

Weighing Scale User and Service Manual

Model: CWT7



Please read this manual carefully before operation

---Important safety info

---Warranty

GRAVITY MEASUREMENT, INC.

Important Safety Information

READ ALL INSTRUCTIONS BEFORE USING SCALES TO ENSURE MAXIMUM SAFETY, BEST PERFORMANCE, AND TO GAIN KNOWLEDGE OF OUR SCALE, IT IS ESSENTIAL THAT YOU OR ANY OTHER OPERATOR OF THE SCALE READ AND UNDERSTAND THE CONTENTS OF THIS MANUAL BEFORE OPERATING THE DEVICE.

When using an electrical device, basic precautions should always be followed, including the following:

1. Please use only the original power cord or DC adapter supplied with the scale.

Other cords or adapters may damage the scale.

2. DC adaptor is used to charge the battery, and scale can operate without DC adaptor.
3. Avoid using long power extension cords – this may cause interference
4. Do not use on surfaces or in areas where vibration, air movement or temperature change.
Do not place in direct sunlight or near air conditioning vents.
5. Avoid high humidity (greater than 80%) that might cause condensation and keep away from direct contact with water and other corrosive chemicals.
6. Static may influence the weighing result. To reduce the static, wipe the pan and scale with anti-static wipes.
7. Don't impact or drop heavy objects on the scale – this may affect accuracy, or cause damage. Do not stack material on the scale when it is not in use.
8. Battery should be removed if the scale is not used for a long period of time. Battery should be recharged every 3 months.
9. Place items to be weighed as close to center of the pan as possible
10. Only use fingers to operate the keypad. Do not press with hard or sharp objects.

Warranty

Gravity Measurement, Inc. (Schenectady, New York) offers one-year limited warranty (parts and labor) for the components failed due to defects in materials or workmanship. Warranty starts from the date of delivery.

During the warranty period, should any repairs be necessary, the purchaser must inform its supplier or Gravity Measurement. The company or its authorized technician reserves the right to repair or replace the components at any of its workshops depending on the severity of the problems. However, any freight involved in sending the faulty units or parts to the service center should be borne by the purchaser.

The warranty will cease to operate if the equipment is not returned in the original packaging and with correct documentation for a claim to be processed. All claims are at the sole discretion of Gravity Measurement.

This warranty does not cover equipment where defects or poor performance is due to misuse, accidental damage, exposure to radioactive or corrosive materials, negligence, faulty installation, unauthorized modifications or attempted repair or failure to observe the requirements and recommendations as given in this User Manual. Additionally, rechargeable batteries (where supplied) are not covered under warranty.

Repairs carried out under the warranty does not extend the warranty period. Components removed during the warranty repairs become the company property.

What Is Inside Box

AC/DC adaptor (110V)

CWT7 weighing scale, with adhesive film covered platter. Two parts are separated to protect the load cell during transportation.

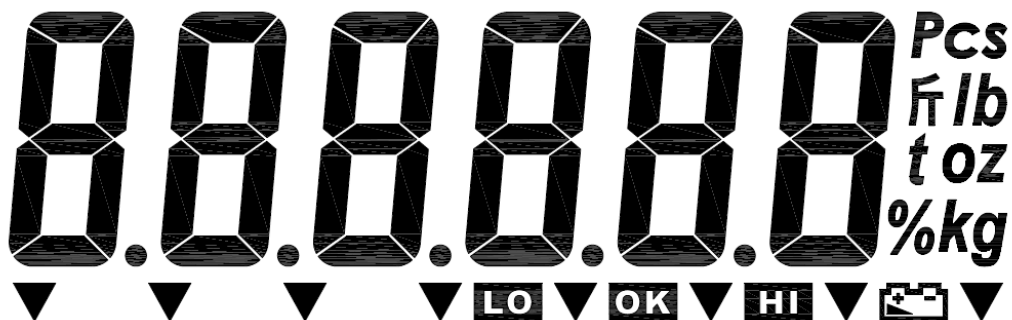
Rechargeable battery is installed inside the scale.

Two wire seals. The wire seal is used usually by the inspector of Department of Weight and Measure or authorized dealer. The wire seal is threaded through a metal rode that protrudes through the bottom of the device and through a hole in the scale base adjacent to the metal rode.

