TRWS series

Waterproof indicator

User's guide

UGTRWS-E1.1

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SECTION 1 INTRODUCTION

The TRWS series of weighing indicator provides an accurate, fast and versatile series of general purpose weighing scale with units conversion and check-weighing functions.

All the keypads are sealed, color coded membrane switches and the displays are large easy to read liquid crystal type displays (LCD). The LCD's are supplied with a backlight.

All units include automatic zero tracking, units conversion, audible alarm for pre-set weights, and an accumulation facility that allows the individual weights to be stored and recalled as an accumulated total.

SECTION 2 SPECIFICATIONS

Model	TRWS
Resolution	Up to 30,000
Interface	RS-232 Output Optional
Stabilisation Time	1 Seconds typical
Operating Temperature	0°C - 40°C / 32°F - 104°F
Power supply (external)	115 / 230 Vac, 120 / 240 Vac, 50/60Hz, 10 watts
Calibration	Automatic External
Display	6 digits 22mm LCD display, attached backlight
Indicator Housing	Stainless Steel
Zero range	0mV~5mV
Signal input range	0~15mV
ADC	Sigma delta
Internal counts	600,000
ADC update	Max 60 times /second
Load cell drive voltage	Max 5V/150mA
Load cells	Up to four 350 ohms cells

SECTION 3 INSTALLATION

GENERAL INSTALLATION

The scales should be sited in a location that will not degrade the accuracy.

Avoid extremes of temperature. Do not place in direct sunlight or near air conditioning vents.

Avoid unsuitable tables. The tables or floor must be rigid and not vibrate. Do not place near vibrating machinery.

Avoid unstable power sources. Do not use near large users of electricity such as welding equipment or large motors.

Avoid high humidity that might cause condensation. Avoid direct contact with water. Do not spray or immerse the scales in water.

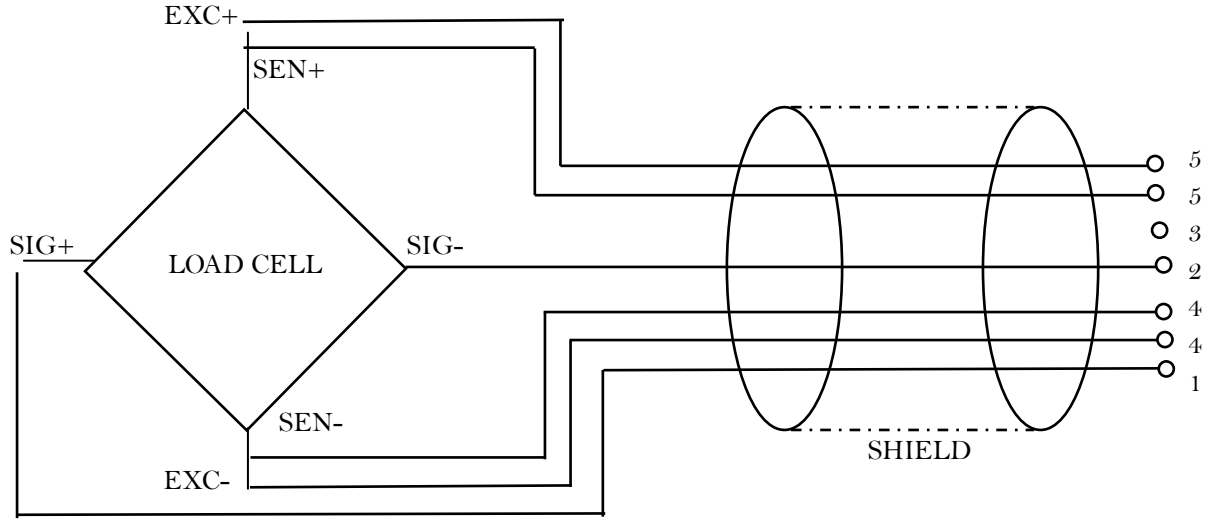
Avoid air movement such as from fans or opening doors. Do not place near open windows.

Keep the indicator clean.

Do not stack material on the scales when they are not in use.

INSTALLATION OF TRWS SERIES

Please make the load cell connector from the load cell follow the drawing below
Attach the AC power adapter to the connector on the back of the indicator.
If you use TRWS for a platform scale, you can use attached indicator bracket.
Load cell connect as below(5pin air connecter)



SECTION 4 KEY DESCRIPTIONS

Zero
Set the zero point for all subsequent weighing. The display shows zero.

