABLE

Disable unimportant or unused keys.

STEP 1: Turn the Power Switch OFF on the rear panel. Slide the **SET** switch to the set side**.**

STEP 2: Turn the power switch ON. The screen will show blinking **SELECT.**

STEP 3: Please press **FF/F4/4** key and a blinking **LOC** will show on the screen. After enter ↵ key, a 〔 〕 will show on the screen. Please press the key you wish to disable. The screen will show the key's number. BDI-2006 will inquire if you want to lock or unlock the key: 〔**00**〕**u or L** (Key number 〔**00**〕: Unlock or Lock the key).

STEP 4: Use the ▲ or ▼ key to choose lock or unlock the key and press ↵ key for confirmation.

STEP 5 : Slide the **SET** switch to the original side for finishing the step.

§ 4-5 COPY SYSTEM PARAMETER

A backup can be stored to prevent data loss.

⊠System Parameter: includes functions FXXX, Calibration parameters, disable keys.

STEP 1: Turn the Power Switch OFF on the rear panel. Slide the **SET** switch to the set side**.**

STEP 2: Turn the power switch ON. The screen will show blinking **SELECT.**

STEP 3: Please press **HI/F5/5** key and a blinking **COPY** will show on the screen. Please enter ↵ key.

STEP 4: Use the ▲ or ▼ key to choose **NO** or **YES** . If **NO** is entered, the screen will show **END**. If **YES** is entered, the screen will show ……→ **END** .

STEP 5 : Slide the **SET** switch to the original side for finishing the step.

§ 4-6 RESTORE SYSTEM PARAMETERS

Restoration can be used when system failed or human operation error happens.

ⓘ Restoration will not restore set-point parameters.

⊠System Parameter: includes functions FXXX, Calibration parameters, disable keys.

⊠Set-point Parameter: includes Final, SP1, SP2, Free Fall, Hi, Lo.

STEP 1: Turn the Power Switch OFF on the rear panel. Slide the **SET** switch.

STEP 2: Turn the power switch ON. The screen will show blinking **SELECT.**

STEP 3: Please press **Lo/F6/6** key and a blinking **RESTORE** will show on the screen. Please enter ↵ key.

STEP 4: Use the ▲ or ▼ key to choose **NO** or **YES** . If **NO** is entered, the screen will show **END**. If **YES** is entered, the screen will show ……→ **END** .

STEP 5 : Slide the **SET** switch to the original side for finishing the step.

§ 4-7 SYSTEM INITILAIZE

Re-install resets the BDI-2006 to the initial factory settings. Use Re-install 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, and slide **SET** switch to the set side**.**

STEP 2: Turn the power switch ON. The screen will show blinking **SELECT.**

STEP 3: Please press **TARE CLR / 0** key and a blinking **init** will show on the screen. Please enter ↵ key.

STEP 4: Use the ▲ or ▼ key to choose **NO** or **YES** . If **NO** is entered, the screen will show **END**. If **YES** is entered, the screen will show ……→ **END** .

STEP 5 : Slide the **SET** switch to the original side for finishing the step.

§ 4-8 CLEAR SET POINT DATA

STEP 1: Turn the Power Switch OFF on the rear panel. Slide the **SET** switch to the OFF side (The SET switch remain in OFF status)**.**

STEP 2: Turn the power switch ON. The screen will show Normal operation condition**.**

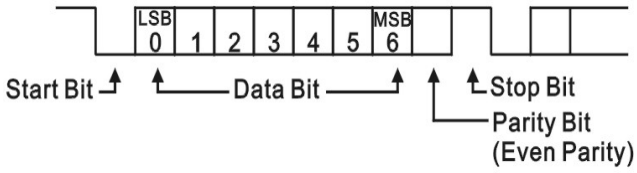
STEP 3: Please press I／⏻ key first. Hold PRINT/ CLR and CODE /ESC key at the same time until the screen shows Clear cd . Please press the ↵ key and the BDI-2006 will subsequently ask the operator to clear set point data.

STEP 4: Use ▲ or ▼ key to choose **NO** or **YES** and press the ↵ key to confirm.

§ 4-9 20mA Current Loop

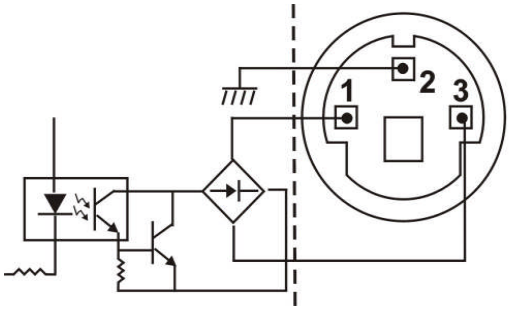
20 mA Current Loop Specifications

1. Baud Rate ：1200 bps
2. Data bit ：7 bit
3. Parity ：Even Parity
4. Stop bit ：1 bit
5. Output Code ：ASCII



	CURRENT LOOP
1	20 mA
0	0 mA

Pin Assignment：



Pin 1：Serial Output
Pin 2：Frame Ground
Pin 3：Serial Output
＊＊Output has no polarity , rather it is bi-directional.

CHAPTER 5 SET POINTS

§ 5-1 SET POINTS

5-1-1 Change Set point code and Set point values

F106	Input Mode		Set Point Input
✯	1	Panel key	From Panel key
	2	BCD Input: Code Input from rear panel	From Panel key
	3	Serial Input: RS-232 or RS-422/485 when F203=5	From Panel key or Serial Input

Ready to change set-point code: Please make sure the LED on the up – right corner is not light up.

Please identify the function F106=1. Otherwise, the operator can only review the set-point codes.

5-1-2 Change Set point Code

How to change the Set point Code: Please press CODE key, the screen will show blinking code 00. Please use the ▲,▼, or number keys to input value. Please press the ↵ key to finish. If ESC key is pressed, setup will not be stored.

5-1-3 Change Set point values (parameters in set point)

Please use ▲,▼, or number keys to input values, and press ↵ key to finish.

Please press FINAL key to set Final Weight, and press ↵ key to finish.
Please press SP1 key to set point 1 value, and press ↵ key to finish.
Please press SP2 key to set point 2 value, and press ↵ key to finish.
Please press FF key to set Free Fall value, and press ↵ key to finish.
Please press HI key to set Hi limit, and press ↵ key to finish.
Please press LO key to set Lo limit, and press ↵ key to finish.

§ 5-2 Accumulator / counter

Press DISP MODE key until displays accumulator/counter mode.
Press ↵ key, -CODE- will blink. Choose the code number you wish to clear value, and press ↵ key to finish.

