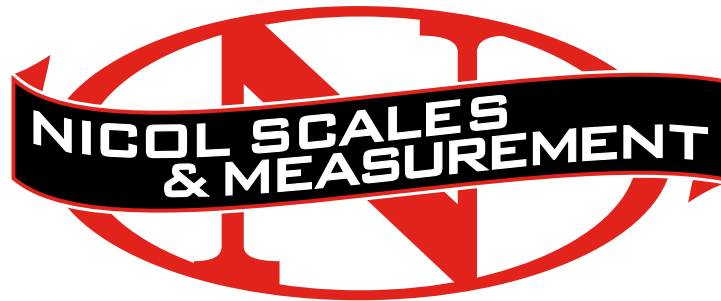PRESENTED BY

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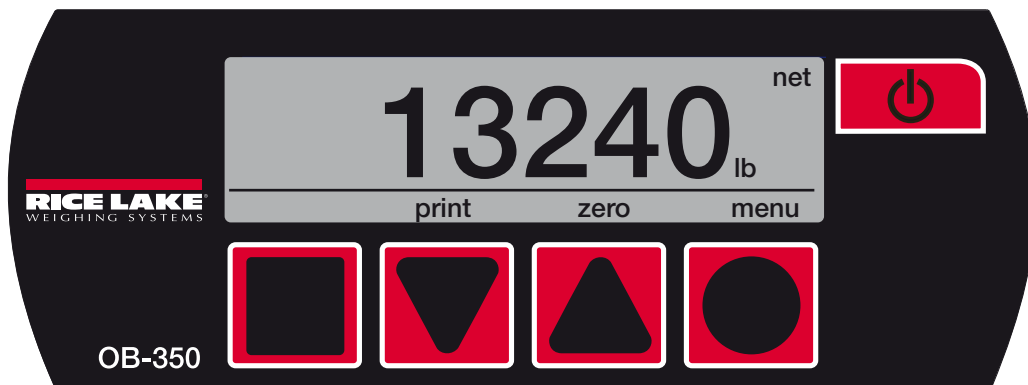
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of weighing and measurement products since 1931.

OB-350 Indicator

LoadRunner® Series Onboard Weighing System

Operator's Manual

RICE LAKE
WEIGHING SYSTEMS

To be the best by every measure®

160914

Contents

*Rice Lake continually offers web-based video training on a growing selection of product-related topics at no cost. Visit **www.ricelake.com/webinars**.*

About This Manual

This manual is intended for use by trained and qualified personnel for installing and servicing the *OB-350* digital weight indicators. This manual applies to indicators using version 4D-02-05 of the *OB-350* software.

Manuals can be viewed and downloaded from the Rice Lake Weighing Systems website at www.ricelake.com/manuals.

1.0   Introduction

The *OB-350* Onboard indicator is for industrial road going vehicles. It has been designed to be simple to operate, giving the driver precise weight information where and when it is needed. It incorporates a clear, easy-to-read OLED (organic light emitting diode) display. This is the clearest display currently available.

The *OB-350* digital weighing indicator features:

- Two input channel for separate groups of load cells
- CANbus (control area network) input & output
- RS-232 output
- ABS injection molded housing
- Organic light emitting diode (OLED) high quality 64 x 264 pixel (picture element) display
- Four-button keypad

1.1   Safety

Safety Symbol Definitions:

⚠ DANGER	*Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury.*
⚠ WARNING	*Indicates a potentially hazardous situation that, if not avoided could result in serious injury or death, and includes hazards that are exposed when guards are removed.*
⚠ CAUTION	*Indicates a potentially hazardous situation that, if not avoided may result in minor or moderate injury.*
Ⓘ Important	*Indicates information about procedures that, if not observed, could result in damage to equipment or corruption to and loss of data.*

General Safety

Do not operate or work on this equipment unless you have read and understand the instructions and warnings in this manual. Failure to follow the instructions or heed the warnings could result in injury or death. Contact any Rice Lake Weighing Systems dealer for replacement manuals. Proper care is your responsibility.

⚠ WARNING

Failure to heed may result in serious injury of death.

Some procedures described in this manual require work inside the indicator. These procedures are to be performed by qualified service personnel only.

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

DO NOT allow minors (children) or inexperienced persons to operate this unit.

DO NOT operate without all shields and guards in place.

DO NOT use for purposes other then weight taking.

