



BST106-B11/B21/C11/C21 Weighing Controller

For: Hopper Scale / Platform Scale
Ration Feeding Scale with Single-Material&Single-speed Feeding
Ration Batching Scale with 3-Material&Double-speed Feeding

Operation Manual V7.2

Changsha Supmeter Technological Co.,Ltd.

Preface

Thank you very much for your purchase!

This manual covers safety precaution, technical specification, operation interface, installation& connection, function&operation and so on. In order to make the product running at its best, please read this manual in advance, and reserve it for the future reading.

The technology update, function enhancement and quality improvement may lead to some differences between this manual and the physical product, please understand.

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Main Features:

- ✧ Suitable for Hopper Scale, Platform Scale, Ration Feeding Scale with Single-material & Single-speed Feeding and Ration Batching Scale with 3-Material & Double-speed Feeding.
- ✧ EMC design with high anti-jamming capability, suitable for industrial environment.
- ✧ Model LED: 6 Red LED digital tubes for English character and digit display; 64-segment LED for percent display.
- ✧ Model VFD: 6 Green VFD digital tubes for English character and digit display.
- ✧ Optional English keypad, Simplified Chinese keypad and Complex Chinese keypad.
- ✧ Menu&Shortcut mode operation with key tone.
- ✧ 24-bit High-precision and high-speed Σ - Δ A/D conversion module with 1/1,000,000 internal resolution and sampling frequency 200Hz.
- ✧ Special anti-vibration digital filtering algorithm for ensuring the weighing stability and accuracy when there is strong vibration on the load receptor, and the rapid response capability when the weight signal changes.
- ✧ Max. Connection Quantity: 8 Loadcells (350 Ω).
- ✧ Auto Zero Initial Calibration after Power-on, Auto Zero Tracking, Zero Fine Adjustment, Zero Calibration and Load Calibration functions available.
- ✧ Optional Data Calibration function.
- ✧ Auto-locking, Key-locking, Key-unlocking, Digital Setting&Calibration and I/O Testing functions available.
- ✧ 1 Optional and definable analog signal output [AO: 4~20mA].
- ✧ 3 Normally open switch inputs [DI] and 4 normally open relay switch outputs [DO].
- ✧ 2 Optional communication ports for connecting Host IPC/PLC, LED Remote Display, Serial Printer and Wireless Module.
- ✧ Hopper Weighing Report, Ration Feeding Report and Ration Batching Report can be printed.
- ✧ With the multitasking mode, the weighing&control process will not be interrupted by parameter setting and the other operations.

Model Panel-mounting [DC24V/AC220V]: B11[LED], C11[VFD]

Model Wall-mounting [DC24V&AC220V]: B21[LED], C21[VFD]

Model Explosion-proof [DC24V&AC220V]: B21EX[LED], C21EX[VFD]

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1. Safety Precaution

● Lithium Battery Installation

A Lithium battery should be equipped in the product. If it is not allowed to be transported together with the product because of embargo, please make a purchase according to the model offered by us and install it by yourself.

● Application environment

Make sure that this product works under the environment where is accord with the technical specifications. Do not open the shell before power-off.

● Avoid using the product under overheated environment

Make sure that the product works under the environment with allowed temperature range to get good performance and long working life.

Please keep the product away from direct sunlight. If it is installed in a cabinet, please install cooling fans on the top of the cabinet.

● Controller Grounding Protection

The product, as a low-voltage equipment, should be kept away from the high-voltage equipments.

For avoiding bodily injury from electric shock accident and keeping the product separate from strong interference, the metal shell of the product should be grounded directly and the ground resistance should be less than 4Ω .

● Scale Frame Grounding Protection

For avoiding bodily injury from electric shock accident and keeping the loadcells separate from strong interference, the scale frame should be connected with the electronic scale grounding net and the ground resistance should be less than 4Ω .

● Cable Laying

Weighing signal, analog signal and communication signal cables should be laid in pipes, and do not lay them together with power cables.

● Power Supply

Please make sure that the inputted voltage is correct before power-on.

If the voltage fluctuation exceeds the allowed range, please use a power stabilizer to get a stable voltage supply.

● Environmental Protection

Before the Lithium battery equipped in the product being discarded, please insulate its positive or negative pole, do not put it into fire.

Although the product is made of the lead-free components, after used in the industrial environments, it's possible to be polluted. So, while being discarded as worthless, the product should be processed lawfully as leady industrial waste for environment protection.

● Other Notes

The installation, wiring and maintenance should be operated by the engineers with the relevant professional knowledge and safety operation ability. Although being not described in this manual, the relevant safety operating procedures and standards should be followed.

2. Technical Specification

- Executing Standard
 - ✧ CMC GB/T 7724-2008 《Electronic Weighing Meter》 PRC National Standard.
 - ✧ OMIL R76: 2006 《Non-automatic Weighing Instruments》 International Recommendation.
 - ✧ Accuracy Grade: III .
 - ✧ Number of Verification Intervals: 5,000.
 - ✧ Static Weighing Accuracy: 0.2‰.
- Display
 - ✧ Model LED: 6 Red LED digital tubes for English character and digit display; 64-segment LED for percent display.
 - ✧ Model VFD: 6 Green VFD digital tubes for English character and digit display.
 - ✧ Weight Display Range: -99,999~+99,999.
 - ✧ Scale Capacity: Setting Range 1~99,999.
 - ✧ Scale Division: Optional 1, 2, 5, 10, 20, 50, 100, 200, 500.
 - ✧ Display Resolution: 1/100,000.
 - ✧ Weight Unit: Optional kg, t, g, none.
 - ✧ Decimal Point: Optional 0, 0.0, 0.00, 0.000, 0.0000.
 - ✧ Display Refreshing Time: Setting Range 0.01~1.00s.
- Keypad
 - ✧ Optional 6-key English keypad, Simplified Chinese keypad and Complex Chinese keypad.
 - ✧ Menu&Shortcut operation with key tone.
- Loadcell Interface
 - ✧ Excitation Voltage/Max. Current: DC10V/250mA [8-350Ω loadcells].
 - ✧ Signal Input Range: 0~25mV.
 - ✧ Output Sensitivity of Loadcell: 1.0~2.5mV/V.
 - ✧ 24-bit Σ - Δ ADC with internal resolution 1/1,000,000.
 - ✧ Sampling Frequency: 200Hz.
 - ✧ Special anti-vibration digital filtering algorithm.
 - ✧ Zero Drift: $\pm 0.1\mu\text{V}/^{\circ}\text{C}$ RTI (Relative to Input).
 - ✧ Gain Drift: $\pm 5\text{ppm}/^{\circ}\text{C}$.
 - ✧ Non-linearity: 0.005%FS.
- Switch&Analog Signal Interface
 - ✧ 3 Normally Open Switch Inputs [DI].
 - ✧ 4 Normally Open Relay Switch Outputs [DO]: AC250V/DC24V, 1A.
 - ✧ 1 Optional&Definable Analog Signal Output [AO]: 4~20mA, Non-linearity: 0.05%FS.
- Digital Communication Interface
 - ✧ COM1: Fixed configuration RS232&RS485. Free to use one of them.

- ✧ COM2: Optional RS232/RS485/RS422/Profibus-DP/Ethernet modules.
- ✧ Connectable: Host IPC/PLC, LED Remote Display, Serial Printer and Wireless Module.

□ Report Print

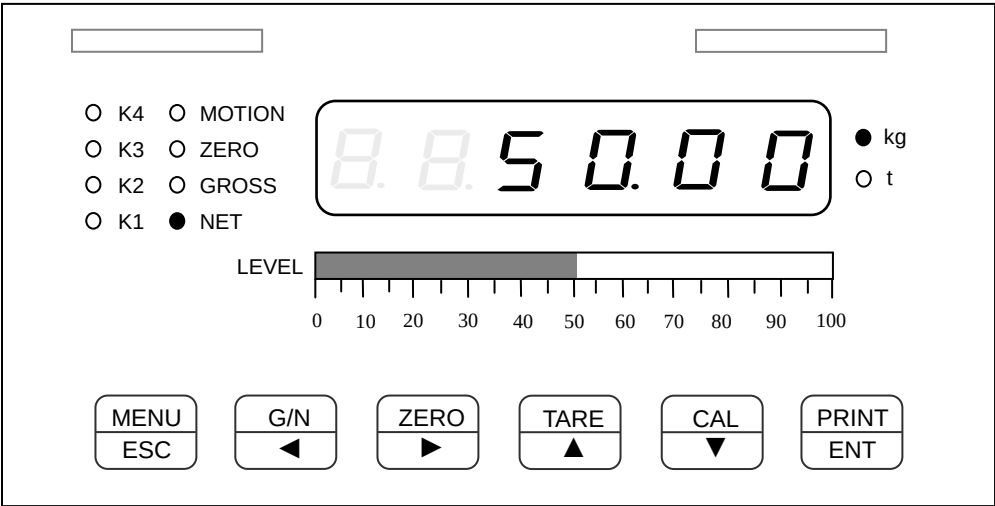
- ✧ Hopper Weighing Report, Ration Feeding Report and Ration Batching Report can be printed.

□ Operating Specification

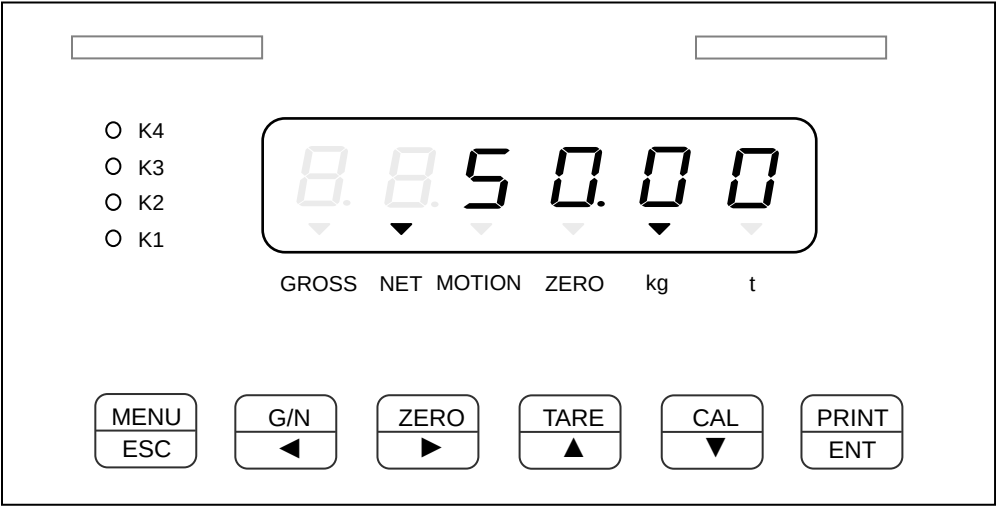
- ✧ Optional Operating Voltage
 - Operating Voltage 1: DC24V±20%.
 - Operating Voltage 2: AC220V±15%, 50/60Hz.
 - Model Panel-mounting: Free to configure one of them.
 - Model Wall-mounting / Model Explosion-proof: Free to use one of them.
- ✧ Max. Power Consumption: 10W.
- ✧ Outline Size
 - Model Panel-mounting [DC24V]: 170×91×184mm [W×H×D].
 - Model Panel-mounting [AC220V]: 160×84×188mm [W×H×D].
 - Model Wall-mounting: 202×305×90mm [W×H×D].
 - Model Explosion-proof: 340×390×205mm [W×H×D].
- ✧ Panel Cut-out Size
 - Model Panel-mounting: 151×76mm [W×H].
- ✧ Operating Temperature: -25℃ to +40℃.
- ✧ Storage Temperature: -30℃ to +60℃.
- ✧ Relative Humidity: Max. 85%RH.
- ✧ Application Environment of Model Explosion-proof
 - Explosion gas environment: Zone 1&2.
 - Classes of explosion gas mixture: IIA, IIB.
 - Temperature grades of explosion gas mixture: T1~T6.
 - Ex-mark: Ex d IIB T6 Gb.
- ✧ Protection Level
 - Front Panel of Model Panel-mounting: IP65.
 - Model Wall-mounting: IP65.
 - Model Explosion-proof: IP65.
- ✧ Weight
 - Model Panel-mounting: Approx. 1.5kg.
 - Model Wall-mounting: Approx. 3.4kg.
 - Model Explosion-proof: Approx. 19.2kg.