A secondary function ↵, of "Enter" key when setting parameters or other functions.

Tare
Tares the scale. Stores the current weight in memory as a tare value, subtracts the tare value from the weight and shows the results. This is the net weight. Entering a value using the keypad will store that value as the tare value.
A secondary function ↑, of incrementing the active digit when setting a value for parameters or other functions.

G/N
Press the key, the scale can to select gross weight or net weight after you tare a weight.
Secondary function ▶ , In the setting mode, this key used to move active digits right.

PRINT/M+
To PRINT the results to a PC or Printer using the optional RS-232 interface. It also adds the value to the accumulation memory if the accumulation function is not automatic.

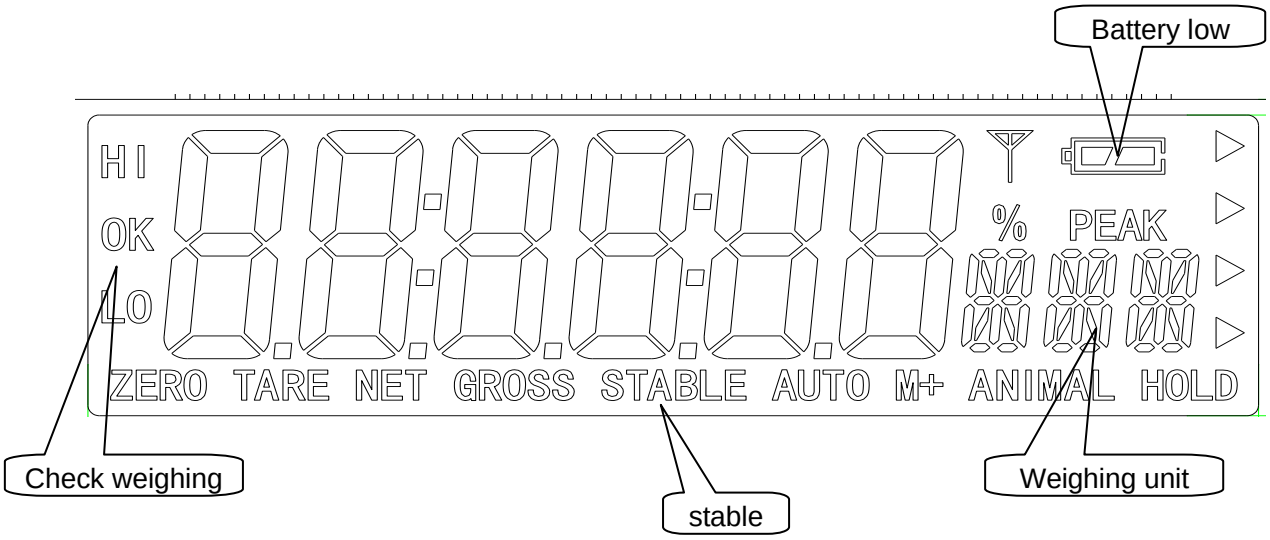
Secondary function (**C or** ◀) , is to act as a clear key or to move active digits left when setting values for parameters or other functions.

UNIT or U
Press this key to select the weight unit. Move the active digit left when setting values for other functions.
Secondary function (ESC) , is to return to normal operation when the scale is in a parameter setting mode.

ON/ OFF
Turn on or off the power.

SECTION 5 DISPLAYS

The LCD display will show a value and a unit to the right of the digits.
In addition there are labels for TARE, GROSS weight, Zero and for Low battery



SECTION 6 OPERATION

6.1 Zeroing The Display

You can press the **ZERO** key at any time to set the zero point from which all other weighing and counting is measured, within 4% of power up zero. This will usually only be necessary when the platform is empty. When the zero point is obtained the display will show the indicator for zero.

The scale has an automatic rezeroing function to account for minor drifting or accumulation of material on the platform. However you may need to press the **ZERO** key to rezero the scale if small amounts of weight are shown when the platform is empty.

6.2 Taring

Zero the scale by pressing the **ZERO** key if necessary. The zero indicator will be on.

Place a container on the platform, a value for its weight will be displayed.

Press the **TARE** key to tare the scale. The weight that was displayed is stored as the tare value and that value is subtracted from the display, leaving zero on the display. The "TARE" indicator will be on. As product is added only the weight of the product will be shown. The scale could be tared a second time if another type of product was to be added to the first one. Again only the weight that is added after taring will be displayed.

