DIGITAL HIGH PRECISION WEIGHING SCALES

USER INSTRUCTIONS

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BEFORE USING THE SCALE

To enable you to use this scale correctly, we suggest that you read this manual carefully.

- 1. Do not use scale in areas with excessive water and don't spray the scale or indicator with water when cleaning. Remove all water from the scale and indicator with a clean dry cloth.
- 2. The load placed on the platform must not exceed the maximum weighing capacity of the scale.
- 3. Keep the scale away from high temperatures and damp conditions.
- 4. If the scale is not going to be used for some time, please clean it and store it in a plastic bag in dry conditions. A desiccant sachet may be included to prevent moisture build up.
- 5. If the scale is not going to be used for some time, the internal rechargeable battery should be recharged every three months.
- 6. Before using the scale after a long period of storage, please ensure that the internal battery is fully charged. NOTE: Care should be taken not to leave the internal battery on charge for too long, as this may decrease the life of battery.

PREPARING TO USE THE SCALE

- 1. Locate the scale on a firm level surface free from vibrations for accurate weight readings.
- 2. Adjust the four levelling feet to set the scale platform level using the spirit level bubble located on the scale platform frame.
- 3. Avoid operating the scale in direct sunlight or drafts of any kind.
- 4. Remove any weight that might be on the scale platform before the scale is switched on.
- 5. Once the scale has been switched on, it will go through a LCD display test and then re-zero to be ready for use.
- 6. The scale requires 15~20 minutes warm up before operation to ensure best accuracy.
- 7. Please note when the symbol is shown on the display, the internal battery needs to be recharged.
- 8. All goods weighed should be placed in the centre of the platform for accurate weighing. The footprint of the goods being weighed should not overhang the edges of the platform.

INTRODUCTION

1. FEATURES

- 1. **Dual-weighing units:** Kilogram (kg) and pound (lb).
- Multi-function operation: Full range tare; Pre-tare; Hold function; Net / Gross weight display; Simple counting; Preset weight value and quantity value; Adjustable noise filter setting from 01 ~ 15 (≥15,000 division configuration only); Check-weighing configuration.

3. User-friendly design:

- ♦ Auto calibration
- ♦ AC / DC power supply
- ◆ Large LCD display with built-in backlight
- Auto power-off design to ensure the performance stability
- ♦ Double over-load protection
- 4. **Variable calibration settings** depending on the different calibration division:
 - Standard division (under 10,000 internal resolution): Capacity and weight calibrations are available for accurate weighing.
 - High precision division (over 10,000 to 150,000 internal resolution): Linearity, capacity, and weight calibrations are available for accurate weighing.

5. Options

- ♦ RS-232 interface
- Relay output
- 6. High performance in A/D converter (weighing indicators)
 - Input sensitivity: 0.3 μ V/D
 - Sample speed up to 16 times / second
 - Non-linearity: 0.01 % of full scale
 - ♦ Input zero range: -1 mv ~ +5 mv
 - ♦ Input signal range: -1 mv ~ +14 mv
 - ♦ Load cell excitation: 5V DC ± 5% 100mA
 - Load cell drive capacity: up to 4 350 Ω load cells

2. SPECIFICATIONS

The available capacities for selection are different and depend on various models:

Capacity	Division	
3 kg (6 lb)	0.2 g (0.0005 lb)	
6 kg (12 lb)	0.2 g (0.0005 lb)	
7.5 kg (15 lb)	0.5 g (0.001 lb)	
15 kg (30 lb)	1 g (0.002 lb)	
30 kg (60 lb)	2 g (0.005 lb)	
75 kg (60 lb)	5 g (0.01 lb)	
150 kg (150 lb)	10 g (0.02 lb)	
300 kg (600 lb)	20 g (0.05 lb)	
600 kg (1200 lb)	50 g (0.1 lb)	
Operating Temperature: 0°C ~ 40°C (32°F ~ 104°F) OIML: -10°C ~ 40°C (14°F ~ 104°F)		
Power Source: AC 110V/220V (±10%) + DC 6V/4.5AH Rechargeable Battery		
Display: LCD, 6 digits, 25 mm (Height), EL backlight		

