JWI-710 Series

Weighing Indicator

User Manual

Content

Appendix 1:   Printing format (Optional)

1. Introduction

Thanks for purchasing the JWI-710 Series weighing indicator. Please read the manual completely before installation and operation.

2. Precautions

- Place the indicator on a flat and stable surface.
- Verify that the input voltage and the plug type match the local AC power supply, see 3-4.
- Over 2 years without using the scale for the first time, please charging fully before utility.
- Please cut off the charging power after the battery is fully charged.
- If the charge indicator indicates red light (24 hours or more) when the battery is charged, please check the scale or replace a new battery.
- Warm up for 15 minutes before using it at the first time.
- Battery lifetime is about 1 year. Please replace a new battery once it's damaged.
- Keep the indicator away from EMI noise, strong wind and vibration, which might cause incorrect reading.
- Avoid sudden temperature changes (suitable operating temperature is between 0℃~ 40℃.)
- Disconnect the power supply when cleaning the indicator with wet cloth.
- Do not immerse the indicator in water or other liquids.
- Service should be performed by authorized personnel only.

3. Product Introduction
3-1 Specifications & Features

Specifications

| Model	JWI-710
Input sensitivity	0.2 uV/DIV
Input voltage range	-2 mV ~20 mV
Load cell excitation	DC 5V, Up to 4 ×350 ohm load cells
Non-linearity	0.007% of full capacity（assure of 15000 accuracy）
Input impedance	More than 10×10^8 ohm
A/D conversion mode	$\Delta\text{-}\Sigma$
A/D internal resolution	700,000 count
A/D conversion speed	10 times/second
External display resolution	15000 count
Display	6 digits

Power supply	AC 100V~240V or Rechargeable battery（6V/4A）
Certification	CE

Features

- Simple operation: pre-tare, manual tare, check weighing, simple counting, gross or net weight switchable function and so on.
- Large LED display, clear and easy to read the weight..
- Adjustable capacities, resolutions（division is from 300 to 300000）.
- Suitable for a wide range of bases and load cells
- Adjustable filtering level for weighing under various conditions

3-2 Front Panel
3-2-1 Display
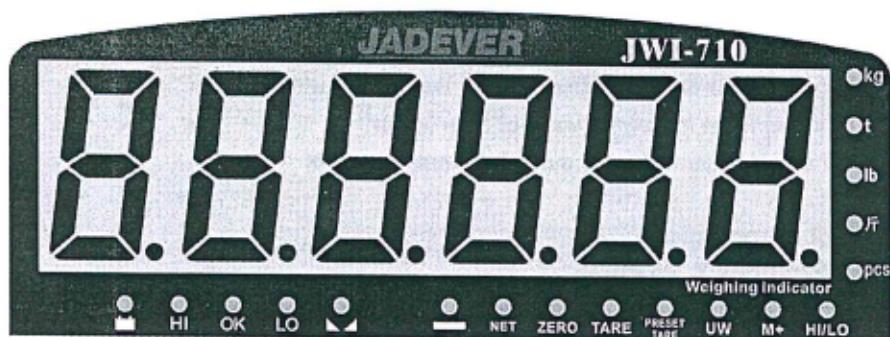
⊞　　Low battery indication

ZERO　Turn to zero indication. The range of turning to zero is in 2% of scale full capacity

◣◢　　Stable indication

TARE　the tare light is start when the weight of the container is tared

PRESET

TARE　　the light starts up when finish setting preset tare value

NET　Net weight--Gross weight minus Tare. "NET" lights up when Tare or Preset Tare action is done.

UW　"UW" lights up when calculated unit weight is lower than 4/5 of scale division. Unit weight is too small for ensuring accurate quantity calculations.

