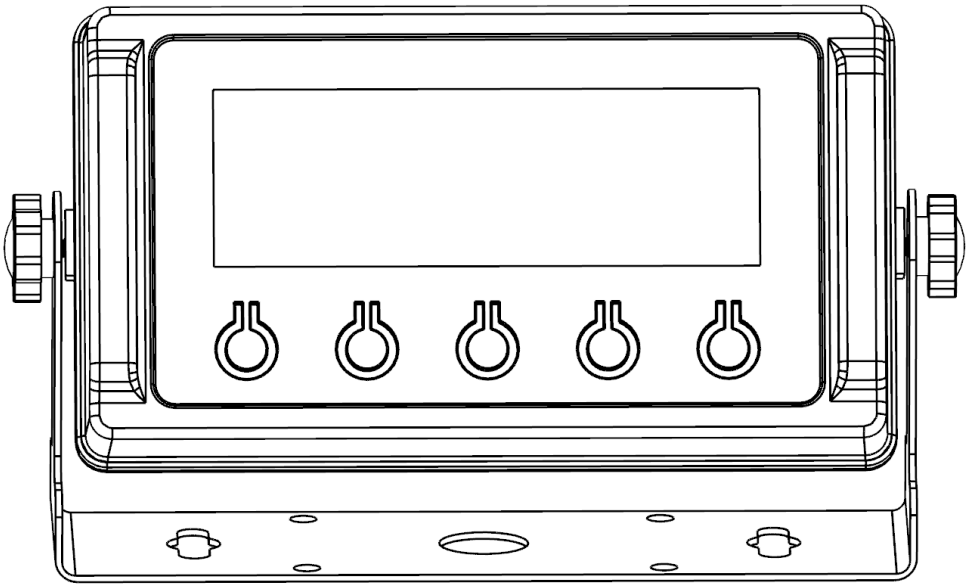
User's Manual



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SAFETY PRECAUTIONS

Please read and follow all the instructions before using the unit. Calibration, inspections, and maintenance shall be performed by professionals

- Make sure the indicator is on a stable surface.
- DO NOT disassemble or modify unit.
- DO NOT exceed the rated load limit of the unit.
- DO NOT use this product if there are any signs of damage.
- DO NOT use for purposes other than weighing.
- Keep other electronic equipment away from the unit.

Electrical Safety

- Unit must be connected to a GFCI outlet.
- Disconnect power before servicing unit.
- All operators MUST discharge themselves before servicing unit.
- Always pull the plug – not the cord – when disconnecting from the outlet.
- DO NOT use if the power cord is worn or damaged
- Power cord should only be replaced by certified service technicians using the original parts
- Remove the batteries if it is not expected to be used for extended periods of time.

PREPARATION & SET UP

- If the indicator is powered with an adapter, plug the adapter directly into the "DC" pin located at the bottom of the indicator.
- Always use a wall outlet to avoid interference from other wires
- Turn on the indicator when there is no load
- Calibrate before weighing when the scale is initially installed or moved to a new location

FEATURES

Main Features

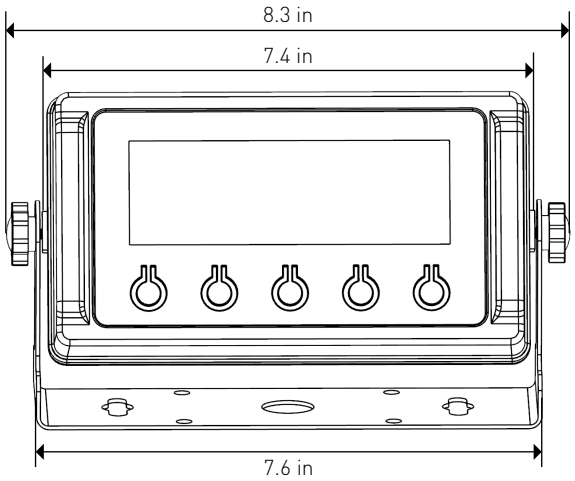
- LCD display
- Weighing units lb/kg
- Gross/Tare/Pre-Set Tare/Zero
- Multiple Hold functions
- Overload / Underload indication
- Power saving mode
- Ability to modify gravity based on different geographical locations
- RS232 output
- Optional dual load cell ports

