

BH3

Precision Balance

User Manual



© Excell Precision Limited 2017. 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 authorised 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.



Table of Contents

PRECAUTIONS FOR USE 3

PREPARING TO USE THE BALANCE 3

PROTECTION IN THE TRANSPORTATION..... 4

CHAPTER ONE PRODUCT FEATURES..... 5

 1-1 Features 5

 1-2 Specifications 6

 1-3 Plastic Shield Installation & Dimension 8

 1-4 Description of Power Supply 9

 1-5 Error Messages..... 9

 1-6 Display 10

 1-7 Keyboard Function 10

CHAPTER TWO OPERATION INSTRUCTIONS 11

 2-1 Zero Function 11

 2-2 Simple External Calibration 11

 2-3 Operation Mode Conversion 11

 2-3-1 Weighing Mode..... 12

 2-3-2 Counting Mode 13

 2-3-3 Percentage Mode 14

CHAPTER THREE FUNCTION SETTINGS 15

 3-1 GENERAL FUNCTION SETTING 01 Fnc 16

 3-1-1 First Unit Setting Fnc 01 17

 3-1-2 Operation Units Setting Fnc 02 18

 3-1-3 Auto-Off Timer Setting Fnc 03 18

 3-1-4 Backlight Mode Setting Fnc 04 20

 3-1-5 Noise Filter Setting Fnc 05 21

 3-1-6 Forward Zero Display Setting Fnc 06 22

 3-1-7 Backward Zero Display Setting Fnc 07 23



3-1-8 Auto Unit Weight Averaging Setting	F n C 08	24
3-1-9 Zero Tracking Range Setting	F n C 09	25
3-2 Weight Calibration and Gravity Compensation	02EC	26
3-2-1 External Weight Calibration	EC 01	27
3-2-2 Gravity Compensation	EC 02	28
3-2-3 Restore to the Default Setting	EC 03	29
3-3 RS232 SERIAL INTERFACE SETTING	03 r 5 1	30
3-3-1 Transmission Mode Setting	r 5 1 0 1	31
3-3-2 Baud Rate Setting	r 5 1 0 2	32
3-3-3 Communication Protocol Setting	r 5 1 0 3	32
3-3-4 Output Format Setting	r 5 1 0 4	34
3-3-5 Re-zero Range Setting	r 5 1 0 5	35
3-3-6 Weight Range Setting	r 5 1 0 6	36
3-3-7 Date & Time Display Setting	r 5 1 0 7	37
3-3-8 Date & Time Setting	r 5 1 0 8	38
APPENDIX I UNIT CONVERSION TABLE		39
APPENDIX II FULL CAPACITY TABLE		40
APPENDIX III RS232 BI-DIRECTION FORMAT		42




PRECAUTIONS FOR USE

Thank you for purchasing **BH3 precision balance**.

To enable you to use this balance correctly, we suggest that you read these precautions carefully.

1. It must be prevented from getting wet. If it gets wet, please wipe it dry with a cloth. If there is something wrong with the machine, please contact your supplier.
2. Keep it away from high temperatures and damp conditions.
3. Don't bump the balance against other items, nor load it with excessively heavy weights (The load must not exceed the maximum capacity of the balance).
4. If a balance is not used for a long period of time, please remove the dry batteries, clean and store in a polythene bag. A desiccant may be included.
5. Objects to be weighed should be placed at the center of the platter, and can't exceed the dimension of the platter.
6. Any opinions and suggestions on this product are welcome.

PREPARING TO USE THE BALANCE

1. For accurate weight readings locate the scale on a firm level surface free from vibrations.
2. Avoid operating the scale in direct sunlight or drafts of any kind.
3. 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.
4. Please use an independent power outlet to avoid interfered by other electrical appliances.
5. Don't put any object on the scale while switching on the balance.
6. Please keep the balance switched on for 15~20 minutes before operation.
7. When the low battery indicator  appears in the right corner of the display, replace the dry batteries or recharge the battery.
8. The balance will work with either dry batteries or the adaptor. When the balance is out of battery with its adaptor unplugged, time will need to be reset. Please replace the battery before proceeding to reset the time.



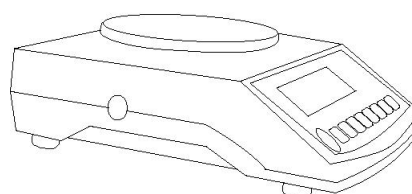
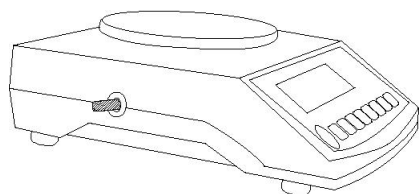
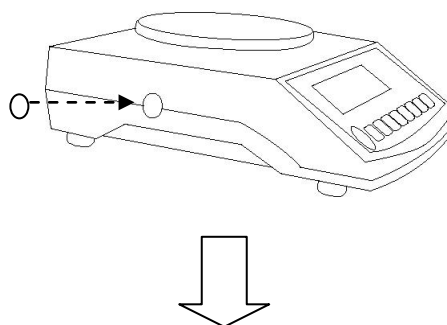
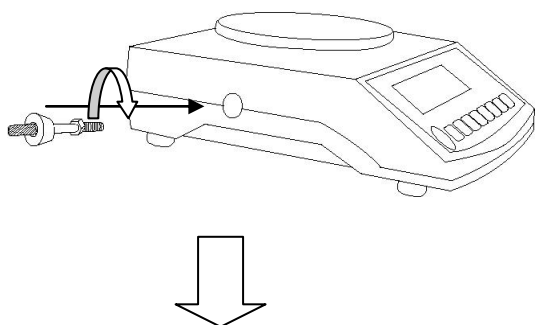
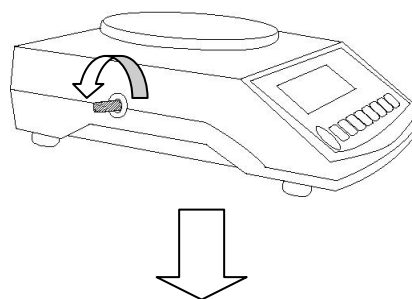
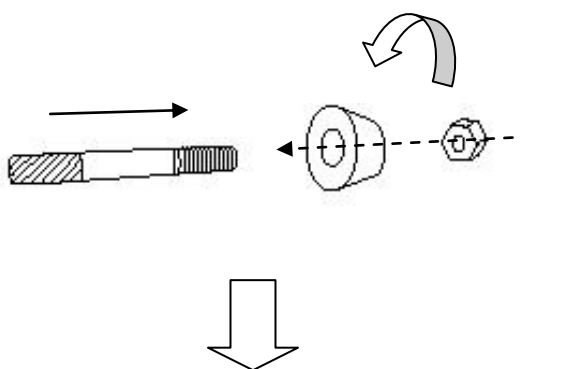
PROTECTION IN THE TRANSPORTATION

Before using the BH3 Precision Balance, please read the following illustrations to take off the protection screw.

For the maintenance of this machine, install the protection screw before the transportation to avoid any damage on the sensitive components.

A. Install the protection screw:

B. Take off the protection screw:





CHAPTER ONE PRODUCT FEATURES

1-1 Features

- ◆ 1/30,000 and 1/60,000 display resolution available.
- ◆ Auto calibration.
- ◆ Weighing, counting and percentage modes.
- ◆ Setting the usable units from 13 weighing units.
- ◆ Default unit selectable, Auto-off timer setting, Backlight mode setting, Digital filter setting, Adjustable gravity value and External weight calibration.
- ◆ Bi-directional RS-232 interface and Plastic shield included.
- ◆ Low power indication and auto power off.
- ◆ Easily adjusted leveling feet for stability of the scale.
- ◆ Operating temperature: 5°C~35°C
- ◆ RTC card



1-2 Specifications

External resolution: 1/30000

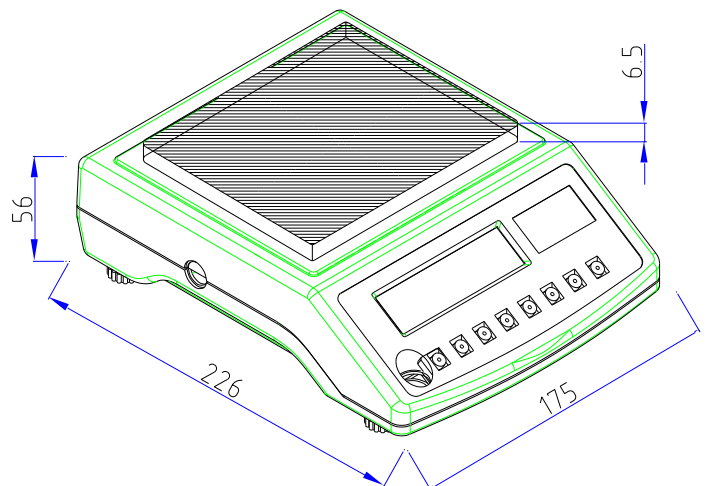
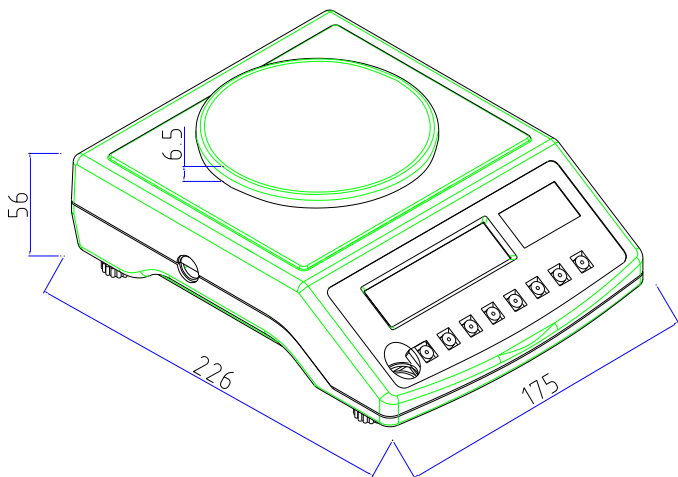
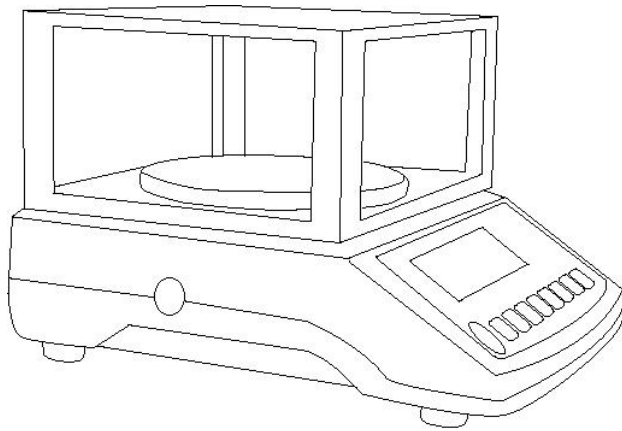
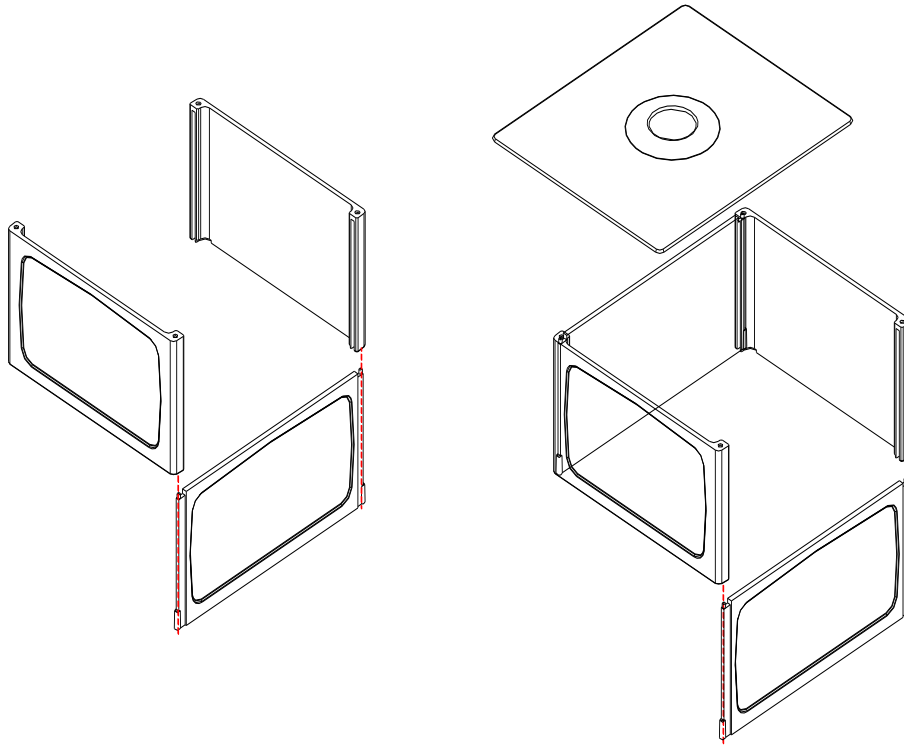
		150 Series	300 Series	600 Series	1500 Series	3000 Series
g	Hr	150 × 0.005	300 × 0.01	600 × 0.02	1500 × 0.05	3000 × 0.1
	nr	150 × 0.05	300 × 0.1	600 × 0.2	1500 × 0.5	3000 × 1
ct	Hr	750 × 0.05	1500 × 0.05	3000 × 0.1	7500 × 0.5	15000 × 0.5
	nr	750 × 0.5	1500 × 0.5	3000 × 1	7500 × 5	15000 × 5
lb	Hr	0.33 × 0.00002	0.66 × 0.00005	1.32 × 0.00005	3.3 × 0.0002	6.6 × 0.0005
	nr	0.33 × 0.0002	0.66 × 0.0005	1.32 × 0.0005	3.3 × 0.002	6.6 × 0.005
oz	Hr	5.2 × 0.0002	10.5 × 0.0005	21 × 0.001	52 × 0.002	105 × 0.005
	nr	5.2 × 0.002	10.5 × 0.005	21 × 0.01	52 × 0.02	105 × 0.05
dr	Hr	84 × 0.005	160 × 0.01	330 × 0.02	840 × 0.05	1600 × 0.1
	nr	84 × 0.05	160 × 0.1	330 × 0.2	840 × 0.5	1600 × 1
GN	Hr	2300 × 0.1	4600 × 0.2	9200 × 0.5	23000 × 1	46000 × 2
	nr	2300 × 1	4600 × 2	9200 × 5		
ozt	Hr	4.8 × 0.0002	9.6 × 0.0005	19 × 0.001	48 × 0.002	96 × 0.005
	nr	4.8 × 0.002	9.6 × 0.005	19 × 0.01	48 × 0.02	96 × 0.05
dwt	Hr	96 × 0.005	190 × 0.01	380 × 0.02	960 × 0.05	1900 × 0.1
	nr	96 × 0.05	190 × 0.1	380 × 0.2	960 × 0.5	1900 × 1
MM	Hr	40 × 0.002	80 × 0.005	160 × 0.01	400 × 0.02	800 × 0.05
	nr	40 × 0.02	80 × 0.05	160 × 0.1	400 × 0.2	800 × 0.5
tl.J	Hr	4 × 0.0002	8 × 0.0005	16 × 0.001	40 × 0.002	80 × 0.005
	nr	4 × 0.002	8 × 0.005	16 × 0.01	40 × 0.02	80 × 0.05
tl.T	Hr	4 × 0.0002	8 × 0.0005	16 × 0.001	40 × 0.002	80 × 0.005
	nr	4 × 0.002	8 × 0.005	16 × 0.01	40 × 0.02	80 × 0.05
tl.H	Hr	3.9 × 0.0002	7.9 × 0.0005	15 × 0.001	39 × 0.002	79 × 0.005
	nr	3.9 × 0.002	7.9 × 0.005	15 × 0.01	39 × 0.02	79 × 0.05
t	Hr	12.8 × 0.0005	25 × 0.001	51 × 0.002	128 × 0.005	250 × 0.01
	nr	12.8 × 0.005	25 × 0.01	51 × 0.02	128 × 0.05	250 × 0.1

