EXCELL PRECISION CO.,LTD.

X Series Weighing Scale
User Manual

V22. 1222

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Check Firmware Version

Turn on scale and hold ZERO key during countdown. Display firmware version 02036. Turn off scale and turn on scale and hold TARE key during countdown. Display maintenance number XXX, which is ranged from 0~999. Turn off and turn on scale to return to weighing mode.

Thank for your purchasing of our EXCELL Weighing Scale. To guide you to use our product correctly, please read this User Manual carefully to extend the life of machine and to avoid error.

Preparing to Use the Scale

1. Locate the scale on a firm level surface free from vibrations for accurate weight readings. Adjust the four leveling feet to centre the leveling bubble on the scale.
2. Avoid hot sunshine directly on the scale or near the exhaust port of ventilating system.
3. Please use a separate power source plug to avoid the disturbance of other electric appliances.
4. There should be no weight on the scale when power is turned on.
5. Commodity should be placed at the centre of platter when being weighed, and its size should not exceed the dimension of the platter.
6. Please warm the scale 15 ~ 20 minutes before using.
7. Please note that when  symbol appears on the screen, the scale needs to be charged.
8. Any suggestion is warmly welcome.

Precautions for Use

(1) Please operate or charge the scale in an open area. Do not squeeze the power cord to avoid wire on fire.
(2) Please keep scale in a cool and dry place. Do not store under high temperatures.
(3) Please keep the scale clean and free from insect infestation.
(4) Avoid impacting with other items or overloaded with excessively heavy weights (The load must not exceed the maximum capacity of the scale).
(5) If the scale is not going to be used for some time, please clean it and store it in a plastic bag in dry condition. A desiccant sachet may be included to prevent moisture from building up.
(6) Operating temperature: -10℃ ~ + 40℃
(7) It is recommended to be used indoors and in environments with a height of less than 2000m
(8) If the product is used in a manner not specified by the manufacturer, product warranty may be limited.

Safety Instructions for Lithium Batteries

1. Please pay attention to the storage temperature of the product. Do not place it in a high temperature environment. The ambient temperature should be less than 50C.
2. After installing the battery, if no display when power is turned on, please check whether the battery polarity is reversed. The polarity must be installed correctly to avoid battery power wasted away.
3. When the LED flashes in the charging state, it means there are the following abnormal states, please check:

   a) Battery is installed but the contact is poor, please check whether the battery is installed properly.

   b) Please check whether the polarity of the battery is reversed. When the polarity is reversed, the LED will flash after charging for a period of time.

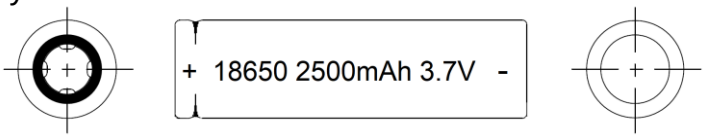
   c) When battery is removed and the AC power cord is still plugged in, the LED will also flash. When plugged in without the battery installed, there will be a slight frequency conversion sound, which is normal and does not affect the use of the function.

4. When  symbol appears, scale needs to be charged.

   a) When charging, the red LED will light up. Please refer to 1-4 for estimated charging hours.

   b) When the battery is fully charged, blue LED will light up.

   c) If scale is fully charged, after plugging in, the blue light will turn on after about 5~10 minutes of voltage detection. The LED charging indicator is to indicate the status of the charging process and whether the charging is working properly. To check the battery level, please unplug the AC cable first and turn on scale, and then check the battery symbol  displayed in the lower left corner of the display. The number of bars under the battery symbol indicates battery level. 0 bar means <= 10% when the low power warning symbol () flashes to indicate that scale needs to be charged.
5. Please operate or charge the scale in an open area. Do not squeeze the power cord to avoid wire on fire. While charging, the temperature of battery should below 45℃.
6. Our product uses a single-cell cylindrical 18650-3.7V lithium-ion battery. Battery's should be 3.6~3.7V and capacity is not restricted.



7. If the appearance of the battery is deformed, damaged, etc., please do not install it for the safety of use.

Chapter 1 Introduction

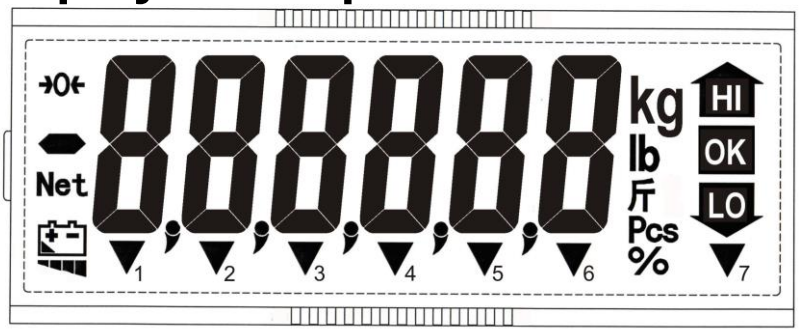
1-1 Production Introduction

1. High performance A/D converter

- 0.3 uv/D high sensitivity
- Sampling speed 10 times/second
- non-linear scale 0.01% full scale
- zero point adjustable range -2mV~ +5mV
- use range -4mV ~ +30mV
- load cell stimulate power source 5V DC ±2% 100mA

2. According to different resolution to do linearity calibration
   - ➢ Ordinary resolution models (below 10000)
     Do specification calibration first then do weight calibration
   - ➢ High resolution models (10000~30000)
     Do linearity calibration first→ specification calibration → weight calibration at last
3. LCD display with LED backlight, powered by battery or plug-in mains, automatic power-off function to ensure the stability of the scale. When battery voltage is lower than the system voltage, scale is automatically powered off to ensure the accuracy and stability of the scale.
4. Check Weighing function for high limit and low limit and OK range.
5. 4 HOLD functions including animal scale HOLD
6. Depending on actual space, a RS232 card and/or a relay card can be installed.

1-2 Display Description



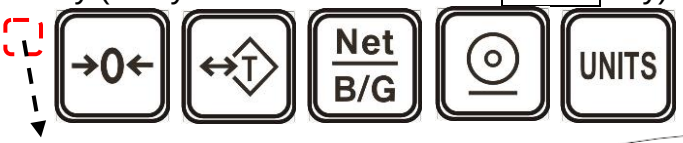
HI	:	High limit value
OK	:	OK range within HI and LO limits
LO	:	Low limit value
kg	:	“kg” unit
lb	:	“lb” unit
Pcs	:	Counting mode
%	:	Percent indication
→0←	:	“Zero” indication
Net	:	“Net weight” indication
	:	“Low battery power” indication

▼1		“Stable” indication
▼2	:	“Pre-tare mode” indication
▼3	:	(M+) “Accumulation mode” indication
▼5	:	( ) “Samples insufficient” indication
▼6	:	( ) “Unit weight insufficient” indication
▼7	:	“Viss” unit (Burma unit)

For Dual Range Models, the indicator 5 and 6 will be defined as below:
▼6 is Range 1 ▼5 is Range 2

