

# User Manual

## Waterproof Weighing Scale

### ELW Plus / ESW Plus

### ELW AirCharge / ESW AirCharge

© Excell Precision Limited. All rights reserved Worldwide.

The information contained herein is the property of Excell Precision Limited and is supplied without liability for errors or omissions. No part may be reproduced or used except as authorized by contract or other written permission. The copyright and the foregoing restriction on reproduction and use extend to all media in which the information may be embodied.



6F, No. 127, Lane 235, Baoqiao Rd., Xindian District,  
New Taipei City 23145, Taiwan



[pm-all@excell.com.tw](mailto:pm-all@excell.com.tw)



+886-2-8919-1000



<https://www.excell-scale.com>



+886-2-8919-2209

V23.0215

# Table of Content

INSTRUCTION FOR USE .....	1
PREPARING TO USE THE SCALE.....	1
CHAPTER 1 INTRODUCTION .....	2
1-1 Features and Specifications.....	2
1-2 Power Supply.....	2
1-3 Panel and Keyboard Introduction .....	4
1-4 Self-Test Mode .....	6
1-5 Error Messages.....	7
1-6 Weight Unit .....	7
CHAPTER 2 ADVANCED FUNCTIONS.....	8
2-1 01 FnC General Function .....	8
2-1-1 FnC 01 Automatic Backlight Function Setting.....	8
2-1-2 FnC 02 Automatic Power-off Timer Setting.....	9
2-1-3 FnC 03 Hi/Lo/OK Function Setting.....	9
2-1-4 FnC 04 Restore to the Default Setting .....	10
2-1-5 FnC 05 Noise Filter Setting.....	10
2-1-6 FnC 06 Hold Function Setting.....	10
2-1-7 FnC 07 Auto Unit Weight Averaging Setting .....	11
2-1-8 FnC 08 Two Weighing Units Setting .....	11
2-1-9 FnC 09 Unstable Tare .....	11
2-2 02 EC Weight Calibration.....	12
APPENDIX 1 COMMAND MODE & OUTPUT DATA FORMAT.....	13
APPENDIX 2 7-SEGMENT DISPLAY CHARACTERS.....	15

## Check Firmware Version

Turn off the scale and hold **TARE** key, then turn on the scale and hold **ZERO** key. Display 01 Adc. Press **ZERO** key twice, then display 03 VEr. Press **TARE** key. Display firmware version 02026 or 02031. Press **TARE** key. Display maintenance number 1XX (lead acid battery) or 4XX (dry battery) or 8XX (lithium battery) for 2 seconds. Turn off and turn on scale to return to weighing mode.




Thank you for purchasing waterproof weighing scale. In order to use the scale properly, please read this instruction carefully before use. If you have a problem concerning the scale, please contact your supplier.

## Instruction for Use

1. Please keep the scale in a cool dry place. Do not store it at high temperature.
2. Avoid objects impacting with the scale. Do not drop loads onto the scale or subject the weigh pan to any strong shock loads.
3. The load placed on the weigh pan must not exceed the maximum weighing capacity of the scale.
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 any moisture build up.
5. Please operate or charge the scale in an open area. Do not squeeze the power cord to avoid wire on fire.
6. Operating temperature:  $-10^{\circ}\text{C} \sim +40^{\circ}\text{C}$
7. Please operate the scale in indoor spaces under a height of 2000m.
8. If the device isn't operated appropriately, it may void the warranty on your device.
9. Please feel free to contact if there is any suggestion for this product.

## Preparing To Use the Scale

1. Adjust the four levelling feet (if fitted) to set the scale pan level using the spirit level bubble located at the front of the scale.
2. Avoid operating the scale in direct sunlight or drafts of any kind.
3. If possible avoid connecting the scale to ac power outlet sockets which are adjacent to other appliances to minimise the possibility of interference affecting the performance of the scale.
4. Remove any weight that might be on the weigh pan before the scale is switched on and avoid leaving weight on the pan for long periods of time
5. All goods weighed should be placed in the centre of the weigh pan for accurate weighing. The overall dimensions of the goods being weighed should not exceed the dimension of the weigh pan.
6. We suggest to warm up the scale for 15~20 minutes before operation to ensure best accuracy.
7. When  symbol keep flashing on the display, please charge the batteries soon.





# Chapter 1 Introduction

## 1-1 Features and Specifications

- ◆ Sealed waterproof silica gel strip blocks water from infiltrating into the scale.
- ◆ Surrounded by waterproof grade sheeting to ensure the water free.
- ◆ 1/3,000~1/6,000 display resolution available.
- ◆ ESW Plus and ESW AirCharge adopt stainless steel housing while ELW Plus and ELW AirCharge adopt plastic ABS housing.
- ◆ High speed of 24bits AD fast reacts and shortens the weighing operation duration.
- ◆ Selectable units: Kilogram (kg), gram (g), ounce (oz), and pound (lb) weighing units available.
- ◆ Built-in rechargeable battery can be easily replaced.
- ◆ Well-designed protection point for transportation.
- ◆ Low power indication and auto power off.

