



21^e

Configurable Indicator Operation Manual (Full Version)



PLEASE READ THIS MANUAL VERY CAREFULLY BEFORE OPERATING THIS INSTRUMENT

Specifications subject to change without prior notice

V130 July 2019

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Cautions

- 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.
- Do not place this instrument in where shock, excessive vibration or extremes of temperature (before or after installation) exist.

1. Reminders

1.1 Metrological Legislation

Because of metrological legislation, some metrological parameter settings are limited to be done by authorized personnel only. Do not attempt to change any parameters under internal function number F39 ~ F99. Contact your dealer for installation and technical assistance.

1.2 Seal & Serial Number

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) or serial number affixed to this instrument. No warranty service will be provided if the seal (or stamp) or data plate affixed to this instrument is damaged or removed. Always contact your dealer for after sales service.

1.3 Placing the Weighing Platform

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

1.4 Support & Service

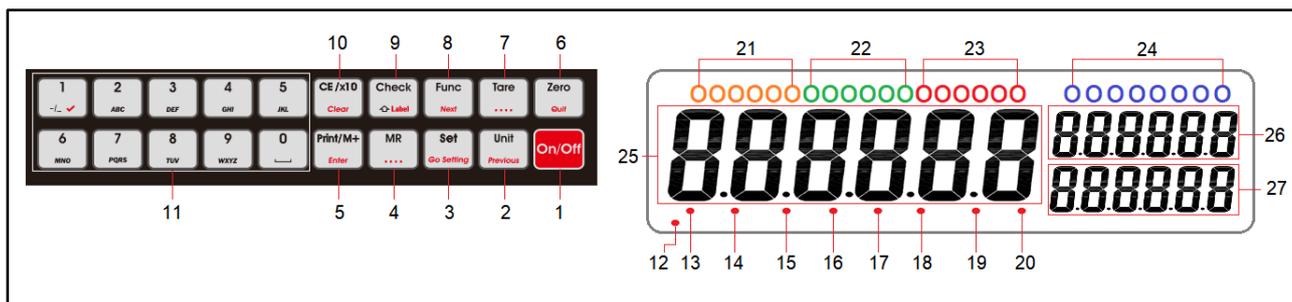
Always contact your dealer for product information, after sales service and questions when in doubt.

2. Specifications

Capacity and Readability	Free Setting
Weighing Range	Single Range, Dual Range, Dual Interval
Weight Units	kg, g, lb
Displays	<ul style="list-style-type: none"> • Display #1: - 6 x 25mm LED Numeric Digits • Display #2: - 6 x 10mm LED Numeric Digits • Display #3: - 6 x 10mm LED Numeric Digits
Load Cell Connection	<ul style="list-style-type: none"> • Excitation Voltage = 5V DC • Support both 4-wire & 6-wire Load Cells • Maximum Load Cell Connection = 10 x 350Ω or 20 x 700Ω Load Cells • Maximum Load Cell Rated Output 4mV/V
A/D Converter & Internal Resolution	<ul style="list-style-type: none"> • 24 bit Low-Noise Delta to Sigma (Δ-Σ) • 3.200,000 Counts at 15 mV • Minimum input per d = 0.05μV
AD Conversion Speed	15, 30, 60, 120, 240, 480 times/second Selectable
Max. Tare Range	<ul style="list-style-type: none"> • -Max for Single Weighing Interval or • -Max₁ (Subtractive Tare)
Calibration Methods	<ul style="list-style-type: none"> • 2 Span Points Calibration (Linearity Calibration), or • 1 Span Point Calibration, or • Numeric Calibration Through Keyboard
Power Source	<ul style="list-style-type: none"> • Built-in Rechargeable Battery = 6V, 4AH • External Power Adaptor = DC 12V, 1A
Accessories	Pillar Mount Holder (\varnothing 35~38mm), Built-in Rechargeable Battery, Universal Power Adaptor, Dust Cover
Packing	<p>Individually Packed</p> <ul style="list-style-type: none"> • Dimensions = 36 x 32 x 16cm. Net / Gross = 2.35 / 2.85kg <p>6 Units in Shipping Carton</p> <ul style="list-style-type: none"> • Dimensions = 102 x 35 x 35cm. Net / Gross = 17.00/ 18.50kg
Operation Environment	-10 ~ 40°C. Non-condensed. R.H. \leq 85%

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

3. Panel and Keys



3.1 Key Board Description

No.	Description	Key Function	
		Normal Operation	Internal Function Setting
1	On/Off Key	Power instrument on or off.	Quit without saving and power off.
2	Unit Key	Shift among various weight units (if weight unit conversation is enable).	Go to previous page.
3	Set Key	<ul style="list-style-type: none"> When in weighing mode: - to access internal function setting mode (F1~F38), To prompt/introduce an operation parameter/value during piece count, auto tare accumulation and animal weighing mode. 	During power on countdown process: - to access internal function mode (F1~F99) ¹ .
4	MR Key	Recall total stored transactions	Nil
5	Print/M+	Send print data out and/or accumulate current value to memory ² .	Enter, save and return.
6	Zero Key	Set weight displayed to zero when unloaded.	<ul style="list-style-type: none"> Set F1 value being shown to zero and to display the net span gain of additional load applied, Quit without saving.
7	Tare Key	To tare off the weight of a container.	Nil
8	Function Key	Shift among various function modes.	Go to next page.
9	Check Key	Start check function and to enter value for LO / HI Limit or Set Point (SP) values.	<ul style="list-style-type: none"> Quick access to label settings, F2: Check Battery Voltage, F29: Display current pointer value.
10	CE/x10 Key	<ul style="list-style-type: none"> Clear value entered during setting process, or Trigger the extended display mode. 	Clear.

¹ F60~F99 requests password or jumper to access.

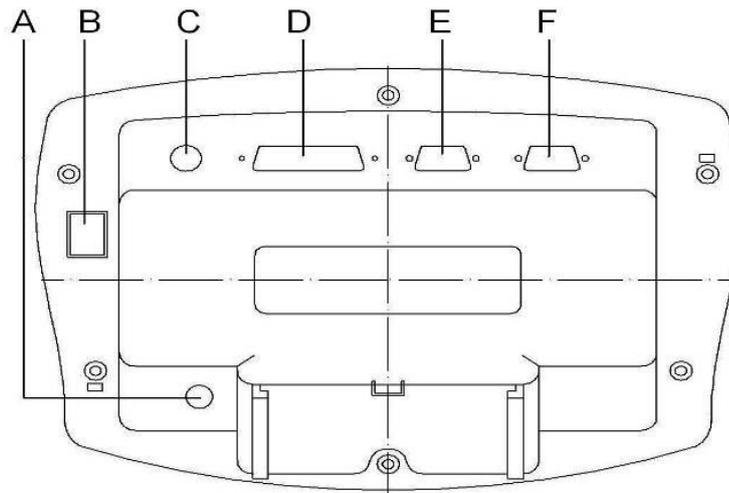
² Refer to F16 and F17 settings for details.

11	Numeric Key 0 ~ 9	<ul style="list-style-type: none"> • Press [0] to go to F1. • Press [1] to go to F10. • • Press [9] to go to F90.
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3.2 Display Panel Description

No.	Name	Description
12	Charge Status Indicator	<ul style="list-style-type: none"> • Red color: Recharging battery, • Green color: Charging completed.
13	Zero Indicator	Visible when instrument is at zero status.
14	Net Indicator	Visible when net result is being displayed.
15	Weight Unit (kg) / Stable Indicator	Visible when weight unit is = kg. <ul style="list-style-type: none"> • Flashing = Weight unstable • Lit on = Weight stable
16	Weight Unit (g) / Stable Indicator	Visible when weight unit is = g. <ul style="list-style-type: none"> • Flashing = Weight unstable • Lit on = Weight stable
17	Weight Unit (lb) / Stable Indicator	Visible when weight unit is = lb. <ul style="list-style-type: none"> • Flashing = Weight unstable • Lit on = Weight stable
18	PCS Indicator	Visible when instrument is in Piece Count mode. <ul style="list-style-type: none"> • PCS Indicator only = Value being displayed is number of pieces. • PCS Indicator + any Weight Indicator = Value being displayed is unit piece weight.
19	M+ Indicator	Visible when memory contains of accumulated data.
20	Lo Battery Indicator	Visible when built-in rechargeable battery is low. <ul style="list-style-type: none"> • Flashing: - Battery level is below normal level. Apply power adaptor to recharge battery as soon as possible. • Lit on: - Battery level is at extreme low. Apply power adaptor to recharge battery immediately otherwise instrument will power off automatically shortly.
21	Lo Light Bar	<ul style="list-style-type: none"> • Weighing Mode: - Visible when check result is = Lo. • Grading Mode: - Visible when grade result is = Low.
22	Ok Light Bar	Visible when check result is = Ok.
23	Hi Light Bar	<ul style="list-style-type: none"> • Weighing Mode: - Visible when check result is = Hi. • Grading Mode: - Visible when grade result is = High.
24	Relay Output Indicators	<ul style="list-style-type: none"> • From left to right = Relay 1 ~ 8. • Visible when the corresponding relay is triggered.
25	LED1	LED display panel #1.
26	LED2	LED display panel #2.
27	LED3	LED display panel #3.

4. Connection Points



A. DC Jack Input for Indicator

External power adaptor (DC12V, 1A centre positive) 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)

Load Cell Connector Pin Assignment Table

Pin # on Load Cell Connector	Pin Assignment
1	Excitation +ve
2	Remote Sense +ve
3	Excitation -ve
4	Remote Sense -ve
5	Signal +ve
6	Signal -ve
7	Ground

Notes: -

- Apply both the 4/6 wire load cell jumpers on mainboard when 4-wire load cell is used.
- Remove both the 4/6 wire load cell jumpers from mainboard when 6-wire load cell is used.

D. Control Output Port

Control Output Port Pin Assignment Table

Pin No. on Control Output Port	Description	Diagram
1	Relay Output #1, Normal Open	
2	Relay Output #1, Common	
3	Relay Output #1, Normal Close	
4	Relay Output #2, Normal Open	
5	Relay Output #2, Common	
6	Relay Output #2, Normal Close	
8	Relay Output #3, Normal Open	
9	Relay Output #3, Common	
10	Relay Output #3, Normal Close	
11	Relay Output #4, Normal Open	
12	Relay Output #4, Common	
13	Relay Output #4, Normal Close	
14	Relay Output #5, Normal Open	
15	Relay Output #5, Common	
16	Relay Output #5, Normal Close	
17	Relay Output #6, Normal Open	
18	Relay Output #6, Common	
19	Relay Output #6, Normal Close	
20	Relay Output #7, Normal Open	
21	Relay Output #7, Common	
22	Relay Output #7, Normal Close	
23	Relay Output #8, Normal Open	
24	Relay Output #8, Common	
25	Relay Output #8, Normal Close	

Notes: -

- a. In case control output is used, always plug in the power adaptor which comes with this instrument. Otherwise, no output signal will be sent.
- b. Common of a particular output is independent to the common of other control outputs.
- c. Dry contacts only.

E. Comport 2

F. Comport 0

Comports Pin Assignment for Comport 0 and Comport 2

Comport 0 (male)	Comport 2 (female)
2 = RXD	2 = TXD
3 = TXD	3 = RXD
5 = GND	5 = GND
9 = DC 5V Output	Nil

Notes: -

Contact your dealer for below connection types: -

- 4-20mA and 3-21mA DAC output.
- 0-5V and 0-10V DAC output.
- LAN communication.
- RS485
- WIFI communication
- Bluetooth 4.0 BLE and Bluetooth 2.0
- TTL communication
- Isolated RS232 communication.

5. Power Adaptor, Built-In Batteries and Recharging

5.1 Power Adaptor

Always use the power adaptor supplied together with this instrument to avoid un-recoverable damages to this instrument.

5.2 Before Plug in Power Adaptor to Electricity Grid

Double check if the input voltage marked on adaptor data matches with the electricity grid. If not, do not plug in and contact your dealer immediately.

5.3 Before First Time Use

To ensure the best battery performance, plug in the power adaptor to recharge the built-in battery for at least 8 hours before power on instrument.

5.4 CR1220 Real Time Clock Backup Battery

A CR1220 battery is installed to back up the real time clock of the system and other application parameters. Replace this battery with new one every 12 months for best performance. After replacing this battery, check and double check / set system date and time format and value.

5.5 Battery Voltage and Battery-Operation Application

Battery voltage is displayed during power on countdown process and also by means of internal function F2.

Battery voltage below 6.0 is considered to be low and is not recommended for any battery-operated application which lasts for longer than 60 minutes (depends on actual system configuration).

5.6 Battery Lo Indication

When **Lo Battery Indicator** appears, battery level is low. Apply power adaptor to recharge battery immediately otherwise instrument will power off automatically shortly.

- Flashing: - Battery level is below normal level. Apply power adaptor to recharge battery as soon as possible.
- Lit on: - Battery level is at extreme low. Apply power adaptor to recharge battery immediately otherwise instrument will power off automatically shortly.

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.

5.7 Battery Charging Status

Battery charging status is shown on the dual colour **Charge Status Indicator**: -

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

6. Internal Function Settings

Description about Internal Function

To enable this instrument to meet and to give the best performance under various application requirements and demands, a set of internal functions are built-in.

Most internal function comes with various parameters which user can select according to actual application demands and preference.

These internal functions are classified into 3 categories: -

- User accessible functions (F1 ~ F38 of below table), which do not request any password to access.
- Supervisor accessible function (F39 ~ F59), which may need the supervisor or distributor password to access.
- Distributor accessible function (F60 ~ F99), which may need the distributor password to access.

Do not attempt to access or alter any parameters without authorization to avoid system malfunction.

Internal Function Table

No.	Description	Parameters / Note Default = **
F1	Internal Analogue to Digital (AD) Value	<p>Press [Print/M+] to set offset value to zero when unloaded. Then add load on the platform to observe the span value of load applied.</p> <ul style="list-style-type: none"> • LED2 represents the million digits of the AD value. • LED3 represents the AD value up to 999,999. <p>For example: -</p> <ul style="list-style-type: none"> • LED2 displays 1 • LED3 display 083690 <p>Then the actual AD value is 1,083,690.</p> <p>Press [Zero] to quit to F1.</p>

F2	All Segment Check & Battery Voltage	All display segments and indicators will be lit on. Check any segments or indicators are missing. Press [Zero] to quit to F2 or [Check] to show current battery voltage.						
F3	Capacity, Division & Default Weight Unit	Display basic metrology characteristics (capacity, division, and weight unit). <ul style="list-style-type: none"> Capacity x Division of W_1 is shown on LED 2. Value displayed = $Max_1 + e_1$. Capacity x Division of W_2 (if set) is shown on LED3. Value displayed = $Max_2 + e_2$. 						
F4	Date Format & Date	DD/MM/YY	** YY/MM/DD			MM/DD/YY		
	<ul style="list-style-type: none"> Press [Func] or [Unit] to change date format and press [Print/M+] to confirm. Then press [Print/M+] to check current date value. To change date value, press [Print/M+] then enter date value and then press [Print/M+] to confirm. Instrument will then convert and display the month and date value entered into week and day number (0 ~ 6 for Sunday ~ Saturday) of the year value entered. Select Date Output Type: - 2 parameters are available: - <ul style="list-style-type: none"> ➤ Date = Normal date format as per input above. ➤ Week = WWYYDD format. WW = week number; YY = year value; DD = weekday (Monday = 01... Sunday = 07). 							
F5	Time	HH/MM/SS						
	To change time, press [Print/M+] , then enter a new value and press [Print/M+] .							
F6	System (F7~F34) Initialization	** NO			YES			
	<ul style="list-style-type: none"> Press [Func] to shift between NO and YES and press [Print/M+] to confirm. If YES is selected, press [1] when "SURE?" is displayed. Instrument shows Done when initialization is completed. 							
F7	Auto Power Off Setting	OFF	1	3	** 5	10	20	Other
	<p>Notes: -</p> <ul style="list-style-type: none"> Off = Auto power off disabled. 1 ~ 20 = Auto power off after this idle time (minute). Other = Set specific auto power off time. Auto Power off time parameter 1 ~ 20 will be ignored when instrument is powered by power adaptor. <p>To enter a specific auto power off time: -</p> <ol style="list-style-type: none"> select Other and press [Print/M+], Enter the specific power off time in the format of HH.MM.SS then press [Print/M+] to save. 							
	Auto power off function will be disabled when an energized power adaptor is plugged in.							
F8	Brightness	1	2	** 3	4	5		

	<ul style="list-style-type: none"> • 1 = dimmest; 5 = brightest • Press [Func] or [Unit] to change setting and then press [Print/M+]. 									
F9	Weight Unit Enable / Disable	kg (** On/Off)			g (On/** Off)				lb (On/** Off)	
	<p>Notes: -</p> <ol style="list-style-type: none"> 1. Current weight unit is displayed on LED2. 2. Press [Func] until the preferred weight unit and status (On = enable; Off = disable) appears on LED3 and press [Print/M+] to save and go to next weight unit. 3. Repeat point b for all other weight units. 4. After all weight units are set, instrument returns to F9. 									
F10	Filter Strength	1	2	3	4	** 5	6	7	8	9
	<p>Press [Func] or [Unit] to select: -</p> <ol style="list-style-type: none"> 1 (strongest filter) for bad working environment where vibration, wind flow... etc. affect stable reading, 5 for normal environment, 9 (least filter) for very good working environment where wind and vibration have no effect to stable reading. Then press [Zero] to quit or [Print/M+] to save and continue with AD conversion speed setting. <p>6 AD conversion speed parameters (15 ~ 480 time per second) are available.</p> <p>Press [Func] or [Unit] to select: -</p> <ol style="list-style-type: none"> ** 15 times per second. 30 times per second. Recommended maximum resolution = 30,000 division 60 times per second. Recommended maximum resolution = 15,000 division 120 times per second. Recommended maximum resolution = 7,500 division 240 times per second. Recommended maximum resolution = 3,000 division 480 times per second. Recommended maximum resolution = 1,500 division <p>Note: - After the AD conversion speed is changed, instrument will restart automatically.</p>									
F11	Operation Mode Enable / Disable	<ul style="list-style-type: none"> • Weigh (Weighing) ** On / Off • Count (Piece Counting) On / ** Off • AtM (Action Tare Memory) On / ** Off • PEAK (Peak Hold) On / ** Off • Ani (Animal) On / ** Off • Grade (Grading) On / ** Off • C.P.Code (Quick Access to Customer & Product Code Setting) On / ** Off 								
	<p>Notes: -</p> <ol style="list-style-type: none"> 1. Name of the current operation mode is displayed on LED2. 2. Press [Func] until the preferred status (On = enable; Off = disable) appears on LED3 and press [Print/M+] to save and go to next operation mode. 3. Repeat step 2 for all other operation modes. 4. After all operation modes are set, instrument returns to F11. 									
F12	Auto Tare Function	** Off			On				Contn	

	Notes: - <ul style="list-style-type: none"> • Off = Auto Tare Function disable. • On = Only the first table weight applied will be tared off. Minimum tare load $\geq 2d$. • Contin = All stable weight applied will be tared off. Minimum tare load $\geq 10d$. • If Contin is set, select also delay time (0.0 ~ 9.9 second). Delay time is the time duration from a stable weight is detected and until it is automatically tare off. • Delay time value is display on LED3. Enter the preferred delay time value through numeric keys and then press [Print/M+] to save. 					
F13	Repetitive Tare Function	OFF			** ON	
	If F12 is set = Contin, Repetitive Tare setting "Off" will be surpassed.					
F14	Buzzer	Kb (keypad buzzer) (**On/Off)			St (System buzzer) (**On/Off)	
F15	Check Result Buzzer/Light Bar Format	oFF	** in	out	Hi	Lo
	Setting procedures: - <ol style="list-style-type: none"> 1. Set Check Result Buzzer then press [Print/M+]. 2. Set Light Bar Format then press [Print/M+]. 3. Set Action on Negative Value then press [Print/M+] to return to F15. Check Result Buzzer <ul style="list-style-type: none"> • oFF = Check Buzzer disabled. • in = Check Buzzer activates when reading is within range. • out = Check Buzzer activates when reading is out of range. • Hi = Check Buzzer activates when reading more than Hi limit. • Lo = Check Buzzer activates when reading lower than Lo limit. Light Bar Format <ul style="list-style-type: none"> • Off = Light Bar off. • ** Mode 1 = Check Result Mode (Progress Mode). • Mode 2 = Check Result Mode (Single Bar Mode). • Mode 3 = Capacity Result Mode (Single Dot Mode). • Mode 4 = Check Result Mode (Range Position Mode). Action on Negative Value <ul style="list-style-type: none"> • Off = Check Mode Disable when Value is less than zero. • ** On = Absolute value, all negative values will be deemed and checked as positive ones. 					
F16	UART (Comport) Setting	4 UARTs (UART 0, 1, 2, 3) are available. Refer to operation manual for more setting details.				
F17	Reserved					
F18	Machine ID and Group Number	Machine ID			Group Number	
	Notes: -					

	<ul style="list-style-type: none"> Machine ID number entered is also used as the address number of the instrument for RS485 communication. When machine ID is = blank. It means that this instrument does not have any address number in the RS485 network. In multi-instrument application with the same RS485 network, each machine should have a unique machine ID number. Group number can be considered as production line number in multi-instrument application. The machine ID and group number entered will be carried out automatically on printout formats Lab 2 ~ Lab 5. <p>Setting procedures: -</p> <ol style="list-style-type: none"> Go to F18 and then press [Print/M+]. Set Machine ID number (00 ~ 98) then press [Print/M+]. To clear machine ID number, press [CE/x10] then press [Print/M+] to save. Set group number (00 ~ 99) then press [Print/M+]. To clear group number, press [CE/x10] then press [Print/M+] to save and return to F18. 			
F19	Manual Customer & Product Code Setting	H Code	M Code	L Code
	<ul style="list-style-type: none"> Customer & Product code by keyboard accept both numeric numbers and alphabets. Maximum length = 18 digits. Enter code starting from H code, then M code and finally L Code. Press [Print/M+] to confirm and end editing after last digit has been input. Customer and Product code does not support print format 1 (Lab 1). Customer and product code entered will be carried out automatically on printout formats Lab 2 ~ Lab 5. 			
F20	Keyboard Lock	** Off (Disable)		On (Enable)
	When keyboard lock is = ON , only [Zero] , [Tare] , [Set] & [On/Off] key will be accessible during operation status.			
F21	Weight Function Lab 2 Output Print Format	** STD		CUSTOM
F22	Counting Function Lab 2 Output Print Format	** STD		CUSTOM
F23	Grade Function Lab 2 Output Print Format	** STD		CUSTOM
F24	Animal Functions Lab 2 Output Print Format	** STD		CUSTOM
F25	Check Modes	<ul style="list-style-type: none"> ** Mode 1 = Standard static/Dynamic Weight Check Mode. Mode 2 = Inflow/Outflow Control Logic Mode. Mode 3 = Constant Feeding Mode. Mode 4 = Constant Dispensing Mode 		

		<ul style="list-style-type: none"> • Custom = Custom Relay Output • Fill (Filling) • Batch (Batching) • Discharg (Discharge) • Both (Fill + Discharge) <p>Note: - if Mode 1 is selected, set also F26.</p>
F26	Near Zero Value	** 000000
	<p>Near Zero value is useful for dynamic weight check applications to bypass unnecessary Lo alarm during uploading and unloading process. Notes: -</p> <ul style="list-style-type: none"> • Value entered valid only when Check function is activated. • Near zero weight value can be any value between 20d and Lo limit. • Any near zero value which less than 20d will be ignored. Instrument will deem 20d as minimum near zero weight value. • The Hi Lo comparison remains non-activated when weight reading is less than the near zero value entered here. 	
F27	Reserved	
F28	Ask for Operator Number when Power On	Yes ** No
	<ul style="list-style-type: none"> • Yes: - Instrument will ask for operator number when power on. Enter 4-digit operator number or press [CE/x10] to skip operator number when asked. • No: - Instrument will not ask for operation number when instrument power on. <p>Notes: -</p> <ul style="list-style-type: none"> • If a different operator number (than what is running now) is entered, instrument displays Clear. • The operator number entered will be carried out automatically on printout formats Lab 3 ~ Lab 5. 	
F29	<p>Read Calibration & Parameter Counts and Pointer Value</p> <ul style="list-style-type: none"> • C (Calibration count): - shows total times of calibration. • O (Parameter set count): - shows total times that the important parameters (F80~F88) has been altered. <p>Press [Zero] to quit to F29 or [Check] to display the current pointer value. Refer to operation manual for more details about Pointer Value.</p>	
F30	Allow Letters and Symbols for Customer & Product Code Manual Entry	** No Yes
F31	Auto Power Saving	Off ** On
	<ul style="list-style-type: none"> • Off = Auto Power Saving disable. • On = Display brightness will switch to minimum when weight remains unchanged for 30 seconds. 	