Set up the Scale

Place the scale on a stable, level surface out of the way of air currents. The scale must be level during use. Adjust the feet and use the integrated bubble at the front of the scale to achieve level. Be sure that scale does not rock back and forth. Ensure no weight is on the pan when turning on the scale. Scale is operated using the rechargeable battery or AC adaptor. is used to charge the battery, and scale can operate without DC adaptor.

LCD Display

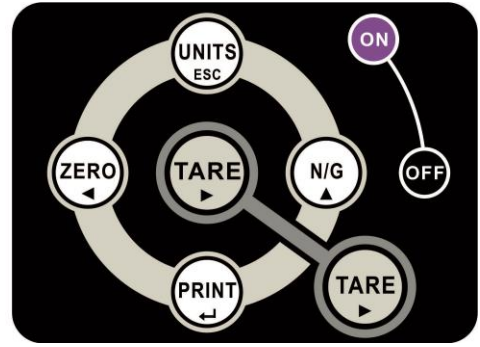
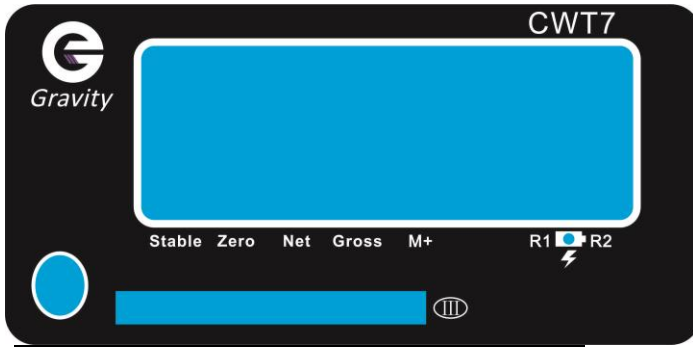


Size: 130 mm x 46 mm X 2.8 mm

Font height: 30 mm

Segments: 6 or 7??

Key DESCRIPTION



Press and hold this key for 2 seconds to turn off the balance.



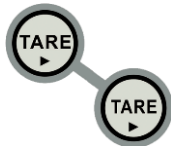
Press this key to turn on the balance



UNITS To select the desired weight unit.
ESC To exit from setup mode.



ZERO To reset the weight to "0", but the display value has to be lesser than $\pm 2\%$ of maximum capacity.
◀ To move one space to the left or downward in setup mode.



TARE To subtract the container's weight.
▶ To move one space to the right or upward in setup mode.






N/G To view gross or net weight when the balance is on tare status. All other keys will be disabled when gross weight is activated.
▲ To increase value in setup mode.








PRINT Manually transmitting data through RS232 to print.
← Confirmation in setup mode.

BASIC PARAMETER SETTING














To access to functions setting, press the  and  key at the same time in weighing mode, and LCD displays **UF-1**. Press  key to rotate **UF-1** to **UF-9**

“*” This flag indicates that the function is locked when “Approval Version”.

UF-1 A/D count

1. Press the  key to view the A/D count.
2. Press the  key to view the the battery voltage or press the  key to exit back to menu **UF-1**
3. To move to next parameter press the  key.
4. To exit and return to normal weighing press the  key.

UF-2 High / Low limits setting

1. Press the  key to enter.
2. The display will show **00.000L** (set low limit).
3. Use the keys  and  to move cursor and press the  to select number.
4. Press the  key to confirm.
5. The display will show **00.000H** (set high limit).
6. Use the keys  and  to move cursor and press the  to select number.
7. Press the  key to confirm.
8. The display will show **0 .000**, look at the remarks below.
9. Use the keys  and  to move cursor and press the  to select number.
10. Press the  key to confirm.

Remarks: 0 0 0
 A B C

A --- Buzzer on: 0= Stable not required 1= Stable required

B -- LCD indicator and RELAY on: 0= Stable not required 1= Stable required

C : Buzzer beeps when: 0= Buzzer off 1= OK 2= LO and HI






- Low limit set as 0 will clear all check weigh values.
- This function is locked when **UF-5** is set as “Hold 1”

UF-3 Auto-power off

Modes: **RoFF00**: Auto-turn off disabled.

