

Technical Manual

TBWS Washdown Bench scales



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PRECAUTIONS



WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, CLEANING, OR SERVICING. FAILURE TO DO SO COULD RESULT IN BODILY HARM OR DAMAGE THE UNIT.

- Permit only qualified persons to service the instrument
- Before connecting or disconnecting any components, remove the power.
- Failure to observe these precautions could result in bodily harm or damage to or destruction of the equipment.



- The weighing indicator is a precision electronic instrument, handle it carefully.
 - Do not install the scale in direct sunlight.
 - Verify the local voltage and receptacle type are correct for the scale.
 - Only use original adaptor, other could cause damage to the scale.
 - Pluggable equipment must be installed near an easily accessible socket outlet.
 - Avoid unstable power sources. Do not use near large users of electricity such as welding equipment or large motors.
 - Avoid sudden temperature changes, vibration, wind and water.
 - Avoid heavy RF noise.
 - Keep the indicator clean

1. SPECIFICATION

DIMENSIONS (inch/mm)



Model	TBWS-100	TBWS-200	TBWS-500
Display	2.	05inch / 52mm L(CD
Housing		Stainless steel	
Operating Temperature	-10°(C - 40°C / 14°F - ′	104°F
Resolution		1/5000	
Keypad	7 Keys		
Power	AC (110V/60Hz)/ Battery (6V/4Ah)		
Calibration	Automatic External		
Interface	RS-232 Output		
Load cell drive Voltage	Max: 5V/150mA		
Load Cells	Up to 4 load cell		
ADC	Sigma Delta		
ADC Update	≤1/10 second		
Stabilization Time	C	One seconds typic	al

2. INTRODUCTION

- The TBWS series weighing indicator that amplifies signals from a load cell, converts it to digital data and displays it as a mass value.
- It is suitable for general weighing or more specialized applications such as check weighing, animal weighing and accumulation applications.
- > It can connect the indicator to a printer or a PC.
- Large LCD with white LED back light displays

3. INSTALLATION

3.1Unpacking

When you receive the Indicator, inspect it to make sure that it is not damaged and that all are parts are included:

- Remove the Indicator from the carton.
- Remove the protective covering. Store the packaging to use if you need to transport the scale later.
- Inspect the indicator for damage.
- Make sure all components are included.
 - 1. Indicator
 - 2. Manual
 - 3. Indicator holder (Optional)
 - 4. Load cell Output connecter (Optional)
 - 5. RS-232 Output Connecter (Optional)

3.2 Installation

- Place the Indicator on a table or use indicator holder to connect with stand.
- Connect the plat form load cell cable to the indicator load cell connecter. Load cell connecter is locating back side of the indicator.
- Connect the adaptor pin to the indicator adaptor jack. Adaptor jack is locating, back side of the indicator.
- Adaptor connects into your AC power socket. Pluggable equipment must be installed near an easily accessible socket outlet with a protective ground/ earth contact.
- Turn on the On/Off key. If you want to turn off, press the key again.
- Display will show the scale capacity and will be starting self-checking.
- After self-checking, display will be come to normal weighing mode.
- Warm-up time of 15 minutes stabilizes the measured values after switching on.
- Calibrate with exact calibration weights, minimum 1/3 of the scale capacity should be used for calibration. For calibration see details in parameter.

Then you can start your operation.

3.3 Load cell connections

• Connect the load cell cables to the terminal as shown below.

7Pin	
Conne	ection
Pin 1	Signal -
Pin 2	Signal +
Pin 3	Exc -
Pin 4	Exc +
Pin 5	Sen -
Pin 6	Sen +
Pin 7	Shield

- It can connect four 350 ohm load cells.
- The load cell drive voltage is 5V DC ±5% between Excitation + and Excitation -.

3.4 Connect Adaptor and Charging

- To charge the battery insert the adaptor pin to jack. Simply plug the adaptor into the main power. The scale does not need to be turned on.
- The battery should be charged for 8 hours for full capacity.
- In lower left side of the keyboard is an LED to indicate the status of battery charging. When the scale is plugged into the main power the internal battery will be recharged. If the LED is green, the battery is fully charged. If it is red, the battery is nearly out and if yellow, the battery is being charged.
- Do not use any other type of power adaptor than the one supplied with the scale.
- Verify that the AC power socket outlet is properly protected.