HI/LO   HI/LO lights up when start the function

kg, t, lb, ｆｔ, pcs   Units of measurement

HI   The weight on the weighing pan is greater than the upper limit and equals to or exceeds 20 division (with HI lamp on)

OK   The weight on the weighing pan is between upper and lower limits and equals to or exceeds 20 division (with OK lamp on)

LO   The weight on the weighing pan is smaller than lower limit and equals to or exceeds 20 division (with LOW lamp on)

3-2-2 Keyboard

◀/M+/MR	1. Adds the indicated weight into accumulation memory 2. Long press to enter into Memory recall 3. Shift keys leftwards
+/PRINT/HI	1. During setting value, add 1 to the current value 2. Print by hand 3. Long press to set the upper limit of the weighing check
-/G/N/LO	1. During setting value, deduct 1 to the current value. 2. Displays gross and net weight by turns. 3. Long press to set the lower limit of the weighing check
TARE/ ▶	1. Tares the weight of the container or accepts the keypad tare entries 2. Long press to enter pre-tare 3. Shift keys rightwards
ZERO/ESC	1. Reset zero point 2. Press one time to exit 3. Long press to exit from certain operation without save
UNIT/SET	1. Units change 2. Long press to set parameters

3-3 Rear Panel

1. Port for connecting load cell
2. RS-232 port: Serial interface port (computer, printer,
   Light Tower and Large LED display)
3. Power socket

JWI-710
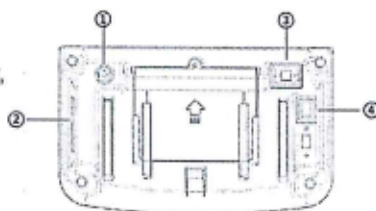
4. Power ON/OFF switch

3-4 Power supply

1) AC 100V~240V

2) (6V/4A) Internal Rechargeable Battery

Power Consumption

About 65 hours with brightest backlight

About 80 hours with our factory setting backlight

Low battery warning

When "▉▉" lights up, the battery power requires recharging. The charge lamp turns green from red when the recharging is completed (which takes about 8 hours). Disconnect the scale from power supply once it is fully charged.

Note: Battery is to be replaced only by an authorized service dealer .Risk of explosion can occur if replaced with the wrong type or connected improperly.

4. Installation

4-1 Load cell connection
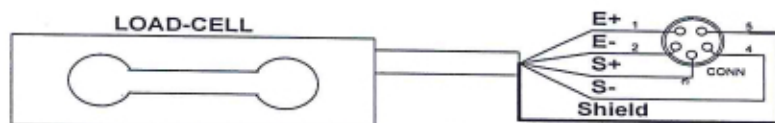
		PIN	SIGNAL
LOAD CELL		1	E+
		2	E-
CONNECTION		3	S+
		4	S-
		5	SHIELD

4-2 Assembly Description of Upright Pole

(1) Rod seat

(2) Upright pole
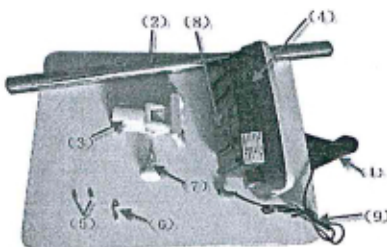
(3) Racket

(4) Indicator

(5) Screw (for fixing the upright pole)

(6) Screw (for fixing bracket)

(7) Knob pole

(8) Bracket slot

(9) Load cell wire

Step 1: Thread the wire of the Load Cell (9) on the rod seat (1) through the upright pole (2). Insert
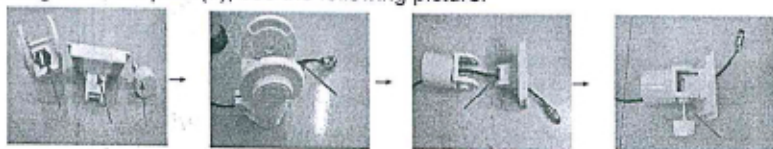
JWI-710

5

The upright pole into the rod seat and then
Lock it with two screws (5).

Step 2: After threading the Load Cell wire through
the bracket (3), attach the bracket to the
upright pole and then lock it with the screw (6).

Note: if the load cell connector is too big to thread through the bracket, then separate the bracket
by removing the knob pole (7), see the following picture:

Step 3: Install the Indicator (4) on the bracket, with the bracket aligning with the bracket slot
(8) of the indicator.