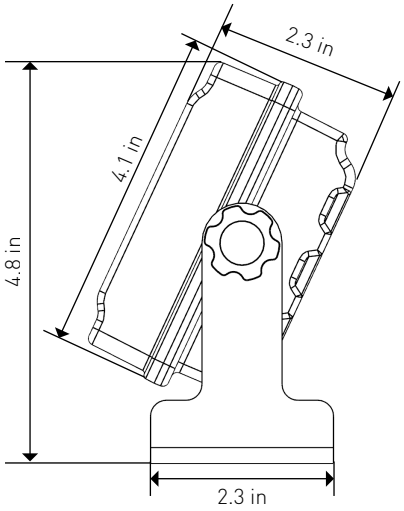
Technical Parameters

Accuracy class	5000 e
Zero stability error	TK0＜0.1μV//K
Span stability error	TKspn＜± 6 ppm//K
Sensitivity (internal)	0.3 μV / d
Input voltage	-30 to +30mV DC
Excitation circuit	5 VDC, 4 or 6 wire connection, 8 load cells of 350ohm max
AC power	AC 100-250V (use only the included 9V adapter supplied)
Operation temperature	14-104°F (-10 °C ~ +40 °C)
Operation humidity	⩽90%RH
Storage temperature	-40-158°F (-40 °C ~ +70 °C)

SPECIFICATIONS

INDICATOR MEASUREMENTS





POWER SUPPLY

AC Adapter

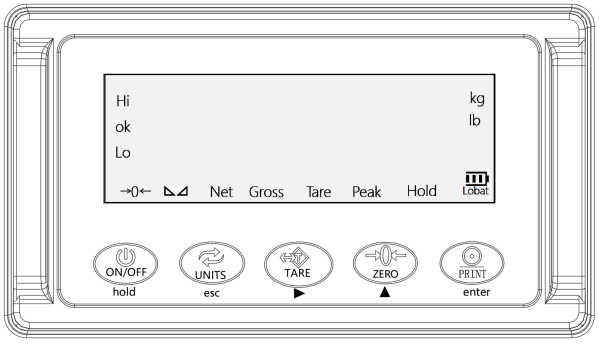
If the indicator is powered with an adapter, plug the adapter directly into the "DC" pin located at the bottom of the indicator. It is recommended to plug into a wall outlet to avoid interference with wirings.

Battery

3 AA batteries
Remove the batteries if it is not expected to be used for extended periods of time.

LIGHT INDICATION AND KEYPAD

FRONT VIEW



1. LIGHT INDICATION

lb: ON when the weight unit is pound [lb]
kg: ON when the weight unit is kilogram [kg]
GROSS: ON when the current weight is the GROSS weight
NET: ON when the current weight is the NET weight
→0←: ON when the current weight is 0 lb (0 kg)
HOLD: ON when the weight value is being held
Lo: ON when the weight is below the min preset value
ok: ON when the weight is within the acceptable range
Hi: ON when the weight is over the max preset value

2. KEYPAD

ON/OFF — Power on or off (Press hard and hold for 2 seconds)

UNITS — Shift between weighing units

TARE — 1. Resets the scale to zero when there is something on the scale (ex. Tare out the weight of a pallet to weigh only the items on it)
2. Clears tare weight for gross weight