Note: Please charge the battery before using the scale for the first time.

4. KEYS DESCRIPTION

Key Board



Keys	Description
ONIOFF	Power turn ON/OFF
ZERO	Set the Zero Display
TARE	To perform a tare function, Subtracts weights.
SECTO Prive	Accumulator key, current values will store to the memory to send the data to printer or PC
GIN	Shift to Gross / Net Weight.
PCS	Counting
UNIT	To change the unit (kg/g/lb/oz)

Secondary functions of the keys

Function	Keys
To confirm the selected menu	ZERO
To change the menu and active digit	TARE
To move the active digit to right	
To move the active digit to left	GIN
To enter the menu	PCS
Escape from the menu to normal operation.	UNIT

5. OPERATION

Initial Start-up

Warm-up time of 15 minutes stabilizes the measured values after switching on.

5.1. Basic Operation

1. Power On/Off:

Turn on the balance by pressing on/off key. The display is switched on and the test is started and to turn off the scale, press the key again.

2. Zero

Environmental conditions can lead to the balance exactly zero despite the platform not taking any strain. However, you can set the display of your

3. Tare



The weight of any container can be tared by pressing **LARE**, button so that with subsequent weighing the net weight of the object being weighed is always displayed.

- Load weight on the platform.
- Press [1999] key. Zero is displayed, and tare is subtracted.
- Remove weight on the platform. Tared weight is displayed. It can set only one tare value. It will be shown with a minus value.
- Press [[]] to change between gross weight and net weight.
- To clear the tare value, remove the load and press **TARE** key. Zero is displayed, tare weight is cleared.

4. Select Unit and Sampling operation

Press week, it can change unit and sampling operation.

5.2. Check Weighing

It can set an upper or lower limit when weighing with the limit range.

During the limit controls, whether a value is within the upper or lower limits can be known with an alarm sound.

5.2.1. Set Limits

- Press and the key together, display will be show set h.
- Press wey to select set h or set I
- Press key to confirm, display will show 00000 and will blink the last digit.
- Enter the high limit value by using and keys to change the

active digits and press IIIII key to increment the value.

- Press zero, key to confirm, display will show set I
- Enter the high limit value by using and keys to change the active digits and press key to increment the value.
- Press zero, key to confirm.
- To escape from the settings press **burg** key.

5.2.2. Set Check Weighing

- Press and the key together, display will be show set h.
- Press **TARE** key to select display **beep**.
- Press key to confirm, display will be shown **none** or **ok** or **ng**
- Check mode none : No beep sound in the limits. Function turned off.
- **Check mode ok :** When the weight is between the limits. OK will shown and beeper will be sounded.

• **Check mode ng :** When the weight is out of the limits, **t**he beeper will be sounded and OK will shown.

Note: Check weighing available only when weight more than 20d

5.3. Accumulation

The scale can be set to accumulate manually by pressing key. For settings, see the parameter **p 1 Com » mode » pr 2** Before operation scale should be stable and return to zero, accumulation available only when weight more than 20d

Accumulation Operation

- Place the load on the platform.
- Press key, when displayed STABLE indication.
- Display will be show **acc 1** then will be show the total saved value. These displays will be shown only three seconds.
- Remove the weight from the pan.
- When display get zero and stable then place the second weight.
- It can continue until the memory gets fully or 99 items.

5.3.1 Memory Recall



To recall the memory press key when there is no load on the platform.

Display will be show **acc X** (X: Total number of accumulation) then will be show the total saved value. These displays will be shown only three seconds.

5.3.2. Memory Clear

To clear the memory, press and keys together.

Display will show **Acc 0**; all accumulation memory is cleared from the memory.