## 1-2 Power Supply

### Power Supply Selection and its Power Consumption

#### ● DC 6V / 4Ah rechargeable battery, AC 100V~240V (±10%) adapter

Power Consumption: 29 mA (system no backlight)	about 153 hours
80 mA (system backlight)	about 50 hours

### Storage battery safety precautions

Due to the storage battery adopt the advanced free-maintaining technique, customers need not to replenish electrolyte. The scale should be recharged every 3 months to prevent failure of the internal rechargeable battery.

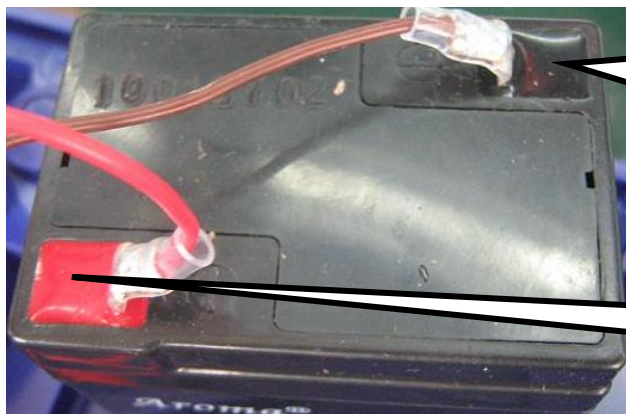
1. The battery should be charged for 8~10 hours.
2. The temperature of battery should below 45°C.

### Maintaining

1. Please do not discharge with over-current when using the battery. Please charge the battery after discharging current.
2. Please take down the battery when the scale is not used for a long time or break the connection of cathode.
3. Do not short the battery terminals to check whether there is current. Please check whether the connection point is firm to guarantee good connection.
4. The battery should be replaced by professional. Otherwise reverse-battery or the product **will be damaged.**



- Anode(+) of battery should be connected with Anode of product battery (usually red cable)
- Cathode(-) of battery should be connected with Cathode of product battery (usually



Brown cable(or black cable)  
connected with Cathode of  
battery

Red cable connected with  
Anode of battery

## Safety warnings

- The electrolyte of battery is caustic which causes metal, cotton, etc to corrode.
- The hydrogen will be resolved when using or charging the battery and it will cause explosion when approaches fire.



No burning



Caution Corrosion



Warning explosion



Children faraway

## ② Dry battery: 4 x D size dry batteries (alkaline, IEC LR20) (not included)

Power Consumption: 30 mA (system no backlight)  
36 mA (system backlight)

about 400 hours  
about 200 hours

## ③ Wireless Charging: AirCharge

Power Supply: adapter 100V~240V(50~60Hz) Battery: 3.7V 6100mA (18650 dual battery)

AirCharge: 12V/1.5A (15W) output Qi TX module

Wipower(out of production): DC5V/2A (5W)output Qi TX module

Power Consumption: 29 mA (system no backlight)  
80 mA (system backlight)

about 102 hours  
about 37 hours

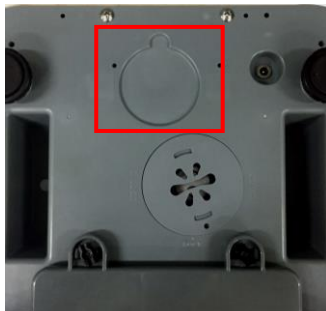
- While the scale is charging, the spacing between charging plate and scale shall be within 2mm. Metal objects are prohibited between the spacing; otherwise, it might cause overheating or burning.
- Charging without battery will cause charging indicator to flash red and green. Please avoid that.



Plug in wireless adapter



Position hole is located the bottom of the scale



Raise the scale and aim the point near the center. Slide the charging plate and attach to the position hole



Try to move around the charging plate and ensure it is unmovable



Charging indicator on the display will show:


Red indicates it is charging

Green indicates it is fully charged



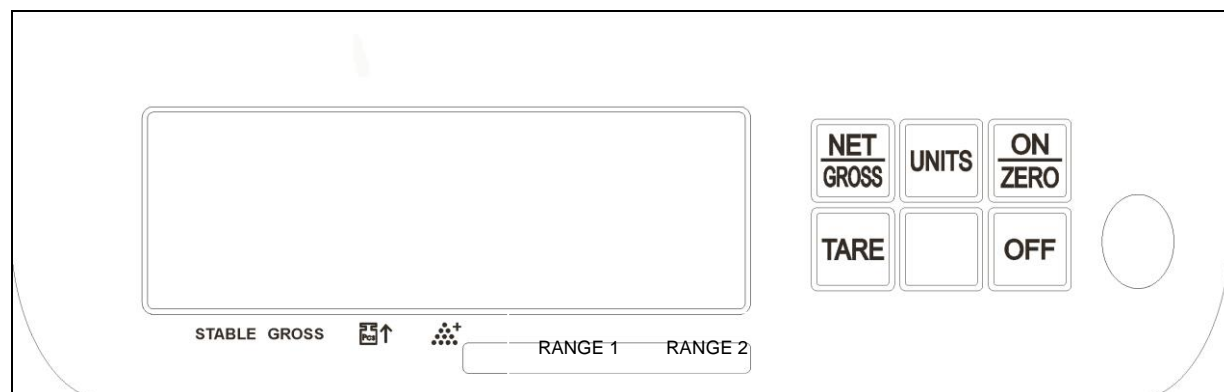
## Low Battery Warning

When  symbol keep flashing on the display, the battery should be recharged right away.