ZERO — Zero's the scale

PRINT — Prints

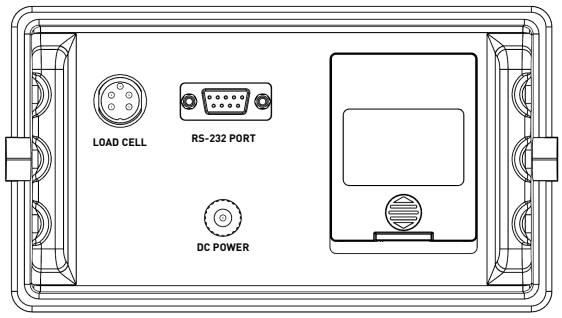
esc — Save and Exit

► ▲ — Arrow keys

enter — Enter

hold — Weight value hold (2 Hold options; can be changed in parameter settings)

BOTTOM VIEW



- LOAD CELL: Port for connecting the scale.
- RS-232 PORT: Serial interface port. (printer, second display)
- DC POWER: Port for DC power. (DC 9V adapter available)

OPERATING INSTRUCTIONS

Power On

- Turn on the power by pressing the power button for 2 seconds. Once it is on, the unit begins to auto-check and count down from 0-9 before entering the weighing mode
  Note: Anything on the scale before powering on will automatically be tared out.

Zero

- Zero is only used when the scale is supposed to be empty
- Pressing the ZERO key will reset the scale to 0
- If it is out of the range, there will be an error code. In this case, taring the weight will be necessary.

Unit Selection

To switch between measuring units (lb/kg) press the UNITS key

Tare Function

Tare is used to clear any weight that is on the scale. When the indicator is in gross mode (gross light is ON) pressing the TARE key will Tare the current weight on the scale and enter the net mode (net light is on)

For example, add a container to the scale, press tare and the display will show the tare symbol and reset back to 0. Now add the product to the container, it will only display the weight of the product, not the container.

- To exit Tare mode, press the TARE key again to enter gross mode. This is the total weight of weight of the container and the product

Note: If the container is removed the scale will display the negative weight of the container

Hold

There are 2 different hold functions in the C11 parameter

1. Peak Hold: Grabs the highest weight (for materials testing, ie. tension and pulling force)
- Press the HOLD key then add weight to the scale
- The indicator will show the highest weight it recorded and hold it on the screen until a higher weight is placed on the scale

2. Average Hold: Used for weighing animal, the indicator will display the average weight sampled from 3 seconds
   Add livestock to scale and press HOLD
   Indicator screen will show "LOC" for 3 seconds, then display the average weight from those 3 seconds
- Press HOLD again to exit holding mode

Print

- If the indicator is connected to a printer and the weight on the scale is stable press the PRINT key to print the current weight

CALIBRATION PROCEDUER

How to enter

1. Turn on the scale by holding **ON/OFF** for 2 seconds
2. Press **UNITS** and **PRINT** together to access the setup menu.

Available Keys

[►] Move to the right by 1 place of the set value

[▲] Increase the set value

[esc] Exit current menu

[enter] Move into next menu

[hold] Weight value hold (2 Hold options; can be changed in parameter settings)