DO NOT place fingers into slots or possible pinch points.

DO NOT use any load bearing component that is worn beyond 5% of the original dimension.

DO NOT use this product if any of the components are cracked.

DO NOT exceed the rated load limit of the unit.

DO NOT make alterations or modifications to the unit.

DO NOT remove or obscure warning labels.

DO NOT use near water.

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

2.0 Operation

The *OB-350* indicator has a power button, but it can also be permanently powered through the ignition 9-30 VDC.

Turn ignition on or press the power button and the software version and serial number appear in the 10 second welcome screen.

The vehicle's gross weight will then display. Take weight readings when the vehicle is static and on level ground. An empty vehicle may drift from a true zero by a few pounds, press **ZERO** to return the display to **0 lb** when the vehicle is empty. For roll off and dump truck installations, raise body three to four degrees using the inclinometer screen before zeroing or weighing.

2.1 Front Panel

The four symbol keys: square, down arrow, up arrow and circle on the keypad are assigned in both operator and setup modes, and are used to navigate through the menus as indicated by the text or symbol in the OLED display. Weight readings are in lb.

Operator Mode
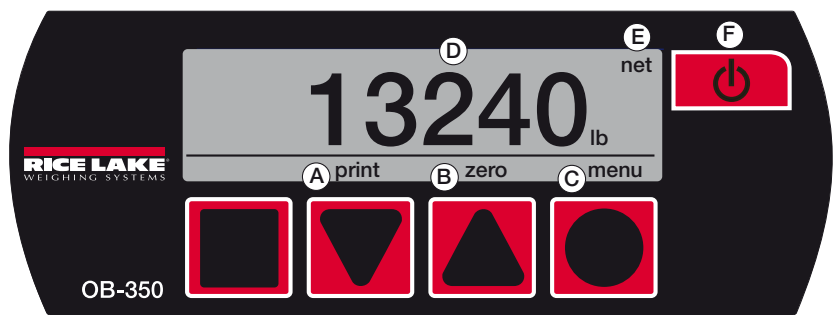
Figure 2-1. Operator Mode

Key	Description
A	Print key - prints net, gross, time & date in weighing screens when activated. Acts as an accumulation button in load/deliver mode.
B	When the vehicle is completely empty and in the weighing position, the front panel ZERO or TARE can be used to adjust the display to read '00000', up to 1100 lb.
C	MENU key - scrolls through' NET, GROSS, MENU & any options activated.
D	Displayed weight.
E	Shows active function or weighing mode.
F	Power button.

Operator Configuration and Technician Setup Menu
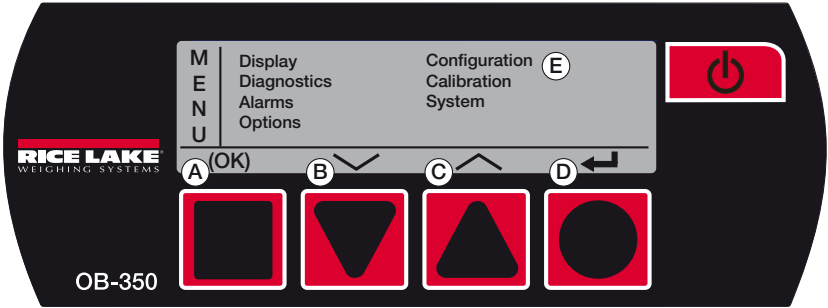
Figure 2-2. Setup Mode

Key	Description
A	OK key - acts as enter or accept key.
B	Down arrow key - scrolls down menu.
C	Up arrow key - scrolls up menu.
D	Back-up key - goes back a step (in some modes, acts as enter or accept key).
E	Selectable MENU options.
Display	Changes OLED contrast to high, medium or low. Also shows software version and serial number.
Diagnostics	Shows two channel weights, input mV signals & CANbus connections.
Alarms	Two alarm set points - PIN code required to mute Alarm - press any key.
Options	Activates options and changes settings.
Configuration	Selects 1 channel, or 2 channel, air, oil or fifth wheel, split axle systems, etc.
Calibration	Weighing system calibration settings, Tare, Zero & Span.
System	Accesses password set and resets. 📝**Note** *For PUK (PIN unlock code) contact RLWS service to for instructions through your PIN retrieval.*

3.0 Installation

Locate the most convenient place for mounting the indicator. When attaching the u-bracket, ensure there is adequate headroom. The cables will be wired into the back of the indicator, so make sure to allocate enough space for them during installation.

