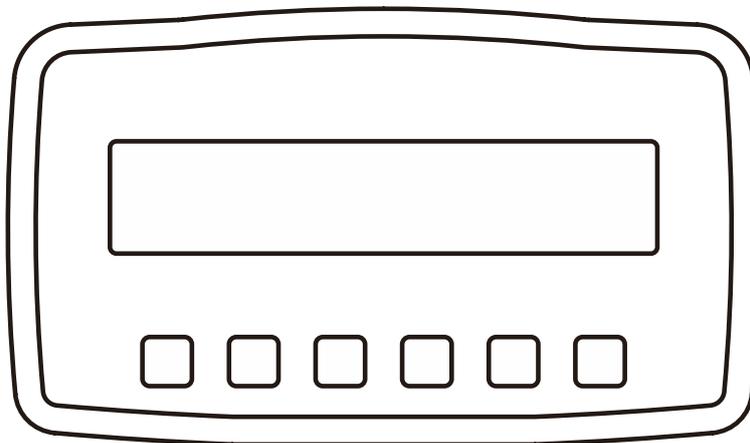
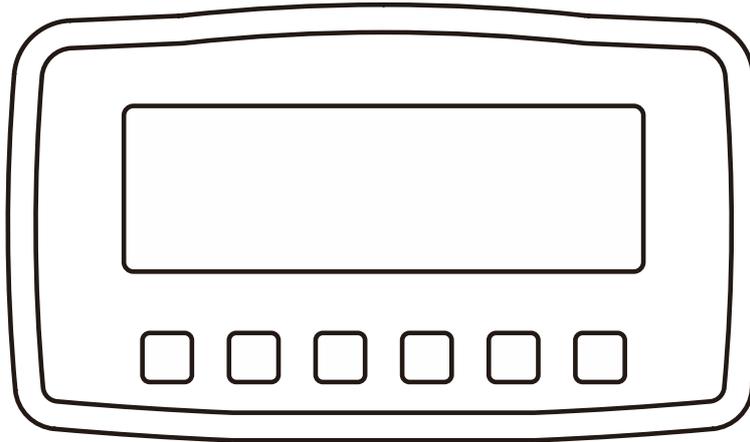


HF12 Series Weight Indicator



User Guide

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 Please read this manual carefully before operating the indicator.

1 Introduction

1.1 Warnings

Failure to heed may result in serious injury or death.

-  DO NOT allow children or inexperienced persons to operate the indicator.
-  DO NOT operate without all shields and guards in place.
-  DO NOT step on the unit.
-  DO NOT use for purposes other than weight taking.
-  DO NOT place fingers into slots or possible pinch points.
-  DO NOT use the indicator if any of the components are cracked.
-  DO NOT exceed the rated load limit of the indicator.
-  DO NOT make alterations or modifications to the indicator.
-  DO NOT remove or obscure warning labels or seals.
-  DO NOT use near water.

Before opening the indicator, ensure the power cord is disconnected from the outlet.

Keep hands, feet and loose clothing away from moving parts.

1.2 Features

This indicator is a single-channel high resolution general purpose weight indicator. Housed in enhanced ABS plastic enclosure, the indicator's front panel consists of a large 6-digit 7-segment display and 6-button keypad.

- Available in alphanumeric LED and LCD display versions
- Available in 110/115 VAC and 220/230 VAC versions
- One configurable user-defined function key
- Two configurable software set-points
- Built-in high capacity maintenance-free rechargeable battery
- One full duplex RS-232 communication port
- Calibration password protection or calibration switch with seal protection (optional)
- One RS-485 communication port (optional)
- Built-in full time and date stamping clock (optional)
- Extended serial interface printer (optional)
- RF module for interfacing with RF scoreboard or RF transmitter (optional)

1.3 Specifications

Analog Performance

Full Scale Input Signal	-11.7 ~ +11.7 mV (-3.9 ~ +3.9 mV/V)
Loadcell Excitation Voltage	3.00±2% Vdc (typ.)
Number of Loadcells	4X350Ω / 8X700Ω
Input Impedance	1 MΩ (typ.)
Internal Resolution	1 000 000 counts
Measurement Rate	10 measurements/s
System Linearity	±6 ppm
System Offset Error	-1 μV
System Offset Drift	25 nV/degC
System Gain Error	±0.1 %F.S.
System Gain Drift	6 ppm/degC (max.)

Metrology Performance

Accuracy Class	Class III (eqv. to OIML R76)
Overload Range	100 %F.S.+9e
Tare Range	100 %F.S.
Auto-Zero Range	±20 %F.S. (dft.)
Manual-Zero Range	±4 %F.S. (dft.)
Center of Zero	±0.25 e
Return-to-Zero Range	5.0 e
Zero-tracking	0.5 e/s (dft.)

User Interface

LED Display	6-digit high-intensity LED, 1.2inch/30mm 7-segment
LED Annunciators (LED display)	Zero, Net, Stable, Hold, Peak-Hold, View Total
LCD Display	6-digit HTN LCD, 1.6inch/40mm 7-segment
Backlight (LCD display)	High-intensity white LED
Keypad	6-key flat tact switch

Power Supply

AC Power Voltage	94~121 / 187~242 Vac
AC Power Frequency	50~60 Hz
Fusing	1.1A PPTC resettable fuse
Internal Battery	6V4.0Ah acid-lead rechargeable battery
Low Battery Caution	5.80 Vdc (typ.)
Low Battery Auto Power-Off	5.60 Vdc (typ.)
Battery Life	50 ~ 130 hours (typ.)

Battery Charging Cycles	over 300 cycles (typ.)
Auto Power-Off Timing	Disabled (dft.)
Sleep Timing	30 s (dft.)

Serial Communication

Port	Full duplex RS-232 and RS-485 (optional)
Baudrate	9600, 4800, 2400, 1200 bps
Data Format	1-bit start, 8-bit data, 1-bit stop
Parity	None parity
Output Data Type	Gross, Net, Tare weight
Output Mode	Continuous Mode / Request Mode

RF Performance (Optional)

Frequency Range	433 / 470 / 868 / 915 MHz
Number of RF Channel	16 chs (dft.)
Modulation System	GFSK (Gauss Frequency Shift Keying)
Receiver Sensitivity	≤ -114 dBm

Environmental

Operating Temperature	-10 ~ +40 degC (+14 ~ +104 degF)
Storage Temperature	-20 ~ +50 degC (-4 ~ +122 degF)
Operating Humidity	0 ~ 90 % at 20 degC (rel.)

Enclosure

Enclosure Material	ABS plastic
Indicator Net Weight	1.55 kg (3.40 lb)
Mounting Bracket	Stainless steel for wall or bulkhead mounting
Mounting Bracket Net Weight	0.25 kg (0.55 lb)
Enclosure Dimensions	24.5 x 14.5 x 10 cm (9.5 x 6 x 4 inch)
Package Gross Weight	2.15 kg (4.74 lb)
Package Dimensions	29 x 20.5 x 16.5 cm (11.5 x 8 x 6.5 inch)
Outer Package Gross Weight	28 kg (61.7 lb)
Outer Package Dimensions	61 x 42 x 51 cm (24 x 16.5 x 20.5 inch)

1.4 Functions

- Zero, Tare In, Tare Out, View Tare, Total, View Total, Hold, Peak Hold
- Battery Supervision, Charging Indication, Low Battery Power-off
- Power-off Timing, Sleep Timing, Display Luminance Adjustment
- Piece Count, Animal Weighing, Extended Resolution View, Conversion Code View
- Hi-Ok-Lo Set-point Alarm
- Serial Communication

1.5 Options

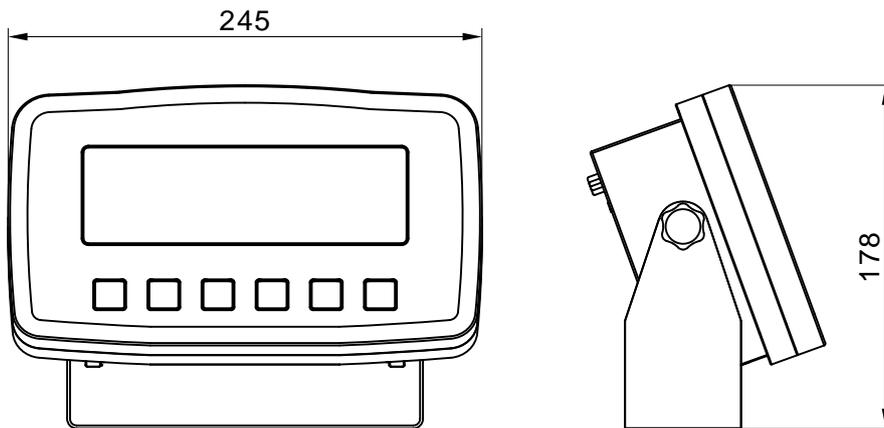
Options which you may have ordered with this indicator include:

- kg/lb unit switch function (m)
- Preset Tare function (t)
- Calibration switch with seal protection (S)
- RS-485 communication port (4)
- Built-in real-time calendar and extended serial interface printer (C)
- Built-in RF module for interfacing with RF scoreboard or RF transceiver (F)

2 Installation

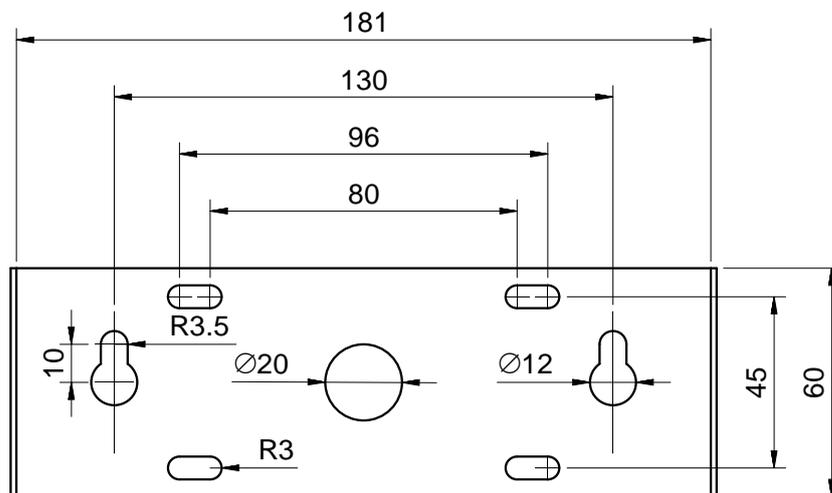
2.1 Dimensions

2.1.1 Indicator



Dimensions in Millimeters

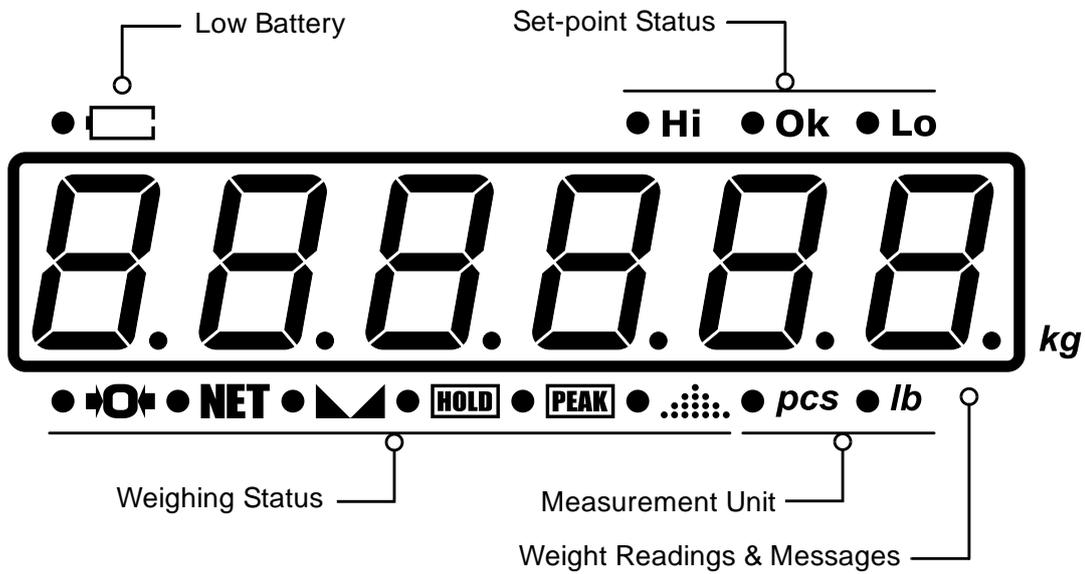
2.1.2 Mounting Bracket



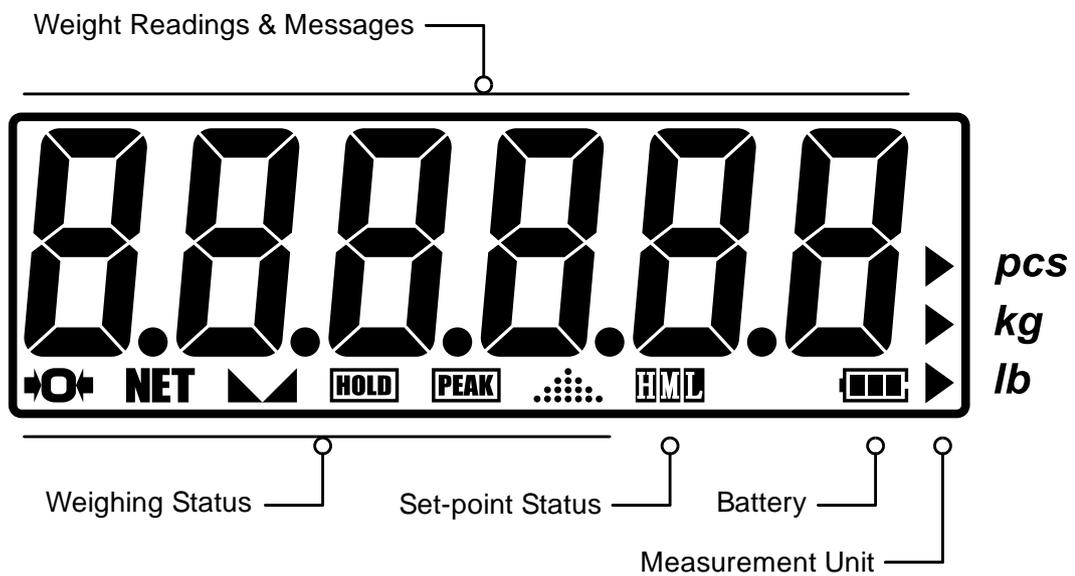
Dimensions in Millimeters

2.2 Front Panel

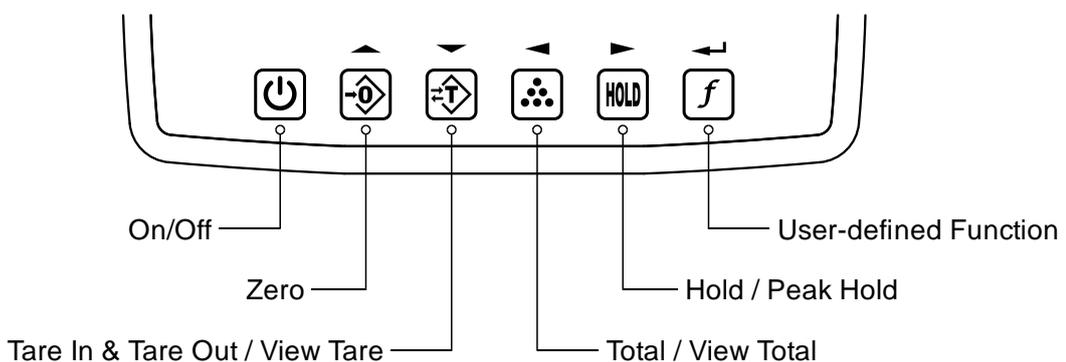
2.2.1 LED Display



2.2.2 LCD Display



2.2.3 Keypad

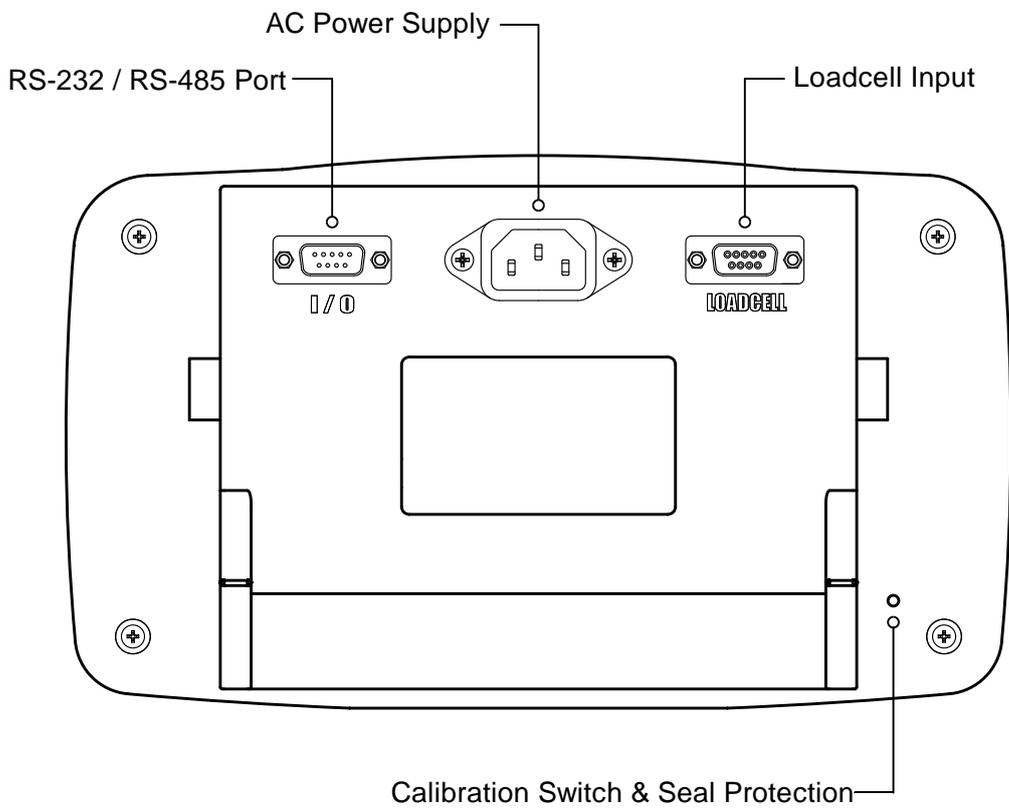


	On/Off	Return to normal WEIGHING mode. Press 1s to power on/off the indicator.
	Zero	Manual Zero. / Increase blinking digit. Press 1s to toggle unit (optional).
	Tare	Tare In & Tare Out. / Decrease blinking digit. Press 1s to preset tare (optional).
	Total	Total weighing data. / Move blinking digit left. Press 1s to enter/exit VIEW TOTAL mode.
	Hold	Enter/exit HOLD mode. / Move blinking digit right. Press 1s to enter/exit PEAK HOLD mode.
	Function	User-defined function. Press 1s to enter User Configuration. / Input decimal point.

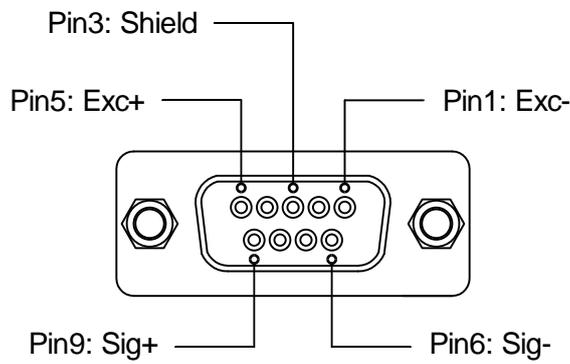
2.2.4 Annunciators

	Zero	shows if weight is within center of zero ($\pm 0.25e$)
	Net	shows if weight is in NET mode
	Stable	shows if load is stable
	Hold	shows if weight reading is locked in HOLD mode
	Peak-Hold	shows if weight reading is locked in PEAK HOLD mode
	View Total	shows if indicator is in VIEW TOTAL mode
	Low Battery (LED display)	shows if battery is out of power blinks if battery is being charged hides if battery is fully charged
	Set-point	Hi shows if load is greater than high set-point; Lo shows if load is less than low set-point; Hi and Lo shows if load is either greater than high set-point or less than low set-point; Ok shows if load is in between high and low set-point
	Status	
	(LED display)	
	Battery (LCD display)	 shows if battery is less than 25%, charging is required  shows if battery is less than 50%  shows if battery is less than 75%  shows if battery is fully, scrolls if it is being charged
	Set-point (LCD display)	 shows if load is greater than high set-point;  shows if load is less than low set-point;  and  shows if load is either greater than high set-point or less than low set-point;  shows if load is in between high and low set-point

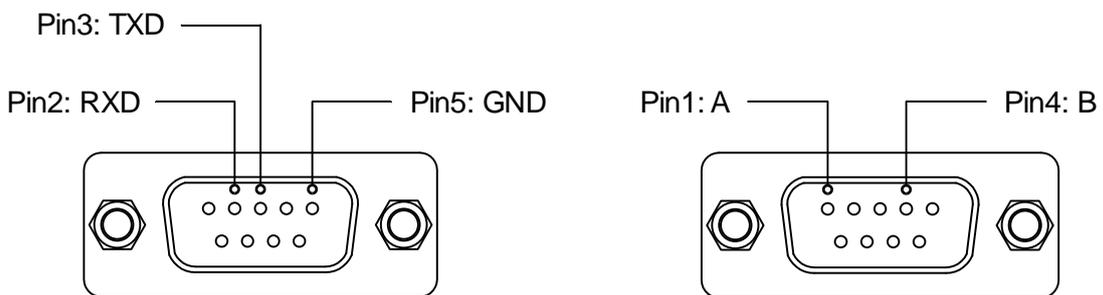
2.3 Interface



2.3.1 Loadcell Cabling



2.3.2 RS-232 & RS-485 Cabling



2.4 Built-in Battery