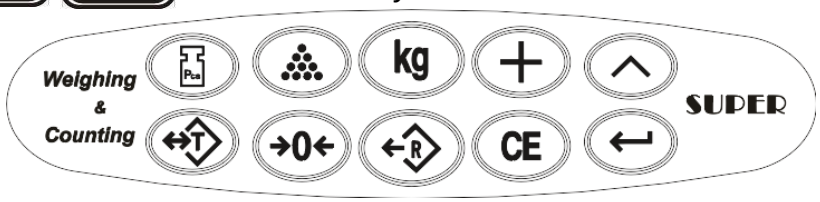
1-3 Keypad Functions Description

5 key (4 key model does not have UNITS key)

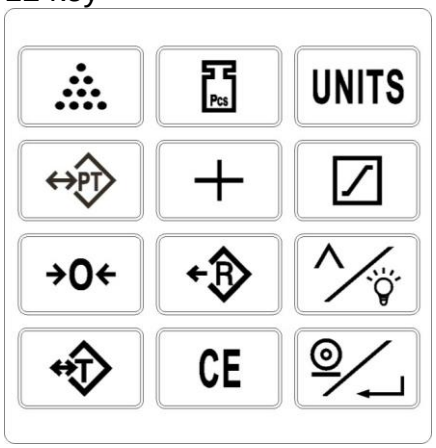


Hidden backlight key at upper left corner

10 key



12 key



Key description	4/5 key	10 key	12 key	Other variation
Net/Gross key	Net B/G			NET/GROSS
Loop select from the preset units	UNITS	UNITS	UNITS	lb/kg
Preset weight and quantity for weight check or quantity check				TGT SET
Accumulate weight or quantity		+	M+	
Tare to deduct the container weight	T	T	T	TARE
Set preset tare			PT	
Recall the totalization value, preset value and pre-tare value		R	R	RE-CALL
Clear the totalization value, preset value and pre-tare value.		CE	CE	
Zero the scale.	→0←	→0←	→0←	ZERO
Press this key to input the numbers (0 ~ 9) and to light up the backlight.		^	^	
Press this key to print the total data and to confirm		↵	↵	PRINT
Go into counting mode.				COUNT or Q'TY SET
Press this key to sample.		Pcs	Pcs	SMPL

PT key and ☑ key are not available for 10-key models.

1-4 Power Description

Power	Battery	18650 3.7V lithium battery
	Plugged in	100~240V AC
Power consumption varies depending 0~100% backlight used (mA)	No backlight	75% backlight (factory default)
	≈ 24	≈ 28

Scale has a built-in power saving function to extend usage time. Table below shows the battery capacity and estimated usage time. Time may vary with different brands of lithium batteries and are for reference only.

Battery capacity	2000mA	2500mA	3000mA	3200mA	3500mA
Average usage time	80~90 hours	95~105 hours	110~120 hours	120~130 hours	130~140 hours
Estimated charging time	≈2.5 hours	≈3 hours	≈3.5 hours	≈4 hours	≈4.5 hours
Assume 25% in use for average usage time. If use continuously, time will be reduced by ~40%.					

Low Power Alarm

When symbol flashes, scale needs to be charged. To check the battery level, please unplug the AC cable first, and check the battery symbol displayed in the lower left corner of the display. The number of bars under the battery symbol indicates battery level. 4 bars mean 100%, 3 bars mean 75%, 2 bars mean 50%, 1 bar means 25%, and 0 bar means <= 10% when the low power warning symbol ( ) flashes to indicate that scale needs to be charged. If not charge immediately, scale auto shuts down within 5~10 hours or 1~2 hours with backlight. The cut voltage is about 3.5V. Once it auto shuts down and enters the battery protection mode, it must be charged before it can be used again.

Please recharge at once when the symbol shows in order to keep the weight accuracy.

Charging indicator a) When charging, the red LED will light up. Please refer to 1-4 for estimated charging hours.

b) When the battery is fully charged, blue LED will light up.

c) If scale is fully charged, after plugging in, the blue light will turn on after about 5~10 minutes of voltage detection. The LED charging indicator is to indicate the status of the charging process and whether the charging is working properly. To check the battery level, please unplug the AC cable first and turn on scale, and then check the number of bars under battery symbol for battery level.

1-5 Error Messages

oL ⇒ Weight exceeds 9d of maximum capacity. (d=division)

E1 ⇒ Zero value after power on is over +10% FS.

E2 ⇒ Zero value after power on is less than -10% FS.

need to set C5 to 1 to have E1 and E2 warnings

E4 ⇒ Unstable zero return, unstable over 10 sec. Press →0← to leave E4.

E6 ⇒ Zero is too high when calibrating. (over internal value 350,000)

E7 ⇒ Zero is too low when calibrating. (under internal value 80,000)

E8 ⇒ Resolution is set higher than factory setting. Send it back to us to unlock to set new resolution.

E10 ⇒ The scale is not in level status.(only available with level detector equipment.)

- - - - - - ⇒ For weight < -20d without tare or pretare device in operation.

OIML approval models need to set C5 to 1 to show "- - - - - -"

E10 Level Switch (option)
Make PCB J3 open circuit and connect signal to CN7 of PCB. Display shows E10 after 2 seconds and all keys stop working in the mean time. If you do not need level switch, make J3 short circuit.

Chapter 2 General Operation Description

2-1 Backlight Function

Press [☼] key to loop select the display backlight mode: Auto 1~4, bL. on, bL. oFF.
Auto 1~4 ⇒ "Auto Backlight" mode. When the weight is over 10d or any key is pressed, the backlight will be switched on. When the weight returns to zero (the weight on platform is less than 10d), the display backlight will switch off after 10 seconds. 1~4 (25%~100% backlight) is the brightness selection. **Default is 3** (75%).
bL. On ⇒ Display backlight is on all the time.
bL. oFF ⇒ Display backlight is off.

2-2 Weighing Mode

2-2-1 Units Selection (not available in 4 key model)

1. After indicator is turned on, use UNITS key to select a unit from kg, lb, tael or viss, as the screen indicated.
2. The selected unit will be memorized when you turn the indicator off. And the memorized unit will appear after you turn on the indicator next time.

2-2-2 Zero Function

Press [→0←] key to re-zero the display with no load on the platter. When zero is set, the (→0←) symbol will be displayed.

2-2-3 Tare Function

1. When the weight of the container is unknown **(** [→T←] **)**

❶ Place the container on the platter, after stable and press [→T←] key, the weight value returns to zero and net indication (Net) is on.
❷ Place goods into the container, then the indicator shows the net weight of goods.
❸ Clear tare value
When removing the container and goods, the display shows the negative weight value of the container. Then press [→T←] key to clear tare value. The indicator returns to zero and net indication (Net) is on.
❹ Recall tare value
Press [→R←] then [→T←] key ⇒ the display shows tare value

Multiple tare operation ⇒ Users can continuously increase or decrease the tare value by pressing the [→T←] key.

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

2. When the weight of the container is known **(** [→PT←] **)**

❶ Press [→PT←] key and the display shows [0] – –.– – P.
Use [☼] and [⊙/⏎] keys to input weight value of the container. After finishing the procedures, the net indication (Net) and pretare indication "▼" is on.
❷ Place goods into the container, then the indicator shows the net weight of goods.
❸ Clear pretare value
Press [→R←] then [→PT←] key, and then press [CE] key to clear pretare value.
When indicator returns to zero, net indication (Net) and pretare indication "▼" are off.