00 C000
00000.000
0.000

§ 5-3 Check Gross / Tare / Net Weight

Press DISP MODE key until the screen displays G/T/N mode.
Press ↵ key, -CODE- will blink. Choose the code number you wish to clear value, and press ↵ key to finish.

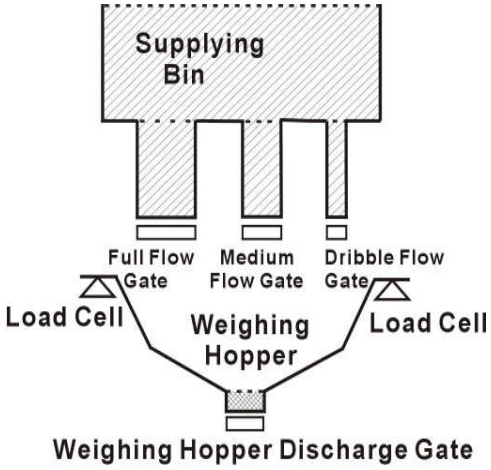
G 0.000
T 0.000
N 0.000

CHAPTER 6 Batching Modes

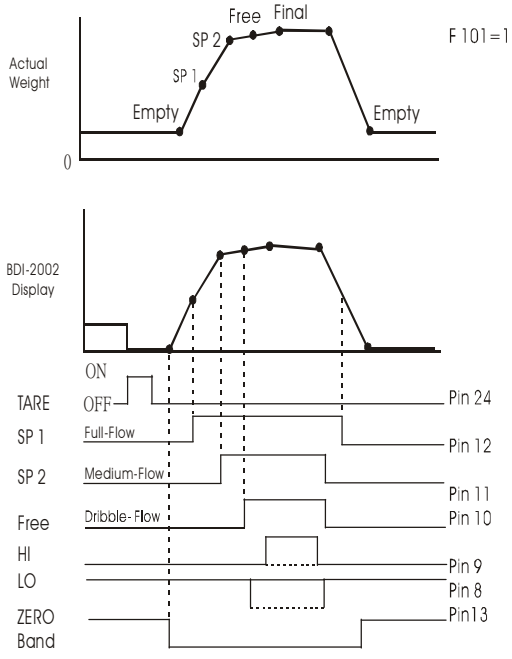
§ 6-1 Batching Modes

		Type	
		Normal Batching	Loss-in-Weight Batching
Final	Finish Weight	Finish Weight	Finish Weight
SP1	Set-point 1	Net weight ≧Final - SP 1	Gross weight > SP 1
SP2	Set-point 2	Net weight ≧Final - SP 2	Net weight ≧Final - SP 2
FF	Free Fall	Net weight ≧Final - FF	Net weight ≧Final - FF
HI	Hi limit	Net weight > Final + Hi limit	Net weight > Final + Hi limit
LO	Lo limit	Net weight > Final - Lo limit	Net weight > Final - Lo limit

◎ Customer Programmed Control Mode: Normal Batching(F101 = 1)

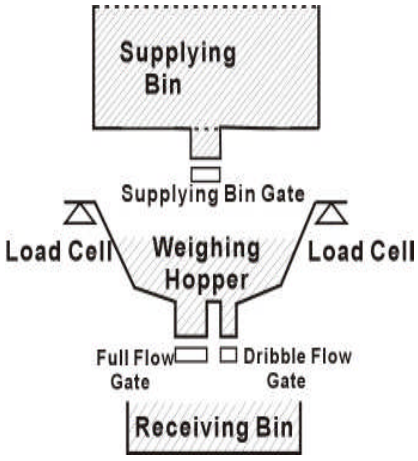


SP1 – Full Flow Gate
SP2 – Medium Flow Gate
Free – Dribble Flow Gate

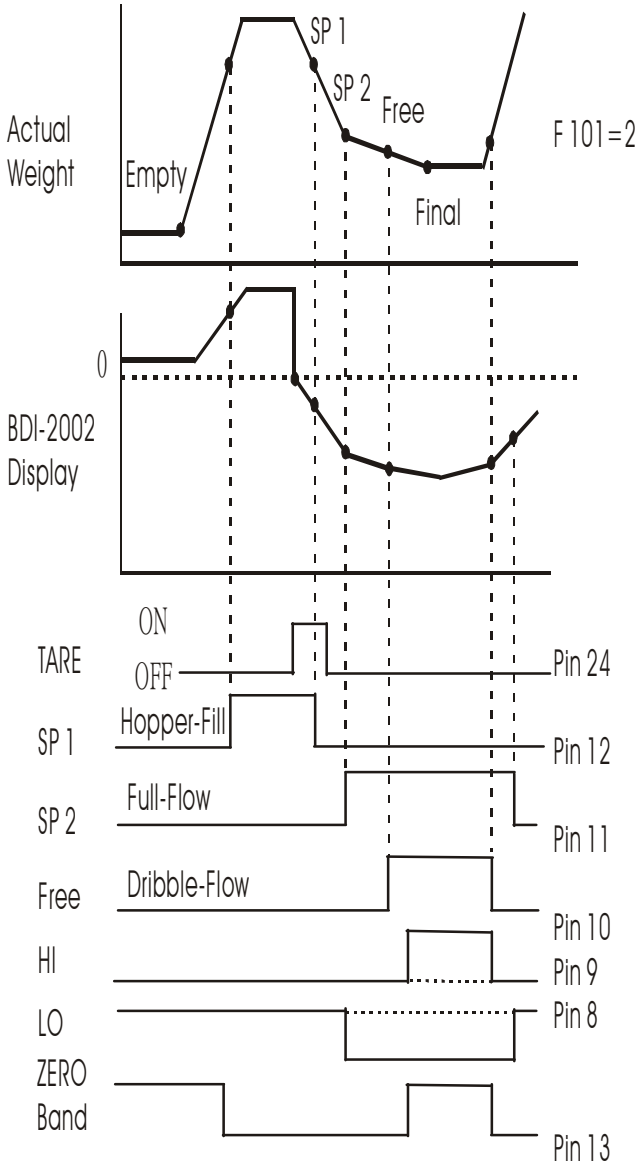


1. The Weighing Hopper is empty, the display shows "0", and all Gates are closed. If the display is not at ZERO, **input a TARE** signal (Pin 24) to **re-ZERO the display**.
2. Open the Supply Bin's: Full-Flow Gate, Medium-Flow Gate, and Dribble-Flow Gate.
3. When the display reaches "**Final - SP 1**", 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.