3. POWER CONSUMPTION

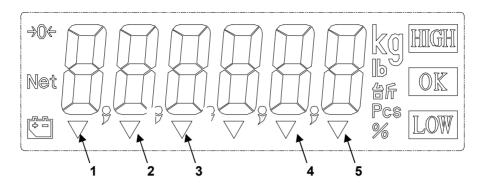
- The power consumption is around DC 20 mA (system + load cell), the rechargeable battery can be used up to 200 hours.
- 2. The power consumption is around DC 67 mA (system + load cell + backlight), the rechargeable battery can be used for 60 hours approximately.
- 3. The power consumption is around DC 71 mA (system + load cell + backlight + RS-232), the rechargeable battery can only be used for 56 hours approximately.

4. LOW BATTERY WARNING

Please note when the symbol is shown on the display, the internal battery needs to be recharged.

The scale will power off automatically without recharging after the low battery symbol shows upon for 20 to 30 hours (3 to 5 hours if the backlight is active) on the display. As a recommendation, the scale must be fully recharged before operating the scale again.

LCD DISPLAY SYMBOLS



HIGH: Preset High Limit Weight Value

OK: The range between Low & High Limit Weight Value

LOW: Preset Low Limit Weight Value

kg: "kg" unit

Ib : "lb" unit

Pcs : "COUNTING" mode indicating the number of pieces

à **0 i** "ZERO" indication and platform stable confirmation

Net: "Net Weight "indication

: "Low Battery" indication

61 : (STABLE) "Stable" indication

62 : (PT) "Pre-set Tare" mode

63 : (M+) "Accumulation" mode

64 : ("Sample Too Small" indication

65 : (Piece Weight Too Small" indication

KEYBOARD FUNCTION

1. UNITS : Units Key to choose the desired unit weight (kg or lb).

2. Preset High & Low Limit value.

4. \bigcirc \bigcirc \bigcirc \Rightarrow Print Key to print the total data ; \bigcirc \Rightarrow Confirmation Key.

5. Sample Key to set the sample quantity.

6. M+ : Accumulation Key to add the displayed value into memory.

7. Re-call accumulated or preset high & low limit values or preset tare value.

8. CE : Clear Key to delete the existing accumulated values.

9. Press this key to enter the counting mode.

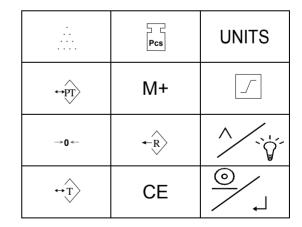
10. → PT : Preset Tare Key.

11. $\rightarrow 0 \leftarrow$: Zero Key to re-zero the scale.

12. : Tare Key to deduct the container weight.

KEYBOARD SYMBOLS:

COUNT	SMPL	UNITS
PRE-TATR	M+	PST
ZERO	RE-CALL	^ BL
TARE	CE	PRINT



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OPERATION

1. DISPLAY BACKLIGHT

Press th	ne ^/ `ਊ´	key to choose the desired display backlight mode:
ЬL.	886	$ullet$ \Rightarrow "Auto Backlight" mode. When the weight is over 10 divisions or any
		key is pressed, the display backlight will be switched on. When the weight returns to zero or the weight on platform is less than 10 divisions, the display backlight will switch off after 5 seconds.
	90_	\Rightarrow Display backlight is on all the time.
ЪL.	OFF	⇒ Display backlight is off.

2. ZERO

Press the $\rightarrow 0 \leftarrow$ key to re-zero the display with no load on the weigh pan. When zero is set, the (\grave{a} 0 $\mathrel{\hbox{\it G}}$) symbol will be displayed.

3. WEIGHING MODE

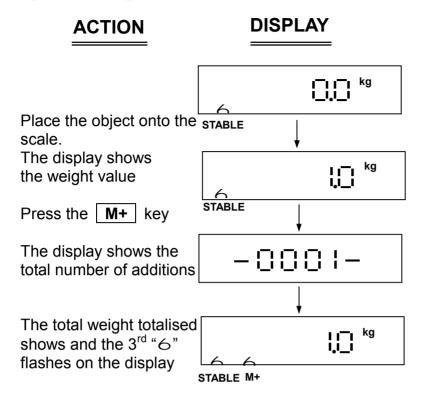
(1). Units Selection

- 1. Press the **UNITS** key in the weighing mode to choose the desired weighing unit and the display will show the "kg" or "lb" symbol on the top right of the LCD display.
- 2. The unit status will be memorized when turning the machine off.