	Note: - Auto Power Saving will be disabled when instrument is powered by power adaptor.						
F32	External Input Assignment	in1 (Input 1)	in2 (Input 2)	in3 (Input 3)	in4 (Input 4)	in5 (Input 5)	in6 (Input 6)
	<p>1 of the below 9 input parameters can be assigned to each external input.</p> <ul style="list-style-type: none"> • ZERo = [Zero] • tARe = [Tare] • unit = [Unit] • Print = [Print/M+] • ACC-Mr = [MR] • CLEAR = [CE/x10] • FunC = [Func] • Check = [Check] • Set = [Set] <p>Setting procedures: -</p> <ol style="list-style-type: none"> 1. Go to F32 then press [Print/M+]. 2. Name of the current external input point No. is displayed on LED2. 3. Press [Func] or [Unit] until the preferred external input point No. appears on LED2 then press [Print/M+]. 4. Press [Func] or [Unit] until the preferred input parameter appears on LED3 then press [Print/M+] to save 5. Instrument displays the next external input point No. on LED2. 6. Repeat above steps 2 ~ 5 for all other external input points. 						
F33	Report Output Comport & Report Content Settings	Set report output comport No. then report content detail parameters.					
	<p>Setting procedures: -</p> <ol style="list-style-type: none"> 1. Go to F33 then press [Print/M+]. 2. Name of the report output port is displayed on LED2. Note: - avoid assigning RS485 for report output unless Machine ID (set in F18) is = blank. 3. Press [Func] or [Unit] until the preferred report output port appears on LED2 then press [Print/M+]. 4. Instrument displays report content detail setting and parameter on LED2 and LED3 respectively. At this point, report output comport No. is set. Press [Zero] to quit to F33 or continue with below to set preferred report content detail parameters. 5. Press [Func] or [Unit] until the preferred report content detail parameter appears on LED3 then press [Print/M+]. <p>Notes: -</p> <p>2 report content detail parameters (Custom and Off) are available: -</p> <ul style="list-style-type: none"> • If Off is selected, instrument returns to F33. In this case, output report contents only the following data <ul style="list-style-type: none"> ○ Non-Resettable Transaction Memory Serial No., ○ Date of the individual transaction, ○ Net Weight of the individual transaction, ○ Tare weight of individual transaction, ○ Gross weight of individual transaction. 						

	<ul style="list-style-type: none"> • If Custom is selected, follow the below procedures for report content detail settings. <ol style="list-style-type: none"> 6. Press [Func] or [Unit] until the preferred report content detail parameter appears on LED3 then press [Print/M+]. Below parameters are available. <ul style="list-style-type: none"> • oP.Code (Operator No.) • oP. Mode (Working Mode No.) • id (Machine ID) • Group (Machine Group No.) • Time (Time of the individual transaction) • C Code (Customer Code) • P Code (Product Code) • Count (No. of pieces) • Ref (Lo and Hi limit value of the individual transaction) • Result (Check result of the individual) 7. Press [Func] until the preferred parameter (On / Off) appears on LED3 then press [Print/M+] to save and go to next report content detail parameter setting. 8. Repeat above steps 6 and 7 to set all other report content detail until instrument returns to F33. At this point, report content detail setting is completed. 				
F34	Report Output / Search Criteria & Date Range	oP.Code (On/** Off)	C Code (On/** Off)	P Code (On/** Off)	Check (On/** Off)
	<ul style="list-style-type: none"> • oP.Code = Operator Code. • C Code = Customer Code • P Code = Product Code • Check = Check Result <p>Setting Procedures: -</p> <ol style="list-style-type: none"> 1. Go to F34 then press [Print/M+]. 2. Name of the 1st search criteria name is displayed on LED2. 3. Press [Func] or [Unit] until the preferred search criteria appears on LED3 then press [Print/M+]. <p>Notes: -</p> <ul style="list-style-type: none"> • Select On to enable that search criteria. • Select Off to disable that search criteria. <ol style="list-style-type: none"> 4. Name of the next search criteria name is displayed on LED2. 5. Repeat above steps 2 and 3 for all other search criteria until instrument displays Report on LED2. Instrument is now in report output date duration setting status. 4 output date duration parameters are available: - <ul style="list-style-type: none"> • Day = All transaction recorded on specified date • Month = All transaction recorded in specified month • Period = All transaction recorded within the specified period • All = All transaction recorded in Non-Resettable Transaction Memory. 6. Press [Func] or [Unit] until the preferred output date duration parameter appears on LED3 then press [Print/M+]. <ul style="list-style-type: none"> • If Day is selected, enter the requested date value then press [Print/M+] to output. • If Month is selected, enter the first date of the requested month value (e.g. 17.12.01 for the month of December 2017) then press [Print/M+] to output. • If Period is selected, enter the requested starting date value then press [Print/M+] and then enter the requested ending date value then press [Print/M+] to output. 				

- If All is selected, press **[Print/M+]** to output.

7. Recommended Setting Procedures for User

1. Power off instrument and remove power adaptor.
2. Complete connection with load cells or junction box.
3. Complete all hardware connection with peripheral **except all relay signal receiving devices.**
Note: - It is recommended that before connecting to any relay signal receiving devices, the relay output behavior should be checked and confirmed first through relay output indicators on panel during test runs.
4. Apply power adaptor and power on.
5. Go to F1 and check internal count value. Verify load cell / junction box connection is correctly done, by applying and removing loads from load receiving platform. Internal count value increases when extra loads are applied to load receiving platform. Likewise, internal count value decreases when loads are removed from load receiving platform.
6. Go to F2 and check and make sure no LED segments or indicators are missing.
7. Go to F3 and make sure that capacity x division are correctly set.
8. Go to F4 to check and set date format and value.
9. Go to F5 to check and set time value.
10. Go to F6 to do system initialization.
11. Check and set all other operation parameters from F7, F8, F9.... F34 according to numeric order of the internal function number.
12. Conduct test runs to determine if the above settings best suit the application requirements. If not, set again the corresponding parameters.

Always contact your dealer for product information, after sales service and questions when in doubt.

8. UART & Comport Settings

An UART (Universal Asynchronous Receiver/Transmitter) is the communication device inside the MCU of this instrument which controls the communication device to which it is attached.

An UART can be converted into various transmission types (e.g. RS232, RS485, WIFI, LAN, Bluetooth, TTL) with the assistance of corresponding components.

A comport is the physically connection port to which an external equipment is connected with this instrument.

This instrument is equipped with 4 built-in UARTs. Refer to below table for transmission type and assigned comport number.

8.1 UART Transmission Type & Assigned Comport No. Table

UART #	Transmission Type	Connected to Comport #	Remark
UART 0	RS232	Comport 0	Standard
UART 1	TTL Output	Comport 1	Standard
	Isolated RS232	Comport 1	Optional
UART 2	RS232	Comport 2	Standard

	RS485	RS485 Port	Standard. Note 2
	Bluetooth	N.A.	Optional
UART3	WIFI	N.A.	Optional
	LAN	LAN Port	Optional
	RS485	RS485 Port	Standard. Note 2

Note 1: - only one transmission type can be selected per each UART.

Note 2: - only one of the UART 2 or UART 3 can be assigned as RS485.

Setting procedures: -

1. Go to F16 then press **[Print/M+]**.
2. Name of the current UART # appears on LED2.
3. Press **[Func]** until the UART # (Uart 0 ~ 3) appears on LED2 then press **[Print/M+]**.
4. Press **[Func]** or **[Unit]** until the preferred transmission type appears on LED3 then press **[Print/M+]** to set data communication types. 8 parameters are available: -
 - Off = No data output.
 - Auto 1 = auto print when weight is stable.
 - Auto 2 = the highest stable weight value (of a weighing process) will be automatically printed when all loads are removed (and gross weight returns to zero or minus).
 - Auto 3 = the last stable weight value (of a weighing process) will be automatically printed when all loads are removed (and gross weight returns to zero or minus).
 - Manual = Manual output by pressing **[Print/M+]**.
 - PC = Continuous or selected periodic output of real time result according to predefined format.
 - CMD = Command / information request mode. This mode allows instrument to do question and answer with computer and smart devices.
 - Scanner = Bar code scanner.

Notes: -

- If PC, CMD or Scanner is set, refer to **8.2** for rest of the setting.
 - If Auto 1 ~ 3 or Manual is set, refer to **8.3** for rest setting.
 - Press **[Func]** or **[Unit]** until the preferred parameter appears on LED3 then press **[Print/M+]** to save and continue until completed.
 - Off = No data output.
 - PC = Continuous or time interval controlled output of predefined or custom protocol / format.
 - Manual = Manual output to printer or computer.
 - Auto 1 = auto print when weight is stable.
 - Auto 2 = the highest stable weight value (of a weighing process) will be automatically printed when all loads are removed (and gross weight returns to zero or minus).
 - Auto 3 = the last stable weight value (of a weighing process) will be automatically printed when all loads are removed (and gross weight returns to zero or minus).
 - Command = Command / information request mode and APP mode.
5. Repeat above steps **3** and **4** for other set items.
 6. Repeat above steps **1 ~ 5** for all other UARTs.

8.2 Parameters Table for PC, Command & Scanner

Step No.	Set Item	Parameters	PC	CMD	Scanner
1	Baud Rate	1200 ~ 921600 in 12 steps Default = 115200	■	■	■
2	Parity	None / Odd / Even Default = None	■	■	■
3	Data Length	7 / 8 Default = 8	■	■	■
4	Protocol Type Note G	Protocol 0 ~ 9 & Custom Default = Protocol 1	■	Completed	Completed
5	Transmission Interval Note A	0 ~ 300 (second) in 10 steps Default = 0	Completed		

8.3 Parameters Table for Auto 1 ~ 3 & Manual

Step No.	Set Item	Parameters	Auto 1	Auto 2	Auto 3	Manual
1	Baud Rate	1200 ~ 921600 in 12 steps Default = 115200	■	■	■	■
2	Parity	None / Odd / Even Default = None	■	■	■	■
3	Data Length	7 / 8 Default = 8	■	■	■	■
4	Auto Accumulation Note B	Off / On Default = On	■	■	■	■
5	Check Control Note C	Off / On Default = Off	■	■	■	■
6	Stability Control Note D	Yes / No Default = Yes	■	■	■	■
7	Minimum Output Weight Note E	0 ~ 20d in 21 steps Default = 20d	■	■	■	■
8	Output Format Note F	Lab 1 ~ Lab 5, LP 50 and TSC Default = Lab 2	■	■	■	■
9	Other		Note H~ M			

Note A: - Transmission interval is the time interval (in second) between each output. 0 = continuous output.

Note B: - On = Auto Memory accumulation enabled.

Off = Auto Memory accumulation disabled.

Note C: - On = (When check function is in effect) Only OK value (value which is within Lo and Hi Limits) will be transmitted.

Off = (When check function is in effect) Check control is disabled.

Note D: - Yes = Only stable weight will be transmitted.

No = Transmission is activated when **[Print/M+]** is pressed disregarding the weight stable status.

Note E: - Minimum weight value to be transmitted. Instrument will not generate any output if the actual weight is less than the minimum output weight selected here.

Note F: - Output format description: -

- Lab 1 = Output in landscape direction. Refer to paragraph **24** for more information.
- Lab 2 = Output in portrait direction. Refer to paragraph **25** for more information.
- Lab 3 = Database output mode. Refer to paragraph **26** for more information.
- Lab 4 = Journal output format with gross and net weight of each individual transaction. Refer to paragraph **27** for more information.
- Lab 5 = Journal output format with time and net weight of each individual transaction. Refer to paragraph **27** for more information.
- LP-50 = Output to LP-50 label printer. Refer to paragraph **32** for more information.
- TSC = Output to TSC label printer. Refer to paragraphs **30~32** for more information.

Notes: -

- Lab 1 and Lab 3 are good for computer.
- Lab 2, Lab 4 and Lab 5 are good for both ticket printer and computer.

Note G: -

- Refer to paragraph **28** for Prot 1 ~ Prot 9.
- Refer to paragraph **29** for Custom.

Note H: - If Lab 1 is set in Print format, select line number then press **[Print/M+]** to save. Setup is then completed.

Note I: - If Lab 2 is set in Print format, select number of copy then press **[Print/M+]** to save. Setup is then completed.

Note J: - If Lab 3 is set in Print format, press **[Print/M+]** to save. Setup is then completed.

Note K: - If Lab 4 is set in Print format, select statistic data output then press **[Print/M+]** to save. Setup is then completed.

Note L: - If Lab 5 is set in Print format, select statistic data output then press **[Print/M+]** to save. Setup is then completed.

2 parameters are available: -

- Sd = On: - statistic data will be outputted automatically when memory is clear.
- Sd = Off: - no statistic data will be outputted when memory is clear.

Note M: - If LP50 or TSC is selected: -

- a. Select number of copy (1 ~ 8) then press **[Print/M+]** to continue the below setting,
- b. Select label file number (FL1 01 ~ FL1 99) to print in label format group 1 then press **[Print/M+]** to continue the below setting.
- c. Select label file number (FL2 01 ~ FL2 99) to print in label format group 2 then press **[Print/M+]** to continue the below setting.

9. Analogue Outputs

If ordered, this instrument comes with a built-in 16-bit digital to analogue converter is used to provide DAC output. The DAC output accuracy of this instrument is better than 1/60000. Use only very high precision measuring equipment (e.g. a good 5 ½ digit measuring meter) to determine output accuracy of this instrument. Handheld multi-meter is not a suitable equipment to determine DAC output accuracy of this instrument.

This analogue converter provides one of the below output types set forth in internal function number F70 setting. Supervisor password is needed to access to this internal function number.

- a. Off = DAC Output disabled.
- b. 4-20 = 4-20mA output.
- c. 0-5 = 0-5V output.
- d. 0-10 = 0-10V output.

If DAC output is not used, always set it to Off.

For other connection details and setting procedures, contact the authorized person or your dealer.

10. Commands

This instrument supports the following command types: -

- Keyboard commands,
- Operation result commands, and
- System parameter inquiry commands.

A command can be sent by any external equipment which support data sending and receiving, e.g. a computer.

10.1 Comport Setting

A command sending devices should be assigned to one of the 4 UARTs.

Transmission type of the assigned comport should be set = CMD.

Refer to paragraph 8 for setting details and procedures.

10.2 Sending Command through RS485

1. Address code in the format of @XX.. Followed by

Notes: -

- XX is the 2-digit (00~98) machine ID set forth in F18, followed by
 - To send the same command to all instruments within the same RS485 network, input 99 for XX.
2. Hex code 0D (CR), followed by
 3. Hex code 0A (LF), followed by
 4. The desired command code, followed by
 5. Space (Hex code 20)

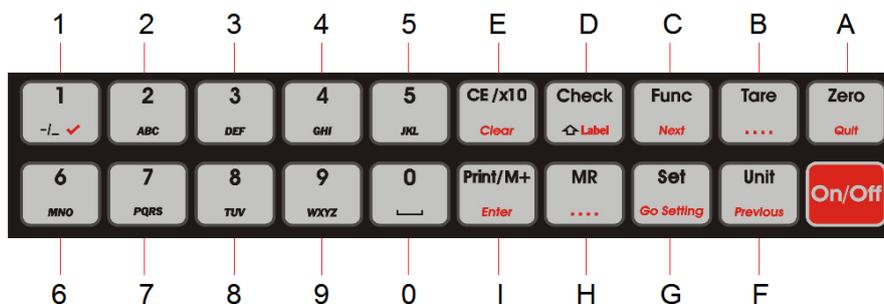
10.3 Sending Command through all other Transmission Type (Except RS485)

1. Hex code 0D (CR), followed by
2. Hex code 0A (LF), followed by

3. The desired command code, followed by
4. Space (Hex code 20)

10.4 Keyboard Command Codes³

Each key (except On/Off) is assigned with a command code. Refer to below diagram for keyboard command codes.



10.5 Operation Result Command Codes

All operation results can be requested by a smart device (e.g. computer or tablet) by sending a command to this instrument. Refer to paragraph 33 for details.

10.6 System Parameter Inquiry Command Codes

System parameter settings of this instrument can requested by a smart device (e.g. computer or tablet) by sending a command to this instrument. Refer to paragraph 34 for details.

³ Keyboard commands are case sensitive.

11. Non-Resettable Transaction Memory & Management Report

11.1 Non-Resettable Transaction Memory Description

This instrument is equipped with non-resettable transaction memory to record all individual transaction records.

Management reports can be generated based on data saved in transaction memory, and: -

- Criteria set forth in F71 (supervisor password is needed to access this internal function), and
- Format set forth in F33, and
- Search criteria and time duration set forth in F34.

Notes: -

- The non-resettable transaction memory is independent to those data obtained through memory accumulation (e.g. manual memory accumulation by pressing **[Print/M+]** key and auto accumulation result by ACC = On in transmission type Manual and Auto 1 ~ Auto 3) during an operation.
- Maximum records can be saved = 131,072 transaction.
- When remaining memory is low: - Instrument displays Li xxx in power on countdown process. xxx is the number of memory remains before instrument starts overwriting historical records.
- When memory is full: - instrument overwrites old records with new record based on first in first out base.
- After management reports are created.

11.2 Define when a Transaction Data is saved to Non-Resettable Transaction Memory

It is important to define first the timing at when the data of a transaction is saved to Non-Resettable Transaction Memory during system setup. To do so, go to F71 (supervisor password may be needed) and select the preferred parameter. 6 parameters are available.

- a. Off = No transaction will be recorded by Non-Resettable Transaction Memory.
- b. Auto 1 = All stable weight (starts from gross zero or minus) is recorded by system automatically.
- c. Auto 2 = The highest stable weight value of a weighing process is recorded by system automatically (when all loads are removed and gross weight returns to zero or minus).
- d. Auto 3 = The last stable weight value of a weighing process is recorded by system automatically (when all loads are removed and gross weight returns to zero or minus).
- e. Manual = Transaction is recorded by system automatically when **[Print/M+]** is pressed.
- f. ACC = Transaction is recorded by system automatically when a new accumulated data is created automatically or manually.

11.3 Output and Settings for Non-Resettable Transaction Memory & Management Report

Complete both 2 procedures below to output management report.

1. Define report output comport and report content in F33. Refer to **F33 of Internal Function Table** on paragraph **6** for details. Avoid assigning RS485 for report output unless Machine ID (set in F18) is = blank.
2. Define search for search criteria and date range in F34. Refer to **F34 of Internal Function Table** paragraph **6** for details. Multiple search criteria are acceptable based on condition "AND". For example, Operator Code number XXXX and Produce Code YYYY. All transactions which fulfil **both** these 2 criteria will be outputted.

11.4 Totalization

Except date range "All" is selected, instrument will automatically output the totalized data of below result at the end of the output.

- Total number of transaction of the date range
- Total Net Weight
- Total Gross Weight
- Total Piece Count

12. Data Output Protocols & Formats

This instrument supports various PC output protocol, print formats, command answering. Refer to below paragraphs and paragraph **8** for details and setting procedures.

12.1 PC Output Protocols

- 9 predefined PC Output Protocols. Refer to paragraph **28** for details.
- 1 customized Printout Format. Refer to paragraph **29** for details.

12.2 Printout Formats

- 5 predefined Printout Formats (Lab1 ~ Lab 5). Refer to below Appendixes for details.
 - **Lab 1 Output Format** (paragraph **24**)
 - **Lab 2 Output Format** (paragraph **25**)
 - **Lab 3 & Output Format** (paragraph **26**)
 - **Lab 4 & Lab 5 Output Format** (paragraph **27**)
- Label Printing through **Datecs LP-50 & TSC TDP247, TDP345, TTP247, TTP345** label printer. Refer to the below Appendixes for details: -
 - **TSC Printer Installation & Setup Procedures** (paragraph **30**)
 - **Create & Upload Print Label File to TSC Printer** (paragraph **31**)
 - **Label Printing (LP-50 & TSC Label Printers)** (paragraph **32**)

13. Customer & Product Codes

This instrument supports product and customer code entry. Both Product and Customer codes accept numeric numbers, letters, symbols and any combination of these. Maximum code length = 18 digits. Refer to below table for code entry assignment.

Key	Assignment				
0	0	Space			
1	1	-	/	_	
2	2	A	B	C	
3	3	D	E	F	
4	4	G	H	I	
5	5	J	K	L	
6	6	M	N	O	
7	7	P	Q	R	S
8	8	T	U	V	
9	9	W	X	Y	Z
Check	Shift				

Notes: -

- To enable symbol and letter entry through keyboard, set F30 to Yes.
- Cursor location of current entry is indicated by flashing decimal sign at its right side.
- When inputting upper case letters, the Ok Light Bar will light up.

13.1 Create a Customer / Product Code and Save to PLU

1. Enter a customer & product code manually⁴ by entering customer/product code setting manual by either one of the below methods.
 - a. If Quick Manual Code Entry function (PCd) in F11 is set to on: -
 - Press **[Func]** until C.P. Code appears then press **[Print/M+]**.
 - Press **[Func] or [Unit]** until the desired mode appears (select C Code to enter customer code or select P Code to enter product code), then press **[Print/M+]** to confirm.
 - b. If Quick Manual Code Entry function (PCd) in F11 is set to Off: -
 - Go to F19, then press **[Print/M+]**.
 - Press **[Func] or [Unit]** until the desired mode appears (C Code for customer code, P Code for product code), then press **[Print/M+]** to confirm.
2. Instrument displays H code followed by the 1st 6 digits. Enter the first 6 digits of the code here, then press **[Print/M+]** to confirm.
3. Instrument displays M code followed by the 2nd 6 digits. Enter the 7th ~ 12th digits of the code here, then press **[Print/M+]** to confirm.