Calibration Menu

1. Turn on the scale by holding **ON/OFF** for 2 seconds.
2. Press **UNITS esc** and **PRINT enter** together to access the setup menu.
3. If done correctly, the display should now show C01.
4. Press **PRINT enter** to access the C1 channel. The display should show [C 1 #].
5. Press **ZERO ▲** to choose which unit to calibrate in (1 = kg, 2 = lb).
6. Press **PRINT enter** to set the value. The display will now show C02.
7. Press **PRINT enter** to access the C2 channel. The display should show [C2 #].
8. Press **ZERO ▲** to change the setting to the decimal places desired (The C2 channel is used to adjust the decimal point on the scale. A value of 1 means there is one digit behind the decimal point.)
9. Press **PRINT enter** to set the value. The display will now show C03.
10. Press **PRINT enter** to access the C3 channel. The display should show [C3 #].
11. Press **ZERO ▲** to cycle through the values until the desired graduation appears. (The C3 channel adjusts the divisions on the scale. A value of 1 selected and C2 set to 1, the scale will read in 0.1 lb. increments.)
12. Press **PRINT enter** to set the value. The display will now show C04.
13. Press **PRINT enter** to access the C4 channel. The display will show [######].
14. Enter in the maximum capacity by using **TARE** ► to move the cursor right, and **ZERO ▲** to move the values up. (The C4 channel is used to enter in the max capacity of the scale; Make sure this doesn't exceed the max capacity of the scale Max capacity divided by the increment set in C02 and C03 above cannot exceed 5000.)
15. Press **PRINT enter** to set the value. The display will now show C05.
16. Press **PRINT enter** to access the C5 channel. The display should show [C5 #].
17. The C5 channel calibrates zero on the scale. Make sure the scale is empty.
18. Press **ZERO ▲** to change the value to 1.
19. Press **PRINT enter**. The display will count down from 10-1 while the scale is calibrating zero. When the display shows 0 the zero calibration is complete.
20. Press **PRINT enter** to continue. The display will now show C06.
21. Press **PRINT enter** to access the C06 channel. The display will show [C6 0].
22. The C6 channel is used to calibrate the scale with a known weight. Press **ZERO ▲** to set the value of C6 to [C6 1]. Press **PRINT enter** . The display will flash SPAN, and then show [######].

23. Enter the calibration weight being used (at least 10% of max capacity set in C04 by using **TARE** ► to move the cursor right, and **ZERO** ▲ move the values up.)
24. Place the calibration weight on the empty scale and press **PRINT**.
25. The scale will count down from 10 to 0. Once 0 has been reached, the display will show CALEnd.
26. Press **PRINT enter** to set the value. The display will now show C07.
27. Press **UNITS esc** to save and exit the setup menu.
28. The scale has now been calibrated. The display will show the value of the calibration weight on the scale.
29. If the scale does not show the value of the calibration weight, it might be because the feet are screwed up too tight, or they are not leveled.
30. Unload the scale; the display should read 000000.
31. If the scale does not display 000000, check that the feet on the platform are not screwed in too tightly, and verify that the platform is level.

INDICATOR PARAMETER SETTINGS

The parameter settings menu has a calibration section (C01 to C07 explained above) and a parameter settings section (C08 and up).

To enter calibration/parameter settings, follow the procedure below:

1. Make sure UNITS is set to either kg or lb
2. Press and hold **UNITS** and **PRINT** key at the same time for 2 seconds
3. Navigate through the settings (C01 to C38) as shown in the table 4 below by using the arrow keys and return keys as labeled under each indicator button
4. Press **PRINT** key to enter/edit the parameter setting
5. Press **PRINT enter / UNITS esc** key to save and exit settings at any time

Function	Parameter	Settings/Options
Weighing Unit	C01	1 = kg 2 = lb Note: for calibration only kg or lb are allowed
Decimal Setting	C02	0 = no decimal 1 = 0.0 2 = 0.00 3 = 0.000 4 = 0.0000
Graduation Setting (readability of the least significant digit)	C03	options: 1/2/5/10/20/50 Example with no decimal places (ie. C02=0) 1 = 1 lb 2 = 2 lb 5 = 5 lb 10 = 10 lb 20 = 20 lb 50 = 50 lb
Maximum Capacity	C04	set max capacity
Zero Calibration	C05	0 = zero calibration not needed 1 = set the zero calibration (Please ensure scale is empty and the stable light is on)
Calibration	C06	0 = calibration not needed 1 = Ready to calibrate with one calibration weight 3 = Sensitivity Output