When the container is removed a negative value will be shown. If the scale was tared just before removing the container this value is the gross weight of the container plus all product that was removed. The zero indicator will also be on because the platform is back to the same condition it was when the **ZERO** key was last pressed.

6.3 Weighing a sample

To determine the weight of a sample first tare the empty container then place the sample in the container. the display will show the weight and the units of weight currently in use.

6.4 Check-Weighing

6.4.1 About check-weighing

Check-weighing is a procedure to cause an alarm to sound when the weight on the scale meets or exceeds values stored in memory. The memory holds values for a

high limit and a low limit.

Check mode 2:
When check range, the display will show OK and the beeper will sound when the weight is between the limits.
Check mode 3:
When check range, the display will show OK and the beeper will sound when the weight is out of the limits.

6.4.2 Set limits
Press the **UNIT** key and **PRINT/M+** key together in the weighing mode, it will display "F0 H-L", press **ZERO** key to enter, use **TARE** key to select "SEt H i" or "SEt Lo", press **ZERO** key to enter, use **G/N** key to move active digit, use **TARE** key to change value, use **UNIT** key to clear value. After you enter the value, press **ZERO** key to sure, press **UNIT** key to escape.

6.4.3 Set check weighing mode
Press the **UNIT** key and **PRINT/M+** key together in the weighing mode to enter setting mode, press **TARE** until display show "F4 oFF", press **ZERO** key to enter, press **TARE** key until display show "bEEP", press **ZERO** key to enter, press **TARE** key to select bP 2(check mode 2), bP3 (check mode 3), bP 1(no beep), press **ZERO** key to sure, press **UNIT** key to escape.

6.4.4 NOTE

The weight must be greater than 20 scale divisions for the check-weighing to operate.
To disable the Check-Weighing function enter zero into both limits by pressing the **UNIT** key and **PRINT/M+** key together in the weighing mode, then the current limits are shown, then set zero and store the zero values.

6.5 Accumulated Total

6.5.1 Note
The scale can be set to accumulate manually by pressing the **PRINT/M+** key. See the PARAMETERS Section for details of selecting the method using function "F4 P rt". The accumulation function is only available when weighing.

Please note before every accumulate operate, scale need return to zero, and only press **PRINT/M+** key when stable, when weight less than 20d, accumulate operate will be invalid.

6.5.2 Accumulate operate
The weight displayed will be stored in memory when the **PRINT/M+** key is pressed and the

weight is stable.

The display will show "ACC 1" and then the total in memory for 2 seconds before returning to normal. (After do accumulate operate, PRINT indicator will turn on) If the optional RS-232 interface is installed the weight will be output to a Printer or PC.

Remove the weight, allowing the scale to return to zero and put a second weight on. Press the PRINT/M+ key, the display will show "ACC 2" and then the new total.

Continue until all weights have been added.

*Note: after you change weighing unit, accumulate value will be clear.

6.5.3 Memory recall
To view the totals in memory press **PRINT/M+** key in zero point (ZERO indicator on).

6.5.4 Memory clear
To clear the memory, just press **UNIT** key

6.5.5 Automatically accumulate
At first, you need set scale to auto accumulate mode, Press the **UNIT** key and **PRINT/M+** key together in the weighing mode, it will display "F0 H-L", press **TARE** key until display show "F4 Prt", press **ZERO** key to enter, press **TARE** key to select "P AUto", press **ZERO** key to sure, then you need set baud rate and print format, print type, see detail in SECTION 7

After you set, AUTO indicator on.

Press weight on platform, after stable, you will hear beep on twice, you can add or remote weight now, scale will beep on again after stable, at last, remove all weight on platform, the last weight value will store in memory

6.6 Animal Scales
TRWS can set as an animal scale, you just need set P4 CHK to rodE2, see detail in SECTION12.
Let the animal on the platform, after some second, if reading data change not a lot, you can hear beep sound and reading data will be locked.

In reading data lock mode, if you add/remove big weight, display will still update and lock new reading data.

6.7 Subtration scale

This is used for hopper scale, you need set auto zero range to 0 (see detail in

SECTION 7) and set scale mode to mode3/mode4 (see detail in SECTION12)

Turn on power, scale will show "Err4", then show current total weight on platform, press **TARE** key, display show 0.00, then remove goods in hopper, display will show it's weight in "-" mode, press **PRINT/M+** key, scale will print out weighing ticket, mode3/mode4 only different is print format.