This indicator has a built-in 6V4.0Ah rechargeable maintenance-free lead-acid backup battery.

Depending on the configuration of display luminance and sleep timing, loadcell resistance and daily operations, battery works from 50 hours to 130 hours. When powered by the built-in battery, proper configurations of Auto-Off, sleep timing and display luminance, greatly reduce power consumption and conserve battery life.

The AC power supply charges battery automatically. Charging time for a completely discharged battery is approximately 10 to 20 hours, depending on battery’s charged cycles and charging temperature.

During battery charging,  (LED display) blinks,  (LCD display) scrolls.

After battery is fully charged,  (LED display) hides,  (LCD display) shows.

To obtain the built-in battery maximum service life, stored indicator shall be re-charged every three months.

3 Operation

3.1 Power On / Off

When powered off

 Press  1s to power on the indicator.

Indicator starts with power-on beeping, and 9 to 0 count-down display test. It then performs weight detection until load becomes stable. Finally, the indicator Auto Zero the scale if properly configured.

- ⚠ If `-----` keeps showing, check if the load is in motion, the loadcell cable connection is loosen, loadcell is defective, or re-calibrate the scale if necessary.
- ⚠ If `no rF` keeps showing, check if the RF transmitter is properly working (optional).
- ⚠ If the load is out of Auto Zero Range, message `oUtrnG` shows 1s.

In WEIGHING mode

 Press  1s to power off the indicator.

3.2 Zero

Zero function takes out small deviations in zero when scale is unloaded, and sets a new zero reading of the scale.

In WEIGHING mode

 Press  to set the scale to zero.

 shows, indicating weight is within $\pm 0.25e$.

- ⚠ If load is unstable ( hides), message `UnStb` shows.

- ⚠ If weight is in NET mode (**NET** shows), message **tArEd** shows.
- ⚠ If load is out of Manual Zero Range, message **oUtrnG** shows.

3.3 Tare

Tare is typically used to zero out a known weight such as a packing container or pallet and display the load in NET mode.

Tare will reduce the apparent overload range of the scale. For example, tare in a 20kg container on a 100kg scale, the scale will overload at a new net weight of 80kg (100-20) plus 9.0e.

3.3.1 Tare In

In GROSS mode

Press  to tare in the weight.

NET shows, indicating weight is in NET mode.

- ⚠ If load is unstable ( hides), message **UnStb** shows.
- ⚠ If weight is negative, message **nEGt W** shows.
- ⚠ If load is within zero ($\pm 0.25e$), message **inZEro** shows.
- ⚠ If load is out of full scale, message **oUt F3** shows.

