AFM18 / FM18 / FM18S

ELECTRONIC WEIGHING INDICATOR

OPERATION MANUAL

PLEASE READ THIS MANUAL VERY CAREFULLY BEFORE ATTEMPT TO OPERATE THIS INSTRUMENT

Specifications subject to change without prior notice

V118 December 2015 Rev1

Content

1. Installation

Because of metrological legislation, installation / some metrological parameter settings are limited to be done by authorized personnel only. Do not attempt to change any of the built-in parameters. Contact your dealer for installation and technical assistance.

Caution: -

This instrument is legal for trade only when it is sealed (and/or stamped) and bearing a serial number. Do not attempt to break the seal (or stamp) affixed to this instrument and/or remove the serial number. Contact your dealer for more information and after sales service.

For most accurate weighing result, do not use the unit in where or when the environment condition falls beyond as those listed on **Specifications**.

Do not attempt to open this instrument or conduct any trouble shootings.

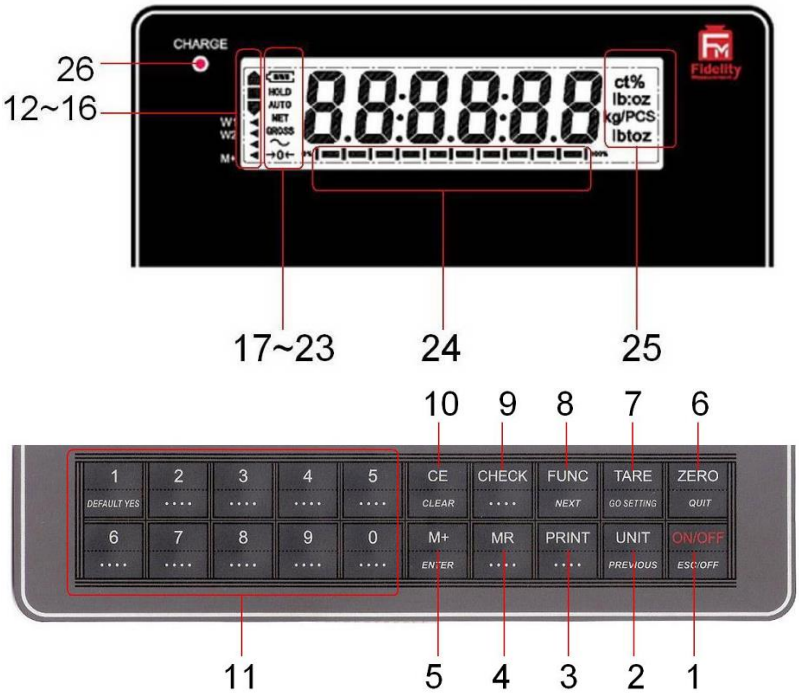
2. Specifications

Maximum Capacity	**Single Range Mode: -** • Max = 1 ~ 999,999 (kg or lb) **Dual Range Mode: -** • Max_1 = 1 ~ 999,998(kg or lb) • Max_2 = 2 ~ 999,999(kg or lb) • Condition = $Max_1 < Max_2$
External Resolution	**Single Range Mode: -** • Recommend = 15,000 ~ 30,000 • High = 30,000 ~ 60,000 **Dual Range Mode: -** • Recommend (Max_2 / d_1) = 15,000 ~ 30,000 • High (Max_2 / d_1) = 30,000 ~ 60,000 • Condition = $d_1 < d_2$
Weight Units	Kg, g, lb
Offset Range	≥0.2mv (10000 Count)
Tare Range	- Max (Subtractive Tare)
Max. Measuring Range	15 mV
A/D Sampling Speed	15 times/ second
Power Voltage Requirements	Built-in Rechargeable Battery = 6V DC External Power Adaptor = 12V DC, 800mA
Load Cell Excitation Voltage	5 VDC
Minimum/Maximum Load Cell Impedance	350Ω/1000Ω
Load Cell Connection	Supports 4-wire and 6-wire Load Cell Connections
Maximum Load Cell Connection	8 x 350Ω Load Cells, or 16 x 700Ω Load Cells
Operation Environment	-10 ~ 40°C. Non-condensed. R.H.≦ 85%

In the interest of improvement, specifications may change prior to notice

3. Keys, Display & Connections

3.1 Keys & Display Indicators



1. ON/OFF KEY

Press this key to turn this instrument on or off.

2. UNIT KEY

Press this key to shift among various weight units (if weight unit conversation is enabled).

3. PRINT KEY[1]

Press this key to print the results to a computer or a printer through the RS-232 output.

4. MR KEY

Press this key to recall total stored transactions.

5. M+ KEY

Press this key to accumulate current weight to memory manually.

6. ZERO KEY

Press this key to set weight displayed to zero when an empty scale has drifted away from a true zero reading.

7. TARE KEY

Press this key to tare off the weight of a container.

8. FUNCTION KEY

Press this key to shift between percentage, piece count and animal[2] mode.

9. CHECK FUNCTION

Press this key to start check weighing function and to enter value for Hi and Lo limits.

10. CE KEY

Press this key to clear value entered.

11. NUMERIC KEYS

Numeric keys 0 ~ 9.

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1 This key is also used to accumulate the current weight value to memory when internal function F17 is set to ON.

2 When F11 = ON.

12. CHECK SYMBOLS

- Hi = Weight reading is higher than the Hi limit entered,
- OK = Weight reading is in between than the Lo and Hi limits entered,
- Lo = Weight reading is lower than the Lo limit entered.

13. W_1 INDICATOR[3]

(When under dual weighing range mode[4]) Visible when this instrument is in the first weighing range (W_1).

14. W_2 INDICATOR[5]

(When under dual weighing range mode) Visible when this instrument is in the second weighing range (W_2).

15. SPARE

Blank, no function assigned.

16. M+ INDICATOR

Visible when the total accumulated weight value is being displayed.

17. BATTERY POWER / LEVEL INDICATOR

Visible to show: -

- This instrument is being powered by the built-in rechargeable battery,
- Remaining battery level.

18. HOLD INDICATOR

(When under animal mode) Visible when weight reading being displayed is a frozen value.

19. AUTO INDICATOR

Visible when the instrument is in animal weighing function.

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[3] This indicator will not appear when this instrument is in single range mode.

[4] This instrument can support two weighing ranges with different maximum capacities (Max) and different scale intervals (d), each range extending from zero to its maximum capacity.

[5] This indicator will not appear when this instrument is in single range mode.

20. NET INDICATOR

Visible when the tare function is in effect. Weight reading shown is net value.

21. GROSS INDICATOR

Visible when gross weight reading is displayed.

22. STABLE INDICATOR

Visible when weight reading is stable.

23. ZERO INDICATOR

Visible when instrument is at true zero weight status.

24. CAPACITY TRACK BAR

The ratio (increment = 10%) of applied & remaining weighing capacities are shown here.

25. WEIGHT UNITS AND FUNCTIONS

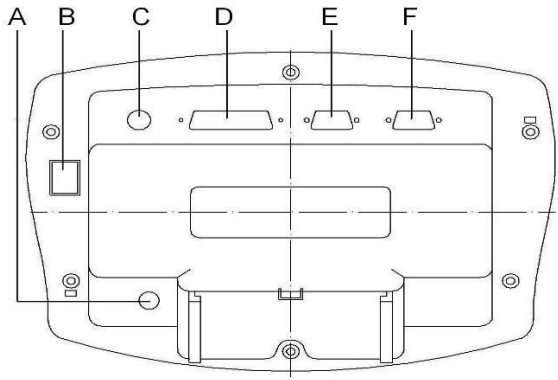
- % = Percentage (when Percentage Mode in function),
- kg = kilogram,
- PCS = Pieces (when Piece Count Mode in function),
- kg/PCS and g/PCS = Weight per piece (when Piece Count Mode in function),
- lb = pound.

26. CHARGE STATUS INDICATOR

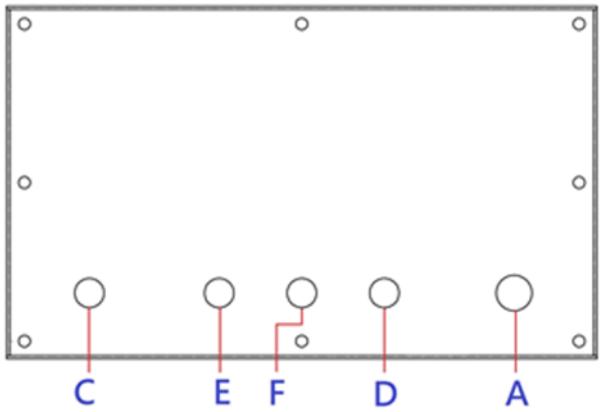
- Red color: Recharging battery,
- Green color: Charging completed.

3.2 Connection Points

AFM18 & FM18



FM18S



A**. DC Jack Input for Indicator**

External power adaptor (DC9 ~ 12V) is plugged in here. Do not plug in any other power adaptor than the one which comes with this instrument.

B**. RESERVED**

C. **LOAD CELL CONNECTOR (7-Pin)**

- AFM18 & FM18: - Signal wires from load cell (or junction box) are connected here.
- FM18S: - Thread though signal cable from load cell (or junction box) here.

D**. TTL RELAY OUTPUT PORT (If equipped)**

- AFM18 & FM18: - Optional Control output port.
- FM18S: - Thread through optional control put cable here.

E**. TTL COMPORT (if equipped)**

- AFM18 & FM18: - Comport 2 (serial).
- FM18S: - Thread through cable of Comport 2 (serial).

F**. RS232 COMPORT**

- AFM18 & FM18: - Comport 1 (serial or TTL)
- FM18S: - Thread through cable of Comport 1 (serial or TTL)

4. Getting Started

In order to obtain an accurate weighing result, the weighing platform must be placed on a strong and level surface. Avoid using the platform and this instrument in environment where excessive wind flow, vibration and extreme temperature change exist

General Warnings: -

- The instrument is not an explosion proof device.
- The instrument is not a water proof device.
- Do not open the instrument, no user serviceable parts inside. Always contact your dealer for service.
- The instrument not to be subject to shock, excessive vibration or extremes of temperature (before or after installation).

4.1 Built-In Rechargeable Battery

The instrument is equipped with a built-in rechargeable battery. Before first time use, recharge it for at least 8 hours to ensure the best battery performance.

4.2 Power Adaptor

Before plugging in the power adaptor, check and make sure the input voltage of the adaptor matches with output voltage of the electricity outlet. If not, contact your dealer immediately.

Note: - for FM18S

The DC input connector and the output plugs of the power adaptor both comes with a cover. Always screw tightly the cover to the DC input connector when not used and battery recharge is in process.

4.3 Connecting Other Devices[6]

4.3.1 Connection with Weighing Platform (Load Cell)

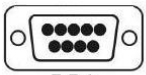
Connect this instrument with a weighing platform (load cell) through **LOAD CELL CONNECTOR** located at the back according to the below pin assignment table.

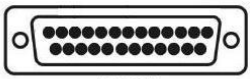
If a 4-wire load cell or junction box is used, short-circuit pin 1 & 2 and pin 3 & 4. Otherwise, this instrument will not work.