**External resolution: 1/60000**

		300 Series	600 Series	1200 Series	3000 Series
g	Hr	300 × 0.005	600 × 0.01	1200 × 0.02	3000 × 0.05
	nr	300 × 0.05	600 × 0.1	1200 × 0.2	3000 × 0.5
ct	Hr	1500 × 0.05	3000 × 0.05	6000 × 0.1	15000 × 0.5
	nr	1500 × 0.5	3000 × 0.5	6000 × 1	15000 × 5
lb	Hr	0.66 × 0.00002	1.32 × 0.00005	2.64 × 0.00005	6.6 × 0.0002
	nr	0.66 × 0.0002	1.32 × 0.0005	2.64 × 0.0005	6.6 × 0.002
oz	Hr	10.5 × 0.0002	21.1 × 0.0005	42 × 0.001	105 × 0.002
	nr	10.5 × 0.002	21.1 × 0.005	42 × 0.021	105 × 0.02
dr	Hr	169 × 0.005	330 × 0.01	670 × 0.02	1690 × 0.05
	nr	169 × 0.05	330 × 0.1	670 × 0.2	1690 × 0.5
GN	Hr	4600 × 0.1	9200 × 0.2	18500 × 0.5	46000 × 1
	nr	4600 × 1	9200 × 2	18500 × 5	46000 × 10
ozt	Hr	9.6 × 0.0002	19.2 × 0.0005	38 × 0.001	96 × 0.002
	nr	9.6 × 0.002	19.2 × 0.005	38 × 0.01	96 × 0.02
dwt	Hr	192 × 0.005	380 × 0.01	770 × 0.02	1920 × 0.05
	nr	192 × 0.05	380 × 0.1	770 × 0.2	1920 × 0.5
MM	Hr	80 × 0.002	160 × 0.005	320 × 0.01	800 × 0.02
	nr	80 × 0.02	160 × 0.05	320 × 0.1	800 × 0.2
tl.J	Hr	8 × 0.0002	16 × 0.0005	32 × 0.001	80 × 0.002
	nr	8 × 0.002	16 × 0.005	32 × 0.01	80 × 0.02
tl.T	Hr	8 × 0.0002	16 × 0.0005	32 × 0.001	80 × 0.002
	nr	8 × 0.002	16 × 0.005	32 × 0.01	80 × 0.02
tl.H	Hr	7.9 × 0.0002	15.8 × 0.0005	31 × 0.001	79 × 0.002
	nr	7.9 × 0.002	15.8 × 0.005	31 × 0.01	79 × 0.02
t	Hr	25.7 × 0.0005	51 × 0.001	102 × 0.002	257 × 0.005
	nr	25.7 × 0.005	51 × 0.01	102 × 0.02	257 × 0.05



1-3 Plastic Shield Installation & Dimension





1-4 Description of Power Supply


Power supplies

1. 4 pcs of UM-2 dry batteries
2. 9V DC 300mA adaptor

Power Consumption

1. The power consumption is around DC 0.5 mA (standby mode).
2. The power consumption is around DC 30~35 mA (system + load cell).
3. The power consumption is around DC 40~50 mA (system + load cell + backlight).

Low Battery

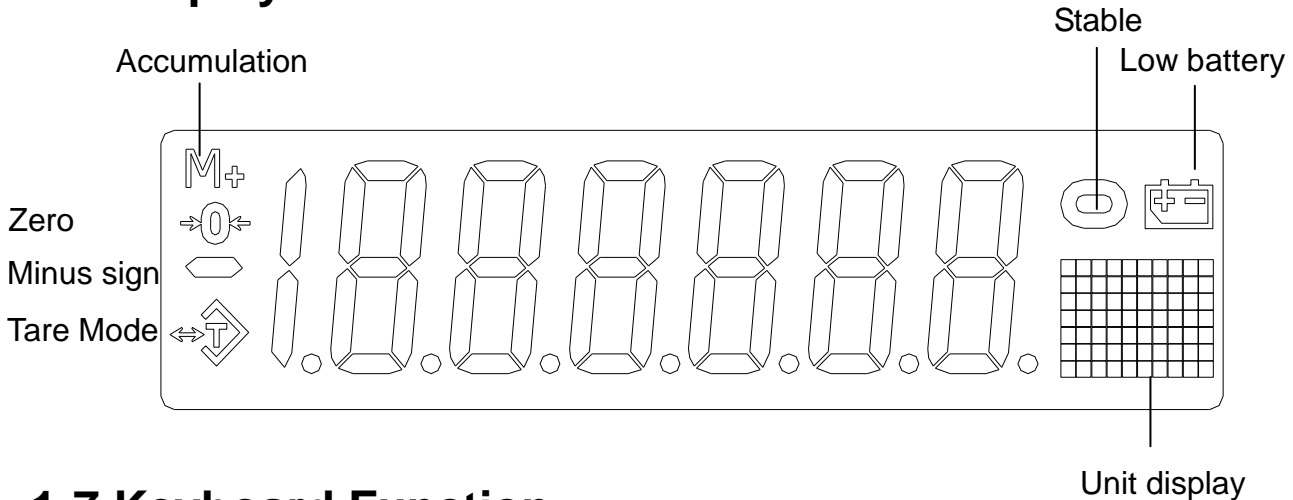
Please note when the  symbol is shown on the display, the internal battery needs to be replaced.

1-5 Error Messages


If one of the error messages **E 1**, **E 2**, **E 5** or **OL** is displayed, please send the balance back to your dealers for repair.





1-6 Display





1-7 Keyboard Function


-  : Off key. Press the key to switch the balance off.


-  : Function key. Press the key to select different operation modes: weighing mode, counting mode, and percentage mode.


-  : Units key. Press the key to select the desired weighing unit.


-  : Unit weight key (for non-approval models). Press the key to show the unit weight.
 “ ▼ ” ⇒ In the calibration mode or function settings, press the key for downward digit selection and downward moving.

-  : Resolution key (for approval models). Press the key to show the unit weight or shift weighing resolution between normal resolution and high resolution.
 “ ▼ ” ⇒ In the calibration mode or function settings, press the key for downward digit selection and downward moving.

-  : Sample key. In the counting or percentage mode, press the key to calculate the unit weight of the sample.
 “ ▲ ” ⇒ In the calibration mode or function settings, press the key for upward digit selection and upward moving..

-  : Confirmation key. Press the key to confirm the setting.


-  : Tare key. Press the key to deduct the weight of a container. To exit the tare mode, press the tare key again, when the plate is empty.
 “ ◀ ” ⇒ In the calibration mode or function setting, press the key to move the cursor one step to the left.

-  : On/Zero key. When the scale is off, press the key to switch the scale on. When the scale is on, press the key to zero the scale.
 “ ▶ ” ⇒ In the calibration mode or function setting, press the key to move the cursor one step to the right.



CHAPTER TWO OPERATION INSTRUCTIONS

2-1 Zero Function


When the display shows weight value without anything placed on the platter, press the  key to re-zero the balance. The zero indicator →0← is on, indicating a center-of zero gross weight condition.

Note: Zero Range

- Non-approval and OIML approval models: Zero-point deviation* is within $\pm 2\%$ x full scale
- Sri Lanka approval models: Zero-point deviation* is within $\pm 3\%$ x full scale


*Deviation is based on the power-on zero point.

2-2 Simple External Calibration

Press the  key for 3 seconds, the **calibration weight value**** shows in the display. Place the same weight as the calibration weight value on the platter. After stable, the calibration procedure is completed.

- **Calibration weight value**** = The value was input in the external weight calibration setting.
(Please refer to page 27)

2-3 Operation Mode Conversion


Press the  key to convert among the available operation modes: Weighing Mode, Counting Mode and Percentage Mode. When selecting a different operation mode, the representative unit or symbol (g, pcs and %) will show in the right side of display.




2-3-1 Weighing Mode


I . Units Selection

Press the  key to select the desired weighing unit.




 There are 13 units available: g, ct, lb, oz, dr, GN, ozt, dwt, MM, tl.J, tl.T, tl.H and t.





II . Display Mode/Resolution Selection

Non-approval models: Press the  key to shift between Display Unit Weight Mode and Display pcs Mode.

Approval models: Press the  key to shift weighing resolution between normal resolution and high resolution.







III . Tare Function



1. Place the container on the platter. After stable, press the  key to deduct the container weight. The display returns to zero and the tare indicator  is on.
2. Place the object into the container, and the net weight of the object is displayed.
3. Remove the container and the object from the platter, and the negative value of the container weight is displayed. Press the  key again to re-zero and the tare indicator is off.

- The balance can be tared continuously up to its full capacity.
- If the tare indicator  is still on, after pressing the  key to exit the tare mode.
Please press the  key to zero the balance, and the tare indicator  will go off.
- For Sri Lanka approval model(s), you can only tare once.

2-3-2 Counting Mode

Sampling

1. Press the  key to select the Counting mode and the display shows  pcs.
2. Press the  key to select a sample size from 10, 20, 50, 100, or 200 pcs.
3. Place as many items as the selected sample size, and press the  key. After the sign “- - - - -” disappears, the sampling process is completed and the balance is ready to count.
4. Press the  /  key to shift between “Unit Weight Mode Display” and “PCS Mode Display”.


- The unit weight of sample is not sufficient: The weight of a sample should be heavier than the 0.2d (d=division). When the unit weight of the sample is too small (less than 0.2 divisions), “- -  - pcs” is displayed.
- The last sample size is memorized when the balance is switched off. When the balance is switched on again, press the  key to enter the counting mode.
- If “Auto Unit Weight Averaging” setting is enabled, the scale will recalculate average unit weight when current sample count (of current objects on the platter) exceeds previous sample count by more than 5 pcs and is less than 200% of previous sample count, i.e.
$$(p + 5) < (c) < (200\% \times p)$$
whereas
p = previous sample count
c = current sample count

2-3-3 Percentage Mode

Sampling

1. Press the  key to select the “Percentage” mode and the display shows

1000 %.

2. Press the  key to select 100.0% or 100.00%.

3. Place enough sampling weight on the platter and press the  key. Wait until the sign

“- - - - -” disappears, and % symbol in the right lower corner of the display stops flashing .

The sampling procedure is completed, and the percentage mode is ready.




➤ When the unit weight of the sample is too small (less than 0.2 divisions),

“- - 0 r - %” is displayed.

➤ The last sample size is memorized when the balance is switched off. When the balance is

switched on again, press the  key to enter the percentage mode.