RoFF01: The balance will automatically turn off after 1 minute of inactivity.

This time can be set up to 99 minutes.




1. Press the  key to access to auto-power configuration.
2. Use the keys  and  to move cursor and press the  to select number.
3. Press the  key to confirm.

UF-4 Backlight setting

Modes: **lit A**: Automatic

lit on: Backlight on

lit off: Backlight off

1. Press the  key to access to backlight configuration.
2. Use the  key to select the desired mode.
3. Press the  key to confirm.

UF-5 HOLD function (*)




Modes: **HoLd 0** Disable

HoLd 1 Animal (motion) Hold function


HoLd 2: Peak value hold (when held can press any key to cancel)

HoLd 3 Stable hold (when held can press any key to cancel)

HoLd 4 Stable hold (when held can auto cancel at zero)

1. Press the  key to access to hold function configuration.
2. Use the  key to select the desired mode.
3. Press the  key to confirm.

Remarks: **HoLd 1**:

1. Press the  key will show **PCE002**

2. Use the keys **TARE** and **ZERO** to move cursor and press the **N/G** to select number, this can set the range from 001 ~ 100 units of the animal hold.
3. Press the **PRINT** key will show **E 17E 8**
4. Use the **N/G** key to select 1,2,4,8,16,32 or 64 times within the hold range.
5. Press the **PRINT** key to confirm.

UF-6 RS-232 Output

1. Press the **PRINT** key to enter.
2. The display will show **232 1**.
3. Press the **N/G** key to select the modes.
4. Press the **PRINT** key to confirm, and will show **b 9600**.
5. Use the **N/G** key to select the baud rate.
6. Press the **PRINT** key to confirm.

Modes: **232 0** : RS-232 disable
232 1 : Stable output – Format 1
232 2 : Stream output – Format 1
232 3 : Manual output – Format 1
232 4 : Stable output – Format 2
232 5 : Stream output – Format 2
232 6 : Manual output – Format 2
232 7 : Manual accumulate output – Format 3
232 8 : Auto accumulate output – Format 3
232 9 : Manual accumulate output – Format 4
232 10 : Auto accumulate output – Format 4
232 11 ~ 232 13 : LP50 printer is used

Baud rate **b 1200** : Baud rate 1200
b 2400 : Baud rate 2400
b 4800 : Baud rate 4800
b 9600 : Baud rate 9600
b 19200 : Baud rate 19200
b 38400 : Baud rate 38400

Remarks:

Format 1 output examples :

ST, GS, + 1.0001b

Format 2 output examples :

+ 1.0001b


Format 3 output examples :

S/N	WT/1b
0001	2.205
0002	2.205

Format 4 output examples :

```
TICKET NO. 0001
G      3.0001b
T      1.0001b
N      2.0001b

TOTAL NUMBER
OF TICKETS 0001
TOTAL
NET      2.000
```

- Format 3 and format 4 if you want to print the total weight, press the  key twice, and the accumulative weight will be removed.

Communication Protocol:

UART signal of EIA-RS232 C

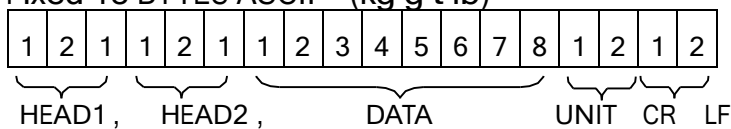
Format:

1. Baud rate: 9600
2. Data bits : 8 bits
3. Parity bits: None
4. Stop bits : 1 bit

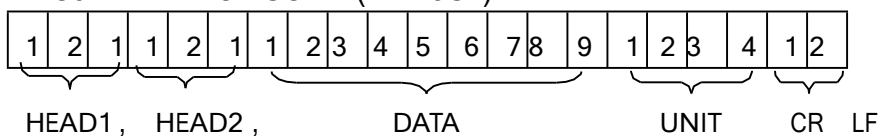
Format 1 (232 1 – 3):

HEAD1 (2 BYTES)	HEAD2 (2 BYTES)
OL – Overload	
ST – Stable	NT – Net weight
US – Unstable	GS – Gross weight