Step 4: After connecting load cell connector to load cell port, the installation is completed.

Note: Use the knob pole (7) to adjust the inclination angle of indicator and the screw (6) to adjust
direction of indicator. Please lock the screw after adjusting the indicator to an optimal position.

5. Setting Mode

5-1 Maximum Weighing Capacity & Division Setting

1. Press key TARE/ ► and key ZERO/ESC to power on, then enter into capacity setting and it
   displays " 300.00 kg ".

2. Method 1: press key +/PRINT/HI or key -/G/N/LO to choose common used value, press key
   ◄/M+/MR or key TARE/ ► to shift decimal point leftward or rightward, press key
   UNIT/SET to choose unit: kg, t, lb or 台斤.

Method 2: If the capacity needed is not within the default common used value, long press key UNIT/SET to enter into capacity free setting mode while the number leftest blinking; Press the key ◀/M+/MR or key TARE/ ▶ to shift key leftward or rightward; Press key +/PRINT/HI or -/G/N/LO to change the value or shift the decimal point; Press key UNIT/SET to choose kg, t, lb or 台斤.

Press the key ZERO/ESC to save and enter into division setting, while long press key ZERO/ESC to return to weighing condition without saving.

3. The window displays *0.02kg* when entering division setting after finishing capacity setting.

4. Model 1: Press key +/PRINT/HI or key -/G/N/LO to choose division; Press key ◀/M+/MR or key TARE/ ▶ to shift decimal point leftwards or rightwards.

   Model 2: If the division needed is not within the default common used value, long press key UNIT/SET to enter into division free setting based on the principle of 1/2/5 minmum division while the number rightest blinking; Press key ◀/M+/MR or key TARE/ ▶ to shift leftwards and rightwards; Press key +/PRINT/HI or key -/G/N/LO to change the value or shift the decimal point.

   Press key ZERO/ESC to save and enter into the calibration setting while press key ZERO/ESC to return to capacity setting without saving.

5. The window displays "*CAL*" when entering the calibration setting after finishing division setting. Press TARE/ ▶ to enter calibration setting. Press ZERO/ESC to return to weighing condition without saving.

5-2 Function Setting

1. Press key UNIT/SET to power on, or long press key UNIT/SET under normal weighing mode to enter function setting.

2. Press key ◀/M+/MR or key TARE/ ▶ to shift between the functions.

3. Press key UNIT/SET to enter the parameter setting.

4. Press key ◀/M+/MR or key TARE/ ▶ to shift between the function parameters.

5. Press ZERO/ESC to save and return. Long press ZERO/ESC to exit without saving.

6. Press ZERO/ESC toreturn to weighing condition.

5-3 Description of Parameter Values

1. ᴄᴴᴇᴄᴄ Offset value Displays the offset value and the keypad testing can be conducted.

2. ᴸ ᵢᵤᴴᴸ Backlight mode; available: 1, 2, 3 (the higher, the brighter)

3. $Po.u\overline{\tilde{u}Hu}$ **power saving mode**, available: 5, 10, 30, 60, OFF (enter into power saving mode with no action after 5, 10, 30, 60). LED display shows as a decimal dot under power saving condition.

4. $\overline{\tilde{H}u\tilde{L}\Omega}$ **Auto-off**

   Off : Non power off

   5, 10, 30, 60(less than 9d of gross weight) : Auto power off when "------" appears after keeping the scale unused for **5, 10, 30, 60**(minutes).

5. $\overline{\tilde{U}n\;\tilde{L}}$ **Unit setting**

   Init : Press key **Unit** to select the default unit when powering on the scale: kg, t, lb…, final (Final = keep the final being used unit when power off)

   Use: Press key **Unit** to select the using unit. **on** : Enable the unit **off** : Disable the unit

   Note: press UNIT/SET **to choose unit, and Press key** ◀/M+/MR **or key** TARE/ ▶ **to start or close.**

6. $\overline{?\tilde{L}r\Omega}$ **Zero range**

   d0, d1, d2, d3, d4 and **d5** (d= scale division)

   d0: the first division can be shown; d1: 2 times of division could be shown and it shows 0 when place the first division weight. d2~d5 are the like.