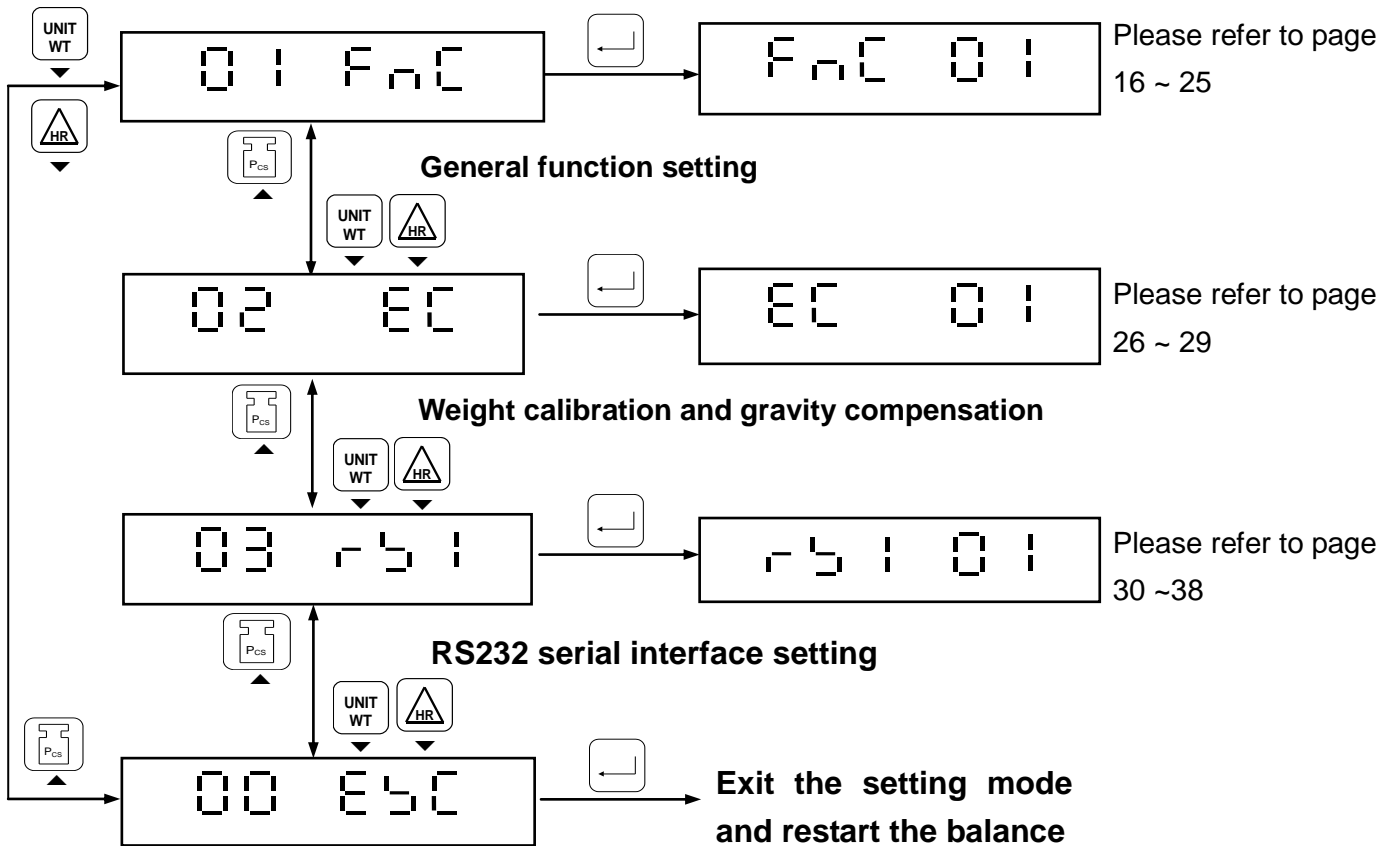
Notes

1. In the counting or percentage mode, press the  key or the  key to switch to the weighing mode, after the sampling process is completed. Press the  key to convert the balance into the counting or percentage mode, and the balance memorizes the data of sampling that has previously been taken.
2. While shifting between the counting and percentage modes, the last sampling data will be saved automatically.



CHAPTER THREE FUNCTION SETTINGS

Press **MODE** key for 3 seconds or hold **MODE** and **↵** keys together, the balance enters the function setting mode, and the display shows **01 Fnc**.

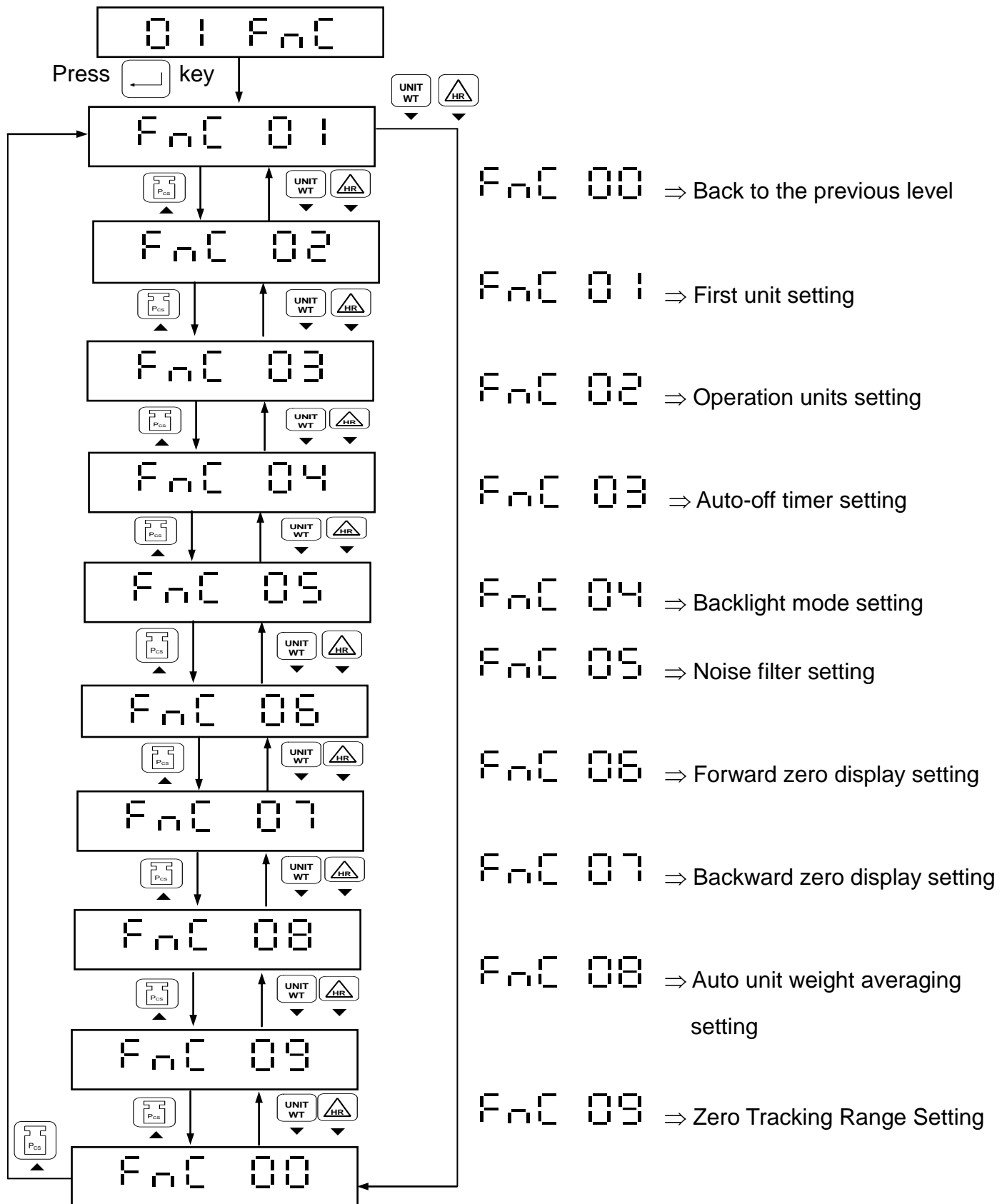


01	Fnc	⇒	General function setting
02	EC	⇒	Weight calibration and gravity compensation
03	r51	⇒	RS232 serial interface setting
00	E5C	⇒	Exit the setting mode and restart the balance



3-1 GENERAL FUNCTION SETTING 01 Fnc

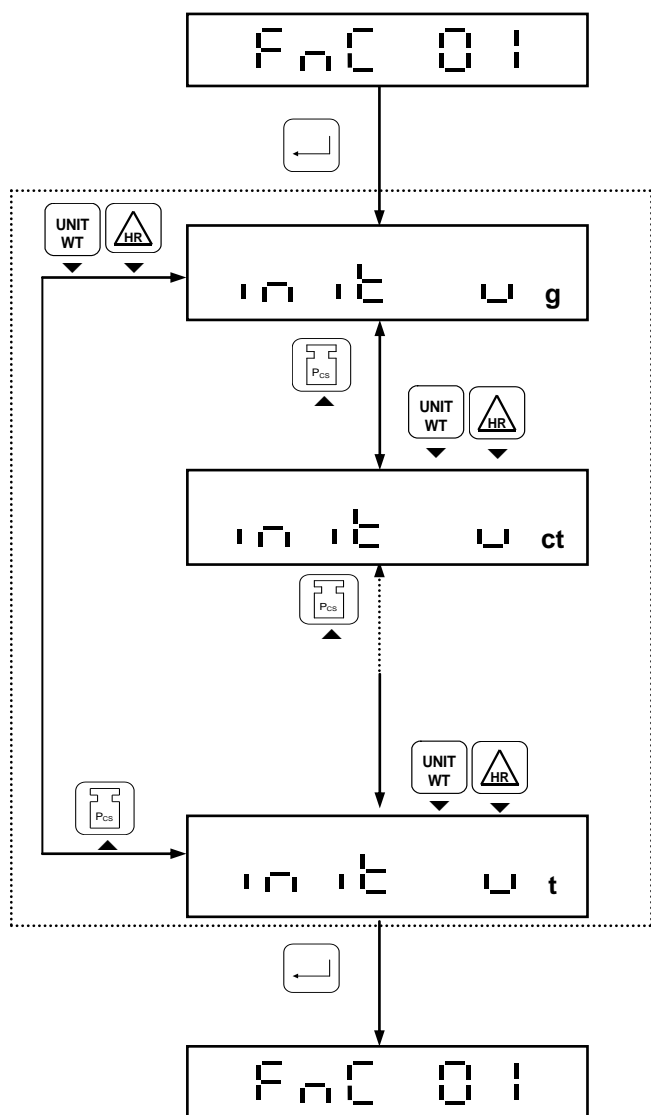
There are nine functions settings available Fnc 01 ~ Fnc 09.





3-1-1 First Unit Setting F n C 0 1

The default setting is “g”







Use the or key to select the unit in cycle, and press the key to confirm the setting.

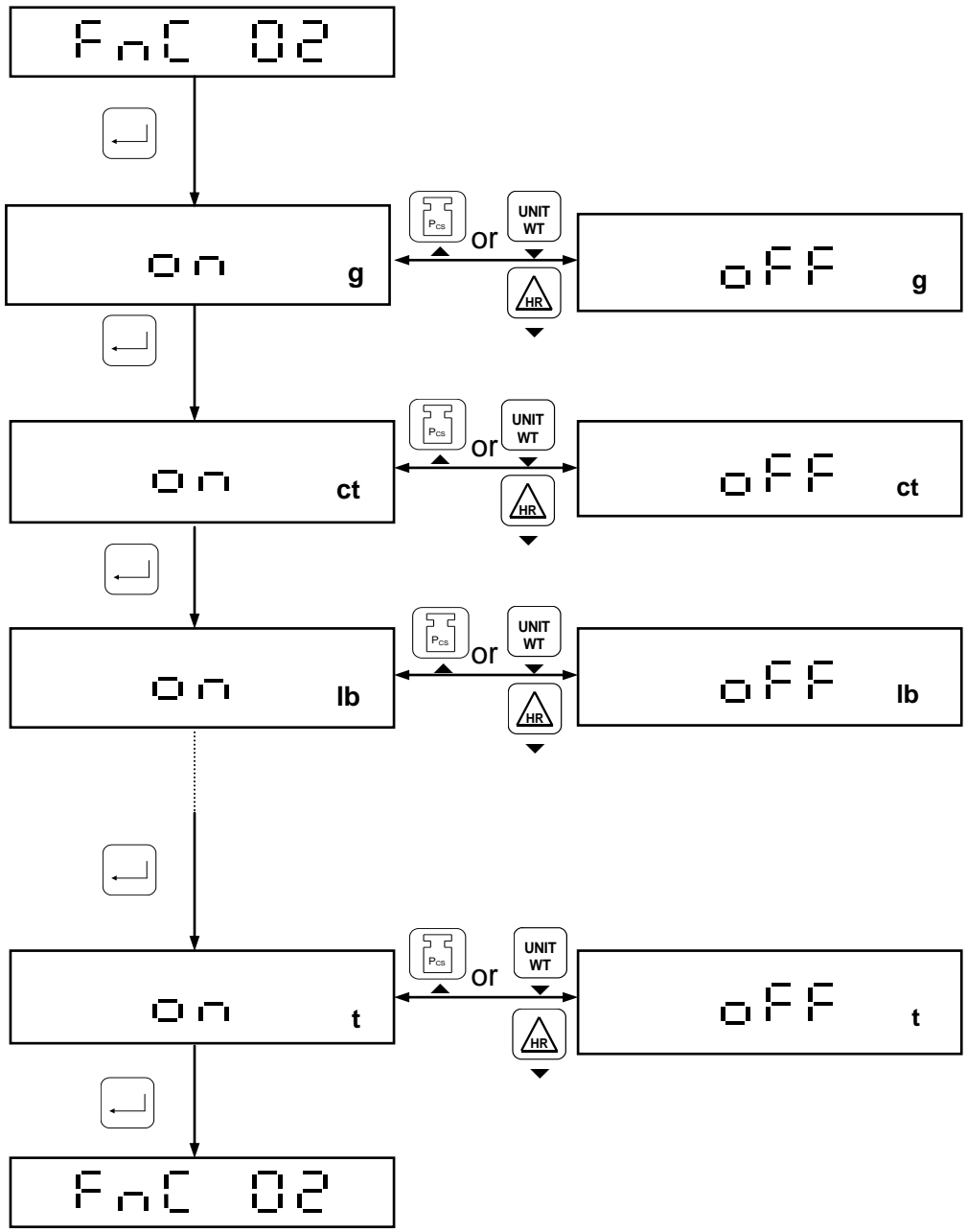
There are 13 weighing units available for selection: g, ct, lb, oz, dr, GN, ozt, dwt, MM, tl.J, tl.T, tl.H, t



3-1-2 Operation Units Setting F n C 02

There are 13 weighing units available for selection. Use the  or the  /  key to switch between **ON** and **OFF** for each unit.