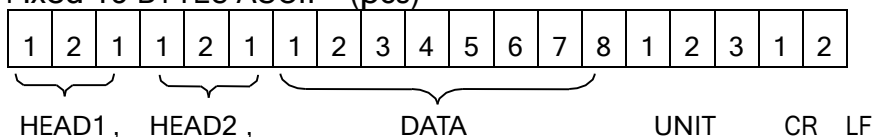
Fixed 18 BYTES ASCII (kg g t lb)



Fixed 21 BYTES ASCII (tl.T lboz)



Fixed 19 BYTES ASCII (pcs)






UF-7 Speed setting (*)

Modes: **SPEED1**: Standard speed

SPEED2: High speed

SPEED3: Low speed

1. Press the  key to enter.
2. Press the  key to select the desired mode.
3. Press the  key to confirm.

UF-8 Zero tracking(*)

Modes: **2P 0** : OFF




2P 1 : One division tracking at zero

2P 2 : Two division tracking at zero







2P 3 : Three division tracking at zero

2P 4 : Four division tracking at zero

2P 5 : Five division tracking at zero

1. Press the  key to enter.
2. Press the  key to select the desired mode.
3. Press the  key to confirm.

UF-9 G Value setting

1. Press the  key to display the G value of manufacture place.
2. If set the G value of local press the  key and then press the  or  key and  key to input the new G value.
3. Press the  key to confirm.

Advanced Functions

Warning: Due to regulation by Bureau of Weights and Measures of each State, for the scales legal for trade, weight calibration is conducted by authorized dealers or your local metrology workers using a known standard weight. Weight calibrations are usually locked for end user, and therefore those functions are not accessible (Table). Wrong operation by end user may cause the compliance issue or wrong performance of the scale


Table: Availability of UF, ECF, and LF Functions with Calibration Switch Location and Type Approval Settings

Calibration Switch Location	Type Approval LF6	UF 1-9	ECF 1-3	LF
OFF	□ iπL	UF5, UF7, UF8, and UF9 are not available	No	No
OFF	nonE	UF5, UF7, and UF8 are not available	Yes	Need password
ON	□ iπL	UF5, UF7, and UF8 are not available	No	Yes
ON	nonE	All functions are available	Yes	Yes







The following instructions are intended for trained scale dealers/distributors, state inspectors.

Weight Calibration ECF1-ECF3



To enable weight calibration and other advanced functions, calibration switch inside the scale must be at on position and LF6 has to set to nonE.

1. In weight mode, press the  and  keys, the display will show **ECF-1**.
2. Press the  or  key to select **ECF-1**, **ECF-2** or **ECF-3**.






ECF-1 Zero and Span Calibration

1. Press the  key to enter, display will show **CAL2**.
2. Press the  key to calibrate zero point.
3. The display will show the calibration weight **006.000**. Depending on the capacity, your value can be different.
4. Use the keys  and  to select the digit, and press  key to input the weight value.
5. Put the calibration weight on the platter and press the  key to calibrate.
The scale will return to weighing mode automatically.

***[[F-2* Zero Calibration**

1. Press the  key to enter, display will show **CAL 2**.
2. Press the  key to calibrate zero point.
3. The scale will return to weighing mode automatically.

***[[F-3* Span Calibration**

1. Press the  key to enter, display will show the calibration weight **0**.
2. Use the keys  and  to select the digit, and press  key to input the weight value.
3. Put the calibration weight on the platter and press the  key to calibrate.
The scale will return to weighing mode automatically.

Locked Function (LF) Operations

CAL switch has to be ON (which is located inside the scale. You have to open the hole at the back to get access to CAL switch. Password required when CAL switch is OFF.

Keep pressing the **【ZERO】** key (no releasing) while turning on the indicator. After self-checking finishes, it displays **P 0000**. Input the password **P 0020**, and then press **【Print】** to enter the parameter setting mode

*Press **【ZERO】** key or **【TARE】** key to shift between functions LF-1 ~ LF-8.

*Press **【Zero】【Tare】【N/G】** to move and change the digits

*Press **【UNIT/ESC】** to quit and the indicator will restart for normal weighing mode

LF1 Weight Calibration

Press **【Print】** key to enter zero calibration **CAL2**.