3. Operation Interface

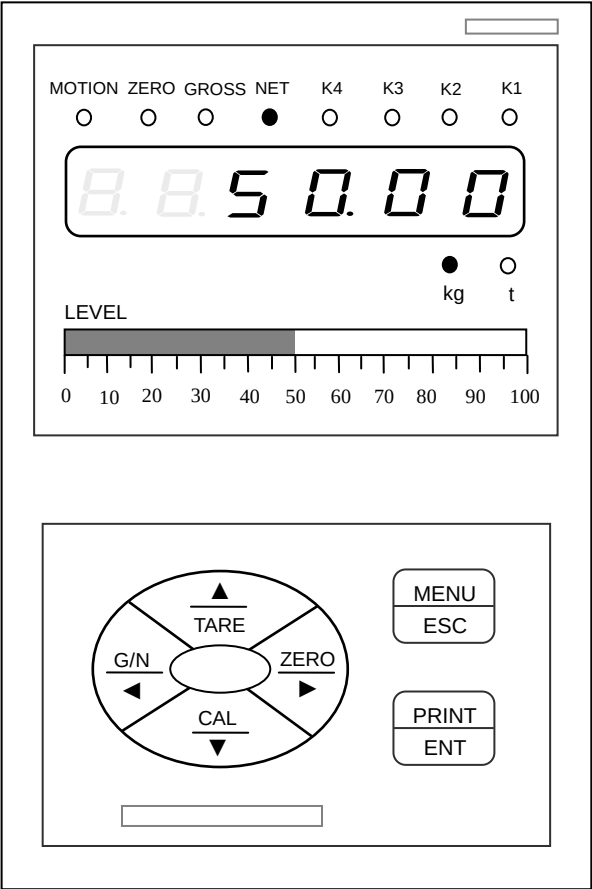
3.1 Model LED Panel-mounting Operation Interface



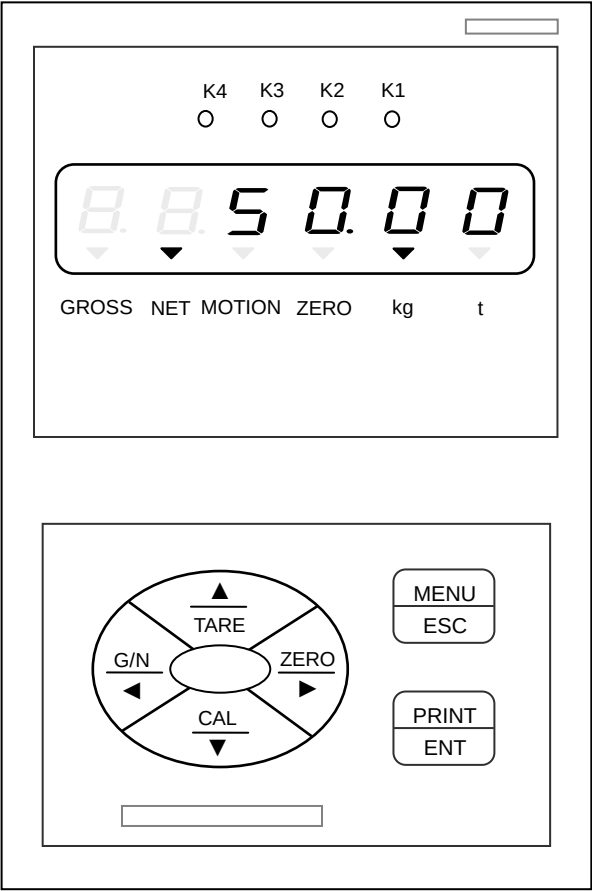
3.2 Model VFD Panel-mounting Operation Interface



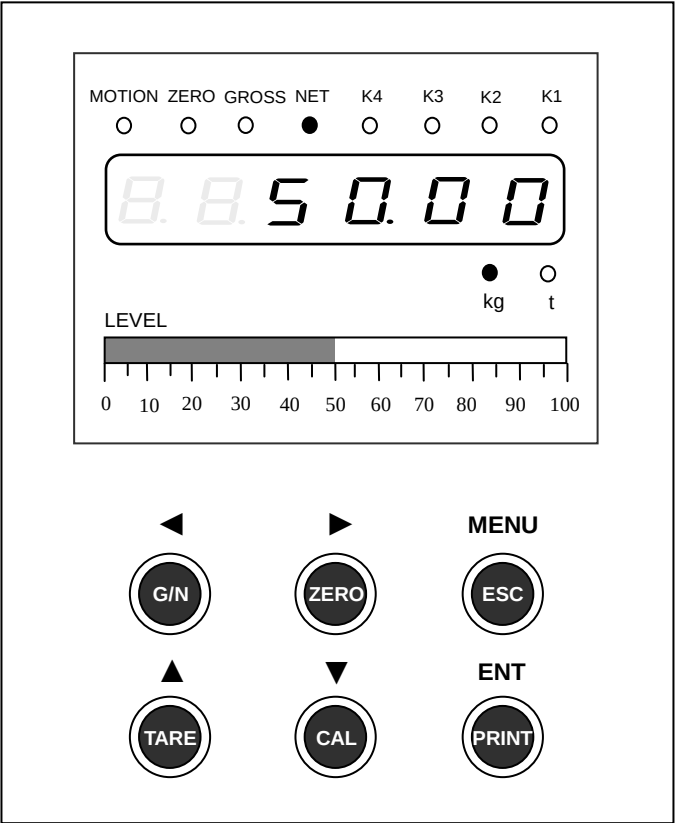
3.3 Model LED Wall-mounting Operation Interface



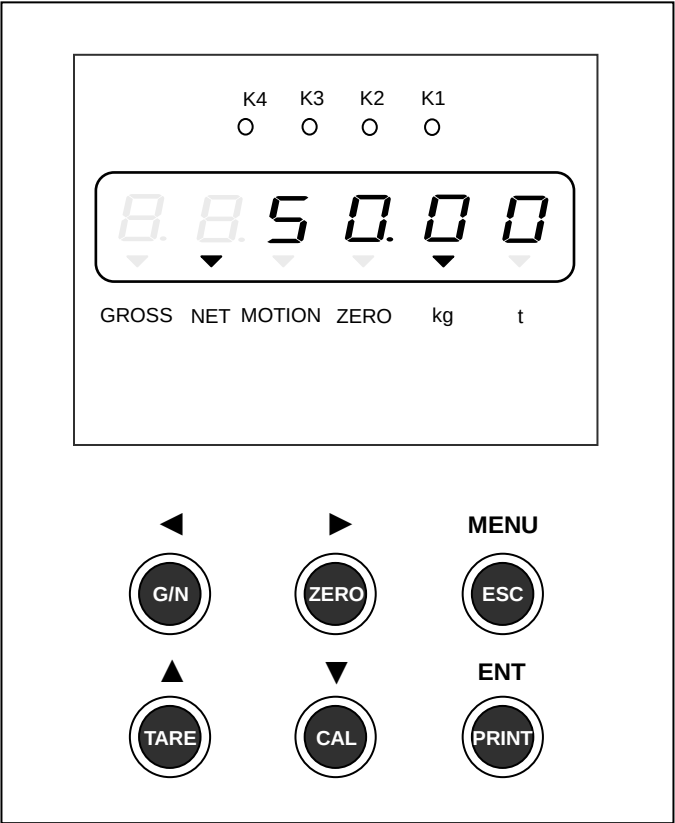
3.4 Model VFD Wall-mounting Operation Interface



3.5 Model LED Explosion-proof Operation Interface



3.6 Model VFD Explosion-proof Operation Interface



3.7 Keypad Operation

If there is not any keypad operation in one minute and it's not in the processes of 'F2 Calibration' & 'F6 Factory Adj.', the controller will return to 'Main Display Interface' automatically.

Menu Operation	
Key Name	Description
【MENU】	Enter Main Menu.
【ESC】	Exit.
(【LOCK】)	Keep it pressed for 2 seconds: Key-locking / Key-unlocking.
【ENT】	Enter/Save/Alarm Acknowledge.
【◀】	Cursor shifts left.
【▶】	Cursor shifts right.
【▲】	Display the previous option. Digit input: +1.
【▼】	Display the next option. Digit input: -1.
Quick Operation	
【G/N】	APL0 Hopper Weighing Mode: Gross Weight / Net Weight display switch.
	APL1 Ration Feeding/Batching Mode: Gross Weight / Net Weight / Feeding Weight display Switch.
	✧ [A./b./c.]: Feeding Weight of Material M1/M2/M3.
	✧ [t.]: Total Feeding Weight.
【ZERO】	✧ [-ZEro-]: Zero Calibration with Power-down Protection and Clearing Tare Weight.
	✧ [≡ZEro≡]: Zero Fine Adjustment without Power-down Protection and without Clearing Tare Weight.
	✧ The controller will switch to Gross Weight display.
【TARE】	✧ [≡tArE≡]: Manual Tare without Power-down Protection.
	✧ [-PStr-]: Preset Tare Weight with Power-down Protection.
	✧ [-rStr-]: Clear Tare Weight with Power-down Protection.
	✧ The controller will switch to Net Weight display.
【CAL】	✧ [-LoAd-]: Load Calibration.
【▲】【▼】*	* Keep it pressed for 2 seconds: Setpoint parameters setting.
【PRINT】	Print Weighing/Batching Report.

3.8 State Indication

LED light	Description
[K1~K4]	DO1~DO4 turns on.
[GROSS]	Gross Weight value and Percent display. Gross Weight Percent = (Gross Weight / Max. Capacity)×100%.
[NET]	Net Weight value and Percent display. Net Weight Percent = (Net Weight / Max. Capacity)×100%.
[MOTION]	Weight Dynamic Changing: Weight Variance per [107] 'Stablity Judging Time' is exceeding [106] 'Stablity Judging Range'.
[ZERO]	Net Weight value ≤ Non-load Zero Range.
[kg/t]	Weight Unit.

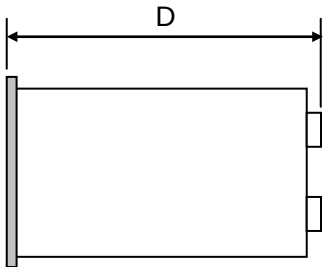
3.9 Alarm Sign

Sign	Alarm Cause	Solution
Err1	RAM Failure.	Replace the chip RAM.
Err2	EEPROM Failure.	Replace the chip EEPROM.
Err3	Signal reversed or not connected.	Connect the loadcell correctly.
Err4	ADC Failure.	Replace the ADC module.
oV-Ad	Over ADC Range.	Weighing signal exceeds A/D conversion range. 1. Check if the loadcell is connected. 2. Check if the capacity of loadcell is too small. 3. Check if the loading weight is too big.
oL	Overload Alarm.	Gross Weight > (Scale Capacity + 9 × Scale Division). 1. Check if the loadcell is connected. 2. Check if the capacity of loadcell is too small. 3. Check if the loading weight is too big.
oV-tr	Not meet the condition of Maunal Tare.	When Gross Weight is at the state with negative value display, overload alarm or dynamic variation, 'Manual Tare' will be invalid.
oV-nZ	Over 'Zero Fine Adjusting Range'.	Refer to parameter [123] 'Zero Fine Adjusting Range'.
HtXX.XX	Preheating Time Countdown [min.sec].	Refer to parameter [128] 'Auto Zero Initial Calibration after Power-on', [129] 'Auto Zero Initial Calibrating Time' and [130] 'Auto Zero Initial Calibrating Range'. Wait for the preheating time over or press any key to exit.
oV-Zr	Over 'Auto Zero Initial Calibrating Range'.	
no-Prt	Print port is not defined.	Refer to 'Communication Parameters'.