 Voltage under low power  $\approx$  5.6V DC (lead acid battery)

or 3.8 V DC (dry battery)  $\approx$  3.4V DC (lithium battery)



## 1-3 Panel and Keyboard Introduction







## Icon Introduction

STABLE	: The weight is stable.
GROSS	: The scale is in the gross mode. The display shows the goods and any container weight. This Gross status indication is on when the TARE function is used.
	: The unit weight is not sufficient. When the icon is on, the counting function is operational but the count may contain errors.
	: The sampling size is not sufficient. When the icon is on, the counting function is operational but the count may contain errors.
RANGE 1	: Only available for multi-range models
RANGE 2	: Only available for multi-range models


## Keyboard Function

### OFF KEY

When the scale is switched on, press the **OFF** key, the scale will switch off.


### ON/ZERO KEY

This key possesses two functions: ❶Power On and ❷Zero function.

 When the weigh pan is empty (free of load) and the display is not showing zero, press the **ON/ZERO** key to zero the scale. At zero, the “→0←” indication is on.

### UNITS KEY

Press the **UNITS** key to switch weight units; the icons will indicate the active units.

 After power off, the scale will memorize the active units. When the scale is powered on again, it displays the previously active units.

### TARE KEY

The tare function will not operate during the following conditions:


1. When the scale powers on if the weight is negative and after a container is placed on the weigh pan if the weight is still below zero.
2. The tare value is over the full scale capacity.

❶ Put a container on the weigh pan and after the weight is stable, press the **TARE** key to zero the weight of the container. The screen displays the “Net” icon.

❷ Put the goods in the container, the screen displays the net weight value of the goods.

❸ Remove the full container; the screen displays the negative weight value of the container. At this time pressing the **TARE** key again will cancel the tare and the scale reverts back to zero. The “Net” icon is switched off.

 The tare function can be operated continually to the full weighing capacity of the scale.

 Continual tare operation is adding or removing tare objects on weigh pan and pressing the **TARE** key each time.

### NET/GROSS KEY

In the Tare mode, the screen displays the “Net” icon, press the **NET/GROSS** key to



switch between the “Net value” and the “Gross value”.

When the ▼ GROSS icon is on, the weight value on the display is the total amount of the tare value and net value.

At the Gross status, only [OFF] and [NET/GROSS] keys are functional.

[NET/GROSS] key is only used in Tare mode.

## SIMPLE COUNTING FUNCTION

Use the [UNITS] key to enter into the “PCS” mode

① Press the [NET/GROSS] key to select the counting sample size

(S = 10, S = 20, S = 50, S = 100, S=200).

The LCD shows [ 10 ], [ 20 ], [ 50 ], [ 100 ], [ 200 ] in order.

② Put the samples on the weigh pan and press the [UNITS] key, the screen displays “-----”.

After the sampling process is complete, put the goods on the weigh pan and the screen shows the quantity of the items.

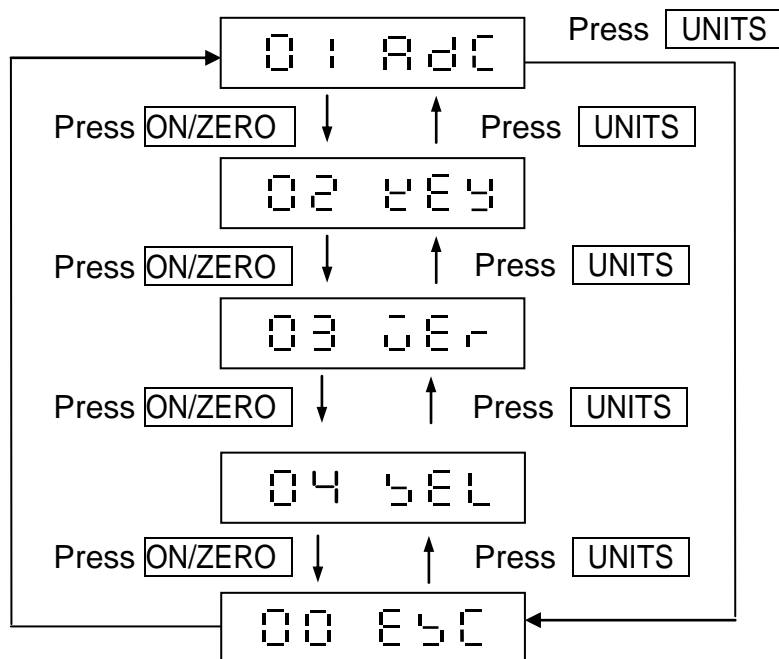
The sample weight should be heavier than the minimum capacity of the scale (20d), if not the arrow pointing to the icon(▼) will be activated.

To power off in this mode, the scale will memorize the “Pcs” unit. When the scale is powered on again, it directly enters the simple counting mode.

While the “Auto unit weight average” function is available in the Advanced Function, the goods on the weigh pan are 5pcs greater than the sample size and less than double the sample size, the scale will automatically re-sample the unit weight.

## 1-4 Self-Test Mode

Set the switch SWA1 on the bottom of machine to the LOCK position. When power is off, hold [NET/GROSS], and press [ON/ZERO] key, Wait till display shows 01 Adc to enter “Self-Test Mode”.