Make sure nothing on the platform of the scale and press **【M+】** to finish zero calibration

Display the full capacity **0300.00**

**Full capacity weights recommended for calibration of the scale, or at least 60% F.S. to assure the accurate weighing, it's not allowed to do with 1% F.S weight or more than 100%F.S.weight.*

Change the display value to be the same as the test weight.

Press **【Print】**, the digits will twinkle

Place the test weights on the platform (example of 300Kg)

Press **【Print】** until the indicator recognizes the weight correctly.

Finish of calibration.

LF2 Parameter Setting

Press **【Print】** key to enter parameter setting mode and it will display the internal A/D value.

Press **【Print】** key to set the weight units **110002** (both kg and lb units are enabled with calibration using unit lb)

110002

ABCDEF

A.....0= disabled.....1=Kg 2=Ton 3=g

B.....0= disabled.....1=lb 2=lb/oz

C.....0= disabled.....1=TW Kg 2=HK kg 3=VISS

D.....0= disabled.....1=PCS off 2=PCS ON

E.....0= disabled.....1=Multi interval 2=Multi range

F.....1=Calibration In Kg 2=Calibration in lb

110022 (both kg and lb units are enabled with calibration using unit lb, dual range)

110122 (In addition, PCS is on, and therefore used as a counting scale)

Press **【Print】** key to set the capacity of the scale **000300**

Press **【Print】** key to set the decimal point **dP 0.00**

Using **【Zero】** key or **【Tare】** key to shift it from 0.0 until 0.00000

Press **【Print】** key to set the division **d, μ 01**

Using **【N/G】** key to shift it between 01/02/05/10/20/50

LF3 Linearity Calibration

Press **【Print】** key to set the linearity calibration **11 0**

Press **【ON/T】** key to enter next step **11 1**

Put 1/3F.S. test weight and press **【ON/T】** to enter next step **11 2**

Put 2/3F.S. test weight and press **【ON/T】** to enter next step **11 3**

Put 100%F.S. test weight and press **【ON/T】** to enter next step **11 4**

Press **【Print】** key to exit and back to **LF-3**

LF4 A/D Converting Speed

The same operation as Weighing Speed

*It was blocked when UF-5 set of HOLD 1

*1=15Hz 2=30Hz 3=7.5Hz

LF5 Zero Tracking

The same operation as **UF 8** Zero Track

*It was blocked when **UF-5** set of HOLD 1 (animal weighing)

LF6 Type Approval

nonE is for non-certified scales, and **0, μ L** is for NTEP (United States) or OIML (Europe)

LF7 Gravity Adjustment

The same operation as **UF 9** Gravity Adjusting

LF8 Zero

Press **【Print】** key to set the initial zero function **SEt2 4**

4.....Reset of the zero point each time when the scale switches on

n.....Disable resetting zero when switching on the scale

Error Messages and Troubleshooting



Error Display	Meaning	
hhhhhh	Overload	Weight on pan exceeds maximum capacity
LLLLLL	Weight is too low	Weight is too low at the negative
-----	Price is out of range	Total price exceeds 999999
Err n	Weight unstable	Vibration or varying load on the pan during switch-on
Err H	Initial zero too high	Scale turned on with weight > 10% of maximum capacity already on the pan
Err L	Initial zero too low	Scale turned on with upward force > 10% of maximum capacity acting on the pan
 Battery symbol visible	Battery voltage is lower than 5.6 V	Battery needs charging. Connect to main adaptor. Press 【 T 】 and 【 6 】 together to view battery voltage. Press 【 CE 】 to return to weighing mode
 Battery symbol flashing	Battery voltage is lower than 5.5 V	Battery needs charging. Connect to main adaptor
Scale automatically shuts off	Battery voltage is lower than 5.4 V	Battery needs charging. Connect main adaptor

Table: List of UF, ECF, and LF

Function	Description
UF1	Display A/D count, Battery Voltage
UF2	High / Low limits setting
UF3	Auto-power off
UF4	Backlight setting
UF5	HOLD function
UF6	RS-232 Output
UF7	Speed setting
UF8	Zero tracking
UF9	Gravity Adjustment
ECF1	Zero and Span Calibration
ECF2	Zero Calibration
ECF3	Span Calibration
LF1	Weight Calibration
LF2	Parameter Setting