7. $\overline{L\tilde{h}J\tilde{I}}$ **Check weighing memory**

   on : Check weighing on when reboot   **off** : Check weighing off when reboot

8. $\overline{Lh.\tilde{J}L}$ **Check weighing function**

   On: Check weighing under the condition that the weight is within the limits and the stable indication appears.

   Off: Check weighing under the condition that the weight is within the limits

9. $\overline{bLLP}$ **Check Weighing buzzer beep**

   Hi: There will be a warning sound when the weight of articles exceeds the upper limit, and the weight is equal or more than 20d

   LO: There will be a warning sound when the weight of articles under the lower limit, and the weight is equal or more than 20d

   ok : There will be a warning sound when the weight of articles is between the upper and lower limit (including the upper and lower limits), and the weight is equal or more than 20d

   out : There will be a warning sound when the weight of articles is beyond the upper & lower limit, and the weight is equal or more than 20d

   no.beep: without beep

10. $\overline{PLr\,\tilde{I}}$ **External device, available choices:** ET, CX, PC, JMS, Godex , BIRCH, ZEBRA, GP, DMP, CK, T.CONT, EXCEL, U-KEY, LP-50

PC: computer

JMS: JADEVER management system

GODEX: Godex printer

BIRCH: Birch printer

ZEBRA: Zebra printer

GP: Adhesive sticker label printer

DMP: Dot matrix printer

CK: Thermal printer(Chinese available)

ET: Large LED display

CX: CX large screen display (version 0.02)

T.CONT: the output format is compatible with Toledo Continuous Mode

EXCEL: Work with the function of "Use Serial Keys" of Windows and transfer

the weight Data to Excel and other software. Reference to the user manual:

http://www.jadever.com.cn/Download.aspx.

U-KEY: Work with the U.KEY Connector to output the weighing data to Excel and other

software. Windows XP / Win7 system is available.

LP- 50: Adhesive sticker label printer

Note: if you want to use CK printer in Chinese, please contact with authorized personal to set.

11. $b\overline{Rud}$ RS-232 Serial Transmission Rate

Available: 9600, 4800, 2400.

12. $Prt\overline{n}$ Print mode   Available: key, stable, contin.

Key: Manual print by pressing key +/PRINT/HI

stable: Stable printing （weight is equal or more than 20d）

Contin: Continuous printing

13. $PrtF$ Print format

See the appendix (more than 100 formats. The appendix just shows two formats.)

14. $F\ iL$ Filtering setting   Options: 1, 2, 3, 4

Set the filtering level when the stable indication turns on. The higher the setting, the more stable the weighing condition.

15. $\overline{r}-t$ Tare/Zero condition

Stable: Only after the stable indication appears, Tare or Zero function acts after pressing key

TARE/ ►or ZERO/ESC

Always: Tare or Zero function acts by pressing key TARE/ ►or ZERO/ESC even if it is not

stable

Auto: Press key ⟨TARE/ ►⟩ or ⟨ZERO/ESC⟩ is available even if it is not stable, but Tare/Zero function acts only after stable.

16. ⌐ㄴㄴ RTC set

OFF: Disable RTC function

ON: Enable RTC function (set RTC to ON, press key ⟨UNIT/SET⟩ to show year, press ⟨UNIT/SET⟩ again to activate the setting, Press *M+* or *TARE* to shift the digit, press *HI/LO* to change the value, after year is set, press *Zero* to exit and save, and press *TARE* to shift to date/month setting, screen display month and date. Press ⟨UNIT/SET⟩ to activate the setting, Press *M+* or *TARE* to shift the digit, press *HI/LO* to change the value,after month or date is set, press *ZERO* to exit and save, and press *TARE* to shift to time setting. when time display, press ⟨UNIT/SET⟩ to activate the setting , press *M+* or *TARE* to shift the digit, press HI/LO to change the value, after time is set, press *ZERO* to exit. And again to save by pressing *zero* 3 times till you go back to weighing mode.