⁴ If a customer/product code is less than 18 digits, press **[Print/M+]** to skip all blank digits displayed until instrument return to F19.

4. Instrument displays L code followed by the 3rd 6 digits. Enter the last 6 digits of the code here, then press **[Print/M+]** to confirm.
5. Instrument displays **PLu=?**. At this point: -
 - c. Press the preferred PLU position (numeric key 0 ~ 9), then press **[Print/M+]** to save to that PLU position or
 - d. Press **[Print/M+]** to utilize the code immediately but without saving to PLU, or
 - e. Press **[Zero]** to quit.

13.2 Recall a Customer / Product Code from PLU

Follow the below steps to recall a customer/product code from PLU.

1. Select desired operation mode and weight unit, then press and hold the PLU position (numeric key 0 ~ 9) then press **[Print/M+]** to recall the product or customer code stored in that position.
2. Press **[Func]** or **[Unit]** until the desired mode appears (select C Code for customer code or select P Code for product code), then press **[Print/M+]** to confirm.
3. Code stored is now effective.

13.3 Clear Customer / Product Code from PLU

1. Refer to paragraph 13.1 and then enter blank value (by pressing **[CE/x10]** for H code in step 2 then press **[Print/M+]**).
2. Instrument displays **PLu=?**.
3. Then press the preferred PLU position to clear.

13.4 Enter a Customer / Product Code by Scanner⁵

- a. Scan one of the below barcode depends on input target.
- b. Then scan a customer or product barcode.



13.5 Clear a Customer & Product Code Entered

To clear a customer/product code entered, press **[CE/x10]** on above procedures 2, 3 and 4 on paragraph 13.1.

⁵ Maximum = 18 digits.

13.6 Print a Customer & Product Code Entered⁶

Once a customer/product code is entered, it will be printed automatically through the assigned comport. No other setting is required.

14. Basic Operation

14.1 Power Instrument On and Off

- To power on: - press **[On/Off]** and then release.
- To power off: - press **[On/Off]** and then release.

14.2 Power On Countdown Process

After powered on, instrument goes through the power on countdown process and display the below information.

1. Software number (LED2) and version (LED1)
2. All display segments.
3. Calibration count value (LED2) and parameter set count value (LED3).
4. Battery voltage (LED1).
5. Capacity & division set in the format of Max plus 1 division ($LED2 = W_1 + e_1$); ($LED2 = W_2 + e_2$)
6. At this point, depends on internal function number F28 setting, instrument may ask for operator number input. If this is the case: -
 - a. Input 4-digit operator number, or
 - b. Press **[CE/x10]** then **[Print/M+]** to skip operator number when oP appears.
7. At this point, instrument is in weighing mode and is ready for operation.

14.3 Operator Code

If F28 is set to Yes, instrument will ask for operator code input during power on countdown process.

- Input operator code: - when prompted, input 4-digit operator code then press **[Print/M+]**.
- To clear operator code: - when prompted, press **[CE/x10]** then press **[Print/M+]**.

Once an operator code entered, instrument will automatically transmit the code entered in Lab 1, Lab 3, Lab 4 and Lab 5 output format.

14.4 Warm Up Time

It is important to allow the instrument enough warm up time. This is especially important when this instrument is running at high resolution (e.g. 6000d or higher) application.

- Allow a warm up period of not less than 60 seconds before calibration. The higher the setup resolution, the longer the warm up period is required. In most cases, 120 seconds is considered as a safe warm up period for all applications.
- This warm up period is needed to energy all components to reach a stable status.
- To read the internal AD count value, enter internal function F1. The internal AD count value of a not yet fully energized PCB will go up continuously.
- The internal count value is deemed stable when the internal AD count varies less than AD 1/3 of the AD conversion speed within 2 seconds.

⁶ Print format LAB 1 does not support customer/product code.

14.5 Loads and Weighing Platform

- Always place an object onto platform gently. Excessive force / shock applied to platform may cause un-recoverable damage to the weight sensor inside platform.
- It is a good practice to remove all loads from platform after weighing. It will prolong the life of the weight sensor.

14.6 Operation Mode Selection

This instrument is built-in with various operation modes, all of them can be enabled and disabled independently in F11.

Refer to **Internal Function Table** on paragraph 6 on how to enable and disable an operation mode.

- Weigh (**Weighing**)
- Piece Count (**Count**)
- Action-Tare-Memory (**AtM**)
- Peak Hold Function (**Peak**)
- Animal Weighing (**Ani**)
- Grading (**Grade**)
- Quick access to Customer & Product Code Setting (**PCd**)

To shift to other function mode, press [**Func**] until the abbreviation of the desired function mode appears then press [**Print/M+**] to enter.

14.7 Weight Unit Selection

This instrument is equipped with the below weight units. These weight units can be enable / disable individually in F9. To shift to other weight unit, press [**Unit**] until the requested Weight Indicator lights up.

- KG = kilogram;
- G = gram,
- LB = pound.

Disregarding F9 setting, weight unit gram (g) is available only when 3 or 4 decimal places (0.000 or 0.0000) is selected in F81. Contact your dealer for more information about this.

14.8 Keyboard Lock

When keyboard lock is enabled in F20, only [**On/Off**], [**Zero**], [**Tare**] and [**Set**] keys can function during normal operation.

14.9 Manual Zero

If zero weight cannot be obtained when unloaded, press [**Zero**]. **Zero Indicator** lights up when instrument is at zero status.

14.10 Tare Functions

This instrument is equipped with the below tare functions. These functions can be selected in F12.

- Off: - Manual Tare

- Auto: - instrument will assume the first stable weight ($\geq 20d$ or $20d1$) applied is a container and will then tare off the weight of it automatically. When container is removed and gross weight result is zero, tare effect will be cancelled automatically.
- Contin (continuous auto tare): - all stable weight ($\geq 20d$ or $20d1$) applied will be tared off automatically. When all loads are removed and gross weight result is zero, tare effect will be cancelled automatically.

Notes: -

- If Contin is set, select also d.t. (delay time, 0.0 ~ 9.9 second. **Default = 0.5 second**).
- Delay time is the time duration from when a stable weight is detected until it is automatically tared off.
- Enter the preferred d.t. value through numeric keys and then press **[Print/M+]** to save.

14.10.1 Repetitive / multiple tare

This instrument is equipped with multiple tare operation. F13 is required in a weighing process, set F13 to On.

- Set F13 to on to allow multiple tare operation in a single weighing operation. If it is the case, instrument will permit multiple tare operation provided that **both** of the below requirements are met: -
 - The tare operation does not permit a reduction of the value of the tare, and
 - The tare effect can only be cancelled when there is no load on the platform.
- Set F13 to off to reject multiple tare operation in a single weighing operation. If this is the case, tare effect can only be cancelled when container is removed and gross weight is zero.

14.10.2 Preset tare

Preset tare allows a pre-determined tare weight value can be entered via numeric keys.

14.10.3 Introduce a preset tare value

During weighing mode and when weight is zero, press **[0]**, then enter the pre-determined tare weight value through numeric keys then press **[Print/M+]** to enter. After the pre-determined tare value has been entered: -

- Instrument displays the preset tare value entered.
- **Net indicator** appears to indicate the value being displayed is net weight.

14.10.4 Cancel a preset tare value

A preset tare value can be cancelled by either method below: -

- Remove all loads from platform then press **[Tare]**, or
- Enter a zero preset tare value then press **[Set]**.

14.11 Memory Accumulation

There are 2 types of memory accumulation: -

- Automatic accumulation mode, and
- Manual Accumulation mode.

Notes: -

- Memory accumulation supports weighing, counting, ATM, animal weighing and grading function.
- Memory accumulation does not support Peak Mode.
- For piece counting mode, both net weight and piece value will be accumulated.
- Data stored will be erased when weight unit or working mode or operator code is changed.

14.11.1 Manual accumulation

Press **[Print/M+]** to accumulate the current value to memory.

14.11.2 Automatic accumulation

Automatic accumulation is activated when Auto Accumulation is set to **On** in Auto 1, Auto 2, Auto 3 or Manual mode is selected in F16. Under the automatic accumulation mode, corresponding results will be accumulated automatically.

Unstable results or results which are less than 20d (or 20d₁ for dual weighing range/interval mode) will not be automatically accumulated.

14.12 When Data Is Accumulated To Memory

When a result is accumulated to memory: -

- instrument displays “**n_____x**” (except ATM mode)
- **M+ Indicator** appears to indicate that memory contains stored data. “x” means the total number of transactions accumulated to memory.
- This instrument returns to normal display status after 2 seconds.

14.13 Memory Recall and Clearance

To recall memory, press [**MR**] to recall total accumulated summary.

- Number of accumulation is displayed on LED1.
- Total accumulated weight is displayed on LED2.
- Total accumulated piece number is displayed on LED3.

At this point, press [**Zero**] to return to operation or press [**CE/x10**] to clear memory.

14.14 Auto Power Saving & Auto Power off Time

This instrument is equipped power saving and auto power off time.

- Auto Power Saving: - Refer to F31 on **Internal Function Table** on paragraph 6 for setting and details. Auto Power Saving will be disabled when power adaptor is plugged in.
- Auto Power Off Time: - Refer to F7 on **Internal Function Table** on paragraph 6 for setting and details.

15. Weighing Mode

Before a weighing transaction / process: -

1. Set preferred weight unit by pressing **[UNIT]** until the desired weight unit indicator appears.
2. Remove all loads from weighing platform.
3. If zero weight cannot be obtained when unloaded, press **[Zero]**. After **[Zero]** is pressed, the **Zero Indicator** will appear.
4. If a container is needed, place it onto the platform and press **[Tare]** manually (in case auto tare is not enabled).

15.1 Basic Weighing Operation

Place the subject to be measured on weighing platform gently. The weight of the object is displayed on LED1 automatically.

15.2 Weight Check Function

This instrument is equipped with weight check function.

15.2.1 Enable Weight Check function

1. Press **[Check]** and then enter the Lo weight limit through numeric keys then press **[Print/M+]**.
2. Then enter the Hi weight limit through numeric keys then press **[Print/M+]**.
3. Weight check function is now enabled.

Once the Lo and Hi weight limits are entered: -

- Lo weight limit value entered is now displayed on LED3.
- Hi weight limit value entered is now displayed on LED2.

15.2.2 Disable Weight Check function

1. Press **[Check]** and then **[CE/x10]** to clear the Lo weight limit then press **[Print/M+]**.
2. Then press **[CE/x10]** to clear the Hi weight limit then press **[Print/M+]**.
3. Weight check function is now disabled.

15.3 Check Result Light Bars

The check result of the load on weighing platform is then displayed on one of the lights bars and according to the display format set in F15.

15.4 Relay Output Indicators

Under the weight check function: -

- Relay 1 synchronizes with buzzer output.
- Relay 2 synchronizes with Lo output.
- Relay 3 synchronizes with Ok output.
- Relay 4 synchronizes with Hi output.

Note: - Above relay output behavior will be superseded if Mode 25 is set = Custom.

15.5 Create & Save Lo and Hi Weight Limits to PLU

1. Press **[Check]** and then enter the Lo weight limit through numeric keys then press **[Print/M+]**.
2. Then enter the Hi weight limit through numeric keys then press and hold **[Check]** for 2 seconds.
3. Instrument displays **Save =?**. At this point: -
 - a. Press the preferred PLU position (numeric key 0 ~ 9), then press **[Print/M+]** to save to that PLU position and utilize these limits immediately, or
 - b. Press **[Print/M+]** to utilize these limits immediately but without saving to PLU, or
 - c. Press **[Zero]** to quit.

15.6 Recall Weight Limits from PLU

1. Press and hold **[Check]** for 2 seconds.
2. Instrument displays **CHK =?**. Press PLU position (numeric key 0 ~ 9) then press **[Print/M+]** to recall the Lo & Hi limits stored in that position.
3. Instrument displays Lo and Hi limits and these values are now effective.

15.7 Clear Weight Limits from PLU

1. Enter zero value (by pressing **[CE/x10]**) for both Lo and Hi limits in step 1 and 2 on paragraph **15.5**.
2. Then press the preferred PLU position
3. Then press **[Print/M+]** to clear.

16. Piece Count Mode

Before a piece count transaction / process: -

1. Before entering Piece Count Mode, set preferred weight unit in internal function F9 first.
Note: - Piece Count Mode does not support weight unit conversion.
2. Remove all loads from weighing platform.
3. If zero weight cannot be obtained when unloaded, press **[Zero]**. After **[Zero]** is pressed, the **Zero Indicator** will appear.
4. If a container is needed, place it onto the platform and press **[Tare]** manually (in case auto tare is not enabled).

16.1 About Average Piece Weight

Average Piece Weight is the basic of all piece count transaction / process. Average Piece Weight can be obtained through either below methods: -

- a. Recall the last average piece weight before Powered Off.
- b. Recall from PLU.
- c. Manually define Average Piece Weight.

Go through the sampling process by either one of the below methods.

16.1.1 Recall the last average piece weight before powered off

Press **[Set]**, then **[MR]** to recall the last average piece weight before instrument was powered off.

16.1.2 Recall from PLU

Refer to Paragraph **16.9** for details.

16.1.3 Manually define the average piece weight

1. Apply samples with the known quantity (sample size) on weighing platform.
2. Press **[Set]** then input the sample quantity through numeric keys then press **[Print/M+]**.
3. This instrument will calculate and store the average piece weight and confirm with 2 beeps. The quantity is then displayed.
4. Add to or remove from the platform, the corresponding quantity will be displayed automatically.
5. To count different articles, press **[Set]** and repeat procedures listed above.

16.2 Basic Piece Count Operation

1. Place the subject to be measured on weighing platform gently.
2. The weight of the object is displayed on LED1 automatically.
3. To print the count results manually, press **[Print/M+]**.

16.3 Auto Average Piece Weight Enhancement Function

In order to obtain the best counting result and minimize sampling error, this instrument is equipped with Auto Average Piece Weight Enhancement Function. This function will automatically be employed when Average Piece Weight is determined by actual sample method.

Auto Average Piece Weight Enhancement Function is built-in the Piece Count Mode. This function starts automatically when all of the below are met: -

- a. Average piece weight is determined by actual sampling method.
- b. The quantity **added** to platter is more than 5 pieces but less than current quantity on scale.
- c. The total quantity on scale is less than 10000 pieces.

When all the above requirements are met, a new average piece weight will be calculated and stored in memory, displayed and confirmed by a "beep" sound.

16.4 Shift among Quantity, Average Piece Weight and Weight Info

Press **[Unit]** to shift among quantity, average piece weight and weight info. Relative result will be displayed on LED 1 ~ LED3.

- LED1
 - When only Weight Unit Indicator is light up = Weight.
 - When only PCS Indicator is light up = No. of pieces.
 - When both Weight Unit and PCS Indicator are both light up = Average piece weight (weight unit based on the weight indicator being displayed).
 - Basic piece count = No. of quantity (PCS indicator lights up).
- LED2
 - When under Piece Count Check Function = High quantity Limit.
 - When only Weight Unit Indicator is light up = blank.
 - Else = wording "Count".
- LED3
 - When under Piece Count Check Function = Lo quantity Limit
 - When only Weight Unit Indicator is light up = blank.
 - Else = No. of pieces.

16.5 Piece Count Check Function

This instrument is equipped with piece count check function.

16.5.1 Enable Piece Count Check function

1. Press **[Check]** and then enter the Lo quantity limit through numeric keys then press **[Print/M+]**.
2. Then enter the Hi quantity limit through numeric keys then press **[Print/M+]**.
3. Piece count check function is now enabled.

Once the Lo and Hi quantity limits are entered: -

- Lo quantity limit value entered is now displayed on LED3.
- Hi quantity limit value entered is now displayed on LED2.

16.5.2 Disable Piece Count Check function

1. Press **[Check]** and then **[CE/x10]** to clear the Lo quantity limit then press **[Print/M+]**.
2. Then press **[CE/x10]** to clear the Hi quantity limit then press **[Print/M+]**.
3. Piece count check function is now disabled.

16.6 Check Result Light Bars

The check result of the load on weighing platform is then displayed one of the lights bars and according to the display format set in F15.

16.7 Relay Output Indicators

Under the weight check function: -

- Relay 1 synchronizes with buzzer output.
- Relay 2 synchronizes with Lo output.
- Relay 3 synchronizes with Ok output.
- Relay 4 synchronizes with Hli output.

Note: - Above relay output behavior will be superseded if Mode 25 is set = Custom.

16.8 Create & Save Lo and Hi Quantity Limits to PLU

1. Press **[Check]** and then enter the Lo quantity limit through numeric keys then press **[Print/M+]**.
2. Then enter the Hi quantity limit through numeric keys then press and hold **[Check]** for 2 seconds.
3. Instrument displays **Save =?**. At this point: -
 - a. Press the preferred PLU position (numeric key 0 ~ 9), then press **[Print/M+]** to save to that PLU position and utilize these limits immediately, or
 - b. Press **[Print/M+]** to utilize these limits immediately but without saving to PLU, or
 - c. Press **[Zero]** to quit.

16.9 Recall Quantity Limits from PLU

1. Press and hold **[Check]** for 2 seconds.
2. Instrument displays **CHK =?**. Press PLU position (numeric key 0 ~ 9) then press **[Print/M+]** to recall the Lo & Hi limits stored in that position.
3. Instrument displays Lo and Hi limits and these values are now effective.

16.10 Clear Quantity Limits from PLU

1. Enter zero value (by pressing **[CE/x10]**) for both Lo and Hi limits in steps 1 and 2 on paragraph **16.8**.
2. Then press the preferred PLU position
3. Then press **[Print/M+]** to clear.

17. Action-Tare-Memory (ATM) Mode

17.1 Description of ATM Mode

It means action, then tare, then memory: -

- a. Action = load or remove weight from weighing platform.
- b. Tare = the above weight added on or removed from will be tare off automatically.
- c. Memory = the above weight will be added to or deducted (in case of removal) from accumulated memory.

17.2 Before Running ATM Mode Process

1. Set preferred weight unit by pressing **[UNIT]** until the desired weight unit indicator appears.
2. Remove all loads from weighing platform.
3. If zero weight cannot be obtained when unloaded, press **[Zero]**. After **[Zero]** is pressed, the **Zero Indicator** will appear.
4. Press **[Set]** to select Auto Accumulation target then press **[Print/M+]**.
 - Gross = Gross weight will be accumulated.
 - Net = Net weight will be accumulated.
5. Instrument prompts for delay time (second). Delay time is the time interval (0 ~ 99 seconds): -
 - Between a valid stable weight result is obtained and before it is tare off and accumulated to memory.
 - Display time of total accumulated weight result (after all loadings are removed) and before it is clear from print out memory.
6. Enter delay time through numeric keys then press **[Print/M+]** to enter.
7. At this point, ATM mode is ready for use.

17.3 Basic ATM Operation⁷

1. Apply container on platform. Instrument will tare off the weight of the container.
2. Apply or remove load on or from platform. The weight result is displayed for the time interval set forth by above delay time. Instrument will then accumulate the weight result in memory then clear it from the display. **Notes:** -
 - Both positive and negative weight will be accumulated to memory.
 - Positive weight will be added to the accumulated memory.
 - Negative weight will be deducted from the accumulated memory.
3. Apply/remove another load on/from platform. The weight result is displayed for the time interval set forth by above point 2. Then instrument will accumulate the weight result in memory and clear it from the display.
4. Repeat point 3 until all weighing sequence is completed.
5. To recall current total accumulated weight, press **[MR]**.
6. At this point: -
 - a. Press **[Zero]** to quit, or
 - b. Press **[Print/M+]** to print the current accumulated weight.
7. When all loads are removed from weighing platform. Total accumulated weight value will then be erased automatically.

⁷ Weight changed less than 10d will not be processed.

17.4 ATM Weight Check Function

This instrument is equipped with weight check function.

17.4.1 Enable ATM Weight Check Function

1. Press **[Check]** and then enter the Lo Limit through numeric keys then press **[Print/M+]**.
2. Then enter the Hi Limit through numeric keys then press **[Print/M+]**.
3. Weight check function is now enabled.

Once the Lo and Hi weight limits are entered: -

- Lo weight limit value entered is now displayed on LED3.
- Hi weight limit value entered is now displayed on LED2.

17.4.2 Disable ATM Weight Check Function

1. Press **[Check]** and then **[CE/x10]** to clear the Lo weight limit then press **[Print/M+]**.
2. Then press **[CE/x10]** to clear the Hi weight limit then press **[Print/M+]**.
3. Weight check function is now disabled.

17.5 Check Result Light Bars

The check result of the load applied on weighing platform is then displayed one of the lights bars and according to the display format set in F15.

17.6 Relay Output Indicators

Under the weight check function: -

- Relay 1 synchronizes with buzzer output.
- Relay 2 synchronizes with Lo output.
- Relay 3 synchronizes with Ok output.
- Relay 4 synchronizes with Hi output.

Note: - Above relay output behavior will be superseded if Mode 25 is set = Custom.

17.7 Create & Save Lo and Hi Weight Limits to PLU

1. Press **[Check]** and then enter the Lo weight limit through numeric keys then press **[Print/M+]**.
2. Then enter the Hi weight limit through numeric keys then press and hold **[Check]** for 2 seconds.
3. Instrument displays **Save =?**. At this point: -
 - a. Press the preferred PLU position (numeric key 0 ~ 9), then press **[Print/M+]** to save to that PLU position and utilize these limits immediately, or
 - b. Press **[Print/M+]** to utilize these limits immediately but without saving to PLU, or
 - c. Press **[Zero]** to quit.

17.8 Recall Weight Limits from PLU

1. Press and hold **[Check]** for 2 seconds.
2. Instrument displays **CHK =?**. Press PLU position (numeric key 0 ~ 9) then press **[Print/M+]** to recall the Lo & Hi limits stored in that position.
3. Instrument displays Lo and Hi limits and these values are now effective.

17.9 Clear Weight Limits from PLU

1. Enter zero value (by pressing **[CE/x10]**) for both Lo and Hi limits in step 1 and 2 on paragraph 17.7.
2. Then press the preferred PLU position
3. Then press **[Print/M+]** to clear.

18. Peak Hold Mode⁸

Under this mode, the instrument will display and hold the highest load/force detected. This mode can be used for tension (positive) or compression (negative) tests, all peak results are treated as absolute values.

18.1 Peak Hold Operation

1. Set preferred weight unit by pressing **[UNIT]** until the desired weight unit indicator appears.
2. Complete all necessary test setup. If mounting/support accessories are used, apply all of them.
3. Press **[Tare]** to cancel the effect of any extra loads.
4. Start measuring process, the peak value detected will be held and flashing on LED1.
5. To print the peak value manually, press **[Print/M+]**⁹.
6. To display actual current value (e.g. after a tension force has been decreased), press **[CE/x10]**.

18.2 Check Result Light Bars

As a safety feature, under this mode, all 3 check result bars form the progressive capacity bar on this instrument according to the capacity (Max) set.

Example: - If Max set is = 1000kg while the real time load applied is = 500kg, then 50% of the check result indicators will light up.