❹ Recall pretare value

Press [R] then [PT] key ⇒ the display shows pretare value

In Tare mode, the Preset tare function is disabled.

The indicators with two weighing ranges can NOT pre-set the tare value larger than the first weighing range. For example: a 30 kg indicator is set by two weighing ranges. The first range is 0 to 15 kg, and the second range is 15 to 30 kg. The pre-set tare value can not be larger than 15 kg.

2-2-4 Net/Gross Function (only available in 4/5 key models)

In Tare mode, press [Net B/G] key once to display gross value. Net symbol "▼"disappears, and the gross value "▼" appears. Press [Net B/G] key again, it displays net value, net symbol "▼" appears and gross symbol "▼" disappears. Press [Net B/G] key continually to display net value or gross value. In tare mode, [Net B/G] key is able to work. When it displays "▼", all keys are disable except [Net B/G].

2-2-5 Check Weighing Mode (4/5 key models need to set through F4)

1. Preset " High limit", "Low limit" and " Beeper value" operation

Use [▲/☼] and [◎/↵] key to preset values.

For example:

Preset "Low limit" (Low limit >10d) ***e.g. Low limit = 20 kg***

Press [☑] key — the display shows 0 - - .- - L

Press [◎/↵] key 1 time — the display shows 0 0 - .- - L

Press [▲/☼] key 2 times — the display shows 0 2 - .- - L

Press [◎/↵] key 4 times — the display shows 0 2 0.00 0

Preset "High limit" (High limit ≥ Low limit) ***e.g. High limit = 25 kg***

Press [◎/↵] key 1 time — the display shows 0 - - .- - H

Press [◎/↵] key 1 time — the display shows 0 0 - .- - H

Press [▲/☼] key 2 times — the display shows 0 2 - .- - H

Press [◎/↵] key 1 time — the display shows 0 2 0 .- - H

Press [▲/☼] key 5 times — the display shows 0 2 5 .- - H

Press [◎/↵] key 3 times — the display shows 0 2 5.00 0

Preset "Beeper value" (Refer to **Note**) ***e.g. Beeper value = 22***

Press [◎/↵] key 1 time — the display shows 0 - b

Press [▲/☼] key 2 times — the display shows 2 - b

Press [◎/↵] key 1 time — the display shows 2 0 b

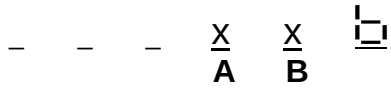
Press [▲/☼] key 2 times — the display shows 2 2 b

Press [◎/↵] key 1 times — the display shows 0.000

Preset Single point (preset low limit only):

After “preset low limit” procedures is completed and the display shows 0 - - . - - H, then press [☑] key again, the display shows 0.000. This means that the “preset single point” procedure is completed.

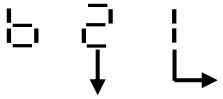
NOTE



A Setting for the status that LCD is on and the beeper beep:
0 = when stable, the beeper beeps and LCD is on.
1 = when stable, the beeper beeps; whether stable or not, LCD is on.
2 = whether stable or not, the beeper beeps and LCD is on.
3 = open warning device: when the weight is higher than HI value and the weight is stable, LCD is on and Relay Card open.

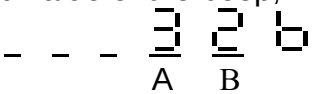
B Setting for the beep status:
0 = No beep
1 = OK (when the weight is over Low Limit & under or equal to High Limit.), the beeper beeps.
2 = When the weight is under or equal to Low Limit & over High Limit, the beeper beeps.

- Under Status in Preset Low Limit (preset single point only)
  The BEEP, LCD mode should be fixed as follows:



When over “Low Limit”, the beeper beeps and [LO] is off
Whether stable or not, the beeper beeps and LCD indication is on

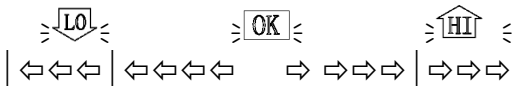
- Warning device setting (not available in 4/5 key models)
  Set HI value and value of the beep, LCD mode should be fixed as follows:



When the weight equals to HI value, Relay Card open and the weight is accumulated. Press [CE] key to dismiss the warning sound and the range of accumulated weight is [000.000]~[999999].

- Clear warning accumulation (not available in 4/5 key models)
  - ♦ Press [→R] key first and then press [CE] key to clear all accumulated data.
  - ♦ Accumulated data is cleared automatically under following conditions
    a. when shift among weight mode, counting mode and warning accumulation mode.
    b. when shift the units
    c. turn off the scale

- LCD indication:



◆ To exit preset mode, please press [UNITS] key.

2. Recall Check-weighing Values (not available in 4/5/10 key models)

Press [☑] key then press [→R] key ⇒ Recall “Low limit value”
Then press [→R] key again ⇒ Recall “High limit value”
Then press [→R] key again ⇒ Recall “Beeper value”
Then press [→R] key again ⇒ Back to the beginning

3. Clearing Check-weighing Values (not available in 4/5/10 key models)

Press [☑] key then press [→R] key, and then press [CE] key ⇒ Recall “Low limit

value". Then press [CE] key again ⇒ Clear "High limit value" and "Beeper value"
Press [☑] key then press [⊙/↵] key 6 times continuously ⇒ Clear all values.

2-2-6 Totalizing (not available in 4/5 key models)

1. Weight Totalizing

Place goods on the platter, after stable and press [M+] key to save the weight value. Then the display shows the total number of additions and the totalized weight value. And the (M+) indication "▼" will flash on the display. The indicator will recover to show the weight value of the goods on the platter after 3 seconds and the (M+) indication "▼" is on.

- The indicator allows the next totalizing 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 10d. The indicator will save the totalized weight value after the weight is stable.
- The indicator can totalize positive or negative weight but can't do both at the same time. The totalized weight store must be reset to zero before it is possible to select positive or negative totalizing mode.
- The totalizing function can be used up to a maximum of 9999 times before it must be reset. The totalizing display is limited to 6 digits maximum.
- When totalizing, RS-232 will also output. (Refer to F5 setting)

2. Clear Totalized Weight Values (not available in 4/5 key models)

- ♦ Press [→R] then [CE] key to clear all totalized weight values.
- ♦ When changing between weighing and counting mode, or selecting weighing unit, the indicator will automatically clear all the totalized weight values.
- ♦ The indicators will automatically clear all the totalized weight values after turning on.

3. Recall Totalized Weight Values (not available in 4/5 key models)

Press [→R] key to display the total number of additions and the totalized weight value. And the (M+) indication "▼" will flash on the display. The indicator will return to the weighing mode after 3 seconds.

- The indicator will not display the negative sign "-" for negative totalized weight values when recalling a totalized weight value, but when printing, the negative sign "-" will be printed out (transmitted serially) for each negative weight and negative totalized weight.