(2). Totalising

- 1. The scale allows the next totalising operation, even when the weight value does not return back to zero. The M+ key is functional, when the weight value changes by more than 10 d. The scale will store the totalised weight value after the weight is stable.
- 2. The scale can totalise positive or negative weight but not both at the same time. The totalised weight store must be reset to zero before it is possible to select positive or negative totalising mode.

I. Weight Totalising



▼ The totalising function can be used up to a maximum of 9999 times before it must be reset.

The totalising display is limited to 6 digits maximum.

II. Recall Totalised Weight Values

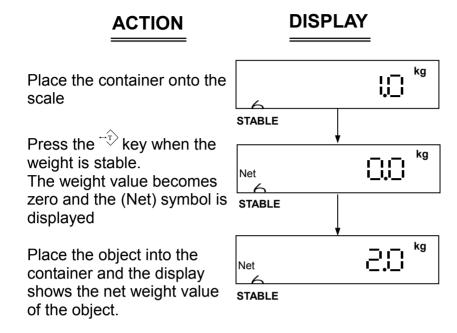
- 1. Press the key to display the total number of additions and the totalised weight value. The 3rd "6" symbol located above (M+) icon will flash on the display. The scale will return to the weighing mode after 3 seconds.
- ▼ The scale will not display the negative sign "-" for negative totalised weight values when
 recalling an a totalised weight value, but the negative sign "-" will be printed out (transmitted
 serially) for each negative weight and negative totalised weight.

III. Clear Totalised Weight Values

- 1. Press the key followed by pressing the ce key to clear the totalised weight values.
- 2. All totals will be lost in the following three circumstances:
 - The mode is changed from weighing to counting or vice versa.
 - The scale is switched off.
 - The weight unit is changed.

(3). Deduction of the Container Weight

I. The weight of the container is unknown (Tare)



II. Recall the semi-auto tare value

III. Clear the semi-auto tare

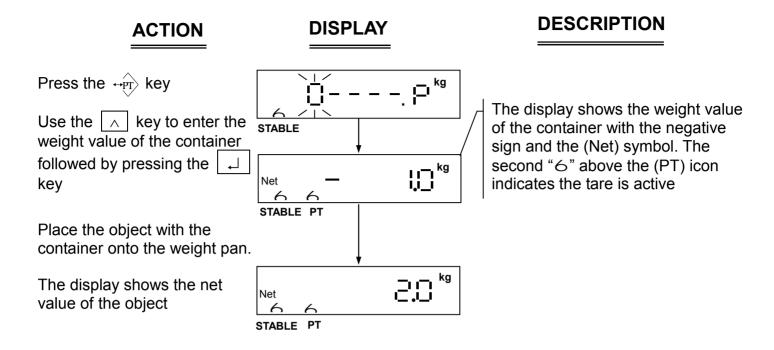
When the container is removed from the scale, the display shows the container weight value with a negative sign. Press the key to reset the scale to zero, and the (Net) symbol will switch off.

NOTE:

- ✓ Multiple tare operation ⇒ Users can continuously increase or decrease the tare value by pressing the
 →

 key.
- ▼ The total tare value (tare value + pre-set tare value) can equal the full capacity of the scale.

IV. The weight of the container is known (Pre-set tare)



V. Recall the pre-set tare value

Press the key followed by pressing the key ⇒ The display shows the pre-set tare value.

VI. Clear the pre-set tare value

Press the key followed by pressing the key, then press the CE key to clear the pre-set tare value. The scale resets back to zero, and the (Net) symbol and the second "6" icon (PT) will switch off.