3.1 Mount Options

Dash mount

Roof/under dash mount

Panel mount

Optional Radio DIN mount
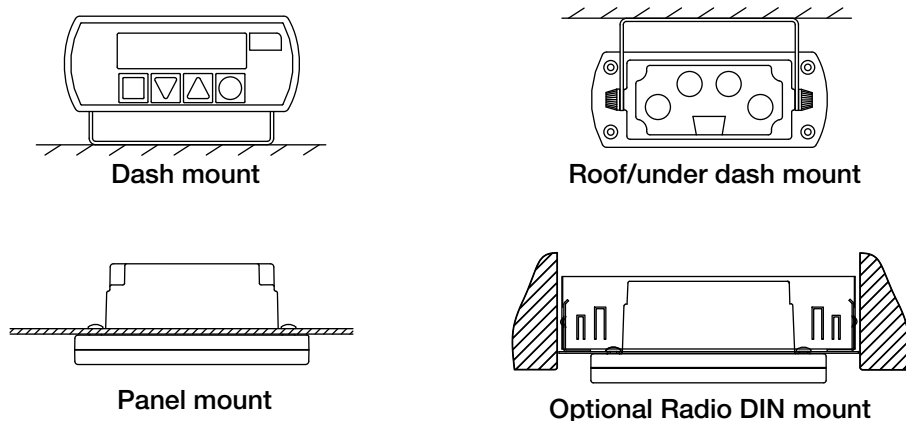
Figure 3-1. Mounting Options

3.2 Dimensions

100.5

62.5

18

145

44

145

122 centres

40 ctrs 59

90

90 centres

U-bracket fixings 6.5 mm
dia holes 2 places

Pannel mount fixings
4 mm self taper
3.5 deep - 4 places

Figure 3-2. Dimensions

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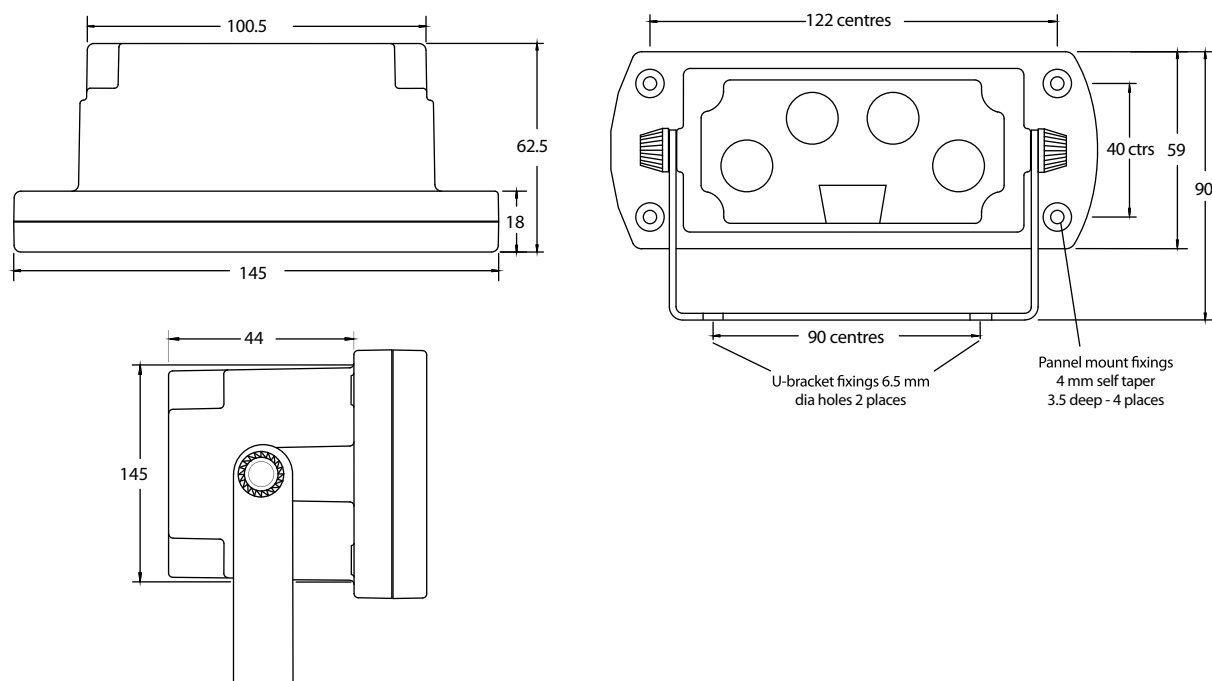
3.3 Electrical Wiring and Data Connections

The *OB-350* is fitted with one Power and one Input Channel connector as standard. CANbus, Channel 2 and RS-232 are optional. Full connector options is shown for illustration.