2-3 Counting Function (not available in 4/5 key models)

2-3-1 Sampling

❶ Press [Pcs] key to select sample quantity from 10, 20, 50,100

❷ Select sample quantity and then place samples on the platter, and then press [⁂] key, the display shows " SAMPLE".

After stable, the scale enters into counting mode and the display shows sample quantity.

- ♦ Sample Too Small (⁂+) ⇒ Sample is less than 20 divisions.
- ♦ Unit Weight Too Small (Pcs|) ⇒ Unit weight is less than 0.2 division. (0.1 d for Brazil regulation)

- When sampling, the above two symbols indications are on. Under such conditions, the scale can still work, but may result in lower count precision.
- When using 2-segment weighing mode, the above two symbol indications change to Range 2 and Range 1 and the two symbol indications are off.

2-3-2 Check Weighing

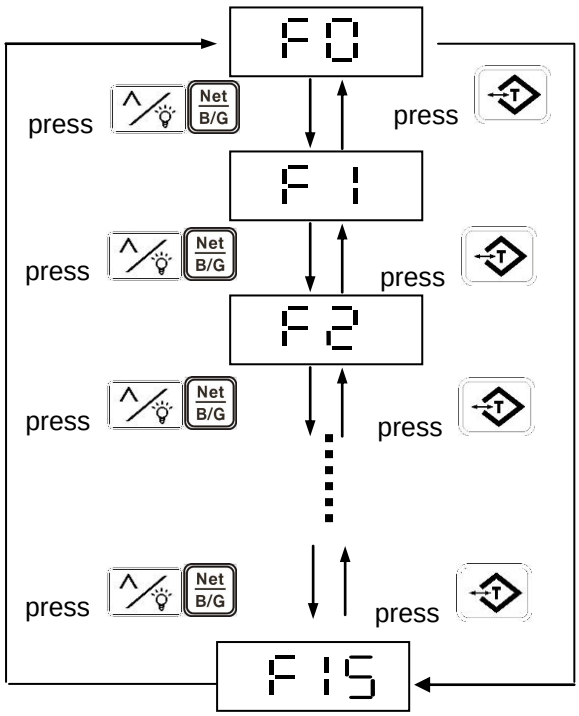
Refer to the operation of check weighing in weighing function.

2-3-3 Totalizing

Refer to the operation of totalizing in weighing function.

Chapter 3 General Function Setting

- Switch on the scale. While the scale is counting down to zero, press and hold →0← key until the display shows the software version number 02036. Release the →0← key, the scale enters into the configuration setting mode and display F0.



F4	Check Weighing Configurations
F5	RS232 Output Setting (Option)
F6	Exit Function
F7	Internal Value Display Mode
F8	Weight Hold Mode Setting
F11	ID Code Setting
F12	Print Key Function Setting
F14	Customized Header Setting (r n P 6, r n P 7)

F0~F3, F9, F10, F13, F15 are reserved.

Net B/G key ⇒ upward key

key ⇒ downward key

key ⇒ to confirm

3-1 F4 Check Weighing Configurations

- If hold mode (F8) is set, accessing to F4 is denied.

  Press [▲] [Net B/G] or [→T←] key to select F4

F4

Press [Enter] key

0 - - . - - L kg

Press [Enter] key for 5 times to clear HI, OK, LO values

000.000 kg

Press [Enter] key

F4

Preset "LO value"

(LO value > 10d)

Press [▲] [Net B/G] and [Enter] key to set " LO value"

E.g. LO value = 2 kg

002.000 kg

Press [Enter] key

0 - - . - - H kg

Preset "HI value"

(HI value ≥ LO value)

Press [▲] [Net B/G] and [Enter] key to set "HI value"

E.g. LO value = 2.5 kg

002.500 kg

Press [Enter] key

0 - b kg

Preset "Beeper value"

Press [▲] [Net B/G] and [Enter] key to set "HI value"

E.g. Beeper value = 22

22b kg

Press [Enter] key

F4

[▲] [Net B/G] key = Increase the flash value by one (from 0 to 9)

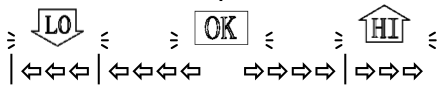
[Enter] key = Confirm key

- - - X X b
A B

A ⇒ 0 = After stable, the beeper beeps and the indications are on
1 = After stable, the beeper beeps; whether stable or not, the indications are on.
2 = whether stable or not, the beeper beeps and the indications are on.
3 = open warning device: when the weight is higher than HI value and the weight is stable, LCD is on and Relay Card open.

B ⇒ 0 = No beep
1 = OK (when the weight is between Low limit & High limit.), the beeper beeps.
2 = When the weight is under or equal to Low limit (must be over 10d) & over or equal to High limit, the beeper beeps.

- LCD indication description:

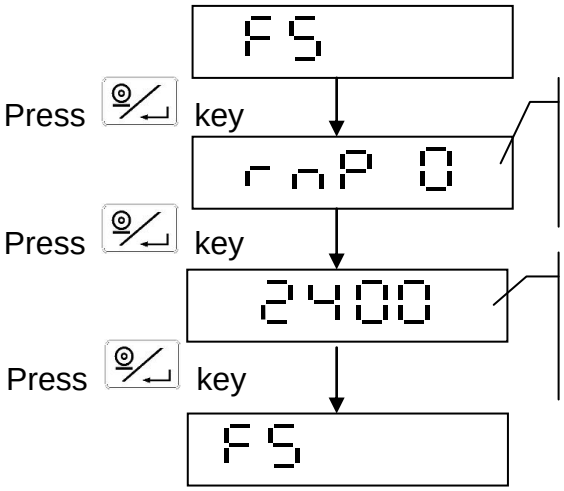


10d Low limit value High limit value

3-2 F5 RS-232 Output Setting (Option)

♦ Make J1、J3 on RS232 short circuit, when connecting to computer.

Use [^/☼] [Net B/G] or [→T] key to select F5.



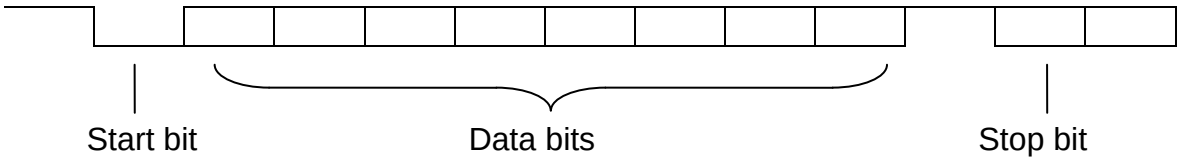
Transmission mode : use [^] [Net B/G] key to select r n P 0 ~ r n P 14 and press [⊙/↵] to save

RS-232 baud rate : use [^] [Net B/G] key to select 1200~9600 and press [⊙/↵] to save

r n P 0 ⇒ RS232 command mode.
r n P 1 ⇒ Stable transmission.
r n P 2 ⇒ Continuous transmission.
r n P 3 ⇒ Press [⊙/↵] key to transmit simple format.
r n P 4 ⇒ Press [⊙/↵] key to transmit complete format.
r n P 5 ⇒ Stable transmission in totalizing mode. Same format as (r n P 3).
r n P 6 ⇒ Press [⊙/↵] key to transmit simple free format. Please refer to F14.
r n P 7 ⇒ Press [⊙/↵] key to transmit complete Free format. Please refer to F14.
r n P 8 ⇒ Press [⊙/↵] key to transmit same format as (r n P 1) and (r n P 2).
r n P 11 ⇒ Print after removing goods (5% mode).
r n P 12 ⇒ Print after removing goods (OK mode).
r n P 13 ⇒ Continuous transmission, bluetooth format.
r n P 14 ⇒ Stable transmission, only weight value is transmitted