◎ Customer Programmed Control Mode: Loss-in-Weight (F101 = 2)

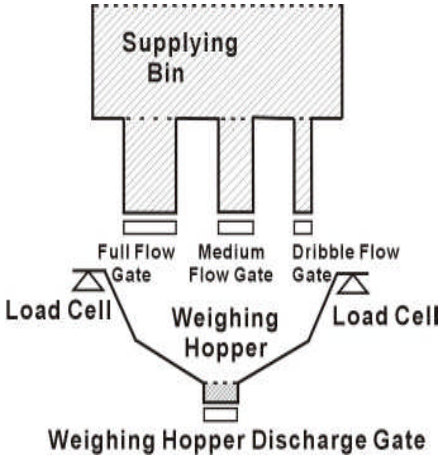


SP1 – Supplying Bin Gate
SP2 – Full Flow Gate
Free – Dribble Flow Gate

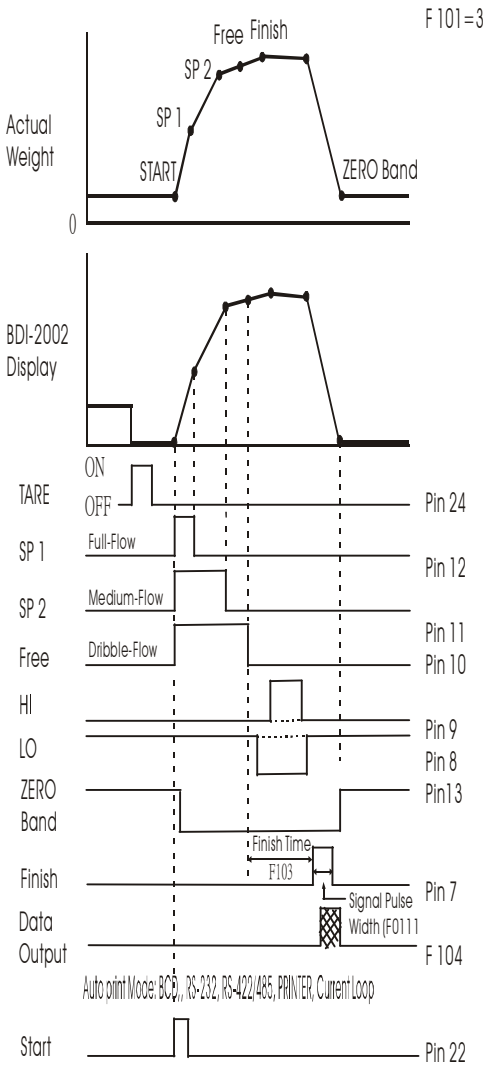


1. The Weighing Hopper is empty as is the Receiving Bin. The display shows "0", and all Gates are closed.
2. Open the Supplying Bin Gate.
3. When the GROSS Weight reaches "**SP 1**", the **SP 1** Output (Pin 12) signal will come **ON**. Closed the Supplying Bin Gate by using the SP 1 Output ON signal.
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.

◎ Built-in Automatic Program Mode: Normal Batching (F101 = 3, 5)



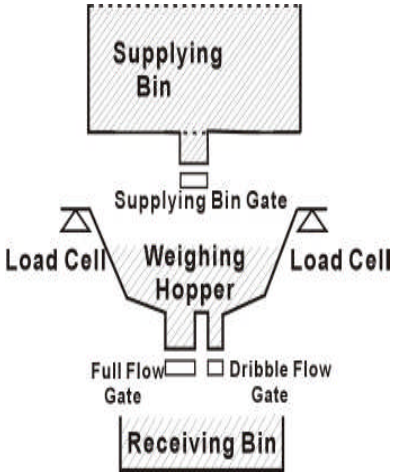
SP1 - Full Flow Gate
SP2 - Medium Flow Gate
Free - Dribble Flow Gate
Start signal – Pin22



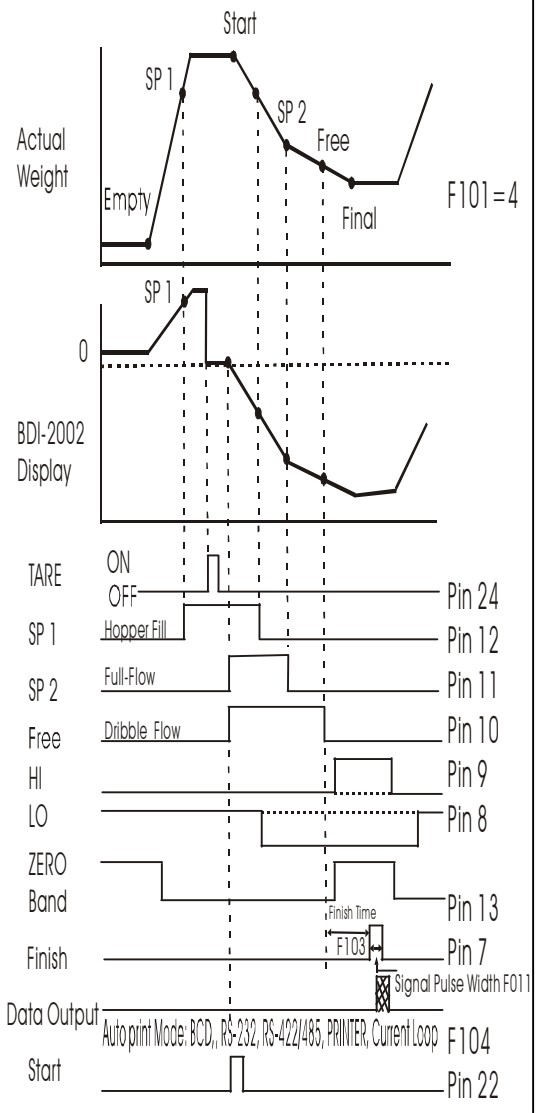
1. The Weighing Hopper is empty, the display shows "0", and all Gates are closed. When F101=3, **input a TARE** signal (Pin 24) to **re-ZERO the display** when display is not ZERO. When F101=5, skip re-ZERO.
2. Check if the Weighing Hopper is empty using the ZERO Band Output (Pin 13).
3. Input the Start 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 "come 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 recalculated 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 (Auto print Mode: BCD, RS-232C, RS-422/485, Printer or Current Loop). 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.