**01 ADC INTERNAL VALUE MODE** (must hook up Load Cell to test)

- ① Press **TARE** to enter, and the display shows internal value
- ② Please check whether the internal value has changed obviously with weight changing.
- ③ Please check the backlight.
- ④ Press **ON/ZERO** key to back to the last screen , the display shows 01 ADC

**02 EEY KEYPAD TEST MODE**

- ① Press **TARE** to enter, display shows EEY 07  
Keypad's internal code: **TARE** key= 07, **NET/GROSS** key=06, **UNITS** key= 05
- ② Press **ON/ZERO** key to back to the last screen , the display shows 02 EEY

**03 EEr FIRMWARE VERSION DISPLAY MODE**

- ① Press **TARE** to enter , display shows the firmware version 02026 or 02031
- ② Press **TARE** key again, the display shows maintenance number 1XX (lead acid battery) or 4XX (dry battery) or 8XX (lithium battery) for 2 secs
- ③ Press **ON/ZERO** key to back to the last screen, display shows 03 EEr

**04 SEL LEAD SEAL MODE**

- ① Press **TARE** to enter , display shows the lead seal number of times 1
- ② Press **ON/ZERO** key, back to the last screen, the display shows 04 SEL
- ③ When the number is "999" and can't enter internal value mode, open the scale and adjust SQA1 to ADJ, reset the number back to 1

**00 ESC BACK TO THE LAST SCREEN**

Press **TARE** key to exit self-test mode, the scale will restart automatically.

## 1-5 Error Messages

E1 ⇒ Initial zero is higher than the zero range when switching the indicator on. (Approval models)

E2 ⇒ Initial zero is lower than the zero range when switching the indicator on. (Approval models)

E4 ⇒ Internal value is below Zero.

oL ⇒ The weight of the object is over 9 divisions of the maximum capacity.

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

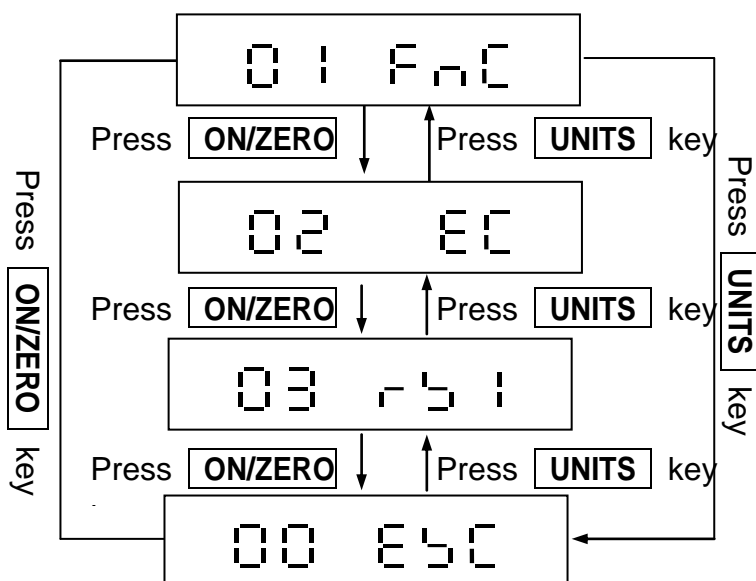
## 1-6 Weight Unit

kg	1 g = 0.001 kg
g	1 g = 1 g
lb	1 g = 0.002204623 lb
oz	1 g = 0.03527396 oz



## Chapter 2 Advanced Functions

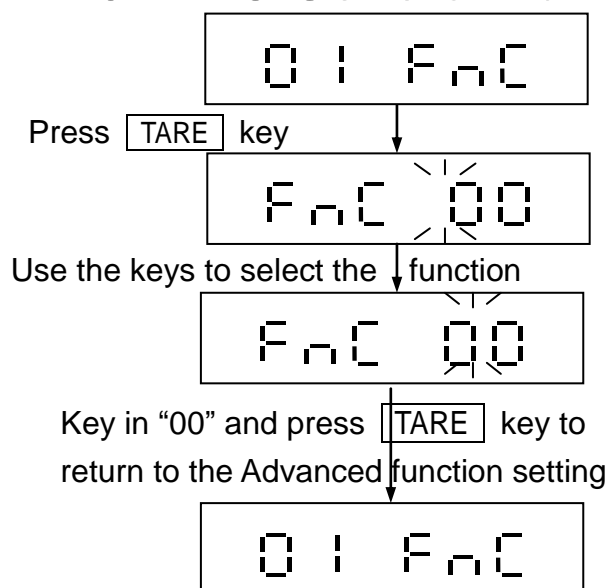
In the weighing mode, press the **NET/GROSS** and **ON/ZERO** keys at the same time to enter the **Advanced Function** setting mode. The LCD shows 01 FnC.