RS-232 Interface Format

I . Mode**:** UART Signal of EIA-RS0232 C
II . Format **:**
1. Baud rate **:** 1 200, 2 400, 4 800, 9 600 bits/second
2. Data bits **:** 8 bits
3. Parity bit **:** None
4. Stop bits **:** 1 bit
5. Code **:** ASCII (Exchange code of American standard)



RS-232 Data Format

Command mode (r n P 0)

Command	Function	Return message definition
C T <CR> <LF>	Clear tare	N P <CR> <LF> already pre-tared
		C T <CR> <LF> successful
M T <CR> <LF>	Tare	N P <CR> <LF> already pre-tared
		M T <CR> <LF> successful
		N S <CR> <LF> unstable
M Z <CR> <LF>	Zero	N P <CR> <LF> already pre-tared
		N T <CR> <LF> already tared
		M Z <CR> <LF> successful
		N Z <CR> <LF> outside zero range
		N S <CR> <LF> unstable
R W <CR> <LF>	Read Weight	Return weight format as (r n p1)
P T , 0 0 0 1 0 0 <CR> <LF>	Set pre-tare	N O <CR> <LF> exceed number of digits
L O , 0 0 0 1 0 0 <CR> <LF>	Set low limit	N N <CR> <LF> non-numeric value
H I , 0 0 0 1 0 0 <CR> <LF>	Set high limit	N G <CR> <LF> over max weight
		N D <CR> <LF> Increment d is incorrect

Stable transmission (r n P 1**), Continuous (**r n P 2**), Press**  **key to transmit (**r n P 8**)**

1. gram as weight unit

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
HEAD		,	HEAD		,	±	DATA							UNIT	CR	LF	g

2. kg or lb as weight unit

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
HEAD		,	HEAD		,	±	DATA							UNIT		CR	LF	kg/lb

HEAD1 (2 BYTES)	HEAD2 (2 BYTES)
OL - Overload , Under load	TR - TARE Mode
ST - Display is Stable	NT - NET Mode
US - Display is Unstable	GS - GROSS Mode

DATA (7 or 8 BYTE)

2B (HEX) = " **+** " (PLUS)
2D (HEX) = " **–** " (MINUS)
2E (HEX) = " **.** " (DECIMAL POINT)

UNIT (2、3 or 4 BYTE)

kg = 6B (HEX) ; 67 (HEX)
lb = 6C(HEX) ; 62 (HEX)
tl.T = 74 (HEX) ; 6C (HEX) ; 2E (HEX) ; 54 (HEX)
hkg = 68 (HEX) ; 67 (HEX)
viss = 76 (HEX) ; 69 (HEX) ; 73 (HEX) ; 73 (HEX)

Transmission examples: (r n P 2) RS-232 continuous transmission

1. The gross weight (+0.876 kg) shows as below, after stable: (no tare or pre-tare mode)

S	T	,	G	S	,	+			0	.	8	7	6	k	g	<CR>	<LF>
HEAD1			, HEAD2		,	DATA								UNIT		CR	LF

2. The net weight (-1.568 lb) shows as below without weight stability: (under tare or pre-tare mode)

U	S	,	N	T	,	-			1	.	5	6	8	l	b	<CR>	<LF>
HEAD1			, HEAD2		,	DATA								UNIT		CR	LF

Press [⊙/↵] key to transmit simple format (r n P 3)

S/N	WT/UNIT (kg / lb)	
0001	1.0000	☜ Press [⊙/↵] or [M+] key
0002	1.0000	☜ Press [⊙/↵] or [M+] key
0003	1.0000	☜ Press [⊙/↵] or [M+] key
0004	1.0000	☜ Press [⊙/↵] or [M+] key
0005	1.0000	☜ Press [⊙/↵] or [M+] key
0005	5.0000	☜ Press [⊙/↵] twice to print TOTAL

Press [⊙/↵] key to transmit complete format (r n P 4)

TICKETS NO. 0001
G 1.000kg
T 0.000kg
N 1.000kg
(3 blank lines)

☜ Press [⊙/↵] or [M+] key

TICKETS NO. 0002
G 1.000kg
T 0.000kg
N 1.000kg
(3 blank lines)

☜ Press [⊙/↵] or [M+] key

TICKETS NO. 0003
G 1.000kg
T 0.000kg
N 1.000kg
(3 blank lines)

☜ Press [⊙/↵] or [M+] key

TOTAL NUMBER
OF TICKETS 0003
TOTAL
NET 3.000kg
(3 blank lines)

☜ Press [⊙/↵] twice to print TOTAL

G = GROSS T = TARE N = NET

Stable Transmission in totalizing mode (r n P 5)

```
S/N      WT/UNIT ( kg / lb )
- - - - - - - - - - - - - -
0001     1.0000          ☜ The scale is stable
0002     1.0000          ☜ The scale is stable
0003     1.0000          ☜ The scale is stable
0004     1.0000          ☜ The scale is stable
0005     1.0000          ☜ The scale is stable
- - - - - - - - - - - - - -
0005     5.0000          ☜ Press [⊙/↵] twice to print TOTAL
```

Press [⊙/↵] key to transmit simple free format (r n P 6)

Same format as (r n P 3). Print the complete format for the first time. Then only print NET weight. Please refer to F14 for details.

Press [⊙/↵] key to transmit complete free format (r n P 7)

Same format as (r n P 4). Print the complete format all the time. Please refer to F14 for details.

RS232 output format in HOLD MODE

Please set (r n P 8) in F5. If there is only RS-232, press [⊙/↵] to print out the HOLD value on the display.

			1	.	0	0	0	k	g	<CR>	<LF>

Print after Removing Goods (5% mode) (r n P 11)

Stage	Condition(s)	Action(s)
1: Goods placed and weighed on platter	Weight has become stable. Weight > zero point Weight ≥ 20 weighing units (i.e. 5% x Weight ≥ 1 weighing unit)	Beeper beeps twice, and printing data (stable weight compliant with conditions on the left) is ready to be sent.
2: Just removed goods from platter	Instantaneous weight reading drops below 95% of last stable weight (stable weight of Stage 1)	Printing data of Stage 1 is sent to the printer (same printing formats as those of (r n P 1).

Print after Removing Goods (OK mode) (r n P 12)

Stage	Condition(s)	Action(s)
1: Goods placed and weighed on platter	Weight has become stable. Weight > zero point Check weighing **OK** status (within a predetermined weight range)	Beeper beeps twice, and printing data (stable weight compliant with conditions on the left) is ready to be sent.
2: Just removed goods from platter	Instantaneous weight reading drops below 95% of last stable weight (stable weight of Stage 1).	Printing data of Stage 1 is sent to the printer (same printing formats as those of (r n P 1).