Built-in Automatic Program Mode: Loss-in-Weight Batching (F101=4,6)



SP1 – Supplying Bin Gate
SP2 – Full Flow Gate
Free – Dribble Flow Gate
Start signal – Pin22

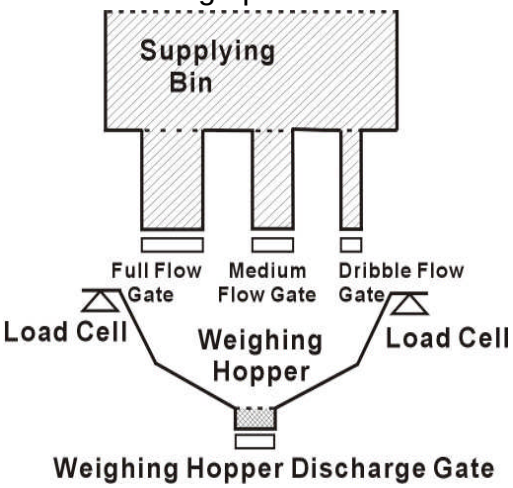


1. The Weighing Hopper is empty as is the Receiving Bin. The display shows "0", and all Gates are closed.
2. Open the Supplying Bin Gate.
3. When the GROSS Weight reaches "**SP 1**", the **SP 1** Output (Pin 12) signal will come **ON**. Closed the Supplying Bin Gate by using the SP 1 Output ON signal.
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. When F101=4, input a TARE signal (Pin 24) to ZERO the display. When F101=6, skip this step.
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 "come ON".

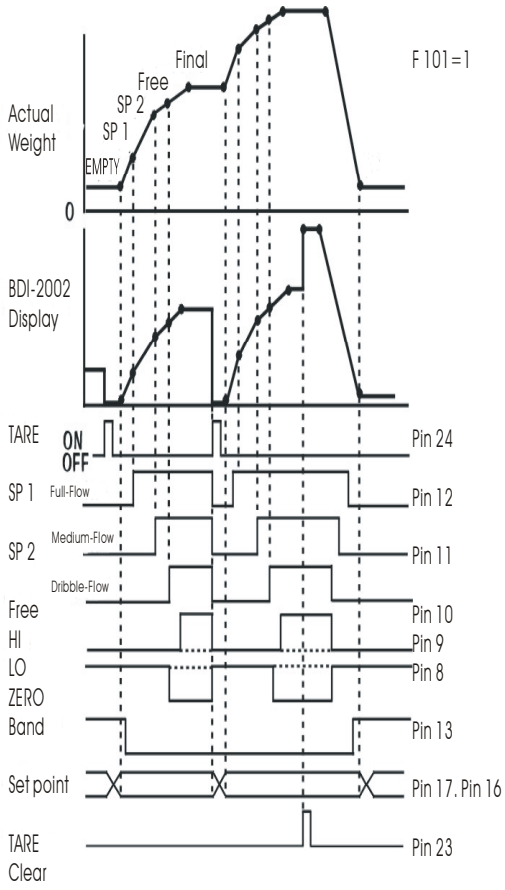
   Note : When the Final Weight is 0, the Pin 11 and 10 are kept OFF .
7. Open the Full-Flow Gate and the Dribble-Flow Gate for Full-Flow filling into the Receiving Bin.
8. When the display reaches "**Final - SP 2**", the **SP 2** Output (Pin 11) signal will come **OFF**. Closed the Full-Flow Gate by using the SP 2 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 (Auto print Mode: BCD, RS-232C, RS-422/485, Printer or Current Loop). The NET Weight data will be accumulated.
15. Signal (Pin 13) will refill using ZERO Band Output if needed.
16. Ready for 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.

◎ Multiple-Ingredient Batching

Multiple-Ingredient Batching can be done in any of the four Batch settings of Function (F101). Accumulation will be performed by Automatic Free Fall Compensation Command (control I/O Pin 10) in the Customer-Programmed Control mode and at Final Output in the Built-in Automatic Program mode. The **example** below is a Normal Batching operation in the Customer Programmed Control Mode.



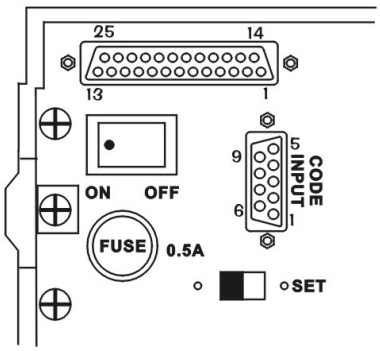
SP1 – Full Flow Gate
SP2 – Medium Flow Gate
Free – Dribble Flow Gate



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. Input the Set Point Code number for Batching.
3. Open the supplying Bin's : Full-Flow Gate, Medium-Flow Gate, and Dribble-Flow Gate.
4. 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.
5. 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.
6. 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.
7. An Automatic Free Fall Compensation Command (Min. 200ms pulse to Pin 21) may be given at this time
8. 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.
9. Please input a TARE signal (Pin 24) and set point code, then preparing another substance batching.
10. Load the next substance into the Supplying Bin. Prepare the proper Program, Operator Settings (if needed). Repeat Steps 3 ~ 8.
11. Use the FREE (Pin 10) signal to delay a time period as the control signal is processing to empty the Weighing Hopper.
12. When the GROSS weight is below the ZERO band, the ZERO Band Output will come ON which signifying the Weighing Hopper is empty. Closed the Weighing Hopper Discharge Gate by using the ZERO Band (Pin 13) Output ON signal.
13. You are now ready for your next batching event.