Figure 3-3. Rear Panel Identification and Bulkhead Connectors

Pin	Description
1	Input Channel 1, Max +/-39.0625 milli-Volts (also known as analog)
2	Input Channel 2, Max +/-39.0625 milli-Volts (also known as analog)
3	Power Input & Alarm Output
4	CANbus digital input & output
5	RS-232 output for printers and data capture devices (pin 9 = vehicle volts, pin 5 = ground, pin = 2 transmit, pin 3 = receive)
6	Alpha-numeric unique indicator serial number, also appears on power-on

SIGNAL channel 1 & 2, socket is FEMALE. – CON 2 & 3 on PCB

Pin 1	BROWN	+ Excitation	5 Volts DC
Pin 2	WHITE	+ Signal	milliVolts from the junction box & loadcells
Pin 3	BLUE	- Excitation	0 Volts
Pin 4	BLACK	- Signal	milliVolts from the junction box & loadcells

POWER & ALARM, socket is MALE – CON 1 on PCB

Pin 1	BROWN	Vehicle voltage	Supply 12V (LCV) or 24V (MCV & HGV)
Pin 2	WHITE	Output 1	12V or 24V
Pin 3	BLUE	Ground	Ground 0 Volts (common)
Pin 4	BLACK	Output 2	12V or 24V

CANbus input and output, plug is MALE – CON 5 on PCB

Pin 1	BROWN	+24V	+24 Volts DC Power Input
Pin 2	WHITE	GND	CAN bus LOW Output
Pin 3	BLUE	CANH	0 Volts Ground
Pin 4	BLACK	CANL	CAN bus HIGH Output

3.4 Cables and Connectors

LoadRunner connectors have keyways and are gendered and thumb tightened for ease of use. System kits are supplied with fully molded connectors. Rewirable plugs are available for replacements or repairs. The RS-232 connector is industry standard. This manual also shows interchangeable rewirable plugs.

**FEMALE moulded plug
POWER & ALARM
supplied as standard**

**MALE moulded plug
SIGNAL & CANbus
supplied as standard**

**Junction boxes
have FEMALE
signal sockets &
MALE indicator
cable socket**

**MALE rewirable plug
SIGNAL
part no CBL0038**

**FEMALE rewirable plug
POWER + ALARM
part no CBL0039**

Figure 3-4. Connectors

RLWS cables and connectors are specially designed to provide maximum signal strength and reliability. Substitution of cabling other than RLWS supplied cabling may cause inconsistent and erratic readings. Care should be taken when routing cables to provide protection from sharp edges, drive-line rotation, exhaust pipe, or any other potential damage. Secure in place with cable ties to a snug fit. Locate the junction box mid-chassis at a suitable accessible position and fix firmly with screws supplied.

4.0 Operating Modes

4.1 Printing & Print Tickets

Ensure the RS-232 option is set to PRINTER and a printer is connected with the cable supplied. The printer is powered through the RS-232 connector and uses a default baud rate of 9600. There are three print tickets available:
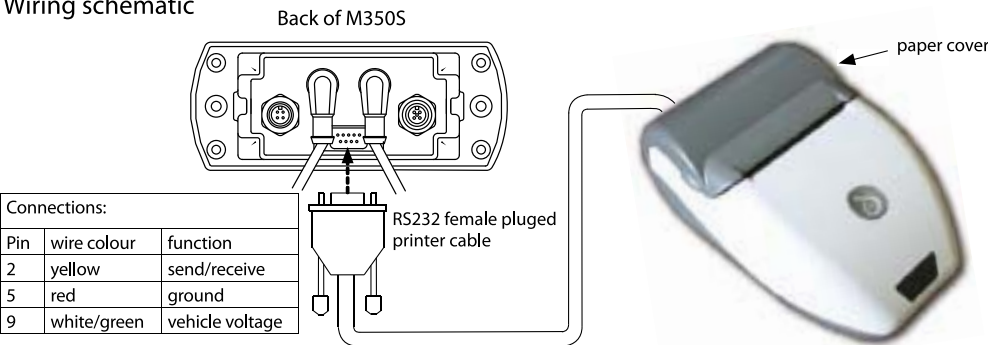
4.1.1 Truck Weights

Press **print**.