17. 0-oFF zero off-set function

OFF: not display the previous weight when powering on again

ON: display the previous weight when powering on again.

18. ⌐ㄴㄴㄴ Initialization

Press ⟨UNIT/SET⟩ for two times to initialization and display ok to finish initialization.

6. Calibration

Note: Before calibration, please set the unit first. The unit used in calibration is the one that has been set before. During the calibration procedure, press ⟨ZERO/ESC⟩ to return to normal weighing mode without saving. Press ⟨TARE/ ►⟩ to power on or after saving the division setting to enter into "CAL" mode.

Here we take 3kg/10g as an example

1. Press and hold ⟨TARE/ ►⟩while powering on. Do not release it till the window displays "*CAL*".

2. With no load on the weighing pan, press ⟨TARE/ ►⟩ to start zero point calibration and "*0.00*" is blinking.

3. Wait till the window displays the first calibration value "**1.00kg**" (the first calibration value is default value according to its 1/3 capacity). If you want to change the calibration value, press ⟨UNIT/SET⟩ to enter free setting mode. Press key⟨◄/M+/MR⟩ to shift leftwards, key ⟨TARE/ ►⟩ to shift rightwards. Press key ⟨+/PRINT/HI⟩ or key ⟨-/G/N/LO⟩ to modify value. Press ⟨ZERO/ESC⟩ to save and exit.

4. Place corresponding weigh and press $\boxed{\text{TARE/} \blacktriangleright}$ to finish the first calibration. (Note: After the first point calibration, the window can display the weight value. If no need for the other point calibration, move to step 6 to finish the calibration procedure)

5. Freely choose the point later to calibrate, If you have place weight of the first calibration at 1 kg, then place another 500g, and the windows will show 1.5kg. Then press $\boxed{\text{TARE/} \blacktriangleright}$ to finish the second calibration. Do the same to continue if you need.

6. Press $\boxed{\text{ZERO/ESC}}$, window shows "PASS", you can save and return to weighing condition.
   Note: the window will show "PASS" after finishing the fifth calibration and it will save and return back to weighing condition.

7. Operation
7-1 Weighing
Place item(s) to be weighed on the scale when there's no load on the weighing pan). The display shown is the gross weight. (Note: the desired weighing unit should be selected before weighing.)

$\boxed{0.000} \rightarrow \boxed{1.000}$

7-2 Tare and Preset tare
Tare

When weighing a sample that must be held in a container, tare is essential to do.

1. Under the weighing mode, place the container on the weighing pan, wait till stable symbol appears, then press the key $\boxed{\text{TARE/} \blacktriangleright}$. The container is tared. $\boxed{1.000} \rightarrow \boxed{0.000}$ (the net lights up now).

2. Place the item(s) to be weighed into the container. The weight displayed is the net weight. $\boxed{2.000}$

3. Remove all items from the weighing pan; the screen displays the tare value. $\boxed{1.000}$
4. To clear tare with an empty pan, press key $\boxed{\text{TARE/} \blacktriangleright}$ or key $\boxed{\text{ZERO/ESC}}$

Preset Tare

1. Long press key $\boxed{\text{TARE/} \blacktriangleright}$ for 3 seconds. The scale is now in digital inputting mode with the left-most digit blinking. $\boxed{0.000}$

2. Set tare value: Press key $\boxed{\blacktriangleleft\text{/M+/MR}}$ to shift leftwards, key $\boxed{\text{TARE/} \blacktriangleright}$ to shift rightwards, key $\boxed{\text{+/PRINT/HI}}$ to increase setting values and key $\boxed{\text{-/G/N/LO}}$ to decrease setting value.

3. Press key ZERO/ESC to save and return to weighing mode. $\boxed{1.000}$ ("-"light , " NET" light and "preset tare" light are all lamp on.)

4. Put the load on the container, the scale will automatically deduct the value of the container from the total value.

5. To clear tare with an empty pan, press key TARE/ ► or key ZERO/ESC

7-3 Check Weighing
Upper limit setting

1. Begin by pressing +/PRINT/HI. The scale is now in digital inputting mode with the left-most digit blinking and the HI/LO lights up.