CHAPTER 7 OPTIONS

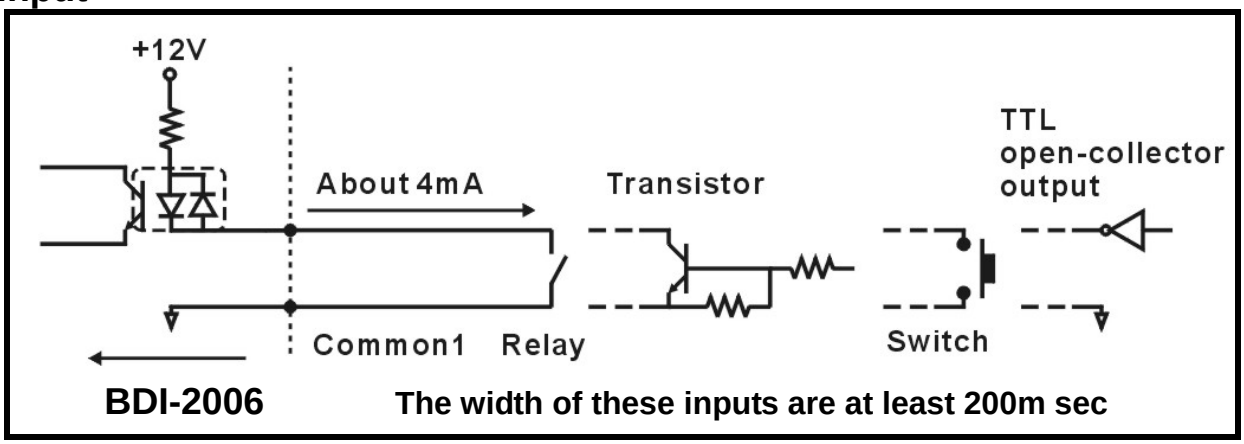
§ 7-1 I/O INTERFACE



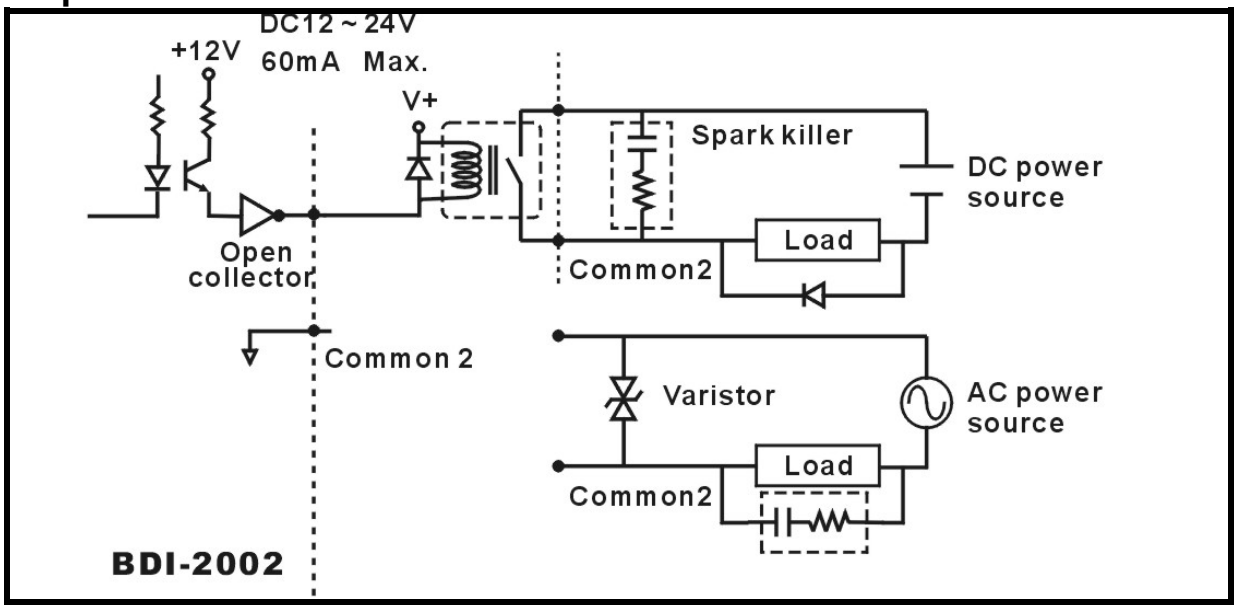
CODE INPUT			
Pin	Pin Name	Pin	Pin Name
1	1x1	6	2x10
2	2x1	7	4x10
3	4x1	8	8x10
4	8x1	9	Common
5	1x10		

◎ Control I / O

Input



Output



◎INPUT SCREW DESCRIPTION

Screw	Signal Name	Description
Pin 25	ZERO Input (Pulse input)	**BDI-2006** returns to the center of ZERO when the weighing device is empty
Pin 24	TARE Input (Pulse input)	**BDI-2006** switches to TARE mode, ZERO's the display and stores the TARE weight in memory.
Pin 23	TARE Reset (Pulse input)	TARE value is cleared to "0".
Pin 22	✓Built-In program Mode, start Batch Input	✓Batching will be started when Pin 22 is short-circuit to COM1
	✓Customer Program- control Mode set point "data" abort read input	✓When Pin 22 is short-circuit to COM1, BDI-2006 will stop receiving data from set points, keeping the previous data.
Pin 21	✓Built-In program Mode, Abort the Batch (Pulse Input)	✓When Pin 21 is short-circuit to COM1, the batch is aborted and FINISH signal is sent, and the NET weight will be accumulated.
	✓Customer Program- control Mode Automatic Free Fall Compensation command (Pulse input).	✓When Pin 21 is short-circuit to COM1, BDI-2006 will estimate the free fall value for the next batch, and the NET weight will be accumulated.
Pin 20	Print Accumulator	Accumulator will be printed when P20 short-circuited with COM1.
Pin 19	PRINT Input (pulse input)	When FC01, F203=3, F401=3, F302=2 shorted with COM1, Data will be sent one time.
Pin 18	Clear Accumulated Value and Count (pulse input)	If this command is accepted, all the accumulated weight and accumulated count will be cleared.
Pin 16 or 17	Input Common (COM1)	

◎OUTPUT SCREW DESCRIPTION

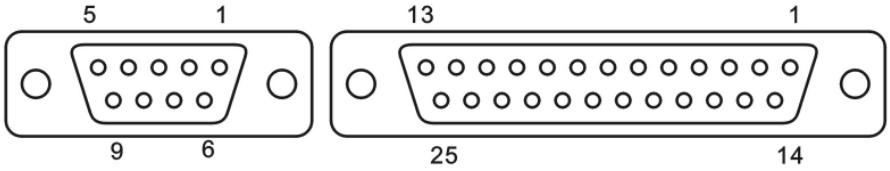
Screw	Signal Name	Description
Pin 13	ZERO BAND Output	GROSS Weight ≦ ZERO Band
Pin 12	SP1 Output	✓Batching Mode: NET Weight ≧ Final Weight– SP1 ✓Loss-in-weight Mode: GROSS Weight ＞ SP1
Pin 11	SP2 Output	NET Weight ≧ Final Weight– SP2
Pin 10	Free Fall Output	NET Weight ≧ Final Weight– Free Fall
Pin 9	HI Output	NET Weight ＞ Final Weight + HI
Pin 8	LO Output	NET Weight ＜ Final Weight – LO
Pin 7	FINAL Output	Built-In program Mode: send signal at Final.
Pin 6	Motion Detection / Error Output	✓ F105 = 0: Output at Stable; Shorted when motion. ✓ F105 = 1: ✓Error occurred, ✓over Zero Band range, or✓Over weight capacity or printer error.
Pin3. Pin4	Output 12V	
Pin 1. Pin2	Output Common	