5.3.3. Automatically accumulation.

The scale can be set to accumulate automatically. For settings, see the parameter **p 1 Com » mode »** auto

Automatic Accumulation Operation

- Place the load on the platform.
- When display gets STABLE indication, display will be show **acc 1** then will show the total saved value. These displays will only be shown for three seconds.
- Remove the weight from the platform.
- When display shows zero and stable then place the second weight.
- It can continue until the memory gets fully or 99 items.

5.4. Parts Counting



To enter the parts counting, press **see and select until display will be show** p 10

Press **Manual** to change the parts quantity. Options: p10 / p20 / p50 / p100 / p200

Parts Counting Operation

- Place the load on the platform
- Select the parts quantity as per the option
- Choose from option depending on how many pieces/items are on the scale
- Press [2000] key to confirm, display will be shown ---- then will show the quantity
- Then can add goods on the platform, display will update the parts quantity automatically



Press we key back to the weighing mode.

5.5. Animal Weighing

TBWS can be used for weighing vibrating loads. This function can use for animal weighing. For settings, see the parameter **p 3 oth** » anm

Bring the load on the platform, when the load few seconds get stable, the reading will be locked for few seconds.

It can add or remove loads also update the weighing locked values.

To enter or exit animal weighing mode, press **use** key until HOLD indicator will be displayed or not..

When in animal weighing mode **HOLD** indicator will be displayed.

5.6. Keyboard Lock

It can set lock key board, for settings, see the parameter **p 3 oth » lock**

When the keys are not using within 10 minutes, the keys will lock automatically. After entering the lock function, pressing any keys will cause the display to show **k-lok.** Then will come to normal display.

If want to unlock and want to use the keys press and hold



keys three seconds. Display will be show **u lck** Then will come to normal display

5.7. Set auto power off

It can set auto power of the scale, when scale not in use, scale will turn off after the setting time.

- Hold *used* key three seconds display will show setbl
- Press they to change **Set of** and press they to confirm
- Press I key to change the options.

	off	To set auto off function turn off, for scale always
Set of		on
	Of 5	Set to turn off five minutes later
	Of 15	Set to turn off fifteen minutes later

• After selecting the auto off option press key to confirm and press

wwww.key to escape from the settings.

5.8. Set Back Light

It can set back light when scale is in use.

- Hold key three seconds display will show **setbl**.
- Press zero, key to confirm.

setbl	au	To set auto option. When start to use back light will be on and when stop the operation back light also will off.
	on	To set always on. After turn on the power, back light also will be on.
	off	To set back light turn off. No back light in the operations



• After selecting the back light option, press key to confirm and press

key to escape from the settings.

6. PARAMETERS

To set parameter, turn on the scale.

- Press even key during the self checking.
- Display will be show **pn**
- Press [GIN], [June] and [TARE] to enter, display will be show **po chk**

(To access parameters **P2 mod; P4 ST; P5CLR** ,the jumper K2 need to make short; if K2 is not shorted ,press K3 button inside the unit to enter)

Menu	Sub Men	u	Description	
P 0 chk	Set H		Set high limits for check weighing	
	Set I Set lo		Set low limits for check weighing	
	beep	None	No beep for check weighing	
		Ok	Beep, when check weighing between the	
			limits	
		ng	Beep, when check weighing out of the limits	
			This option is used to set accumulation	
			and RS-232 communication	
P 1 com	Mode		Options:	
			Cont : data send continues	
			St 1 : Send data one time, when stable.	
			St c : Send data continuously, when stable	
			P r1 : Send data one time, when press print	
			Key (in printer mode)	
			Pr 2 : Send data to print and accumulation,	
			When press	
			Auto : Auto accumulate and auto print	
			When weight stable and return to	
			zero.	
			Ask : Ask mode.	
			Command R ⁻ read data	
			Command T ⁻ Tare	
			Command Z: Zero	
			Wirel [®] Optional Wireless mode	
			communication	
			through wireless)	
			KIT 1: Optional Wireless Mode	