LOAD CELL CONNECTOR PIN #	ASSIGNMENT
1	EXCITATION +ve
2	SENSE +ve
3	EXCITATION –ve
4	SENSE –ve
5	SIGNAL +ve
6	SIGNAL –ve
7	GROUND

4.3.2. Connecting RS232 to Computer

RS232 COMPORT ON INSTRUMENT	COM PORT ON COMPUTER	
	(DB9)	(DB25)
2 = RXD	3 = TXD	3 = TXD
3 = TXD	2 = RXD	2 = RXD
5 = GND	5 = GND	7 = GND


DB9


DB25

[6] Turn this instrument off and cut off power before making any connections or disconnections.

4.3.3 Connecting RS232 to Printer (DB25)

RS232 COMPORT (DB9) ON INSTRUMENT	COMPUTER COM DB25
2 = RXD	3 = TXD
3 = TXD	2 = RXD
5 = GND	7 = GND

4.3.4 Connecting the Optional External Relay Output Module

If the optional relay output module is purchased, simply plug in the DB-25 connector of the relay output module to the TTL & relay output port by using the accessory enclosed.

4.3.5 Connecting to TTL Relay Devices by Others

Follow the below **TTL RELAY OUTPUT PORT PIN ASSIGNMENT TABLE** for connection.

This instrument provides low-active TTL relay signals. Do not connect the TTL relay output port to any other non-TTL relay devices; they may cause unrecoverable damages to this instrument.

TTL RELAY OUTPUT PORT PIN ASSIGNMENT TABLE (LOW-ACTIVE)

RELAY OUTPUT PIN #	ASSIGNMENT
1	BUZZER
3	LO
5	OK
7	HI
8	DC+5v Output
14	Ground

4.3.6 Connecting the Optional Wireless Data Communication Module

If the optional WM-SP wireless data communication module is purchased, simply plug it into the TTL COMPORT.

4.3.7 Connecting Devices by Others to TTL Comport

Follow the below **TTL COMPORT PIN ASSIGNMENT TABLE** for pin assignment.

This instrument provides low-active TTL signals. Do not connect the wireless data communication port to any other non-TTL devices; this may cause unrecoverable damages to this instrument.

TTL COMPORT PIN ASSIGNMENT TABLE (LOW-ACTIVE)

TTL / WIRELESS DATA COMPORT	WIRELESS DATA COMMUNICATION MODULE OR DEVICES
2 = RXD	3 = TXD
3 = TXD	2 = RXD
5 = GND	5 = GND
9 = +5V Output	9 = +5V Input

Notes: -

1. Default setting of wireless data communication = send only. Position of jumper J1 on main board needs to be changed in order to trigger wireless data communication receive function (if it is the case, receive function of the RS232 comport will then be disabled). Contact your dealer for more information.
2. This instrument supports bi-directional data for either the RS232 comport or the TTL comport. Default setting of: -
   - RS232 = bi-directional,
   - TTL comport = single direction (transmission only).

If bi-directional TTL data communication is required, adjust jumper setting on board. On board jumper setting may be required, refer to **Appendix A Bi-Directional Communication Jumper Setting** for detailed information.

4.4 Setting up the Preferred Operation Parameters

Set all preferred operation parameters according to **5.4 Internal Function Table**.

Notes: -

1. F1~F26 are accessible without restriction,
2. F60~F66 are restricted functions, which may request a password or hardware key to access,
3. F80 ~ F99 are restricted functions, which may request a password or hardware key to access. These functions are usually for dealer and authorized personnel only and all settings these functions are monitored and recorded. Do not change any settings of these functions to avoid operation errors.

5. Initial Setup

5.1 Internal Settings

Application parameters can be checked and set through internal functions. Refer to **5.4** for description of all internal functions.

5.2 How to Enter & Select Internal Function

Follow the below steps to enter and select desired parameter of an internal function.

a. Turn this instrument off and on again,
b. Press **[TARE]** during countdown,
c. Display **F1**,
d. This instrument is now in internal function,
e. Quick access to a function number
- Press **[1]** to go to F10,
- Press **[2]** to go to F20,
- Press **[6]** to go to F60 (for dealer and authorized personnel only),
- Press **[8]** to go to F80 (for dealer and authorized personnel only),
- Press **[9]** to go to F99 (for dealer and authorized personnel only),
- Press **[0]** to go to F1.

5.3 Key Function during Internal Function Mode

- **[M+]** = Enter, save and return,
- **[ZERO]** = Quit without saving,
- **[FUNC]** = Go next,
- **[UNIT]** = Go previous,
- **[CE]** = Clear,
- **[TARE]** = Go to internal function during power on countdown, or set F1 value being shown to zero and to display the net span gain by applying additional load applied.

Function No.	TO CHECK AND SET	PARAMETERS / *NOTE* *DEFAULT = ***
F1	Internal Count Value.	***Press [TARE] to set offset value to zero when unloaded. Then add load on the platform to observe the span value of load applied.***
F2	All Segment Check	***All display segments will be lit on. Check if there are any missing segments.***
F3	Capacity, Division & Default Weight Unit	***Display basic metrology characteristics (capacity, division and weight unit) set: -*** ● ***Value displayed when in single range mode = Max + 1d,*** ● ***Values displayed when in dual range mode = Max_1 + d_1 (W_1) & Max_2+d_2 (W_2).***
F4	Date Format & Date	● ***** DD/MM/YY*** ● YY/MM/DD ● MM/DD/YY
	To change date, enter a new value through numeric keys then press [ENTER].	
F5	Time	● HH/MM/SS
	To change time, enter a new value through numeric keys then press [ENTER].	
F6	SET F7 to F24 to Default?	● ***** NO*** ● YES
	If YES is selected, press [1] when SURE is displayed or any other key to quit without saving.	

F7	Auto Power Off Time (Minutes)	OFF	1	** 3	5	10	20
F8	Backlight	OFF		ON		** AUTO	
	Backlight will be turned off when battery is low disregarding setting entered.						
F9	Weight Unit Conversation	** OFF		ON			
	This function is not accessible if: - ● ***Dual range mode is selected (value of F84 is not = zero), or*** ● ***When metric (kg) weight unit is selected as the default weight unit for F81.***						
F10	Filter Speed	1 ***(Strong)***	** 2 (Normal)	3 ***(Mild)***	4 ***(Least)***		
	Select: - ● ***1 for bad working environment where vibration, wind flow… etc affect stable reading,*** ● ***2 for normal environment,*** ● ***3 for good working environment where wind and vibration are not likely to affect stable weighing,*** ● ***4 for very good working environment where wind and vibration have no effect to stable reading.***						
F11	Animal Function	** OFF		ON			
	OFF = Disable. ON = Enable						
F12	Auto Tare	** OFF		ON			
	OFF = Disable. ON = Enable ***Note 1: - If F63 = ON, set F12 to OFF. Otherwise, preset tare (F63 will not operate)***						

F13	Repeated Tare Function	***** OFF***		ON
	OFF = Disable. ON = Enable			
F14	Keypad Buzzer	*OFF*		***** ON***
	OFF = Disable. ON = Enable			
F15	Checkweighing Buzzer	OFF	***** IN***	OUT
	• ***OFF – Buzzer disabled,*** • ***IN = Buzzer activated when reading is within range,*** • ***OUT = Buzzer activated when reading is out of range.***			
F16	M+ Working Mode	AUTO 1	AUTO 2	***** MANUAL***
	• ***AUTO 1 = Auto M+ when weight is stable. M+ key is disabled under this mode,*** • ***AUTO 2 = Auto M+ after the highest stable weight has been removed (and gross weight returns to zero or minus). M+ key is disabled under this mode,*** • ***MANUAL = Manual M+ (by pressing [M+] key)***			
F17	Does **[PRINT]** key also activate M+?	***** OFF***		ON
	• ***OFF =No*** • ***ON =Yes*** ***This function is only accessible when F16 = MANUAL. When this function is = ON, then set F18 to MODE 3.***			

F18	Data Output Mode	MODE 1	** MODE 2	MODE 3	MODE 4

- ***MODE 1 = Continuous output,***
- ***MODE 2 = Continuous output when weight reading is stable,***
- ***MODE 3 = Output to printer,***
- ***MODE 4 =Information request mode.***

Note 1: - If MODE 1 or 2 is selected, set also time delay between each data transmission. 4 parameters are available for selection

- ***0 = max speed; 0,5 = 0.5 second; 1.0 = 1.0 second; 1.5 = 1.5 second***

Note 2: - If MODE 3 is selected,

- ***set also number of copies to be printed each time. 8 parameters (1 ~ 8) are available for selection. Copy 1 = Send 1 copy, ……, Copy 8 = Send 8 copies. Number of copy related to current transaction only. Totalized data printout is always = 1 copy. Press PRINT if extra totalized date printout copies are need.***
- ***select the printer type. 2 parameters (normal and LP-50) are available for selection. Normal = receipt/ticket printer; LP-50 = DATECS label printer model LP-50 or LP-50 compatible label printers.***
- ***if LP-50 is selected, then select the label file stored in For 1 (label format group 1) to be print; and then the label file stored in For 2 (label format group 2) to print.***
- ***5 label file names are available for each label format group are available. Refer to PARAGRAPH 9 for detailed information.***

Note 3: - If MODE 4 is selected, refer to APPENDIX B for detailed information.

F19	Output Baud Rate	1200	2400	4800	** 9600	19200
F20	Data Format (Data Bit / Parity / Stop Bit)	** 8 N 1		7 O 1		7 E 1
	This function is not accessible when F18 = MODE 3 or MODE 4					
F21	Weight Function Output Print Format	** STD		CUSTOM		
	When setting = CUSTOM, maximum lines = 15.					
F22	Counting Function Output Print Format	** STD		CUSTOM		
	When setting = CUSTOM, maximum lines = 15.					
F23	Percentage Function Output Print Format	** STD		CUSTOM		
	When setting = CUSTOM, maximum lines = 15.					
F24	Animal Functions Output Print Format	** STD		CUSTOM		
	When setting = CUSTOM, maximum lines = 10.					
F25	Check Mode	Mode 1	Mode 2	Mode 3		Mode 4
	• ***MODE 1 = Standard HI/OK/LO checkweighing mode*** • ***MODE 2 = Inflow/Outflow control logic mode***					

	• *MODE 3 =Positive constant feeding mode.* • *MODE 4 = Negative constant feeding mode (with auto reservoir /tank refill logic & output).*	
	Notes: - • *MODE 1: if this mode is selected, set also F26.* • *MODE 2: inflow/outflow logic is built-in this mode, additional external PLC or relays are not required. LO normal open output from optional RELAY- 4 relay module can be connected to inflow device; HI normal open output can be connected to outflow device.*	
F26	Near Zero Weight Value	*** 000000*
	Near Zero value is useful for dynamic checkweighing applications to bypass fault LO alarm during uploading and unloading. *Note 1: - This function is only accessible when F25 = Mode 1.* *Note 2: - Enter the near zero value here by numeric keys.* *Note 3: - Near zero weight value can be = any value between 20e and LO limit.* *Note 4: - Any near zero value which less than 20e will be ignored. Instrument will deem 20e as minimum near zero weight value.* *Note 5: - The HI LO comparison remains non-activated when weight reading is less than the near zero value entered.*	
F27	**Reserved. No function now.**	
F28	**Reserved. No function now.**	
F28	**Reserved. No function now.**	

6. Instruction for Use

6.1 Power On

Power on this instrument, it will: -

a. Display software number and revision (if any)
b. Display the calibration count value,
c. Display the parameter set count value,
d. Display all display segments,
e. This instrument is now ready for operation.