Net, gross, time and date is printed

4.1.2 Load Mode

Press **print** in load mode.

Time & date together with individual and total bin collections from a site and truck information is printed. This mode can also be used with the additional keyboard to enter an account number for the site.

Wiring schematic

Back of M350S

paper cover

Connections:

Pin	wire colour	function
2	yellow	send/receive
5	red	ground
9	white/green	vehicle voltage

RS232 female pluged printer cable

```
------------------------------
        R i c e   L a k e
   W e i g h i n g   S y s t e m s

    1 3 : 5 1   2 9 O c t 2 0 1 0
   N E T          1 0 0 4 0 k g
   G R O S S      2 0 0 1 0 k g

    1 3 : 5 4   2 9 O c t 2 0 1 0
   N E T          1 0 2 5 0 k g
   G R O S S      2 0 2 2 0 k g

------------------------------
```

Standard truck weights ticket printed before and after a collection - no options selected

Figure 4-1. Wiring Schematic

4.2   Load Mode

4.2.1   Operator Instructions

Load/Deliver Function

With the load/deliver function turned on, the driver has access to the load/deliver and total screen. This function allows tracking of the print and accumulate transactions for a load (increase in weight) or delivery (decrease in weight).

Note *The OB-350 is designed to only accumulate a positive value, either load or delivery.*

1. To activate, while in the load/deliver screen, select the ON Site key.

    The function keys perform the following:
    - Off – turns off load/deliver accumulation mode and clears the totals accumulation.
    - Print – accumulates displayed weight in total value, prints ticket if printer is attached.
    - Zero – allows the display to be zeroed.

Total Driver Display

With the load/deliver function on, the total display will continue to accumulate the weight value. To clear the total weight value, press the zero key.

Note *Zeroing the total display will not affect the load/delivery accumulation window.*

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5.0 Operator Configuration and Diagnostics

5.1 User and Setup Menu

The menu structure has two levels of security: an open user menu for driver operators and a password setup menu for calibrations and options for making changes to the user menu.

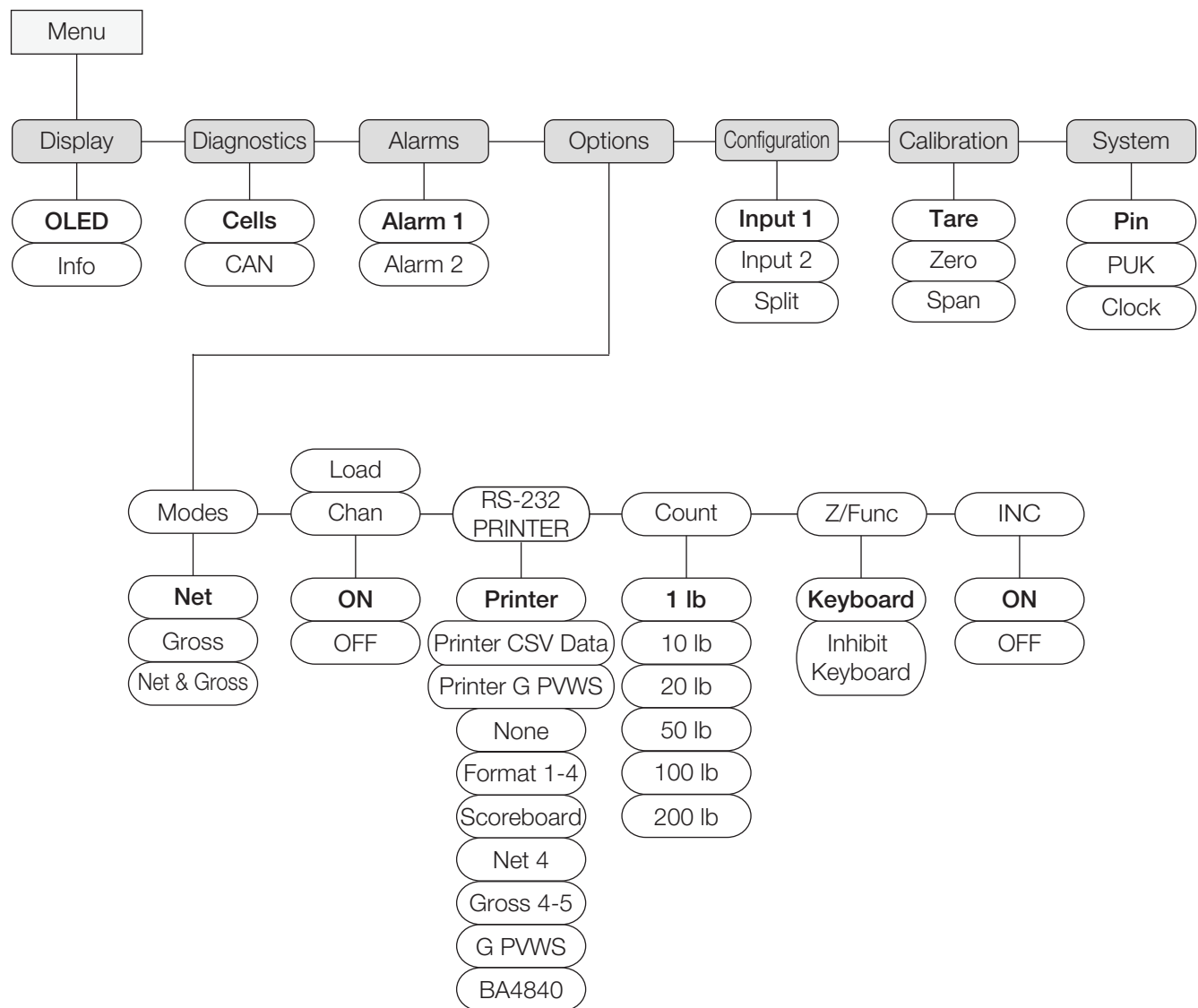**Note** *The default password is* 0350*. Keep this for your records.*