   To set the value of upper limit, press key ◄/M+/MR to shift leftwards, key TARE/ ► to shift rightwards. Key +/PRINT/HI to increase setting values and key -/G/N/LO to decrease setting value. $\boxed{0.100}$
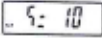
2. Press UNIT/SET to start or close check weighing function. (HI/LO lights up when start)
To save the upper limit and return to weighing mode, press key ZERO/ESC

Lower limit setting

1. Begin by pressing -/G/N/LO. The scale is now in digital inputting mode with the left-most digit blinking.

2. To set the value of lower limit, press key ◄/M+/MR to shift leftwards, key TARE/ ► to shift rightwards. Key +/PRINT/HI to increase setting values and key -/G/N/LO to decrease setting value. $\boxed{0.000}$
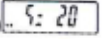
3. Press UNIT/SET to start or close check weighing function.

4. To save the Lower limit and return to weighing mode, press key ZERO/ESC

5. After finishing setting the upper and lower limiting value. Place the sample on the weighing pan:

If the sample weight is under the lower weight range while over or equal to 20d, the LOW lamp will light up. If the sample is within the lower and upper weight range while over or equal to 20d, the OK lamp will light up. If the sample is over the upper weight range while over or equal to 20d, the HI lamp will light up.

Note: weighing check will be open once enter into upper and lower limit setting. If the lower limit value is over upper value, then the upper value auto changes to the lower limit value.

7-4 Simple Counting

1. Press key UNIT/SET to select the unit "PCS".

2. Press key `-/G/N/LO` + key `TARE/ ►` the ex-factory default sample quantity (10pcs) is displayed. `5: 10`

3. Press Key `+/PRINT/HI` and key `-/G/N/LO` to choose sample amount. Available options are10, 20, 50, 100, 200, 500, 1000(pieces) `5: 20`

4. Put the corresponding samples on the weighing pan, and then press key `TARE/ ►` to confirm. " `5RnP` " is displayed momentarily before the display reverts to the sample quantity. `5RnP` → `20`

5. Remove the samples and put the load on the pan, the scale calculates the amount of the load.

6. If you want to go back to the normal weighing mode, remove the load and press key `UNIT/SET` to select the proper weighing unit.

Note:

1. The larger the sample amount, the more accurate the counting.

2. Symbol "▼" points at "UW" when calculated unit weight is lower than 4 / 5 of scale division.

7-5 Accumulation, Accumulation Display and Accumulation clear

Accumulation

Under the weighing mode, put the item on the weighing pan. Press key `◄/M+/MR` at the appearance of "◣ ◢". "`Rddu I`" is displayed momentarily before the display reverts to the weight of the item.

Remove the item and the display goes back to zero before the next accumulation can register.

（The maximum is 99 pieces, display the latest 10 accumulation events in details ）

Accumulation Display

Long press key `◄/M+/MR` to display the accumulation data.

Press `◄/M+/MR` or key `TARE/ ►` to check the total accumulation and each accumulation event in details.

Accumulation Clear

To clear accumulation data (total accumulation data or one of the accumulation events). Press `◄/M+/MR` or key `TARE/ ►` to the window which data is needed to be deleted and press key `-/G/N/LO`. When the total accumulation data is deleted, the sign "▼" disappeared and turn back to weighing mode. To exit and return to normal weighing mode , press key `ZERO/ESC`

7-6 Printer initialization by the indicator operation (optional function)

1. Press UNIT/SET while powering on to enter parameter setting. Press ◄/M+/MR or key TARE/ ► to $P\mathcal{E}r$ ι

2. Press UNIT/SET to enter the external device setting. Press ◄/M+/MR or key TARE/ ► to choose the printer model.

3. Shift to certain printer model. Press UNIT/SET and the window will show "UNSUP" or "INIT?" "UNSUP" means the printer is no need for initialization. Press key ZERO/ESC to return.
"init?" means the printer is should be initialized. Press UNIT/SET to initialize the printer, and it shows init..., and it shows the printer model after one second. Repeat to press key ZERO/ESC to return to $P\mathcal{E}r$ ι. Press ZERO/ESC again to turn back to weighing condition. If you don't want to initialize this printer, then press ZERO/ESC to cancel and window shows the printer model. Press ◄/M+/MR or key TARE/ ► to choose other printers which needed to be initialized.

