TB SERIES VER 103

CRANE-II

Operating Manual

TBL-series TBS-series

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INDEX

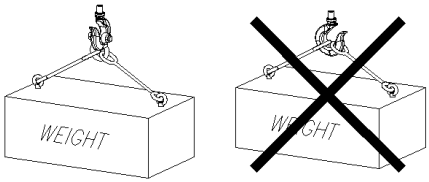
1. INTRODUCTION

This Service and Operation Manual are the specifications for our **TBL/TBS**
The **TBL/TBS** is the product of years of design, development, and in-field testing. This **TBL/TBS** has been designed with reliability, under rigid quality control and with outstanding performance.
This MANUAL included with basic technical information about composition of hardware and programmatic functions.

■ **Precautions**

Please check if the safety hook is connected well before you install our **TBL/TBS**, so that the SHACKLE is not separated.

◆ Don't install the **TBL/TBS** in direct sunlight.
◆ Avoid sudden temperature changes, vibration, wind, water, or excessive dirt.
◆ Avoid from the shock of excessive weight.
◆ Place the scale away from water.
◆ Use away from heavy R.F noise.

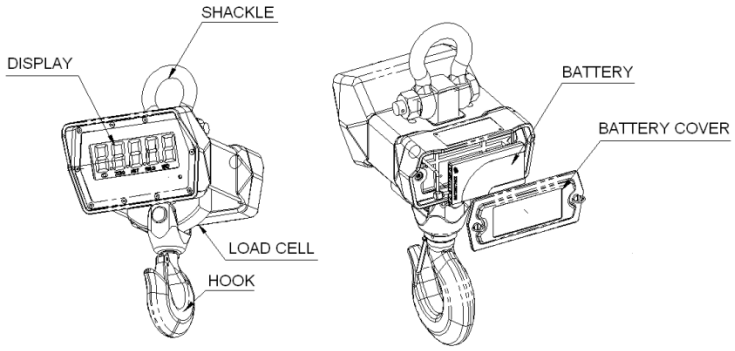


2. MAIN FEATURES

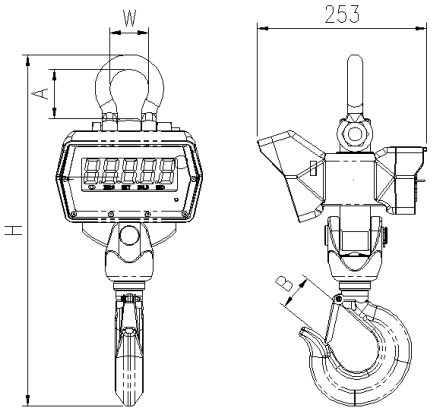
◆ Very light and Sturdy Aluminum Alloyed Case
◆ Very easy-to-read => Downward Display
◆ Standard Remote control
◆ One-Touch Battery Pack (90 degree)
◆ Lithium Polymer Rechargeable Battery Pack
◆ "Hold" (Manual or Automatic) function
◆ Rotating Hook
◆ Weight-Adding Function => Only possible in our optional remote control
◆ RS232C Serial Communication (option 1)
◆ Wireless Communication & Wireless Printer (option 2)

3. TECHNICAL SPECIFICATIONS

◆ **Overall View**



◆ **Size**

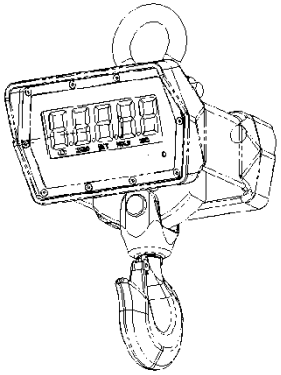


Model	Max.	e=d	Dimensions				Weight
			H	A	W	B	
TBS/TBL-1T	1000kg	0.5 kg	407	62	50	25	8.9kg
TBS/TBL -3T	3000kg	1 kg	525	73	57	34	15.2kg
TBS/TBL -5T	5000kg	2 kg	525	73	57	40	16.7kg
TBS/TBL -10T	10000kg	5 kg	697	101	83	55	26.9kg