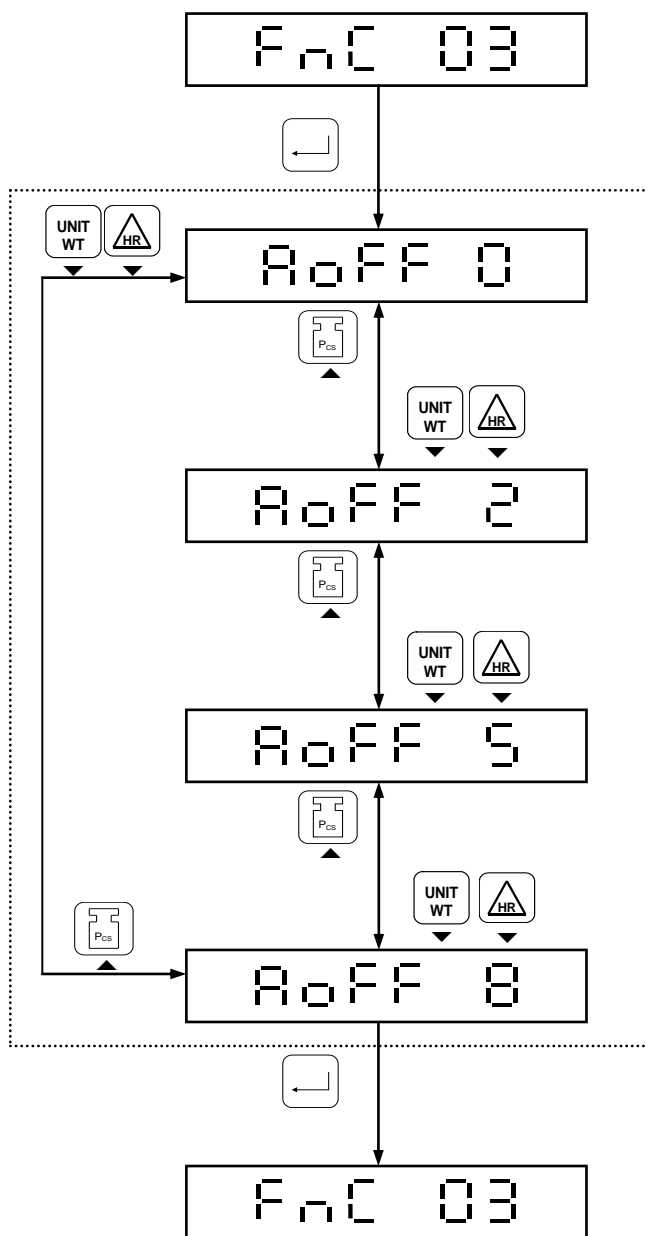
 The default setting for all 13 units are “ON”





3-1-3 Auto-Off Timer Setting F n C 03

The default setting is “0”.



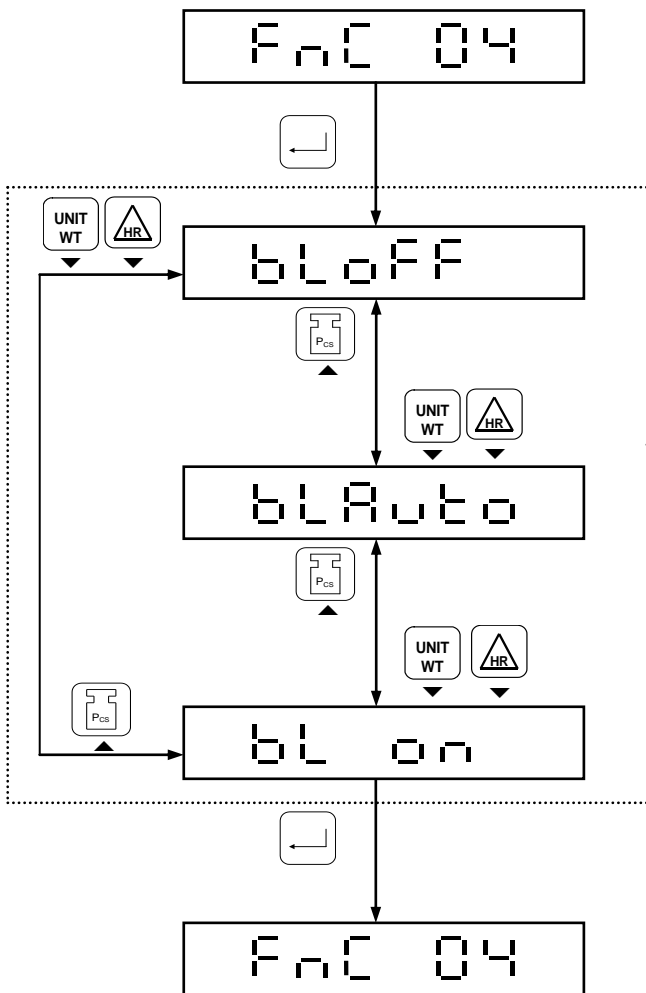
Use the or the key to select one from the four modes:
 Press the key to confirm and the setting procedure is completed.

- A o F F 0 ⇒ Auto-off not available
- A o F F 2 ⇒ Auto-off after 2 minutes
- A o F F 5 ⇒ Auto-off after 5 minutes
- A o F F 8 ⇒ Auto-off after 8 minutes



3-1-4 Backlight Mode Setting F n C 04

- The default setting is “ AUTO ” (The auto backlight is on)
- Auto backlight ⇒ When there is weight on the platter (the value is larger than 10 divisions), or when any key is pressed, the backlight is on. After the weight on the platter keeps under 10 divisions while no key is pressed, the backlight will be off in about 10 seconds.



Use the or the key to select one from three backlight modes. Press the key to confirm the setting.

- bl off ⇒ Backlight is off
- bl Auto ⇒ Auto backlight
- bl on ⇒ Backlight is on all the time

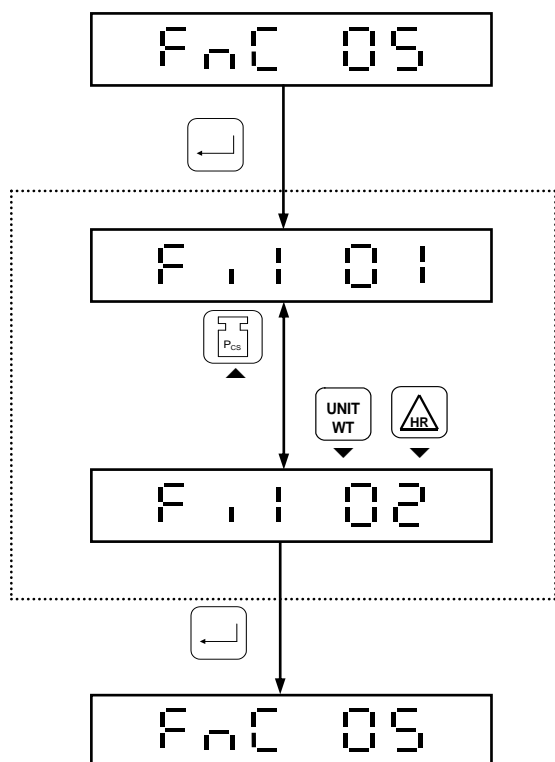


3-1-5 Noise Filter Setting F n C 05

Set a parameter in 01 to 02, according to the environment where the balance is positioned.

- ◆ Please select “01”, when operation environment is unstable.
- ◆ Please select “02”, when operation environment is stable.

The default setting is “01”



Use the or the / key to select a proper parameter.

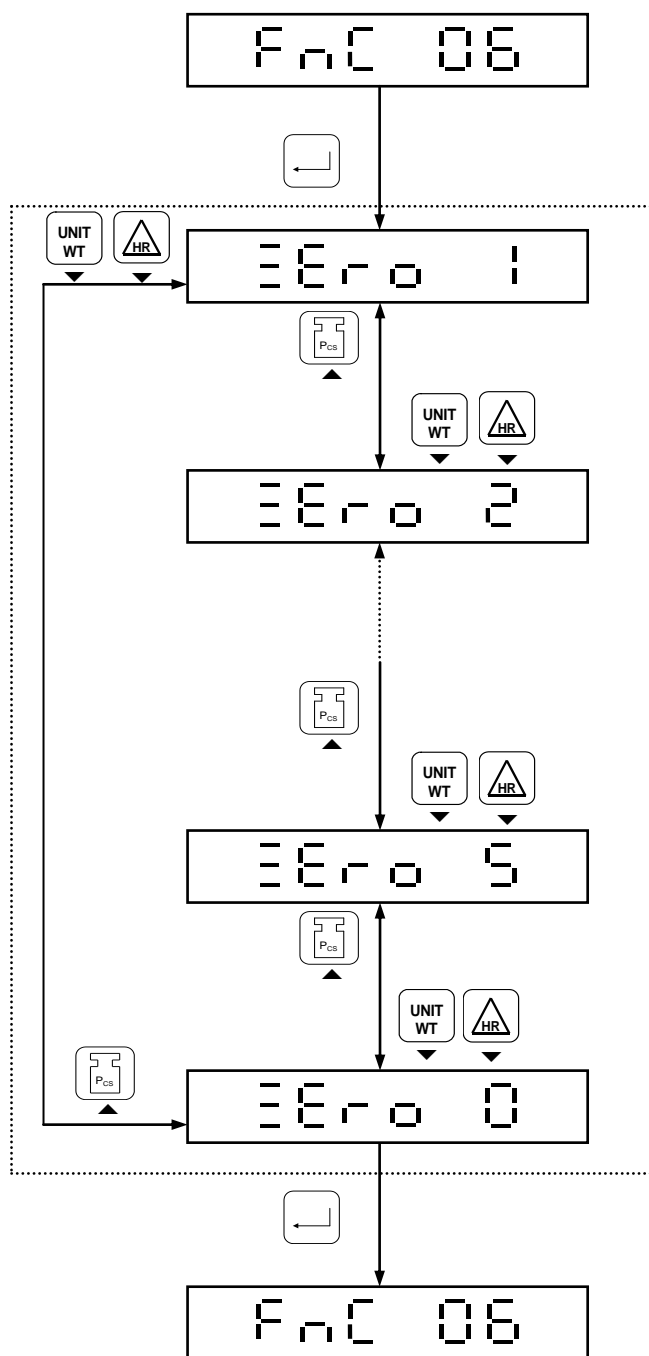
Press the key to confirm the setting.

F . | 01 ⇒ For unstable environment
 F . | 02 ⇒ For stable environment



3-1-6 Forward Zero Display Setting F n C 06

The default setting is “ 1 ” (1d, d=division)



Use the or the / key to select a zero display range.

Press the key to confirm the setting.

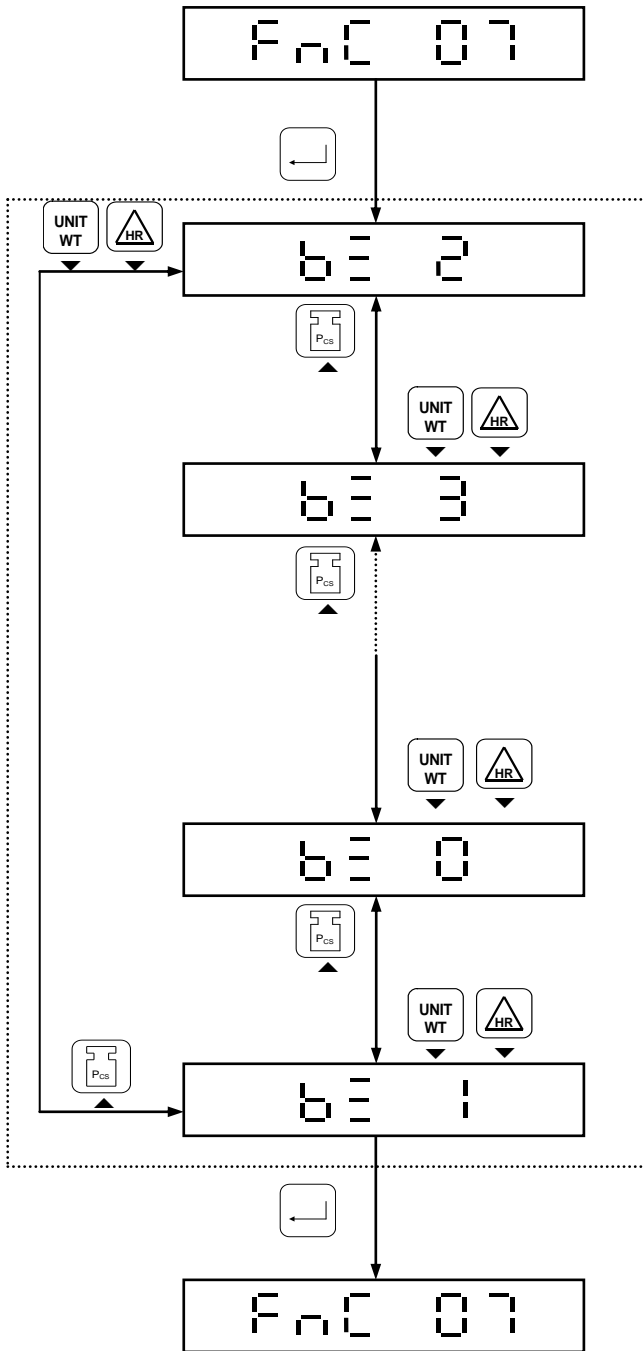
Zero Display Range: (d=division)

- Zero 0 ⇒ 0 d
- Zero 1 ⇒ 1 d
- Zero 2 ⇒ 2 d
- Zero 3 ⇒ 3 d
- Zero 4 ⇒ 4 d
- Zero 5 ⇒ 5 d



3-1-7 Backward Zero Display Setting F n C 0 7

The default setting is “ 2 ” (2d, d=division)



Use the or the / key to select a proper parameter.

Press the key to confirm the setting.