3.3.2 Tare Out

In NET mode

Press  to tare out the weight.

NET hides, indicating weight is in GROSS mode.

3.3.3 Preset Tare (Optional)

Preset Tare function is used to input a known tare weight (as a packing container or pallet) instead of placing it on the scale manually.

In GROSS mode

Press  1s to enter USER INPUT mode.

Press    **HOLD** to input the known tare value, press  1s to input/cancel decimal point if needed.

Press  to confirm.

NET shows, indicating weight is in NET mode.

- ⚠ If the indicator is in NET mode already, Preset Tare is not allowed, and message **tArEd** shows 1s.

3.4 Total

For accumulation of multiple weight, the indicator's accumulator always uses the displayed weight, so GROSS and NET readings are added into the same memory.

It requires that the weight on the scale falls below +5.0e before next weight can be

totaled. This assures that a weight on the scale is only totaled to the accumulator once.

3.4.1 Manual Total

In WEIGHING mode

 Press  to total current weight.

Message **tOtAL** shows, indicating weight is totaled.

-  If load is unstable ( hides), message **UnStb** shows.
-  If weight is negative, message **NEGt W** shows.
-  If load is out of full scale, message **out Fb**
-  If weight is less than +5.0e or hasn't returned +5.0e before, message **Error** shows.

3.4.2 View Total

In WEIGHING mode

 Press  1s to enter VIEW TOTAL mode.

 shows.

In VIEW TOTAL mode

 Press  1s to exit from VIEW TOTAL mode.

 hides.

3.4.3 Clear Total

In VIEW TOTAL mode

 Press  1s to clear the total.

Message **CLAR** shows, indicating accumulator is cleared and empty.

3.5 Hold

3.5.1 Weight Hold

Hold function is used to pause display refreshing when weight reading is changing or weight is unloaded.

In HOLD mode, the indicator still calculates actual weight in background, therefore, all functions like set-point capturing, serial port output, etc., still work normally.

In WEIGHING mode

 Press  to lock the weight reading.

 shows.

In HOLD mode

 Press  to unlock the weight reading.

 hides.

3.5.2 Peak Hold

Peak Hold is typically used to monitor and capture peak weight. Different from Hold,

Peak Hold only locks the maximum weight reading. If new weight comes and is greater than current locked weight, display refreshes to the new weight reading.

In WEIGHING mode

 Press  1s to enter PEAK HOLD mode.

 shows.

In PEAK HOLD mode

 Press  1s to exit from PEAK HOLD mode.

 hides.

3.6 Unit Switch (Optional)

The indicator supports kg and lb measurement units.

The indicator's calibration unit is always fixed to kg. The Unit Switch function simply calculates new weight reading as a result of multiplying kg by unit switch ratio. Therefore, the Unit Switch function doesn't change indicator's verification interval.

 Press  1s to toggle between kg and lb.

New unit will be activated and saved in nonvolatile memory for next power-up.

3.7 User-defined Function

The indicator comes with one configurable User-defined Key , which can be programmed to user preferred function.

By default, the Sleep function is assigned to .

In WEIGHING mode

 Press  1s to enter User Configuration menu. *USER* shows.

 Press  4 times to enter User-defined Key. *F* shows.

 Press  /  to select preferred function.

 Press  to assign the selected function to .

 Press  to save and return to WEIGHING mode.

Available functions can be programmed by user are listed as below.

<i>d is</i>	No function is assigned.
<i>SLEEP</i>	Enter SLEEP mode.
<i>Ext</i>	Extended Resolution View function.
<i>Code</i>	Conversion Code View function.
<i>An in</i>	Animal Weighing function.
<i>Cnt</i>	Piece Count function.
<i>Print</i>	Print function (optional)

3.7.1 Sleep

 The Sleep function shall be assigned to  first.

The Sleep function switches indicator to SLEEP mode immediately.

Press  to set indicator to SLEEP mode.

 If load is unstable ( hides), Sleep is not valid.

In SLEEP mode

The indicator display blinks - to save power (LED display).

The display's backlight turns off to save power (LCD display).

3.7.2 Extended Resolution View

 The Extended Resolution View function shall be assigned to  first.

Typically used in testing or calibration, the Extended Resolution View function enables user to read weight in 10 times high division for 5s. After 5s, display interval resumes normal.

Press  to start Extended Resolution View.

 If the display interval is 0.005, 0.002 or 0.001, Extended Resolution View is not allowed to perform, and message **Error** shows 1s.

3.7.3 Conversion Code View

 The Conversion Code View function shall be assigned to  first.

Usually used in linearity testing, Conversion Code View enables user to read indicator's internal ADC conversion code for 5s. After 5s, display resumes normal.

Press  to start Conversion Code View.

3.7.4 Animal Weighing

 The Animal Weighing function shall be assigned to  first.

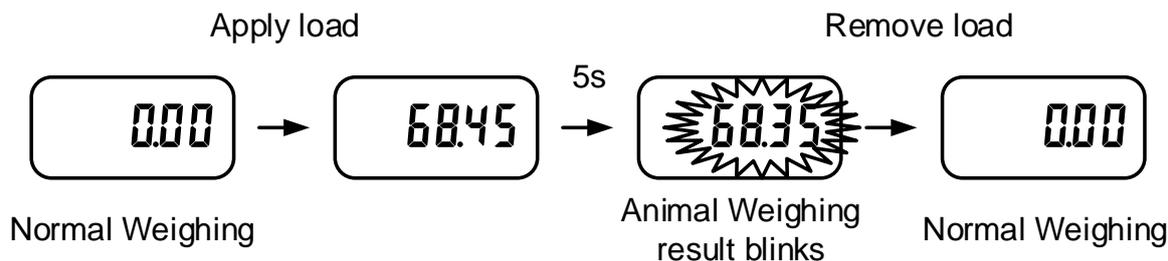
In some application, the load (animal, etc.) keeps in motion on the scale, resulting that the weight reading fails to settle down. The Animal Weighing function detects and calculates the load's average weight in every 5s, making it easy to read weight on display.

Press  to enable Animal Weighing.

Message **An 1 00** shows 1s, indicating Animal Weighing is enabled.

Weight reading blinks and is updated in every 5s with a beep alarm as long as load exceeds 20e. If load is less than 20e, Animal Weighing is halted automatically.

The below operation flowchart shows the whole Animal Weighing procedure.



Press  again to disable Animal Weighing.

Message **An 10FF** shows 1s, indicating Animal Weighing is disabled.

3.7.5 Piece Count

The Piece Count function shall be assigned to first.

In PIECE COUNT mode, the indicator shows the number of parts on the scale rather than the weight of those parts.

Acquire Sample Weight

In WEIGHING mode

Place empty parts container on scale. Wait until the container is stable.

Press to acquire the tare weight of the container.

Place sample parts on scale. Wait until the parts are stable.

Press to acquire the sample weight and enter QUANTITY SELECTION mode.

Select Sample Quantity

In QUANTITY SELECTION mode

Press / to select sample size from 1, 2, 3, 5, 10, 20, 30, 50, 100, 200, 300, 500, and 1000..

Indicator shows .

Press to confirm the sample size and enter PIECE COUNT mode.

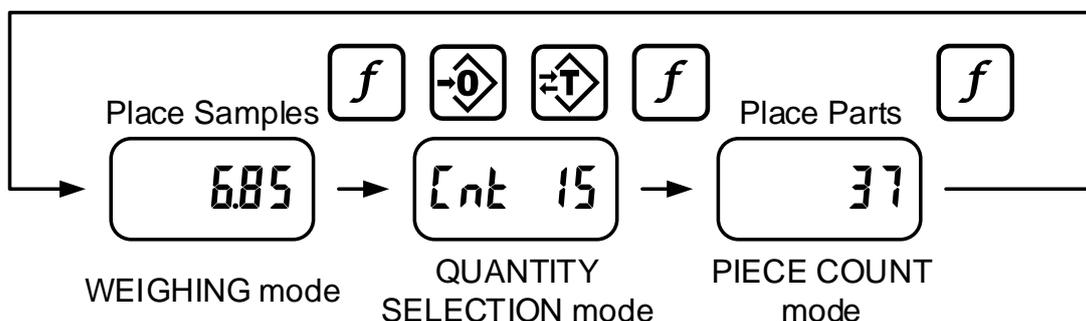
Piece Count

In PIECE COUNT mode

The indicator shows the number of parts on the scale rather than their weight.