Function	Parameter	Settings/Options
Restore Default Settings	C07	0 = do not restore 1 = restore to default settings
Warning Tone	C08	0 = turn off warning tone 1 = turn on warning tone
Automatic Power Off	C09	0 = turn off auto power off 10 = power off automatically if no change within 10 minutes 30 = power off automatically if no change within 30 minutes 60 = power off automatically if no change within 60 minutes
Power Saving Mode	C 10	0 = close the backlight 1 = backlight will light up when the weight changes 2 = backlight on
Hold Function	C 11	0 = turn off hold function 1 = Peak hold - Grabs the highest weight 5 = Auto Average hold - Average hold without the need to press the hold key
Unit Conversion	C 12	0 = keep unit 1 = convert unit
Upper Limit Alarm	C 13	Set upper limit within the max. capacity
Lower Limit Alarm	C 14	Set lower limit within the max. capacity
Inner Code Display	C 15	check the inner code (raw data)
Communication Setting	C 18	Set the serial interface data output method: 0 = Turn off serial interface data output 1 = Continuous sending mode, for remote display 2 = Print to paper thermal ticket printer 5 = PC/remote display, continuous sending mode
Baud Rate	C 19	0 = 1200 (for OP-910 remote display) 1 = 2400 2 = 4800 3 = 9600 (for all printers and OP-910X, OP-910XL remote display) 4 = 14400
Manual Zero Range	C20	0 = turn off manually zero setting 1 = ±1% max capacity 2 = ±2% max capacity 4 = ±4% max capacity 10 = ±10% max capacity 20 = ±20% max capacity 100 = ±100% max capacity

Function	Parameter	Settings/Options
Initial Zero Range	C21	0 = no initial zero setting 1 = ±1% max capacity 2 = ±2% max capacity 5 = ±5% max capacity 10 = ±10% max capacity 20 = ±20% max capacity 100 = ±100% max capacity
Zero Tracking	C22	0= turn off zero tracking 0.5 = ±0.5d d = division 1.0 = ±1.0d 2.0 = ±2.0d 3.0 = ±3.0d 4.0 = ±4.0d 5.0 = ±5.0d Note: zero tracking range cannot be bigger than manual zero range
Zero Tracking Time	C23	0 = turn off zero tracking time 1 = 1 second 2 = 2 seconds 3 = 3 seconds
Overload Range	C24	00 = turn off overload range 01-99d = overload range setting d = division
Negative Display	C25	0 = -9d 10 = -10% max. capacity 20 = -20% max. capacity 50 = -50% max. capacity 100 = -100% max. capacity
Standstill Time	C26	0 = Fast 1 = medium 2 = slow
Standstill Range	C27	1 = 1d d = division 2 = 2d 5 = 5d 10 = 10d
Digital Filter (for filtering moving items such as animals)	C28	0 = turn off dynamic filter 1 = 1 digital filter strength 2 = 2 digital filter strength 3 = 3 digital filter strength 4 = 4 digital filter strength 5 = 5 digital filter strength 6 = 6 digital filter strength 7 = 7 digital filter strength 8 = 8 digital filter strength 9 = 9 digital filter strength Note: The higher the number, the higher the filter strength
Noise Filter	C29	0 = turn off noise filter 1 = 1 digital filter strength 2 = 2 digital filter strength 3 = 3 digital filter strength

Function	Parameter	Settings/Options
Zero Setting	C34	0 = Back to zero 1 = Press ZERO and PRINT together to back to zero.
Gravity of Calibration Location	C36	9.7000 - 9.9999
Gravity of Destination	C37	9.7000 - 9.9999
Version No.	C38	