Continuous transmission, bluetooth format (r n P 13)

HEAD1 (2 BYTES)	HEAD2 (2 BYTES)
OL - Overload , Under load	N - TARE Mode
ST - Display is Stable	G - NET Mode
US - Display is Unstable	GS - GROSS Mode

DATA (8 BYTE)

2B (HEX) = " **+** " (PLUS)
2D (HEX) = " **–** " (MINUS)
2E (HEX) = " **.** " (DECIMAL POINT)

UNIT (3 BYTE)
' 'kg; ' 'lb; tlT; hkg; vis

1. The gross weight (+0.876 kg) shows as below, after stable: (no tare or pre-tare mode)

S	T	,	G		,	+			0	.	8	7	6		k	g	<CR>	<LF>

HEAD1 , HEAD2 , DATA UNIT CR LF

Stable transmission only weight value is transmitted (r n P 14)

No +/-. If display is 1.000kg , transmit

		1	.	0	0	0	<CR>	<LF>

DATA CR LF

F5	Function	Press M+ key	Press ◎ key	Press ◎ key twice after zeroing
r n p 0	RS232 command mode	Once received read weight command, transmit weight in same format as r n p 1.		
r n p 1	Stable transmission	After return to zero, transmit next stable weight.		
r n p 2	Continuous transmission.	RS232 transmit continuously. Keypad has no effect.		
r n p 3	Press ◎/↵ key to transmit simple format	Transmit when weight change >±10d,	Transmit when weight change >±10d,	Print TOTAL and clears totalized values
r n p 4	Press ◎/↵ key to transmit complete format.	Transmit when weight change >±10d,	Transmit when weight change >±10d,	Print TOTAL and clears totalized values
r n p 5	Stable transmission in totalizing mode (After return to zero, transmit next stable weight which is > +10d)	No transmission	No transmission	Print TOTAL and clears totalized values
r n p 6	Press ◎/↵ key to transmit simple free format	Transmit when weight change >±10d,	Transmit when weight change >±10d,	Print TOTAL and clears totalized values
r n p 7	Press ◎/↵ key to transmit complete free format	Transmit when weight change >±10d,	Transmit when weight change >±10d,	Print TOTAL and clears totalized values
r n p 8	Press ◎/↵ key to transmit same format as (r n P 1) and (r n P 2)	No transmission	Transmit as stable weight >±10d	No transmission, totalized values not cleared
r n p 9	Continuous Transmission (Brazil)	Continuous transmission	Continuous transmission	Continuous transmission, totalized values not cleared

r n p 10	M+ or key Transmission (Brazil)	RS232 transmit	RS232 transmit	Print TOTAL and clears totalized values
r n p 11	Print after removing goods (5% mode)	After placing item and become stable, beep twice. RS232 transmit item weight after item is removed.		
r n p 12	Print after removing goods (OK mode)	RS232 transmit only “OK” item weight after item is removed. No transmission while in “HI” or “LO”.		
r n p 13	Continuous transmission, bluetooth format	Bluetooth transmit continuously through RS232. Keypad has no effect.		
r n p 14	Stable transmission, only weight value is transmitted	After return to zero, transmit next stable weight’s weight value only.		

3-3 F6 Exit Function

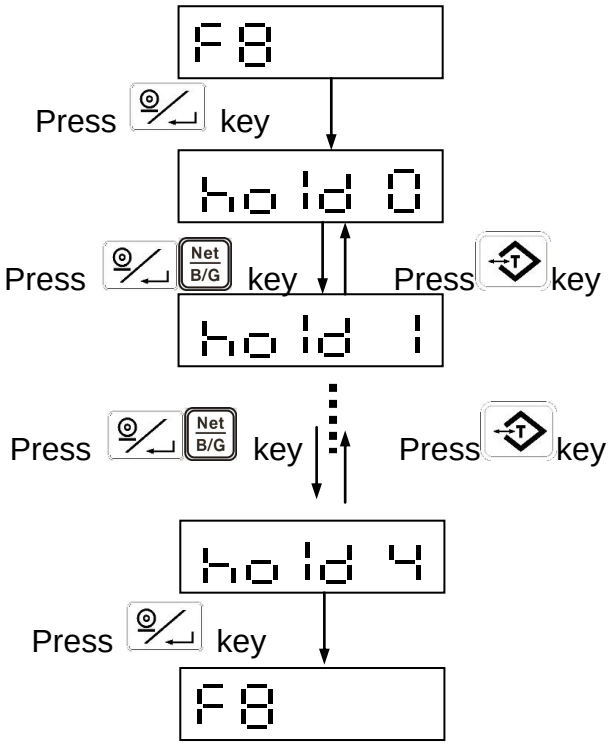
Use Net B/G or to select F6. Then press to count down to zero and exit the setting.

3-4 F7 Internal Value Display Mode

Use Net B/G or to select F7. Then press to display internal value. Press again will see F7.

3-5 F8 Weight Hold Mode Setting

Use Net B/G key or key choose F8



♦ Before setup, please switch the SWA1 on MINI JUMPER to ADJ position

♦ After setup, please switch the SWA1 on MINI JUMPER back to LOCK position

In hold mode, press key, to print the hold value as shown on display.

(It’s not related to the settings of F5 transmission mode, but it needs to select the proper Baud rate according to the transmission of the receiver.)

(To setup transmission rate, please refer to F5 RS-232 Interface Output Setting (option))

Use Net B/G key to select a value from hold 0 ~ hold 4 and then press key to complete setup.

hold 0 = No hold function

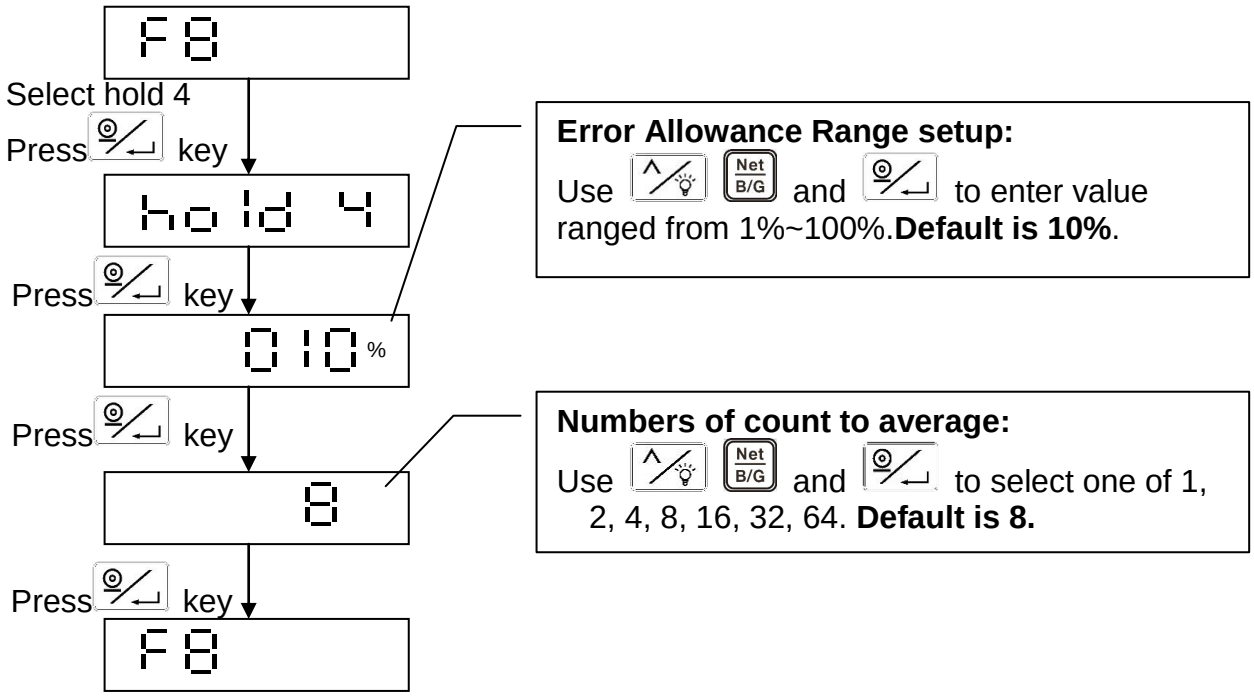
hold 1 = For varying weighing value, the scale will automatically hold the maximum weighing value to display. To exit hold mode, press any key (except the key).