Press again to return to WEIGHING mode.

The below operation flowchart shows the whole Piece Count procedure.



3.7.6 Print (Optional)

The Print function drives the optional extended serial printer to print weight ticket in customized format.

The printed weight will be automatically totaled at the same time.

The Print function shall be assigned to Key first.
 The output mode of serial port shall be configured to print mode.

Press Key to print out weight ticket.

Message *Print* shows, indicating weight is printed out.

If load is unstable (hides), message *UnStb* shows.

- ⚠ If weight is negative, message **nEGt w** shows.
- ⚠ If load is out of full scale, message **out F5** shows.
- ⚠ If weight is less than +5.0e or hasn't returned +5.0e before, message **inUFLd** shows.

3.8 Set-point

The indicator comes with 2 software set-points, which can fill a variety of applications in control, batching, safety and informational warnings.

When net weight meets configured triggering condition, the indicator responds with annunciator indication and beeping alarm.

When set-point triggered, indicator can be configured to:

- no response (set-point function disabled),
- optical alert,
- acoustic and optical alert.

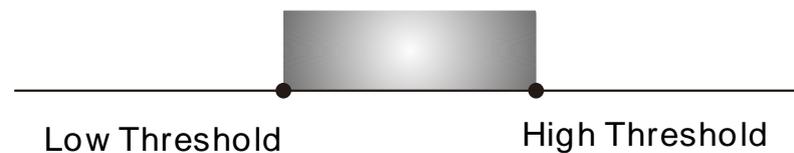
Triggering Condition

There are 4 types of set-point triggering conditions:

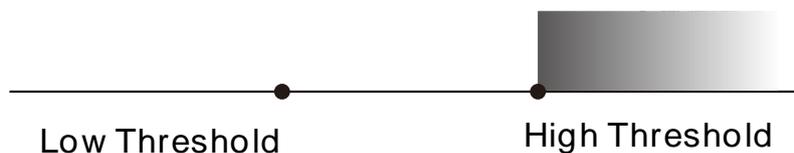
1) **Lo**: triggered if weight is less than low threshold, **Lo** /  shows.



2) **oH**: triggered if weight is in between high and low threshold, **Ok** /  shows.



3) **Hi**: triggered if weight is greater than high threshold, **Hi** /  shows.

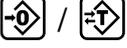


4) **LoHi**: triggered if 1) or 2) satisfied, **Hi** /  and **Lo** /  shows.



Select Set-point Mode

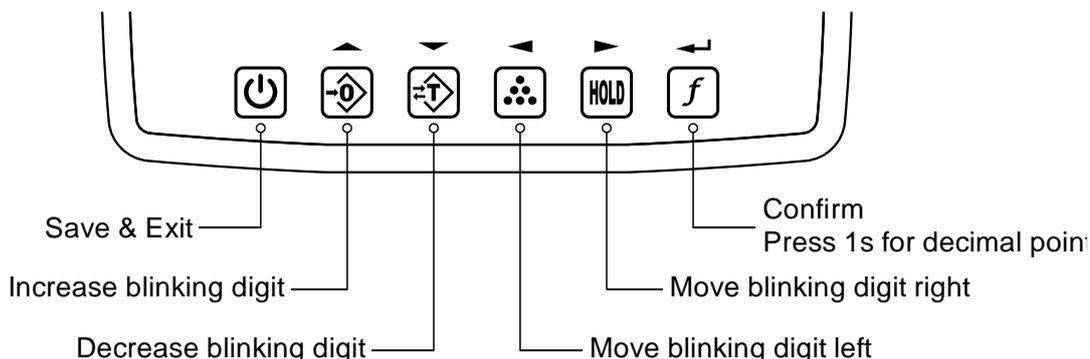
In WEIGHING mode

-  Press  1s to enter User Configuration menu. **USER** shows.
-  Press  5 times to enter Set-point parameter. **SP** shows.
-  Press  to scroll up / down to select set-point working mode.

Selectable set-point mode are:

- **d b**: no response (set-point function disabled),
- **no bP**: no beeping, only annunciator indication,
- **Lo / oP / Hi / LoHi**: beeping alarm and annunciator indication.

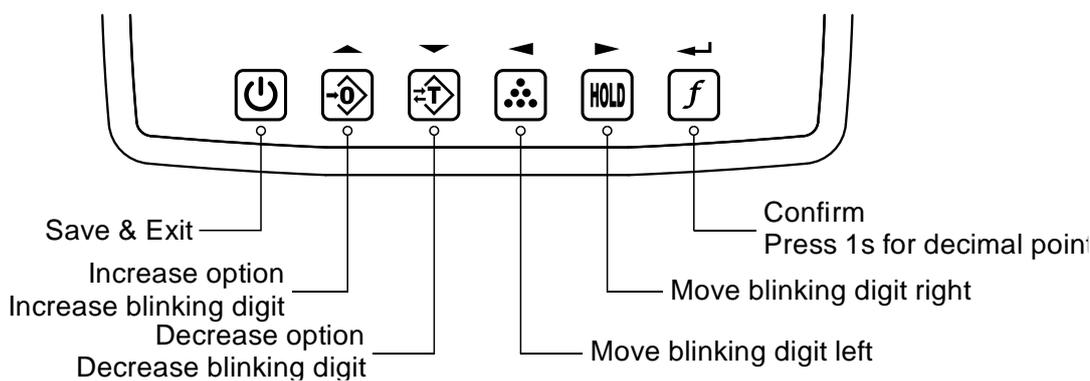
Configure Set-point Threshold



- Press **f** to enter High Threshold parameter. **H** shows.
- Press **←** / **→** to increase / decrease blinking digit. Press **⋮** / **HOLD** to move blinking digit left / right. Press **f** 1s to input / cancel decimal point of blinking digit. Input High Threshold value.
- Press **f** to enter Low Threshold parameter. **L** shows.
- Same as High Threshold parameter. Input Low Threshold value.
- Press **⏻** to save and return to WEIGHING mode.

4 Configuration

4.1 Menu Navigation



- Press **f** to enter the first or next parameter.
- Press **⏻** to save and exit from Configuration immediately.
- If option is selectable
- Press **←** / **→** to scroll up / down blinking option.
- If option is user input
- Press **←** / **→** to increase / decrease blinking digit
- Press **⋮** / **HOLD** to move blinking digit left / right.
- Press **f** 1s to input / cancel decimal point of blinking digit.

4.2 User Configuration

In **WEIGHING** mode

 Press **[f]** 1s to enter User Configuration menu, **USER** shows.

4.2.1 Power Management

Auto-off Timing

Auto-off Timing maximizes the indicator's built-in battery life against people's carelessness to forget powering off indicator when it's not working.

Auto-off starts countdown timer when there's no action or when load is stable. Any key pressing or motion in load restarts countdown timer.

The selectable Auto-off Timing are: disabled, 3min, 5min, 10min, 15min, 30min, and 60min.

Sleep Timing

If properly set, the indicator automatically enters SLEEP mode to save battery power after a set period, when there's no action or the load is stable. Any key pressing or motion in load wakes up scale from SLEEP mode.

In SLEEP mode, scale works in low-power consumption status. For LED display version, the indicator display blinks - to save power. For LCD display version, the display backlight turns off to save power.

The selectable Sleep Timing are: disabled, 3s, 5s, 10s, 15s, 30s, and 60s.

Display Luminance

Dim display luminance to saves battery power dramatically.

The selectable LED display luminance are: 1 (low), 2 (medium), and 3 (high).

The selectable LCD backlight luminance are: disabled (backlight off), 1 (low), 2 (medium), and 3 (high).