NOTE:

- ✔ In Tare mode, the Preset tare function is disabled.
- ▼ The scales with two weighing ranges can NOT pre-set the tare value larger than the first weighing range. For example: a 30kg scale is set by two weighing ranges. The first range is 0 to 15kg, and the second range is 15 to 30kg. The pre-set tare value can not be larger than 15kg.

(4). Check Weighing

Press the _____ key to enter the check weighing function. Press the _____ key to return back to the weighing mode.

I. Pre-set the "Low limit value", "High limit value", and "the buzzer" operation

Press the ^/ \ key to enter the value required and step to the next digit by pressing the // key.

DISPLAY ACTION Press the kev to select the check weighing function Set the "Low limit value" STABLE Press the $| \land |$ key to enter the 00000 Low limit value. Press the key to confirm the setting **STABLE** Set the "High limit value" STABLE Press the $| \land |$ key to enter the 00002,D^{kg} High limit value. Press the key to confirm the setting STABLE Set the "buzzer" operation STABLE Press the $| \land |$ key to set the buzzer operation. Press the key to confirm the setting **STABLE** The scale returns to the weighing mode. STABLE

key = Upward key (0~9 digit entry)

(move the cursor one step to the right)

DESCRIPTION

Buzzer Setting

 $A \Rightarrow$

- **0** = When the weight is stable the buzzer sounds and the High, OK or Low icon is displayed.
- **1** =. The High, OK or Low icon is displayed irrespective of the stability of the weight. The buzzer sounds only when the weight is stable.
- **2** = The buzzer sounds and the High, OK or Low icon is displayed irrespective of the stability of the weight.

 $\mathsf{B} \Rightarrow$

- **0** = The buzzer does not sound.
- **1** = The buzzer sounds at the OK status.
- **2** = The buzzer sounds when the weight of the object is lower or equal to the lower limit value, or higher than the upper limit value.

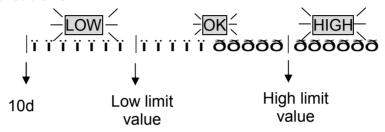
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II. Pre-set the Low limit value only

After completing the Low limit value setting, the display shows key to complete the setting, and the display shows stable

▼ When users only pre-set the Low limit value, the buzzer setting is fixed at:

III. High/OK/Low indications



IV. Recall the check weighing setting

- 1. Press the key followed by pressing the key to recall the Low limit value.
- 2. Then press the key again to recall the High limit value.

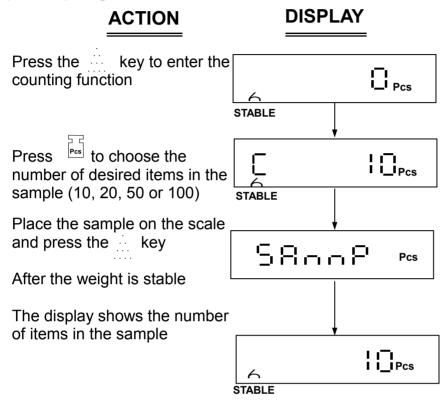
V. Clear the check weighing settings

- 1. Press the key followed by pressing the key, and then press the key to clear the Low limit value.
- 2. Press the **CE** key again to clear the High limit value and the buzzer setting.

4. COUNTING FUNCTION

Press the key to enter the counting function. Press the **UNITS** key to return back to the weighing mode.

(1). Sampling



NOTE:

- ▼ The larger the sample size, the more accurate the unit weight. (The minimum sample weight = 20d)
- ▼ A sample size of 10 pieces gives a typical count accuracy of 95%.
- ▼ A sample size of 50 pieces gives a typical count accuracy of 98%.

SAMPLE TOO SMALL ($\stackrel{\cdot \cdot \cdot +}{\dots \cdot \cdot}$) \Rightarrow Sample is less than 20 divisions.

UNIT WEIGHT TOO SMALL (\rightarrow Unit weight is less than 1/5 of a division.

Under such conditions, the scale can still work, but may result in lower count accuracy.