§ 7-2 RS-232, RS-422/485

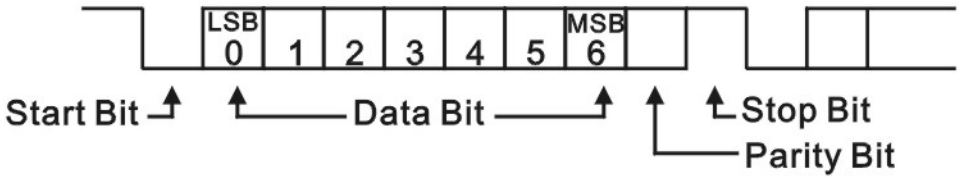
◎ SERIAL 〔RS-232〕		OP- 02
F 200	Baud Rate	1200 BPS,/ 2400 BPS ,/ 4800 BPS/ 9600 BPS/19200 BPS
F 201	Parity	Non-parity, Even Parity, Odd Parity
F 202	Output Data	Same as display/ Gross Weight/ NET Weight TARE Weight, Gross Weight, NET Weight, TARE Weight
F 203	Output Mode	Stream/ Stable and auto print/ Manual Print Mode/ Accumulate and Print / Command Mode
F 204	Output Format	Sending without Set point Code/ Sending with set point Code

◎OP-02

RS-232 **RS-232C**

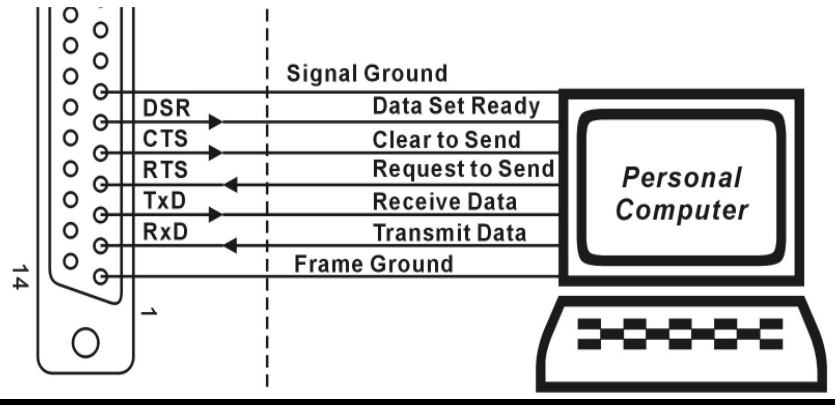


Specifications		
Type	EIA-RS-232C 12V	
Transmission	Half Duplex, Asynchronus Transmission	
Baud Rate	1200BPS、2400BPS、4800BPS、9600BPS	
Bit	8 bit non- parity	7 bit even parity, odd parity
Parity		
Stop Bit	1 bit	
Output Code	ASC II	



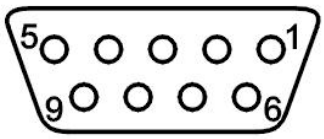
I/O Specifications

（1）25Pin D Shape



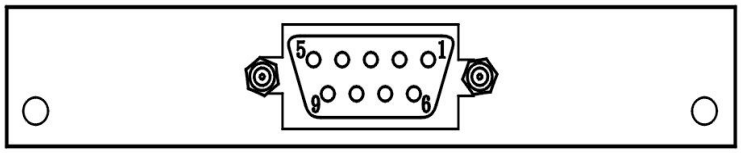
Pin	Name
Pin 1	FG
Pin 2	R xD
Pin 3	T xD
Pin 4	RTS
Pin 5	CTS
Pin 6	DSR
Pin 7	SG

（2）9Pin D shape

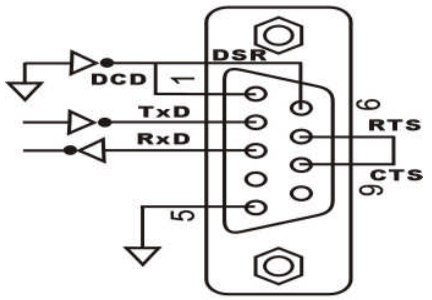


Pin	Name
Pin 2	TxD (Transmit Data)
Pin 5	SG (Signal Ground)

＊ OP-02A1



I/O Specifications



Pin	Name
Pin 1	DCD
Pin 2	T ×D
Pin 3	R ×D
Pin 5	Signal Ground
Pin 6	DSR
Pin 7	RTS
Pin 8	CTS

＊ OP-02B

Specifications		
Type	EIA-RS-232C 12V	
Transmission	Half Duplex, Asynchronus Transmission	
Baud Rate	1200BPS、2400BPS、4800BPS、9600BPS	
Bit	8 bit non- parity	7 bit even parity, odd parity
Parity		
Stop Bit	1 bit	
Output Code	ASC II	

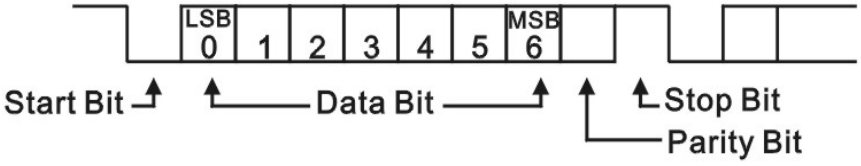
RS-422 Specifications

（1）Type：EIA-RS-422　　（2）Transmission：Half Duplex, Asynchronus

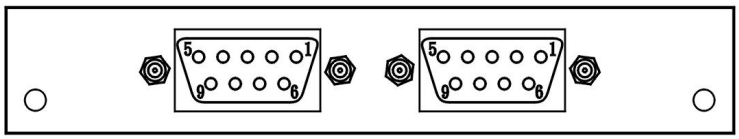
（3）Baud Rate：1200、2400、4800、9600、19200BPS　　（4）Bit：7 bit

（5）Parity：Odd parity、Even parity　　（6）Stop bit：1 bit

（7）Output code：ASCⅡ

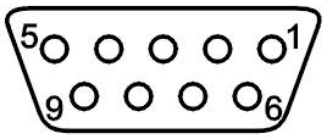


＊ OP-02B RS-422



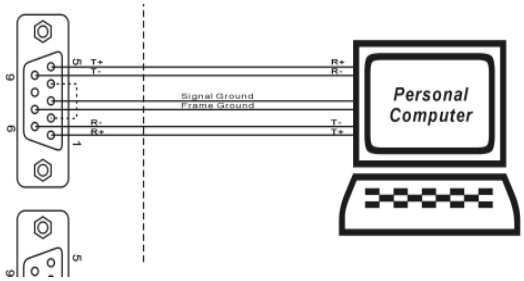
	RS-422
1	R+＞R−
0	R+＜R−

Pin assignment



Pin	Name	Pin	Name
1	R+	6	R−
2	100Ω	7	Frame Ground
3	Signal Cround	8	54Ω
4	Terminal	9	T−
5	T+		