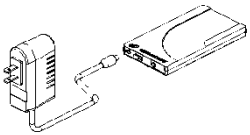
◆ Specifications

MODEL	TBS-series	TBL-series
Display	5 digit LED (Character Size 30mm)	5 digit LCD (Character Size 40mm)
Display lamp	LOW BATTERY, ZERO, TARE, HOLD	
Temperature	-10℃ ~ 40℃	
Function	ON/OFF, ZERO, TARE, HOLD, *	
Maximum tare weight	Full Tare	
Zero point	Within 2% of Maximum Weight	
Initial zero band	Within 10% of Maximum Weight	
Battery time	About 100 hr	About 200 hr
Nominal voltage	DC 7.4V	DC 3.7V
Rechargeable adaptor	DC 12V, 1A	DC 5V, 1A
Assembly	Manual 1EA , Battery pack 2EA Rechargeable adaptor 1EA , Infrared remote control 1EA(OPTION)	

◆ Part list



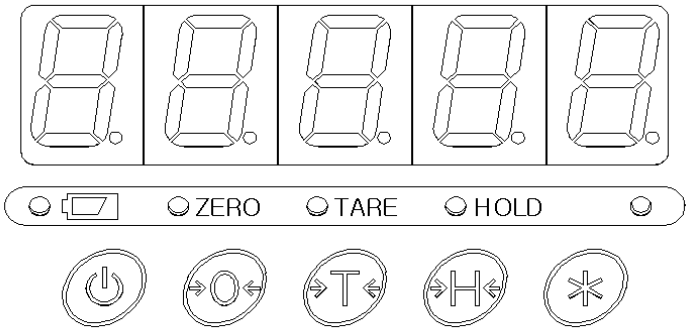
[Crane scale]



[Rechargeable adaptor]

[Infrared remote controller]

4. DISPLAY & KEYS



◆ Display Description

-88888.kg	Displays the accurate weight
○	Displays that weight is Stable
ZERO	Displays that current weight is Zero
TARE	Displays the net weight, when the tare is included
HOLD	Used to weigh an unstable or moving thing
BAT	Displays when a battery has to be recharged

◆ Key Function

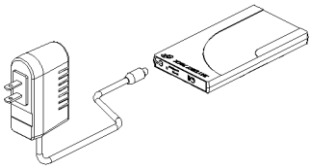
Key		Description
⏻	ON/OFF	Turn on and off the scale
→0←	ZERO	Reset scale to zero
→T←	TARE	Input a tare weight
→H←	HOLD	Weigh an unstable and moving thing (Manual / Auto)
*	ENTER	Testing Mode or Returning a new Mode

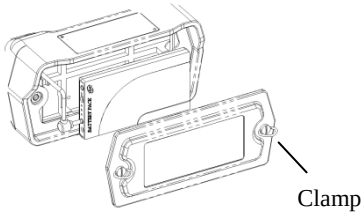
5. USE OF BATTERY CHARGING

(1) Method of recharge battery

■ Check the power supply voltage.
■ If adaptor is still being charged, the RED lamp is on.
■ If a charging is completed, the RED lamp is off.

The battery charging time takes about 6 hr. (The battery charging time is subject to be changed according to battery condition.)





(2) Method of exchange battery pack

a. Turn clamps that exit on both sides of charger to the right in a quarter
b. Pull out a battery pack
c. Inserting is in reverse

(3) Battery pack specifications

Nominal capacity	4000mAH
Nominal voltage	7.4V
Dimensions	125 * 68 * 12 (mm)

(4) Low battery lamp

In order to prevent the electric discharge, after **LOW BATTERY LAMP** is on**,** the power will be turned off automatically after about 1~5 hours.
(It's subjected to be changed according to using conditions.)

6. GENERAL FUNCTIONS

Press the **ON/OFF KEY** The scale & RF indicator will perform RF self-test on Weight Display and will be ready to RF communication.

(1) Zero function

Use to correct drifted zero value when the scale is unloaded, and motion is not detected.

This function works when **ZERO KEY** is pressed, and the **ZERO LAMP** is on.