01 FnC ⇒ General Function setting mode  
 02 EC ⇒ External Weight Calibration  
 00 ESC ⇒ Exit the Advanced Function setting mode

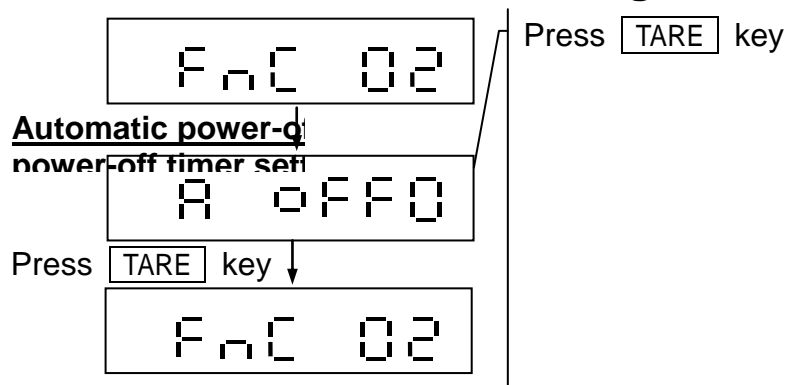
For Brazil approval models, only when the unit weight is 0 can we enter the advanced function setting mode. Returning to the weighing mode by 00 ESC, LCD would display E1 if the unit weight exceeds 2% of the high limitation. It will reset automatically until the unit weight is lower than 2% of the high restriction.

### 2-1 01 FnC General Function



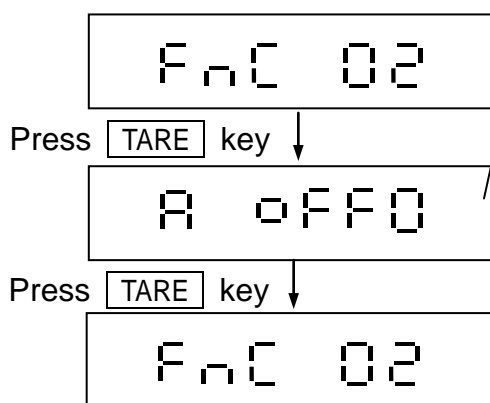
FnC 00 ⇒ Back to the previous level  
 FnC 01 ⇒ Automatic Backlight Function Settings  
 FnC 02 ⇒ Automatic Power-off Timer Settings  
 FnC 03 ⇒ Hi/Lo/OK Settings  
 FnC 04 ⇒ Restore the Default Settings  
 FnC 05 ⇒ Noise Filter Settings  
 FnC 06 ⇒ Hold Function Settings  
 FnC 07 ⇒ Auto Unit Weight Averaging Setting  
 FnC 08 ⇒ Two Weighing Units Setting  
 FnC 09 ⇒ Unstable Tare

#### 2-1-1 FnC 01 Automatic Backlight Function Setting





## 2-1-2 FnC 02 Automatic Power-off Timer Setting



**ON/ZERO** key ⇒ Upward key (from 0 to 9)  
**UNITS** key ⇒ Downward key (from 9 to 0)  
**TARE** key ⇒ Move the cursor to right  
**NET/GROSS** key ⇒ Move the cursor to left.

### Automatic power-off timer setting

Use **ON/ZERO** or **UNITS** key to key in parameter

0 ⇒ No auto power-off

1 ⇒ When the scale is idle for 1 minute, the scale automatically switches off

2 ⇒ When the scale is idle for 2 minutes, the scale automatically switches off

⋮

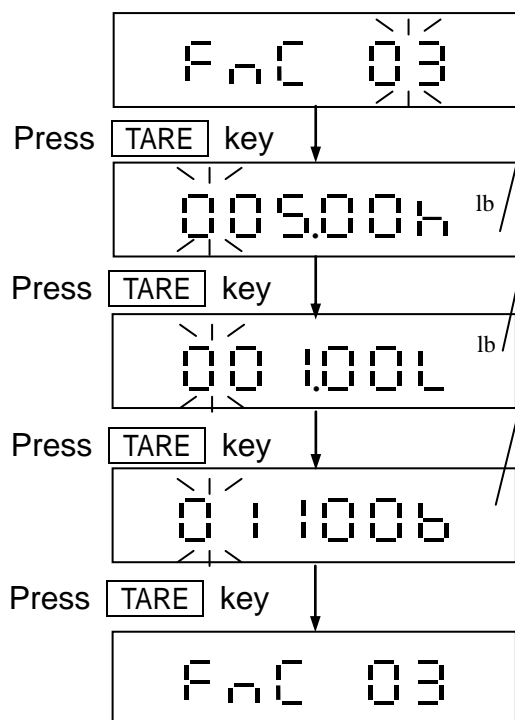
9 ⇒ When the scale is idle for 9 minutes, the scale automatically switches off

### Automatic power-off function

When the scale is idle near zero (< 10d) without any key being pressed, the scale will automatically switch off once it reaches the set time (1~9 minutes).

## 2-1-3 FnC 03 Hi/Lo/OK Function Setting

When the high limit and low limit are both set as "0", the Hi/Lo/OK function is disabled. This function is available in all unit modes. In one specific unit mode, enter FnC 03 to set the Hi/Lo/OK values.



LCD displays the last saved status. Key in the desired high limit value, then press **TARE** key.

LCD displays the last saved status. Key in the desired low limit value, then press **TARE** key.

LCD displays the last saved status.