Specification



Serial Interface【OP-02】Data format

Format 1

C	D	,	0	1	,	S	T	,	N	T	,	+		5	4	3	2	•	1	k	g	Cr	Lf

≤CODE ≤ Code number ≤Header 1 ≤ Header 2 ≤ Data (8 digits in length) ≤ UNIT

※HEADER 1		
O	L	□ Over Max. Capacity or under Min. Capacity
S	T	□ STABLE
U	S	□ UNSTABLE

※HEADER 2		
N	T	□ NET
G	S	□ GROSS
T	R	□ TARE

※UNIT		
k	G	□ Kilogram
l	B	□ Pound

ASCII data characters

“ **0** ” ~ “ **9** ”

“ ” **Space（20H）**

“ **•** ” **Decimal Point（2EH）**

“ — ” **Minus（2DH）**

“ + ” **Plus（2BH）**

※Command List Table

Sending Command to BDI-2006	BDI-2006 response
R Cr Lf 〈READ〉	Sending latest data once (Data format depends on F202)
Z Cr Lf 〈ZERO〉	BDI-2006 display will ZERO. Z Cr Lf will be sent by BDI-2006.
T Cr Lf 〈TARE〉	BDI-2006 will go to NET Mode and display will TARE. T Cr Lf will be sent by BDI-2006.
N Cr Lf 〈NET〉	BDI-2006 will go to NET Mode. N Cr Lf will be sent by BDI-2006.
G Cr Lf 〈GROSS〉	BDI-2006 will go to GROSS Mode. G Cr Lf will be sent by BDI-2006.

*If an invalid character is received ? Cr Lf will be sent by the BDI-2006

*If the commands are not accepted for any reason：I Cr Lf will be sent by the BDI-2006

Sending Command to **BDI-2006**	**BDI-2006** response
BB Cr Lf ＜BEGIN BATCHING＞	Send back signal “BB”. “BB” can only be received in the Built in Automatic Program Control Mode
HB Cr Lf ＜HALT BATCHING＞	Send back signal “HB”. “HB” can only be received in the Built in Automatic Program Control Mode
RF Cr Lf ＜READS FINAL NET＞	Sending Final NET weight. If B Cr Lf is send by BDI-2006, that means batching is still in process.
S Cr Lf ＜SETPOINT＞	Signal “S Cr Lf” will send back by BDI-2006. BDI-2006 will send back SET POINT CODE until totally receive SET POINT CODE data.
SS ×× Cr Lf ＜SET SETPOINT＞	SS XX Cr Lf will send back by BDI-2006. BDI-2006 will send back SET POINT values until totally receive SET POINT values.
RS ×× Cr Lf ＜READ SET POINTS＞	BDI-2006 receives signal “RS xx Cr Lf”, and read xx set point value.
SA Cr Lf ＜SET ACCESSORIES＞	BDI-2006 will send back signal “SA Cr Lf”. BDI-2006 will send back ZERO band data until totally receive Zero Band Value.
RA Cr Lf ＜READ ACCESSORIES＞	BDI-2006 receives signal “RS xx Cr Lf”, and read xx Zero Band Value.
CC ×× Cr Lf ＜CODE CHANGE＞	BDI-2006 will send back signal “CCXX Cr Lf” and send back ZERO band data (F106＝3)

※Command Format SSXX Cr Lf

6	5	4	3	2	1	4	5	6	7	8	9	0	2	3	4	5	6

□Final □SP1 □SP2

1	2	3	4	1	2	3	4	1	2	3	4	Cr	Lf

□ Free Fall □ HI □LO

※Command Format SA Cr Lf

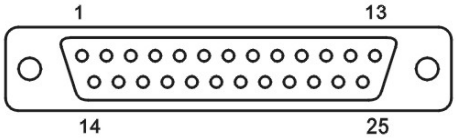
0	0	3	4	5	6	Cr	Lf

Zero Band Range

§ 7-3 PRINTER INTERFACE (INCLUDING DATE AND TIME)

◎PRINTER		OP-03
F 300	Setting Date, Time	Setting Year. Month, day, hour, minute, second
F 301	Data Format	
	Date	Not print / Only print above the latest data / Print on all
	Time	Not print / Only print above the latest data / Print on all
	Set	Not print / Only print above the latest data / Print on all
	Serial Number	Not print / Print
	Weight	Same as display / Gross Weight / NET Weight / TARE Weight / Gross Weight, NET Weight, TARE Weight / Gross Weight, TARE Weight, NET Weight
	Unit	Not print / Only print above the latest data according to F001/ Only print the latest data “g” / Only print above the latest data ”t” / Print on all according to F001/ Print on all “g” / Print on all “t”
F302	Accumulation	
	Date	Not print / Print once
	Time	Not print / Print once
	Count	Not print / Print once
F 303	Output Mode	Stable and auto print / Manual Print Mode / Accumulate and Print
F 304	Select Printer	MINI Printer / Normal Printer

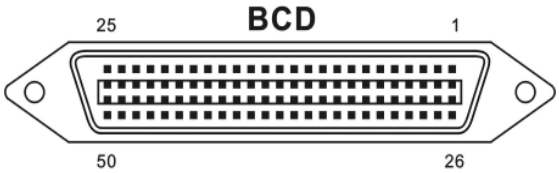
◆**PIN ASSIGNMENTS**:



PIN	PIN NAME	PIN	PIN NAME
1	/STROBE	14	NC
2	DATA1	15	/ERROR
3	DATA2	16	/INIT
4	DATA3	17	NC
5	DATA4	18	NC
6	DATA5	19	NC
7	DATA6	20	GROUND
8	DATA7	21	GROUND
9	DATA8	22	GROUND
10	/ACKNLG	23	GROUND
11	NC	24	GROUND
12	NC	25	GROUND
13	NC		

§ 7-4 PARALLEL BCD INTERFACE

◎ BCD OP-04		
F 400	Data type	Same as display Gross data NET data TARE data
F 401	Output Mode	Stream Stable and print Manual print mode Accumulate and print
F 402	Output Logic	Positive Logic Negative Logic