The light bars change according to the real time result rather than the value being held.

⁸ Peak hold mode does not support memory accumulation, weight unit conversation or check function.

⁹ Peak hold mode does not support Lab1 output format.

19. Animal Weighing Mode

19.1 Setting Animal Weighing Operation Parameters

1. Set preferred weight unit by pressing **[UNIT]** until the desired weight unit indicator appears.
2. Remove all loads from weighing platform.
3. If zero weight cannot be obtained when unloaded, press **[Zero]**. After **[Zero]** is pressed, the **Zero Indicator** will appear.
4. If a container is needed, place it onto the platform and press **[Tare]** manually (in case auto tare is not enabled).
5. Press **[Set]** to select the preferred filter speed by pressing **[Func]** or **[Unit]** key, 5 filter speeds are available from (FLt 1 ~ FLt 5).
 - FLt 1 = Fast (Weight value is based on least number sampling data; accuracy will be lowest).
 - FLt 3 = Normal (Displayed average weight is calculated based on the last 8 internal readings).
 - FLt 5 = Slow (Weight value is based on most number of sampling data, accuracy will be highest).
6. Press **[Print/M+]** to save and then select weight release variation value.
7. Press **[Func]** or **[Unit]** key to select the preferred auto release variation value. 10 parameters are available from Off to 20: -
 - rE oFF = auto release disabled.
 - rE 0.5 = auto release when weight varies $\geq 0.5\%$ of rate capacity (or W1 for dual weighing range/interval mode).
 -
 - rE 20 = auto release when weight varies $\geq 20\%$ of rate capacity (or W1 for dual weighing range/interval mode).
8. Press **[Print/M+]** to save.
9. Instrument is now ready for animal weighing application.

19.2 Basic Animal Weighing Operation

1. Get an animal on platform.
2. This instrument will calculate the weight of an animal. The result obtained will be flashing.
3. In case more animals have to be weighted in the same transaction, then get other animals on platform. An updated weight will be calculated and displayed¹⁰ as above step 2.
4. To print the weight value being held manually, press **[Print/M+]**.
Note: Auto 1 ~ Auto 3 are not suitable transmission types for animal weighing mode. Always use Manual transmission for animal weighing mode.
5. To update the weight reading manually, press **[CE/x10]**.

19.3 Check Result Light Bars

Check result light bars is used to show the real time weight detected on weighing platform.

- Once the weight is held, the middle 2 lamps (green indicator #3 and 4th from left) of Ok Light Bar appears.
- When the real time weight detected on weighing platform remains the same as the weight value being held, these green indicators remain.
- When the real time weight detected on weighing platform is higher than the weight value being held, check result light bars will move to the right.
- When the real time weight detected on weighing platform is lower than the weight value being held, check result light bars will move to the left.

¹⁰ Provide that extra weight added/removed fulfills the weight release variation value listed on point 5 of paragraph 19.1.

20. Grade Modes

20.1 Before Grade Mode Transaction / Process

1. Set preferred weight unit by pressing **[UNIT]** until the desired weight unit indicator appears.
2. Remove all loads from weighing platform.
3. If zero weight cannot be obtained when unloaded, press **[Zero]**. After **[Zero]** is pressed, the **Zero Indicator** will appear.
4. If a container is needed, place it onto the platform and press **[Tare]** manually (in case auto tare is not enabled).
5. Then press **[Set]** to select preferred working type (refer to paragraph **20.2** for details) then press **[Print/M+]** to confirm.
6. Then press **[Func]** to select the preferred Check Monitoring Mode (**CK.Mode**). 2 parameters are available: -
 - a. Stable = Grade results and relay indicators appear only when weight is stable. Select this parameter when relay outputs are connected with external control devices to avoid false signal.
 - b. Contin = Grade results and relay indicators synchronize with real-time weight result detected. Select this parameter when no external control devices are connected for faster grade results indication.
7. Press **[Print/M+]** to confirm.
8. Instrument is now ready for grading application.

20.2 Grade Mode Types

2 types of Grade Mode functions are built-in this instrument: -

- Type 1 (Sorting Function), and
- Type 2 (Sum Up Function).

20.3 Sorting Function Description

Sorting Function is used to show the grade number (according to the predefined Lo and Hi limits of each grade) of the load applied to weighing platform. This mode requests the below data for operation: -

- Minimum weight value of all grades numbers (maximum = 8 grades),
- The weight value equals to or above which is considered to be excessive (referred as Grade High at following paragraphs).

20.4 Sum Up Function Description

Sum up function is used to show the best grade number (according to the predefined Lo and Hi limits of each grade) to take from (and add to the weighing platform) in order to sum up the predefined target value. This mode requests the below data for operation: -

- Various groups of the same product have to be classified first according to the weight value of each grade number. For example, 10 baskets of mushroom of below: -
 - Baskets #1 with mushroom with weight range of grade 1,
 - Baskets #2 with mushroom with weight range of grade 2,
 -
 - Baskets #7 with mushroom with weight range of grade 7,
 - Baskets #8 with mushroom with weight range of grade 8,

- The low, target and high weight values of desired sum up result on weighing platform. For example: -
 - Mean target value is = 2.000kg
 - Lo limit of target value is = 1.800kg
 - Hi limit target value is = 2.20kg

20.5 Grade Numbers

Before operating Grade Mode, weight value of each grade number has to be defined first. Refer to below table for illustration.

20.5.1 Grade Value Illustration Table

Grade #	Value Input ¹¹	Description
Low	Automatic generated	Instrument displays Grade Low when: - $10e \leq \text{weight applied} < 1.000$
1	1.000	The lowest weight value of Grade 1 is = 1.000
2	2.000	The lowest weight value of Grade 2 is = 2.000
3	3.000	The lowest weight value of Grade 3 is = 3.000
4	4.000	The lowest weight value of Grade 4 is = 4.000
5	5.000	The lowest weight value of Grade 5 is = 5.000
6	6.000	The lowest weight value of Grade 6 is = 6.000
7	7.000	The lowest weight value of Grade 7 is = 7.000
8	8.000	The lowest weight value of Grade 8 is = 8.000
High	9.000	Instrument displays Grade High when: - $9.000 \leq \text{weight applied} < \text{scale capacity}$

20.6 About Grade Table

Grade table is the basic of all grading transaction / process. Once all weight values of each grade have been entered, instrument creates a grade table which can be saved to PLU for future use when recalled.

20.7 Activating a Grade Table

Grade table can be activated through either below methods: -

- a. Create a grade table manually. Refer to below paragraphs for procedures and details.
- b. Utilizing the last grade table used: the last grade table used before power off will be employed again automatically when restarted. No operator action is required.
- c. Recall from PLU which has been created previously.

20.8 How to Enter Sorting Function

1. In Grade Mode, press **[Set]**.
2. Press **[Func]** until **Type 1** appears on LED3
3. Press **[Print/M+]** to enter.

¹¹ Condition: - Grade High > Grade 8 > Grade 2 > Grade 1.

20.8.1 Sorting Function: - Create Grade Table & Save to PLU

1. Press **[CHECK]**.
2. Instrument displays **Grade 1** on LED2 and lowest weight value for grade 1 on LED3.
 - a. To confirm this value, press **[PRINT/M+]**, or
 - b. Enter a new value through numeric keys then press **[PRINT/M+]** to continue.
3. Repeat the above step **2** for other grade numbers.

Note: - For application with grade number less than Grade 8: -

 - a. Press **[Print/M+]** after the weight value of the last applicable grade number (e.g. Grade 4) has been entered.
 - b. Instrument displays the next grade number (e.g. Grade 5). At this point, press **[CE/x10]** then press **[Print/M+]**.
 - c. Instrument displays Grade H on LED2.
 - d. Enter weight value for Grade High, then follow the below procedures.
4. After all required grades have been entered: -
 - a. Press **[Print/M+]** to confirm, save and start grade operation or
 - b. Press and hold **[Check]** for 2 seconds
5. Instrument displays **Save =?**. At this point: -
 - a. Press the preferred PLU position (numeric key 0 ~ 9), then press **[Print/M+]** to save to that PLU position and utilize these limits immediately, or
 - b. Press **[Print/M+]** to utilize these limits immediately but without saving to PLU, or
 - c. Press **[Zero]** to quit.

20.8.2 Sorting Function: - Operation

1. Activate desired grade table by either method below: -
 - a. Create manually. Refer to paragraph **20.8.1** for details.
 - b. Utilizing the last grade table used. The last grade table used before power off will be employed again automatically when restarted. No operator action is required.
 - c. Recall from PLU. Refer to paragraph **20.8.4** for details.
2. Place the subject to be measured on weighing platform gently.
3. The weight and grade number of the object is displayed on LED1 and LED3 respectively.
4. To print the grade results manually, press **[Print/M+]**.

20.8.3 Sorting Function: - Result Light Bars and Relay Output Indicators

- Lo Light Bar appears = Grade Low
- Hi Light Bar appears = Grade High
- Relay 1 ~ Relay 8 synchronizes with Grade 1 ~ Grade 8. Refer to **point 6** of **20.1** for more details,

Note: - Above relay output behavior will be superseded if Mode 25 is set = Custom.

20.8.4 Sorting Function: - Recall Grade Table from PLU

1. Under preferred Type number (Type 1 or Type 2) press and hold **[Check]** for 2 seconds.
2. Instrument displays **CHK =?**. Press PLU position (numeric key 0 ~ 9) then press **[Print/M+]** to recall the Lo & Hi limits stored in that position.
3. Instrument displays Load on LED2 and the Grade Table is effective.

20.8.5 Sorting Function: - Clear Grade Table from PLU

1. Enter zero value (by pressing **[CE/x10]**) for both Lo and Hi limits in steps **2** and **3** on paragraph **20.8.1**.
2. Then press the preferred PLU position
3. Then press **[Print/M+]** to clear.

20.9 How to Enter Sum Up Function

1. In Grade Mode, press **[Set]**.
2. Press **[Func]** until **Type 2** appears on LED3
3. Then select the preferred Check Monitoring Mode (**CK.Mode**). Refer to **point 6** of **20.1** for more detail.
4. Press **[Print/M+]** to enter.

20.9.1 Sum Up Function: - Create Grade Table & Save to PLU

1. Press **[Check]**.
2. Enter the Lo limit of target value through numeric keys then press **[Print/M+]**.
3. Enter the mean target value through numeric keys then press **[Print/M+]**.
4. Enter the Hi limit target value through numeric keys then press **[Print/M+]**.
5. Instrument displays **Grade 1** on LED2 and lowest weight value for grade 1 on LED3.
 - a. To confirm this value, press **[PRINT/M+]**, or
 - b. Enter a new value through numeric keys then press **[PRINT/M+]** to continue.
6. Repeat the above step **5** for other grade numbers.

Note: - For application with grade number less than Grade 8: -

 - a. Press **[Print/M+]** after the weight value of the last applicable grade number (e.g. Grade 4) has been entered.
 - b. Instrument displays the next grade number (e.g. Grade 5). At this point, press **[CE/x10]** then press **[Print/M+]**.
 - c. Instrument displays Grade H on LED2.
 - d. Enter weight value for Grade High, then follow the below procedures.
7. After all required grades have been entered: -
 - a. Press **[Print/M+]** to confirm, save and start grade operation or
 - b. Press and hold **[Check]** for 2 seconds
8. Instrument displays **Save =?**. At this point: -
 - a. Press the preferred PLU position (numeric key 0 ~ 9), then press **[Print/M+]** to save to that PLU position and utilize these limits immediately, or
 - b. Press **[Print/M+]** to utilize these limits immediately but without saving to PLU, or
 - c. Press **[Zero]** to quit.

20.9.2 Sum Up Function: - Operation

1. Activate desired grade table by either method below: -
 - a. Create manually. Refer to paragraph **20.9.1** for details.
 - b. Utilizing the last grade table used. The last grade table used before power off will be employed again automatically when restarted. No operator action is required.
 - c. Recall from PLU. Refer to paragraph **20.9.4** for details.
2. Place the container (to which the target value has to be sum up).
3. Press **[Tare]** to tare off the weight of the above container.
4. Target value is displayed on LED2.
5. Start filling the container on weighing platform. Instrument displays on LED3 the grade number from which loads should be transferred to the container on weighing platform.
6. Repeat above step **4** until instrument display OK on LED 2.

7. To print the grade results manually, press **[Print/M+]**.

Note: Auto 1 ~ Auto 3 are not suitable transmission type for Sum Up Function. Always use Manual transmission for Sum Up Function.

20.9.3 Sum Up Function: - Result Light Bars and Relay Output Indicators

- Hi Light Bar appears = Weight on weighing platforms excess Hi limit of target weight.
- Relay 1 ~ Relay 8 synchronizes with Grade 1 ~ Grade 8.

Note: - Above relay output behavior will be superseded if Mode 25 is set = Custom.

20.9.4 Sum Up Function: - Recall Grade Table from PLU

1. Press and hold **[Check]** for 2 seconds.
2. Instrument displays **CHK =?**. Press PLU position (numeric key 0 ~ 9) then press **[Print/M+]** to recall the Lo & Hi limits stored in that position.
3. Instrument displays Lo and Hi limits and these values are now effective.

20.9.5 Sum Up Function: - Clear Grade Table from PLU

1. Enter zero value (by pressing **[CE/x10]**) for all value in steps **2 ~ 6** on paragraph **20.8.1**.
2. Then press the preferred PLU position
3. Then press **[Print/M+]** to clear.

21. Dynamic Check-Weighing and Control Logics

This instrument is equipped with the below dynamic check and control modes.

21.1 Static & Dynamic Check (F25 Control Mode 1)

Refer to paragraph **35** for details.

21.2 Inflow & Outflow Control (F25 Control Mode 2)

Refer to paragraph **36** for details.

21.3 Constant Feeding Mode (F25 Control Mode 3)

Refer to paragraph **37** for details.

21.4 Constant Dispensing with Auto Refilling (F25 Control Mode 4)

Refer to paragraph **38** for details.

21.5 Dual Speed Filling (F25 Control Mode Fill)

Refer to paragraph **40** for details.

21.6 Batching up to 8 Ingredients (F25 Control Mode Batch)

Refer to paragraph **41** for details.

21.7 Dual Speed Discharge (F25 Control Mode Discharge)

Refer to paragraph **42** for details.

21.8 Discharge & Refill (F25 Control Mode Both)

Refer to paragraph 43 for details.

21.9 Customized Relay Output Logic (F25 Customized Relay Output Logic)

Refer to paragraph 39 for details.

22. System Message & Error Code

22.1 System Message Table

System Message	Description
--oL--	Overload (Gross weight is more than Max plus 9d).
bAt.Lo	Battery level low.
HALT	Major system error detected. Power off instrument and remove power adaptor immediately. Then check load cell connection and system power status.
L.i = xxx	<ul style="list-style-type: none">Remain system memory is = xxx. System will start overwriting historical transaction records (on FIFO basic) when system memory is completely full. To preserve historical data in system memory, output all transaction records in system memory to external backup file asap.To clear this message, press [Print/M+] followed by [CE/x10].
UndEr	Negative Weight value exceeds display range.
Reboot	Important parameters have been changed. Power off and then power on instrument again to reboot.
-----	Negative Tare value exceeds display range.

22.2 Error Code Table

Error Code No.	Description
Err 1	Time value error
Err 2	Date value error
Err 3	Exceed manual zero
Err 4	Offset out of range / unstable during power on
Err 5	No load cell 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 set is higher than Hi limit (and Hi is not = 0)
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
Err 13	Exceed maximum power on
Err 19	Capacity or division setting error (Division set is higher than 10000d)
Err 22	Manual Zero and Tare stability error
Err 23	Capacity setting error, Capacity 1 > Capacity 2
Err 24	Division setting error, e1 > e2
Err 25	Span gain is too low
Err 26	Not able to obtain stable status for longer than 10 seconds
Err 27	<ul style="list-style-type: none"> • Calculated value per e of Cal 2 varies more than 1% as of Cal 1. Properly a load cell problem. • Mass value of Cal 2 is less than 150% of Cal 1.
Err 28	Maximum accumulation limit is exceeded
Err 29	Standard deviation data exceed memory size (300 transactions)
Err 30	Working mode (Operation mode AP or STA or AP&STA)
Err 31	WAN Setting
Err 32	Network Protocol Setting
Err 33	LAN Setting
Err 34	Cannot access to command mode of WIFI module
Err 35	STA SSID & KEY Setting
Err 36	AP SSID & KEY Setting
Err 38	Cannot Reload Setting
Err 39	Cannot read MAC of Link
Err 40	Lan Port Communication Error
Err 42	Cannot communicate with Bluetooth module
Err 43	Cannot set Bluetooth module
Err 44	Report output from RS485 port but Machine ID not = blank

23. 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 4 months during long time storage.

24. Appendix: - Lab 1 Output Formats

Lab 1 Print Format¹²

When Lab 1 is selected, output in default format will be generated with printed data is sent. No header will be generated when line number is set = 00. See below table for print format and explanations.

Lab 1 Output Format Illustration Table

Weighing Mode

Date	Time	Seq	M	Net	Tare	Gross	Total	Ref.	R
2017/12/28	20:36:28	1	W	1.500kg	0.000kg	1.500kg	1.500kg		A
2017/12/28	20:36:30	2	W	1.500kg	0.000kg	1.500kg	3.000kg		A
2017/12/28	20:36:31	3	W	1.500kg	0.000kg	1.500kg	4.500kg		A
2017/12/28	20:36:33	4	W	3.000kg	0.000kg	3.000kg	7.500kg		H

Piece Count Mode

Date	Time	Seq	M	Net		Tare	Gross	Total	Ref.	R
2017/12/28	20:41:42	1	C	1000	P	0.000kg	1.500kg	1.500kg	1.50004 g	
2017/12/28	20:41:45	2	C	1000	P	0.000kg	1.500kg	3.000kg	1.50004 g	L
2017/12/28	20:41:48	3	C	1999	P	0.000kg	2.999kg	5.999kg	1.50004 g	A
2017/12/28	20:41:50	4	C	3998	P	0.000kg	5.997kg	11.996kg	1.50004 g	H

ATM Mode

Date	Time	Seq	M	Net	Tare	Gross	Total	Ref.	R
2017/12/28	20:44:01	1	W	1.480kg	0.000kg	1.480kg	1.480kg		L
2017/12/28	20:44:02	2	W	2.999kg	1.499kg	4.498kg	4.479kg		A
2017/12/28	20:44:03	3	W	1.497kg	4.498kg	5.995kg	5.976kg		L
2017/12/28	20:44:04	4	W	1.499kg	5.998kg	7.497kg	7.475kg		L

Animal Weighing Mode

Date	Time	Seq	M	Net	Tare	Gross	Total	Ref.	R
2017/12/28	20:50:28	1	W	2.999kg	0.000kg	2.999kg	2.999kg		

¹² Lab 1 format does not support Customer or Produce Code or Lab 1 output format

2017/12/28	20:50:31	2	W	1.499kg	0.000kg	1.499kg	4.498kg		
2017/12/28	20:50:33	3	W	2.999kg	0.000kg	2.999kg	7.497kg		
2017/12/28	20:50:36	4	W	4.499kg	0.000kg	4.499kg	11.996kg		

Grade Mode Type 1 (Sorting Mode)

Date	Time	Seq	M	Net	Tare	Gross	Total	Ref.	R
2017/12/28	20:55:43	1	W	3.004kg	0.000kg	3.004kg	3.004kg		#3
2017/12/28	20:55:45	2	W	4.506kg	0.000kg	4.506kg	7.510kg		#4
2017/12/28	20:55:46	3	W	1.502kg	0.000kg	1.502kg	9.012kg		#1
2017/12/28	20:55:48	4	W	7.515kg	0.000kg	7.515kg	16.527kg		#7

Grade Mode Type 2 (Sum Up Mode)

Date	Time	Seq	M	Net	Tare	Gross	Total	Ref.	R
2017/12/28	20:57:41	1	W	3.006kg	0.000kg	3.006kg	3.006kg		#
2017/12/28	20:57:43	2	W	1.503kg	0.000kg	1.503kg	4.509kg		
2017/12/28	20:57:44	3	W	4.509kg	0.000kg	4.509kg	9.018kg		#
2017/12/28	20:57:47	4	W	6.013kg	0.000kg	6.013kg	15.031kg		#H

Notes: -

- Date = Date of Output
- Time = Time of Output
- Seq = Accumulate Sequence No
- M = Working Mode
 - W = Weighing, C = Counting, P = Percentage
- Net = Net Result
- Tare = Tare Weight
- Gross = Gross Weight
- Total = Total Accumulated Weight
- Ref. = Average Piece Weight
- R = Check Result: -
 - A = Ok, L = Lo, H = Hi
 - #1 ~ #8 = Grade No
 - # = within target range, #H = above target range

25. Appendix: - Lab 2 Output Formats

25.1 Standard Lab 2 Output Format Illustration Table

Weighing & ATM Mode

Time	21:39:17	<i>Time of Output</i>
Date	2017/12/28	<i>Date of Output</i>
Seq	1	<i>Accumulate Sequence No.</i>
Name	CustomerCode	<i>Customer Code</i>
Pcode	ProductCode	<i>Product Code</i>
Net	3.006kg	<i>Net Weight</i>
Tare	0.000kg	<i>Tare Weight</i>
Gross	3.006kg	<i>Gross Weight</i>
Total	3.006kg	<i>Total Accumulated Net Weight</i>
High	3.500kg	<i>Hi Limit</i>
Low	2.500kg	<i>Lo Limit</i>
Accept		<i>Check Result</i>

Piece Count Mode

Time	21:40:48	<i>Time of Output</i>
Date	2017/12/28	<i>Date of Output</i>
Seq	1	<i>Accumulate Sequence No.</i>
Name	CustomerCode	<i>Customer Code</i>
Pcode	ProductCode	<i>Product Code</i>
Net	3.004kg	<i>Net Weight</i>
Unit.W	1.50004g	<i>Tare Weight</i>
Count	2003pcs	<i>Count Value</i>
Total	3.004kg	<i>Total Accumulated Net Weight</i>
Total	2003pcs	<i>Total Accumulated Count Value</i>
High	2500pcs	<i>Hi Limit</i>
Low	1500pcs	<i>Lo Limit</i>
Accept		<i>Check Result</i>

Peak Hold Mode

Time	21:42:46	<i>Time of Output</i>
Date	2017/12/28	<i>Date of Output</i>
Name	CustomerCode	<i>Customer Code</i>
Pcode	ProductCode	<i>Product Code</i>
Peak	2.999kg	Peak Value

Animal Weighing Mode

Time	21:43:12	<i>Time of Output</i>
Date	2017/12/28	<i>Date of Output</i>
Seq	1	<i>Accumulate Sequence No.</i>
Name	CustomerCode	<i>Customer Code</i>
Pcode	ProductCode	<i>Product Code</i>
Hold.W	2.998kg	<i>Weight Held</i>
Total	2.998kg	<i>Total Accumulated Weight</i>

Grade Mode Type 1 (Sorting Mode)

Time	21:44:30	<i>Time of Output</i>
Date	2017/12/28	<i>Date of Output</i>
Seq	2	<i>Accumulate Sequence No.</i>
Name	CustomerCode	<i>Customer Code</i>
Pcode	ProductCode	<i>Product Code</i>
Net	1.499kg	<i>Net Weight</i>
Tare	0.035kg	<i>Tare Weight</i>
Gross	1.534kg	<i>Gross Weight</i>
Total	2.998kg	<i>Total Accumulated Net Weight</i>
Grade	H < 2.000kg	<i>Hi Limit of Grade No.</i>
Grade	L >= 1.000kg	<i>Lo Limit of Grade No.</i>
Grade	#1	<i>Grade No. / Result</i>

Grade Mode Type 2 (Sum Up Mode)

Time	21:45:52	<i>Time of Output</i>
Date	2017/12/28	<i>Date of Output</i>
Seq	1	<i>Accumulate Sequence No.</i>
Name	CustomerCode	<i>Customer Code</i>
Pcode	ProductCode	<i>Product Code</i>
Net	1.499kg	<i>Net Weight</i>
Tare	0.035kg	<i>Tare Weight</i>

Gross	1.534kg	<i>Gross Weight</i>
Total	1.499kg	<i>Total Accumulated Net Weight</i>

25.2 Customized Lab 2 Output Format

Custom printout is available for the below modes: -

- Piece Count (**Count**)
- Action-Tare-Memory (**AtM**)
- Peak Hold Function (**Peak**)
- Animal Weighing (**Ani**)
- Grading (**Grade**)

19 variants + 2 commands (**Cr LF and End**) are available for custom print output format. Refer to the below paragraph **25.2.1** for more detail.