4.2.2 Parameters Overview

	Name	Unit	Options
OFF	Auto- OFF Timing	min.	d 15, 3, 5, 10, 15, 30, 60
SLP	SL ee P Timing	sec.	d 15, 3, 5, 10, 15, 30, 60
LU	Display LU minance	level	1, 2, 3 (LED display) d 15, 1, 2, 3 (LCD display)
F	User-defined F unction		d 15, SLEEP : enter SLEEP mode, ERV : Extended Resolution View, Code : Conversion Code View, Animal : Animal Hold, Count : Piece Count, Print : Print function (optional)

	Name	Unit	Options
SP	<u>S</u> et- <u>P</u> oint		dis, nobP : no beeping, Lo : less than low threshold, oP : in between low and high threshold, Hi : greater than high threshold, LoHi : less than low or greater than high
H	<u>H</u> igh Threshold		User Input (0.0000~99999)
L	<u>L</u> ow Threshold		User Input (0.0000~99999)
ot	Serial <u>O</u> u <u>T</u> put		dis, Cont : output continuously, req : output upon request, Print : print ticket on extended printer (optional)
b	<u>B</u> audrate	bps	1200, 2400, 4800, 9600
dA	Output <u>D</u> A <u>t</u> a		Grob : output gross weight, net : output net weight, tArE : output tare weight

4.3 Scale Configuration

 It is NOT recommended to access Scale Configuration unless you are authorized from your local representative.

In WEIGHING mode

-  Press  1s to enter User Configuration menu, **USER** shows.
-  Press  /  to scroll from User Configuration to Scale Configuration, **SCALE** shows.

Configuration Password

If the Calibration Switch (optional) is not ordered with this indicator, correct password is required to enter Scale Configuration.

-  Press     to input password value.
-  Press  to confirm and enter Scale Configuration.

 If the input password is incorrect, message **Error** shows 1s, and indicator returns to WEIGHING mode afterward.

Calibration Switch (optional)

As OIML and other Legal-for-Trade standards required, before entering Scale Configuration, the seal must be opened, and the calibration switch must be set to ON (button depressed).

 Before entering Scale Configuration, the Calibration Switch must be set to ON, otherwise message **CALOFF** shows 1s.

If the Calibration Switch (optional) is ordered with this indicator, the password verification is skipped.

 Press  to enter Scale Configuration.

4.3.1 Scale Setting

Verification Interval

Designed to meet the OIML R76's directive, the indicator has the best (default) performance from 2000 to 3000 division.

Maximum Capacity

Do NOT attempt to set Maximum Capacity greater than the scale's actual capacity. Overloading causes severe harm to scale and is very dangerous to human life.

Maximum Capacity can be set from 0.0000 to 99999.

 The numerical position of decimal point is versatile and easy for user to input floating value in very wide range. For example, 0.0000, 0000.0, and 00000 are all equal to 0. Another example, to input 150, 150.00, 0150.0, 00150 are all acceptable.

4.3.2 Zero Functions

Auto Zero Range

Upon powering-up, indicator automatically zero itself if the load is stable. Auto Zero Range defines the maximum deviations in zero which Auto Zero function can take out.

The selectable Auto Zero Range are: disabled, $\pm 2\%F.S.$, $\pm 3\%F.S.$, $\pm 4\%F.S.$, $\pm 10\%F.S.$, $\pm 20\%F.S.$, $\pm 50\%F.S.$, and $\pm 100\%F.S.$.

Manual Zero Range

Manual Zero Range defines the maximum deviations in zero when user press  to set new zero. Manual Zero is allowed only when weight is within the Manual Zero Range.

The selectable Manual Zero Range are: disabled, $\pm 2\%F.S.$, $\pm 3\%F.S.$, $\pm 4\%F.S.$, $\pm 10\%F.S.$, $\pm 20\%F.S.$, $\pm 50\%F.S.$, and $\pm 100\%F.S.$.

Zero-tracking Range

Zero-tracking works in specified range. If properly set, the indicator's Zero-tracking function will enhance scale temperature and drift performance.

The selectable Zero-tracking Range are: $\pm 0.1e$, $\pm 0.2e$, $\pm 0.3e$, $\pm 0.4e$, $\pm 0.5e$, $\pm 0.75e$, $\pm 1e$, $\pm 1.25e$, $\pm 1.5e$, $\pm 1.75e$, $\pm 2e$, $\pm 2.5e$, $\pm 3e$, $\pm 3.5e$, $\pm 4e$, and $\pm 5e$.

Zero-tracking Speed

Zero-tracking works in specified speed.

The selectable Zero-tracking Speed are: disabled, 0.5s, 1s, and 2s.

4.3.3 Weighing Performance

Filter

At the cost of measuring time, the indicator intelligently settles down weight reading when load is in motion. The weaker filter is, the faster weight reading displays, but the longer it takes to get stable weight reading.

Standstill Timing

The stable annunciator  shows when load is detected as standstill.

The selectable Stable-checking Timing are: 0.5s, 1s, 1.5s, 2s, 3s, and 5s.

Standstill Range

The selectable Stable-checking Range are: ±0.1e, ±0.2e, ±0.3e, ±0.4e, ±0.5e, ±0.75e, ±1e, ±1.25e, ±1.5e, ±1.75e, ±2e, ±2.5e, ±3e, ±3.5e, ±4e, and ±5e.

4.3.4 Parameters Overview

	Name	Unit	Options
	Verification Interval		0.001, 0.002, 0.005, 0.01, 0.02, 0.05, 0.1, 0.2, 0.5, 1, 2, 5, 10, 20, 50
	Maximum Capacity		User Input (0.0000~99999)
	Auto-Zero Range	±%F.S.	1, 2, 3, 4, 10, 20, 50, 100
	Manual-Zero Range	±%F.S.	1, 2, 3, 4, 10, 20, 50, 100
	Zero-tracking Range	e	0.1, 0.2, 0.3, 0.4, 0.5, 0.75, 1, 1.25, 1.5, 1.75, 2, 2.5, 3, 3.5, 4, 5
	Zero-tracking Speed	sec.	1, 2, 0.5, 1, 2
	FILTer	level	1, 2, 3, 4, 5, 6, 7
	Standstill Timing	sec.	0.5, 1, 1.5, 2, 3, 5
	Standstill Range	e	0.1, 0.2, 0.3, 0.4, 0.5, 0.75, 1, 1.25, 1.5, 1.75, 2, 2.5, 3, 3.5, 4, 5

4.4 Calendar Configuration (Optional)

In WEIGHING mode

-  Press  1s to enter Configuration menu, **USER** shows.
-  Press  /  to scroll up / down to Clock menu, **CLoCK** shows.
-  Press  to enter DATE SETTING mode.

In DATE SETTING mode

-  Press  /  to increase / decrease blinking digit, press  /  to move blinking digit right / left. Input date in YYMMDD format.
-  Press  to return to WEIGHING mode without saving any changes.
-  Press  to enter TIME SETTING mode.

In TIME SETTING mode

- Same as in DATE SETTING mode, input time in HHMMSS format.
 -  Press  to save new date and return to WEIGHING mode.
 -  Press  to save new date and new time, and return to WEIGHING mode.
- Message **End** shows, indicating both new date and new time are saved.

4.5 RF Configuration (Optional)

In WEIGHING mode

-  Press  1s to enter User Configuration menu, **USER** shows.
-  Press  /  to scroll from User Configuration to RF Configuration, **RF** shows.
-  Press  to enter RF Configuration.

4.5.1 RF Address

The RF Address is the unique ID of the RF communication network. The address of indicator and its RF counterpart must be the same.

RF Address ranges from 000 to 255.

4.5.2 RF Band Seek

If RF communication fails or interrupted caused by improperly configuration or disturbance, use RF Band Seek function to scan all bands and re-connect indicator with its RF counterpart.

In WEIGHING mode

-  Press  1s to enter User Configuration menu, **USER** shows.
 -  Press  /  to scroll from User Configuration to RF Configuration, **RF** shows.
 -  Press  2 times to enter RF Band Seek.
- Message **SEE no** shows.
-  Press  /  to scroll from **no** (no) to **YES** (yes).
 -  Press  to start RF Band Seek.

Indicator will perform handshaking request in each band until correct handshaking response is received. If handshaking is successful, message **PASS** shows, otherwise message **FAIL** shows.

-  Press  to save and return to WEIGHING mode.

4.5.3 RF Band Set

If RF communication is interrupted or delayed due to disturbance, use RF Band Set function to switch the RF network to other band.

In WEIGHING mode

-  Press  1s to enter User Configuration menu, **USER** shows.
 -  Press  /  to scroll from User Configuration to RF Configuration, **RF** shows.
 -  Press  3 times to enter RF Band Set.
- Message **SET no** shows.
-  Press  /  to scroll from **no** (no) to **YES** (yes).
 -  Press  to enter RF Band Set.
- Message **band** shows.
-  Press  /  to select new band.