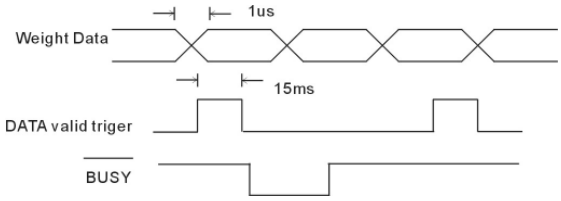
Pin	Pin Name	Pin	Pin Name
1	GROUND	**26**	NC
2	1×1	**27**	Hi＝NET，Lo＝GROSS
3	2×1	**28**	NC
4	4×1	**29**	NC
5	8×1	**30**	NC
6	1×10	**31**	NC
7	2×10	**32**	NC
8	4×10	**33**	Lo＝MOTION
9	8×10	**34**	1×1 CODE
10	1×100	**35**	2×1 〃
11	2×100	**36**	4×1 〃
12	4×100	**37**	8×1 〃
13	8×100	**38**	1×10 〃
14	1×1000	**39**	2×10 〃
15	2×1000	**40**	4×10 〃
16	4×1000	**41**	8×10 〃
17	8×1000	**42**	Lo＝Negative Polarity
18	1×10000	**43**	/ Decimal Point 1
19	2×10000	**44**	/ Decimal Point 2
20	4×10000	**45**	/ Decimal Point 3
21	8×10000	**46**	/ Decimal Point 4
22	1×100000	**47**	Hi＝Overload
23	2×100000	**48**	NC
24	4×100000	**49**	PRN 1
25	8×100000	**50**	/ Busy（input）

※OPEN COLLECTOR TYPE

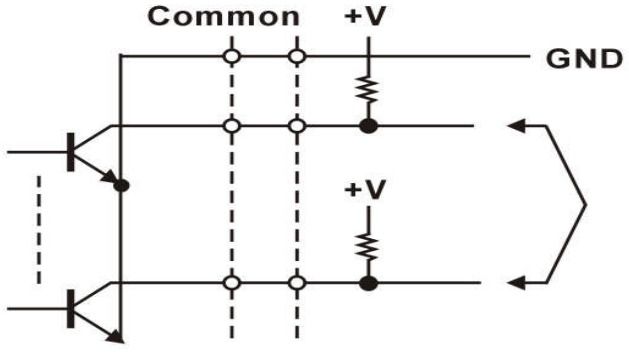
Maximum Voltage：30V

Maximum Current：24mA

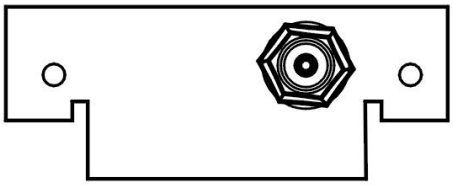
※ Please add a pull-up resistance if connected to a TTL LOGIC.



BDC OUTPUT LAYOUT:



§ 7-5 ANALOG OUTPUT



◎ **Analog Output**		
F 500	Analog Output Data	① Output 4~20 mA ② Output 0~+10 V
F 501	Output Mode	①Same as display ✱Gross data ✛NET data
F 502	Loss-in-weight Absolute Value	①Not read Absolute Value ② BDI-2006 reads Absolute Value
F 503	Output current when display ZERO	0.0mA through 9.99mA (Initial 0.40mA)
F 504	Output current at Full Capacity	0.0mA through 9.99mA (Initial 20.0mA)
F 505	Output Volt when display ZERO	-2.5V through +59.9V (Initial 00.0 V)
F 506	Output Volt at Full Capacity	-2.5V through +59.9V (Initial 10.0 V)

OP-5 OUTPUT 4 ~ 20 mA Specifications

Output Level	4~20 mA effective range. Output range is approximately 2 to 22 mA
Resolution	More than 1 / 1000
Temperature Coefficient	±(0.015 % / ℃ of rdg + 0.01mA) /℃
Maximum	500Ω Maximum

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

ⓘ 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 :

$W = (0.02)^2 \times 500 = 0.2$ when the Output Current is set to 0.2mA

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 "0.2" and thus, the 500Ω resistor is adequate.

Setting Output Current

$I_{OUT} = I_Z + (\text{weight} / \text{capacity}) * (I_M - I_Z)$ (if $2 <= I_{OUT} <= 22$ mA)

I_{OUT}: Output Current

I_Z: Output at ZERO (F501)

I_M: Output at Maximum Capacity (F502)

Example: A weighing system has a Maximum Capacity of 10,000kg. If you need the Output current to be 4mA at ZERO display, and 20mA at 1/2 Maximum Capacity then:

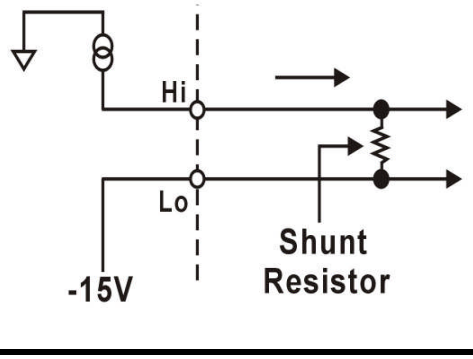
I_M = capacity / simulated) $\times(I_{OUT} - I_Z) + I_Z$

I_M = 10000 / 5000 $\times$(20 mA $-$4 mA) $+$4 mA = 36 mA

When Output at Full Scale is set at 36mA, and Output Current at Display ZERO is set at 4mA, then at 1/2 Capacity (5000kg) the Output Current will be 20mA.

NOTE: The Maximum Output will be saturated at 22mA.

OP-05 OUTPUT LAYOUT:



*OP-6 ANALOG OUTPUT 0～10V

Output Level	0~+10 V effective range. Output range is approximately -1.25~11.25 V
Resolution	More than 1 / 1000
Temperature Coefficient	±(0.015 % / ℃ of rdg + 0.01mA) /℃
Minimum	5 KΩ Minimum

If you add a 10 KΩ 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:

$W = V^2/R$ where

W: Power

V: Output Voltage

R: Resistor

Setting Output Voltage

$V_{OUT} = V_Z + (\text{weight} / \text{capacity}) * (V_M - V_Z)$ (if $0 <= V_{OUT} <= 10$ V)

V_{OUT}: Output Voltage

V_Z: Output at ZERO (F505)

V_M: Output at Maximum Capacity (F506)

NOTE: The Maximum Output will be saturated at 11.25.