### Alarm setting

00000b  
 (a) (b) (c)

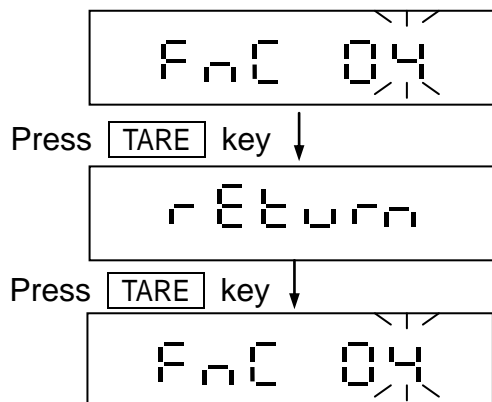
(a) ⇒ 1 = beep sound on  
 0 = beep sound off

(b) ⇒ 1 = beep sound on when stable  
 0 = beep sound on when unstable

(c) ⇒ 1 = beep sound on when the weight is between high and low limits  
 0 = beep sound on when the weight is not between high and low limits and higher than 10d



## 2-1-4 FnC 04 Restore to the Default Setting



Use **ON/ZERO** or **UNITS** keys to select “return” or “format”

**return** ⇒ Return (Cancel the restoration)

**Format** ⇒ Restore to the default setting

The default setting includes the following:

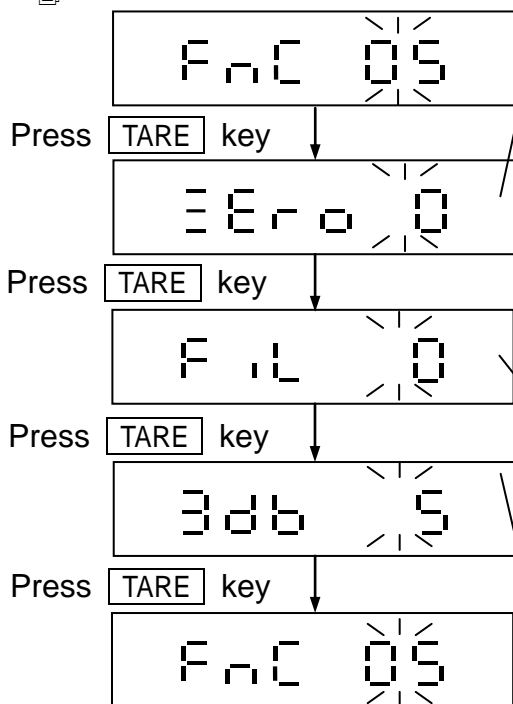
- 1) External weight calibration
- 2) HI/LO/OK setting value
- 3) Noise filter setting (External)
- 4) Sampling setting for the counting function

FnC 04 Setting is only available for non-approval models. (CFN02=0)

If FnC 04 is set to Format, and the scale has not been restarted automatically. Please ensure to restart the scale manually

## 2-1-5 FnC 05 Noise Filter Setting

Select FnC 05 in the General Function setting mode 01 FnC to set the noise filter setting



### Returning to the zero point setting

Use **ON/ZERO** or **UNITS** key to key in the parameters or zero point. Default setting = 0

When the weight on the scale is over 1/3 full capacity, the function is on.

0 ⇒ 0	4 ⇒ ± 4d	7 ⇒ ± 7d
1 ⇒ ± 1d	5 ⇒ ± 5d	8 ⇒ ± 8d
2 ⇒ ± 2d	6 ⇒ ± 6d	9 ⇒ ± 9d
3 ⇒ ± 3d		

### Digital switch & Stabilization range setting

Use **ON/ZERO** or **UNITS** keys to key in the parameters. Default setting = 0

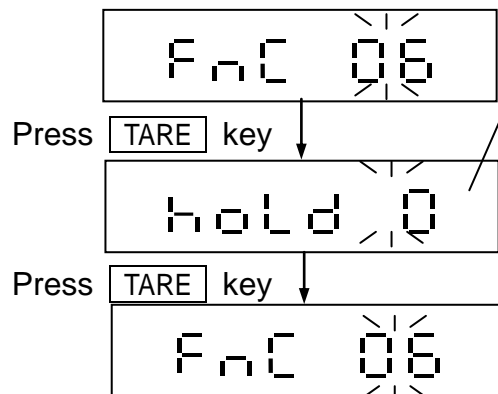
Parameter 0 ~ 9, the larger the number the more stable the weight.

### Filter parameter setting

Use **ON/ZERO** or **UNITS** keys to key in the parameters.

Default setting = 5 Parameter 0 ~ 9, the larger the number, the faster the filter response. Fast response can lead to weight instability.

## 2-1-6 FnC 06 Hold Function Setting



### Hold function setting

LCD displays the last saved parameter setting

Use **ON/ZERO** or **UNITS** keys to key in the parameters

Default setting = 0

- 0 ⇒ Hold function disabled
- 1 ⇒ “Peak hold” mode
- 2 ⇒ “Stable hold 1” mode
- 3 ⇒ “Stable hold 2” mode

FnC 06 Setting is unavailable for Brazil models and approval models.