6.2 Start Weighing

a. If zero weight cannot be obtained when unloaded, press **[ZERO]**. After **[ZERO]** is pressed, the **ZERO INDICATOR** will appear. Refer to **Specifications** for maximum zero range,
b. Always place an object onto platform gently. Excessive force applied to platform may cause damages to the weight sensor,
c. The weight of the object is displayed automatically,
d. It is a good practice to remove all loads from platform after weighing. It will prolong the life of the weight sensor.

6.3 About Weigh Unit Conversion

The default weight unit is = kg. Depends on the internal settings, this instrument supports also g and lb.

6.3.1 Conversion between Metric Weight Units (kg and g)

When 3 or 4 decimal places (0.000 or 0.0000) is selected in F80, reading in g is possible during normal operation by pressing **[UNIT]** disregarding to the setting of **F9**.

The weight unit employed before power off will be employed when powered on again.

6.3.2 Conversion between Metric (kg and/or g) and Imperial[7] (lb) weight units (F9)

This instrument supports conversion among kg, g and lb. To enable this conversion function, set F9 = ON. Press **[UNIT]** to shift among various weight units.

The weight unit employed before power off will be employed when powered on again.

6.4 Tare Off the Weight of A Container

Tare function is used to temporarily set the scale to zero (such as cancelling the weight of a box or a container) in order to get the net weight result

6.4.1 Manual Tare

When a container is used, follow the below steps to tare off the weight of it and to get a net weight result.

a. Remove all loads from platform,
b. Make sure that the **ZERO INDICATOR** is on. If not, press **[ZERO]**,
c. Place container on platform,
d. Press **[TARE]** ,
e. **NET INDICATOR** appears to indicator when tare is in effect and weight displayed is net weight. Refer to **Specifications** for maximum tare range,
f. To cancel tare effect, remove all loads from platform and press **[TARE]**,
g. **NET INDICATOR** disappears. **GROSS INDICATOR** appears to indicate tare effect has been removed and weight displayed is gross weight.

6.4.2 Auto Tare[8] (F12)

If this function is enabled, this instrument will assume the first stable weight applied is a container and will tare off the weight of it automatically.
When container is removed and gross weight result = zero, tare effect will be cancelled automatically.

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[7] To comply with the laws of certain countries and approval requirements, the imperial weight unit may be disabled. Contact your dealer for more information.

[8] Set F12 = ON to enable Auto Tare Function.

6.4.3 Repeated Tare (F13)[9]

When F13 is set to OFF, this instrument does not permit multiple tare operation. Tare effect can only be cancelled when container is removed and gross weight = zero.

When F13 is set to ON, this instrument will permit multiple tare operation provided that both of the below requirements are met: -

a. The tare operation does not permit a reduction of the value of the tare;
b. The tare effect can only be cancelled when there is no load on the platform.

6.4.4 Preset Tare (F63)[10]

A pre-determined tare weight can be entered via keyboard. To enable this function, set F63 to ON, then set also F12 to OFF.

During normal operation, press **[0]** then followed by the pre-determined tare weight through numeric keys and press **[M+]** to enter.

To cancel preset tare effect, remove all loads from platform then press **[TARE]**.

Notes: -

1. The pre-determined tare weight entered will be rounded to the nearest division of the instrument. This does not affect the accuracy of the subsequent weighing and operation.
2. Refer to **Specifications** for maximum tare range.
3. Manual tare is possible when preset tare is in function.
4. Preset Tare is also governed by Repeated Tare (F13)

[9] Set F13 = ON to enable Repeated Tare Function.

[10] This is not a legal for trade function.

6.5 Memory Accumulation Function

6.5.1 To Accumulate a Transaction to Memory[11] [12] [13]

a. Press **[M+]**[14] to save and accumulate data of current transaction to memory,
b. This instrument displays "**≡ n**". **M+ INDICATOR** appears to indicate that memory contains stored data. "**≡ n**" means the total number of transactions accumulated to memory,
c. This instrument returns to normal display status after 2 seconds,
d. Repeat **a** to **c** for subsequent transactions[15],

Note: -
Unstable weight cannot be accumulated to memory. If **[M+]** is pressed when weight reading is not unstable, this instrument will reject this command and response with 3 beeps.

6.5.2 Memory Recall and Clearance

a. Press **[MR]** to recall total accumulated weight from memory,
b. After **[MR]** is pressed, This instrument displays "**≡ n**" (**n** means the number of transactions accumulated) follow by the total accumulated weight stored in memory,
c. At this point: -
   - Press **[ZERO]** to quit, or
   - Press **[ZERO]** followed by **[CE]** to clear memory and return operation. **M+ INDICATOR** disappear to indicate no data is stored in memory.

[11] Memory Accumulation Function support weighing function only.
[12] Weight less than 20d (or 20d1 for dual range) will not be accumulated to memory.
[13] All data stored will be erased when this instrument is powered off.
[14] Or press **[PRINT]** if F17 is = ON.
[15] Weight must return to or below zero to enable another weight accumulation.

6.6 Function Modes

This instrument is equipped with the below function modes: -

- Piece Count,
- Percentage,
- Animal weighing (When F11 = on),
- Checkweighing (HI/LO check) for above functions.

6.7 To Enter & Quit from Supplementary Function Mode

6.7.1 To Enter a Function Mode

Press **[FUNC]** to shift among Piece Count **(CoUnt)**, Percentage **(PErCnt)**, Animal weighing **(Ani)** modes and then press **[M+]** to enter when the desired mode name is being displayed.

6.7.2 To Enter & Quit from a Function Mode

- To change enter a specific supplementary function mode, press **[FUNC]** until the desired supplementary function mode appears. Then press **[M+]** to enter,
- To quit from a supplementary function mode, press **[FUNC]** followed by **[ZERO]**.

6.8 Piece Count Function[16]

Follow the below steps to enter **Piece Count Function: -**

a. Refer to **6.3** on how to select the desired weight unit,
b. If a container is used, place it onto the platform and press **[TARE]**,
c. Press **[FUNC]** to shift among various functions until Piece Count **(CoUnt)** appears,
d. Press **[M+]** to enter,
e. Default[17] sample size and **PCS INDICATOR** appear.
f. The instrument is now in **Piece Count Function**.
g. Refer to **6.8.1** for subsequent operation procedures.

[16] Piece Count Function Mode does not support memory accumulation (M+) function.

[17] Default sample size value = 50 pieces.

6.8.1 Sampling Process

a. Put samples with same quantity on platform then press **[M+]**. Should a different sample size is required, enter the quantity of the sample size through the numeric keys[18],
b. Apply samples with the same quantity as being displayed on this instrument[19] and press **[M+]**,
c. This instrument will calculate, store the average piece weight and confirm with 2 beeps. The quantity applied to platform is then displayed,
d. Sampling process is now completed,
e. Add to or remove from the platform, the corresponding quantity will be displayed automatically.

Note: -
To count different articles, press **[FUNC]** and repeat procedures listed on **6.8** and **6.8.1**.

6.8.2 Shift among Quantity, Average Piece Weight and Weight Info

a. Press **[UNIT]** to shift among quantity, average piece weight and weight info,
b. Quantity Display format = numeric numbers & PCS (e.g. **1000 PCS**) ,
c. Average piece weight display format = numeric numbers & weight unit & / (slash) & PCS (e.g. **499.960g/PCS**) ,
d. Weight display format (when Piece Count Function is in effect) = numeric numbers & weight unit & PCS (e.g. **500 kg PCS**).

6.8.3 To quit Piece Count Function[20]

Refer to **6.7.2** on how to quit and back to weighing function.

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[18] Usually, the more the sample size, the better the counting accuracy.

[19] Although there is no restrictions on the minimum average price weight, for counting accuracy, it is recommended that the average piece weight should not be less than 0.25d or 0.25d1 (dual range mode).

[20] After quit, the average piece weight stored will be erased.

6.9 Percentage Function[21]

Follow the below steps to enter **Percentage Function: -**

a. Refer to **6.3** on how to select the desired weight unit,
b. If a container is used, place it onto the platform and press **[TARE]**,
c. If a reference mass (mass value which is considered as 100%) is available, apply it on platform,
   Note: - If reference mass is not available or reference mass value will be entered through numeric keys, then ignore this step.
d. Press **[FUNC]** to shift among various functions until **Percentage Function (PErCnt)** appears,
e. Press **[M+]** to enter,
f. Reference mass value can be entered by anyone of the below methods: -
   - By applying the reference mass onto the platform during abovementioned step c, or
   - In case there is no reference mass applied to platform, the last reference mass used will be displayed. Press [M+] to confirm, or
   - In case of new reference mass value, enter it through numeric keys and press [M+] to confirm. After a new reference mass is entered, this instrument shows 0% to indicate there is no load applied to platform.
g. This instrument is now ready for percentage calculation.

6.9.1 To Quit Percentage Function[22]

Refer to **6.7.2** on how to quit and back to weighing function.

6.10 Animal Weighing Function[23] [24] [25]

Follow the below steps to enter **Animal Weighing Function: -**

a. Refer to **6.3** on how to select the desired weight unit,
b. If a container is used, place it onto the platform and press **[TARE]**,
c. Press **[FUNC]** to shift among various functions until **Animal Weighing**

[21] Percentage Function does not support memory accumulation (M+) function.

[22] After quit, the average piece weight stored will be erased.

[23] To enable animal weighing function, set F11 = ON.

[24] Weight reading of Animal weighing function cannot be accumulated.

[25] Animal Weighing function will not operate when weight is less than 20d (or 20d1 for dual range).

Function (Ani) appears,

d. Press **[M+]** to enter,

e. Display last error control (**E**) value applied. Select the preferred error control value[26] by pressing **[FUNC] or [UNIT]** key, 5 error control values are available: -

- E 2d = 2d,
- E 5d = 5d,
- E 10d = 10d,
- E 15d = 15d,
- E 20d = 20d.

f. Display last filter (**FLt**) value applied. Select the preferred filter value[27] by pressing **[FUNC] or [UNIT]** key, 3 filter values are available: -

- FLt 1 = Fast (Displayed average weight is calculated based on the last 4 internal readings),
- FLt 2 = Normal ((Displayed average weight is calculated based on the last 8 internal readings),
- FLt 3 = Slow (Displayed average weight is calculated based on the last 12 internal readings).

g. Display the last weight release variation value (**rE**) applied. Under the animal weighing function, this instrument will hold a weight result until the pre-defined weight release variation value is achieved,

h. Select the preferred weight release variation value by pressing **[FUNC]** or **[UNIT]** key. 5 auto release range values are available: -

- rE oFF = auto release disabled,

---

[26] Error control is the maximum difference value (in term of d) of the current detected weight (calculated internally) from the average weight (calculated by the number of times as defined by filter value set forth under FLt) before this instrument dim the current detected weight as stable and holds it on the display panel.