(2). Totalising

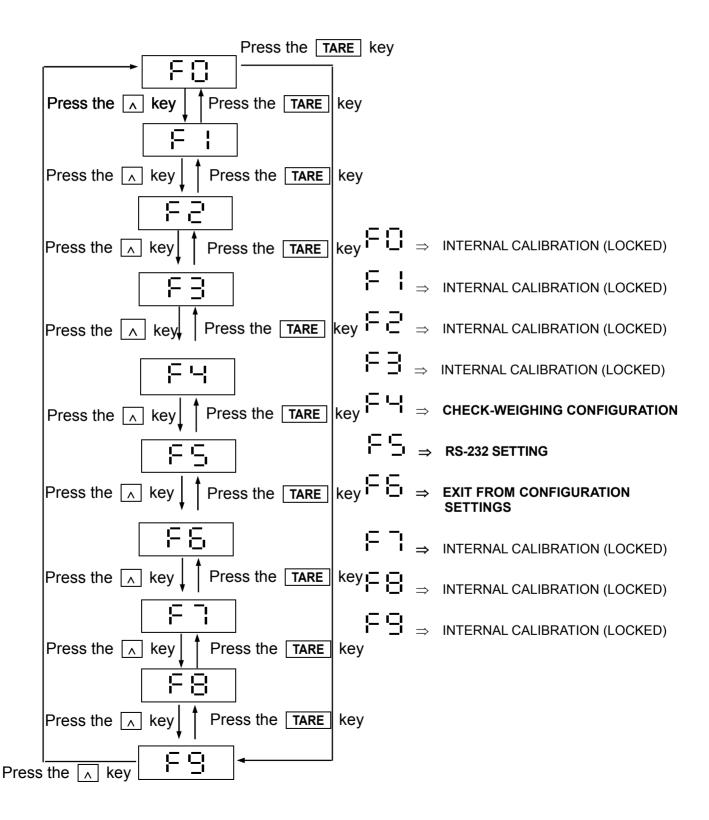
Refer to the operation of totalising in the weighing function on page 9.

(3). Check Weighing

Refer to the operation of check weighing function on page 13.

CONFIGURATION SETTINGS

Switch on the scale. While the scale is counting backward to zero, press and hold the $\longrightarrow 0 \leftarrow$ key until the display shows the software program version number: " $\square \square \square \square \square$ ". Release the $\longrightarrow 0 \leftarrow$ key, the scale enters the configuration setting mode. $\square \square$ is displayed.



1. CHECK-WEIGHING CONFIGURATION ☐ ☐

♦ F8 (Hold) affects access to F4. If F8 is set, access to F4 is denied.

Press the $^{^{\prime}}$ or $^{^{\prime}}$ key to select the **F4** function \Rightarrow the display shows $^{^{\prime}}$

DISPLAY **ACTION** Press the | \(\price \) key to enter the check weighing configuration Press the | \(\) key to enter the STABLE low limit value. Press the │ → key to confirm the setting 0000 **STABLE** Set the "High limit value" Press | \(\) | key to enter the high limit value. Press the key to confirm the setting 00002.0^{kg} **STABLE** Set the "buzzer" operation kg Press the $| \land |$ key to set the STABLE confirm the setting **STABLE** The scale returns to the weighing mode. **F 4**

DESCRIPTION

Press the key

for 5 times to clear
the configuration
settings

STABLE

Press the key

Buzzer Setting

- A ⇒ **0** = When the weight is stable the buzzer sounds and the High, OK or Low icon is displayed.
 - **1** =. The High, OK or Low icon is displayed irrespective of the stability of the weight. The buzzer sounds only when the weight is stable.
 - 2 = The buzzer sounds and the High, OK or Low icon is displayed irrespective of the stability of the weight.
- $B \Rightarrow 0$ = The buzzer does not sound.
 - **1** = The buzzer sounds at the OK status.
 - **2** = The buzzer sounds when the weight of the object is lower or equal to the low limit value, or higher than the high limit value.

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2. RS-232 SETTING F 5

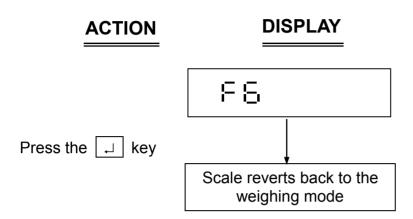
- ♦ J1 and J3 on the RS-232 interface are connected together (short), when the RS-232 interface is connected to a computer.
- ◆ J2 and J4 on the RS-232 interface arte connected together (short), when the RS-232 interface is connected to a printer.