(2) Setting tare weight function.

Press the **TARE KEY**. Then, the scale will memorize the weight of the tare and will display zero alue '0'kg. The **TARE LAMP** will be on.

To escape this function, remove everything from the scale, and press the **TARE or ZERO KEYS**.

Then, the **TARE LAMP** will be off and this function is terminated.

(3) Hold function

Automatic hold function

- Press **HOLD KEY** when the scale is empty (Initial Zero State).
- The weight display will indicate  . **HOLD LAMP** is on.
- After loading a thing, if the weight turns stable then, a display shows  and average weight will appear.
- The weight of a loaded thing is displayed.
- To escape the automatic hold mode, when zero point is on, press **HOLD KEY**.

Then, the message of  is displayed and **HOLD LAMP** is off and normal weighing mode is reverted.

Manual hold function

- Press **HOLD KEY** loading a thing.
- This message of  is displayed and sequentially the message of  is shown with appearing the average weight.
- The weight of a loaded thing is displayed.
- To escape the manual hold mode, remove everything from a hook, or press the **HOLD KEY**. Then, **HOLD LAMP** will be off and the scale changes from a hold mode to a normal mode.

7. SETTING MODE

(1) How to enter this mode

Press the **ON/OFF KEY** while pressing the **TARE KEY**.

(2) Keyboard

■  : Use to set up an initial zero value (0).

■  : Used to increase the setting constant one by one.

■  : Used to save the setting constant changed and to move into normal mode.

(3) Setting menu (F1 – F18)

■ F01 : Adjustment the speed of weight change (1～9)

Setting Menu	Description
F01-1	Very fast
F01-5	Normal
F01-9	Very slow

■ F02 : Weight Storage Function

Setting Menu	Description
F02-0	Not used
F02-1	Use

■ F03 : Adjustment the hold speed (1～9)

Setting Menu	Description
F03-1	Very fast
F03-5	Normal
F03-9	Very slow

■ F04 : Stable condition set of weight (1~9)

Setting Menu	Description
F04-1	Sensitive
F04-5	Normal
F04-9	Insensitive

■ F05 : Time of Power Saving Mode

Setting Menu	Description
F05-0	Not used
F05-1	20sec
F05-2	1min

■ F06 : Automatic Zero Condition (00~99)

Setting Menu	Description
F06-00	No compensation
F06-23	Compensation for gradual change below 1 division for 3 sec.
F06-99	Compensation for gradual change below 4.5 division for 9 sec.

■ F07 : Auto Hold Start

Setting Menu	Description
F07-0	Manual
F07-1	Automatic

■ F08 : Initialization Hold Weight (1~9)

Setting Menu	Description
F08-0	Zero (0)
F08-3	Below 3 division
F08-9	Below 9 division

■ F09 : Function * key **-option 1,2**

Setting Menu	Description
F09-0	Use to clear previously added weights.
F09-1	Print command key
F09-2	Weighing data send to computer
F09-3	Wireless print command key (include print format)
F09-4	Wireless print command key (only weight data)

■ F10 : Device number (Identification number of each scale) **-option 1,2**

Setting Menu	Description
F10-0	Device No.0
F10-5	Device No.5
F10-9	Device No.9

■ F11 : Item number (Identification number of each Item) **-option 1,2**

Setting Menu	Description
F11-0	Item No.0
F11-5	Item No.5
F11-9	Item No.9

■ F12 : Data set sent to computer **-option 1,2**

Setting Menu	Description
F12-0	No data output
F12-1	Command mode
F12-2	Transmission in an state of stable & unstable.
F12-3	Transmission only in stable state

■ F13 : Wireless real time communication **-option 1,2**

Setting Menu	Description
F13-0	Not used
F13-1	Auxiliary display
F13-2	TF200 (Wireless dongle)

■ F14 : Print line feed **-option 1,2**

Setting Menu	Description
F14-0	1 line feed
F14-5	6 line feed
F14-9	10 line feed

■ F15 : Print form **-option 1,2**

Setting Menu	Description
F15-0	Form 0 (serial No., Item No., weight)
F15-1	Form 1 (weigh No., Item No., weight)
F15-2	Form 2 (weight)