The smaller the error control parameter, the more accurate the displayed weight, but it will be difficult to get a stable weight status for printout.

The higher the error control parameter, the higher the chance to obtain a stable weight status, but it will be easier to get a stable weight status for printout.

Sometimes, it also means the maximum allowed error allowed between the printed weight and the actual calculated average weight.

[27] It is a trade-off between motion filtering and accuracy. The faster the filter, the lower the accuracy; the slower the filter, the higher the accuracy. It is recommended that FLt 3 should be applied first. Should situation requires, change to a lower FLt number.

- rE 2 = auto release when weight varies ≥2% of rate capacity (or W1 for dual range),
- rE 5 = auto release when weight varies ≥5% of rate capacity (or W1 for dual range),
- rE 10 = auto release when weight varies ≥10% of rate capacity (or W1 for dual range),
- rE 20 = auto release when weight varies ≥20% of rate capacity (or W1 for dual range).

i. Press **[M+]** to enter,
j. Display **Ani. AUTO INDICATOR** appears to indicate Animal Weighing Function is in effect.

6.10.1 Weighing Animal

a. Get animal on platform,
b. This instrument will calculate the mean weight of an animal or a group of animals. The result obtained will be displayed. **HOLD INDICATOR** appears to indicate that this weight value is being held (frozen)[28],
c. Get other animals on platform in case more animals have to be weight in the same transaction,
d. An updated weight will be calculated and displayed[29] as above step **b**.

6.10.2 To Update Weight Value Manually

To update the weight reading manually, press **[ZERO]**.

6.10.3 To Quit Animal Weighing Function

Refer to **6.7.2** on how to quit and back to weighing function.

After quitting, the **AUTO INDICATOR** disappears to indicate that Animal Weighing is no longer in effect.

[28] When weight value is being frozen, weight unit conversion is not possible.

[29] Provide that extra weight added fulfill the weight release variation value listed on 6.10 step g.

6.11 Checkweighing Mode[30] [31] [32]

This instrument is equipped with various checkweighing modes. See **F25** for check modes availability.

6.11.1 To Trigger Checkweighing Mode 1 and Mode 2

Follow the below steps to trigger checkweighing Mode 1 and Mode 2: -

a. During normal operation (of a function), press **[CHECK]**.
b. The current Hi limit is displayed with the **Hi symbol** on, press **[M+]** to confirm, or
c. Enter a new Hi limit through the numeric keys and then press **[M+]**,
d. Display current Lo limit with the **Lo symbol** on, press **[M+]** to confirm, or
e. Enter a new Lo limit through the numeric keys and then press **[M+]**
f. Checkweighing function is now enabled. The check result is shown by one of the HI/OK/LO symbols,
g. The same result will be sent to the relay module (if ordered) together with the buzzer signal.

Notes: -

1. For normal comparison, set both Hi and Lo limits,
2. To check only if result is lower than or equal to LO (result ≤ LO), set Hi limit = 0,
3. To check only if result is higher than or equal to HI (result ≥ HI), set Lo limit = 0,
4. To check if result is equal to a specified value, set both Hi limit and Lo limit = the specified value
5. To quit / stop from this checkweighing mode, set both Hi and Lo limits to zero.

[30] Checkweighing mode will not operate when weight is less than 20d (or 20d1 for dual range).

[31] Set also F15 for desired Checkweighing buzzer output.

[32] When F25 = Mode 1, set also F26 (Near Zero weight value).

6.12 Standard / Dynamic Checkweighing Mode (F25 = Mode 1[33])

This mode is used to compare the weight reading obtained with the preset Hi and Lo limits set to this instrument. The comparison result (HI, OK or LO) will then be displayed with or without buzzer[34].

External control equipment can utilize the comparison result through the optional RELAY-4, 4-channel relay module. Refer to below table for relay output assignment.

6.12.1 Relay Output Assignment Table (F25 = Mode 1)

Relay on RELAY-4 Module	Synchronized with Indicator signal
RELAY 1	Buzzar Output
RELAY 2	LO Output
RELAY 3	OK Output
RELAY 4	HI Output

Standard checkweighing mode can be activated during the below function modes. Bracketed are the targets to be checked under various functions.

- Weighing (weight value). If it is selected, set also internal function F26 (Near Zero Value). Refer to 6.12.2 for more detail about Near Zero Value,
- Piece Count (number of pieces),
- Percentage (percentage value),
- Animal Weighing (actual weight value35).

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[33] Before using this function mode, set preferred near zero weight value in F26. System will ignore any near zero value entered which is less than 20e. If it is the case, system will use 20e as minimum near zero weight value. For static weighing application, set near zero value to zero.

[34] Set F15 to obtain the preferred buzzer output configuration.

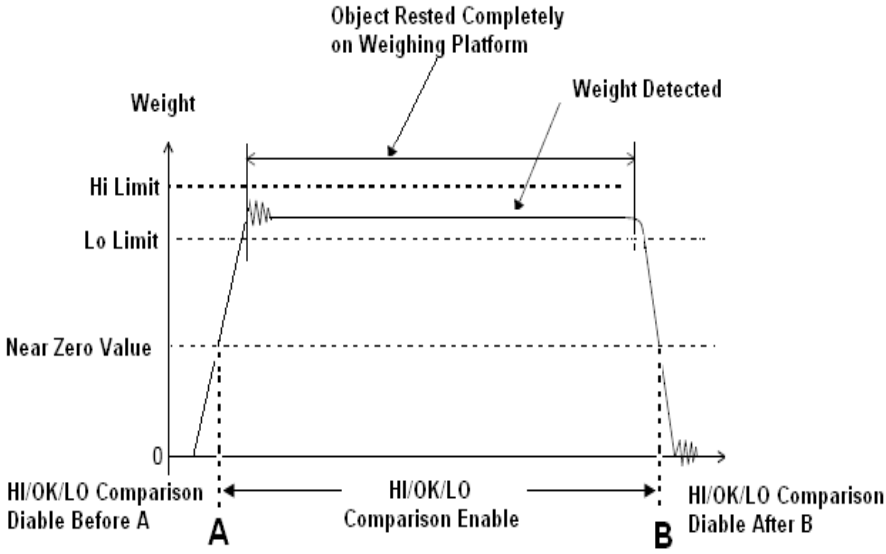
[35] Despite the weight value is being held (frozen), this instrument will still detect continuously the actual weight applied to the platform, compare this actual applied with the HI and LO limits set and present the comparison result based on the actual weight applied.

6.12.2 About Near Zero Value (F26)

Nero zero value is useful for dynamic weighing applications when weight value is the checking target. It is used to avoid false LO signal output when load is approaching and leaving the weighing platform.

HI/OK/LO comparison will only start when weight reading exceeds the pre-set near zero value. Refer to below diagram for more information.

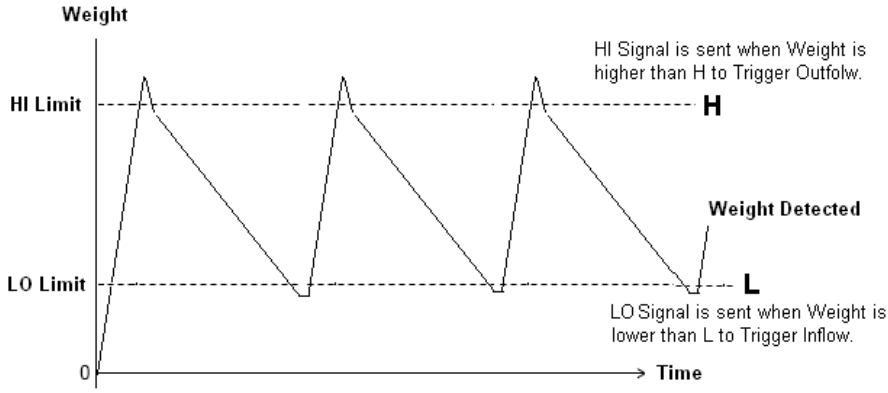
Diagram: - Near Zero Value



6.13 Inflow/Outflow Control Logic Mode (F25 = Mode 2)

The inflow/outflow logic mode is built-in the software to simplify the control system. Refer to below diagram for more information of this control logic.

6.13.1 Diagram: - Inflow / Outflow



Note: -
a. No OK signal will be sent during uploading process (from L to H)
b. OK signal will be sent during unloading process (from H to L)

This control logic should always be achieved through the optional Relay-4 4-Channel Relay Module. Refer to below table for relay output assignment.

6.13.2 Relay Output Assignment Table (F25 = Mode 2)

Relay on RELAY-4 Module	Synchronized with Indicator signal
RELAY 1	Nil
RELAY 2	LO Output (Connected with inflow devices)
RELAY 3	OK Output
RELAY 4	HI Output (Connected with outflow devices)

6.14 Constant Feeding (F25 = Mode 3) & Dispensing (F25 = Mode 4) Modes

Constant feeding and dispensing control logics are built-in the software to support constant feeding and dispensing system.

- To utilize constant feeding function, select Mode 3 in internal function F25.
- To utilize constant dispensing function, select Mode 4 in internal function F25.

Refer to: -

- 6.15.1 for constant feeding mode illustration system block diagram.
- 6.16.1 for constant dispensing mode illustration system block diagram.

6.14.1 Control Parameters

Control parameters are available to achieve various feeding / dispensing applications and target, Refer below table for more details.

Parameter	Description
Tare H	For Mode 3 only. • The highest weight value of an empty container which can be automatically tare off. • Condition: Tare H > = Tare L. • To disable Tare H checking, input 000000.
Tare L	For Mode 3 only. • This is the lowest weight value of a empty container which can be automatically tare off. • Condition: Tare L < =Tare H. • To disable Tare L checking, input 000000.
rEF H (Refill Hi)	For Mode 4 only • This is the weight value of the reservoir at or above which auto refill stops. • Condition: H > = rEF L > = SP2 > = SP1 (SP3 is not considered).
rEF L (Refill Lo)	For Mode 4 only. • This is the weight value of the reservoir at or below

	which auto refill starts. • Condition: rEFl L < = rEF H
SP1 (Set Point 1)	• Set Point 1. • This is the weight value at or above which fast feeding/dispensing comes to end. • Condition: SP1 < = SP2.
SP2 (Set Point 2)	Set Point 2. It is usually used for slow feeding / dispensing comes to end. • This is the weight value at or above which slow feeding/dispensing comes to end. • Condition: SP1 < = SP2 < = SP3.
SP3 (Set Point 3)	Set Point 3. It is usually used as alarm when the preset value is reached / exceeded. • This is the weight value at or above which (if such weight value is achieved within the time delay duration set in Delay 3) Relay 4 starts action. • Condition: SP1 <= SP2 <= SP3.
dELAy1 (Delay Time 1)	Time duration (00 ~ 99 sec). This is the time duration in between: - • When [FUNC] key (Start) key is pressed, and • SP1 (Relay 2) starts action.
dELAy2 (Delay Time 2)	Time duration (00 ~ 99 sec) This is the time duration in between: - • When weight value of SP1 is reached or exceeded (Relay 2 stops action), and • SP2 (Relay 3) starts action.
dELAy3 (Delay Time 3)	Time duration (00 ~ 99 sec). This is the time duration in between: - • (Normal case) When weight value of SP2 is reached or exceeded (Relay 3 stops action) and before feeding / dispensing sequence stops, or • (Alarm case) When weight value of SP2 is reached or exceeded and before weight value set in SP3 is/will

	be reached (Relay 4 starts action). SP3 is the preset alarm weight value. ***SP3, Delay 3 and Relay 4 together are used for fail safe proposes.***

6.14.2 Key Functions during Operation and Parameters Setting

Refer to the below table for Key functions during feeding / dispensing operation and parameters setting.