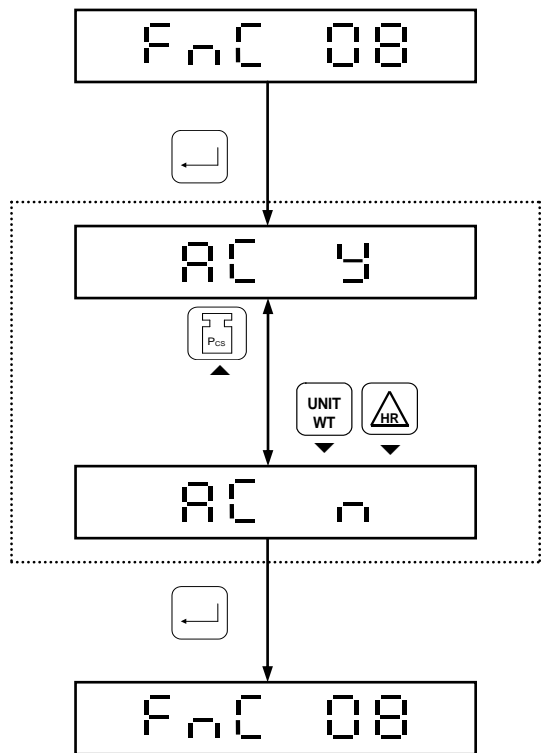
Backward zero display setting: (d=division)




- b 0 ⇒ 0 d
- b 1 ⇒ 1 d
- b 2 ⇒ 2 d
- b 3 ⇒ 3 d
- b 4 ⇒ 4 d
- b 5 ⇒ 5 d




3-1-8 Auto Unit Weight Averaging Setting F n C 08

The default setting is “Yes” (Automatic Unit Weight Calibration)

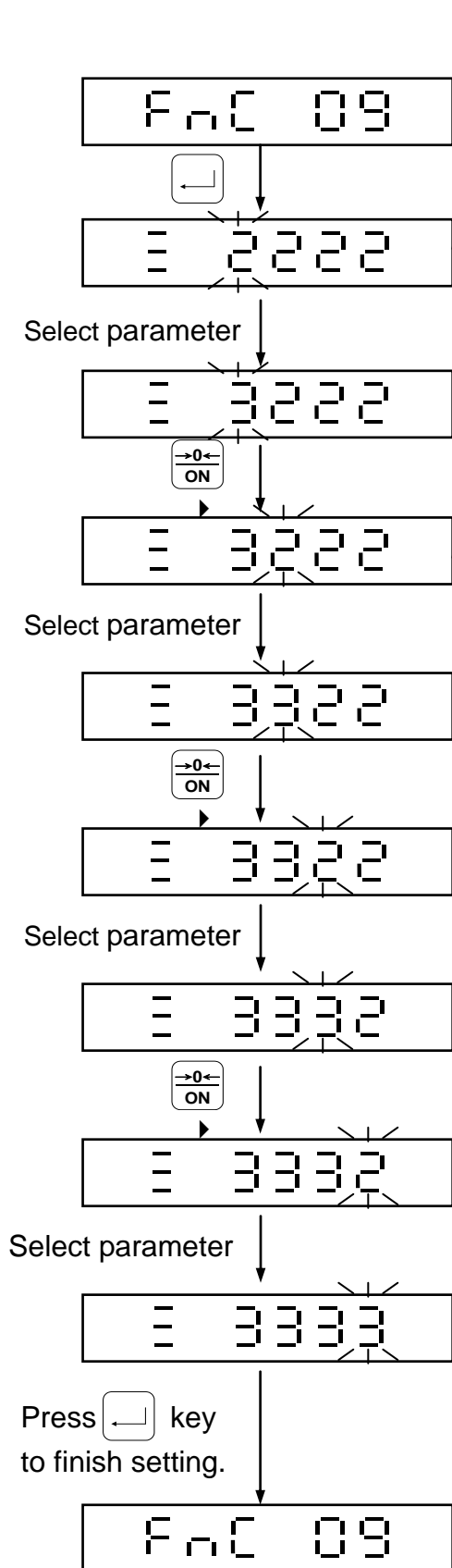


Use the  or the  /  key to select “Yes” or “No.”

Press the  key to confirm the setting.

AC y ⇒ **YES** (Auto Unit Weight Averaging is active)

AC n ⇒ **NO** (Auto Unit Weight Averaging is off)

3-1-9 Zero Tracking Range Setting **F n C 09****Zero Tracking Range Setting**

(default value: 3 ⇒ 3/4 d)

Press or / key to select parameter.

1 ⇒ 1/4 d 2 ⇒ 2/4 d 3 ⇒ 3/4 d
 4 ⇒ 1 d 5 ⇒ 5/4 d 6 ⇒ 6/4 d
 7 ⇒ 7/4 d 8 ⇒ 2 d

Zero Indication Range Setting

(default value: 2 ⇒ 2/4 d)

Press or / key to select parameter.

1 ⇒ 1/4 d 2 ⇒ 2/4 d 3 ⇒ 3/4 d
 4 ⇒ 1 d 5 ⇒ 5/4 d 6 ⇒ 6/4 d
 7 ⇒ 7/4 d 8 ⇒ 2 d

Stable Range Determination Setting

(default value: 2 ⇒ 2/4 d)

Press or / key to select parameter.

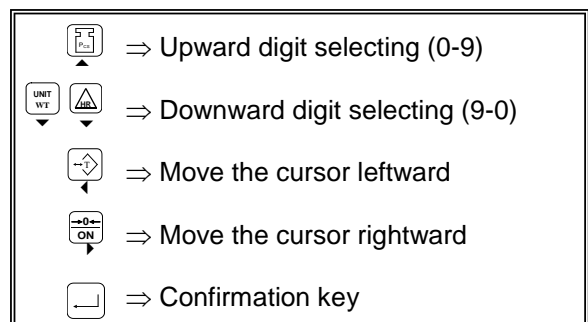
1 ⇒ 1/4 d 2 ⇒ 2/4 d 3 ⇒ 3/4 d
 4 ⇒ 1 d 5 ⇒ 5/4 d 6 ⇒ 6/4 d
 7 ⇒ 7/4 d 8 ⇒ 2 d

Stable Times Determination Setting

(default value: 4 ⇒ 8 counts)

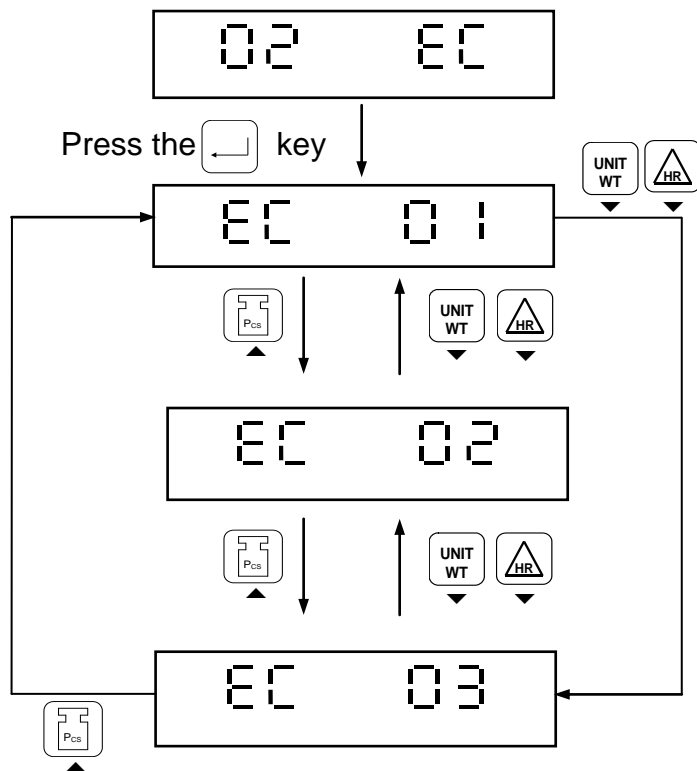
Press or / key to select parameter.

1 ⇒ 2 counts 2 ⇒ 4 counts 3 ⇒ 6 counts
 4 ⇒ 8 counts 5 ⇒ 10 counts 6 ⇒ 12 counts
 7 ⇒ 14 counts 8 ⇒ 16 counts





3-2 Weight Calibration and Gravity Compensation 02 EC



EC 01 ⇒ Weight Calibration

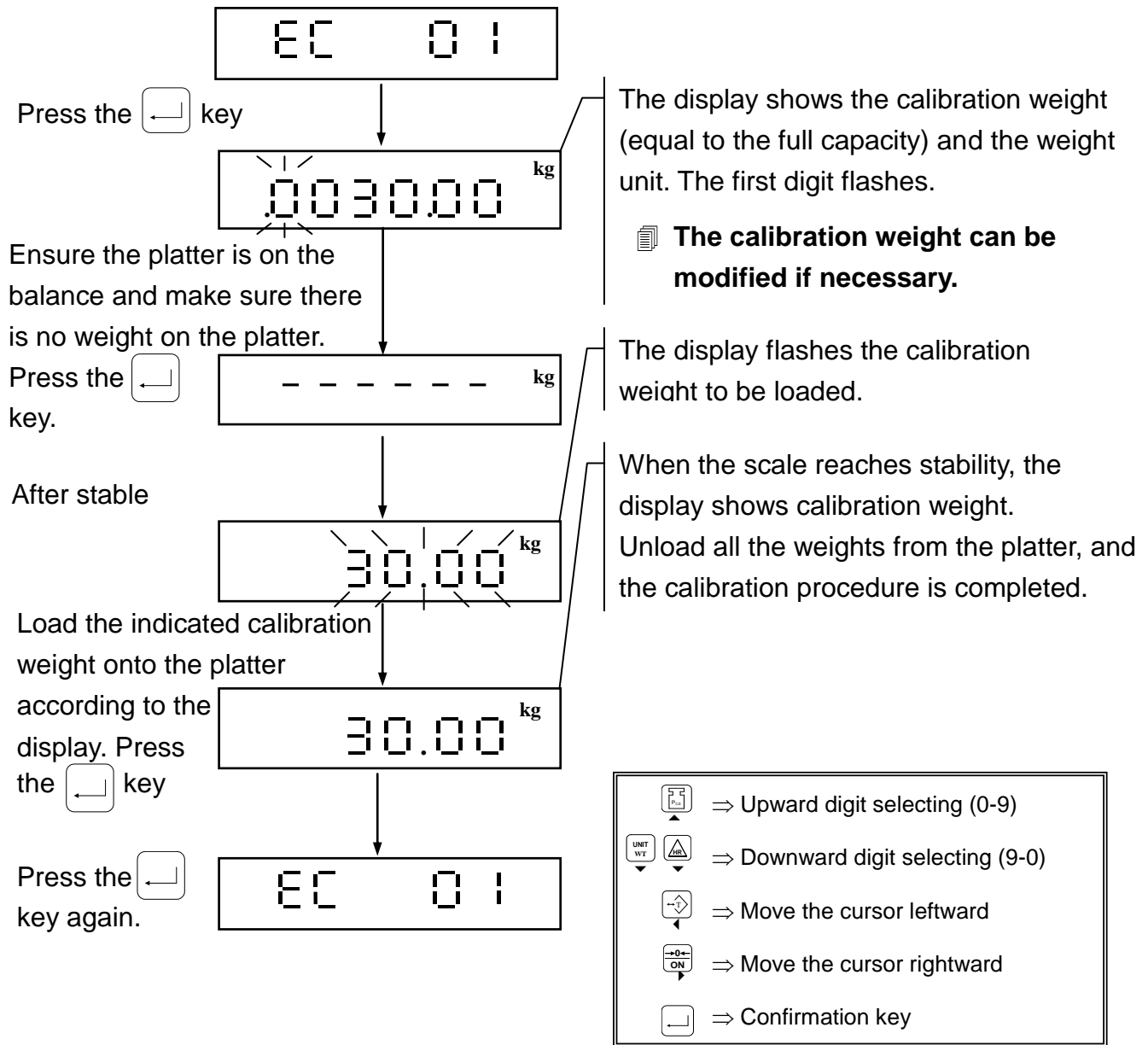
EC 02 ⇒ Gravity Compensation

EC 03 ⇒ Restore to the default setting

📄 When **CFn 04** set as “YES” for the external Gravity calibration function, the **EC 02** function is available.



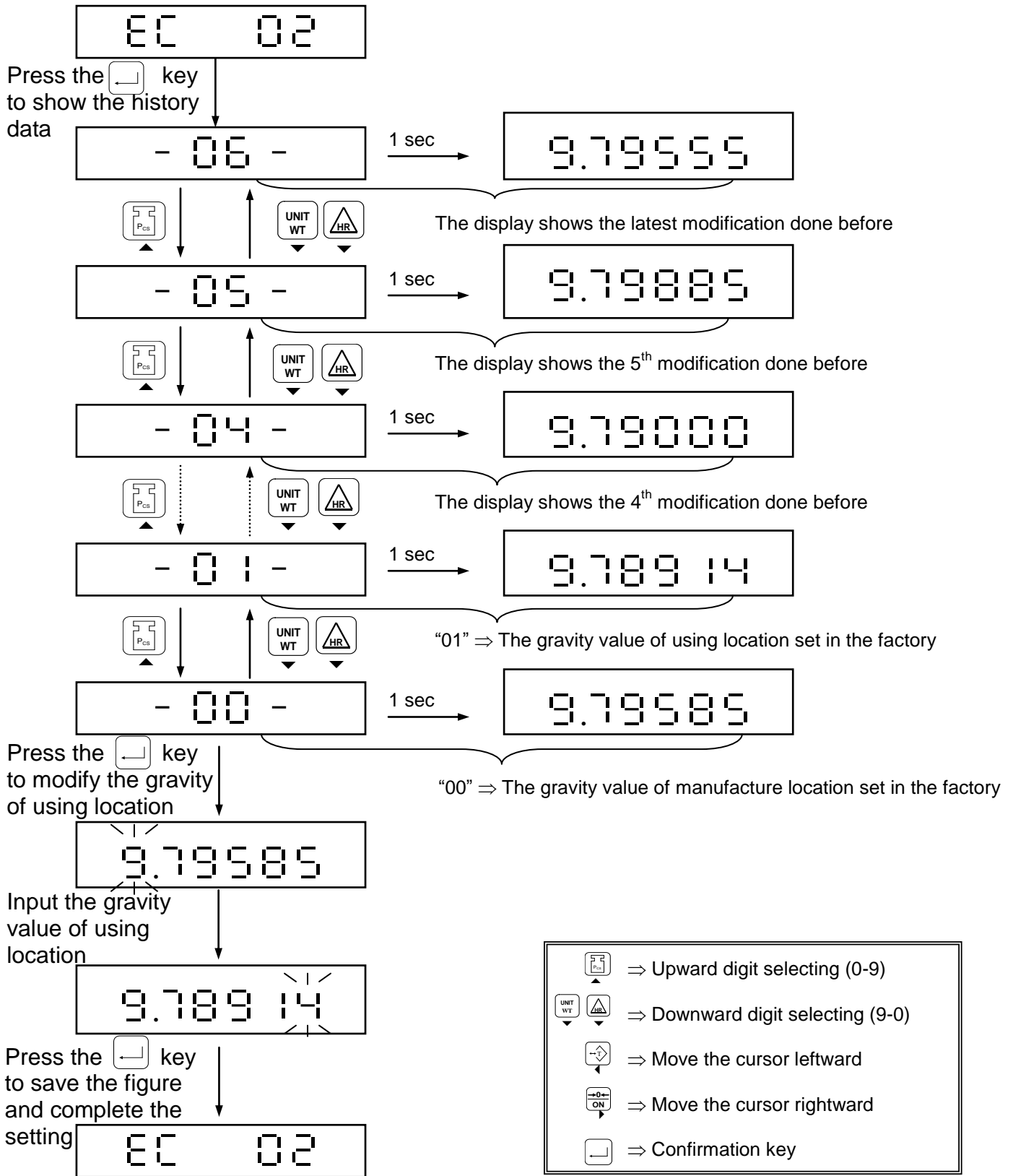
3-2-1 External Weight Calibration EC 01



The input calibration weight must be the value ranged from 90% to 110% of interval value of the original calibration weight.