25.2.1 Print output format variants table

Symbol	Description
End	Edit finished
Cr LF	Insert one blank row
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
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
P Code	Product code
Peak	Peak hold value
Id	Machine ID
GrouP	Machine group number
oPCodE	Operator number
C CodE	Customer code

25.2.2 To edit custom Lab 2 print output format

Follow the below steps to create custom printout.

1. Go to internal function and select the desired function number to edit,
2. Select **CUSTOM** and press **[Print/M+]**,
3. This instrument displays **Line 1** and the last variant or command (refer to paragraph **25.2.1** for details) stored,
4. Press **[Print/M+]** to confirm or select other variant or command by press **[Func]** or **[Unit]**. Then press **[Print/M+]** to confirm and save,
5. This instrument displays **Line 2** and the last variant or command stored,
6. Repeat steps **4** and **5** for other lines,
7. To finish editing, select command **End**, then press **[Print/M+]** to confirm,
8. This instrument returns to and displays the current internal function number,
9. If required, repeat steps **1** to **8** to create and edit custom printout format for other modes.

26. Appendix: - Lab 3 Output Formats

Current working mode and all related data are sent under this mode. Refer to below table for data output format. Semi colon is inserted between data.

Lab 3 Output Format Illustration Table

Mode & Output	Weighing	Count	ATM	Peak Hold	Animal	Sorting	Sum Up
Data 1	Opr	Opr	Opr	Opr	Opr	Opr	Opr
Data 2	Seq	Seq	Seq	(Blank)	Seq	Seq	Seq
Data 3	0	1	2	3	4	5	5
Data 4	Mac	Mac	Mac	Mac	Mac	Mac	Mac
Data 5	MacGp	MacGp	MacGp	MacGp	MacGp	MacGp	MacGp
Data 6	Date	Date	Date	Date	Date	Date	Date
Data 7	Time	Time	Time	Time	Time	Time	Time
Data 8	Name	Name	Name	Name	Name	Name	Name
Data 9	Pcode	Pcode	Pcode	Pcode	Pcode	Pcode	Pcode
Data 10	Gross	Gross	Gross	Tare	Gross	Gross	Gross
Data 11	Net	Net	Net	Peak	Net	Net	Net
Data 12	Tare	Tare	Tare	Unit	Tare	Tare	Tare
Data 13	Low	Total.W	Low	CR LF	Total.W	Low	(Blank)
Data 14	High	Unit	High		Unit	High	(Blank)
Data 15	Result	Count	Result		CR LF	Result	(Blank)

Data 16	Total.W	Unit.W	Total.W			Total.W	Total.W
Data 17	Unit	Unit	Unit			Unit	Unit
Data 18	CR LF	Low	CR LF			CR LF	CR LF
Data 19		High					
Data 20		Result					
Data 21		Total.C					
Data 22		CR LF					

27. Appendix: - Lab 4 & Lab 5 Output Formats

Current working mode and all related data are sent under this mode. Refer to below table for data output format. Semi colon is inserted between data.

27.1 Output Format Illustrations

27.1.1 Lab 4 Print Format

Transaction data is sent in journal output format with gross and net weight of each individual transaction. Refer to right diagram for details.

Name ASDFGHJKLQWERTYUIO		
Pcode 123456789012345678		
Opr 0123		
Mac 66		
MacGp 22		
Date 2017-02-27		
Time 13:58:54		
Seq	Gross	Net
001	5.000	5.000 kg
002	5.000	5.000 kg
003	5.000	5.000 kg
004	10.000	10.000 kg
005	10.000	10.000 kg
006	10.000	10.000 kg

006	45.000	kg
Max	10.000	kg
Min	5.000	kg
Diff	5.000	kg
x	7.5000	kg
Sd	2.7386	kg
Srel	36.5147	%

Data Explanation

Customer Code (if entered)
Product Code (if entered)
Operator No. (if entered)
Machine ID (if entered)
Machine Group No. (if entered)

Date of 1st Printout
Time of 1st Printout

Accumulation No., Gross Weight and Net Weight or Pieces

Total Accumulation No. and Total Net Weight or Pieces

Maximum Value
Minimum Value
Differentiation (Max - Min)
Mean (Average) Value
Standard Deviation . Formula used: $s = \sqrt{\frac{\sum(X - \bar{X})^2}{N}}$
Relative Standard Deviation

27.1.2 Lab 5 Print Format

Transaction data is sent in journal output format with time and net weight of each individual transaction. Refer to right diagram for details.

```
Name ASDFGHJKLQWERTYUIO
Pcode 123456789012345678
Opr 0123
Mac 66
MacGp 22

Date 2017-02-27

Seq Time Net
001 14:00:17 4.999 kg
002 14:00:20 4.999 kg
003 14:00:23 4.999 kg
004 14:00:27 4.999 kg
005 14:00:30 4.999 kg
006 14:00:33 4.999 kg
-----
006 Total 29.994 kg

Max 4.999 kg
Min 4.999 kg
Diff 0.000 kg
x 4.9990 kg
Sd 0.0000 kg
Srel 0.00000 %
-----
```

Printout Format #5
with Statistic Results Output

Data Explanation

Customer Code (if entered)
Product Code (if entered)
Operator No. (if entered)
Machine ID (if entered)
Machine Group No. (if entered)

Date of 1st Printout

Accumulation No., Time of Printout and Net Weight or Pieces

Total Accumulation No. and Total Net Weight or Pieces

Maximum Value
Minimum Value
Differentiation (Max - Min)
Mean (Average) Value
Standard Deviation . Formula used: $s = \sqrt{\frac{\sum(x - \bar{x})^2}{N}}$
Relative Standard Deviation

28. Appendix: - Pre-Defined PC Output Protocols

28.1 Data Abbreviation Table

Data Code	Description
,	Comma
+,-	Polarity Sign Positive = space. Negative = minus (-)
P	Polarity Sign Positive = 0. Negative = minus (-)
C	Control Command <ul style="list-style-type: none"> ETX: End of Text STX: Start of Text CR: Carriage Return LF: Line Feed SOH: Start of Heading =: ASCII equal sign (DEC 61, HEX 3D)
G/N	Gross/Net <ul style="list-style-type: none"> NT = Net weight GS = Gross weight
NET	Net Weight
S	Status Code <ul style="list-style-type: none"> ST for Stable US for unstable
R	Revered 7 digits weight value including location of decimal point. If there is no decimal point, then the last character = space.
SP	Space
SWA	Status Word A

SWB	Status Word B
U	Weight Unit <ul style="list-style-type: none"> kg = kilogram lb = pound g(space) = gram
W	7 digits weight value including location of decimal point. If there is no decimal point, then the first character = space.

28.2 Output Formats Tables

Protocol 1 Output Format

Position	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Data	S	S	,	G/N	+, -	W	W	W	W	W	W	W	W	,	U	U	C	C
1.000kg	S	T	,	G	S				1	.	0	0	0	,	k	g	CR	LF
-0.012kg	S	T	,	G	S	-			0	.	0	1	2	,	k	g	CR	LF
220.450lb	S	T	,	G	S		2	2	0	.	4	5	0	,	l	b	CR	LF

Protocol 2 Output Format

Position	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17		
Data	C	SWA	SWB	SP	Field 1 (Net Weight)						Field 2 (Tare Weight)						CR		
Net	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Tare Value	
-0.015kg	STX	5	7		0	0	0	0	1	5	0	0	2	0	0	0	0	CR	2.000kg
220.450lb	STX	5	!		2	2	0	4	5	0	1	0	0	0	0	0	0	CR	100.000lb

Protocol 3 Output Format

Position	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Data	C	C	SP	+, -	W	W	W	W	W	W	W	SP	U	U	SP	SP	SP	SP	C	C
1.000kg	SOH	STX					1	.	0	0	0		k	g					CR	LF
-0.015kg	SOH	STX		-			0	.	0	1	5		k	g					CR	LF
220.450lb	SOH	STX			2	2	0	.	4	5	0		l	b					CR	LF

Protocol 4 Output Format

Position	1	2	3	4	5	6	7	8	9
Data	C	R	P						
1.000kg	=	0	0	0	.	1			0
-0.015kg	=	5	1	0	.	0			-
220.450lb	=	0	5	4	.	0	2	2	0

Protocol 5 Output Format

Position	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Data	S	S	,	G/N	,	+, -	W	W	W	W	W	W	W	W	U	U	C	C
1.000kg	S	T	,	G	S	,				1	.	0	0	0	k	g	CR	LF
-0.015kg	S	T	,	G	S	,	-			0	.	0	1	5	k	g	CR	LF
220.450lb	S	T	,	G	S	,		2	2	0	.	4	5	0	l	b	CR	LF

Protocol 6 Output Format

Position	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Data	NET			SP	+,-	W	W	W	W	W	W	W	U	U	C	C
1.000kg	N	E	T					1	.	0	0	0	k	g	CR	LF
-0.014kg	N	E	T		-			0	.	0	1	4	k	g	CR	LF
220.450lb	N	E	T			2	2	0	.	4	5	0	l	b	CR	LF

Protocol 7 Output Format

Position	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Data	C	C	SP	+,-	W	W	W	W	W	W	W	SP	U	U	SP	SP	SP	C	C
1.000kg	SOH	STX					1	.	0	0	0		k	g				CR	LF
-0.015kg	SOH	STX		-			0	.	0	1	5		k	g				CR	LF
220.450lb	SOH	STX			2	2	0	.	4	5	0		l	b				CR	LF

Protocol 8 Output Format

Position	1	2	3	4	5	6	7	8	9	10
Data	C	+,-	W	C						
1.000kg	STX				1	.	0	0	0	ETX
-0.015kg	STX	-			0	.	0	1	5	ETX
220.450lb	STX		2	2	0	.	4	5	0	ETX

Protocol 9 Output Format

Position	1	2	3	4	5	6	7	8	9	10	11	12
Data	C	+,-	SP		W	W	W	W	W	U	U	C
1.000kg	STX				1	.	0	0	0	k	g	ETX
-0.015kg	STX	-			0	.	0	1	5	k	g	ETX
220.450lb	STX		2	2	0	.	4	5	0	l	b	ETX

29. Appendix: - Customized PC Output Protocol

Under this mode: -

- 2 data separation types
- 7 control codes, and
- 23 different transaction data

are available from instrument.

29.1 Custom PC Output Protocol Setting Procedures

1. Go to F16 and select the preferred UART number depends on the output comport number.
2. Select PC, then set baud rate, parity and data length.
3. Select Custom in Protocol page. Then press **[Print/M+]**.
4. Instrument displays Separa then followed by data separator selection page.
5. Select preferred data separator CoMMA (comma) or SemiCo (semi colon) then press **[Print/M+]**.

Notes: -

- Data separator is a symbol inserted between transaction data and is usually used by computer program to separate various data.
 - No data separator is inserted between in front or after control commands.
 - Separator in front and after a control code (C1 ~ C6) will not be surpassed. For example: - STXdata,data,dataETX
 - Exception of above is when control codes are in between 2 data. For example: - data,CR LF data
6. Instruments displays Item Number, then followed by the content page.
Note: - Item number means output sequence, e.g. Item 1 = the first content to output, Item 3 = the third content to output.
 7. Press **[Func]** and **[Unit]** until the preferred content appears then press **[Print/M+]**. Refer to below **Custom PC Output Content Table** for details.
 8. Repeat step **6** to include other transaction data or control.
 9. To complete and save a Custom output, select **End** then press **[Print/M+]**.
 10. Then select output time interval (refer to paragraph **8.1** for details).
 11. Press **[Print/M+]** to save.

29.2 Custom PC Output Content Table

Symbol	Explanations	Nature	No. of Digit	Remarks
CoMMA	Comma	Data Separator	1	Select either one
SemiCo	Semi Colon		1	
Cr LF	HEX Code 0D 0A	Control Code	2	
Cr	HEX code 0D		1	
LF	HEX code 0A		1	
SOH	HEX code 01		1	
STX	Hex code 02		1	
ETX	Hex code 03		1	

Status	Weigh Status		2	ST = Stable / US = Unstable / OL = Overload
nT-GS	Net/Gross Sign		2	NT = Net / GS = Gross
Date	Date of Output		10	
Time	Time of Output		8	
Net	Net Weight		8	
Tare	Tare Weight		8	Numeric value only, without weight unit
Gross	Gross Weight		8	
Unit	Weight Unit		2	kg = Kilogram / (space)g =g / lb = Pound
H ref	Hi Limit	Transaction Data	8	8-digital including decimal (if any)
L ref	Lo Limit		8	8-digital including decimal (if any)
Ck res	Comparison Result		2	Lo/Ok/Hi / Grade Result for grading
id	Machine ID		2	00 ~ 98, Blank = None
Group	Machine Group Number		2	00 ~ 99, Blank = None
Op Code	Operator Number		4	0000 ~ 9999, **** = None
P Code	Product Code		1 ~ 18	Blank = not entered
C Code	Customer Code		1~ 18	Blank = not entered
Trans	No. of accumulated transaction		8	Blank = none
ACC	Total Accumulated Weight		8	Blank = none
unit.Wt	Average piece weight		8	When weight unit is = kg, unit weight is based on g
Count	Number of piece	Transaction Data	8	Piece Counting Mode only
t.Count	Total Accumulated Pieces		8	Piece Counting Mode only
Ani	Weight hold (Animal Weighing)		8	Animal Weighing Mode Only
PEAk	Peak Value		8	Peak Hold Mode Only
End	End of Input			None

30. Appendix: - TSC Printer Installation & Setup Procedures

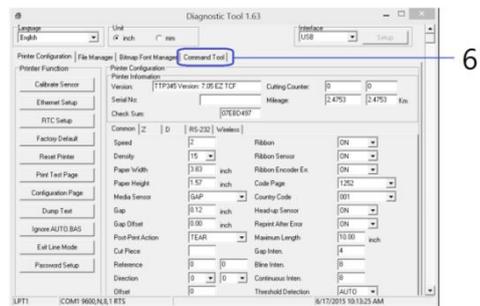
30.1 Before Installation

Get the below ready before printer installation.

- An appropriate cable to connect printer and computer. This cable usually comes with the printer. If not, contact your printer supplier.
- Printer installation driver. This driver usually comes with the printer. If not, contact your printer supplier.
- Diagnostic tool for printer. This tool usually comes with the printer. If not, contact your printer supplier or download it at: - www.fi-measurement.com/resource/driversnsoftwares
- TCF file for printer. The suitable TCF file can be downloaded at: -
 - For TDP247 and TDP345 at www.fi-measurement.com/resource/driversnsoftwares
 - For TTP247and TTP345 at www.fi-measurement.com/resource/driversnsoftwares

30.2 Printer Installation

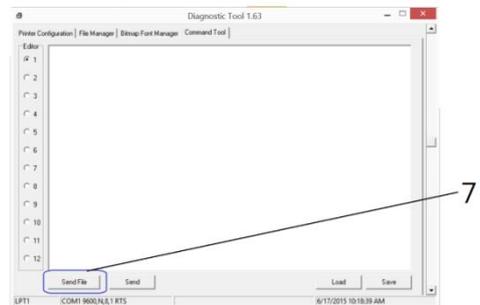
- a. Turn off the printer, connect the appropriate cable, and then turn on the printer.
- b. If the printer supports Plug-and-Play, and you have connected it using a USB or Parallel cable, then the Windows Add Hardware Wizard will automatically detect the printer and display a dialog that allows you to install a driver. Click Cancel and do not install the driver using this wizard.
- c. Run the Driver Wizard utility from the Installation Directory where the driver files are located.
- d. Install Printer Drivers and complete the wizard.
- e. The driver should now be installed.



30.3 Uploading TCF File to Printer

In order to allow proper operation between this instrument and TSC label printer, a TCF file must be uploaded to printer.

1. Connect printer with computer.
2. Power on printer.
3. Download the correct TCF file on paragraph 30.1.
4. Unzip the download file and save in to computer.
5. Run Diagnostic tool for printer.
6. Click on Command Tool.
7. Click on Send file.
8. Double click on the TCF file and it will be uploaded to printer automatically.



31. Appendix: - Create & Upload Print Label File to TSC Printer

31.1 Selecting the Correct Edition for Bartender Software

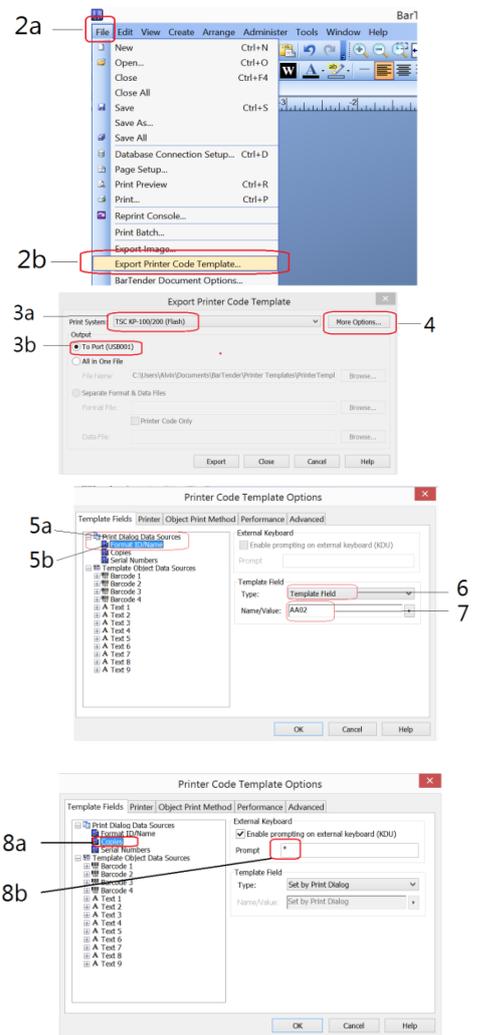
To enable label uploading from computer to TSC printer, it is necessary to run as Bartender as Automation or Enterprise Automation edition. Procedures as below: -

1. Install Bartender Software to computer. The Bartender software usually comes with the TSC printer. If not, please contact your printer supplier.
2. Run Bartender, then click on Help, then click on Edition Selection.
3. Select Enterprise Automation or Automation, then click OK.
4. At this point, correct Bartender edition is selected.

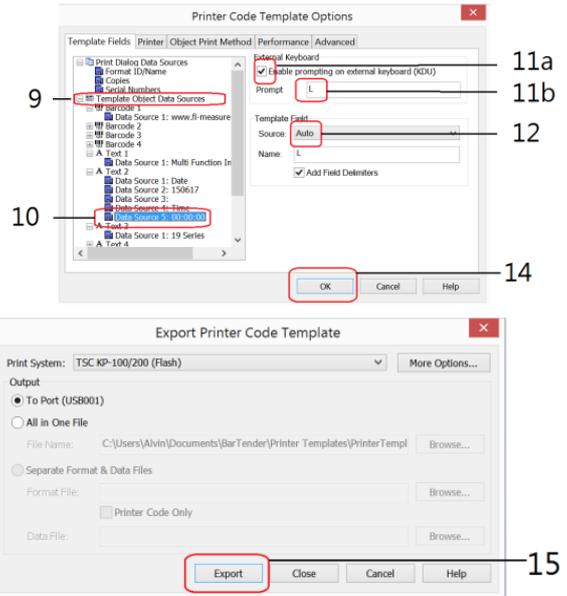
31.2 Adding Information from Instrument to Label & Uploading to a TSC Printer

The below procedures are based on Bartender Label Software. If a different label creating software is used, contact your label software for more details if in doubt.

1. Create the foundation of a label by Bartender. All information to be obtained from instrument should be added afterward.
2. Once the label foundation has been completed; (a) click on File and (b) select Export Printer Code Template.
3. On Print System; (a) select TSC KP-100/200 (Flash) and (b) select to Port.
4. Click More Option.
5. Then (a) click Print Dialog Data Sources, then (b) click on Format ID/Name.
6. On Template Field, select Template Field for Type.
7. Enter the correct label file name on Name/Value. Refer to paragraph 32.1 for correct file name format.
 - (a) Click Copies, check KDU and (b) input asterisk (*) on Prompt box.
8. Below procedures explain how to edit information to be obtained from instrument.
9. Click Template Object Data Sources and Select the object which information from instrument (for example net, gross, tare weight and product code) to be sent to printer and printed on label.



10. Double click on the preferred data source to which variant(s) has/have to add.
11. check the box below External Keyboard, then
12. enter the appropriate command on the Prompt Box (refer to paragraph 32.2.1 for command detail).
13. Select Auto on the Source box under Template Field.
14. Repeat point 11 to 12 for all other data sources.
15. Click OK.
16. Click Export. In case of Verification Messages appear, select one of method on the dialogue box to fix and click Continue.



32. Appendix: - Label Printing (LP-50 & TSC Label Printers)

This instrument supports the below label printer models: -

- a. LP50 by Datecs (www.datecs.bg/en)
- b. TDP247, TDP345 by TSC (www.tscprinters.com)
- c. TTP247, TTP345 by TSC (www.tscprinters.com)

Notes: -

- Refer to paragraph 8 to complete all preferred comport parameters.
- Refer to paragraph 30 for TSC printer installation and setup procedures.
- Refer to paragraph 31 for details on how to create and upload label to TSC printer by Bartender Label software.

Cautions: -

- Do not combine data of different working modes on the same label.
- Do not print any labels of non-current working mode. This will retrieve wrong data of non-current working mode.
- Print only label data when the same working mode is in operation.
- Do not combine data of various working modes on same label. This will retrieve wrong data of non-current working mode.

32.1 Label Format Groups & Label File Names

2 label format groups are available, these are: -

- FL1 (label file format group 1), and
- FL2 (label file format group 2).

32.1.1 FL1 (Label Format Group 1)

FL1 (label file format group 1) is for current transaction data printing (during normal working status).