Press the | ^/ ` \overrightarrow{T} DESCRIPTION **DISPLAY ACTION** Press the | → | key 두 독 $0 \Rightarrow \text{No transmission}$ - - $1 \Rightarrow$ Stable transmission იიმ Transmission mode 2 ⇒ Continuous transmission Press the | \(\) key to set | იი2 transmit (simple mode) the transmission mode 닉 Then press the | → | key - - - - - - key to to confirm the setting transmit (complete mode) - - - 5 \Rightarrow Stable transmission 2488 Baud rate default setting (totalising mode). The format is as same as $C \cap P_{3}$ Press the | \(\) key to set the baud rate (1200, 2400, $\mathbf{G} = \mathbf{G} \cdot \mathbf{G} \cdot \mathbf{G}$ 6 \Rightarrow EZ-2 printer mode 4800 or 9600) 9800 The format is as same as Then press the | → | key to confirm the setting -- $\mathbf{7} \Rightarrow \mathsf{EZ-2}$ printer mode. $F \subseteq$ Configuration complete Press the key to transmit same as - - 1 1 1 & 2.

v When choosing "EZ-2 printer mode", the baud rate should be set to 9600 Baud

3. EXIT CONFIGURATION SETTINGS $\vdash \exists$

Press the $^{^{^{\prime}}}$ or $^{^{\prime}}$ key to select the **F6** function \Rightarrow the display shows $^{^{\prime}}$



RS-232 AND RELAY OUTPUT

1. RS-232 OR SERIAL PRINTER OUTPUT

(1) RS-232 (25 Pin 'D' type) Pin Description

J1 - J3 SHORT; J2 - J4 OPEN (default setting)
 Pin 2 ⇒ RXD
 Pin 3 ⇒ TXD
 Pin 7 ⇒ GND

 $^{\cdot}$ J2 - J4 SHORT ; J1 - J2 OPEN Pin 2 \Rightarrow TXD Pin 3 \Rightarrow RXD Pin 7 \Rightarrow GND

 Please refer to F5 function settings for transmission mode, baud rate setting and data format.

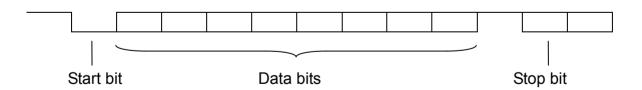
(2) RS-232 Interface Format

I . Mode: EIA-RS232 C's

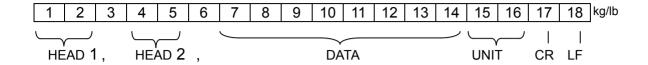
II . Format :

1. Baud rate: 1200, 2400, 4800 or 9600

Data bits: 8 BITS
 Parity bit: None
 Stop bits: 1 BIT
 Code: ASCII



(3) Data Format



	HEAD 1 (2 BYTES)			HEAD 2 (2 BYTES)		
OL	-	Overload, Under load	TR	-	TARE Mode	
ST	-	Display is Stable	NT	-	NET Mode	
US	-	Display is Unstable	GS	-	GROSS Mode	

DATA (8 or 9 BYTES)

2E (HEX) = "." (DECIMAL POINT)

UNIT (2, 3 or 4 BYTES)

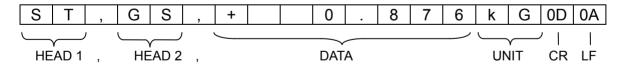
kg = 6B (HEX) ; 67 (HEX) lb = 6C (HEX) ; 62 (HEX)

tl.T = 74 (HEX); 6C (HEX); 2E (HEX); 54 (HEX)

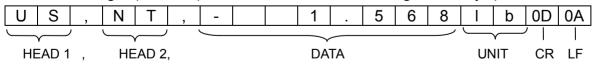
hkg = 68 (HEX) ; 6B (HEX) ; 67 (HEX)

Transmission example:

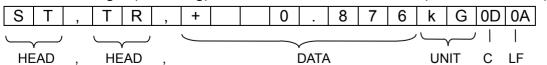
1. The gross weight (+0.876kg) shows as below, after stable: (in the tare mode)



2. The net weight (-1.568lb) shows as below without weight stability: (Not in the tare mode)



3. The net weight (+0.876kg) shows as below, after stable: (in the tare mode)



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Press the 🔲 key to transmit (simple mode) – – 🗀 🗒

S/N	WT/UNIT (kg / lb)	
0001	1.0000	E Press the 🔟 key or the M+ key
0002	1.0000	E Press the ☐ key or the ☐ M+☐ key
0003	1.0000	E Press the key or the key
0004	1.0000	E Press the 🔟 key or the M+ key
0005	1.0000	E Press the [] key or the [M+] key
0005	5.0000	E Press the 🔟 key for 2 times to printout the total

Stable transmission (totalising mode)

S/N	WT/UNIT (kg / lb)
0001	1.0000	E scale stable, transmitting
0002	1.0000	E scale stable, transmitting
0003	1.0000	E scale stable, transmitting
0004	1.0000	E scale stable, transmitting
0005	1.0000	E scale stable, transmitting
0005	5.0000	E Press the key for 2 times to printout the total

EZ-2 printer mode, press the key to transmit (Baud rate must be set at 9600)

Only prints out the "weight value". The proportion of the printed typeface \Rightarrow Height : Width = 3:2

+100.0 kg

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TICKET NO .0001 G 1.000kg T 0.000kg PT 0.000kg N 1.000kg	E	Press the key or the hey
(Blank line x 3)		
TICKET NO .0002 G 1.000kg T 0.000kg PT 0.000kg N 1.000kg	E	Press the key or the M+ key
(Blank line x 3)		
TICKET NO .0003 G 1.000kg T 0.000kg PT 0.000kg N 1.000kg	E	Press the key or the M+ key
(Blank line x 3)		
TOTAL NUMBER OF TICKETS 0003 TOTAL NET 3.000 kg	E	Press the
(Blank line x 3)		

<Remarks>: G = GROSS T = TARE PT = PRE-TARE N = NET

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2. RELAY OUTPUT

(1) Relay Output

Relay's function acts as signal output in the check-weighing mode. When an object's weight value reaches one of the setting points (HI, OK, LOW), the relay outputs a signal through PIN 1, PIN2, or PIN 3. To set the check-weighing configuration by pressing the key (in TW & AW models) or enter F4 (please refer to page 12 or 16 for operations).

(2) Relay Pin Description

 $PIN 1 \Rightarrow OK$ output

 $PIN 2 \Rightarrow High output$

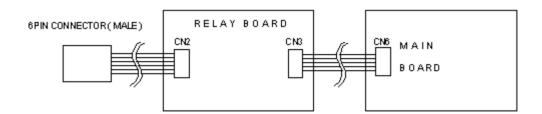
 $PIN 3 \Rightarrow Low output$

PIN 4 ⇒ VDD

PIN 5 ⇒ GND

PIN 6 ⇒ COMMON

(3) Connection Illustration

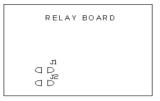


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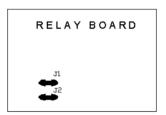
(4) Power Source Illustration

The relay circuit board can be supplied either by the external AC power or internal DC power.

Relay powered by external AC power
 PIN4 and PIN5 are connected with AC power source; J1 and J2 OPEN



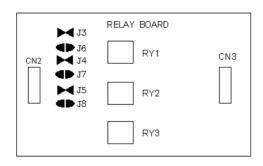
, Relay powered by internal DC power No power source input to PIN4 and PIN5; J1 and J2 SHORT

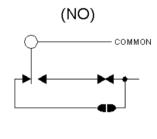


(5) Connection Setting

OK, High, Low can be set at ${\bf NO}$ (normal open status) or ${\bf NC}$ (normal close status) respectively.

OK · High · Low at NO (normal open status) ⇒ default setting





, OK · High · Low at **NC**(normal close status)
Please use a knife to cut the J3, J4 and J5 not connect (open) and solder the J6, J7 and J8 connected.