[FORM 0]

001, ID_9, 25 kg

[FORM 1]

SN_012, ID_9, 25 kg

[FORM 2]

25 kg
62 kg

■ F16 : Initialization of number measured daily (weigh No.) **-option 1,2**

Setting Menu	Description
F16-0	Maintain current number
F16-1	Initialization (starting from No.1)

■ F17 : Auto print **-option 1,2**

Setting Menu	Description
F17-0	Not used
F17-1	Auto print (include print format)
F17-2	Auto print (only weight data)
F17-3	Wireless Auto print (include print format)
F17-4	Wireless Auto print (only weight data)

■ F18 : Hold data auto print **-option 1,2**

Setting Menu	Description
F18-0	Not used
F18-1	used

8. SELF TEST MODE

(1) How to enter this mode

Press the **ON/OFF KEY** while pressing the **ZERO KEY**.

(2) Self test menu (TEST 1 –TEST 6)

■ **TEST 1 : Keyboard test**

	Key	Display	Descriptions
ZERO	→O←		If you push the button that you want to test, the key number is appeared on the display. If press the **ENTER KEY**, it moves into TEST 2.
TARE	→T←		
HOLD	→H←		
SUM			
ENTER	✳		

■ **TEST 2 : Display test**

Display	Description
	TEST 2 runs off automatically and a display is on. If press a **ENTER KEY**, move on TEST3.

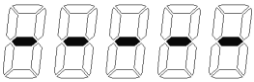
■ **TEST 3 : A/D conversion test (Load cell test)**

Display	Description
	The value is the conversion constant for A/D. The value may be different according to scale models. If a **ENTER KEY**, move on the weighing mode.

Please check if the displayed number is easily changed with giving force to a hook. If the displaying number is not changed or remains '0', then it needs the service after sales.

■ **TEST 4 : Not used**

■ **TEST 5 : RS-232C test -option 1,2**

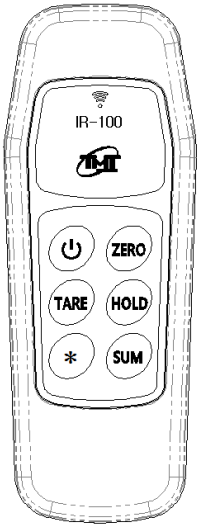
Display	Description
	Ex) 49-13 : Transmit 49 (ZERO KEY) Receiver 13 (PC ENTER KEY) (ZERO KEY 49, TARE KEY 50, HOLD KEY 51)

■ **TEST 6 : Wireless communication test -option 1,2**

Press **ZERO KEY** at the scale. The numeric character increases on the auxiliary display.

9. INFRARED REMOTE CONTROL

(1) How to use



- ■ OFF KEY : Use to power off the scale
  (Power-ON is available only on scale.)
- ■ ZERO KEY : Same as Scale keyboard
- ■ TARE KEY : Same as scale keyboard
- ■ HOLD KEY : Same as scale keyboard
- ■ SET KEY (CLEAR) : Use to clear previously added weights.
- ■ SUM KEY : Use to add weights.

If press a SUM KEY, the sum of weights is displayed. After that, about 2 sec later, a weighing mode is reverted.

(2) Specifications

List	Description
Available Distance	6 m ~ 10 m
Available Angle	60°
Power	3V (1.5V AA 2 EA)

10. OPTIONS

(1) <u>OPTION 1 : RS-232C serial out</u>

■ RS-232C port connection

Connect serial port of the scale to serial port of PC as follows.

(RED) TXD ---------- RXD (2)

(WHITE) RXD ---------- TXD (3)

(GREEN) GND ---------- GND (5)

[RS232C wire of JAC737] [Serial port of computer]

■ Data format

Type : EIA-RS-232C

Method : Full-duplex, asynchronous transmission Format

① Baud rate : 9600 bps

② Data bit: 8, Stop bit: 1, Parity bit: None

③ Code : ASCII

④ When data is sent to computer? Set in SET mode(F12).