100 printout selections (00 ~ 99) are available in label file format group 1. In order to trigger the preferred label to be printed, label files stored in printer for this format group must have a file name of AA01, AA02, AA03.... AA99.

- **FL1 00:** - Select this to disable current transaction label printing.
- **FL1 01:** - Select this to print label file AA01 stored in printer.
- **FL1 02:** - Select this to print label file AA02 stored in printer.
-
- **FL1 98:** - Select this to print label file AA98 stored in printer.
- **FL1 99:** - Select this to print label file AA99 stored in printer.

32.1.2 FL2 (Label Format Group 2)

FL2 (label file format group 2) is for totalized (MR) data printing (during normal working status).

100 printout selections (00 ~ 99) are available in label file format group 2. In order to trigger the preferred label to be printed, label files stored in printer for this format group must have a file name of BB01, BB02, BB03.... BB99.

- **FL2 00:** - Select this to disable totalized (MR) data label printing
- **FL2 01:** - Select this to print label file BB01 stored in printer.
- **FL2 02:** - Select this to print label file BB02 stored in printer.
-
- **FL2 98:** - Select this to print label file BB98 stored in printer.
- **FL2 99:** - Select this to print label file BB99 stored in printer.

32.2 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.

32.2.1 Label programing information table

Prompt Command ¹³	Description	Working Mode ¹⁴	Suggested Length
a	Peak Value	Peak	9
b	Product Code	All	18
c	Total accumulated pieces	Piece count	10
d	Machine ID	All	4
e	Machine Group Number	All	2

¹³ Prompt commands are case sensitive.

¹⁴ "All" means the information is good for all working modes.

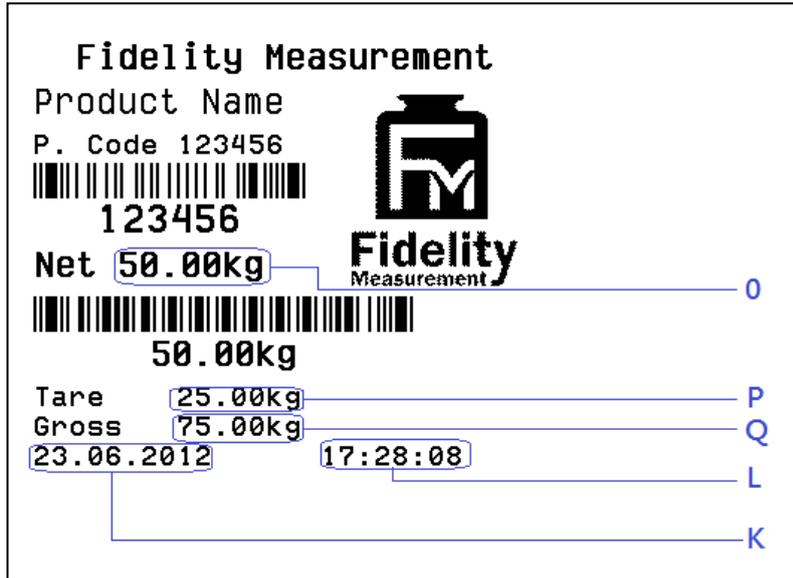
f	Operator Number	All	4
K	Date	All	10
L	Time	All	8
M	No. of accumulated transaction (8 digits with leading space)	All	8
m	No. of accumulated transaction (6 digits with leading zero)	All	6
N	Total accumulated weight	All	9
n	Total accumulated weight without unit or decimal	All	6
O	Net weight	All	10
o	Net weight without unit or decimal	All	6
P	Tare weight	All	10
p	Tare weight without unit or decimal	All	6
Q	Gross weight	All	10
q	Gross weight without unit or decimal	All	6
R	Hi limit ¹⁵	All	10
S	Lo limit ¹⁶	All	10
T	Comparison Result	All	11
U	Number of piece	Piece Count	10
V	Average piece weight	Piece Count	9
Y	Weight hold	Animal Weighing	11
y	Weight hold without unit or decimal	Animal Weighing	6
Z	Customer Code	All	18

¹⁵ Each working mode has its own Hi Limit format (weight for weighing & auto tare accumulation mode; pieces for piece count mode). If Hi Limit has to be printed, set Hi Limit value under the preferred working mode.

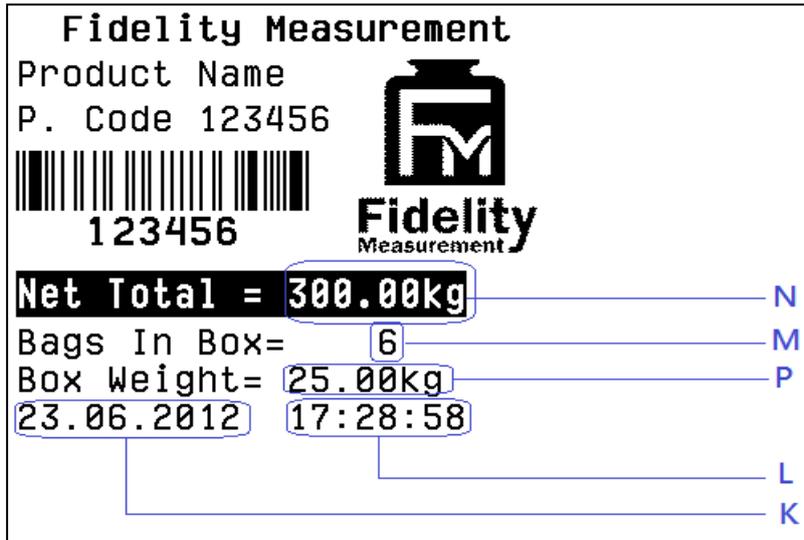
¹⁶ Each working mode has its own Lo Limit format (weight for weighing mode& auto tare accumulation; pieces for piece count mode). If Lo Limit has to be printed, set Lo Limit value under the preferred working mode.

32.2.2 Label programming sample

32.2.2.1 Sample label of current transaction (FL1)



32.2.2.2 Sample label of totalized data (FL2)



32.3 Quick Access to Label Settings

If label printer is selected, follow the below procedures to access quick label settings during operation.

1. Press **[Set]**.
2. Instrument displays F1.
3. Press **[Check]**, instrument displays number of copy to generate each time. Press **[Func]** or **[Unit]** until the preferred parameter appears then press **[Print/M+]** to save.
4. Instrument displays label file number (FL1 00 ~ FL1 99) to print in label format group 1. Enter the preferred file number through numeric then press **[Print/M+]** to confirm.
5. Instrument displays label file number (FL2 00 ~ FL2 99) to print in label format group 2. Enter the preferred file number through numeric then press **[Print/M+]** to confirm.
6. At this point, label settings are completed.

32.4 Repetitive Printout

This instrument supports repetitive printout under Manual Print Mode. Press **[Print/M+]** for additional printout copies.

Conditions and criteria as below: -

- When Auto Accumulation is set to On: Repetitive print is only possible when the actual weight on scale is equal to the weight value of the 1st printout.
- When Auto Accumulation is set to Off: Repetitive print is possible if minimum output weight set is matched and when **[Print/M+]** is pressed.
- Weight value of repetitive printout will not change the total accumulation result. Only the weight value of the 1st printout will be accumulated to memory.

33. Appendix Operation Result Command Codes Table

Prompt Command ¹⁷	Description
a	Peak Value
b	Product Code
c	Total accumulated pieces
d	Machine ID
e	Machine Group Number
f	Operator Number
g	Customer Code
J	Current status, weight and tare weight values
K	Date
L	Time
M	No. of accumulated transaction
N	Total accumulated weight
n	Total accumulated weight without unit or decimal
O	Net weight
o	Net weight without unit or decimal
P	Tare weight

¹⁷ Prompt commands are case sensitive.

p	Tare weight without unit or decimal
Q	Gross weight
q	Gross weight without unit or decimal
R	Hi limit
S	Lo limit
T	Comparison Result
U	Number of pieces
V	Average piece weight
Y	Weight hold
y	Weight hold without unit or decimal
Z	Read internal count (AD) value

34. Appendix: - System Parameter Inquiry Command Codes Table

Command Code	Description	Number & Description Responded Parameters Notes: -
		a. If more than one parameter, semi colon separation is inserted between parameters. b. Response from instrument always end up with Hex code 0D 0A
Aa	Calibration weight unit and application	<ul style="list-style-type: none"> d1 = calibration weight unit: - 0 = kg; 1 = lb. d2 = application: - 0 = none; 1 = OIML; 2= NTEP
Ab	Decimal format, decimal point of kg, g and lb	<ul style="list-style-type: none"> d1 = decimal format: - 0 = dot; 1 = comma d2 = kg: - 0 = no decimal; 1 = 1 decimal place..... 4 = 4 decimal places d3 = g: - 0 = no decimal; 1 = 1 decimal place..... 4 = 4 decimal places; n = not applicable d4 = lb: - 0 = no decimal; 1 = 1 decimal place..... 4 = 4 decimal places
Ac	Capacity1 of kg, g, lb	<ul style="list-style-type: none"> d1 = capacity in kg. Data length = 8 including decimal with leading space (Hex code 20)

		<ul style="list-style-type: none"> • d2 = capacity = g. Data length = 8 including decimal with leading space (Hex code 20) • d3 = capacity = lb. Data length = 8 including decimal with leading space (Hex code 20)
Ad	Capacity 2 of kg, g, lb	<ul style="list-style-type: none"> • d1 = mode: - 0 = Off; 1 = dual weighing range; 2 = dual interval • d2 = capacity in kg. Data length = 8 including decimal with leading space (Hex code 20) • d3 = capacity = g. Data length = 8 including decimal with leading space (Hex code 20) • d4 = capacity = lb. Data length = 8 including decimal with leading space (Hex code 20)
Ae	Division 1 of kg, g, lb	<ul style="list-style-type: none"> • d1 = kg: - 0 = 1; 1 = 2; 2 = 5; 3 = 10; 4 = 20; 5 = 50 • d2 = g: - 0 = 1; 1 = 2; 2 = 5; 3 = 10; 4 = 20; 5 = 50 • d3 = lb: - 0 = 1; 1 = 2; 2 = 5; 3 = 10; 4 = 20; 5 = 50
Af	Division 2 of kg, g, lb	<ul style="list-style-type: none"> • d1 = kg: - 0 = 1; 1 = 2; 2 = 5; 3 = 10; 4 = 20; 5 = 50 • d2 = g: - 0 = 1; 1 = 2; 2 = 5; 3 = 10; 4 = 20; 5 = 50 • d3 = lb: - 0 = 1; 1 = 2; 2 = 5; 3 = 10; 4 = 20; 5 = 50
Ag	Gravity Factor of Calibration Place and Operation Place	<ul style="list-style-type: none"> • d1 = gravity factor of calibration place. Data length = 8 including decimal with leading space (Hex code 20). • d2 = gravity of location of operation place. Data length = 8 including decimal with leading space (Hex code 20).
Ah	Linearity Compensation Function	0 = Off; 1 = On
Ai	ad value of zero point (offset) value, weight value of LD1, ad value of LD1, weight value of LD2 and ad value of LD2	<ul style="list-style-type: none"> • d1 = ad value of zero point. Data length = 8 including decimal with leading space (Hex code 20). • d2 = weight value of LD1. Data length = 8 including decimal with leading space (Hex code 20). • d3 = ad value of LD1. Data length = 8 (integers only) with leading space (Hex code 20).

		<ul style="list-style-type: none"> • d4 = weight value of LD2. Data length = 8 including decimal with leading space (Hex code 20). • d5 = ad value of LD2. Data length = 8 (integers only) with leading space (Hex code 20).
Aj	ad value of zero point (offset), span weight value, net span AD value	<ul style="list-style-type: none"> • d1 = as value of zero point. Data length = 8 (integers only) with leading space (Hex code 20). • d2 = span weight value. Data length = 8 including decimal with leading space (Hex code 20). • d3 = net span AD value. Data length = 8 (integers only) with leading space (Hex code 20)
Ak	Weight unit enable/disable for kg, g and lb	<ul style="list-style-type: none"> • d1 = kg: - 0 = Off; 1 = On • d2 = g: - 0 = Off; 1 = On • d3 = lb: - 0 = Off; 1 = On
Al	Filter strength	0 = level 1; 1 = level 2; ... ; 7 = level 8; 8 = level 9
Am	Initial Zero range, manual zero range, auto zero tracking speed	<ul style="list-style-type: none"> • d1 = initial zero range: - 0 = Off, 1 = 1%, 2 = 2%; ... 5 = 5%; 6 = 10%; 7 = 20% • d2 = manual zero range: - 0 = 1%; 1 = 2%; 2 = 3%; 3 = 4%; 4 = 5%; 5 = 10%; 6 = 20%; 7 = 50%; 8 = 75%; 9 = 100% • d3 = auto zero tracking speed: - 00 = Off; 01 = 0.25e; 02 = 0.50e; 03 = 10e; 04 = 1.5e; 05 = 2.0e; 06 = 2.5e; 07 = 3.0e;; 09 = 5e; 10 = 7.5e; 11 = 10e
An	Auto tare, repetitive tare and preset tare	<ul style="list-style-type: none"> • d1 = auto tare: - 0 = Off; 1 = On; 2 = Continuous • d2 = repetitive tare: - 0 = Off; 1 = On • d3 = Preset tare: - 0 = Off; 1 = On
Ao	Stability control of manual zero and manual tare	<ul style="list-style-type: none"> • d1 = manual zero stability control: - 0 = no (disable); 1 = Yes (enable) • d2 = manual tare stability control: - 0 = no (disable); 1 = Yes (enable)
Ap	Auto power off time, backlight brightness, color ratio, keypad buzzer and system buzzer	<ul style="list-style-type: none"> • d1 = auto power off time: - 0 = Off; 1 = 1 minute; 2 = 3 minute; 3 = 5 minute; 4 = 10 minute; 5 = 20 minute; 6 = Other • d2 = backlight brightness (01 ~ 99). 01 = lowest, 99 = highest. • d3 = color ratio (01 ~ 99). 01 = least red output, 99 = highest red output • d4 = keypad buzzer: - 0 = Off; 1 = On • d5 = system buzzer: - 0 = Off; 1 = On

Aq	Check result buzzer, near zero value, high limit for weighing, low limit for weighing, high limit for counting, low limit for counting	<ul style="list-style-type: none"> • d1 = check result buzzer: - 0 = Off; 1 = In; 2 = Out; 3 = hi, 4 = lo • d2 = near zero value. Data length = 8 with leading space (Hex code 20) • d3 = Hi Limit for weighing. Integer only. Data length = 8 including decimal with leading space (Hex code 20). • d4 = Lo Limit for weighing. Integer only. Data length = 8 including decimal with leading space (Hex code 20). • d5: = Hi Limit for counting. Integer only. Data length = 8 (integers only) with leading space (Hex code 20). • d6: = Lo Limit for counting. Integer only. Data length = 8 (integers only) with leading space (Hex code 20).
At	Current weight unit and function mode	<ul style="list-style-type: none"> • d1 = weight unit: - 0 = kg; 1 = g; 2 = lb • d2 = function mode: - 0 = weighing; 1 = piece count; 2 = AT 1; 3 = peak hold; 4= animal weighing
Av	Operation mode enable/disable status	<ul style="list-style-type: none"> • d1 = Piece count: - 0 = Off; 1 = On • d2 = ATM: - 0 = Off; 1 = On • d3 = Peak Hold: - 0 = Off; 1 = On • d4 = Animal Weighing: - 0 = Off; 1 = On • d5 = Grade: - 0 = Off; 1 = On • d6 = Weigh: - 0 = Off; 1 = On • d7 = CPCCode: - 0 = Off; 1 = On
Aw	Machine ID & group number	<ul style="list-style-type: none"> • d1 = 4-digit machine ID number. Nothing = no machine ID is set • d2 = 2-digit machine group number. Nothing = no group number is set
Ax	Operator Number	4-digit operator number. **** = no operator number is set

35. Appendix: - F25 Control Mode 1 (Static & Dynamic Check)

This mode is used to compare the result (of a dynamic application) obtained with the preset Lo and Hi Limits set to this instrument. The comparison result (Hi, Ok or Lo) will then be displayed with or without buzzer¹⁸. Check results are also sent to Control Output Port¹⁹ for other external control devices/proposes.

35.1 Operation Specifications

- Maximum belt speed: - 30 meter per minute.
- Maximum accuracy: - 3000d.
- Maximum speed: - 30 pack per minutes.

35.2 Settings & Before Starting

1. Go to F25 and press **[Func]** until Mode 1 appears on LED3 then press **[Print/M+]** to confirm.
2. Press **[Zero]** to quite to normal operation status.
3. Dynamic Check Mode should be run under Weighing Mode. Press **[Func]** until Weigh appears on LED1 then press **[Print/M+]** to confirm.
4. At this point, the Lo and Hi Limits used before power off are now in effective. If different Lo and Hi limits are needed, go through one of the below methods: -
 - a. Recall preferred Lo and Hi limits from PLU (refer to below paragraph **35.4** for procedures), or
 - b. Set Lo and Hi limits manually (refer to below paragraph **35.3**) for procedures
5. Go to F26 and set near zero value in F26. It is recommended that this value is = 70% of the target weight value.

Notes: -

- Nero zero value is very useful for dynamic and conveyor weighing applications. 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 illustration.
6. Go to F10 to set preferred filter strength and AD conversation speed. Refer to F10 on Internal Function Setting for details. Conduct test runs and perform adjustments if necessary.
 7. At this point, instrument is ready for weight check operation.

35.3 Create & Save Lo and Hi Weight Limits to PLU

1. Press **[Check]** and then enter the Lo weight limit through numeric keys then press **[Print/M+]**.
2. Then enter the Hi weight limit through numeric keys then press and hold **[Check]** for 2 seconds.
3. Instrument displays **Save =?**. At this point: -
 - a. Press the preferred PLU position (numeric key 0 ~ 9), then press **[Print/M+]** to save to that PLU position and utilize these limits immediately, or
 - b. Press **[Print/M+]** to utilize these limits immediately but without saving to PLU, or
 - c. Press **[Zero]** to quit.

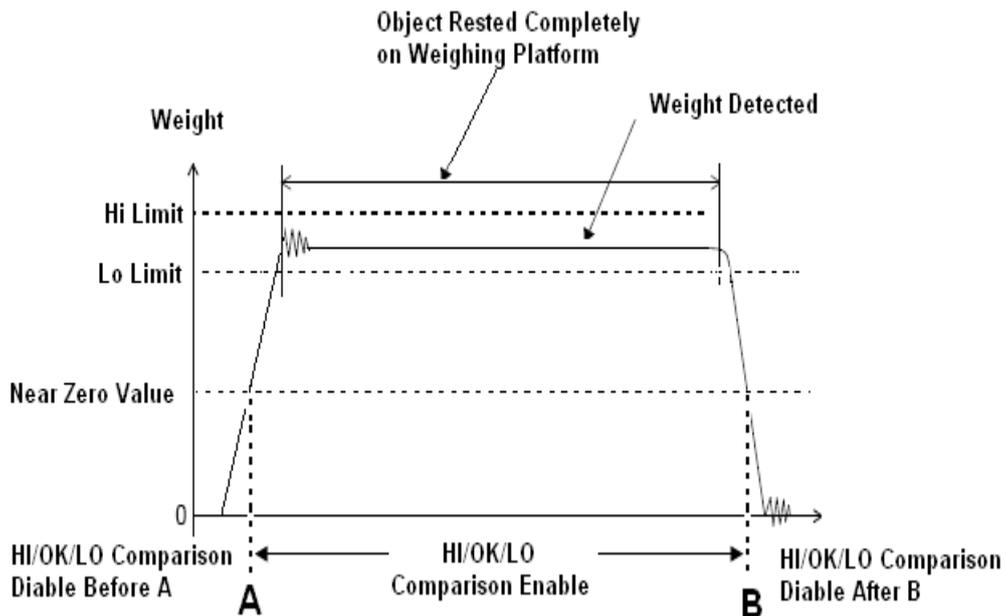
35.4 Recall Weight Limits from PLU

1. Press and hold **[Check]** for 2 seconds.
2. Instrument displays **CHK =?**. Press PLU position (numeric key 0 ~ 9) then press **[Print/M+]** to recall the Lo & Hi limits stored in that position.
3. Instrument displays Lo and Hi limits and these values are now effective.

¹⁸ Set F15 to obtain the preferred buzzer output configuration.

¹⁹ Refer to paragraph **4** for details.

35.5 Near Zero Value Illustration Diagram



35.6 Check Result Light Bars

The check result of the load on weighing platform is then displayed one of the lights bars and according to the display format set in F15.

35.7 Relay Output Indicators

Under the weight check function: -

- Relay 1 synchronizes with buzzer output.
- Relay 2 synchronizes with Lo output.
- Relay 3 synchronizes with Ok output.
- Relay 4 synchronizes with Hi output.

35.8 Clear Weight Limits from PLU

1. Enter zero value (by pressing **[CE/x10]**) for both Lo and Hi limits in steps 1 and 2 on paragraph **35.3**.
2. Then press the preferred PLU position
3. Then press **[Print/M+]** to clear.

36. Appendix: - F25 Control Mode 2 (Inflow & Outflow Control)

Inflow/outflow logic is built-in to trigger external control devices. This mode is used to maintain the content level inside a tank or container or reservoir.

36.1 Set Points Needed

- **Low** is used to define the minimum weight level before an alarm or refilling device is triggered.
- **High** is used to define the maximum weight level before an alarm or outflow device is triggered.

36.2 Settings & Before Starting

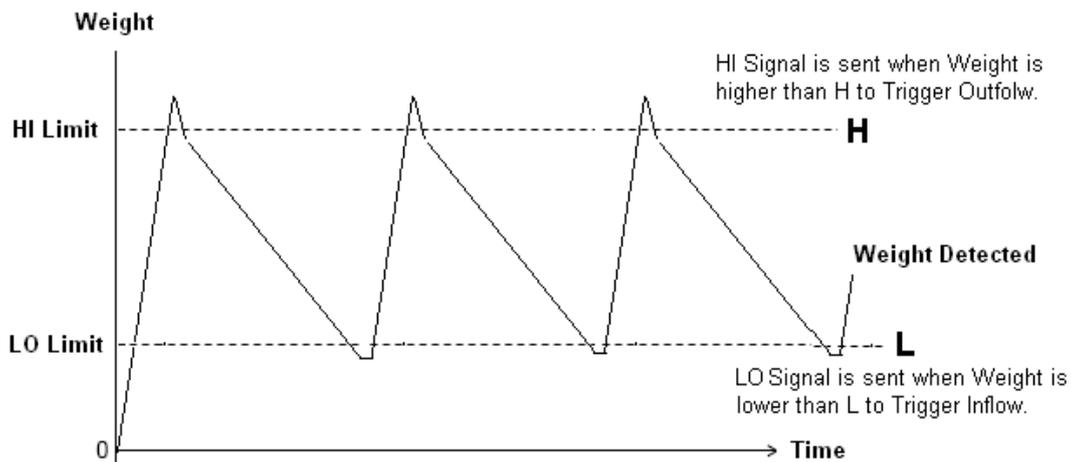
1. Go to F25 and press **[Func]** until **Mode 2** appears on LED3 then press **[Print/M+]** to confirm.
2. Press **[Zero]** to quite to normal operation status.
3. Dynamic Check Mode should be run under Weighing Mode. Press **[Func]** until Weigh appears on LED1 then press **[Print/M+]** to confirm.
4. Set Low and High. Refer to paragraph 15.2 for details.
5. If necessary, go to F10 to set preferred filter strength and AD conversation speed. Refer to F10 on Internal Function Setting for details. Conduct test runs and perform adjustments if necessary.