Key	Function Description
[ZERO]	• Before auto feeding / dispensing starts: - To set weight displayed to zero manually. • During auto feeding / dispensing process: - No function.
[TARE]	• Before auto feeding / dispensing starts: - To tare off the weight of a container manually. • During auto feeding / dispensing process: - No function.
[FUNC]	• During operation: - To start / stop feeding / dispensing operation process. • During parameter setting: - Go next.
[CHECK]	To start parameter setting menu.
[CE]	• During operation: - No function. • During parameter setting: - To clear value entered.
[UNIT]	• Before feeding / dispensing sequence starts: - Trigger Relay 1. • During operation (Mode 3): - No function. • During operation (Mode 4): - Select weight unit. • During parameter setting: - Go previous.
[PRINT]	• During operation: - Send current weight result to printer. • During parameter setting: - No function.

[MR]	• During operation: - To recall total number of stored transactions and total accumulated gross weight. • During parameter setting: - No function.
[M+]	• During operation: - Accumulate current weight to memory (if a net weight = zero or negative has been previously attained). • During parameter setting: - Enter, save and return.
[0 ~ 9]	• During operation: - No function. • During parameter setting: - Numeric keys.

6.14.3 To Enter and Set Parameters for Mode 3 & Mode 4

a. Select and set desired working mode (**Mode 3** or **Mode 4)** in internal function number F25,
b. During normal operation status, press **[CHECK]**,
c. Instrument displays one of the parameters listed on **6.14.2**,
d. Input value for each of the parameters. Refer to **6.14.2** for key function during parameter setting,
e. Press **[ZERO]** to quit to operation status.

6.14.4 To Trigger/Stop Feeding / Dispensing Mode 3 and Mode 4

a. During normal operation status, press **[FUNC]** to start.
b. During feeding / dispensing sequence, press **[FUNC]** to stop.

6.14.5 Constant Feeding and Dispensing Control Logic Outputs

The control logic output of these 2 modes should always be achieved through the optional Relay-4 4Channel Relay Module. Refer to below table for relay output assignment for both modes.

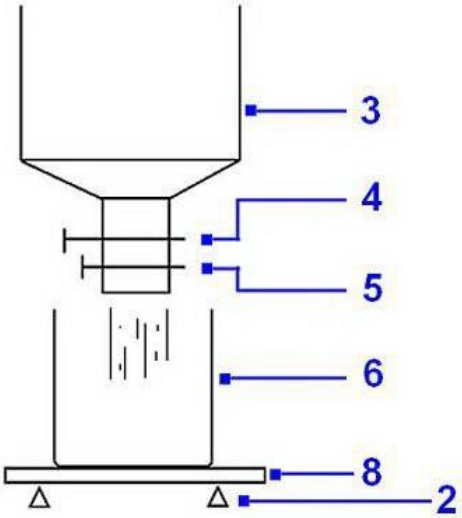
Constant Feeding and Dispensing Relay Output Assignment Table (F25 = Mode 3 & 4)

Relay on RELAY-4 Module	Mode 3	Mode 4
RELAY 1	Manual Output	rEF L

	(by **UNIT** Key)	(Connected with reservoir refill start/stop)
RELAY 2	SP1 Output. • To be connected with fast feeding valve / gate (**Mode 3**) • To be connected with fast dispensing valve / gate (**Mode 4**)	
RELAY 3	SP2 Output • To be connected with slow feeding valve / gate (**Mode 3**) • To be connected with slow dispensing valve / gate (**Mode 4)**	
RELAY 4	SP3 Output • To be connected with system alarm / system halt devices for both **Mode 3** and **Mode 4**.	

6.15 Constant Feeding Mode

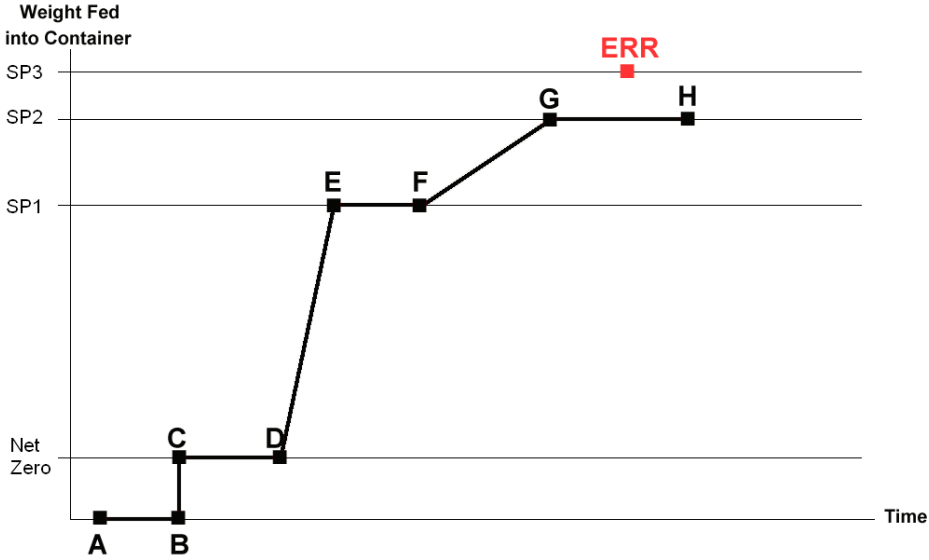
6.15.1 Constant Feeding Illustration System Block Diagram



Marking	Description
2	Load Cell
3	Reservoir
4	Solenoid Valve/Gate 1
5	Solenoid Valve/Gate 2
6	Container
8	Weighing Platform

6.15.2 Constant Feeding Sequence Diagram

Refer to below illustration diagram for feeding sequence.



6.15.3 Constant Feeding Sequence Description

Seq.	Point	Description
1	A	a. In case **[UNIT]** key is pressed, or automatically triggered by Seq. 11 automatically) b. Relay 1 starts action.
2	B	a. **[FUNC]** key is pressed. b. Relay 1 stops action. (If Relay 1 has been triggered)
3	C	a. Instrument displays **Start**. b. Feeding sequence starts.
4	C ➔ D	Time delay as set forth in Delay 1.

5	D	a. Weight of container is tare off automatically[36]. b. Relay 2 (SP1) starts action. c. Fast feeding starts.
6	E	a. Weight value of SP1 is reached. b. Relay 2 stops action. c. Fast feeding stops.
7	E ➔ F	a. Time delay as set forth in Delay 2. This is the stabilization waiting time before SP2 (slow feeding) starts. b. If a weight value **less** than SP1 is detected in this period, Seq. **5** and **6** will be repeated automatically.
8	F	a. Relay 3 (SP2) starts action. b. Slow feeding starts.
9	G	a. Weight value of SP2 is reached. b. Relay 3 stops action. c. Slow feeding stops.
10	G ➔ H	a. Time delay as set forth in Delay 2. This is the stabilization waiting time before the feeding process is completed and automatically stopped. b. If a weight value **less** than SP2 is detected in this period, Seq. **8** and **9** will be repeated automatically. **Notes**: - if any weight (e.g. a value = point **ERR**) >= SP3 is detected in this period: - • Relay 4 (error) will be triggered. • Feeding sequence come to a halt. • Manual intervention is required set.
11	H	a. Instrument displays **Stop**. b. Feeding sequence completed.

[36] Tare L<= weight of container <=Tare H.

		c. Instrument displays gross weight (Tare weight + weight of material filled). d. A printout[37] [38] is generated automatically. e. A signal is sent to trigger Relay1.

6.15.4 Constant Feeding Auto Printout[39]

After each successful feeding transaction, a printout of that transaction will be generated. Refer to below for printout content and description.

TIME	23:04:56	
DATE	25.10.2010	
NO.	1	**(Note 1)**
NET	234kg	**(Note 2)**
TARE	97kg	**(Note 3)**
GROSS	331kg	**(Note 4)**
TOTAL	234kg	**(Note 5)**

TIME	23:06:16	
DATE	25.10.2010	
NO.	2	**(Note 1)**
NET	236kg	**(Note 2)**
TARE	56kg	**(Note 3)**
GROSS	292kg	**(Note 4)**
TOTAL	470kg	**(Note 5)**

Notes: -

1. (In case internal function F17 auto accumulation is set to on) sequence number (also = total number) of current feeding transaction accumulated to memory. 1 = 1st, 2 = 2nd …etc. 0 = auto accumulation function disable.
2. Weight of material fed of this feeding transaction.

[37] When F18 is set to Mode 3.

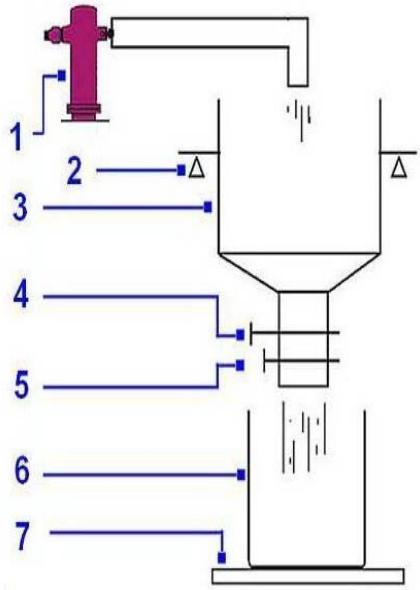
[38] Whether the current transaction will be automatically accumulated to memory depends on F17 setting.

[39] Number of printout copy depends on setting for internal function F18 Mode 3.

3. Weight of value (of the container) of this current feeding transaction has been tare off.
4. Gross weight of the container (after material has been filled in).
5. Total accumulated net weight of material fed.