SECTION 7 PARAMETERS

The scale has 6 parameters that can be set by the user plus a method of entering the calibration section.

Press the **UNIT** key and **PRINT/M+** key together in the weighing mode.

The display will show the first function, "F0 H-L".
Pressing the **TARE** key will cycle through the other functions.
Pressing **ZERO** will allow you to set the function. It may be necessary to either use **TARE** or set a value using the **G/N** key to move the active digit and then using the **TARE** key to increment a digit, followed by the **ZERO** key to enter the value. Use the **UNIT** key to leave a parameter unchanged.

For example when the display shows "F0 H-L" press the **ZERO** key to begin.
The display will show "SEt Lo", press the **ZERO** key to set the low limit, or press the **TARE** to skip to the next parameter, "SEt Hi" for setting the high limit.

After pressing the **ZERO** key to set a limit, use the **G/N** keys to change the flashing digit, then use the **TARE** key to increment the flashing digit. Continue to the next digit and set it as needed.

When all digits have been set press the **ZERO** key to store the value. The display will go back to the parameter just set, i.e. "SEt Lo". Advance to another parameter if needed or press the **UNIT** key to return to weighing.

FUNCTION MENU SETTINGS

FUNCTION	SUB-FUNCTION	DESCRIPTION	DEFAULT VALUE
F0 H-L	SEt Lo	Set a value for the Low limit.	000000
	SEt Hi	Set a value for the High Limit.	000000
F1 toL	to CLr	Clears the accumulation memory without printing the results.	
	to P-C	prints the Accumulation memory total and then clears the memory.	
	to Prt	prints the Accumulation Total, does not clear the memory.	
F2 Unt		Sets the displayed unit, you can press TARE key to set ON or OFF, press ZERO key to sure	kilogram, g, lb, oz, tj, hj.
F3 oFF	bL	Set the backlight to be on, automatic or off, EL on / EL AU / EL oFF	EL Au
	bEEP	Set the beep mode.(check weighing mode 2, check weighing mode 3, mode 1 (no beep))	

FUNCTION MENU SETTINGS

FUNCTION	SUB-FUNCTION	DESCRIPTION	DEFAULT VALUE
F4 PrT	Set the RS-232 , at first set RS-232 working mode (press **TARE** key to change, press **ZERO** key to sure) P PrT: print weighing ticket when the **PRINT/M+** key is pressed, P Cont: send weighing data continuously, connect to PC , ASK: ask and answer mode (bi-direction mode), connect to PC. Command "R": send weighing data to PC Command "T": do tare operate Command "Z": do zero operate P Cnt2: send weighing data continuously, connect to PC, the other mode to send data. P STAb: print after stable. P AUto: auto print mode. SE irE: connect with remote display (also send continuously) Then set baud rate After set working mode, display will show b xxx, this is current baud rate, you select baud rate by **TAKE** key ad press **ZERO** to sure. If you set P Cont, then need set communication protocol, display will show Con x, con1 is TSCALE standard protocol, con2 and con3 is other communication protocol, see detail in section 9. If you set printer (PPrT, PAUto), then you can set print out format. Display show "LAb x", set gross/acc print format, you can see detail below. These parameter only available in MODE0(normal mode), see detail in section 12. set printer type, tY-tP: mini ticket printer tY 711: A711 label printer LP-50: LP-50 label printer then set ACC on/off. ACC on: set accumulation and print working at the same time. ACC oFF: set print without accumulation.		P Prt
ProG	P in	Enter the programming and calibration menus by entering the correct password. See the section 12.	

print out format form 1 (for TpuP printer)

lab	0	1	2	3
	GS: 0.888kg	NT: 0.666kg TW: 0.222kg GW: 0.888kg	GS: 0.222kg TOTAL: 0.222kg	NT: 0.222kg TW: 0.666kg GW: 0.888kg TOTAL: 0.222kg

SECTION 8 BATTERY OPERATION

The weighing indicator can be operated from the battery if desired. The battery life is approximately 35 hours.

When the battery needs charging a symbol on the weight display will turn on. The battery should be charged when the symbol is on. The scale will still operate for about 10 hours after which it will automatically switch off to protect the battery.