Table 3. Default Parameter Settings

Function	Parameter	Default Setting
Weighing Unit	C01	1
Decimal Setting	C02	0
Graduation Setting	C03	1
Maximum Capacity	C04	100000
Zero Calibration	C05	0
Calibration	C06	0
Restore Default	C07	0
Warning Tone	C08	1
Automatic Power Off	C09	0
Power Saving Mode	C 10	1
Hold Function	C 11	0
Unit Conversion	C 12	1
Upper Limit Alarm	C 13	000000
Lower Limit Alarm	C 14	000000
Inner Code Display	C 15	
Communication Setting	C 18	1
Baud Rate	C 19	3 (9600)
Manual Zero Range	C20	10
Initial Zero Range	C21	10
Zero Tracking	C22	2.0
Zero Tracking Time	C23	1
Overload Range	C24	9
Negative Display	C25	10
Standstill Time	C26	1
Standstill Range	C27	2
Digital Filter	C28	2
Noise Filter	C29	2
Multi-connection add.	C34	0
Gravity of Calibration Location	C36	9.7936
Gravity of Destination	C37	9.7936

CONNECTORS

1. Load cell connection

- The indicator can work with up to 8 load cells of 350Ω
- Either 4 wire or 6 wire load cell connection
- Please contact us directly for other applications
- There are two connection methods between the load cell and indicator

Quick Disconnect as shown below:

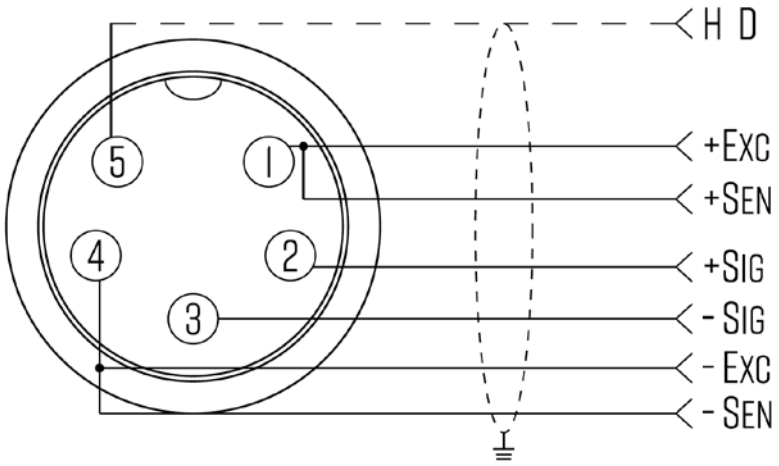


FIGURE 2: QUICK DISCONNECT CONNECTION DIAGRAM

Hardwire (Using Inner Terminal Block Connection:
Note: Make sure to follow all the anti-static rules to avoid damage to your indicator

- Excitation voltage: 5V DC
- Largest output current: 120 mA
- Excitation circuit: 5 VDC, 4 wire connection, 8 load cell of 350ohm maximum
- Open the back cover of the weighing indicator, and insert signal cable to the terminal block (see figure 3); Make sure the screw on terminal block is fixed tightly

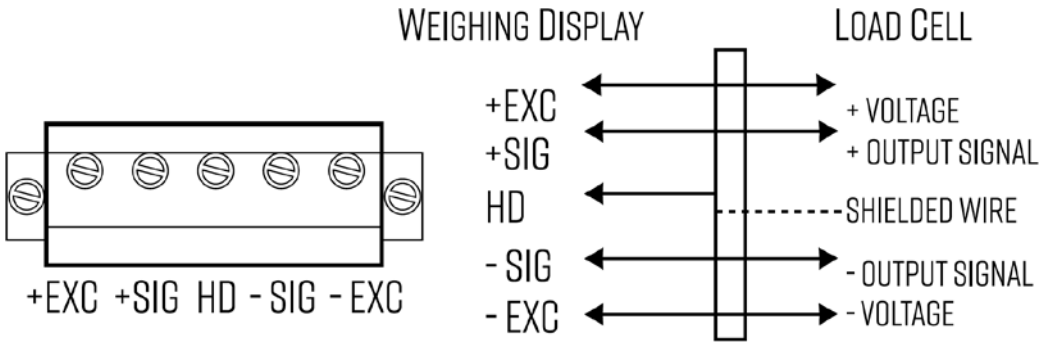


FIGURE 3: INNER TERMINAL BLOCK CONNECTION DIAGRAM

Table 4. Wiring Color Code

Signal Name	Color Code	Description
+Exe/ +EX	RED	Positive excitation voltage to load cell
+IN / +SIG	GREEN	Positive output signal from load cell
HD / SHLD	YELLOW/THICK BLACK	Shield Wire
-IN / -SIG	WHITE	Negative output signal from load cell
-EXC / -EX	BLACK	Negative excitation voltage to load cell