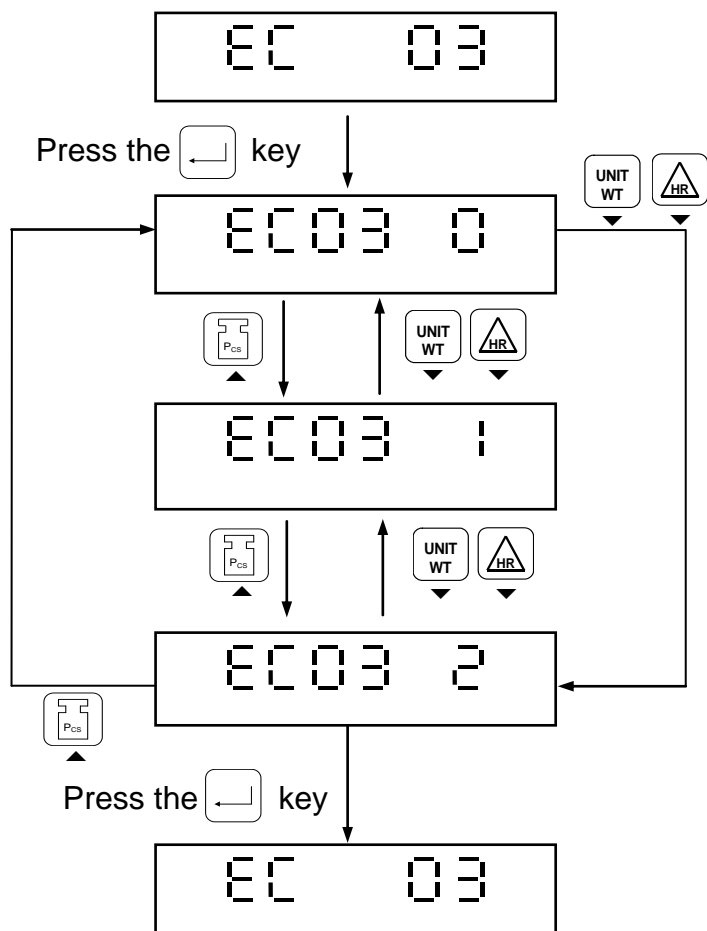


3-2-2 Gravity Compensation EC 02





3-2-3 Restore to the Default Setting EC 03



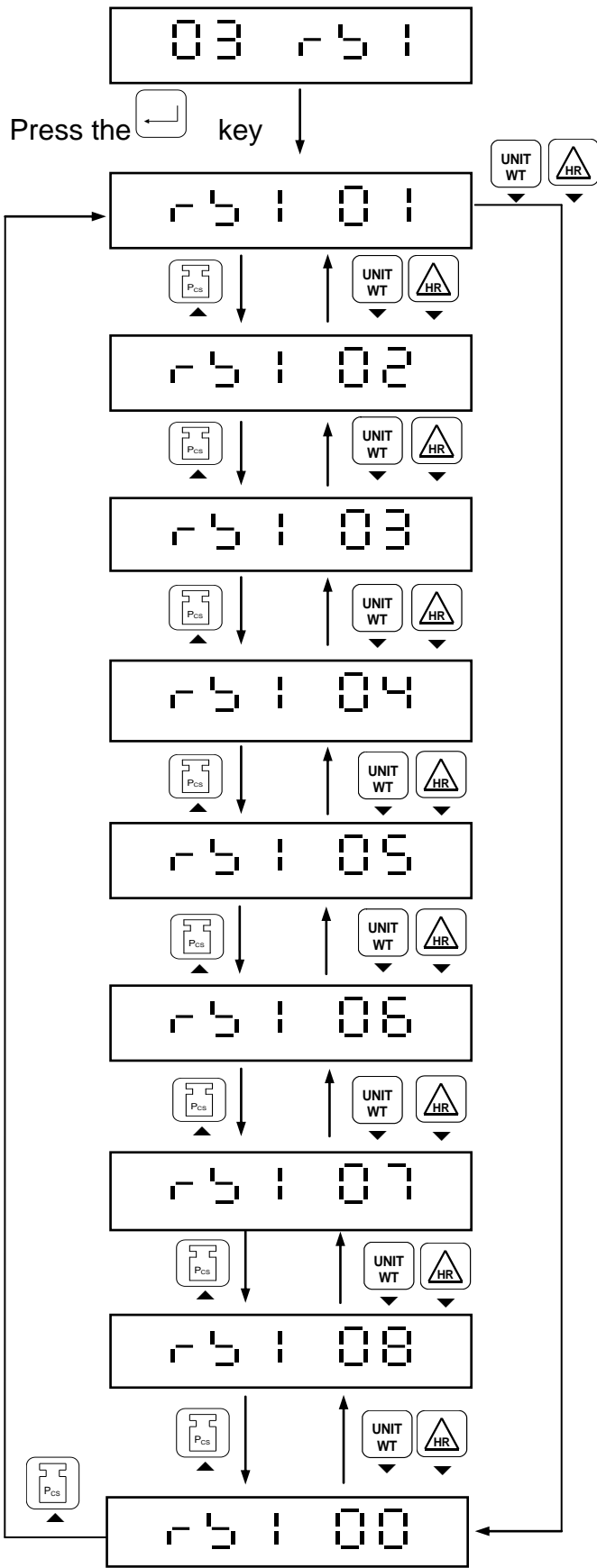
EC03 0 ⇒ Return to upper level

EC03 1 ⇒ Restore to the default setting in external weight calibration and gravity compensation

EC03 2 ⇒ Restore to the default setting in the general function settings



3-3 RS232 SERIAL INTERFACE SETTING 03 r5 1

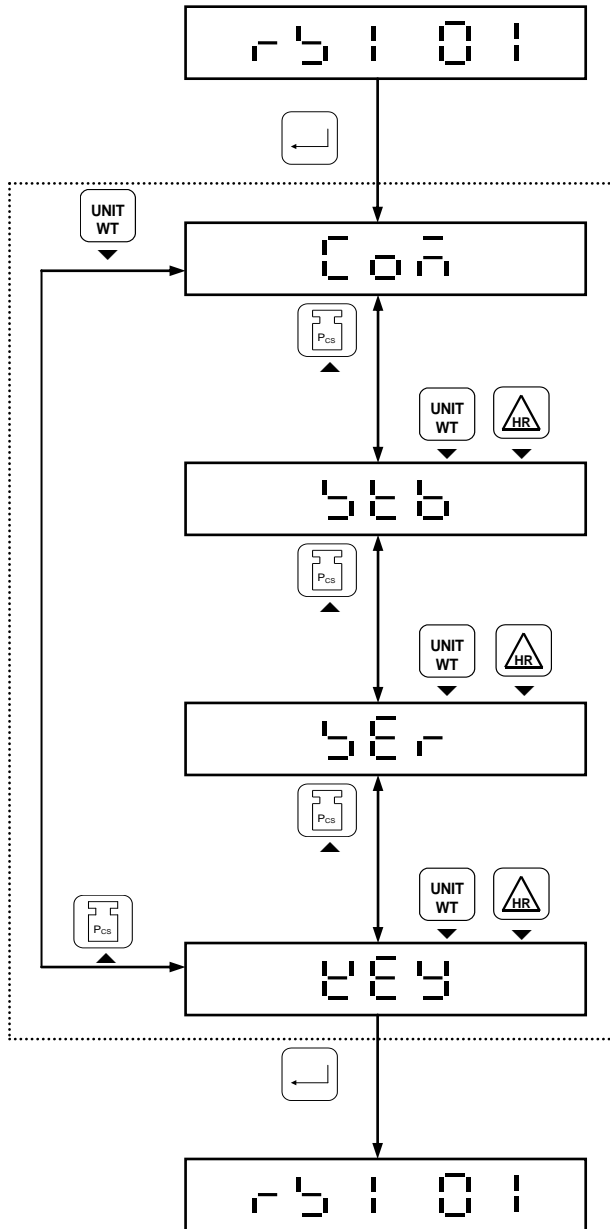


- r5 1 00 ⇒ Return to upper level
- r5 1 01 ⇒ Transmission Mode Setting
- r5 1 02 ⇒ Baud Rate Setting
- r5 1 03 ⇒ Communication Protocol setting
- r5 1 04 ⇒ Output Format Setting
- r5 1 05 ⇒ Re-zero Range Setting
- r5 1 06 ⇒ Weight Range Setting
- r5 1 07 ⇒ Date & Time Display setting
- r5 1 08 ⇒ Date & Time Setting



3-3-1 Transmission Mode Setting r 5 1 0 1

The default setting: “ C o ñ ”



Use the or the / key to select from the 4 modes available:
 Press the key to confirm the setting.

C o ñ ⇒ Directive Mode

5 6 6 ⇒ Stable transmission + Directive Mode

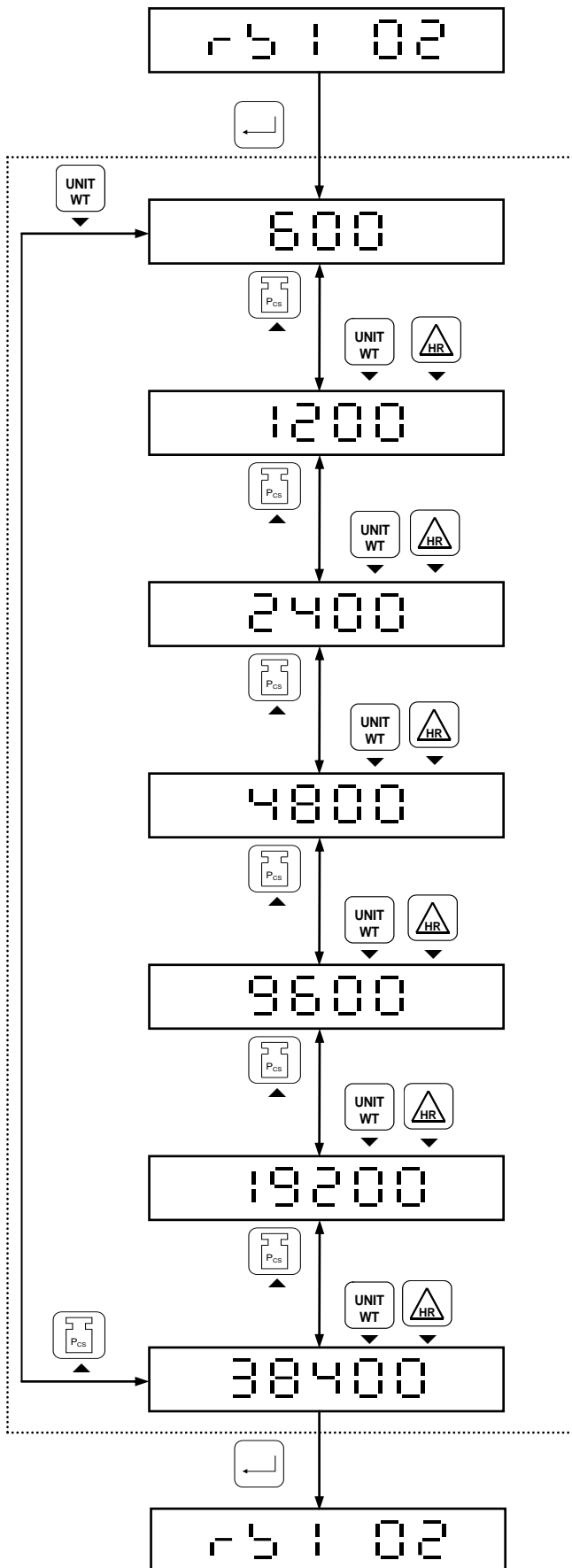
5 E r ⇒ Continuous transmission + Directive Mode

2 E 4 ⇒ Manual transmission + Directive Mode



3-3-2 Baud Rate Setting r 5 1 0 2

The default setting: “ 9600 ”



Use the or the / key to select from the 7 baud rates:

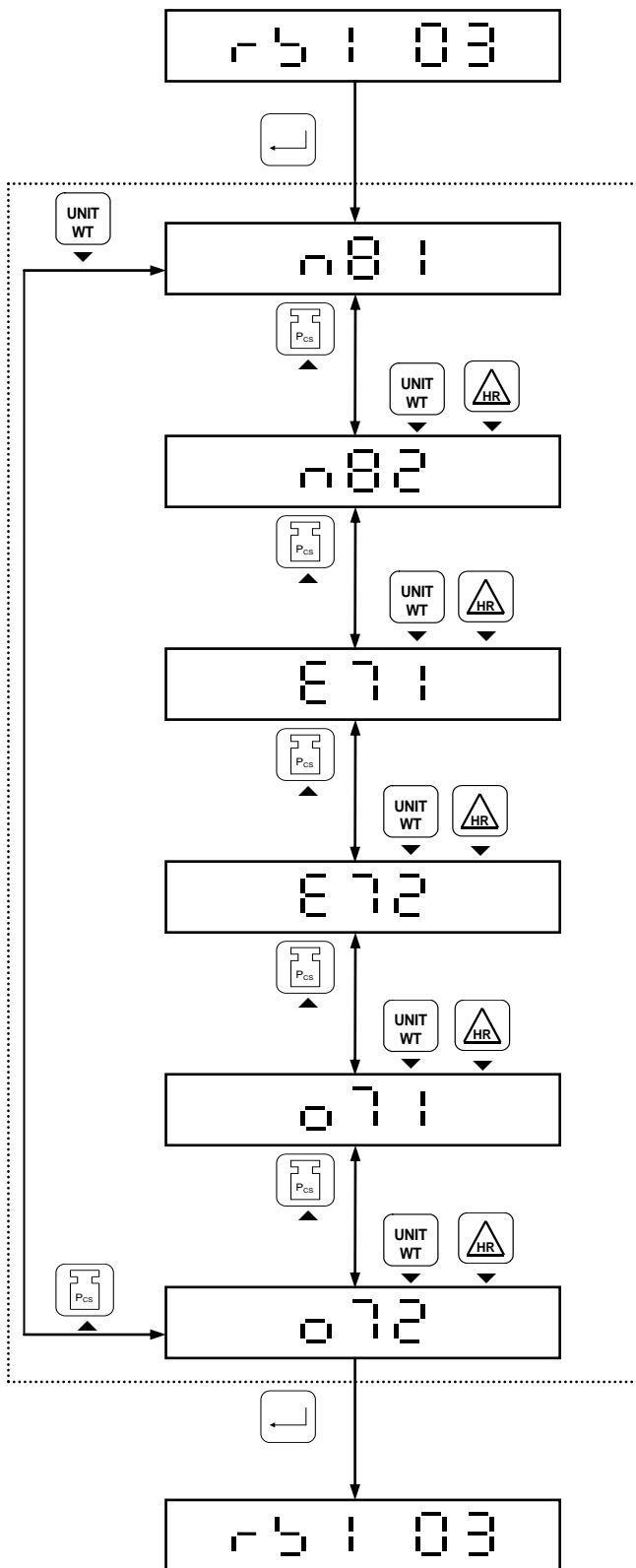
Press the key to confirm the setting.