6.16 Constant Dispensing Mode

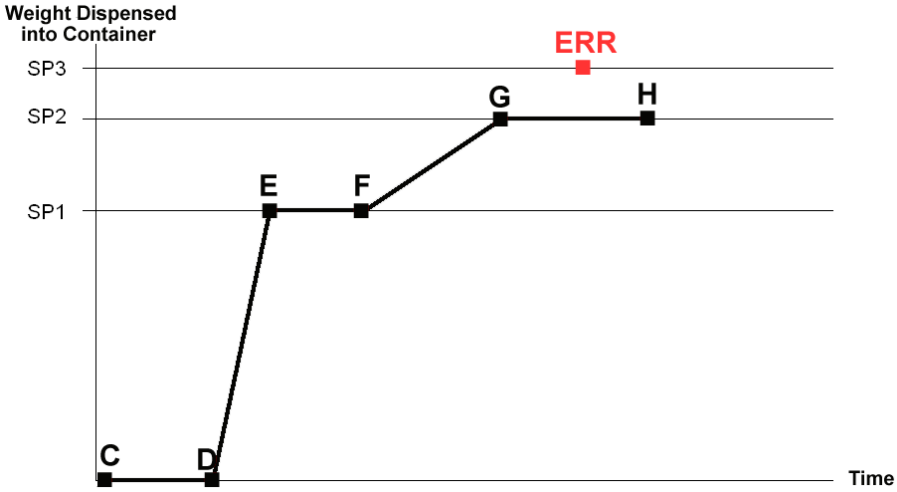
6.16.1 Constant Dispensing Illustration System Block Diagram



Marking	Description
1	Reservoir Refill Devices
2	Load Cell
3	Reservoir
4	Solenoid Valve/Gate 1
5	Solenoid Valve/Gate 2
6	Container
7	Working Platform

6.16.2 Constant Dispensing Sequence Diagram

Refer to below illustration diagram for dispensing sequence.



6.16.3 Constant Dispensing Sequence Description

Seq.	Point	Description
1	C	a. **[FUNC]** key is pressed. b. Instrument displays **Start**.
2	C ➔ D	Time delay as set forth in Delay 1.
3	D	a. Dispensing sequence starts. b. Relay 2 (SP1) starts action. c. Fast dispensing starts.
4	E	a. Weight value of SP1 is reached. b. Relay 2 stops action. c. Fast dispensing stops.
5	E ➔ F	a. Time delay as set forth in Delay 2. This is the stabilization / waiting time before SP2 (slow dispensing) starts. b. If a weight value **less** than SP1 is detected in this period, Seq. **3** and **4** will be repeated

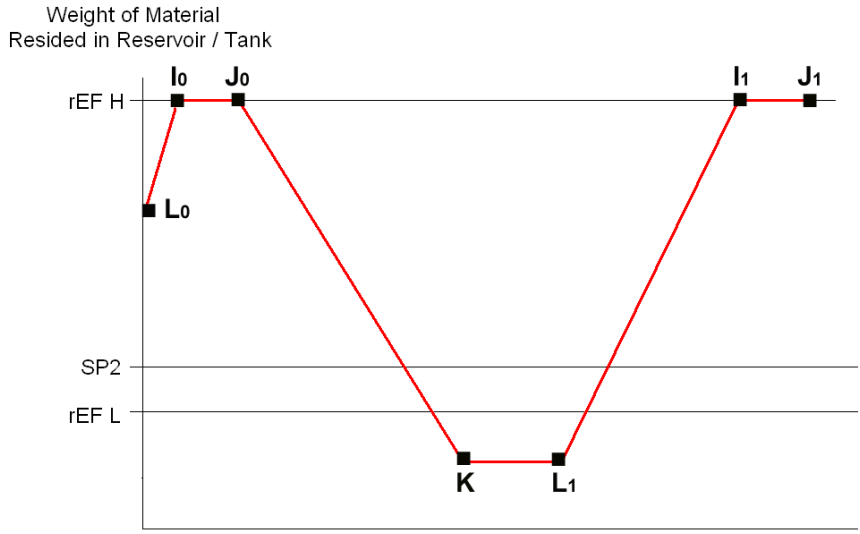
		automatically.
6	F	a. Relay 3 (SP2) starts action. b. Slow dispensing starts.
7	G	a. Weight value of SP2 is reached. b. Relay 3 stops action. c. Slow dispensing stops.
8	G ➔ H	a. Time delay as set forth in Delay 3. This is the stabilization / waiting time before the dispensing process is completed and automatically stopped. b. If a weight value **less** than SP2 is detected in this period, Seq. **6** and **7** will be repeated automatically. **Notes: -** If any weight (e.g. a value = point **ERR**) >= SP3 is detected in this period: - • Relay 4 (error) will be triggered. • Dispensing sequence come to a halt. • Manual intervention is required set.
9	H	a. Instrument displays **Stop**. b. Dispensing sequence completed. c. Instrument displays gross weight (Tare weight + weight of material filled). d. A printout[40] [41] is generated automatically. e. A signal is sent to trigger Relay1.

[40] Number of printout copy depends on F18 Mode 3.

[41] Whether the current transaction will be automatically accumulated to memory depends on F17 setting.

6.16.4 Auto Reservoir Refill Function

The constant dispensing control logic comes with auto reservoir refill & output logic. Refer to below diagram illustration diagram for auto reservoir refill sequence.



6.16.5 Auto Reservoir Refill Sequence Description

Seq.	Point	Description
1	L_0 ➔ I_0	Reservoir refill in process. Relay 1 in action.
2	I_0	a. Reservoir refill completed. b. Relay 1 stops action.
3	I_0 ➔ J_0	c. In case **[FUNC]** key is pressed or had been previously pressed (at reservoir weight value less than rEF L). d. Time delay as set forth in Delay 1.
4	J_0	Dispensing sequence starts.
5	J_0 ➔ K	Weight of material in reservoir decreased after one or more dispensing sequence.

6	K	d. Weight of material in reservoir drops below SP2 after the last dispensing sequence completed. e. **[FUNC]** key is pressed to start another dispensing sequence.
7	K ➔ L_1	Time delay as set forth in Delay 1.
8	L_1	a. Relay 1 starts action. b. Reservoir refill starts.
9	L_1 ➔ I_1	Reservoir refill in process.
10	I_1	a. Reservoir refill completed. Relay 1 stops action. b. In case **[FUNC]** key is pressed or had been previously pressed (at reservoir weight value less than rEF L), then = point C of **6.14.6.1a**.
11	I_1 ➔ J_1	Time delay as set forth in Delay 1.
12	J_1	= point D of **6.14.6.1a** above table.

6.16.6 Constant Dispensing Auto Printout[42]

After each successful dispensing transaction, a printout of that transaction will be generated. Refer to below for printout content and description.

TIME	06:59:53	
DATE	27.10.2010	
NO.	1	**(Note 1)**
NET	213kg	**(Note 2)**
TARE	0kg	
GROSS	816kg	**(Note 3)**
TOTAL	213kg	**(Note 4)**

[42] When F18 is set to **Mode 3**.

TIME	07:01:00	
DATE	27.10.2010	
NO.	2	**(Note 1)**
NET	201kg	**(Note 2)**
TARE	0kg	
GROSS	615kg	**(Note 3)**
TOTAL	414kg	**(Note 4)**

Notes: -

1. (In case internal function F17 auto accumulation is set to on) sequence number (also = total number) of current dispensing transaction accumulated to memory. 1 = 1st, 2 = 2nd …etc. 0 = auto accumulation function disable.
2. Weight of material dispensed if this dispensing transaction.
3. Weight value of material resided in reservoir after the current transaction.
4. Total accumulated weight of material dispensed.

7. RS232 Data Output Mode

There are 3 data output modes available[43]: -

- Mode 1 and Mode 2 are for communication with computer and other peripherals which accept and process continuous data communication,
- Mode 3 is for transmission to printer or other peripheral which accepts only single or manual data transmission.

7.1 Auto Weight Format String[44] [45]

Data is transmitted in ASCII code. Data format is listed on below table.

Data Bit	Description
1~2	**Motion Status** US = Unstable ST = Stable
3	**Comma Separation**
4~5	**Net/Gross** NT = Net Weight GS = Gross Weight
6	**Sign** (Sign of weight reading) Positive = space. Negative = minus (-)
7~13	**Weight Value** 7 digits weight value including location of decimal point. If there is no decimal point, then the first character = space.
14	**Comma Separation**
15~16	**Unit** kg = Kilogram lb = Pound
17	**Cr**
18	**LF**

[43] Refer to F18 for more information.

[44] When F18 is either set to **Mode 1** or **Mode 2**.

[45] Overloaded weight will not be sent.

8. Ticket / Receipt Printing

If a ticket/receipt printer is used, select **Mode 3**… **normal** should be selected in internal function F18.

8.1 Standard Print Output Format[46] [47]

Standard ticket/receipt printout of various function modes are illustrated below. Press **[PRINT]** for manual output or set F17 = ON for automatic output.

8.1.1 Standard Output Print Format

8.1.1.1 Weighing function

7 lines will be transmitted as below: -

1. Time of printing,
2. Date of printing,
3. Transaction sequent number (if this transaction is accumulated to memory),
4. Net weight,
5. Tare Weight,
6. Gross Weight,
7. Total accumulated net weight (if accumulation function is in effect).

Sample 1

TIME	15:21:00	
DATE	14.04.2009	
NO.	1	(First transaction added to memory)
NET	500.0kg	
TARE	0.0kg	
GROSS	500.0kg	
TOTAL	500.0kg	(Total accumulated net weight)

[46] When Normal is selected under **Mode 3** of F18.

[47] This instrument does not support DTR (data of offline detection).

Sample 2

TIME	15:21:16	
DATE	14.04.2009	
NO.	2	(Second transaction added to memory)
NET	200.0kg	
TARE	0.0kg	
GROSS	200.0kg	
TOTAL	700.0kg	(Total accumulated net weight)

Sample 3

TIME	15:21:25	
DATE	14.04.2009	
NO.	3	(Third transaction added to memory)
NET	500.0kg	
TARE	200.0kg	
GROSS	700.0kg	
TOTAL	1200.0kg	(Total accumulated net weight)

8.1.1.2 Piece count function

5 lines will be transmitted as below: -

1. Time of printing,
2. Date of printing,
3. Net weight,
4. Unit weight (average piece weight),
5. Count (quantity in terms of number of pieces).

Sample 1

TIME	15:30:44
DATE	14.04.2009
NET	300.0kg
UNIT.W	599.949 g
COUNT	500PCS

Sample 2

TIME	15:31:54
DATE	14.04.2009
NET	500.0kg
UNIT.W	599.949 g
COUNT	833PCS

8.1.1.3 Percentage function

5 lines will be transmitted as below: -

1. Time of printing,
2. Date of printing,
3. Net weight,
4. Weight value of reference (100%) mass,
5. Count (quantity in terms of number of pieces).

Sample 1

TIME	15:39:13
DATE	14.04.2009
NET	699.0kg
REF %	200.0kg
PERCENT	350.00%

8.1.1.4 Animal weighing function

3 lines will be transmitted as below: -

1. Time of printing,
2. Date of printing,
3. Weight (Net) being held.

Sample 1

TIME	16:33:42
DATE	14.04.2009
HOLD.W	496.0kg

8.1.2 Standard Output Print Format of Checkweighing Mode[48]

8.1.2.1 Weighing function with checkweighing

12 lines will be transmitted as below: -

1. Time of printing,
2. Date of printing,
3. Transaction sequent number (if this transaction is accumulated to memory),
4. Net weight,
5. Tare Weight,
6. Gross Weight,
7. Total accumulated net weight (when accumulation function is in effect),
8. One blank line,
9. One blank line,
10. Hi limit,
11. Lo limit,
12. Comparison result.