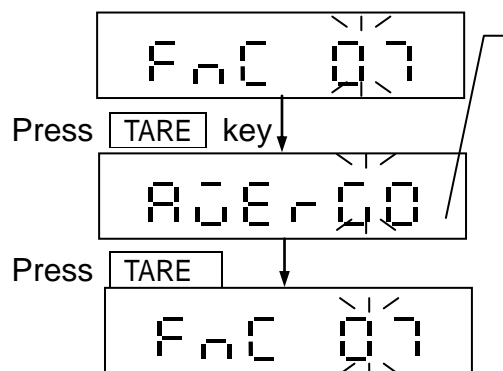
hoLd 0 = **Hold function disabled**

hoLd 1 = **“Peak hold” mode** Keep displaying the maximum weight when the weight is continually changing. To exit this mode, press any key

hoLd 2 = **“Stable hold 1” mode** When the weight is stable, the LCD shows the current weight value. To exit this mode, press any key

hoLd 3 = **“Stable hold 2” mode** When the weight is stable, the LCD shows the current weight value. When the weight returns to zero (<10d), the hold mode is cancelled automatically.

## 2-1-7 FnC 07 Auto Unit Weight Averaging Setting



### Auto unit weight averaging setting

LCD displays the last saved parameter setting

Use **ON|ZERO** or **UNITS** keys to key in the parameters

Default setting = 0

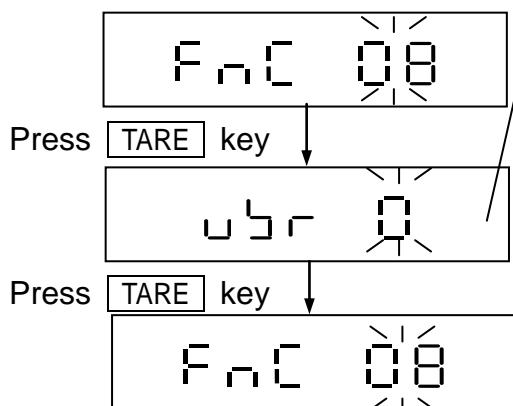
0 ⇒ Auto unit weight averaging

1 ⇒ Disable auto unit weight averaging

☞ If CFN02=4, CFN05=OFF, FNC 07 setting is unavailable.

☞ FnC 07 Setting is unavailable for Brazil models.

## 2-1-8 FnC 08 Two Weighing Units Setting



### Two weighing units setting

LCD displays the last saved parameter setting

Use **ON|ZERO** or **UNITS** key to key in the parameters for two weighing units

Default setting = 0

0 ⇒ two weighing units function is not activated

To activate two weighing units, please set the 2nd weighing unit to be:

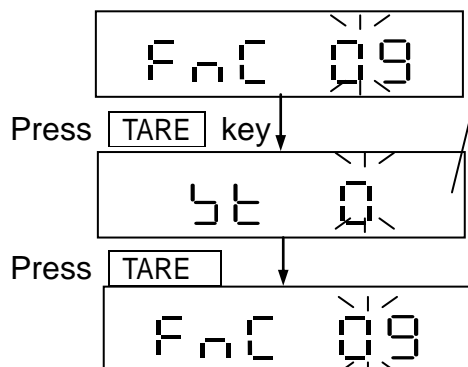
1 ⇒ 2nd weighing unit in CSP 01

2 ⇒ 3rd weighing unit in CSP 01

3 ⇒ 4th weighing unit in CSP 01

If it set to 1~3, it only displays the 1st weighing unit and the selected 2nd weighing unit

## 2-1-9 FnC 09 Unstable Tare



### Unstable Tare setting

LCD displays the last saved parameter setting

Use **ON|ZERO** or **UNITS** key to key in the parameters for second weighing unit