 Press **[f]** to start band hopping.

If band hopping is successful, message **PA55** shows, indicating that both bands of indicator and its counterpart have changed to the new one, otherwise message **FRIL** shows.

 Press **[f]** to exit and return to WEIGHING mode.

4.6 Print Configuration (Optional)

The content of weight ticket in this indicator can be customized by user input, with easy-to-use command and rules.

The format of print ticket is consist of up to 250 characters of information, such as company name, telephone number, address, etc, on printed tickets.

4.6.1 Command String

The below table lists commands that can be used to format the print formats.

Command	Description
<E>	End of format string
<G>	Gross weight with unit sign
<N>	Net weight with unit sign
<T>	Tare weight with unit sign
<DA>	Current date, in format YY-MM-DD
<TI>	Current time, in format HH:MM:SS
<DT>	Current date and time, in format YY-MM-DD HH:MM:SS
<SP>	Space
<NL>	New line
<SPnn>	Space (nn is the number of spaces, must be from 01~99)
<NLnn>	New line (nn is number of termination characters, must be from 01~99)

Text characters can be any ASCII character that can be printed by the extended serial printer.

Commands in the format strings must be enclosed between < and > delimiters. Any characters outside of the delimiters are printed as text characters on the ticket.

Default format string is as below:

```
<SP7>GROSS <G><NL><SP7>TARE<SP2><T><NL><SP7>NET<SP3><N><NL6><E>
```

4.6.2 Customize Format

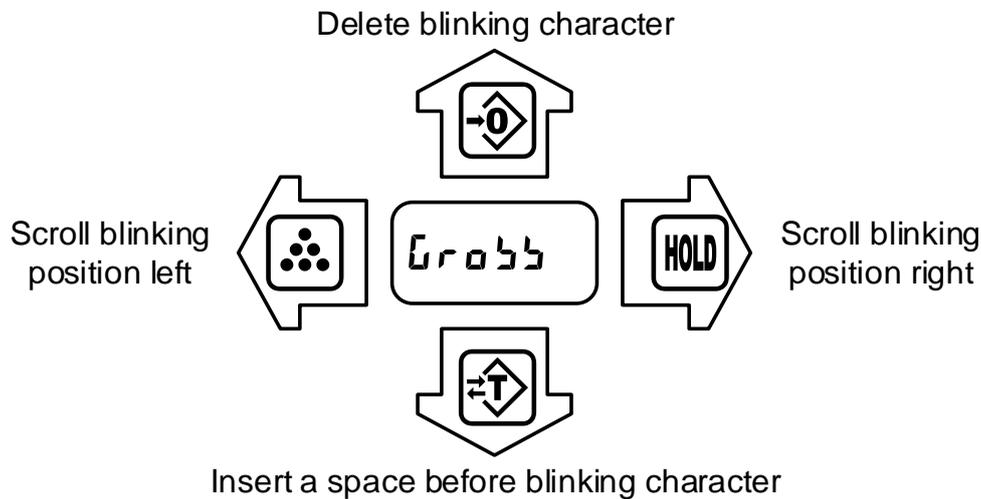
In WEIGHING mode

 Press **[f]** 1s to enter User Configuration menu, **USER** shows.

 Press **[↑]** / **[↓]** to scroll up / down to Print Configuration, **Print** shows.

 Press **[f]** to enter String Edit, **SET** shows.

- ✎ Press / to scroll up / down to select *no* / *YES*.
- ✎ Press to edit Ticket Format, if yes is selected.

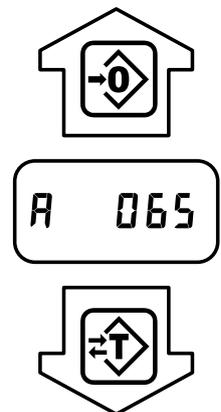


In String Edit mode

- ✎ Press to delete the blinking character.
- ✎ Press to insert a space before the blinking character.
- ✎ Press / to scroll blinking character left / right.
- ✎ Press / 1s to scroll 6 characters left / right.
- ✎ Press 1s to enter the Character Edit mode.
- ✎ Press to confirm and enter Default Format.

In Character Edit mode

- ✎ Press / to increase / decrease ASCII code value.
- ✎ Press 1s to save and return to String Edit mode.



4.6.3 Load Default Format

- ✎ Press to enter Default Format, *dFl* shows.
- ✎ Press / to scroll up / down to select *no* / *YES*.
- ✎ Press to load default ticket format, if yes is selected.
Message *rESET* shows, indicating default ticket format is loaded.

5 Calibration

5.1 Calibration Operation

It is NOT recommended to do the calibration unless you are authorized from your local representative and with accurate test weight system of adequate capacity.

Step 1. Enter Calibration

- ✎ Press 1s to enter User Configuration menu, *USER* shows. Press or to scroll from User Configuration to Calibration menu, *CAL* shows.

Calibration Password

If the Calibration Switch (optional) is not ordered with this indicator, correct password

is required to enter Calibration.

Press to input password value. Press to confirm and enter Calibration.

⚠ If the input password is incorrect, message **Error** shows 1s, and indicator returns to WEIGHING mode afterward.

Calibration Switch (optional)

As OIML and other Legal-for-Trade standards required, before entering Calibration, the seal must be opened, and the calibration switch must be set to ON (button depressed).

⚠ Before entering Calibration, the Calibration Switch must be set to ON, otherwise message **CAL OFF** shows 1s.

If the Calibration Switch (optional) is ordered with this indicator, the password verification is skipped.

Press to enter Calibration.

Step 2. Zero Calibration

When **LoAd 0** shows, remove load from the scale's load receptor, make the scale empty (without any load).

Press to view the conversion code.

Wait until the conversion code is settled down.

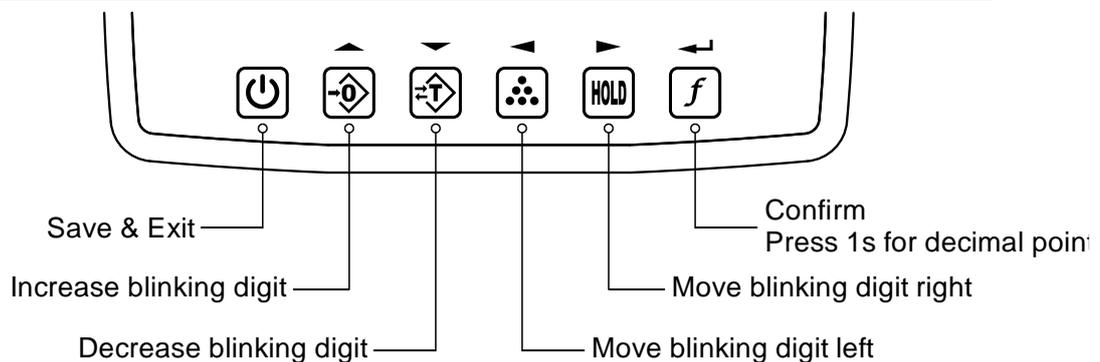
Press to save zero.

Step 3. Weight Calibration

When **LoAd 1** shows, apply the test weight on the scale's load receptor.

Press to enter USER INPUT mode. Press to input weight value, press 1s to input/cancel decimal point of blinking digit if needed.

📄 The numerical position of decimal point is versatile and easy for user to input floating value in very wide range. For example, to input 150, 150.00, 0150.0, 00150 are all acceptable.



Press to confirm and view the conversion code.

Wait until the conversion code is settled down.

Press to finish Calibration, and return to WEIGHING mode.