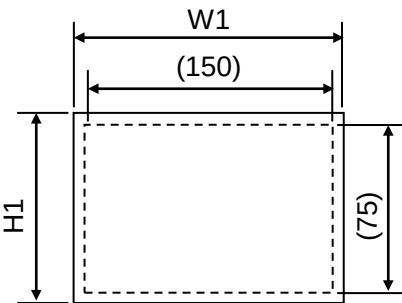
4. Installation&Connection

4.1 Installation

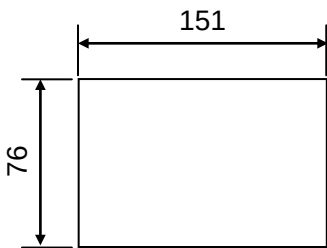
4.1.1 Model Panel-mounting Installation



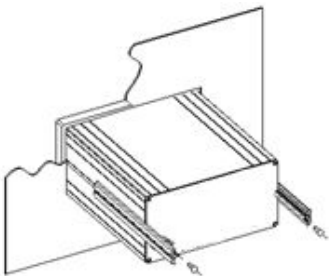
Outline Size



Front Panel Size



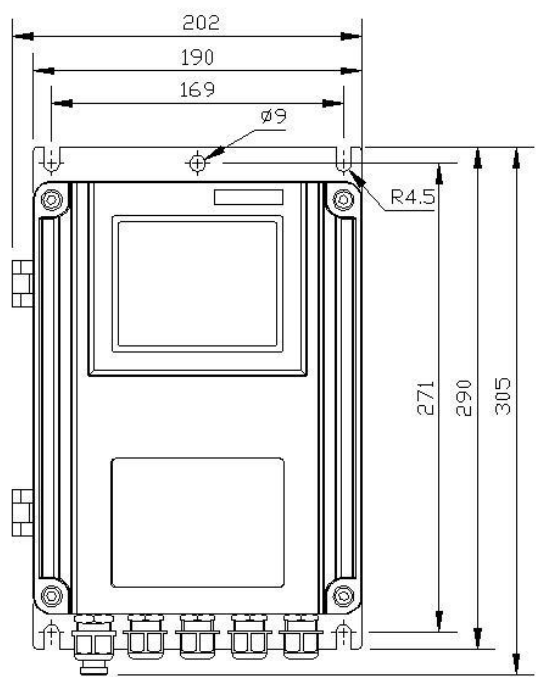
Panel Cut-out Size



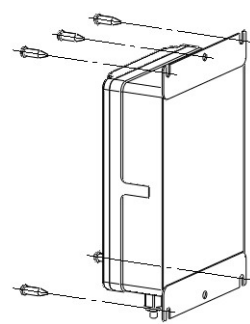
Installation Mode

Model	Outline Size W×H×D [mm]	Front Panel Size W1×H1 [mm]	Box Body Size W×H [mm]	Panel Cut-out Size W×H [mm]
DC24V	170×91×184	170×91	150×75	151×76
AC220V	160×84×188	160×84	150×75	151×76

4.1.2 Model Wall-mounting Installation



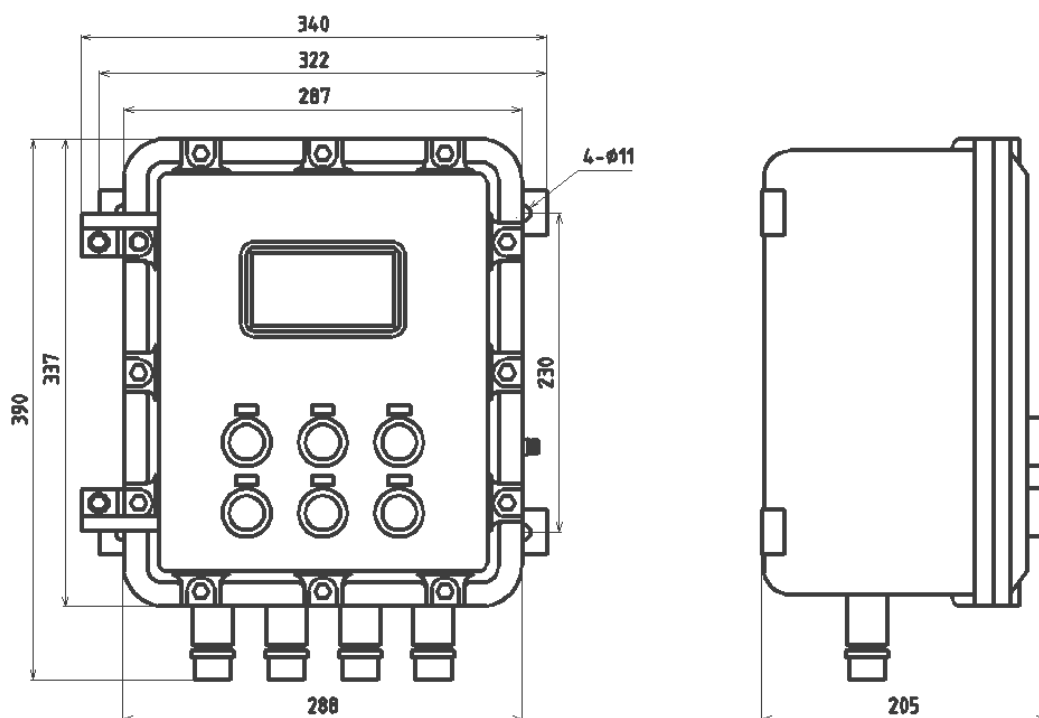
Outline Size



Installation Mode

Outline Size W×H×D[mm]	Mounting Size W×H[mm]	Mounting Hole Size [mm]
202×305×90	169×271	Φ9

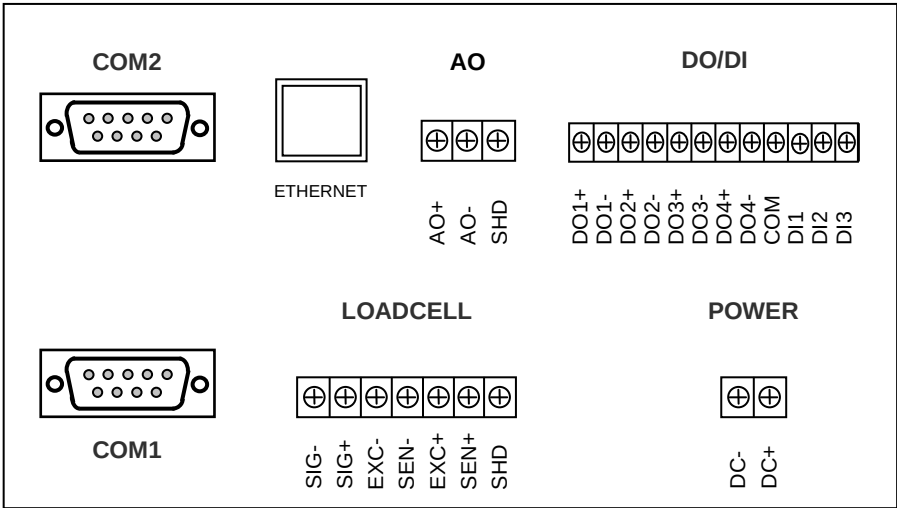
4.1.3 Model Explosion-proof Installation



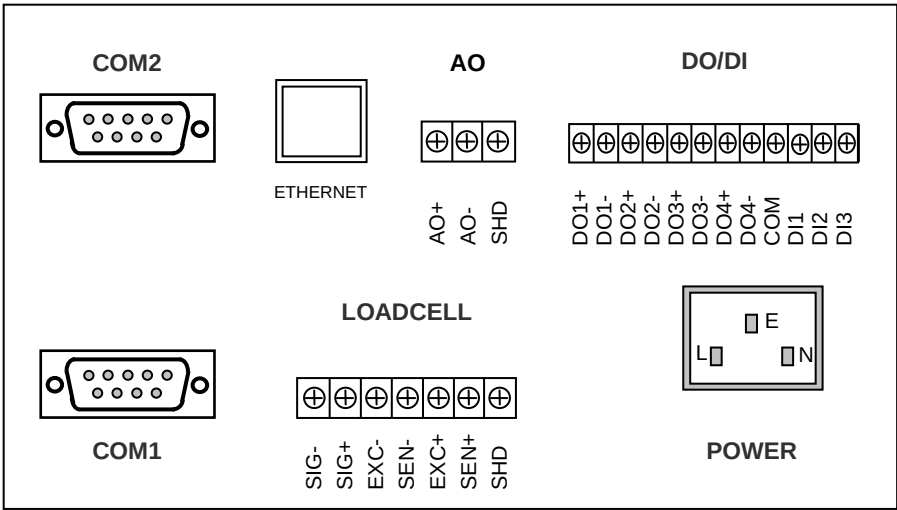
Outline Size W×H×D[mm]	Mounting Size W×H[mm]	Mounting Hole Size [mm]
340×390×205	288×230	Φ11

4.2 Terminal

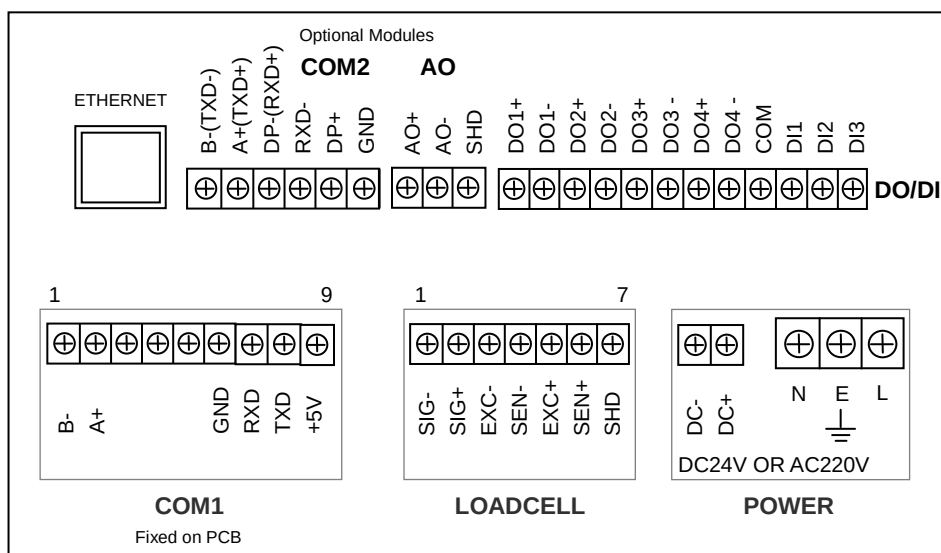
4.2.1 Model Panel-mounting [DC24V] Terminal