Default setting = 0

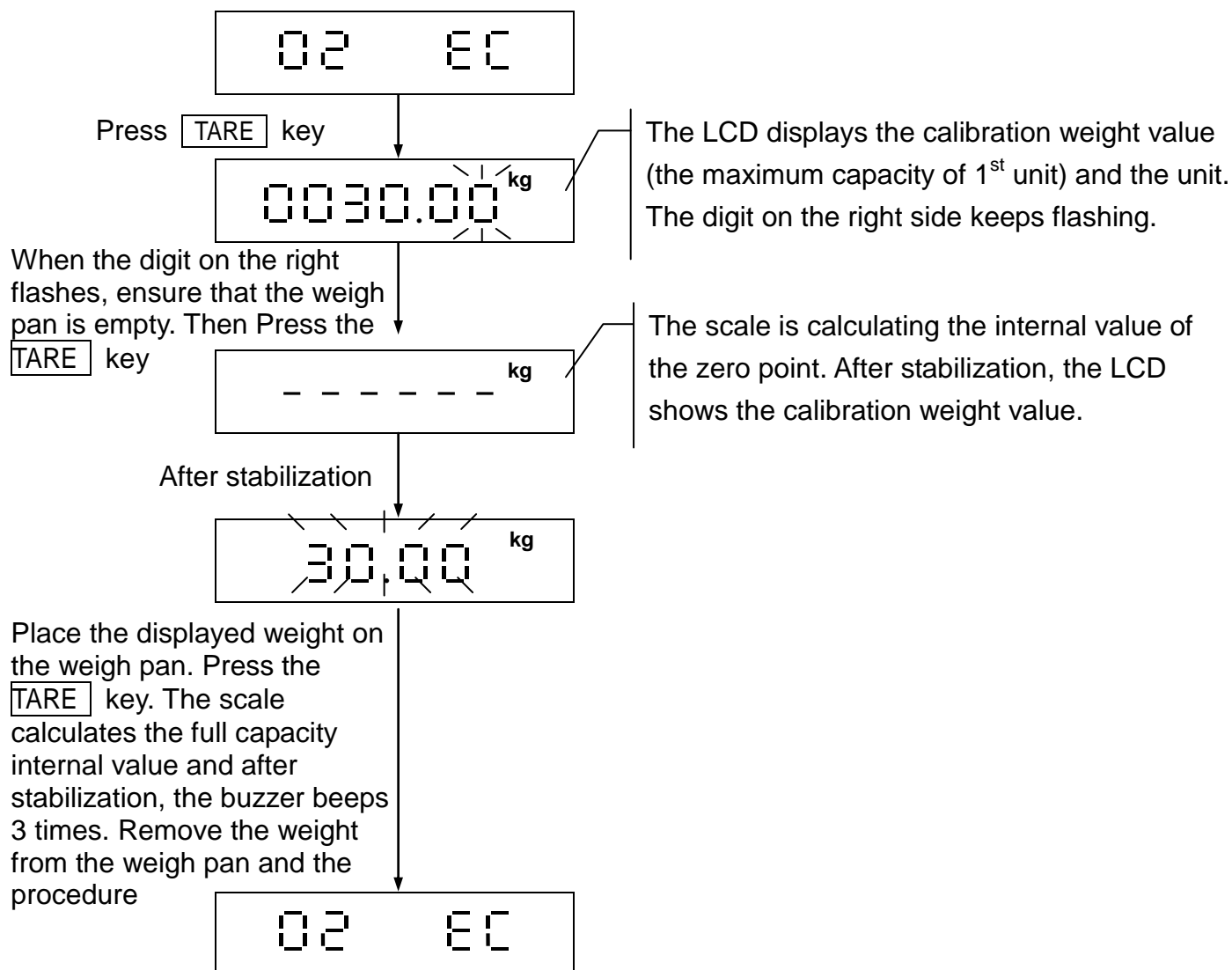
0 ⇒ Disable tare operation while unstable

1 ⇒ Enable tare operation while unstable

☞ Only available for non-approval models. (CFN 02=0)



## 2-2 02 EC Weight Calibration



Unavailable for approval models can't enter weight value mode by 02 EC

**Weight calibration conditions:**

The calibration weight value placed on the weight pan must be over 100e, and must be within the 90% and 110% of the full weight





# Appendix 1 Command Mode & Output data format

only work with models have WIFI card or BLE card installed inside

Command Mode

## Command Format A

Host	Command			
Slave			Command	

MZ	Zero	UA	Switch to the first weighing unit
MT	Tare	UB	Switch to the second weighing unit
MG	Gross weight		
MN	Net weight		
CT	Clear TARE value		

**Note:** UB depends on the setting in FnC08

## Command Format B

Host	Command			
Slave			Data	

RG	Read Gross weight
RN	Read Net weight
RT	Read TARE

**Note:** add % before the command to read continuously

## Read HIGH/LOW values in FnC 03 RS○○□□

○○: Weighing unit (00 ~ 09)    □□: Setting Items

HI	HIGH value
LO	LOW value

**Note :** ○○( weighing unit) is various depended on models  
00 ⇒ The first weighing unit

<b>EX:</b>	RS02LO<CR><LF>	Read LOW values
<b>ANS:</b>	RS02LOXXXXXX<CR><LF>	

## Command Format C

Host	Command+ Data			
Slave			Command+ Data	

## Write HIGH/LOW values in FnC 03 WS○○□□XXXXXX

○○: Weighing unit (00 ~ 09)    □□: Setting Items    XXXXXX: Setting Value

HI	HIGH value
LO	LOW value

**Note :** ○○ (Weighing unit) is various depended on models



00 ⇒ The first weighing unit

EX:	WS00HI001000 <CR> <LF>	Write HIGH values
ANS:	WS00HI001000 <CR> <LF>	

## Command Format D

Host	Data	
Slave		

Value (e.g. Price)						Position of decimal point	CR	LF
1	2	3	4	5	6	1		

When the Slave receives this data format, it will transfer the data and display it on its LCD.



12345.6

Only effective when the weight value is over 10d.

The above 4 (ABCD) command formats are RS232 bi-directional. The following error messages might be received by Slave terminal (scale).

Error messages:

E1: Wrong command

E2: Command format error (Wrong parameters)

E3: Do not match with the executing conditions for Command

## Output Data Format

6 places ( first decimal place not included)

Weight format

Gross	S	T	,	G	S	,	+	1	2	3	4	5	6	7	SP	SP	o	z	CR	LF
Net	S	T	,	N	T	,	+	.	2	3	.	4	5	6	t	l	.	g		
Tare	S	T	,	T	R	,	+	1	2	.	3	4	5	6	SP	SP	k	g		
Plus OL	O	L	,	G	S	,	+	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP		
Minus OL	O	L	,	G	S	,	-	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP		
Unstable	U	S	,	G	S	,	+	1	2	3	4	.	5	6	SP	SP	l	b		

## Serial Data Transfer/Receive Format

		LSB		MSB		1
n , 8 , 1	S	8-bit data			STOP	0

Note:

S	:	Start bit
STOP	:	Stop bit
P	:	Parity bit



## Appendix 2 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				