- 600 ⇒ 600 bps
- 1200 ⇒ 1200 bps
- 2400 ⇒ 2400 bps
- 4800 ⇒ 4800 bps
- 9600 ⇒ 9600 bps
- 19200 ⇒ 19200 bps
- 38400 ⇒ 38400 bps



3-3-3 Communication Protocol Setting r 5 1 0 3

The default setting: “ n 8 1 ”



Use the or the / key to set the parameter

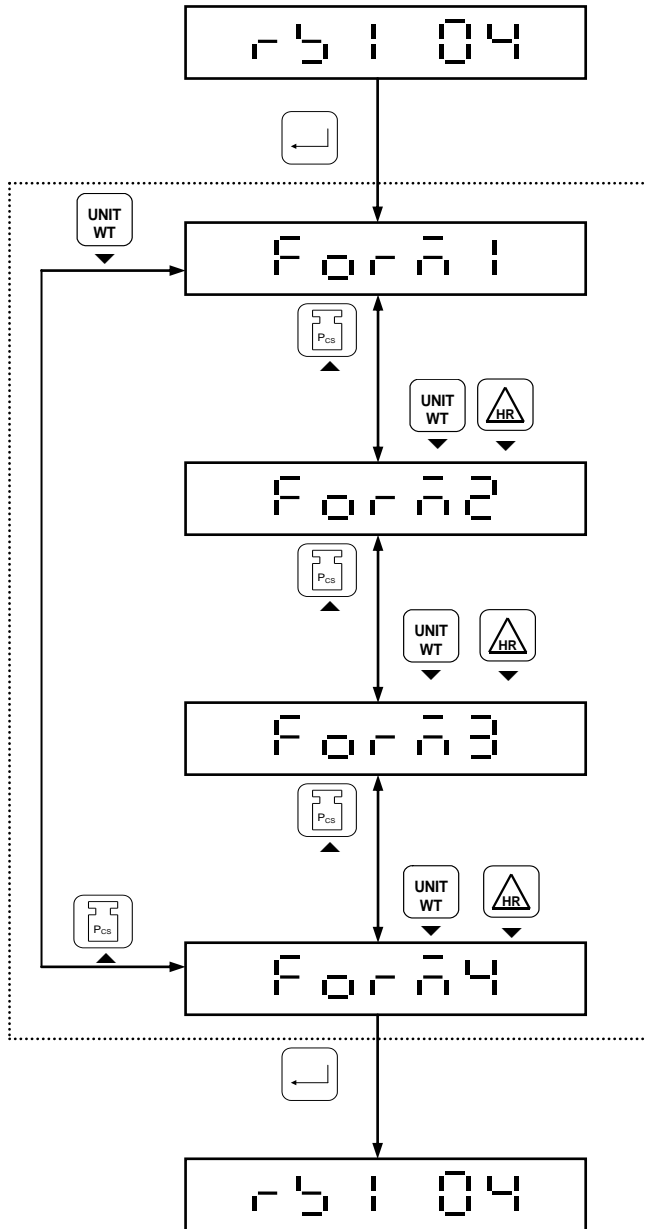
Press the key to confirm the setting.

- n 8 1 ⇒ 8 data bit, No parity bit, 1 stop bit
- n 8 2 ⇒ 8 data bit, No parity bit, 2 stop bit
- E 7 1 ⇒ 7 data bit, Even parity bit, 1 stop bit
- E 7 2 ⇒ 7 data bit, Even parity bit, 2 stop bit
- O 7 1 ⇒ 7 data bit, Odd parity bit, 1 stop bit
- O 7 2 ⇒ 7 data bit, Odd parity bit, 2 stop bit



3-3-4 Output Format Setting r 5 1 0 4

The default setting is “F o r m 1”



Use the or the key to select format mode.

Press the key to confirm the setting.

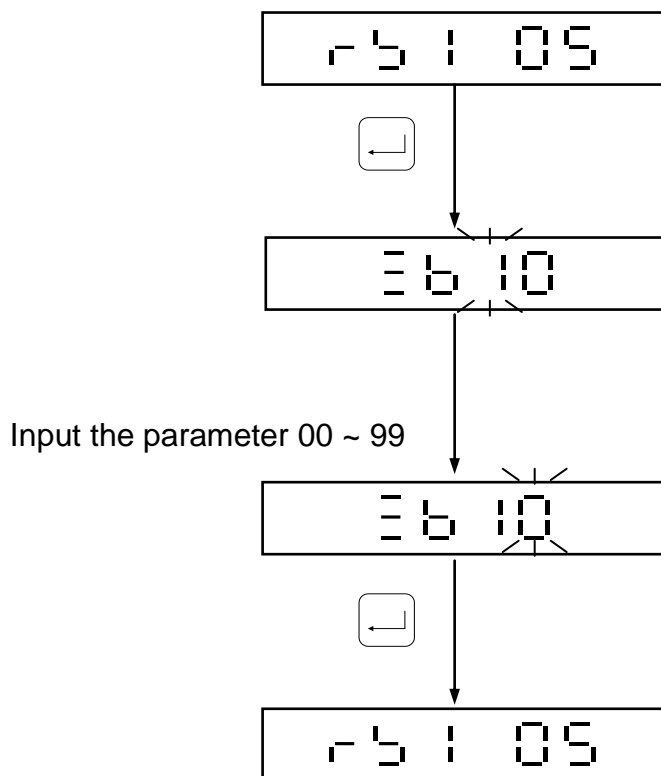
- F o r m 1 ⇒ Format 1
- F o r m 2 ⇒ Format 2
- F o r m 3 ⇒ Format 3
- F o r m 4 ⇒ Format 4

Refer to Appendix 3



3-3-5 Re-zero Range Setting r 5 | 05

- The default setting: “ 10 ”
- Setting range is from 00 ~ 99



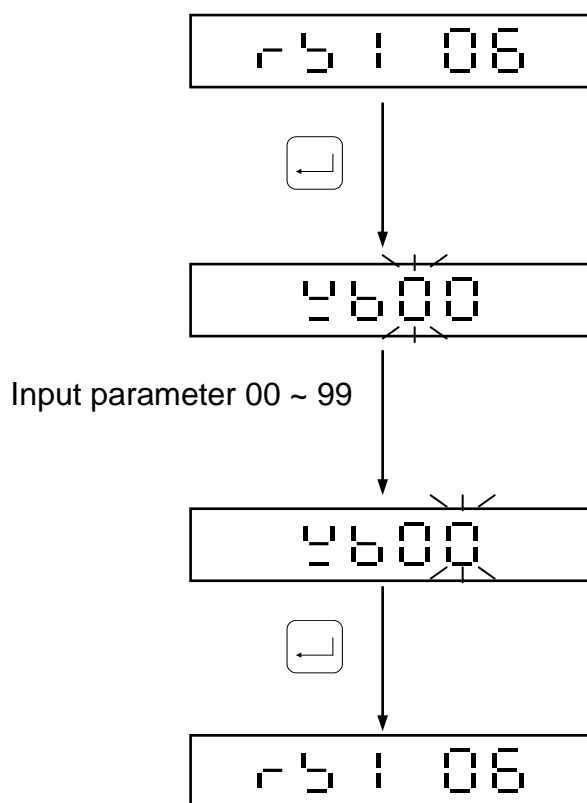
	⇒ Upward digit selecting (0-9)
	⇒ Downward digit selecting (9-0)
	⇒ Move the cursor leftward
	⇒ Move the cursor rightward
	⇒ Confirmation key



3-3-6 Weight Range Setting r 5 1 0 6

- The default setting: “ 0 0 ” (The weight range change will not be defined)
- Weight Range can be set 00 ~ 99. And “ 00 ” is default.

When range is over set value, and Stable Transmission or Manual Transmission Modes is set, the value will print out.



	⇒ Upward digit selecting (0-9)
	⇒ Downward digit selecting (9-0)
	⇒ Move the cursor leftward
	⇒ Move the cursor rightward
	⇒ Confirmation key



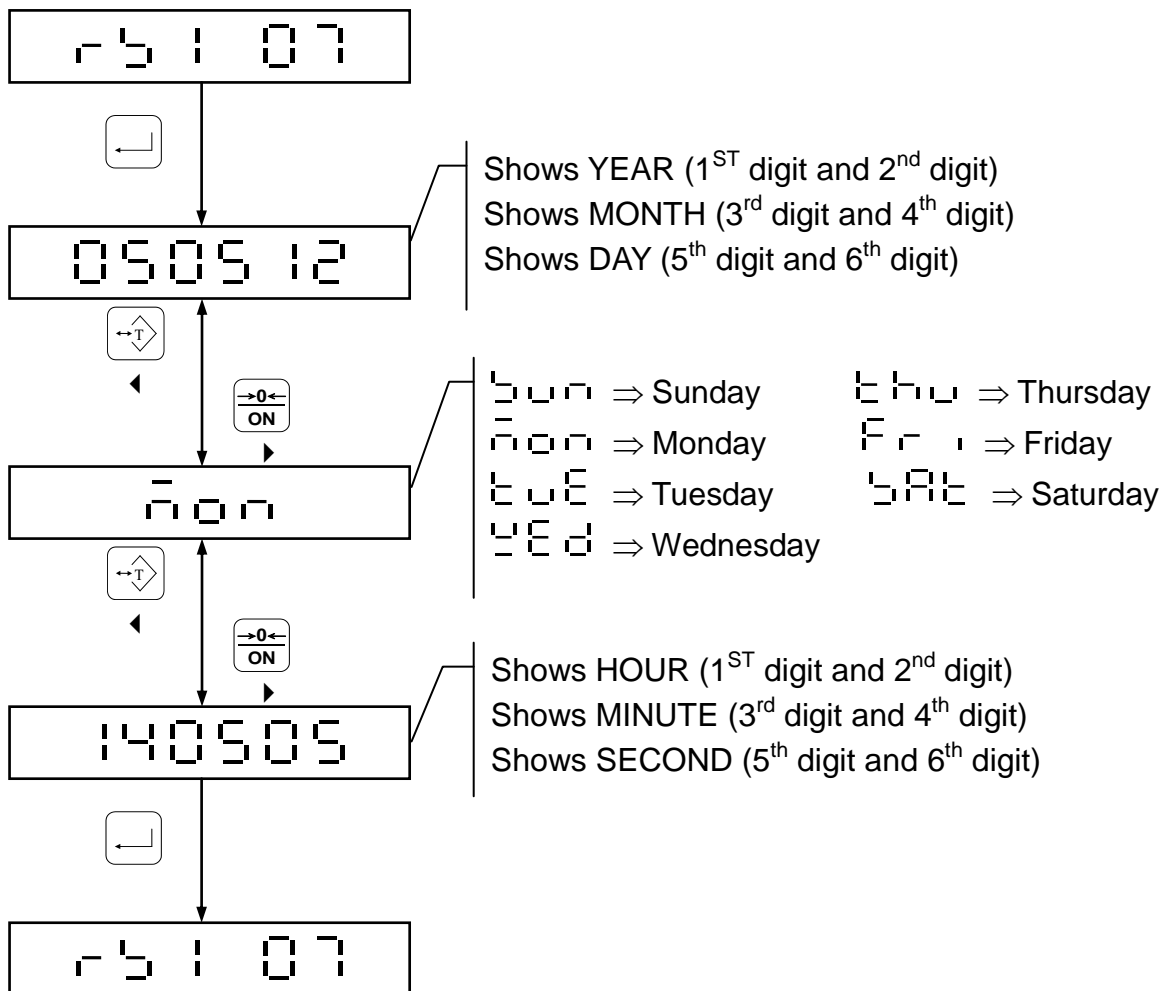
3-3-7 Date & Time Display Setting r 5 | 0 7

This function is available with RTC card.

Time will need to be reset when the balance is out of battery with its adaptor unplugged. Please replace the battery before proceeding to reset the time.

Use the or the key to select DATE, TIME OR MONDAY in cycle.

And press the key to return to the upper level.