4.2.2 Model Panel-mounting [AC220V] Terminal



4.2.3 Model Wall-mounting / Model Explosion-proof [DC24V&AC220V]Terminal



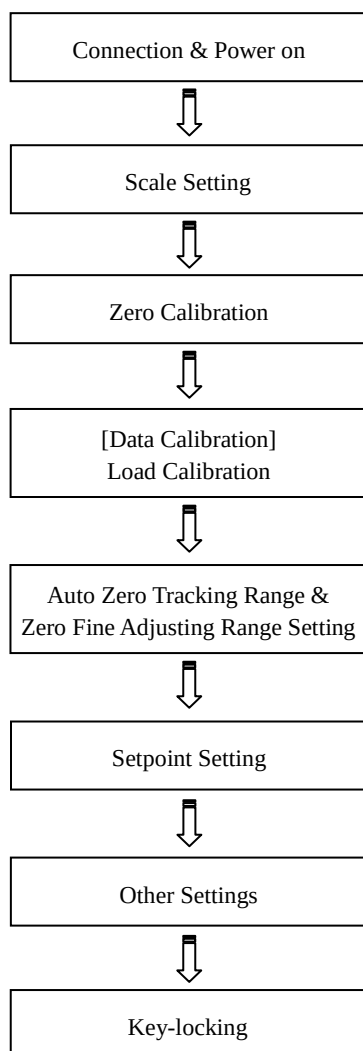
No.	Pin	Description	
LOADCELL		Loadcell Port	
Connection Mode		6-Wire	4-Wire
Internal Dip Switch DIP1/S3		DIP1/S3→ 【6-WIRE】	DIP1/S3→ 【4-WIRE】 [Default Set]
1	SIG-	Weighing Signal [mV] Input -.	Weighing Signal [mV] Input -.
2	SIG+	Weighing Signal [mV] Input +.	Weighing Signal [mV] Input +.
3	EXC-	Excitation Voltage -.	Excitation Voltage -.
4	SEN-	Feedback Voltage -.	
5	EXC+	Excitation Voltage + [DC10V].	Excitation Voltage + [DC10V].
6	SEN+	Feedback Voltage +.	
7	SHD	Shield Ground.	Shield Ground.
POWER		Power Input Port	
DC24V		DC24V[±20%] Power Input	
1	DC-	DC Input -.	
2	DC+	DC Input +.	
AC220V		AC220V[±15%] Power Input	
1	N	Null Wire.	
2	E	Protective Ground.	
3	L	Live Wire.	
The metal shell should be grounded directly to avoid electric shock.			

Digital Communication Port of Model Panel-mounting					
No.		Pin		Description	
COM1		RS232/RS485 Digital Communication Port			
		[Free to use one of them]			
DB9 Socket		RS232		RS485	
1	B-			Data -.	
2	A+			Data +.	
3					
4					
5	GND	Signal Ground / Shield Ground.		Shield Ground.	
6	TXD	Transmit Data.			
7	RXD	Receive Data.			
8					
9	+5V	+5V/100mA Output.		+5V/100mA Output.	
COM2		RS232/RS485/RS422/Profibus-DP/Ethernet Digital Communication Port			
		[It's optional to configure one of them]			
DB9 Socket		RS232	RS485	RS422	Profibus-DP
1			B-	TXD-	
2		RXD	A+	TXD+	
3		TXD		RXD+	DP- [B-]
4				RXD-	
5		GND	GND	GND	GND
6					
7					
8					DP+ [A+]
9					
RJ45[DCE] Socket		Ethernet			
		[T568B Wiring Mode]			
1	RXD+	Orange-white			
2	RXD-	Orange			
3	TXD+	Green-white			
4	Unused	Blue			
5	Unused	Blue-white			
6	TXD-	Green			
7	Unused	Brown-white			
8	Unused	Brown			

Digital Communication Port of Model Wall-mounting & Model Explosion-proof					
No.	Pin	Description			
COM1		RS232/RS485 Digital Communication Port [Free to use one of them]			
Wiring Terminal		RS232		RS485	
1	B-			Data -.	
2	A+			Data +.	
3					
4					
5					
6	GND	Signal Ground / Shield Ground.		Shield Ground.	
7	RXD	Receive Data.			
8	TXD	Transmit Data.			
9	+5V	+5V/100mA Output.		+5V/100mA Output.	
COM2		RS232/RS485/RS422/Profibus-DP/Ethernet Digital Communication Port [It's optional to configure one of them]			
Wiring Terminal		RS232	RS485	RS422	Profibus-DP
1			B-	TXD-	
2		RXD	A+	TXD+	
3		TXD		RXD+	DP- [B-]
4				RXD-	
5					DP+ [A+]
6		GND	GND	GND	GND
RJ45[DCE] Socket		Ethernet [T568B Wiring Mode]			
1	RXD+	Orange-white			
2	RXD-	Orange			
3	TXD+	Green-white			
4	Unused	Blue			
5	Unused	Blue-white			
6	TXD-	Green			
7	Unused	Brown-white			
8	Unused	Brown			

No.	Pin	Description
AO		Analog Output Port [Definable]
1	AO+	4~20mA Output +.
2	AO-	4~20mA Output -.
3	SHD	Shield Ground.
DO/DI		Relay Switch Signal Output / Switch Signal Input Port
DO		Relay Switch Signal Output [Definable]
1	DO1+	Normally Open Contact Output 1 [+/-].
2	DO1-	
3	DO2+	Normally Open Contact Output 2 [+/-].
4	DO2-	
5	DO3+	Normally Open Contact Output 3 [+/-].
6	DO3-	
7	DO4+	Normally Open Contact Output 4 [+/-].
8	DO4-	
DI		Switch Signal Input [Definable]
9	COM	DI Common Terminal [GND].
10	DI1	Switch Signal Input 1.
11	DI2	Switch Signal Input 2.
12	DI3	Switch Signal Input 3.
Contact Capacity of Relay Switch: AC250V/DC24V, 1A.		

5. Operation Procedure



6. Function&Operation

6.1 Main Menu

Main Menu		Second Menu	
Sign	Function	Sign	Description
F1-SEt	Parameter Setting	-SCAL-	Scale parameters setting.
		-CALP-	Calibration parameters setting.
		-SEtP-	Setpoint parameters setting.
		-SErP-	Communication parameters setting.
		-dISP-	Display and operation interface parameters setting.
		-dAtE-	Date setting: [903] 'Date Format'.
		-tIEE-	Time setting: HH. MM. SS [Hour. Minute. Second].
F2-CAL	System Calibration	-ZEro-	Zero Calibration without loading on the weigher to correct Zero Value.
		-dAtA-	Data Calibration: Input the specification parameter values of loadcell [Total Capacity and Output Sensitivity] according to the actual configuration of the weighing system to correct Span Coefficient. If there is no access to get the specification parameter values for Data Calibration, then it's necessary to do Load Calibration.
		-LoAd-	Load Calibration: After doing Data Calibration, if there are conditions for Load Caliration, do Load Caliration with loading standard weight on the weigher to correct Span Coefficient further for higher weighing accuracy.
F3-rEC			Unused.
F4-CLn			Unused.
F5-Loc	Key-locker	-oPEn-	Key-unlocking.
		-Locc-	Key-locking.
		-PASS-	Password Set. Exfactory Passwords: ✧ Operator Password: 000. ✧ Administrator Password: 001.

Main Menu		Second Menu	
Sign	Function	Sign	Description
F6-FAC	Factory Adjustment	Special for manufacturer.	
		-SPAn-	Exfactory Span Adjustment: Use standard weighing test equipment to adjust the weighing signal interface for normalizing Span Coefficient to 1.
		-AdtS-	AD Value of Weighing Signal Linearity Test.
		-AoZr-	AO Zero Adjustment.
		-AoFL-	AO Full Adjustment.
		-AotS-	AO Linearity Test.
		-dotS-	DO Output Test.
		-dItS-	DI Input Test.
		-dEFU-	RAM Reset: Reset to factory defaults.
		-dStS-	Display/DO Reliability Test.
F7-InF	Product Information	Only for query.	
		--VEr-	Version No.
		--Sn--	Serial No.
		-dAtE-	Exfactory Date.
		-Auth-	Authorization Code.
F8-Aud	Audit Trail	Only for query.	
		-Cntr-	Operation Audit Trail Counter [0~999999] (Only for query).
		-oPtr-	Operation Trail. ✧ nonE: No Operation. ✧ SCAL: Scale Setting. ✧ dEFU: RAM Reset.

6.2 F1-SET Parameter Setting

6.2.1 Weighing Parameters (SCAL)

No.	Sign	Range	Default	Description	Set
100	UnIt	0~3	1	Weight Unit 0: None 1: kg 2: t 3: g	
101	d	0~4	000.00	Decimal Point 0: 00000 1: 0000.0 2: 000.00 3: 00.000 4: 0.0000	
102	t	1~99999	10000	Scale Capacity Max. loading weight of the load receptor. Scale Capacity $\leq$ (Loadcell Capacity $\times$ Loadcell Quantity) – Load Receptor Weight. When ‘Weight value = Scale Capacity’, AO of weight signal will output current 20mA.	
103	dIV	1~500	1	Scale Division 1, 2, 5, 10, 20, 50, 100, 200, 500	
104	E	-20000~ +999999	0 [*]	Zero Value Only for query.	
105	C	>0	1.0000 [*]	Span Coefficient Max. display value: 99.9999. Only for query.	
106	Stb	0~500	1	Stablity Judging Range [Division] Set value = 0: No ‘Stablity Judging’. Set value > 0: Weight Variance per [107] ‘Stablity Judging Time’ being in [106] ‘Stablity Judging Range’ means ‘Weight is stable’.	
107	Stbt	0.5~5.0	1.0	Stablity Judging Time [s]	

[*]: ‘RAM Reset’ operation has no effect on the parameter.

No.	Sign	Range	Default	Description	Set
108	FILt	00~79	35	Anti-Vibration Digital Filter 1-2 10 ¹ Digit: Filter1; 10 ⁰ Digit: Filter2.	
				Digit	Cutoff Frequency
				0	None
				1	11.2Hz
				2	8.0Hz
				3	5.6Hz
				4	4.0Hz
				5	2.8Hz
				6	2.0Hz
				7	1.4Hz
				8	1.0Hz
				9	0.7Hz
				Ration Feeding/Batching Mode: Filter1 for SP1 feeding control. Filter2 for SP3 feeding control.	
109	StAb	1~20	1	Smooth Digital Filter 3 Smooth Filtering Sample Number. Further lower the cutoff frequency for more stable weight display.	
110	APPL	0~1	0/1 [*]	Application Mode 0: Hopper/Platform Weighing Mode 1: Ration Feeding/Batching Mode Operating Authorization: Administrator.	

[*]: 'RAM Reset' operation has no effect on the parameter.

6.2.2 Calibration Parameters (CALP)

No.	Sign	Range	Default	Description	Set
120	AZP	0~1	0	Auto Zero Tracking Permission 0: OFF 1: ON (Only when weight is stable, Auto Zero Tracking will be allowed. Refer to Parameter [106]/[107])	
121	AZt	1~10	1	Auto Zero Tracking Time T [s] T = Set value × [107] Stability Judging Time.	
122	AZr	0.1~50.0	0.2	Auto Zero Tracking Range [Division] Zero Tracking Rate = [122] / [121]. Suggestion: Zero Tracking Rate ≤ 0.5[Division/s].	
123	r	0~50000	50	Zero Fine Adjusting Range If Gross Weight variation caused by Zero Value changing is within this range, 'Zero Fine Adjustment' will be valid. Suggestion: Set value ≤ (Scale Capacity × 4%).	
124	L	1~99999	10000	Calibrating Weight Loading Weight for Span Calibration.	
125	T	1~99999	12000 [*]	Total Capacity of Loadcells Total Capacity of Loadcells = Loadcell Capacity × Loadcell Number. Only for query.	
126	o	0.5000 ~5.0000	2.0000 [*]	Output Sensitivity of Loadcell [mV/V] Only for query.	
127	AE	-2.00~+2.00	0.00	AO Offset Value [mA] Try to change 'AO Offset Value' for making the AO current display value of the AO receiving terminal the same as that of the controller. If the AO current display value of the AO receiving terminal is smaller than that of the controller because of signal attenuating, the 'AO Offset Value' should be set to positive value. If the AO current display value of the AO receiving terminal is bigger than that of the controller because of interference signal superposing, the 'AO Offset Value' should be set to negative value. 【▲】 / 【▼】 : Optional '0' or '-' (negative sign) at the highest bit.	