2. RS-232 Connection (DB9 9 pin Connector)

The DB9 9 pin serial connector is used for different purposes depending on the indicator model

- Figure 4 shows the pin assignment on the DB9 9 pin connector

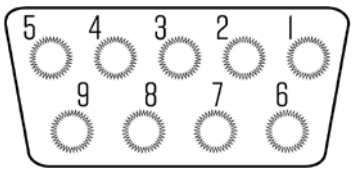


FIGURE 4: DB9 SERIAL CONNECTOR PINOUT

RS232 SERIAL OUTPUT FORMAT

Follow the pin out of Table 5 below to connect the indicator the RS-232 Serial device

Table 5. DB9 Pin Description

DB9 Pin	Definition	Function
2	TXT	Transmit Data
3	RXD	Receive Data
5	GND	Ground Interface

The serial output format depends on the settings for parameter C18. The serial output consists of a string of ASCII characters. Here is a list of the serial parameters

- 8 data bits
- 1 stop bits
- No parity
- No handshaking

Remote Display Continuous Sending Mode (C18=1)

For use with a Scoreboard/Remote Display Note: Baud Rate must be set to 1200 (C19 = 0)

Output Continuous Format																	
STX	SWA	SWB	SWC	X	X	X	X	X	X	X	X	X	X	X	X	CR	CKS
1	2			3						4						5	6

State A			
Bits0,1,2			
0	1	2	Decimal point position
1	0	0	XXXXXX0
0	1	0	XXXXXXX
1	1	0	XXXXX.X
0	0	1	XXXX.XX
1	0	1	XXX.XXX
Bits3,4			Division
0	1		X1
1	0		X2

State B	
BitsS	function
Bits0	gross=0, net=1
Bits1	Symbol: positive=0, negative=1
Bits2	Overload (or under zero)=1
Bits3	dynamic=1
Bits4	unit: lb=0, kg=1
Bits5	Constant 1
Bits6	Constant 0

State C			
Bit2	Bit1	Bit0	unit
0	0	0	Kg or lb
0	0	1	g
0	1	0	t
Bit 3			printing=1
Bit 4			Extend display=1
Bit 5			Constant 1
Bit 6			Constant 0

Print Mode (C18 = 2)

For printing on a non-adhesive ticket printer.

Normal weighing ticket printout example:

Net:	25.6lb
Tare:	10.3lb
Gross:	35.9lb

PC or Remote Display Continuous Sending Mode (C18=5)