⑤ Format (18byte)

Start Code			Blank	Lamp Status		Weighing data		Unit		Stop code	
S U	T S	,			,	+/-	7byte	k	g	CR	LF

- Start code : ST (Stable) / US (Unstable)

- Lamp status byte

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
One decimal point	Two decimal point	Three decimal point	Stable		Zero	Tare	Hold

- Weighing data (8byte)

a. 13.5 kg : '+', ' ', ' ', ' ', '1', '3', '.', '5'

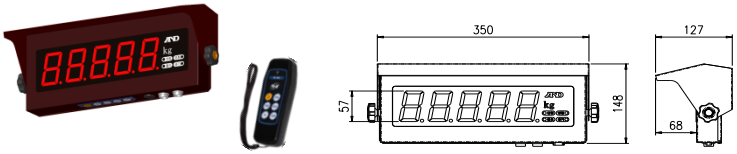
b. -135 kg : '-', ' ', ' ', ' ', ' ', '1', '3', '5'

(2) <u>OPTION 2 : Wireless communication</u>

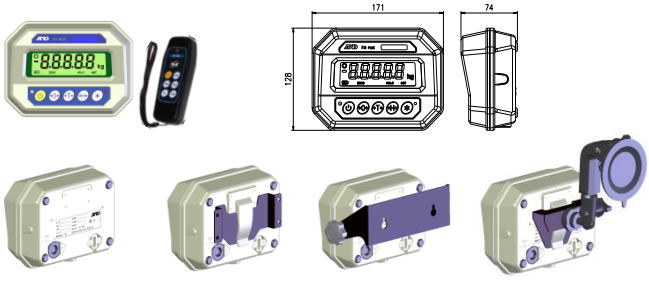
◆ Wireless specification

RF frequency range	2400 ~ 2483.5 MHz
Output power	Max. 4dBm
Channel width	2 MHz
Frequency offset	< ±30ppm
Transmit data rate	250Kbps,500Kbps
Receiver sensitivity	-99dBm (PER <1%)
Maximum input level	0dBm
RF In/out impedance	50 ohm (TXRF, RXRF)
Spurious(2nd harmonics)	< -30dBm
Radio link effective range	Approx. 100M (Open space)

① Wireless auxiliary display (AD-8915F)

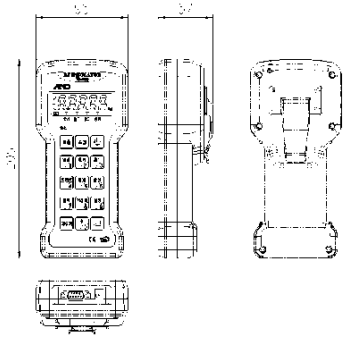


② Wireless auxiliary display (FJD-PLUS)



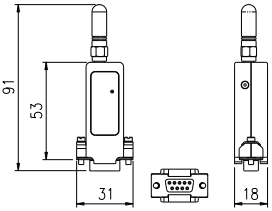
[standard] [wall hanging] [wall rotation] [glass adhesion]

③ Wireless controller (TF-100)

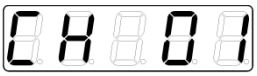


③ Wireless controller (TF-400)

④ Wireless dongle (TF-200)



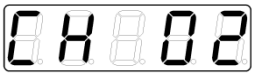
11. ERROR MESSAGE



▣ Error 1

Message : Data in an internal storage allocation are erased owing to any electronic impact.

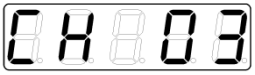
Management : Please contact us to resolve this technical problem.



▣ Error 2

Message : Something wrong in a Load cell connection or in an A/D conversion.

Management : Please contact us to resolve this technical problem.



▣ Error 3

Message : The initial zero range is exceeded within +/- 10% of maximum weight value.

Management : Please check if a hook is empty.

▣ Error

Message : When a thing is over-weighed within the maximum weight value, the error message is displayed.

Management : Do not weigh the thing whose the limit of a maximum weight value is exceeded.
If a load cell is broken, then the load cell has to be replaced.