36.3 Control Logic of Inflow/Outflow Control Mode

When weight detected: -

- a. is lower than the Low, Relay 2 will be triggered and maintained and stopped automatically when High is reached.
- b. is higher than the High, Relay 2 will be triggered and stopped automatically when weight detected is lower than the High.

Inflow/Outflow Illustration Diagram



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)

36.4 Check Result Light Bars

The check result weight detected is then displayed on of the lights bars according to the below table.

36.5 Check Result Light Bars Inflow & Outflow Mode Table

Light Bar	Description
Lo	<ul style="list-style-type: none"> • Decreasing weight (outflow process) = weight detected is lower than Low • Increasing weight (inflow process) = weight detected is lower than High (inflow process not completed)
Ok	<ul style="list-style-type: none"> • Decreasing weight (outflow process) = weight detected is within Lo and Hi. • Increasing weight (inflow process) = Light Bar disabled.
Hi	Weight detected is higher than High.

36.6 Recommended Control Output Pin Assignment Table

Relay No.	Control Proposes
1	Nil
2	<ul style="list-style-type: none"> • Normal Open = Start inflow / filling process or mechanism • Normal Close = Nil
3	<ul style="list-style-type: none"> • Normal Open = Level Ok Indication • Normal Close = Level out of range Indication
4	<ul style="list-style-type: none"> • Normal Open = Level High Alarm / Start Outflow process or mechanism • Normal Close = Nil

37. Appendix: - Control Mode 3 (Constant Feeding Mode)

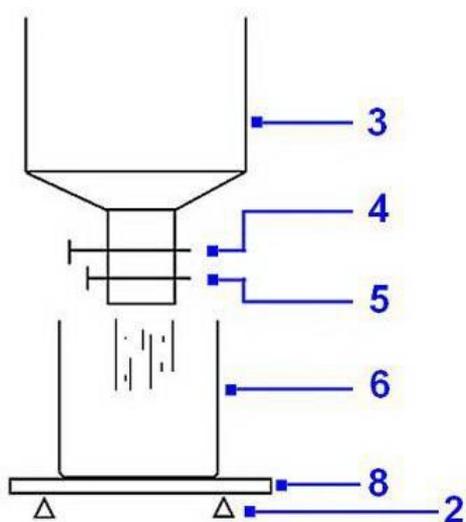
Constant feeding logic is built-in to trigger external control devices so that a pre-defined weight is fed in a container/packing automatically.

37.1 Set Points Needed

5 set points are needed to operate this mode: -

- Tare H = Maximum Tare Value (maximum weight of the container used)
- Tare L = Minimum Tare Value (minimum weight of the container used)
- SP1 is weight value which fast feeding should stop.
- SP2 is the weight value at which slow feeding should stop.
- SP3 is the weight value at or exceed which an alarm signal will be generated / triggered.

37.2 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

37.3 Constant Feeding Control Parameters

Control parameters are available to achieve various applications, functions and targets, refer to below table for more details.

37.4 Constant Feeding Control Parameters Table

Parameter	Description
Tare H	<ul style="list-style-type: none"> • This is the highest weight value of an empty container which can be automatically tare off. • Condition: Tare H > = Tare L • To disable Tare H checking, press [CE/x10].
Tare L	<ul style="list-style-type: none"> • This is the lowest weight value of an empty container which can be automatically tare off. • Condition: Tare L < =Tare H • To disable Tare L checking, press [CE/x10].
SP1 (Set Point 1)	Set Point 1. <ul style="list-style-type: none"> • This is the weight value at or above which fast feeding comes to end.

	<ul style="list-style-type: none"> Condition: $SP1 \leq SP2 \leq SP3$
SP2 (Set Point 2)	<p>Set Point 2. It is usually used for slow feeding comes to end.</p> <ul style="list-style-type: none"> This is the weight value at or above which slow feeding comes to end. Condition: $SP1 \leq SP2 \leq SP3$
SP3 (Set Point 3)	<p>Set Point 3. It is usually used as alarm when the preset value is exceeded.</p> <ul style="list-style-type: none"> This is the weight value at or above which (if such weight value is achieved within the time delay duration set in Delay 3) control output 1 starts action. Condition: $SP1 \leq SP2 \leq SP3$
dELAY1 (Delay Time 1)	<p>Time duration (1~99 sec). This is the time duration in between: -</p> <ul style="list-style-type: none"> When [Func] key (Start) key is pressed, and SP1 (Control output 2) starts action.
dELAY2 (Delay Time 2)	<p>Time duration (1~99 sec) This is the time duration in between: -</p> <ul style="list-style-type: none"> When weight value of SP1 is reached or exceeded (Control output 2 stops action), and SP2 (Control output 3) starts action.
dELAY3 (Delay Time 3)	<p>Time duration (1~99 sec). This is the time duration in between: -</p> <ul style="list-style-type: none"> (Normal case) When weight value of SP2 is reached or exceeded (Control output 3 stops action) and before feeding 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 (Control output 1 starts action). SP3 is the preset alarm weight value <p><i>SP3, Delay 3 and Control output 1 together are used for failing safe proposes.</i></p>

37.5 Settings & Before Starting

- Go to F25 and press **[Func]** until **Mode 3** appears on LED3 then press **[Print/M+]** to confirm.
- Press **[Zero]** to quite to normal operation status.
- Press **[Check]** and enter all set points needed through numeric keys then press **[Print/M+]** to save.
- If necessary, go to F10 to set preferred filter strength and AD conversation speed. Refer to F10 on Internal Function Setting for details. Conduct test runs and perform adjustments if necessary.

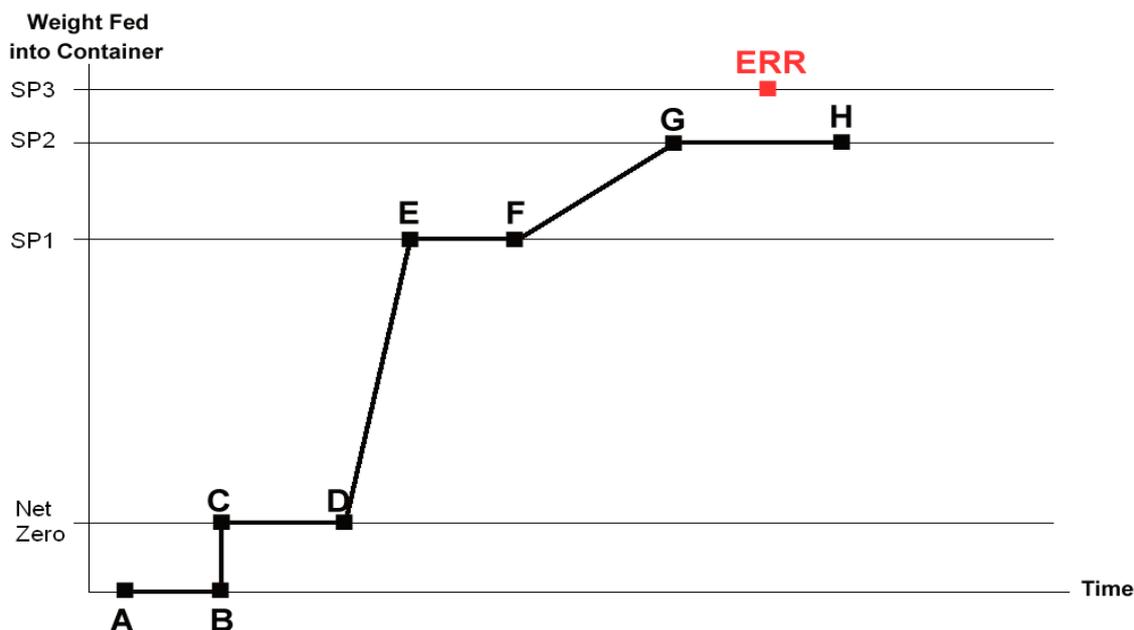
37.6 Start Feeding Process

- If Tare H and / or Tare L have / has been entered, apply container on weighing platform.
- Press **[Func]** to start. Instrument will tare off the weight of the container if weigh of it fulfils the Tare H and Tare I conditions.
- Relay 2 activated, fast feeding process continues until SP1 weight value is reached or exceeded.
- Relay 2 disable to stop fast feeding.
- Relay 3 activated, fast feeding process continues until SP2 weight value is reached or exceeded.
- Relay 3 disable. At this point, one feeding cycle is completed.

Note: - Press **[Func]** to stop all relay output manually during feeding.

Refer to below illustration diagram for feeding sequence.

Constant Feeding Sequence Illustration Diagram



37.7 Relay Output Assignment Table

Output Control of Instrument	Description
Relay 1	Weight \geq SP3. To be connected with system alarm/system halt devices.
Relay 2	Weight $<$ SP1. To be connected with fast feeding valve/gate.
Relay 3	$SP1 \leq$ weight $<$ SP2. To be connected with slow feeding valve/gate
Relay 4	Manual Output (by UNIT Key)

37.8 Constant Feeding Sequence Description

Seq.	Point	Description
1	A	a. When [Unit] key is pressed or automatically triggered by Seq. 11 automatically. b. Control output 4 starts action.
2	B	a. [Func] key is pressed. b. Relay 4 stops action. (If Control output 4 has been triggered)
3	C	a. Instrument displays Start . b. Feeding sequence starts.
4	C \rightarrow D	Time delay as set forth in Delay 1.

5	D	<ul style="list-style-type: none"> a. Weight of container is tare off automatically²⁰. b. Relay 2 (SP1) starts action. c. Fast feeding starts.
6	E	<ul style="list-style-type: none"> a. Weight value of SP1 is reached. b. Realy 2 stops action. c. Fast feeding stops.
7	E → F	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> a. Relay 3 (SP2) starts action. b. Slow feeding starts.
9	G	<ul style="list-style-type: none"> a. Weight value of SP2 is reached. b. Relay 3 stops action. c. Slow feeding stops.
10	G → H	<ul style="list-style-type: none"> 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. <p>Note: - If any weight (e.g. a value = point ERR) >= SP3 is detected in this period: -</p> <ul style="list-style-type: none"> • Relay 1 (error) will be triggered. • Feeding sequence come to a halt. • Manual intervention is required set
11	H	<ul style="list-style-type: none"> a. Instrument displays Stop. b. Feeding sequence completed. c. Instrument displays gross weight (Tare weight + weight of material fed) d. Depends of comport setting, printout and data accumulation can be generated automatically or manually. A signal is sent to trigger control output 4.

37.9 Key Functions during Operation & Parameters Setting

Refer to below table for key functions during feeding operation and parameters setting.

Key	Function Description
[Zero]	<ul style="list-style-type: none"> • Before feeding process starts: - To set weight displayed to zero manually. • During auto feeding process: - No function. • During parameter setting: - Quit without saving.
[Tare]	<ul style="list-style-type: none"> • Before feeding process starts: - To tare off the weight of a container manually. • During auto feeding process: - No function. • During parameter setting: - No function.

²⁰ Tare L<= weight of container <=Tare H

[Func]	<ul style="list-style-type: none"> • Before feeding process starts: - Start / Stop. • During feeding process starts: - Start / Stop. • During parameter setting: - Go to next parameter.
[Check]	<ul style="list-style-type: none"> • Before feeding process starts: - To start parameter setting menu. • During feeding process starts: - No function. • During parameter setting: - Go to next parameter.
[CE/x10]	<ul style="list-style-type: none"> • Before feeding process starts: No function. • During feeding process: - No function. • During parameter setting: - To clear value entered.
[Unit]	<ul style="list-style-type: none"> • Before feeding process starts: - Trigger Relay 4 manually / Stop Disable Relay 4 (if it has been activated). • During feeding process: - During parameter setting: - Go to previous page.
[Print/M+]	<ul style="list-style-type: none"> • Before feeding process starts: - Send current weight result to printer/ Accumulate current weight to memory (if a net weight = zero or negative has been previously attained). • During feeding process: - Send current weight result to printer/ Accumulate current weight to memory (if a net weight = zero or negative has been previously attained). • During parameter setting: - Enter, save and return.
[MR]	<ul style="list-style-type: none"> • Before feeding process starts: - To recall total number of stored transactions and total accumulated gross weight. • During feeding process: - No function. • During parameter setting: - No function.
[0~9]	<ul style="list-style-type: none"> • Before feeding process starts: - Enter preset tare value then press [Print/M+] to confirm. • During feeding process: - No function. • During parameter setting: - Numeric keys.

38. Appendix: - F25 Control Mode 4 (Constant Dispensing with Auto Re-filling)

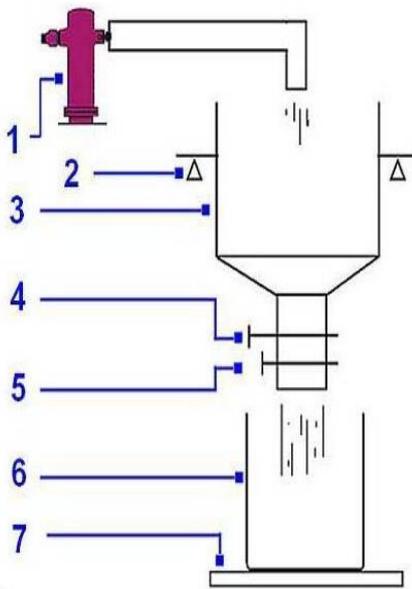
Constant dispense logic is used so that a pre-defined weight is dispensed automatically.

38.1 Set Points Needed

5 set points are needed to operate this mode: -

- rEF H is the weight at or above which a signal is generated to stop auto re-fill device.
- rEF L is the weight at or below which a signal is generated to start auto re-fill device.
- SP1 is weight value which fast dispensing should stop.
- SP2 is the weight value at which slow dispensing should stop.
- SP3 is the weight value at or exceed which an alarm signal will be generated / triggered.

38.2 Constant Dispensing Illustration System Block Diagram



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

Constant dispensing control parameters table

Parameter	Description
rEF H (Re-fill Hi)	<ul style="list-style-type: none"> • This is the weight value of the reservoir at or above which auto re-fill stops. • Condition: $H \geq rEF L \geq SP2 \geq SP1$ (SP3 is not considered)
rEF L (Re-fill Lo)	<ul style="list-style-type: none"> • This is the weight value of the reservoir at or below which auto re-fill starts. • Condition: $rEF L \leq rEF H$
SP1 (Set Point 1)	Set Point 1. <ul style="list-style-type: none"> • This is the weight value at or above which fast dispensing comes to end. • Condition: $SP1 \leq SP2 \leq SP3$
SP2 (Set Point 2)	Set Point 2. It is usually used for slow dispensing comes to end. <ul style="list-style-type: none"> • This is the weight value at or above which slow dispensing comes to end. • Condition: $SP1 \leq SP2 \leq SP3$
SP3 (Set Point 3)	Set Point 3. It is usually used as alarm when the preset value is reached/exceeded. <ul style="list-style-type: none"> • This is the weight value at or above which (if such weight value is achieved

	<p>within the time delay duration set in Delay 3) and control output 1 starts action.</p> <ul style="list-style-type: none"> Condition: SP1 <= SP2 <= SP3
dELAy1 (Delay Time 1)	<p>Time duration (00~99 sec). This is the time duration in between: -</p> <ul style="list-style-type: none"> When [Func] key (Start) key is pressed, and SP1 (Control output 2) starts action.
dELAy2 (Delay Time 2)	<p>Time duration (00~99 sec) This is the time duration in between: -</p> <ul style="list-style-type: none"> When weight value of SP1 is reached or exceeded (Control output 2 stops action), and SP2 (Control output 3) starts action.
dELAy3 (Delay Time 3)	<p>Time duration (00~99 sec). This is the time duration in between: -</p> <ul style="list-style-type: none"> (Normal case) When weight value of SP2 is reached or exceeded (Control output 3 stops action) and before 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 (Control output 1 starts action). SP3 is the preset alarm weight value

SP3, Delay 3 and Relay 1 together are used for failing safe proposes.

38.3 Settings & Before Starting

- Go to F25 and press **[Func]** until **Mode 4** appears on LED3 then press **[Print/M+]** to confirm.
- Press **[Zero]** to quite to normal operation status.
- Press **[Check]** and enter all set points needed through numeric keys then press **[Print/M+]** to save.
- If necessary, go to F10 to set preferred filter strength and AD conversation speed. Refer to F10 on Internal Function Setting for details. Conduct test runs and perform adjustments if necessary.

38.4 Start Dispensing Process

- Press **[Func]** to start.
 - If reservoir weight is lower than rEF L, Relay 4 will be activated to start re-filling.
 - If reservoir weight is higher than rEF L, Relay 2 will be activated to start fast dispensing process.
- Fast dispensing process continues until SP1 weight value has been dispensed reservoir.
- Relay 2 disable to stop fast dispensing process.
- Relay 3 will then be activated to start slow dispensing process.
- Slow dispensing process continues until SP2 weight value has been dispensed from reservoir.
- Relay 3 disable. At this point, one dispensing cycle is completed.

Note: - Press **[Func]** to stop all relay output manually during process.

38.5 Relay Output Assignment Table

Relay No.	Recommended Assignment
Relay 1	Over-dispensed alarm / system stops
Relay 2	Dispensing valve with larger diameter
Relay 3	Dispensing valve with smaller diameter
Relay 4	Re-filling mechanism

38.6 Key Functions during Operation & Parameters Setting

Refer to below table for key functions during dispensing operation and parameters setting.

Key	Function Description
[Zero]	<ul style="list-style-type: none"> • Before dispensing process starts: - To set weight displayed to zero manually. • During auto dispensing process: - No function. • During parameter setting: - Quit without saving.
[Tare]	<ul style="list-style-type: none"> • Before dispensing process starts: - To tare off the weight of a container manually. • During auto dispensing process: - No function. • During parameter setting: - No function.
[Func]	<ul style="list-style-type: none"> • Before dispensing process starts: - Start / Stop. • During dispensing process starts: - Start / Stop. • During parameter setting: - Go to next parameter.
[Check]	<ul style="list-style-type: none"> • Before dispensing process starts: - To start parameter setting menu. • During dispensing process starts: - No function • During parameter setting: - Go to next parameter.
[CE/x10]	<ul style="list-style-type: none"> • Before dispensing process starts: No function • During dispensing process: - No function. • During parameter setting: - To clear value entered.
[Unit]	<ul style="list-style-type: none"> • Before dispensing process starts: - No function • During dispensing process: - Trigger Relay 4 manually. • During parameter setting: - Go to previous page.
[Print/M+]	<ul style="list-style-type: none"> • Before dispensing process starts: - Send current weight result to printer/ Accumulate current weight to memory (if a net weight = zero or negative has been previously attained). • During dispensing process: - Send current weight result to printer/ Accumulate current weight to memory (if a net weight = zero or negative has been previously attained). • During parameter setting: - Enter, save and return.
[MR]	<ul style="list-style-type: none"> • Before dispensing process starts: - To recall total number of stored transactions and total accumulated gross weight. • During dispensing process: - No function. • During parameter setting: - No function.
[0~9]	<ul style="list-style-type: none"> • Before dispensing process starts: - Enter preset tare value then press [Print/M+] to confirm. • During dispensing process: - No function. • During parameter setting: - Numeric keys.

39. Appendix: - Customized Relay Output Logic

If equipped, this instrument comes with an 8-relay control board. The start and end condition of these 8 relays can be programmed individually in order to create the preferred customized relay output logic.

By defining the start and stop timing / condition of the above-mentioned customized relay output logic, operation cycle logic is then created to handle the designed control application / requirements.

39.1 Customized Relay Output Logic Settings Procedures

1. Go to F25 and press **[Func]** until **Custom** appears on LED3 then press **[Print/M+]** to confirm and continue with relay output setting procedures.
2. Instrument displays **r1 S.** (meaning = Relay 1 Start parameter) on LED2 and the start parameter on LED3.
3. Select one start parameter listed on below paragraph **39.7** then press **[Print/M+]** to save and continue.
4. Instrument displays **r1 E.** (meaning = Relay 1 End parameter) on LED2 and the end parameter on LED3.
5. Select one end parameter listed on below paragraph **39.8** then press **[Print/M+]** to save and continue.
6. Repeat above point **4** and **5** for all other relay numbers.
7. Instrument displays **Start** (meaning = Cycle Start condition) on LED2 and the Cycle Start parameter on LED3.
8. Select one parameter listed on below paragraph **39.7** then press **[Print/M+]** to save and continue.
9. Instrument displays **Stop** (meaning = Cycle Stop condition) on LED2 and the Cycle Stop parameter on LED3.
10. Select one end parameter listed on below paragraph **39.8** then press **[Print/M+]** to save and continue.
11. Instrument display **Finish** (meaning = relay status when a cycle is completed) on LED2 and the finish parameter on LED3.
12. Select one finish parameter listed on paragraph **39.9** then press **[Print/M+]** to save and return to F25.
13. At this point, operation cycle logic is created. Press **[Zero]** to return to operation mode.

39.2 Create Set Point Table & Save to PLU

If any set points are included inside the customized relay output logic. A set point table has to be created.

1. Press **[Check]** to continue with set point value setting.
2. Instrument displays **SP** on LED2 and the Set Point (SP) Weight Nature parameter on LED3.
3. Select one weight nature parameter listed on paragraph **39.10** then press **[Print/M+]** to confirm and continue.
4. Instrument displays **SPx (x = SP number)** on LED2 and weight value on LED3.
5. Enter value through numeric keys then press **[Print/M+]** to continue.

Note: -

- a. If SP1 ~ SP8 is selected as Relay End parameter (step #4 of **39.1**), instrument will then asked for delay time.
 - b. If it is the case, input delay time (0 ~ 99 second) when prompted. 0 means no delay time.
 - c. Delay time is the time interval after a certain set point value is reached and before the next relay starts action. It is usually used to determine the actual weight which has been filled into/removed from a container.
6. Repeat above point **5** for all other SP numbers.
 7. Instrument displays **SPx (x = SP number)** on LED2 and weight value on LED3.
 8. Instrument displays **Save =?**. At this point: -
 - a. Press the preferred PLU position (numeric key 0 ~ 9), then press **[Print/M+]** to save to that PLU position and utilize this set point table immediately, or

- b. Press **[Print/M+]** to utilize this set point table immediately but without saving to PLU, or
- c. Press **[Zero]** to quit.

39.3 Test Runs

Once the customized relay output logic settings procedures, and **Set Point Table** has been created, transaction cycle is in operation status automatically.

As a safety measurement, it is highly recommended that test runs and perform adjustments before connecting external mechanism to the built-in relay board. Relay output status is shown by the Relay Output Indicators.

If necessary, go to F10 to set preferred filter strength and AD conversation speed. Refer to F10 on Internal Function Settings for details.