<STX>	<POL>	XXXXX.XX	<L/K>	<G/N>	<STAT>	<CR>	<LF>

Start Transmission

Polarity:
<SP> = Positive
"-" = Negative

Weight Data

Units:
lb = punt
kg = kilogram
pcs = pieces*

Gross/Net:
GR = Gross
NT = Net

Status:
<SP> = Valid
M = Motion
O = Over/under range

Carriage Return

Line Feed

TROUBLESHOOTING

Issues/Error Codes	Possible Causes	Suggested Actions
Scale does not turn on	1. Loose power cord 2. Outlet is defective	1. Ensure the power cord is plugged in 2. Ensure the power source works. Test the power source by connecting a different appliance to the same outlet to check if it's operational.
The reading goes negative when a load is applied	1. The Sig+ and Sig- wires are connected to the wrong ends of the load cell	1. Try switching the Sig+ and Sig- wires connected to the load cell and/or the junction box (if one is used)
UUUUUU	1. Overload 2. Cables are not connected properly 3. Load cell is defective	1. Reduce the weight 2. Check load cell connection 3. Inspect load cell; Check the input/ output 4. If the above actions don't work, try the following instructions: 1. Check if the cable that runs from the indicator to the junction box is damaged. If it is, replace the cable. 2. Check for any water damage inside the junction box. If there is, replace the junction box 3. Ensure all wires on all 5 terminal blocks are not loose. Retighten the screws if needed. 4. Recalibrate 5. If none of the above works, one or more load cells may be defective

nnnnnn	1. Calibration not done correctly 2. Cables are not connected properly 3. Load cell is defective	1. Ensure scale is level 2. Check load cell connection 3. Check load cell input and output resistance 4. If none of the above works; try the following instructions: • Check if the cable that runs from the indicator to the junction box is damaged. If it is, replace the cable. • Check for any water damage inside the junction box. If there is, replace the junction box • Ensure all wires on all 5 terminal blocks are not loose. Re-tighten the screws if needed. • Recalibrate 5. If none of the above works, one or more load cells may be defective
Err 1	No weight was used during calibration or the weight used was above the max capacity.	Use correct weight within the defined range
Err2	The weight used during calibration was below the minimum required weight.	The calibration weight minimum is 10% of the maximum capacity set in C04. It is recommended to use 60%-80% of the maximum capacity.
Err3	During calibration, the input signal is negative	1. Check all wire connections 2. Check load cell for damages 3. Recalibrate 4. If none of the above works, the PCB may need to be replaced
Err4	Signal is unstable during calibration	Start calibration after the platform is stable
Err5	EEPROM Error	Replace the PCB

Err6	Exceed Zero Range	1. Check cables for any indentations, crimps, or cuts. 2. Check the scale for damages. 3. Try calibration first Press and hold the UNITS and PRINT button at the same time for 3 seconds to get into calibration mode. C01 should appear. 4. With C01 on the screen press the PRINT button. On the left side of the screen should show C1 and on the right side be a 1. (C1 1) 1 is the default unit of measurement of Kg. Press the ZERO button to make that 1 to a 2. (C1 2) 2 stands for lbs. 5. Press the PRINT button. C02 should appear. Press the PRINT button. (C2 0) should appear. The 0 is the number of decimal places being used. Press the PRINT button. C03 should appear. 6. Press the PRINT button. (C3 1) should appear. The 1 stands for 1 graduation setting. This means the weight would increment by 1 lb. Press Print, C04 should appear. Press the PRINT button. 7. 100000 should appear. This is the Max Capacity of the scale. Pressing Tare and Zero can change the max capacity. Press the PRINT button when finished. C05 should appear. Press the PRINT button. 8. (C5 0) should appear. This is the zero calibration. Clear the scale and make sure the feet are installed. Press the ZERO button to make the 0 to 1. (C5 1) appears. Press the PRINT button. Count down will appear followed by 0. 0 is a good sign. Press the PRINT button. C06 should appear. 9. Press the PRINT button. (C6 0) should appear. This is where the calibration weight of at least 10% of max capacity is going to be used. Press the ZERO button to make the 0 into a 1. (C6 1) will appear. Press the PRINT button. SPAn will appear followed by 010000. 10. Now enter the weight being used to calibrate. The TARE button will move right and the ZERO button will increment the current flashing value. Keeping pressing the TARE button until the digit being changed is flashing. Pressing the ZERO button will increment that flashing number. Once the weight on the screen matches the weight placed on the scale press the PRINT button. CAL 10, CAL 9, CAL 8… to CAL 0 would appear with some number after. Then CAL End will appear. Remove the weight from the scale. 11. Press PRINT on the CAL End screen. C07/C06 will appear. With nothing on the scale press the UNITS button. Calibration is saved and the scale is ready to be used.