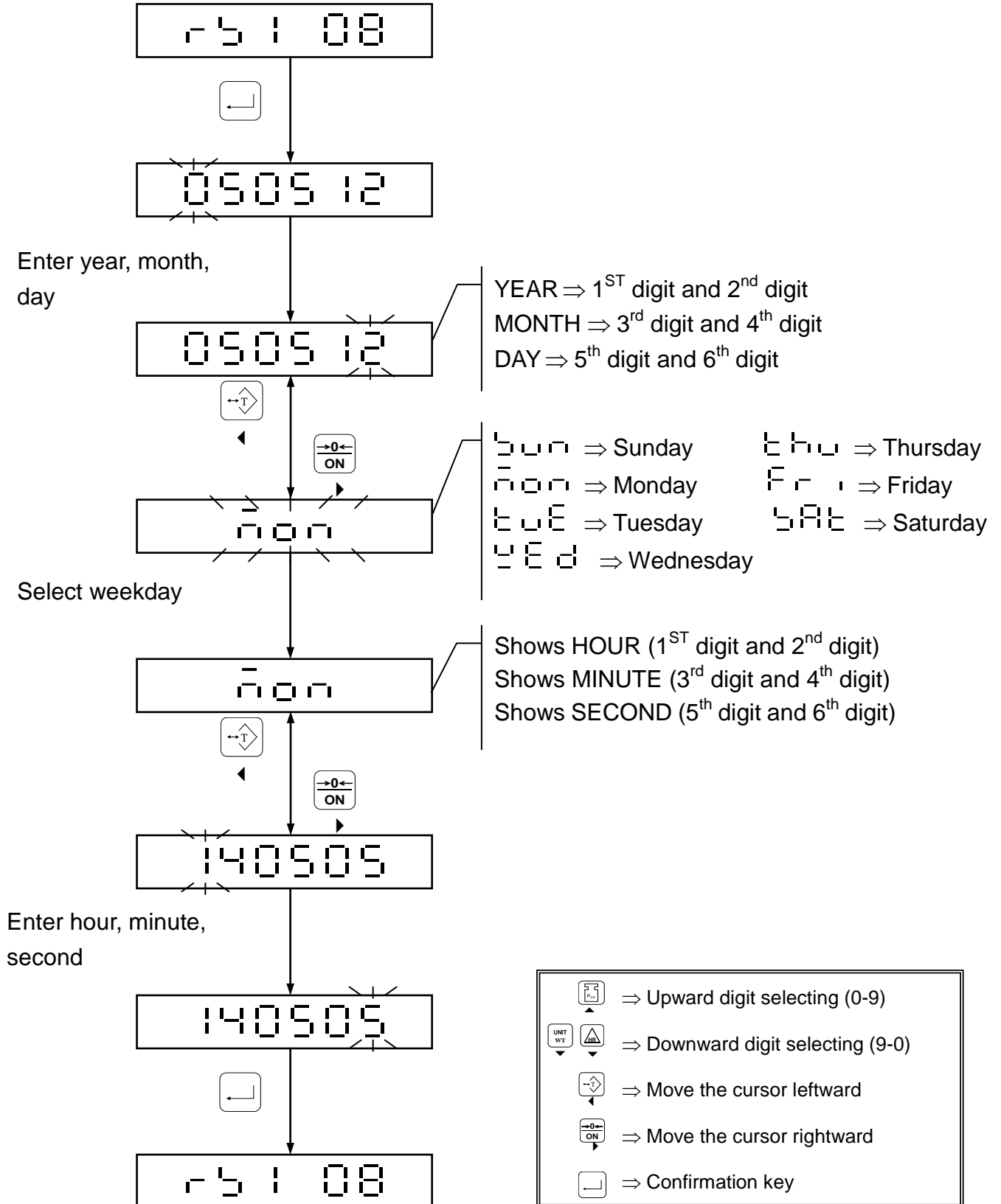




3-3-8 Date & Time Setting 15:08

This function is available with RTC card.

Time will need to be reset when the balance is out of battery with its adaptor unplugged. Please replace the battery before proceeding to reset the time.





APPENDIX I UNIT CONVERSION TABLE

1	ct	[MET.CARAT]	=	0.2 g
1	lb	[AVOIRDUPOIS POUND]	=	453.59237 g
1	oz	[AVOIRDUPOIS OUNCE]	=	28.349523125 g
1	dr	[AVOIRDUPOIS DRAM]	=	1.7718451 g
1	GN	[GRAIN](U.K)	=	0.06479891 g
1	ozt	[TROY OUNCE]	=	31.1034768 g
1	dwt	[PENNYWEIGHT]	=	1.55517384 g
1	MM	[MOMME](JPN)	=	3.749996 g
1	tl.J	[HONG KONG JEWELRY TAE]	=	37.4290018 g
1	tl.T	[TAE](TWN)	=	37.49995 g
1	tl.H	[HONG KONG TAE]	=	37.799375 g
1	t	[TOLA](INDIA)	=	11.6638038 g



APPENDIX II FULL CAPACITY TABLE

External Resolution: 1/30000

		150 Series	300 Series	600 Series	1500 Series	3000 Series
g	Hr	150.045	300.09	600.18	1500.45	3000.9
	nr	150.45	300.9	601.8	1504.5	3009
ct	Hr	750.45	1500.45	3000.9	7504.5	15004.5
	nr	754.5	1504.5	3009	7545	15045
lb	Hr	0.33018	0.66045	1.32045	3.3018	6.6045
	nr	0.3318	0.6645	1.3245	3.318	6.645
oz	Hr	5.2018	10.5045	21.009	52.018	105.045
	nr	5.218	10.545	21.09	52.18	105.45
dr	Hr	84.045	160.09	330.18	840.45	1600.9
	nr	84.45	160.9	331.8	844.5	1609
GN	Hr	2300.9	4601.8	9204.5	23009	46018
	nr	2309	4618	9245	23190	46380
ozt	Hr	4.8018	9.6045	19.009	48.018	96.045
	nr	4.818	9.645	19.09	48.18	96.45
dwt	Hr	96.045	190.09	380.18	960.45	1900.9
	nr	96.45	190.9	381.8	964.5	1909
MM	Hr	40.018	80.045	160.09	400.18	800.45
	nr	40.18	80.45	160.9	401.8	804.5
tl.J	Hr	4.0018	8.0045	16.009	40.018	80.045
	nr	4.018	8.045	16.09	40.18	80.45
tl.T	Hr	4.0018	8.0045	16.009	40.018	80.045
	nr	4.018	8.045	16.09	40.18	80.45
tl.H	Hr	3.9018	7.9045	15.009	39.018	79.045
	nr	3.918	7.945	15.09	39.18	79.45
t	Hr	12.8045	25.009	51.018	128.045	250.09
	nr	12.845	25.09	51.18	128.45	250.9

**External Resolution: 1/60000**

		300 Series	600 Series	1200 Series	3000 Series
g	Hr	300.045	600.09	1200.18	3000.45
	nr	300.45	600.9	1201.8	3004.5
ct	Hr	1500.45	3000.45	6000.9	15004.5
	nr	1504.5	3004.5	6009	15045
lb	Hr	0.66018	1.32045	2.64045	6.6018
	nr	0.6618	1.3245	2.6445	6.618
oz	Hr	10.5018	21.1045	42.009	105.018
	nr	10.518	21.145	42.09	105.18
dr	Hr	169.045	330.09	670.18	1690.45
	nr	169.45	330.9	671.8	1694.5
GN	Hr	4600.9	9201.8	18504.5	46009
	nr	4609	9218	18545	46090
ozt	Hr	9.6018	19.2045	38.009	96.018
	nr	9.618	19.245	38.09	96.18
dwt	Hr	192.045	380.09	770.18	1920.45
	nr	192.45	380.9	771.8	1924.5
MM	Hr	80.018	160.045	320.09	800.18
	nr	80.18	160.45	320.9	801.8
tl.J	Hr	8.0018	16.0045	32.009	80.018
	nr	8.018	16.045	32.09	80.18
tl.T	Hr	8.0018	16.0045	32.009	80.018
	nr	8.018	16.045	32.09	80.18
tl.H	Hr	7.9018	15.8045	31.009	79.018
	nr	7.918	15.845	31.09	79.18
t	Hr	25.7045	51.009	102.018	257.045
	nr	25.745	51.09	102.18	257.45

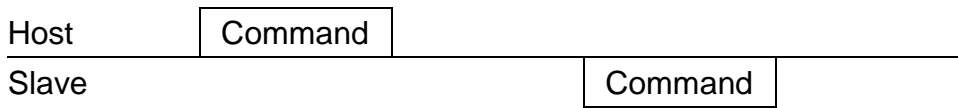


APPENDIX III RS232 BI-DIRECTION FORMAT

General Format

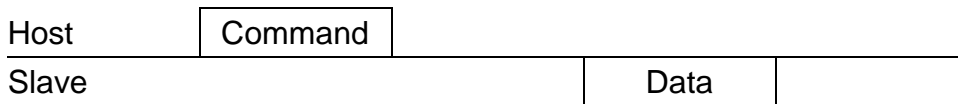
Gross	S	T	,	G	S	,	+	SP	1	2	3	.	4	5	6	SP	SP	SP	g	CR	LF
Net	S	T	,	N	T	,	+	1	2	.	3	4	.	5	6	SP	SP	c	T		
Tare	S	T	,	T	R	,	+	0	1	2	.	3	4	5	6	SP	SP	k	g		
Overload	O	L	,	G	S	,	+	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP		
Under load	O	L	,	G	S	,	-	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP		
Unstable	U	S	,	G	S	,	+	0	1	2	3	.	4	5	6	SP	SP	l	b		

Format A



MZ	Zero	CT	Clear TARE value
MT	Tare	UA	Shift to the 1st Unit
UB	Shift to the second Unit	UC	Shift to the 3rd Unit
UD	Shift to the 4th Unit	UE	Shift to the 5th Unit
UF	Shift to the 6th Unit	UG	Shift to the 7th Unit
UH	Shift to the 8th Unit	UI	Shift to the 9th Unit
UJ	Shift to the 10th Unit	UK	Shift to the 11th Unit
UL	Shift to the 12th Unit	UM	Shift to the 13th Unit
SC	Serial printer output	SA	Auto Transmission Mode
SM	Manual Transmit	SO	Command Mode
%	Stop Continuous transmission and enter the command Mode		

Format B



RW	Read the current Weight	RT	Read TARE
RG	Read the Gross Weight	RN	Read Net weight value

Notes: Prior Camand plus %= Continuous read value

Prior command plus #= Read the stable value

EX:

```

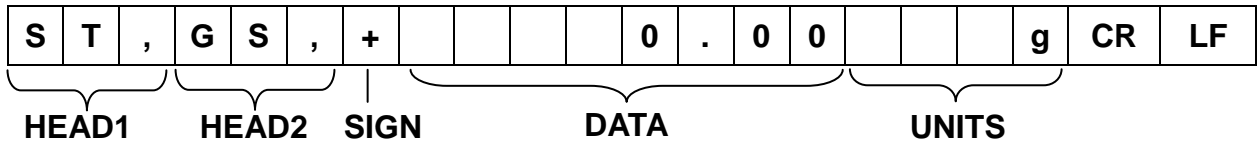
Host    %RW          (Continuous Read)
Slave   5.185        (Continuous transmission)

Host    #RW          (Read the current weight value)
Slave   2.188        (Transmission after the balance is stable)
  
```



RS232 OUTPUT FORMAT

Format 1 (RS1 04 is set form 1)



HEAD1 (3 byte)

S	T	,	Stable
U	S	,	Unstable
O	L	,	Overload

HEAD2 (3byte)

G	S	,	Gross Weight
N	T	,	Net Weight

SIGN (1byte)

+	Positive weight
-	Negative weight

DATA (8byte)

								8 BYTES including the decimal point
--	--	--	--	--	--	--	--	-------------------------------------

UNITS (4byte)

			g
		c	t
		l	b
		o	z
		d	r
		G	N
	o	z	t
	d	w	t
		M	M
t	l	.	j
t	l	.	T
t	l	.	H
			t

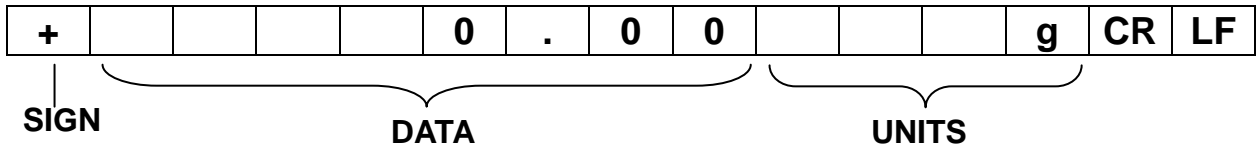
CR, LF (2byte)

CR	LF
----	----

☰ Total length of transmission is 21 bytes (3 + 3 + 1 + 8 + 4 + 2 = 21)



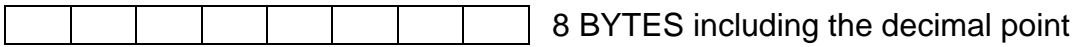
Format 2 (RS1 04 is set form 2)



SIGN (1byte)

+	Positive weight
-	Negative weight

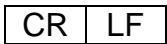
DATA (8byte)



UNITS(4byte)

			g
		c	t
		l	b
		o	z
		d	r
		G	N
	o	z	t
	d	w	t
		M	M
t	l	.	j
t	l	.	T
t	l	.	H
			t

CR,LF (2byte)



Total length of transmission is 15 bytes (1 + 8 + 4 + 2 = 15)

**Format 3 (RS1 04 is set form 3 with option card RTC)****Weight Mode**


D	A	T	E	:		2	0	0	5	/	0	5	/	1	2	CR	LF
T	I	M	E	:		1	2	:	0	0	:	0	0			CR	LF
G						1	0	0	.	0	0				g	CR	LF
T								0	.	0	0				g	CR	LF
N						1	0	0	.	0	0				g	CR	LF
CR	LF																
CR	LF																
CR	LF																

Counting Mode

D	A	T	E	:		2	0	0	5	/	0	5	/	1	2	CR	LF
T	I	M	E	:		1	2	:	0	0	:	0	0			CR	LF
G									5	0	0		p	c	s	CR	LF
T										0			p	c	s	CR	LF
N									5	0	0		p	c	s	CR	LF
CR	LF																
CR	LF																
CR	LF																

Percentage Mode

D	A	T	E	:		2	0	0	5	/	0	5	/	1	2	CR	LF
T	I	M	E	:		1	2	:	0	0	:	0	0			CR	LF
G						1	0	0	.	0	0				%	CR	LF
T								0	.	0	0				%	CR	LF
N						1	0	0	.	0	0				%	CR	LF
CR	LF																
CR	LF																
CR	LF																

 Length of line is 18 bytes. (Including CR LF)



Format 4 (RS1 04 is set form 4)

Weight Mode

G						1	0	0	.	0	0					g	CR	LF
T								0	.	0	0					g	CR	LF
N						1	0	0	.	0	0					g	CR	LF
CR	LF																	
CR	LF																	
CR	LF																	

Counting Mode

G										5	0	0		p	c	s	CR	LF
T												0		p	c	s	CR	LF
N										5	0	0		p	c	s	CR	LF
CR	LF																	
CR	LF																	
CR	LF																	

Percentage Mode

G						1	0	0	.	0	0					%	CR	LF
T								0	.	0	0					%	CR	LF
N						1	0	0	.	0	0					%	CR	LF
CR	LF																	
CR	LF																	
CR	LF																	

Length of line is 18 bytes. (Including CR LF)