39.4 Start Running a Transaction Cycle

1. Press **[Func]** until Weigh appears on LED1 then press **[Print/M+]** to enter.
2. Remove all loads from weighing platform.
3. If zero weight cannot be obtained when unloaded, press **[Zero]**. After **[Zero]** is pressed, the **Zero Indicator** will appear.
4. Create the preferred Set Point Table. Set Point Table can be obtained through either below methods: -
 - a. Recall the last Set Point Table before powered off. The last Set Point Table used before powered off will be used again automatically, no operator action is required.
 - b. Recall from PLU. Refer to paragraph **39.5** for details.
 - c. Manually creation when needed. Refer to paragraph **39.2** for setting details.
5. At this point, transaction cycle will start automatically once the cycle start condition is fulfilled.

To manually abort a cycle, press **[CE/x10]**.

39.5 Recall Set Point Table from PLU

1. Press and hold **[Check]** for 2 seconds.
2. Instrument displays **CHK =?**. Press PLU position (numeric key 0 ~ 9) then press **[Print/M+]** to recall the set point table stored in that position.
3. Instrument displays Load and this set point table is now effective.

39.6 Clear Set Point Table from PLU

1. Enter zero value (by pressing **[CE/x10]**) to all set point in steps **5 ~ 7** on paragraph **39.2**.
2. Then press the preferred PLU position
3. Then press **[Print/M+]** to clear.

39.7 Relay Output Start Parameters & Definition Table

Parameter	Start & Restart Definition	Remarks
Off	Relay output = disable	<ul style="list-style-type: none"> • Output always disabled. • No End definition needed.
unit	When [Unit] key is pressed	
Net 0	Activated when weight is at net 0	Automatic start and restart when condition is met without governed by Start action.
Zero	Activated when weight is stable at	

	gross zero and/or net 0	
Prtare	Activated when Preset Tare is in effect	
Print	Activated when data has been printed	
Net	Activated when result is net weight	
n_zero	Activated when Weight > = Nero Zero	<ul style="list-style-type: none"> Governed by Start, Finished, Gross / Net conditions. Automatic restart after Start until cycle is completed.
Alarm	Activated when alarm is in effect	<p>Best End condition is n.alarm. If n.alarm is not selected as End condition, relay output: -</p> <ul style="list-style-type: none"> Always activated when condition is met. After activated, output maintains. Output cannot be manually disabled After activated, output maintains. even after cycle completed. To disable replay output after activated, resolve reasons causing alarm, then press [CE/x10].
SP1 ~ SP8	Activated when weight > = the value set forth for corresponding SP number	<p>Governed by: -</p> <ul style="list-style-type: none"> Start action, Finished condition, and Weight nature (Gross / Net)
Stable	Activated when weight is stable	<ul style="list-style-type: none"> Not governed by Start action. Automatic start and restart when condition is met without governed by Start action. Auto restart when weight drops below 4d: <ul style="list-style-type: none"> a. After [Clear/x10] is pressed, and b. After a cycle is completed.
Motion	Activated when weight is not stable	
Always	Output Always activated.	<p>No End parameter needed.</p> <p>Not governed by Start Action and Finished condition.</p>

Note: -

Each set point (SP) has its own weight value and is independent to other set points value. For example, SP1 value can be lower or equal to or higher than SP8 value.

39.8 Relay Output End Parameters & Definition Table

Parameter	Start & Restart Definition
Off	No condition
MR	End when [MR] key is pressed
n-zero	End when Weight > = Nero Zero

Net 0	End when weight is stable at net zero
Gros.0	End when weight is stable at gross zero
Zero	End when weight is stable at gross zero and/or net 0
Print	End when data has been printed
Gross	End when result is Gross weight
Not 0	End when weight is not = zero
n. alarm	End when no system alarm exists
SP1 ~ SP8	End when weight > = the value set forth for corresponding SP number
Stable	End when weight is stable
Motion	End when weight is not stable

Note A: - After activated, relay can only be disabled by:

- a. Pressing **[CE/x10]**,
- b. Finished condition is met.

39.9 Relay Status at Finished

Parameter	Definition
Maintn	Maintain all relay output condition.
Clear	Clear All relay output except Always.

39.10 Set Point (SP) Weight Nature Description Table

Parameter	Definition
Nt-GS	Set point value entered refers to the numeric value of the displayed weight without considering Net / Gross nature.
Net	Set point value entered is based on net Weight.

40. Appendix: - F25 Control Mode Fill (Dual Speed Filling)

This fill mode is used for single-speed or dual-speed filling operations. The dual-speed fill operation allows for both a fast and a slow fill mode.

- During a fast-fill, Relay 1 and Relay 2 are activated simultaneously.
- During a slow-fill or single-speed fill, only Relay 2 is activated.

40.1 Settings & Before Starting

1. Go to F25 and press **[Func]** until **Mode Fill** appears on LED3 then press **[Print/M+]** to confirm.
2. Press **[Zero]** to return to normal operation status.
3. At this point, SP1 and SP2 used before power off are now in effect. If different SP1 and SP2 values are needed, go through one of the below methods: -
 - a. Recall preferred SP1 and SP2 value from PLU (refer to below paragraph **40.3** for procedures), or
 - b. Set SP1 and SP2 manually (refer to below paragraph **40.2**) for procedures
4. If necessary, go to F10 to set preferred filter strength and AD conversation speed. Refer to F10 on Internal Function Settings for details. Conduct test runs and perform adjustments if necessary.
5. At this point, instrument is ready for dual speed filling operation.

40.2 Create & Save Set Point Values to PLU

1. Press **[Check]** and then enter SP1 through numeric keys then press **[Print/M+]**.
2. Then enter the SP2 through numeric keys then press and hold **[Check]** for 2 seconds.
3. Instrument displays **Save =?**. At this point: -
 - a. Press the preferred PLU position (numeric key 0 ~ 9), then press **[Print/M+]** to save to that PLU position and utilize these set point values immediately, or
 - b. Press **[Print/M+]** to utilize set point values immediately but without saving to PLU, or
 - c. Press **[Zero]** to quit.

40.3 Recall Set Point Values from PLU

1. Press and hold **[Check]** for 2 seconds.
2. Instrument displays **CHK =?**. Press PLU position (numeric key 0 ~ 9) then press **[Print/M+]** to recall the set point values stored in that position.
3. Instrument displays SP1 and SP2 on LED3 and these values are now effective.

40.4 Start Using Dual Speed Filling

1. Press **[Func]** to start. All loads on weighing platform will be tared off.
2. Relay 1 and Relay 2 both activated. Fast filling process starts.
3. When weight value filled reaches or exceeds SP1: -
 - Relay 1 dis-activated,
 - Relay 2 maintains.
4. Instrument switches to slow filling process.
5. When weight value filled reaches or exceeds SP2, Relay 2 dis-activated.

At this point, current filling cycle is completed.

Note: - To stop filling cycle and all relay output manually, press **[CE/x10]**.

Relay Output Assignment Table

Relay Number	Recommended Assignment
Relay 1	Valve with larger diameter.
Relay 2	Valve with smaller diameter.

Relay Output Actions Illustration

Fill Status	Relay Status
Fast Filling process	<ul style="list-style-type: none"> Relay 1 activated until SP1 is reached. Relay 2 activated until SP2 is reached.
Slow Fill (or Single-Speed Fill)	<ul style="list-style-type: none"> Relay 1 disabled. Relay 2 activated until SP2 is reached.
Filling Cycle Completed	<ul style="list-style-type: none"> Relay 1 disabled. Relay 2 disabled.

40.5 Check Result Light Bars

- Lo Light Bar = Filling process started and weight below SP2.
- Ok Light Bar = Filling process completed and weight \geq SP2.

40.6 Clear Set Points from PLU

- Enter zero value (by pressing **[CE/x10]**) for set points in steps 1 and 2 on paragraph **40.3**.
- Then press the preferred PLU position.
- Then press **[Print/M+]** to clear.

41. Appendix: - F25 Control Mode Batch (Batching up to 8 Ingredients)

This function is used to do batching up to 8 ingredients (Ingredient 1 ~ 8). Ingredients are batched together one after the other. The whole batch process starts by pressing **[Func]**, then start filling method of ingredient 2 ~ ingredient 8 can be individually programmed to either: -

- Automatic start, or
- Manual start by pressing **[Func]**.

41.1 Set Points Needed

Depends of total number of ingredients in a batching process, 8 set points are needed to operate this mode: -

- SP1 is weight value of ingredient 1 in the batch.
- SP2 is weight value of ingredient 2 in the batch.
- SP3 is weight value of ingredient 3 in the batch.
- SP4 is weight value of ingredient 4 in the batch.
- SP5 is weight value of ingredient 5 in the batch.
- SP6 is weight value of ingredient 6 in the batch.
- SP7 is weight value of ingredient 7 in the batch.
- SP8 is weight value of ingredient 8 in the batch.

41.2 Settings & Before Starting

1. Go to F25 and press **[Func]** until **Mode Batch** appears on LED3 then press **[Print/M+]** to confirm.
2. Press **[Zero]** to quite to normal operation status.
3. At this point, SP1 and SP2 used before power off are now in effective. If different SP1 and SP2 values are needed, go through one of the below methods: -
 - a. Recall preferred SP1 and SP2 value from PLU (refer to below paragraph **41.4** for procedures), or
 - b. Set SP1 and SP2 manually (refer to below paragraph **41.3**).

41.3 Create & Save Set Point Values and Start Method to PLU

1. Press **[Check]** and enter SP1 value through numeric keys then press **[Print/M+]** to save and continue with SP2 setting.
2. Enter SP2 value through numeric keys then press **[Print/M+]** to save and to continue with SP2 start method, 2 parameters are available: -
 - a. **Func** = start by pressing **[Func]**, or
 - b. **Auto** = Auto start
3. Press **[Print/M+]** to save and continue.
4. Repeat steps **2** and **3** for all other ingredient numbers until SP8 and start method.

Note: -

If an ingredient number is not need, enter zero value to its SP number. Instrument will skip this ingredient automatically during batching process. For example, if only ingredient 1 ~ 5 and ingredient 8 are used in a batching are used in a batching process, enter zero value for SP7.

5. Once the start method of SP8 has been selected, press and hold **[Check]** for 2 seconds. Instrument displays **Save =?**. At this point: -
 - a. Press the preferred PLU position (numeric key 0 ~ 9), then press **[Print/M+]** to save to that PLU position and utilize these set point values immediately, or
 - b. Press **[Print/M+]** to utilize set point values immediately but without saving to PLU, or
 - c. Press **[Zero]** to quit.
6. If necessary, go to F10 to set preferred Filter strength and AD conversation speed. Refer to F10 on Internal Function Settings for details. Conduct test runs and perform adjustments if necessary.

41.4 Recall Set Point Values and Strat Method from PLU

1. Press and hold **[Check]** for 2 seconds.
2. Instrument displays **CHK =?**. Press PLU position (numeric key 0 ~ 9) then press **[Print/M+]** to recall the set point values stored in that position.
3. Instrument displays Load LED3 and these values are now effective.

41.5 Start Batching Process

1. Press **[Func]** to start. All loads on weighing platform will be tared off. Relay 1 activated, ingredient 1 filling process starts when weight value filled reaches or exceeds SP1. At this point Relay 1 dis-activated. Weight returns to zero.
2. Depends on the setting in point 2 of **Create & Save Set Point Values and Start Method to PLU**: -
 - If **Auto** is selected: - Relay 2 starts automatically and
 - If **Func** is selected: - Ingredient 2 filling process starts by pressing **[Func]**.
3. Above point **2** and **3** will be repeated until all ingredients are filled. Instrument will skip all ingredient with zero set point value automatically during batching process.
4. At this point, current batching circle is completed.

Note: - To stop filling cycle and all relay output manually, press **[CE/x10]**.

41.6 Relay Output Assignment Table

Relay Number	Recommended Assignment
Relay 1	Mechanism controlling Ingredient 1
Relay 2	Mechanism controlling Ingredient 2
Relay 3	Mechanism controlling Ingredient 3
Relay 4	Mechanism controlling Ingredient 4
Relay 5	Mechanism controlling Ingredient 5
Relay 6	Mechanism controlling Ingredient 6
Relay 7	Mechanism controlling Ingredient 7
Relay 8	Mechanism controlling Ingredient 8

41.7 Relay Output Actions Illustration

Batching Status	Relay Status
Ingredient 1 in process	<ul style="list-style-type: none"> Relay 1 = activated, All other relays = disabled
Ingredient 2 in process	<ul style="list-style-type: none"> Relay 2 = activated All other relays = disabled
Ingredient 3 in process	<ul style="list-style-type: none"> Relay 3 = activated All other relays = disabled
Ingredient 4 in process	<ul style="list-style-type: none"> Relay 4 = activated All other relays = disabled
Ingredient 5 in process	<ul style="list-style-type: none"> Relay 5 = activated All other relays = disabled
Ingredient 6 in process	<ul style="list-style-type: none"> Relay 6 = activated All other relays = disabled
Ingredient 7 in process	<ul style="list-style-type: none"> Relay 7 = activated All other relays = disabled
Ingredient 8 in process	<ul style="list-style-type: none"> Relay 8 = activated All other relays = disabled

41.8 Check Result Light Bars

Batching Status	Light Bar indication
SP1 is in process	<ul style="list-style-type: none"> Lo Light Bar = Filling process started and weight < SP1 Ok Light Bar = Filling process completed and weight \geq SP1
SP2 is in process	<ul style="list-style-type: none"> Lo Light Bar = Filling process started and weight < SP2 Ok Light Bar = Filling process completed and weight \geq SP2
SP3 is in process	<ul style="list-style-type: none"> Lo Light Bar = Filling process started and weight < SP3 Ok Light Bar = Filling process completed and weight \geq SP3

SP4 is in process	<ul style="list-style-type: none"> Lo Light Bar = Filling process started and weight < SP4 Ok Light Bar = Filling process completed and weight \geq SP4
SP5 is in process	<ul style="list-style-type: none"> Lo Light Bar = Filling process started and weight < SP5 Ok Light Bar = Filling process completed and weight \geq SP5
SP6 is in process	<ul style="list-style-type: none"> Lo Light Bar = Filling process started and weight < SP6 Ok Light Bar = Filling process completed and weight \geq SP6
SP7 is in process	<ul style="list-style-type: none"> Lo Light Bar = Filling process started and weight < SP7 Ok Light Bar = Filling process completed and weight \geq SP7
SP8 is in process	<ul style="list-style-type: none"> Lo Light Bar = Filling process started and weight < SP8 Ok Light Bar = Filling process completed and weight \geq SP8

42. Appendix: - F25 Control Mode Discharge (Dual Speed Discharge)

This discharge mode is used for single-speed or dual-speed discharge (loss-in-weight) operations according to a predefined discharge value.

- During fast discharge, Relay 1 and Relay 2 are activated simultaneously.
- During slow discharge, only Relay 2 is activated.

42.1 Set Points Needed

2 set points are needed to operate this mode: -

- SP1 is used to set the amount to be discharged during fast discharge.
- SP2 is used to set the amount to be discharged during slow discharge.

Notes: -

- For dual speed discharge, set SP1 > SP2
- For single speed discharge, set SP1 to zero.

42.2 Settings & Before Starting

1. Go to F25 and press **[Func]** until Mode **Dischg** appears on LED3 then press **[Print/M+]** to confirm.
2. Press **[Zero]** to quite to normal operation status.
3. At this point, SP1 and SP2 used before power off are now in effective. If different SP1 and SP2 values are needed, go through one of the below methods: -
 - a. Recall preferred SP1 and SP2 value from PLU (refer to below paragraph **42.4** for procedures), or
 - b. Set SP1 and SP2 manually (refer to below paragraph **42.3**) for procedures.
4. If necessary, go to F10 to set preferred Filter strength and AD conversation speed. Refer to F10 on Internal Function Setting for details. Conduct test runs and perform adjustments if necessary.

42.3 Create & Save Set Point Values to PLU

1. Press **[Check]** and then enter SP1 through numeric keys then press **[Print/M+]**.
2. Then enter the SP2 through numeric keys then press and hold **[Check]** for 2 seconds.
3. Instrument displays **Save =?**. At this point: -
 - a. Press the preferred PLU position (numeric key 0 ~ 9), then press **[Print/M+]** to save to that PLU position and utilize these set point values immediately, or
 - b. Press **[Print/M+]** to utilize set point values immediately but without saving to PLU, or
 - c. Press **[Zero]** to quit.

42.4 Recall Set Point Values from PLU

1. Press and hold **[Check]** for 2 seconds.
2. Instrument displays **CHK =?**. Press PLU position (numeric key 0 ~ 9) then press **[Print/M+]** to recall the set point values stored in that position.
3. Instrument displays SP1 and SP2 on LED3 and these values are now effective.

42.5 Start Using Dual Speed Discharge

1. Press **[Func]** to start. Relay 1 and Relay 2 are both activated. Fast discharge process starts.
2. When weight value discharged reaches or exceeds SP1: -
 - Relay 1 dis-activated,
 - Relay 2 maintains.
3. Instrument switches to slow discharge process.
4. When weight value discharged reaches or exceeds SP2, Relay 2 dis-activated.

At this point, current discharge cycle is completed.

Note: - To stop discharge cycle and all relay output manually, press **[CE/x10]**.

42.6 Relay Output Assignment Table

Discharge Status	Recommended Assignment
Relay 1	Valve with larger diameter.
Relay 2	Valve with small diameter.

42.7 Relay Output Actions Illustration

Discharge Status	Relay Status
Fast discharge process	<ul style="list-style-type: none">• Relay 1 activated until SP1 is reached.• Relay 2 activated until SP2 is reached.
Slow discharge (or Single-Speed discharge)	<ul style="list-style-type: none">• Relay 1 disabled.• Relay 2 activated until SP2 is reached.
Discharge Cycle Completed	<ul style="list-style-type: none">• Relay 1 disabled.• Relay 2 disabled.

42.8 Check Result Light Bars

- Lo Light Bar = Discharge process started and weight value discharged is less than SP2.
- Ok Light Bar = Discharge process completed and weight value discharged \geq SP2.

42.9 Clear Set Points from PLU

1. Enter zero value (by pressing **[CE/x10]**) for set points in steps 1 and 2 on paragraph **42.3**.
2. Then press the preferred PLU position
3. Then press **[Print/M+]** to clear.

43. Appendix: - F25 Control Mode Both (Discharge & Refill)

The combines: -

- a. Manual discharging feature (e.g. from a liquid tank to smaller drum) according to a predefined discharge value, and at the same time,
- b. Manual refilling feature (e.g. refill a tank when content inside is not enough for fill up another drum).

Both discharging and refilling operation are conducted in single speed.

43.1 Set Points Needed

2 set points are needed to operate this mode: -

- SP1 is used to set the Lo limit of the tank at which refilling should take place.
- SP2 is used to set the amount of each discharging.

Note: - Condition $SP1 > SP2$

43.2 Settings & Before Starting

1. Go to F25 and press **[Func]** until Mode **Both** appears on LED3 then press **[Print/M+]** to confirm.
2. Press **[Zero]** to return to normal operation status.
3. At this point, SP1 and SP2 used before power off are now in effect. If different SP1 and SP2 values are needed, go through one of the below methods: -
 - a. Recall preferred SP1 and SP2 value from PLU (refer to below paragraph 43.4 for procedures), or
 - b. Set SP1 and SP2 manually (refer to below paragraph 43.3) for procedures.
4. Press **[Check]** and enter SP1 value through numeric keys then press **[Print/M+]** to continue.
5. Enter SP2 value through numeric keys then press **[Print/M+]** to save.
6. If necessary, go to F10 to set preferred Filter strength and AD conversation speed. Refer to F10 on Internal Function Setting for details. Conduct test runs and perform adjustments if necessary.

43.3 Create & Save Set Point Values to PLU

1. Press **[Check]** and then enter SP1 through numeric keys then press **[Print/M+]**.
2. Then enter the SP2 through numeric keys then press and hold **[Check]** for 2 seconds.
3. Instrument displays **Save =?**. At this point: -
 - a. Press the preferred PLU position (numeric key 0 ~ 9), then press **[Print/M+]** to save to that PLU position and utilize these set point values immediately, or
 - b. Press **[Print/M+]** to utilize set point values immediately but without saving to PLU, or
 - c. Press **[Zero]** to quit.

43.4 Recall Set Point Values from PLU

1. Press and hold **[Check]** for 2 seconds.
2. Instrument displays **CHK =?**. Press PLU position (numeric key 0 ~ 9) then press **[Print/M+]** to recall the set point values stored in that position.
3. Instrument displays SP1 and SP2 on LED3 and these values are now effective.

43.5 Start Discharging & Refilling Process

1. Depends on SP1 and current weight inside tank: -
 - a. If $SP1 \geq$ current weight inside tank, press **[Unit]** to start discharging process.
 - b. If $SP1 <$ current weight inside tank, press **[Func]** to start refilling process.
2. Instrument displays SP No. and target on LED2 and LED3: -

- SP1 = Refilling target. If it is the case, Relay 1 is activated.
- SP2 = Discharging target. If it is the case, Relay 2 is activated.

Note: - To stop all relay output manually, press **[CE/x10]**.

43.6 Relay Output Assignment Table

Relay No.	Recommended Assignment
Relay 1	Refilling mechanism
Relay 2	discharging mechanism

43.7 Relay Output Action Illustration

Status	Relay Status
During Refilling Process	Relay 1 activated until SP1 is reached or exceeded.
During Discharging Process	Relay 2 activated until SP2 has been discharged from tank.
When Refilling / Discharging Cycle Completed	<ul style="list-style-type: none"> • Relay 1 disabled. • Relay 2 disabled.

43.8 Functions during Operation & Parameters Setting

Key	Function Description
[ZERO]	<ul style="list-style-type: none"> • Before feeding process starts: - To set weight displayed to zero manually. • During feeding process: - No function. • During parameter setting: - Quit Setting.
[TARE]	<ul style="list-style-type: none"> • Before feeding process starts: - To tare off the weight of a container manually. • During feeding process: - No function.
[FUNC]	<ul style="list-style-type: none"> • During feeding process: - To start feeding / discharge process • During parameter setting: - Go next.
[CHECK]	To start parameter setting menu.
[CE/x10]	<ul style="list-style-type: none"> • During feeding process: - To stop feeding / discharge process. • During parameter setting: - To clear value entered.
[UNIT]	<ul style="list-style-type: none"> • During feeding process: - To start discharge process • During parameter setting: - Go previous.
[PRINT/M+]	During parameter setting: - Enter, save and go to next parameter.
[MR]	During parameter setting: - No function
[0 ~ 9]	<ul style="list-style-type: none"> • During feeding process: - No function. • During parameter setting: - Numeric keys.

43.9 Check Result Light Bars

Message / Status	Light Bar Action
LED2 Displays SP1	Lo Light Bar = Tank weight value < SP1
LED2 Displays Target	Lo Light Bar = Discharged value < SP2
When Refill / Discharge Completed	Ok Light Bar

43.10 Clear Set Points from PLU

1. Enter zero value (by pressing **[CE/x10]**) for set points in steps 1 and 2 on paragraph **43.3**.
2. Then press the preferred PLU position
3. Then press **[Print/M+]** to clear.



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