To charge the battery simply plug into the mains power. The scale does not need to be turned on.

The battery should be charged for 12 hours for full capacity.

In the LCD display has a battery indicator to indicate the status of battery charging. When the scale is plugged into the mains power the internal battery will be charged. When turn on the indicator, if the battery indicator is full then the battery has a full charge. If it is half then the battery is nearly discharged and empty indicates the battery should be charged.

As the battery is used it may fail to hold a full charge. If the battery life becomes unacceptable then contact your distributor.

SECTION 9 RS-232 OUTPUT

The TRWS Series of scales can be ordered with an optional RS-232 output.

9.1 Basic information

Specifications:

RS-232 output of weighing data
ASCII code
8 data bits
No Parity
Baud rate from 600bps to 9600bps

Connector: 9 pin d-subminiature socket

Pin 2: Input,
Pin 3: Output
Pin 5: Signal Ground

9. 2 Normal print out

Data Format for normal weighing operations, parts counting or recalling of totals from memory will all be different. Examples follow:

Normal Output

S/N	The number increments every time a new value is stored in memory
GW	GW for gross weight, NT for net weight and a unit of weight
<If>	
<If>	Includes 2 line feeds

When parts counting the weight, unit weight and count will be printed.

Gross wt: 0.149KG	GW for gross weight, NT for net weight and a unit of weight
Unit wt: 7.4257G	The average piece weight computed by the scale
Quantity : 20PCS	The number of parts counted
<If>	
<If>	

When recalling the Total weight stored in the accumulation memory the output format is:

**********		A line of stars is shown
<lf>		Includes 1 line feed
Total No:	3	Times of the accumulation memory
Total wt.:	0.447KG	Weight of the accumulation memory
**********		

9. 3 Continuously output protocol

con1: weighing mode

		,			–/␣								k	g	CR	LF
-HEADER1--		-HEADER2-			--- WEIGHT DATA --								-WEIGHT UNIT-		TERMINATOR	

con1: counting mode

P	C	S	:								␣	p	c	s	CR	LF
				- QTY -								-QTY UNIT-				

HEADER1: ST=STABLE， US=UNSTABLE

HEADER2: NT=NET， GS=GROSS

Con2:

Header0	Header1	Header2	Header3	Weight1	Weight2	Weight3	Weight4	Weight5	Weight6	Tare1	Tare2	Tare3	Tare4	Tare5	Tare6	Terminator1	Terminator2

Header0=02H

Header1 follow decimal point

Decimal point=0, header1=22H

Decimal point=1, header1=23H

Decimal point=2, header1=24H

Decimal point=3, header1=25H

Decimal point=4, header1=26H

Header2 follow weigh status, default value=20H

If in net mode (tare value not 0), header2=header2|01H

If gross weight "-", header2=header2|02H

If overload or gross weight "-", header2=header2|04H

If unstable, header2=header2|08H

If weighing unit=kg, header2=header2|10H

Header3 follow weighing unit

If weighing unit=g, header3=21H

If weighing unit=oz, header3=23H

Weight1~weight6: weighing data

Tare1~tare6: tare value

Terminator1: 0DH

Terminator2: 0AH

Con3:

Header0	Header1	Weight1	Weight2	Weight3	Weight4	Weight5	Weight6	Weight7	Unit1	Unit2	Status	Terminator1	Terminator2

Header0=01H

Header1 follow weight "+" or "-"

When weight "+", header1="+", when weight "-", header="-"

Weight1~weight7: weight data (include decimal point)

Unit1~unit2: weight unit

Status: when stable, status=0, when unstable, status=1

Terminator1: 0DH

Terminator2: 0AH

SECTION 10 CALIBRATION

Press **UNIT** key and **PRINT/M+** key together when normal weighing mode, display shows "F0 H-L", press **TARE** key until display shows "ProG", press **ZERO** key, display shows "P in", You can press **G/N**、**UNIT**、**ZERO** key to enter setting mode, press **TARE** key to select "P2 CAL", press **ZERO** key to sure. press **TARE** key to select .While it is showing "CAL " press the **ZERO** key to enter. The display will show "L inEAr".

1. **Normal calibrate**

Press **TARE** key to select "nonL in", then press the **ZERO** key to enter, the display shows: "UnLoAd tG", press the **UNIT** key to select calibration unit (kg or lb). Remove any weight from the platform. After stable indicator on, press the **ZERO** key.