hold 2 = After the scale is stabilized, the scale will automatically hold the display value(not changeable due to external variables)To exit hold mode, press any key.(except the key)

hold 3 = After the scale is stabilized, the scale will automatically hold the display value(not changeable due to external variables).After zero return (or weight is less than 10d), the scale exits the hold mode automatically.

hold 4 = Animal Scale function. When animal is on the scale platter and is stable, the scale will automatically hold the display value (not changeable due to external variables). After the animal is off the scale platter, the scale exits the hold mode automatically.

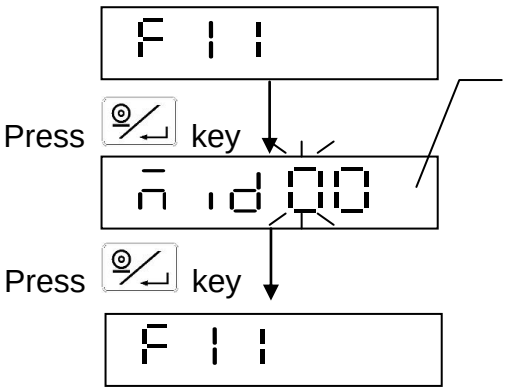
Animal Scale Hold Setup (hold 4)



3-6 F11 ID Code Setting

(must be used with r n P 1, r n P 2, r n P 8 of F5)

Press [^/☼] [Net B/G] key or [→T] key to select F11



Machine ID code setting:

Use [^/☼] [Net B/G] and [⊙/↵] set 01 ~ 99. Default setting: 00

(1) "00": RS-232 does not transmit Machine ID.

(2) "01~99": RS-232 transmits Machine ID.

RS232 DATA FORMAT

Stable transmission (r n P 1**), Continuous (**r n P 2**), Press [⊙/↵] key to transmit (**r n P 8**)**

1. e.g. Machine ID code is 10.

The gross weight (+0.876 kg) shows as below, after stable: (no tare or pre-tare mode)

1	0	S	T	,	G	S	,	+	0	0	0	.	8	7	6	k	g	<CR>	<LF>
ID		HEAD1		,	HEAD2		,	DATA								UNIT			

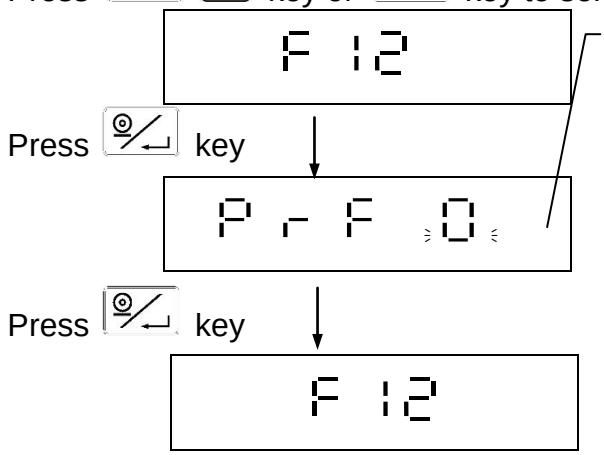
2. e.g. Machine ID code is 00. (Not using Machine ID function.)

The net weight (-1.568 lb) shows as below without weight stability: (under tare or pre-tare mode)

U	S	,	N	T	,	-	0	0	1	.	5	6	8	l	b	<CR>	<LF>
HEAD1		,	HEAD2,				DATA							UNIT			

3-7 F12 Print Key ([⊙/↵]) Function Setting

Press [^/☼] [Net B/G] key or [→T] key to select F12



Print key setting:

Use [^/☼] [Net B/G] and [⊙/↵] to set 0~2. Default setting: 0

P r F 0 ⇒ If weight variation is beyond ±1d ~ ±10d, [⊙/↵] key print totalized weight. Otherwise print current weight. (d=division)

P r F 1 ⇒ [⊙/↵] key print current weight. No totalization.

P r F 2 ⇒ [⊙/↵] key print current weight if it is within the lower and upper limits (ok range). No totalization.

3-8 F14 Customized Header Setting (r n P 6, r n P 7)

CODE	Description	CODE	Description
0	No print.	6	P/N
1	TICKET NO.	7	S/N
2	G	8	DATE (Note: need FB53's MINI_PRINTER to print)
3	T	9	TIME (Note: need FB53's MINI_PRINTER to print)
4	PT	A	PCS
5	N		

F14 contains a 9-digit code. For example: 6 1 2 3 4 5 0 0 0

① F5 = r n P 6 Simple Free Format ② F5 = r n P 7 Complete Free Format

```
P/N 012345678901
TICKET NO. 0001
G          1.2500kg
T          0.2500kg
PT         0.0000kg
N          1.0000kg
S/N        WT/UNIT ( kg )
- - - - - - - - - - - - - -
0001       1.0000
0002       1.0000
- - - - - - - - - - - - - -
0002       2.0000
```

☜ Press [→|] or Press [M+] key

☜ Press [→|] or Press [M+] key

☜ Press [→|] twice to print the total

```
P/N 012345678901
TICKET NO. 0001
G          1.2500kg
T          0.2500kg
PT         0.0000kg
N          1.0000kg
 (three empty lines)
```

```
P/N 012345678901
TICKET NO. 0002
G          1.2500kg
T          0.2500kg
PT         0.0000kg
N          1.0000kg
 (three empty lines)
```

```
TOTAL NUMBER
OF TICKETS 0002
TOTAL
NET        2.0000kg
```

P/N (part No.) and S/N (Serial No.) setup method

In weighing mode, hold [→|] key for 2 seconds to setup.

1 second ⇒

0 ▼	0	0	0	0	0
0	0 ▼	0	0	0	0
0 ▼	0	0	0	0	0
0	0 ▼	0	0		

Use [↑/💡] [Net B/G] , [→|] key to enter 12-digit Part number

1 second ⇒

Use [↑/💡] [Net B/G] , [→|] key to enter 10-digit Serial number

After power-off, S/N will reset as 1. P/N will be saved in memory, available during next power-on.