	Baud		To set the l	baud rate.
			Options:	
	Pr		600 / 1200 / 2400 / 4800 / 9600	
			To set the	parity
			Options:	
			7 e1 / 7 o1	<u>/ 8 n1</u>
	Ptype		l o set print	ter model
			Options:	
			Lp50: Set t	the scale printer LP-50
		To coloci	EP30: Set	ine scale printer EP-50
		TO Select	single rang	
		Count	To check ir	nternal counts
	SinGLE	Deci	To set deci	mal points
		Div	To set incre	ement
		Сар	Set Capaci	ity
		Cal	Calibration	
		gra	Gravity	
		To select dual range - mode 1 Note: Once active second interval (div 2), Then second interval will work until display return to zero		
		Count	To check ir	nternal counts
P 2 mod		Deci	To set decimal points	
		Div	Di v 1	To select first division
			Di v 2	To select second division
		Сар	Cap 1	To select first capacity
			Cap 2	To select second capacity
		Cal	Calibration	
		gra	Gravity	
		To select Note: Firs	dual interv st interval wil	al - mode 2 I active in CAP 1
	Count			
				To coloct first division
		אוט		To select first division
			Car 1	To select first capacity
		Jah	Cap 7	To select mot capacity
		Cal	Calibration	
		ara	Gravity	
P3 oth	Lock	. 3. 4	To set kevr	pad lock
			Options: on / off	
	anm		To set animal mode	

		Options: on / off
P4 S T	ST ON	Mutli Tare Function On
	ST OFF	Mutli Tare Function Off
P5 CLR	CLRCAL	Clear the calibration record
	CLROPT	Clear the parameter modification record
P6 Unt	g	Weighing units select to turn on / off
	Oz	

7. CALIBRATION

To set calibration, turn on the scale.

- Press key during the self-checking.
- Display will be show **pn**
- Press [GN], and [TARE] to enter, display will be show **po chk**
- Press **I** until display will be show **p 2 mod**.

•

Open the display by unscrewing and locate K3 on mainboard. Upon locating, press the button to enter calibration mode.



- Press ZERO, key to confirm and press ZARE, to select cal
- Press **EERO** key to confirm

Calibration Cal

- Press key to enter calibration, display will be show Unld
- Remove all the weight from the platform.
- When indicator get stable, press zero, key to confirm.

• Display will show the last calibration weight. If want to change the

calibration weight value, press and keys to change the active

digits and press **LARE** key to increment the value.

- When the calibration value is correct, press *tested*, key to confirm.
- Display will be show load.
- Place the calibration weight on the platform.
- When indicator becomes stable, press *tend* key to confirm.
- Display will come to normal weighing mode.

8. RS-232 OUTPUT

The TBWS Series of scales can be ordered with a standard RS-232 output.

8.1. Specifications:

RS-232 output of weighing data

Code	: ASCII
Data bits	:8 data bits
Parity	:No Parity
Baud rate	: 600bps to 9600bps selectable

8.2. RS-232 (9pin D type connector)

Pin 2	RXD	Input	Receiving data
Pin 3	TXD	Output	Transmission data
Pin 5	GND		Signal ground

9pin D Connecter:

Indicator	Computer	
Pin 2:	Pin 3	
Pin 3:	Pin 2	
Pin 5:	Pin 5	

Check Weighing Output

Pin 1: VB Pin 4: Vcc 5v (Output) Pin 5: Com (Ground) Pin 6: Ok (Output) Pin 7: Low (Output) Pin 8: Hi (Output) Pin 9: Beep (Output)

8. 3. Continuously output protocol Weighing mode



Counting mode



Print formats

THANK YOU weight: 1.745lb	TOTAL : 6.605 lb COUNT : 6	Gross : 0.500 lb Tare : 0.000 lb Net : 0.500 lb Gross : 0.106 lb Tare : 0.000 lb Net : 0.106 lb Gross : 0.606 lb Tare : 0.106 lb Tare : 0.106 lb Tare : 0.500 lb Tare : 1.106 lb
Label Format	Receipt Format # 1	Receipt Format # 2