[*]: 'RAM Reset' operation has no effect on the parameter.

No.	Sign	Range	Default	Description	Set
128	InI	0~1	0	Auto Zero Initial Calibration after Power-on <i>0: OFF</i> <i>1: ON</i> [without Power-down Protection]	
129	It	0~1800	10	Auto Zero Initial Calibrating Time [s]	
130	Ir	0~9999	50	Auto Zero Initial Calibrating Range Suggestion: Set value $\leq$ (Scale Capacity $\times$ 20%).	

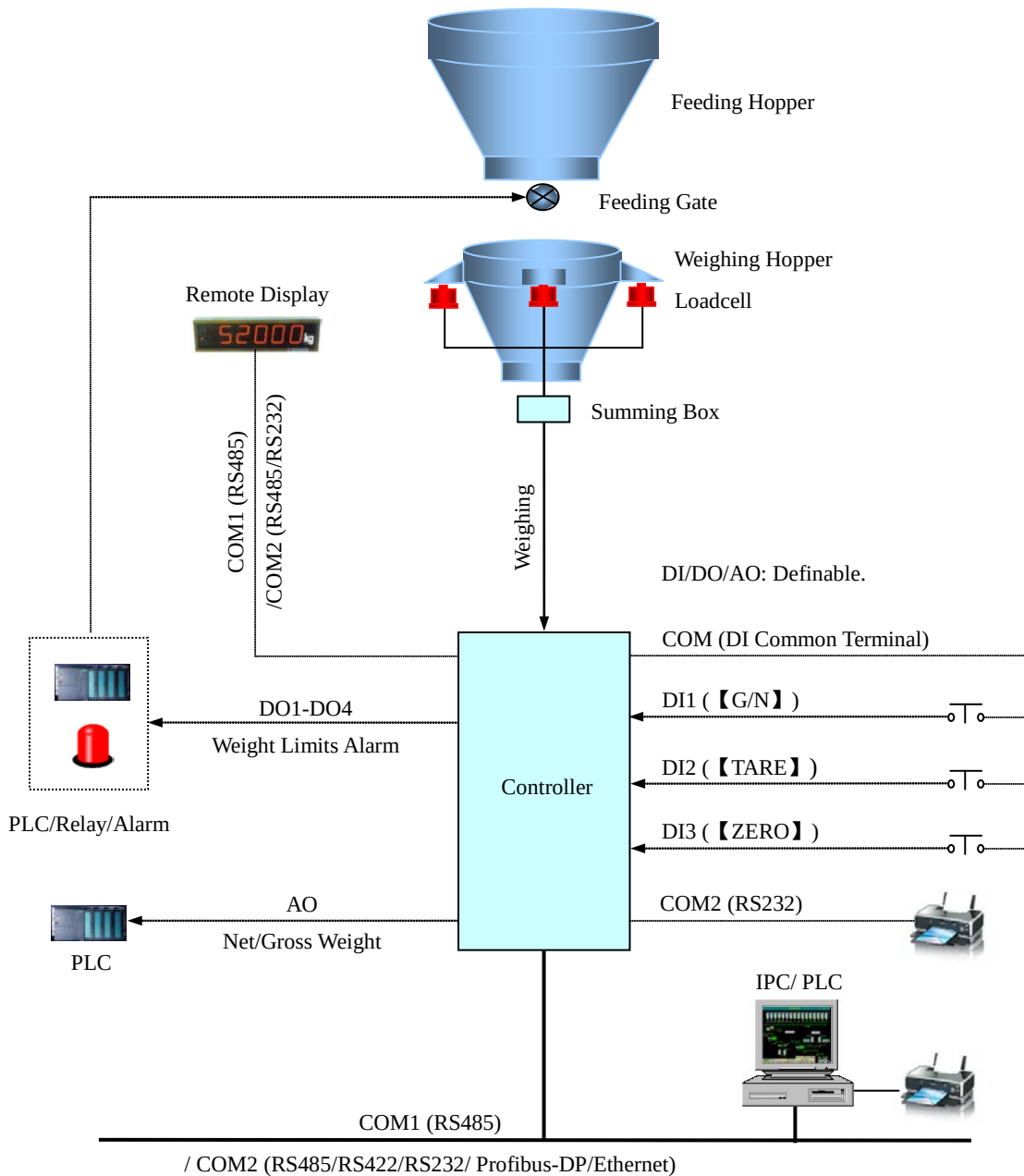
6.2.3 APL0 Setpoint Parameters for Hopper Weighing Mode (SEtP)

No.	Sign	Range	Default	Description	Set
200	n	0~99999	1000	DO1 Weight Lowest Limit / Weight Setpoint 1 Demand: $0 \leq [200] \leq [201] \leq [202] \leq [203] \leq \text{Scale Capacity}$.	
201	Π	0~99999	2000	DO2 Weight Lower Limit / Weight Setpoint 2	
202	u	0~99999	8000	DO3 Weight Upper Limit / Weight Setpoint 3	
203	U	0~99999	9000	DO4 Weight Uppermost Limit / Weight Setpoint 4	
204	nL	0~9999	50	Non-load Zero Range When 'Net Weight $\leq$ Non-load Zero Range', [ZERO] will turn on.	
205	dAtA	0~1	0	Data Compared with Weight Setpoints 0: Gross Weight 1: Net Weight	
206	doSL	0~1	1	DO Output Permission 0: OFF 1: ON	
207	dodL	0.1~5.0	0.5	DO Debounce Delay Time [s] Used for avoiding the related DO switch turning on and off frequently when the real-time data is at the critical point.	
208	Ao	1~3	1	AO Signal 1: Gross Weight 2: Net Weight 3: Displayed Weight	
209	APL0	1~4	1/2/3/4 [*]	Application Mode 1: 'Weight Limits' DO Alarm Mode([205] Weight $\geq$ Upper Limit / Uppermost Limit, [205] Weight $\leq$ Lower Limit/Lowest Limit) 2: '[205] Weight $\geq$ Setpoint' DO Output Mode 3: '[205] Weight $\leq$ Setpoint' DO Output Mode 4: 'DO1~DO3 being controlled by DI1~DI3' DO Output Mode Operating Authorization: Administrator.	

[*]: 'RAM Reset' operation has no effect on the parameter.

Hopper Weighing Mode :

Parameter Setting: [110]APPL=1, [209]APL0=1, 2 or 3.



6.2.4 APL1 Setpoint Parameters for Ration Feeding/Batching Mode (SEtP)

No.	Sign	Range	Default	Description	Set
400	bn	1	1	Unused.	
401	A	0~60000	1000	M1 Target Value If 'set value = 0', M1 will not participate in the feeding process.	
402	AL	0~9999	100	M1 Initial Lead Value for SP1 Fast Feeding When 'Feeding Weight $\geq$ (Target Value - SP1 Lead)' in M1 feeding process, 'SP1 Fast Feeding' DO switch will turn off automatically. If 'set value = 0 or M1 Target Value', 'SP1 Fast Feeding' DO switch will not participate in the feeding process.	
403	AF	0~9999	5	M1 Fall Value for SP3 Slow Feeding When 'Feeding Weight $\geq$ (Target Value - SP3 Fall)' in M1 feeding process, 'SP3 Slow Feeding' DO switch will turn off automatically.	
404	b	0~60000	0	M2 Target Value	
405	bF	0~9999	0	M2 Fall Value for SP3 Slow Feeding	
406	c	0~60000	0	M3 Target Value	
407	cF	0~9999	0	M3 Fall Value for SP3 Slow Feeding	
408	OV	0~9999	5	M1 Positive Deviation Only used for [423]APL1=1/3 'M1 Single-material Feeding Mode'. Positive Deviation = Feeding Weight - Target Value.	
409	dn	0~9999	5	M1 Negative Deviation Only used for [423]APL1=1/3 'M1 Single-material Feeding Mode'. Negative Deviation = Target Value - Feeding Weight.	
410	FCr	0~3	0	Fall Value Auto Correction Ratio [%] 0: 0% 1: 25% 2: 50% 3: 100% New Fall Value = Original Fall Value + Deviation Value $\times$ Fall Value Auto Correction Ratio. Deviation Value = Feeding Weight - Target Value.	

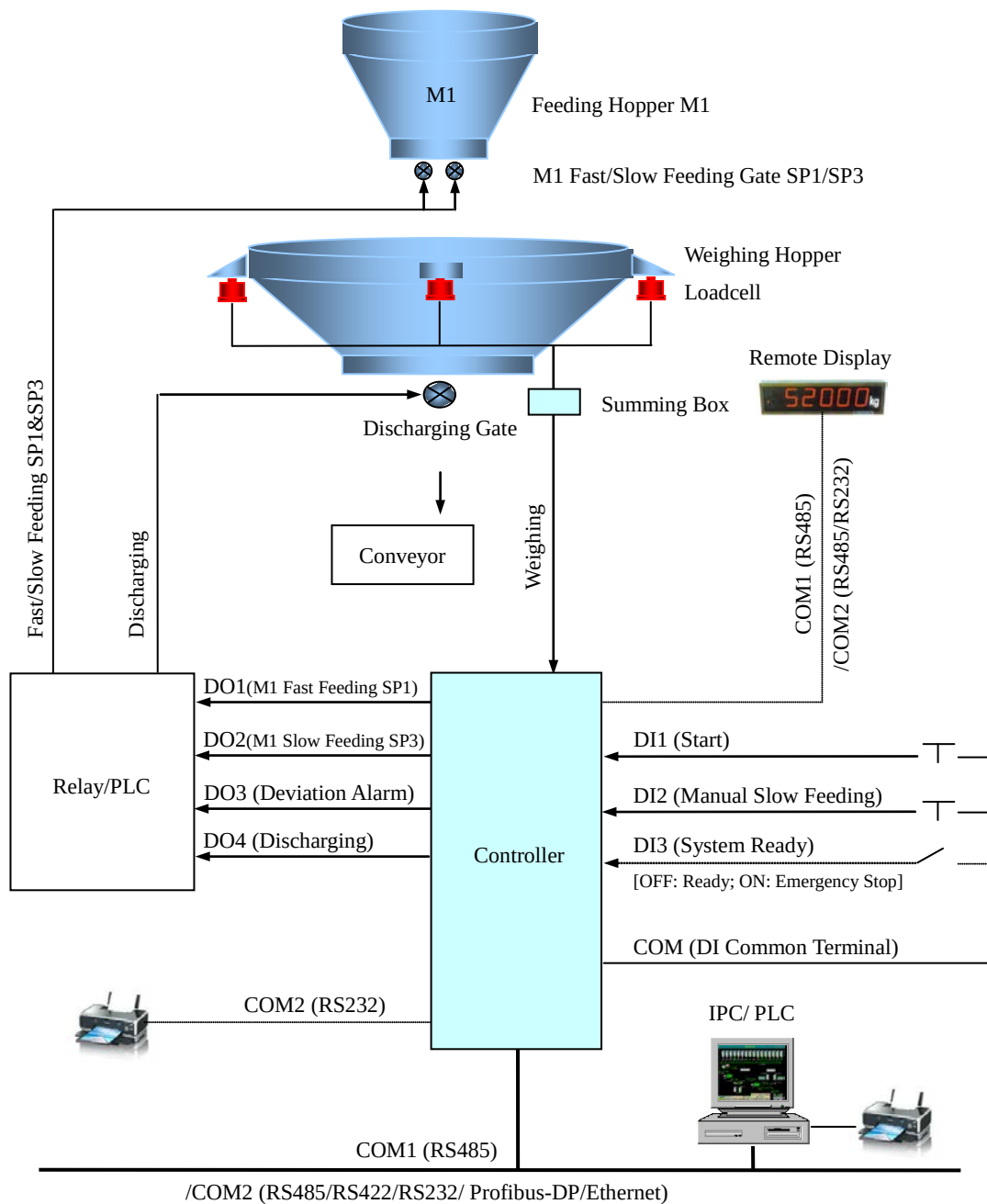
No.	Sign	Range	Default	Description	Set
411	t1	0.0~9.9	1.0	Delay Time Before ZERO/Batching T1 [s] 'ZERO': Auto Zero Fine Adjustment. Refer to Parameter [421] 'Batch Count for Auto Zero Fine Adjustment'.	
412	t3A	0.0~9.9	0.5	Comparing-prohibited Time T3.SP1 [s] When the process of 'Fast Feeding' starts, the impact of falling materials will make the weighing hopper vibrating, so it's prohibited to compare Feeding Weight with SP1 Setpoint in the time T3.SP1.	
413	t3C	0.0~9.9	0.8	Comparing-prohibited Time T3.SP3 [s] When the process of 'Fast Feeding' stops, the flow sudden-change of falling materials will make the weighing hopper vibrating, so it's prohibited to compare Feeding Weight with SP3 Setpoint in the time T3.SP3.	
414	t4	0.0~9.9	1.0	Wait Time for Stabilizing Weight T4 [s] When 'SP3 Slow Feeding' stops, some materials have left the feeding hopper but still in mid-air, so it's necessary to delay the time T4 for ensuring all of the materials in mid-air fell into the weighing hopper. Then the controller will do Feeding Weight Detection, Deviation calculation and Deviation alarm.	
415	t5	0.0~9.9	0.0	Holding Time After Stabilizing T5 [s] After the time T5 delayed, the feeding process of the next material or the discharging process will start.	
416	t6	0.0~9.9	0.0	Delay Time Before Discharging T6 [s] After the Feeding Weight of the last material being measured, Tare Weight will return to zero and the controller will switch to display Gross Weight automatically. And after delaying time T6, 'Discharging' DO switch will turn on automatically for opening the discharging gate.	
417	t7	0.0~9.9	0.5	Delay Time Before Closing Discharging Gate T7 [s] After 'Net Weight $\leq$ Non-load Zero Range' in the auto-discharging process and then the time T7 delayed for ensuring all of the materials in the weighing hopper discharged completely, the DO switch 'Discharging' will turn off automatically to close the discharging gate.	
418	t8	0.0~9.9	1.0	Delay Time After Closing Discharging Gate T8 [s] After the time T8 delayed for ensuring the discharging gate closed, the discharging process will stop, and then the next ration batching process will start.	