Then the display will show the last calibration weight used. If this is correct ,you can continue by pressing the **ZERO** key. If it is not correct use the **PRINT/M+, G/N**, **TARE** keys to change the calibration weight value. When it is correct, press the **ZERO** key.

Then display will show "LoAd tG" or "LoAd Lb". Place the calibration weight on the scale. After stable, press the **ZERO** key. Then the calibration has completed.

2. Linear calibrate

Press the **ZERO** key to enter, the display shows: "LoAd 0 tG", press the **UNIT** key to select calibration unit (kg or lb).Remove any weight from the platform. After stable indicator on, press the **ZERO** key.

Then display will show "LoAd 1 tG" or "LoAd 1 Lb". Place the 1/3 of capacity calibration weight on the scale. After stable, press the **ZERO** key.

Then display will show "LoAd 2 tG" or "LoAd 1 Lb". Place the 2/3 of capacity calibration weight on the scale. After stable, press the **ZERO** key.

Then display will show "LoAd 3tG" or "LoAd 1Lb". Place the full capacity calibration weight on the scale. After stable, press the **ZERO** key. Then the calibration has completed.

If the calibration is acceptable the display will return to normal. If an error message is shown try calibration again as a disturbance may have prevented a successful calibration.

If the problem persist then contact your dealer.

After calibration the scale should be checked to verify the calibration and linearity is correct. If necessary repeat calibration, especially be certain the scale is stable before accepting any weight.

SECTION 11 ERROR CODES

ERROR CODES	DESCRIPTION	RESOLUTION
- - - - -	Over range	Remove weight from the scale. If the problem persist contact your dealer or Taiwan scale for assistance.
Err 4	Zero Setting Error	The scale was outside the normal zero setting range either when it was turned on or when the ZERO key was pressed. Remove weight from the scale and try again. Use the TARE key to set the display to zero value. If the problem persist contact your dealer or Taiwan scale for assistance.
Err 6	A/D out of range	The values from the A/D converter are outside the normal range. Remove weight from the scale if overloaded, make sure the pan is attached. Indicates the load cell or the electronics may be faulty. If the problem persist contact your dealer

SECTION 12 TECHNICAL PARAMETERS

Press **UNIT** key and **PRINT/M+** key together when normal weighing mode, display shows "F0 H-L", press **TARE** key until display shows "ProG", press **ZERO** key, display shows "P in", You can press **G/N**、**UNIT**、**ZERO** key to enter setting mode, press **Tare** key to select parameter, press **Zero** key to sure, press **UNIT** key to escape.

FUNCTION	SUB-FUNCTION	DESCRIPTION
P1 rEF	A2n 0	This option is used to select the auto zero maintain; Options : 0.5d, 1d, 2d, 4d
	0-AUto	This option is used to select the auto zero range when turn the indicator. Options : 0%, 2%, 5%, 10%, 20%
	0- rAnGE	This option is used to select the manual zero range when press the ZERO key. Options: 2%, 4%, 10%, 20%, 50%, 100%
	SPEEd	Set ADC speed, press U. Wt. Key to select ADC speed, press Tare key to enter 7.5: 7.5 times per second 15: 15 times per second 30: 30 times per second 60: 60 times per second Note: 15 times per second or 30 times per second are recommendatory
P 2 CAL	dEC i	This option is used to select the decimal Options : 0, 0.0, 0.00, 0.000
	inC	This option is used to select the division Options : 1, 2, 5, 1 0, 20, 50
	CAP	This display will show xxxxxx for setting the capacity.
	CAL L inEAr / nonL in	Calibrate, see detail in section 10.
P3 P ro	tr i	This display will show xxxxxx for trimming the load cells, see detail in service manual.
	CoUnt	This display will show xxxxxx for indicating the internal counts.
	GrA	Set the gravity.
	rESEt	This display will show SURE for recovering the factory default setting.
P4 CHt	nodE 1	This is mode of the natural scale
	nodE 2	This is animal scale Scale can lock reading when little unstable
	nodE 3	This is a subtration scale (PRINT out "-" weight) PRINT format: GROSS: 0.888KG gross for gross weight NET: 0.222KG net for net weight TARE: 0.666KG tare for tare weight
	nodE 4	As the mode 2, but PRINT out format different NW: 0.222KG nw for net weight GW:0.888KG gw for gross weight