Appendix 1 Option Card Description

RS232 Output

1. Weighing scale (AW, HW, FD, RW, TW)

RS232 card's 6PIN cable connect to CN3 of mainboard

SCALE	⟶	**RS232 PRINTER**	**SCALE**	⟶	**PC**
DB 9 (female)		DB 9 (female)	DB 9 (female)		DB 9 (male)
2 TX	→	3 RX	2 TX	→	2 RX
3 RX	→	2 TX	3 RX	→	3 TX
5 GND	→	5 GND	5 GND	→	5 GND

Relay Output

Principle of Relay operation

Use checkweighing pre-set ☑ key (TW, AW) or though F4 from the menu (TW, AW, RW, HW) to get in checkweighing mode to set the HIGH and LOW limit points. Between HIGH and LOW limits are OK range.

If the weight is below LOW limit, the data will output in LOW port;
If the weight is between HIGH and LOW limits (OK range), the data will output in OK port;
If the weight is above HIGH limit, the data will output in HIGH port

Please refer to the operation of Pre-set ☑ key and F4 function.

Weighing scale (AW, HW, FD, RW, TW)

1. PIN definition

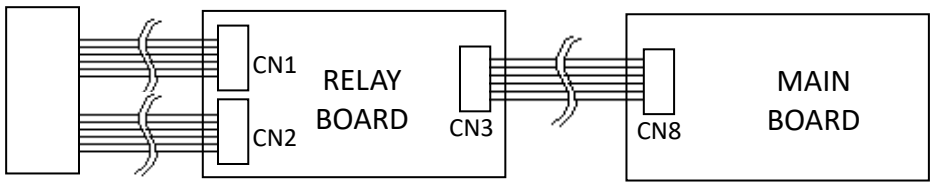
CN1:

PIN 1	⇒	OK output
PIN 2	⇒	High output
PIN 3	⇒	Low output

CN2:

PIN 1	⇒	VDD
PIN 2	⇒	AGND
PIN 3	⇒	COM

2. Connection



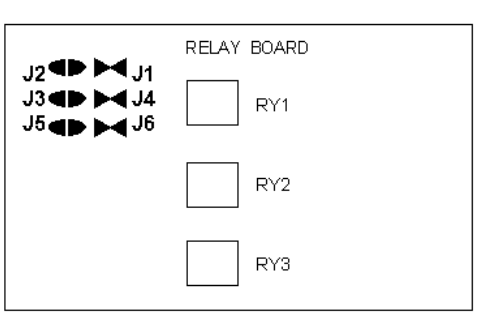
3. Power supply for Relay

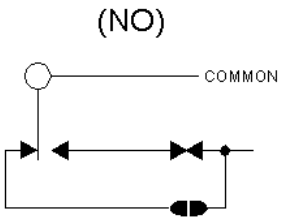
The power supply of the RELAY card is a dual power supply option (5V and 12V) supplied by the system itself. It can also use an external power supply. If so, please open circuit at JP1 and short circuit at JP2.
The factory default is 5V power supply. To use 12V power supply, please short circuit J12.

4. Configuration

OK, High, and Low can be set to NO (normally open, J2, J3, J5) or NC (normally closed, J1, J4, J6). The default value is NO (normally open, J2, J3, J5)

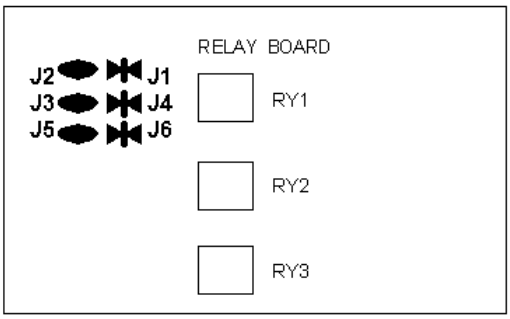
① OK, High, and Low are NO (normally open, J2, J3, J5) ⇒ default

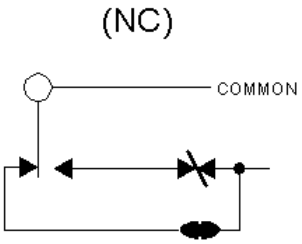




② OK, High, and Low are NC (normally close, J1, J4, J6)

Make J1, J4, J6 open circuit by cutting the circuit. Then make J2, J3, J5 short circuit with solder.





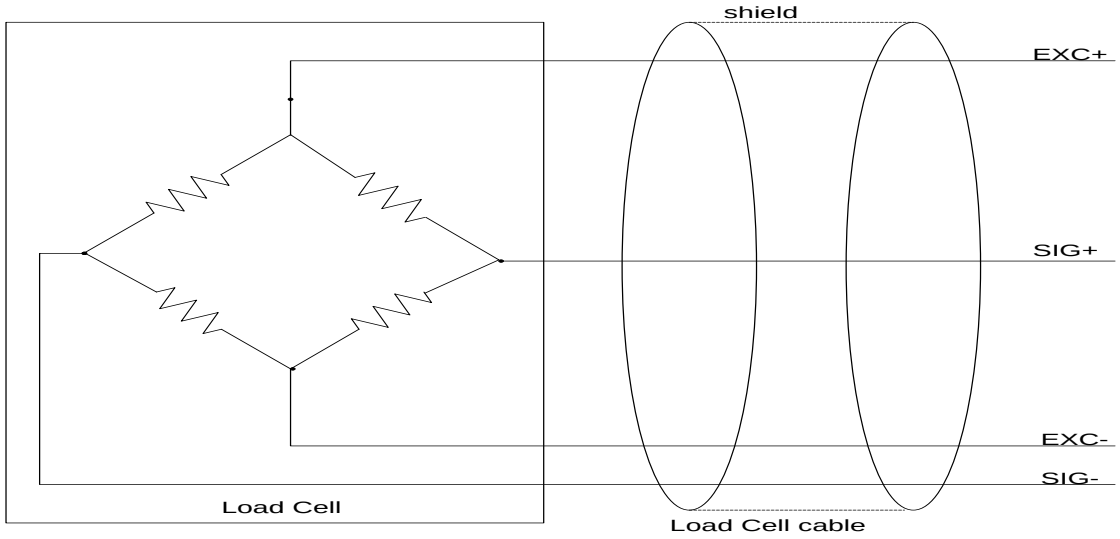
Restore factory settings when RJ45 option card is installed

If scale does not work properly after modifying setting through RJ45 card, please follow the steps below to restore to factory setting.

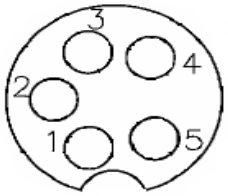
In the weighing mode, hold the  key while press  key at the same time (within 1 second). Then release key, and "RELOAD" appears. When reloading end, please restart the scale to restore to the factory settings.

Appendix 2 Load Cell PIN

For indicators only



5-pin female connector



1	EXC+
2	EXC -
3	SIG+
4	SIG -
5	GND

Appendix 3 7-Segment Display Characters

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