No.	Sign	Range	Default	Description	Set
419	nL	0~9999	50	Non-load Zero Range In the auto-discharging process, 'Net Weight ≤ Non-load Zero Range' is used for judging if the materials in the hopper are full discharged.	
420	Ao	0~3	1	AO Signal 0: None 1: Gross Weight 2: Net Weight 3: Displayed Weight	
421	AuZr	0~99	0	Batch Count for Auto Zero Fine Adjustment 0: No doing Auto Zero Fine Adjustment 1~99: After Batch Count reached to this set value, Auto Zero Fine Adjustment will be done before batching if Gross Weight display value is within 'Zero Fine Adjusting Range'	
422	Cn	0~9999	0	Target Batch Count 0: Unlimited 1~9999 It's valid to Ration Feeding&Batching Mode 3/4. After Batch Count reached to Target Batch Count, the feeding&batching process will stop automatically.	
423	APL1	1~4	1/2/3/4 [*]	Ration Feeding&Batching Mode 1: M1 Single-material&Double-speed Semi-automatic Feeding Mode [When each batch is completed, the feeding process stops automatically] 2: M1~M3 Three-material & Single-speed Semi-automatic Batching Mode [When each batch is completed, the batching process stops automatically] 3: M1 Single-material&Double-speed Automatic Feeding Mode [When each batch is completed, enter the next feeding process automatically] 2: M1~M3 Three-material&Single-speed Automatic Batching Mode [When each batch is completed, enter the next batching process automatically] Operating Authorization: Administrator.	
424	StA	0~1	1	Start Permission 0: OFF [DI1 Start signal is invalid] 1: ON [DI1 Start signal is valid] With this parameter value being changed from '1: ON' to '0: OFF' in running state, the feeding&batching process will stop immediately.	

[*]: 'RAM Reset' operation has no effect on the parameter.

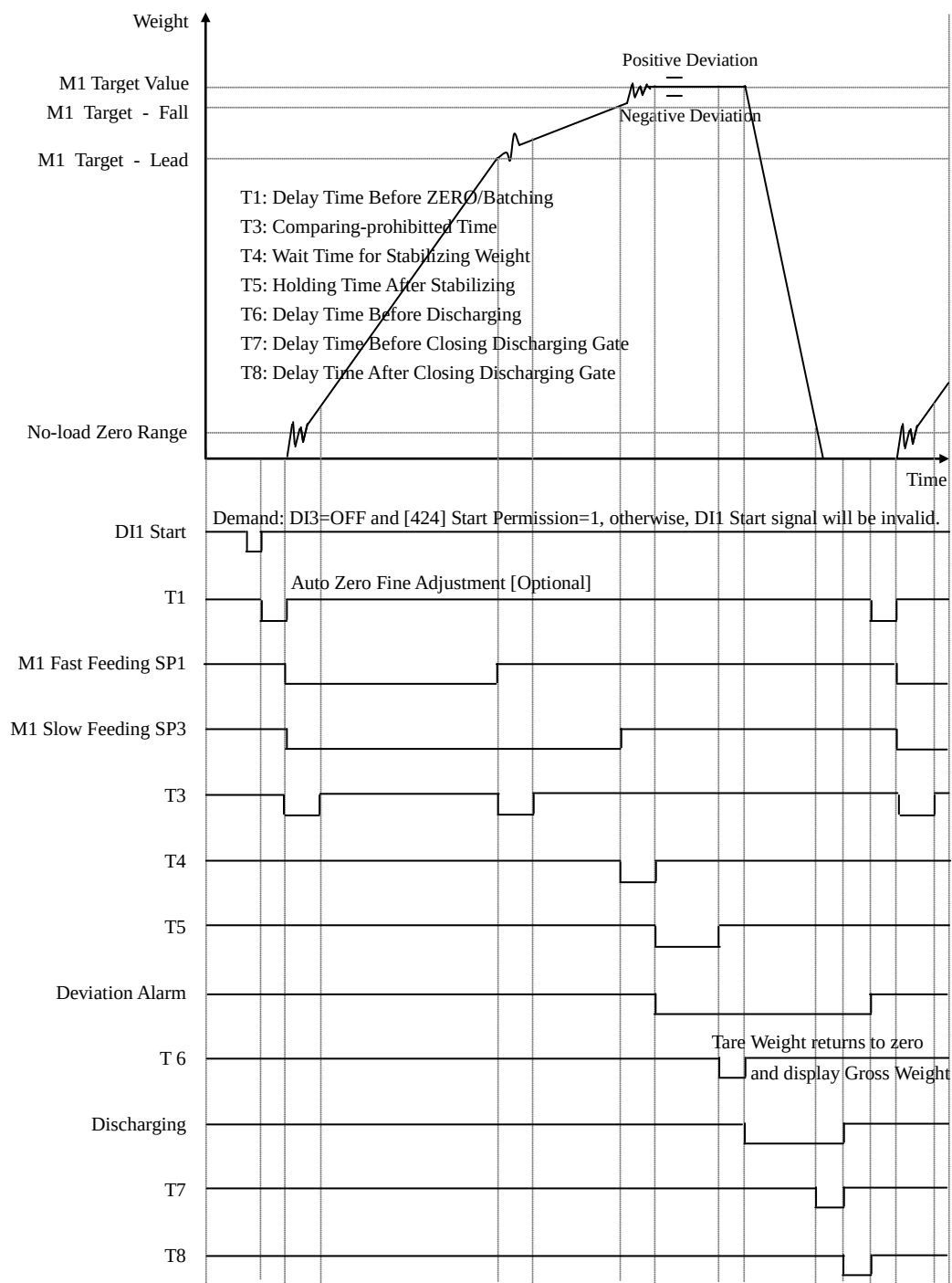
6.2.4.1 M1 Single-material&Double-speed Feeding Mode

Parameter Setting: [110]APPL=1, [423]APL1=1 or 3.



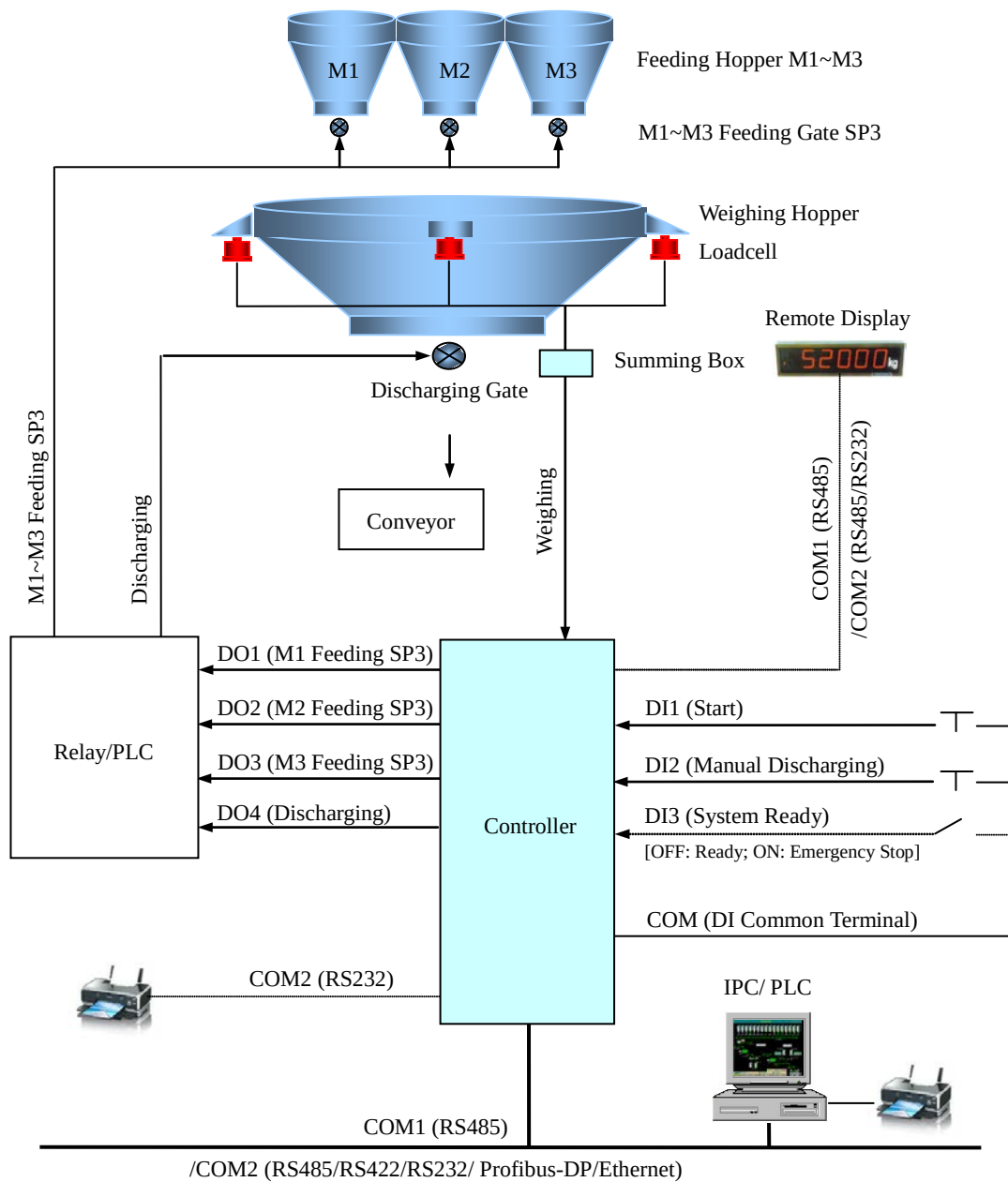
Note: Only the DO of ‘Slow Feeding SP3’ should be used for Single-speed Feeding Mode.