TBWS Parts List-1

51	cable gland	1	PA	
50	inner hexagon screw	2	SST	M5*10
49	hexagon screw	4	SST	M6*35
48	inner hexagon screw	8	SST	M6*30
47	inner hexagon screw	1	SST	M10*20
46	feet	4	rubber	M10
45	lower load cell bracket	: 1	SST	
44	load cell	1	Aluminum	
43	gasket	2	SUS301	
42	inner hexagon screw	4	SST	M6X20
41	level bubble	1		14.7MM
40	pan support stand	4	PA	
39	pipe plug	4	PA	
38	upper load cell bracket	1	SUS304	
37	rubber gasket	6	rubber	
36	SST pan	1	SST	1.1.4
35	gasket	4	SST	M6
34	spring gasket	8	spring stee	I M6
33	pole stand	1	SST	
32	inner hexagon screw	5	SST	M6*16
31	inner hexagon screw	2	SST	M6*10
30	M type pole	1	SST	
29	Support Bracket	1	Zinc Alloy	
28	bracket	1	SUS304	
27	bracket screw	2	ABS	
26	big head screw	4	SST	M4X8

TBWS Parts List-2

26	big head screw	4	SST	M4X8
25	materproof connector	3	PA6	black
24	adapter port assembly	1	rubber	
23	rubber gasket	1	rubber	
22	back cover	1	SUS304	
21	Seal lead	0.1	Cu	
20	hexagon seal screws	1	SUS304	M4X16
19	hexagon seal screws	1	SUS304	M4X10
18	Seal wire	0.1	Cu	
17	battery	1	/	6V/4An
16	battery bar	1	SPCC	
15	switch cover	7	PE	6
14	gasket cover	7	SUS304	
13	rubber gasket	7	rubber	
12	"+"screw	6		M4X16
11	calibration switch board	1		
10	"+"screw	2		M3*6
9	transformer	1		
8	"+"screw	2		M4X10
7	waterproof rubber bar	1	EPDM60°	
6	self-tapping screws	6		M3X8
5	main PCBA	1		
4	"+"screw	6		M3*6
3	display protection plat	e 1	PC	
2	front cover	1	SUS304	
1	overlay	1	PC	
No.	Name	QTY	Materal	Mark

10. ERROR CODES

Error Message	Description	Solution
	Maximum load exceeded	Unload or reduce weight
Err 1	Incorrect date	Enter the date by using format "yy;mm:dd"
Err 2	Incorrect time	Enter the time by using format "hh:mm:ss"
Err 4	Zero setting error	Zero setting range exceeded due to switching on.(4%max) Make sure platform empty.
Err 5	Key board error	Check the keys and connecter.
Err 6	A/D value out of range	Make sure platform empty and check the pan is installed proper. Check the load cell connectors.
Err 7	Percentage Error	Please check input data, must be > 0.5d
Err 8	Calibration weight error	Check the test weights for calibration or linear calibration
Err 9	Unstable Reading	Check any air variation, vibration, RF noise and touching some where. Check the load cell and connecters.
Err 10	Wireless communiation failure	Check wireless settings or change Com settings from the wireless
Err 11	Communication protocol error	Check communication settings
Err 12	Accumulation error	Max accumulation times 99 / 999 / weight 999999
Err 13	Lack of unit weight	Check unit weight entry data, must be >0.5d
Err 14	Lack of sample	Check counting samples entry, must be >20d
Err 15	Gravity error	Check the gravity settings. Gravity range must be 0.9xx ~ 1.0xx

Err 16	Paper error	Check the printer paper
Err 17	Tare out of range	Minus weight or overload. Remove the load and restart scale again.
Err 18	Pre-tare error	Check the pre-tare value
Err19	Initialize zero error	Calibration the scale.
Err P	Printer error	Check the printer settings or connections
Err I	Approval setting error	Check the PCB jumper settings. Must be connect jumper pin to K1 (BW series)
ol	Over range	Remove the load. Re calibrate
lo	Underload	Minus weight, check the platform and restart or calibrate.
Failh / faill / fail	Calibration Error	Check the test weights & Re calibrate
Ba lo / lo ba	Battery low	Re charge battery, check the voltages.

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