LF3	Linearity Calibration
LF4	A/D Converting Speed
LF5	Zero Tracking
LF6	Type Approval
LF7	Gravity Adjustment
LF8	Zero

Order information

Model	Capacity(kg)	Readability(g)	Capacity(lb)	Readability(lb)	Division
CWT7-3	3	0.1	6	0.0002	30000
CWT7-6	6	0.2	15	0.0005	30000
CWT7-15	15	0.5	30	0.001	30000
CWT7-30	30	1	60	0.002	30000
CWT7-3D	1.5/3	0.5/1	3/6	0.001/0.002	3000
CWT7-6D	3/6	1/2	6/15	0.002/0.005	3000
CWT7-15D	6/15	2/5	15/30	0.005/0.01	3000
CWT7-30D	15/30	5/10	30/60	0.01/0.02	3000



Certificate Number: 17-053
Page 1 of 3

NATIONAL TYPE EVALUATION PROGRAM

Certificate of Conformance

for Weighing and Measuring Devices

For:

Computing Scale
Non-computing Scale, Load Cell Electronic,
Multi-Range, Single-Range
Model: CWTxx & CPTxx
 n_{max} : 3000
 e_{min} : See table on page 2
Capacity: See table on page 2
Platform: 320 X 230 mm Stainless Steel
Accuracy Class: III

Submitted By:

Gravity Measurement, Inc.
17 Sterling Heights Drive
Clifton Park, NY 12065
Phone: 518-526-5942
Contact: Z. Rick Pang
Email: Pang@gravitymeasurement.com
Web site: www.gravitymeasurement.com

Standard Features and Options

Automatic Zero Tracking (AZT)	AC Power Supply
Initial Zero Setting Mechanism (IZSM)	DC/Battery Power Supply
Semi-Automatic Zero (Push Button)	Customer Display (Dual) (CPTxx models)
Semi-Automatic Tare (Push Button)	Liquid Crystal Display (LCD)
Keyboard Tare	RS-232 Communication Port
Programmable Tare	Single Range
Price Computing (CPTxx models)	Multi (Dual) Range
Weighing (CWTxx models)	
Counting (CWTxx models)	

Load Cells Used: ZEMIC Model L6D Series (NTEP Certificate of Conformance number 11-012)
or other metrological equivalent and NTEP certified

Temperature Range: -10 °C to 40 °C (14 °F to 104 °F)

This device was evaluated under the National Type Evaluation Program and was found to comply with the applicable technical requirements of "NIST Handbook 44: Specifications, Tolerances and Other Technical Requirements for Weighing and Measuring Devices." Evaluation results and device characteristics necessary for inspection and use in commerce are on the following pages.

Kristin Macey
Chairman, NCWM, Inc.

Jerry Buendel
Chairman, National Type Evaluation Program Committee
Issued: May 2, 2017

1135 M Street, Suite 110 / Lincoln, Nebraska 68508

The National Conference on Weights and Measures (NCWM) does not approve, recommend or endorse any proprietary product or material, either as a single item or as a class or group. Results shall not be used in advertising or sales promotion to indicate explicit or implicit endorsement of the product or material by the NCWM.

Parts

LCD display Part # 20351006

Leoch Maintenance-free Sealed Lead-acid Rechargeable Battery

DJW6-5.0 (6V 5.0AH)

Constant voltage charge

Standby use: 6.75-6.90 V

Cycle use: 7.2-7.5 V

Initial current: less than 1.5 A

Leoch Maintenance-free Sealed Lead-acid Rechargeable Battery

DJW6-4.0 (6V 4.0AH)

Constant voltage charge

Standby use: 6.75-6.90 V

Cycle use: 7.2-7.5 V

Initial current: less than 1.2 A

AL-FURAAT Valve regulated Sealed Lead-Acid Rechargeable Battery

AF4.5-6 (6V, 4.5AH)

Constant voltage charge

Standby use: 6.75-6.90 V

Cycle use: 7.2-7.5 V

Initial current: less than 1.35 A

GRAVITY MEASUREMENT, INC.