Timing Diagram:

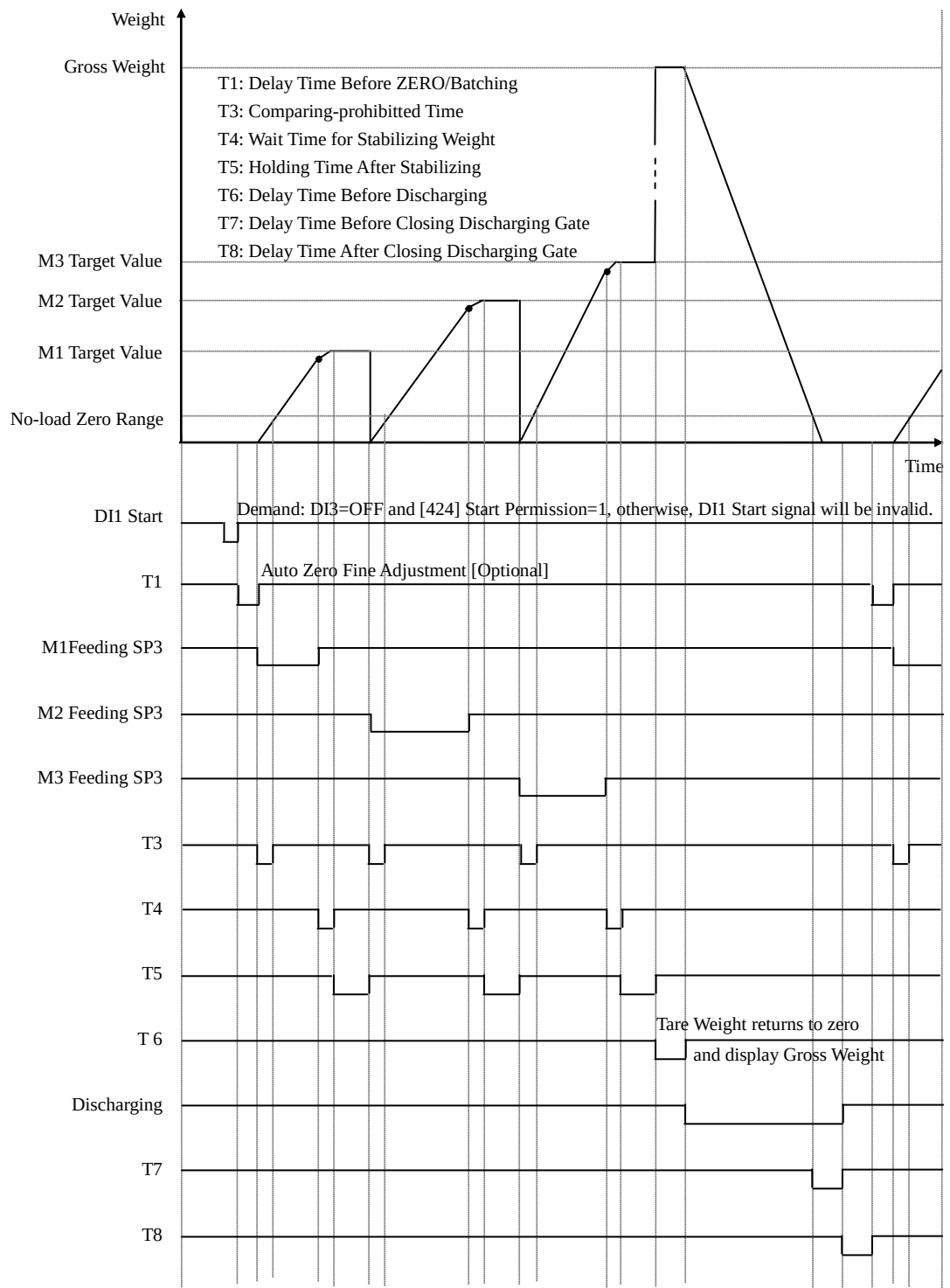


6.2.4.2 M1~M3 Three-material&Single-speed Batching Mode

Parameter Setting: [110]APPL=1, [423]APL1=2 or 4.



Timing Diagram:



6.2.5 Communication Parameters (SErP)

No.	Sign	Range	Default	Description	Set
800	Adr	0~99	1	Communication Address	
801	bPS1	0~5	3	COM1/COM2 Baud Rate <i>0: 1200bps</i> <i>1: 2400bps</i> <i>2: 4800bps</i> <i>3: 9600bps</i> <i>4: 19200bps</i> <i>5: 115200bps</i>	
802	bPS2		3		
803	CHC1	0~2	0	COM1/COM2 Parity Check <i>0: None</i> <i>1: Even</i> <i>2: Odd</i>	
804	CHC2		0		
805	Con1	0~6	4	COM1 Communication Mode <i>0: Host-slave [Self-defined]</i> <i>1: Host-slave [Modbus ASCII]</i> <i>2: Host-slave [Modbus RTU]</i> <i>3: Continuous [Continuous Sending ASCII]</i> <i>4: APL0~APL3 Print</i> <i>5: APL0 Label Print</i> <i>6: APL2 Print with OK Command</i>	
806	Con2	0~7	0	COM2 Communication Mode <i>0: Host-slave [Self-defined]</i> <i>1: Host-slave [Modbus ASCII]</i> <i>2: Host-slave [Modbus RTU]</i> <i>3: Continuous [Sending ASCII]</i> <i>4: Siemens Profibus-DP</i> <i>5: APL0~APL3 Print</i> <i>6: APL0 Label Print</i> <i>7: APL2 Print with OK Command</i>	
807	dAtA	0~3	2	Data for Continuous Sending Mode <i>0: Gross Weight</i> <i>1: Net Weight</i> <i>2: Displayed Weight</i> <i>3: Displayed Characters</i>	

No.	Sign	Range	Default	Description	Set
808	Int	2~200	40	Continuous Sending Interval Number N Sending Interval Time: $T = N \times 5$ [ms]. Sending Frequency: $F = 1000 / T$ [Hz].	
				Examples	
				Interval Number N	Sending Frequency F
				2	100Hz
				4	50Hz
				5	40Hz
				20	10Hz
				40	5Hz
				50	4Hz
				200	1Hz
				Note	
				Baud Rate	Max. Sending Frequency
				1200bps	5Hz
				2400bps	10Hz
				4800 bps	25Hz
				9600 bps	50Hz
				19200 bps	100Hz
				115200 bps	100Hz
809	Prtt	0~1	1	Time Printing Permission 0: OFF 1: ON	

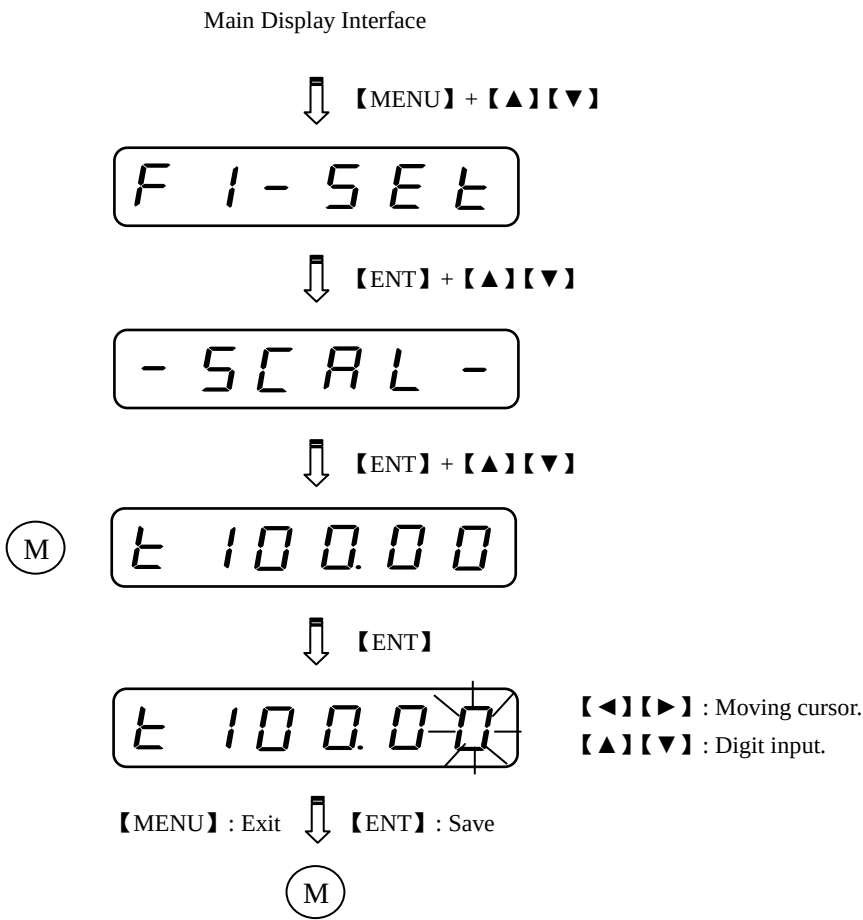
6.2.6 Display Parameters (dISP)

No.	Sign	Range	Default	Description	Set
900	LAng	0~1	0/1 [*]	Printing Language 0. Chinese 1. English	
901	dSt	0.01~1.00	0.20	Display Refreshing Time [s]	
902	ALoc	0~1	0	Auto-Locking 0: OFF 1: ON [If there is not any keypad operation in one minute and it's not in the processes of 'F2 Calibration' & 'F6 Factory Adj.', the controller will lock the keypad and return to 'Main Display Interface' automatically]	
903	dAtE	0~2	0 [*]	Date Format 0: [20]YY. MM. DD 1: MM. DD. [20]YY 2: DD. MM. [20]YY	
904	LigH	5~15	15 [*]	Display Brightness	

[*]: 'RAM Reset' operation has no effect on the parameter.

6.2.7 A Sample of Parameter Setting

Modify the parameter ‘[102] Scale Capacity’.

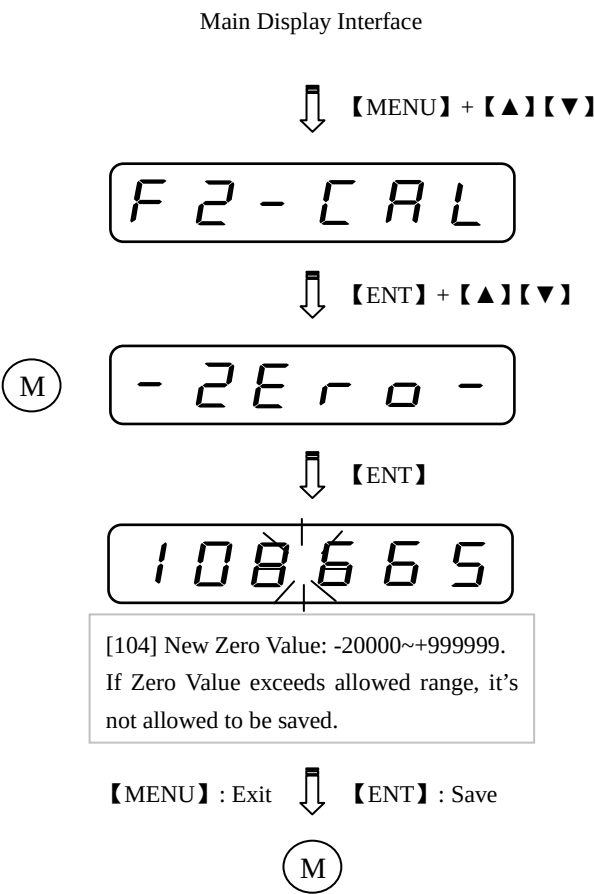


6.3 F2-CAL System Calibration

After doing ‘System Calibration’, Tare Weight value will return to zero automatically.