Sample 1

```
TIME        17:39:05
DATE      14.04.2009
NO.              5
NET         200.0kg
TARE          0.0kg
GROSS       200.0kg
TOTAL      3799.0kg


HIGH        2000.0kg
LOW          500.0kg
BELOW LIMIT
```

[48] Standard output print format of checkweighing mode does not support animal weighing function.

Sample 2

TIME	17:39:15
DATE	14.04.2009
NO.	6
NET	500.0kg
TARE	0.0kg
GROSS	500.0kg
TOTAL	4299.0kg
HIGH	2000.0kg
LOW	500.0kg
ACCEPT	

Sample 3

TIME	17:39:34
DATE	14.04.2009
NO.	7
NET	2500.0kg
TARE	200.0kg
GROSS	2700.0kg
TOTAL	6799.0kg
HIGH	2000.0kg
LOW	500.0kg
ABOVE LIMIT	

8.1.2.2 Piece count function with checkweighing

10 lines will be transmitted as below: -

1. Time of printing,
2. Date of printing,
3. Net weight,
4. Unit weight (average piece weight),
5. Count (quantity in terms of number of pieces),

6. One blank line,
7. One blank line,
8. Hi limit,
9. Lo limit,
10. Comparison result.

Sample 1

```
TIME          17:48:07
DATE        14.04.2009
NET             500.0kg
UNIT.W      1001.04 g
COUNT             499PCS



HIGH             1000PCS
LOW               500PSS
BELOW LIMIT
```

8.1.2.3 Percentage function with checkweighing

10 lines will be transmitted as below: -

1. Time of printing,
2. Date of printing,
3. Net weight,
4. Weight value of reference (100%) mass,
5. Count (quantity in terms of number of pieces),
6. One blank line,
7. One blank line,
8. Hi limit,
9. Lo limit,
10. Comparison result.

Sample 1

```
TIME          17:51:09
DATE        14.04.2009
NET             500.0kg
REF %           200.0kg
PERCENT         250.00kg



HIGH          1500.0 %
LOW            750.0 %
ABOVE LIMIT
```

8.2 Custom Print Output Format[49] [50]

Maximum 10 or 15 lines can be included for the below functions:-

- Weighing[51] (15 lines),
- Piece Count[52] (15 lines),
- Percentage[53] (15 lines),
- Animal weighing[54] (10 lines)

16 variants + 2 commands (**Cr LF and End**) are available for custom print output format. Refer to the below **Print Output Format Variants Table** for more detail.

8.2.1 To Edit Custom Print Output Format

Follow the below steps to create custom printout.

a. Go to internal function and select the desired function number to edit,
b. Select **CUSTOM** and press **[M+]**,
c. This instrument displays **Line 1** and the last variant or command (see **8.2.2** for details) stored,

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[49] When F18 is either set to **Mode** 3.

[50] This instrument does not support DTR (data of offline detection).

[51] Set F21 = CUSTOM to edit print output format.

[52] Set F22 = CUSTOM to edit print output format.

[53] Set F23 = CUSTOM to edit print output format.

[54] Set F24 = CUSTOM to edit print output format.

d. Press **[M+]** to confirm or select other variant or command by press **[FUNC]** or **[UNIT]**. Then press **[M+]** to confirm and save,
e. This instrument displays **Line 2** and the last variant or command stored,
f. Repeat steps **d** and **e** for other lines,
g. (In case, number of lines to be printed is less than 15 lines) To finish editing, select command **End**, then pres **[M+]** to confirm.
h. This instrument returns to and displays the current internal function number,
i. If required, repeat steps **a** to **h** to create and edit custom printout format for other functions.

Notes: -

1. Disregarding the total number of lines, the last line must be = **End**.
2. This instrument will automatically add **End** on line number 15th for Weighing, Piece Count and Percentage function, and on line number 10th for animal weighing function.

8.2.2 Print Output Format Variants Table

Symbol	Description
End	Edit finished
Cr LF	Goto next line
dAtE	Date of printing
tiME	Time of print
nEt	Net weight
tArE	Tare weight
GroSS	Gross weight
Unit	Average piece weight
cOuNT	Number of piece
PCt	Percentage value
P rEF	Reference mass (100%)
H rEF	HI limit
L rEF	LO limit
Ani	Weight Hold (Animal weighing)
Ch rES	Comparison result

trAnS	Transaction sequent number (if this transaction is accumulated to memory)
ACC	Total accumulated weight (when accumulation function is in effect)
SiGn	Signature

8.2.3 Edit Sample for Custom Print Output Format

Print Content		Line No.	Select
TIME	17:39:05	1	tiME
DATE	14.04.2009	2	dAtE
NET	200.0kg	3	nEt
TARE	0.0kg	4	tArE
GROSS	200.0kg	5	GroSS
(Blank line)		6	Cr LF
Signature	_____	7	SiGn
		8	End

9. Label Printing (LP-50 or Compatible)

This instrument supports label printing by LP-50 and any LP-50 compatible label printers. Contact your dealer for more information about label printers.

Comport used to connect with the label printer must be assigned for bi-directional communication; otherwise no printout will be generated. Refer to **Appendix A** for setting information.

Set all preferred operation parameters according to F18 listed on **5.4 Internal Function Table**.

Cautions: -

1. Always design independent labels for different working modes. Do not combine data of different working modes on the same label.
2. Do not print any labels of non-current working mode. This will retrieve wrong data of non-current working mode.
3. Print only label data when the same working mode is in operation.
4. Do not combine data of various working modes on same label. This will retrieve wrong data of non-current working mode.

9.1 Label Format Groups & Label File Names

2 label format groups are available, these are **For 1** (label format group 1) and **For 2** (label format group 2).

9.1.1 For 1 (Label Format Group 1)

For 1 (format group 1) is for current transaction data printing (during normal working status).

In order to trigger the right label to be printed, label files stored in printer for this format group 1 must have a file name of AA1.dlb, AA2.dlb, AA3.dlb, AA4.dlb and AA5.dlb.
In this instrument, 5 printout selections are available in format group 1: -

- For 1 1: - Select this to print label file AA1.dlb stored in printer.
- For 1 2: - Select this to print label file AA2.dlb stored in printer.
- For 1 3: - Select this to print label file AA3.dlb stored in printer.

- For 1 4: - Select this to print label file AA4.dlb stored in printer.
- For 1 5: - Select this to print label file AA5.dlb stored in printer.

9.1.2 For 2 (Label Format Group 2)

For 2 (format group 2) is for totalized data printing (after **[MR]** is pressed and memory recall is in effect).

In order to trigger the right label to be printed, label files stored in printer for this format group 1 must have a file name of BB1.dlb, BB2.dlb, BB3.dlb, BB4.dlb and BB5.dlb.

In this instrument, 5 printout selections are available in format group 2: -

- For 2 1: - Select this to print label file BB1.dlb stored in printer.
- For 2 2: - Select this to print label file BB2.dlb stored in printer.
- For 2 3: - Select this to print label file BB3.dlb stored in printer.
- For 2 4: - Select this to print label file BB4.dlb stored in printer.
- For 2 5: - Select this to print label file BB5.dlb stored in printer.

9.2 Label Programming

Prompt commands, information description, working mode and suggested length on label are listed on the below table**.**

Caution: -
Do not combine information of different working mode on the same label.

For other programming details, refer to use manual of printer and label editing software.

9.2.1 Label Programing Information Table

Prompt Command[55]	Description	Working Mode[56]	Suggested Length
K	Date of printing	All	10
L	Time of print	All	8
M	No. of accumulated transaction	Normal Weighing	7
N	Total accumulated weight	Normal Weighing	9
O	Net weight	All	10
P	Tare weight	All	10
Q	Gross weight	All	10
R	HI limit[57]	**Note A**	10
S	LO limit[58]	**Note A**	10
T	Comparison Result	All	11
U	Number of piece	Counting	10
V	Average piece weight	Counting	9
W	Reference mass (100%)	Percentage	9
X	Percentage value	Percentage	10
Y	Weight Hold (Animal weighing)	Animal Weighing	9

Note A: - Good for all except animal weighing mode.

[55] Commands must be in capital letter.

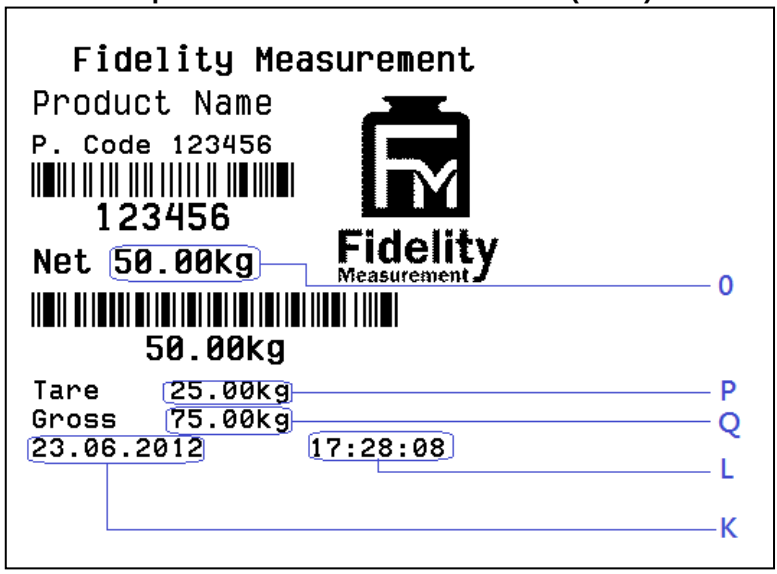
[56] "All" means the information is good for all working modes.

[57] Each working mode has its own Hi Limit format (weight for weighing mode; pieces for counting mode; % for percentage mode. If Hi Limit has to be printed, set Hi Limit value under the preferred working mode.

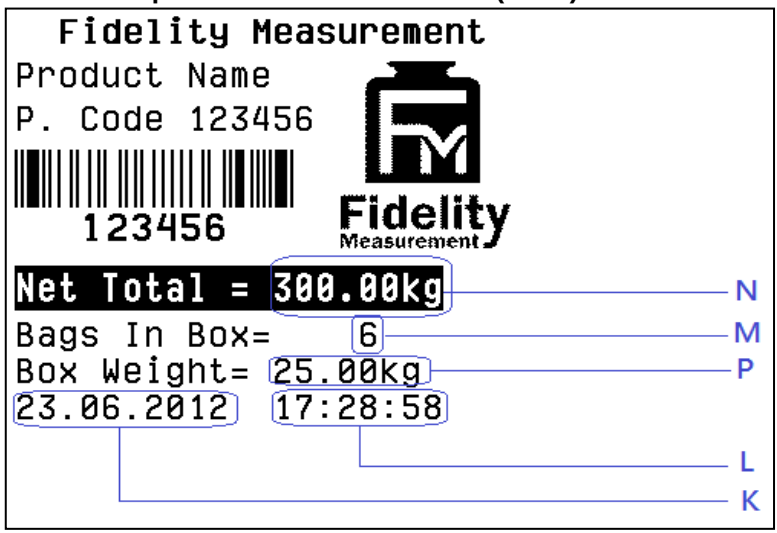
[58] Each working mode has its own Lo Limit format (weight for weighing mode; pieces for counting mode; % for percentage mode. If Hi Limit has to be printed, set Hi Limit value under the preferred working mode.