8. Input commands (optional)

Connect the indicator with computer. Choose PC in $P\mathcal{E}r$ ι, and the print format as **KEY.** Run serial port debugging program on the computer. Input the capital number "Z", "T", "R" , "C" , "P" in the sending area, and the indicator can conduct the corresponding actions and there is sound of key.

R/P=Reading Weighing

Z= Zero

T= Tare

C=Cancel Tare

9. Error message

Error Message	Problem	shootings
ERR0	Exceed the zero range	The item should be within 2% of full load
ERR1	Resolution exceeds 300 to 300000, or the capacity setting is disordered.	Modify resolution or modify resolution after setting the capacity

ERR2	Zero point exceeds 30% of full load	1. Check whether there are other alien articles on the scale pan, remove those articles. 2. Not do calibration, then calibrate at once. 2. LOAD CELL failure, which requires to be changed or to contact our Service.
ERR3	Exceed the A/D resolution range	1. Check whether it is A/D failure, if yes, please replace AD. 2. LOAD CELL failure, replacement is required or contact our Service.
ERR4	EEPROM failure	Re-sold EEPROM or contact our Service.
ERR5	Overload condition	Remove weight that is greater than the scale capacity from the pan.
ERR6	Exceeds the display range	--
ERR7	Accumulated number of weights exceed the display range	Delete the accumulated number which exceeding display range
ERR8	The upper or lower limit value exceeds full load value	Reset the upper and lower limit value
ERR9	Exceed tare or pre-tare range	The tare value should be over zero and less than or equal to full load.
ERR10	Wrong calibration weights	1. The higher resolution, the lower A/D value. (different resolution influences different A/D value) 2. check whether the calibration value is the same as last calibration value 3. place the right calibration value to calibrate and the calibration value should be less than or equal to full load.

Appendix 1: Printing format (Optional)

Printing Device	Format	Sample
PC	prt-01	1. 000 kg

	prt-02	G.W.: 1. 500 kg T.W.: 0. 500 kg N.W.: 1. 000 kg
	prt-03	1. 000 kg
	prt-04	ST GW + 100. 00 kg UT GW + 100. 00 kg UT NW − 200. 00 kg ST NW − 200. 00 kg ST: stable; UT: unstable; NW: net weight; GW: gross weight
	prt-05	ST, GS, + 100. 00kg US, GS, + 100. 00kg US, NT, − 200. 00kg ST, NT, − 200. 00kg ST: stable; US: unstable; NT: net weight; GS: gross weight
	prt-06	ST, + 100. 00kg ST, − 100. 00kg "ST," is the prefix
	prt-07	+ 100. 00kg
	prt-08	⌐+00002621=└

BIRCH/GODEX/ZEBRA/CK/ GP	prt-01	1. 000 kg
	prt-02	G.W.: 1. 500 kg T.W.: 0. 500 kg N.W.: 1. 000 kg
CK (Chinese version)	prt-02	毛重: 1.48 kg 扣重: 0.00 kg 净重: 1.48 kg
DMP	prt-01	1. 000 kg
	prt-02	G.W.: 100.00 kg T.W.: 0.00 kg N.W.: 100.00 kg
ET	prt-01	EtOut: 1. 00 kg
U-key	prt-01	0.985

NOTE:

The printing sample could be of different kinds of formats. When there is specific demand about the format, conduct as follows

1) As for **BRICH/GODEX/ZEBRA/GP** printers, the factory designs the format as planned and email to the user. Add the format into the previous format file via computer. Then it is successful to add the new format and able to print the new format.

2) As for **DMP/CK** printer, it needs to change the scale design