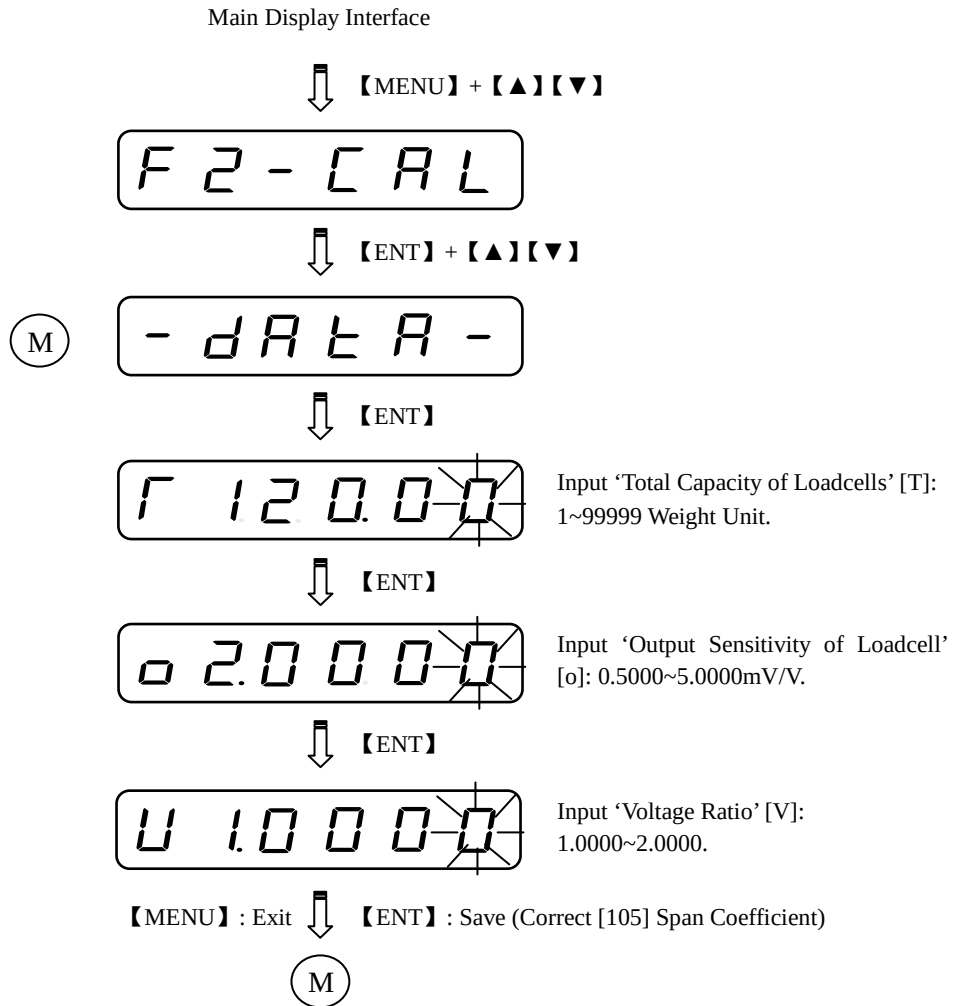
6.3.1 Zero Calibration (ZEro)

Do Zero Calibration with no loading on the weigher and save the new Zero Value.



6.3.2 Data Calibration (dAtA)

Input the specification parameter values of loadcell [Total Capacity and Output Sensitivity] according to the actual configuration of the weighing system to correct Span Coefficient. If there is no access to get the specification parameter values for Data Calibration, then it's necessary to do Load Calibration.



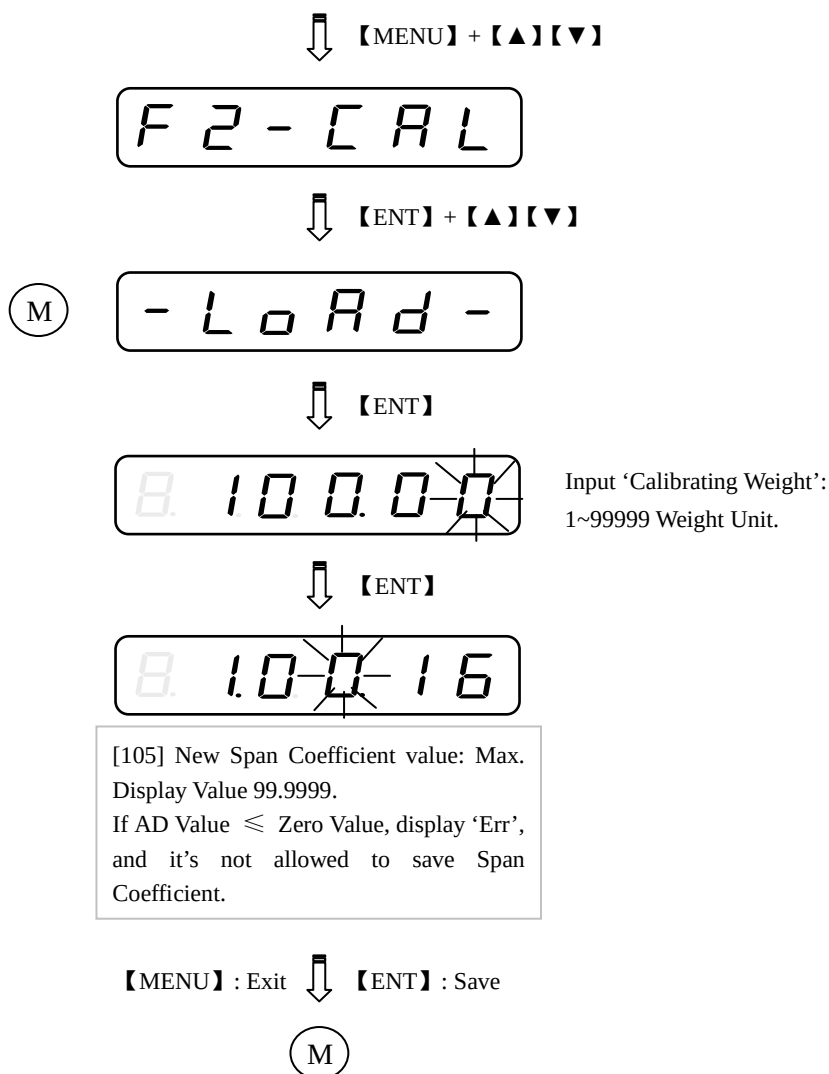
Note:

- ✧ Total Capacity of Loadcells = Loadcell Capacity × Loadcell Number.
- ✧ Voltage Ratio = Excitation Voltage on the terminal of controller / Excitation Voltage on the terminal of loadcells.
- ✧ The rated excitation voltage for loadcells is DC10V. It's best to measure the actual voltage value.
- ✧ 4-wire connection: The voltage attenuation is big, the voltage on both sides should be measured.
- ✧ 6-wire connection: The voltage attenuation is small, Voltage Ratio can be set to 1.0000.

6.3.3 Load Calibration (LoAd)

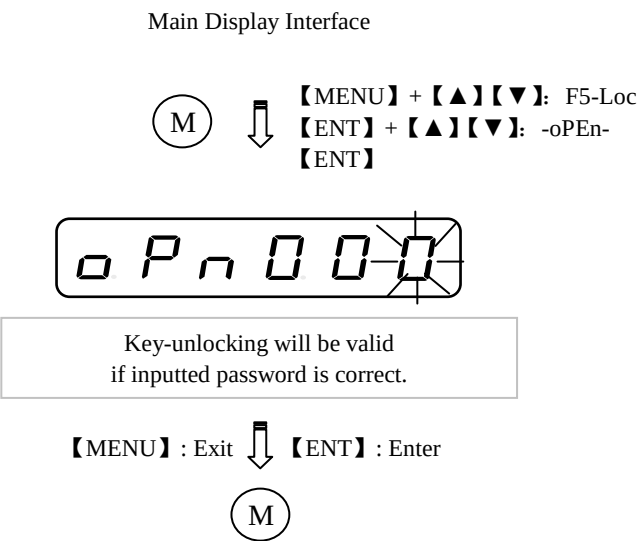
After doing Data Calibration, if there are conditions for Load Calibration, do Load Calibration with loading standard weight on the weigher to correct Span Coefficient further for higher weighing accuracy. The loading weight should be bigger than 50% of Scale Capacity value.

Main Display Interface

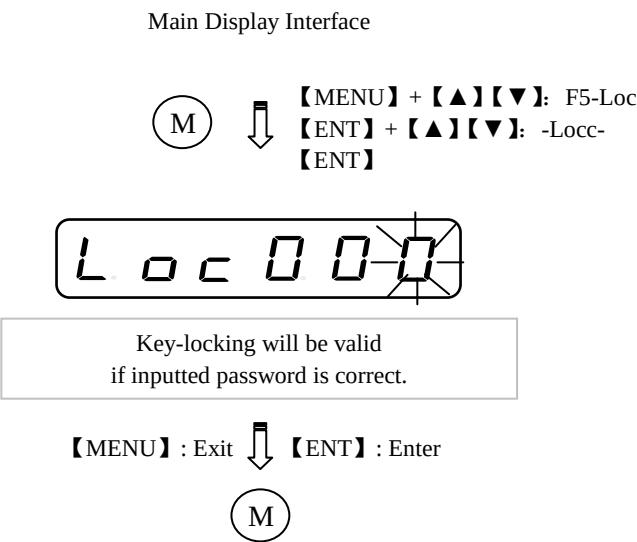


6.4 F5-LOC Key-locker

6.4.1 Key-unlocking (oPEn)



6.4.2 Key-locking (Locc)



6.4.3 Password Set (PASS)

Main Display Interface

M

【MENU】 + 【▲】【▼】 : F5-Loc

【ENT】 + 【▲】【▼】 : -PASS-

【ENT】

P08000

Input the original Password.

【ENT】

If inputted is Operator Password, this operation interface will be skipped; if inputted is Administrator Password, 'Administrator Password [AP]' or 'Operation Password [oP]' can be modified via 【▲】【▼】.

SEL8AP

【ENT】

P18000

Input the new Password.
Please remember it.

【MENU】 : Exit

【ENT】 : Save

M

Appendix A. Print Formats

- Table 1. Hopper Weighing Mode, print Weighing Report

WEIGHT RECORD	
NW: 50.00kg	[Net Weight]
TW: 5.00kg	[Tare Weight]
GW: 45.00kg	[GW=NW + TW]

2009-05-20	15:28

- Table 2. Single-material&Double-speed Ration Feeding Mode, print Feeding Report

RATION RECORD	
ST: 10.00kg	[Target Value]
NW: 10.04kg	[Feeding Weight]

2009-05-20	15:28

- Table 3. Three-material&Single-speed Ration Feeding Mode, print Batching Report

BATCH RECORD	
M1: 10.04kg	[M1 Feeding Weight]
M2: 15.03kg	[M2 Feeding Weight]
M3: 10.02kg	[M3 Feeding Weight]
SUM: 35.09kg	[SUM=M1+M2+M3]
NO.: 10	[Batch No.]

2009-05-20	15:28

Appendix B. Communication Protocols

If you need the communication functions and protocols, please contact us.



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