9.2.2 Label Programming Sample

9.2.2.1 Sample Label of Current Transaction (For 1)



9.2.2.2 Sample Label of Totalized Data (For 2)



10. Battery Power & Recharging

Remaining battery power of the built-in rechargeable battery is displayed on the **BATTERY POWER / LEVEL INDICATOR.**

10.1 Symbols and Remaining Power

 ≥ 6.3V

 ≥6.0V

 ≥5.7V

 <5.7V

10.2 Battery Operation Time

Depends on the battery condition, a new and fully charged rechargeable battery can provide[59]: -

- around 70 hours of continuous operation with backlight on, or
- around 200 hours of continuous operation without backlight.

10.3 Recharge Battery

When  appears, (when battery is less than 5.7V), it means that the built-in rechargeable battery is at low voltage status. Recharge battery as soon as possible.

To protect the built-in rechargeable battery, this instrument will be powered off automatically when battery is at extremely low level. If this is the case, do not attempt to power this instrument on. Recharge this instrument immediately. Fail to do so may cause unrecoverable damages to the built-in rechargeable battery.

Battery charging status is shown on the dual color **CHARGE STATUS INDICATOR**: -

- Red: - Recharging in process,
- Green: - Charging completed.

[59] When connect to one 350 ohm load cell.

Battery recharge is possible while operating. Overcharge protection circuit is inside to prevent battery damages from overcharge.

Heat generated during recharging and it is normal to feel minor heat at front housing of this instrument.

11. Error Codes

Error Code No.	Description
Err 1	Time value error
Err 2	Date value error
Err 3	Exceed maximum power on / manual zero range
Err 4	Offset out of range / unstable during power on
Err 5	No load cell signal detected
Err 6	Tare operation error
Err 7	Logic error. HI limit set is lower than LO limit (and HI is not = 0)
Err 8	Logic error. LO limit is higher than HI limit (and HI is not = 0)
Err 9	Error in percentage function. Input value = 0 or less than 50e
Err 10	(F25 Mode 3) Container weight is higher than tArE H
Err 11	(F25 Mode 3) Container weight is lower than tArE L
Err 12	(F25 Mode 3 and Mode 4) Actual weight is higher than SP3
--oL--	Overload (Gross weight is more than Max plus 9d)
UndEr	Negative Weight values exceeds display range
------	Negative Tare value exceeds display range

12. Daily Care & Maintenance

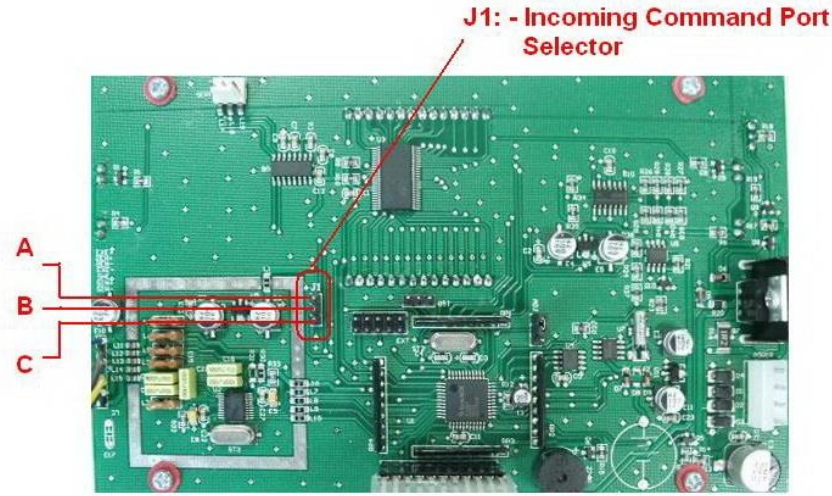
- Clean the instrument with a soft, damp cloth. If necessary, use a mild detergent in water,
- Do not use any harsh, abrasive material, acetone, volatile solvent, thinner or alcohol for cleaning,
- Verify the accuracy of this instrument periodically. Re-calibrate if necessary. In some countries, calibration requires authorized / qualified agent. Contact your dealer for more information,
- Store this instrument in a dry and clean place,
- Recharge battery before and every 2 months during long time storage.

Appendix A: - Bi-Directional Communication Jumper Setting

A. Selecting Incoming Command Comport

Depends on sales territory and metrology requirements, this instruction may equipped with 2 comports (RS232 and TTL comport). Both of them are capable of doing bi-directional communication, but at any time, only one of them can be assigned to do bi-directional communication.

Adjust Jumper J1 on mainboard to assigned specific comport for bi-directional communication. See below diagram for jumper setting.



Shortcuit A & B to assign RS232 comport for Bi-directional communication.
Shortcuit B & C to assign TTL comport for Bi-directional communication.

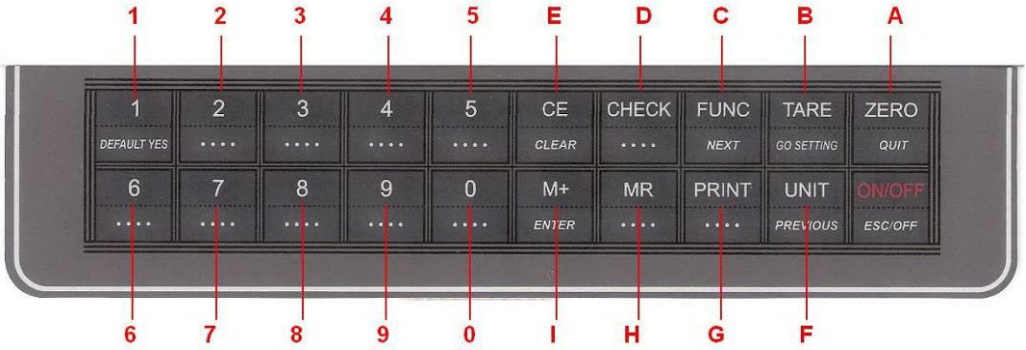
Appendix B: - Bi-Directional Communication Commands

Comport used for bi-directional communication propose must be assigned for bi-directional communication purpose. Refer to **Appendix A** for setting information.

Direct Control commands and information request commands can be sent to this instrument through any standard communication programs like Hyper Terminal, which comes with most of the Windows operating system in computer.

A. Direct Control Commands[60] (F18 = Mode 1, 2 And 4)

Equivalent direct control commands for each of the key on panel from computer are shown below.



Note: -

There is no direct control command to simulate the **[ON/OFF]** key on panel. Thus, power on and off this instrument must be done through key the **[ON/OFF]** key on panel.

B. Information Request Commands (F18 = Mode 4)

Operation data are available by sending information request commands to this instruction.

[60] Direct Control Commands to be transmitted to this instrument are not case sensitive.

Cautions: -

1. Do not retrieve any data of non-current working mode. This will retrieve wrong data of non-current working mode.
2. Retrieve only data when the same working mode is in operation. This will retrieve wrong data of non-current working mode.

B.B.1 Information Request Commands Table

Commands[61]	Operation Data	Working Mode[62]	Data Length
J	Current status, weight and tare weight values	All	24
K	Date of printing	All	10
L	Time of print	All	8
M	No. of accumulated transaction	Normal Weighing	7
N	Total accumulated weight (when accumulation function is in effect)	Normal Weighing	9
O	Net weight	All	10
P	Tare weight	All	10
Q	Gross weight	All	10
R	HI limit	**Note C**	**Note A**
S	LO limit	**Note C**	**Note A**
T[63]	Comparison Result	All	**Note B**
U	Number of piece	Counting	10
V	Average piece weight	Counting	9

[61] Commands must be in capital letter.

[62] "All" means that information is good for all working modes.

[63] Does not support animal weighing function.

W	Reference mass (100%)	Percentage	9
X	Percentage value	Percentage	10
Y	Weight Hold (Animal weighing)	Animal Weighing	9

Note A: - 10 for counting mode; 9 for all other modes.
Note B: - 6 for ACCEPT; 11 digits for BELOW LIMIT and ABOVE LIMIT.
Note C: - Good for all except animal weighing mode.

B.B.2 Data Format[64] [65] [66]

Protocol of data answered by this instrument is illustrated on below table.

Commands	Data example and format Description
J	**ST,NT 123.567,123.567,kg** • 2 digits motion status (ST = stable; US = unstable) • 1 digit comma separation • 2 digits Net/Gross (NT = Net; GS =Gross) • 1 comma separation • 1 digit sign. Positive = space. Negative = minus (-) • 7 digits weight value including decimal point. If there is no decimal point, then the first character = space • 1 digit comma separation • 7 digits tare weight including decimal point • 1 digit comma separation • 2 digits weight unit
K	**22.06.2012** • 8-digit date format depends on F4 setting

[64] All data = align to right.

[65] Insignificant figures = space.

[66] All data end up with CR, LF.

L	**19:06:34**
M	**6** • 6 digits
N	**123.457kg** • 7 digits current weight including decimal point. If there is no decimal point, then the first character = space • 2 digits weight unit
O	**123.567kg** **-123.567kg** • 1 sign of weight reading. Positive = space. Negative = minus (-) • 7 digits weight value including decimal point. If there is no decimal point, then the first character = space • 2 digits weight unit
P	**123.567kg** **-123.567kg** **P23.567kg** • 1 sign of weight reading. Positive = space. Negative = minus (-) • 7 digits tare weight value including decimal point. If there is no decimal point, then the first character = space. For preset tare, the first digits = P • 2 digits weight unit
Q	**123.567kg** **-123.567kg** • 1 sign of weight reading. Positive = space. Negative = minus (-) • 7 digits gross weight value including decimal point. If there is no decimal point, then the first character = space • 2 digits weight unit
R	**250.00kg**

	300000PCS **2000.00 %** • 7 digits Hi Limit value including decimal point. If there is no decimal point, then the first character = space • 2 digits weight unit and % (percentage mode); 3 digits PCS (counting mode)
S	**1500.00kg** **200000PCS** **200000PCS** **1000.00 %** • 7 digits Lo Limit value including decimal point. If there is no decimal point, then the first character = space • 2 digits weight unit and % (percentage mode); 3 digits PCS (counting mode)
T	**ACCEPT** **BELOW LIMIT** **ABOVE LIMIT** • 6 digits ACCEPT; 11 digits for BELOW LIMIT and ABOVE LIMIT
U	**10000PCS** **- 5000PCS** • 1 sign of weight reading. Positive = space. Negative = minus (-) • 1 digit space • 6 digits number of pieces. • 3 digits PCS
V	**123.567 g** • 7 digits unit piece weight value including decimal point. If there is no decimal point, then the first character = space • 2 digits weight unit
W	**123.567kg** • 7 digits reference mass (100%) value including

	decimal point. If there is no decimal point, then the first character = space • 2 digits weight unit
X	**300.00 %** **- 42.00 %** • 1 sign of weight reading. Positive = space. Negative = minus (-) • 7 digits percentage value including decimal point. If there is no decimal point, then the first character = space • 1 digit space • 1 digit %
Y	**123.567kg** • 7 digits hold weight value including decimal point. If there is no decimal point, then the first character = space • 2 digits weight unit