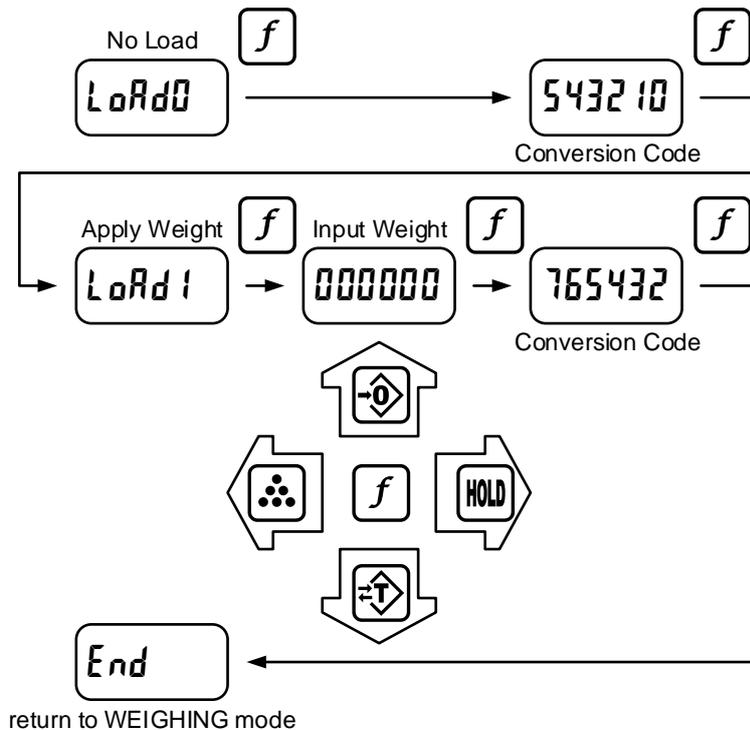
Calibration Switch (optional)

If the Calibration Switch (optional) is ordered with this indicator, as OIML and other

Legal-for-Trade standards required, after calibration, the calibration switch must be set to OFF (button released).

⚠ After Calibration, the Calibration Switch must be set back to OFF, otherwise message **LoAd 0n** keeps showing.

5.2 Calibration Flowchart



6 Serial Communication

This indicator is equipped with one standard full duplex RS-232 and one RS-485 (optional) serial communication port, intended for interfacing extended printer, scoreboard and computer, etc.

Communication state, baudrate and output data type can be configured in User Configuration menu.

6.1 Output Configuration

In WEIGHING mode

- 👉 Press **f** 1s to enter User Configuration menu. **USER** shows.
- 👉 Press **f** 8 times to enter Serial Output Mode parameter. **oE** shows.
- 👉 Press **↑** / **↓** to scroll up / down to select Serial Output Mode.

Selectable Serial Output Mode are:

- **d 15**: serial communication is disabled,
- **Lo nE**: indicator outputs data frame by frame (in Continuous mode),
- **r E 9**: indicator outputs one frame data right after ASCII code 'r' (0x72) or 'R' (0x52) is received (in Request mode).

is received (in Request mode).

• **Print**: indicator's RS-232 port outputs data, and drives extended serial printer to print weight ticket (optional).

Press  to enter Baudrate parameter. **b** shows.

Press  /  to scroll up / down to select baudrate.

Selectable Serial Output mode are: 1200bps, 2400bps, 4800bps, and 9600bps.

Press  to enter Output Data Type parameter. **dR** shows.

Press  /  to scroll up / down to select Output Data Type.

Selectable Serial Output Type are: gross weight, net weight, tare weight.

Press  or  to save and return to WEIGHING mode.

6.2 Byte Format

The indicator outputs data in the format 8N1, which is 1-bit start flag, 8-bit data, 1-bit stop flag, and no checking bit.

6.3 Frame Protocol

The indicator outputs data in frames. One frame is consisted of 14 bytes.

1	2	3	4	5	6	7	8	9	10	11	12	13	14
>	S	G	X	X	X	X	X	X	X	k	g	CR	LF

The 1st byte is always fixed to ASCII code 0x3E ('>').

The 2nd byte indicates the weight state.

- 'S': stable
- 'U': unstable
- 'V': overloading

The 3rd byte indicates the weight data type.

- 'G': gross weight
- 'N': net weight
- 'T': tare weight

From 4th to 10th bytes are the weight value.

The 11th and 12th bytes indicates measurement unit.

- 'k'g': kilo gram
- 'l'b': pound

The 13th byte is fixed to ASCII code 0x0D, carriage return (CR).

The 14th byte is fixed to ASCII code 0x0A, line feed (LF).

7 Appendix

7.1 Display Character

Display	Character	ASCII	Display	Character	ASCII	Display	Character	ASCII
	(space)	32	@	@	64	`	`	96
!	!	33	A	A	65	a	a	97
"	"	34	B	B	66	b	b	98
#	#	35	C	C	67	c	c	99
\$	\$	36	D	D	68	d	d	100
%	%	37	E	E	69	e	e	101
&	&	38	F	F	70	f	f	102
'	'	39	G	G	71	g	g	103
(	(	40	H	H	72	h	h	104
)	)	41	I	I	73	i	i	105
*	*	42	J	J	74	j	j	106
+	+	43	K	K	75	k	k	107
,	,	44	L	L	76	l	l	108
-	-	45	M	M	77	m	m	109
.	.	46	N	N	78	n	n	110
/	/	47	O	O	79	o	o	111
0	0	48	P	P	80	p	p	112
1	1	49	Q	Q	81	q	q	113
2	2	50	R	R	82	r	r	114
3	3	51	S	S	83	s	s	115
4	4	52	T	T	84	t	t	116
5	5	53	U	U	85	u	u	117
6	6	54	V	V	86	v	v	118
7	7	55	W	W	87	w	w	119
8	8	56	X	X	88	x	x	120
9	9	57	Y	Y	89	y	y	121
:	:	58	Z	Z	90	z	z	122
;	;	59	[	[	91	{	{	123
<	<	60	\	\	92	|	|	124
=	=	61	]	]	93	}	}	125
>	>	62	^	^	94	~	~	126
?	?	63	_	_	95			

7.2 Display Message

Display	Message
-----	Power-up weight detection.
-	Blinking in SLEEP mode (LED display)
no rF	NO RF signal is received. RF communication is failed.
rF bAt	RF transmitter BAT tery is low.
UnStb	Load is UNSTa ble (in motion), operation is not allowed.
tARed	Weight has been TARED (in NET mode), operation is not allowed.
oUtrNG	Load is OUT of permitted Ra NGe, operation is not allowed.
nEGt w	Weight is NEGA TIVe (less than 0), operation is not allowed.
oUt Fb	Load is OUT of F ull S cale, operation is not allowed.
inZErO	Weight is with IN ZER O (+/-0.25e), operation is not allowed.
inVALd	INVALi D weight (less than or hasn't returned +5.0e), total is not allowed.
Error	Input or operation is ERROR .
ouEr	Scale is OVER loading (over 100%F.S.+9e)
UndEr	Scale is UNDER loading (under -20e)
bAt Lo	BAT tery is LO w power, charging is required.
oFF	Indicator is powering OFF .
totAL	Weighing data are TOTAL ed in memory.
CLEAR	All weighing data are CLEARE d.
An i on	ANi mal Weighing is set to ON (enabled).
An ioFF	ANi mal Weighing is set to OFF (disabled).
Ct	In CounT mode, select the sample quantity.
End	END of menu, return to WEIGHING mode.
USer	USER Configuration menu
SCALE	SCALE Configuration menu
CAL	CALi bration menu
CLoCK	CLOCK Configuration menu (optional)
rF	RF Configuration menu (optional)
Pr int	PRINT Configuration menu (optional)
CALoFF	The CALi bration Switch is OFF . Turn it on to enter calibration.
CAL on	The CALi bration Switch is ON . Turn it off to exit calibration.
LoAd0	In Calibration, keep the scale no load.
LoAd1	In Calibration, apply the test weight on scale.

7.3 Troubleshooting

Simple problems can be resolved as below listed solutions. If problems still exist, please contact your local representative for help.

Symptom	Possible Cause	Suggested Solution
not power-on after  pressed	discharged or defective battery	charge battery
	power switch is set to OFF	set power switch to ON
	defective  key	press harder and keep pressing for 1s
	defective mainboard	contact representative
no action taken after key pressed	indicator is disturbed	re-boot indicator
	defective key	contact representative
weight reading is not stable	load in motion	wait or keep load stable
	weak filter setting	increase filter level
	damped loadcell or mainboard	dry loadcell or mainboard
	defective mainboard	contact representative
weight reading is not zero when no load	loadcell stressed too long	unload scale in storage
	loadcell zero drifts	contact representative
large error in weight reading	scale not zeroed before loading	zero scale before loading
	improper measurement unit	switch to correct unit
	calibration required	re-calibrate the scale
	defective loadcell or mainboard	contact representative
battery cannot be charged	defective mainboard	contact representative
	defective battery	contact representative

7.4 Note

A series of 20 horizontal dashed lines for taking notes.