Figure 5-1. User and Setup Menu – Electrical Wiring and Data Connections

| User and Setup Menu		
Parameter	**Choices**	**Description**
Display	**OLED** Info	Adjust the brightness of the display; High, Med or Low. Firmware version and serial number display.
Diagnostics	**Cells** CAN	To display mV/V for load cells or transducers on seperate channels. To display CANbus diagnostics (not used).
Alarms	**Alarm 1** Alarm 2	Allows configuration of audible alarms.

User and Setup Menu		
Parameter	Choices	Description
Options	Modes	Select weighing mode to be displayed - Net. Gross or Net & Gross.
	Load/Chan	Load function gives the option to accumulate the amount of load (weight) delivered or collected from site. Channel Function - Split screen function is added to the MENU screen (for semi trucks only).
	RS-232	Select or change RS-232 output option.
	Count	Select count by in lb - 1, 2, 5, 10, 20, 50, 100, 200,
	Z/Func	Allows operator access to Zero/Tare function on the display.
	Inc	For use with roll off systems and dump trucks, turn on to calibrate zero degrees of inclinometer.
Configuration	Input 1(F) Input 2 (R) Split CAN	Air/Oil pressure transducer or load cell setting based on truck type. Air/Oil pressure transducer or load cell setting based on truck type. Setting varies depending on input 1/input 2 values. Not Used
Calibration	Tare Zero Span	Entry of empty vehicle weight for gross weight calculation. No load zero calibration. Entry of load for span calibration.
System	Pin PUK Clock	Enter a password. Not Used. Change system time and date.

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5.2   Operator Settings
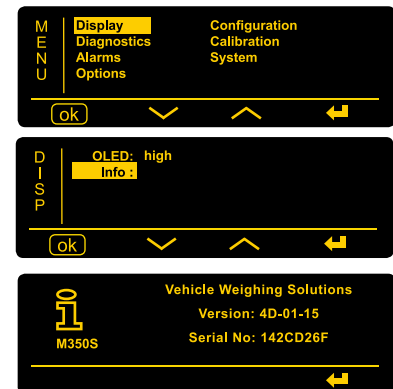
5.2.1   Display Menu

To change the display contrast

1.   In MENU, select **Display.**
2.   Press **(OK).**
3.   Select **OLED**.
4.   Press **(OK).**
5.   Press ⌄ toggle between:

> **High**
>
> **Medium**
>
> **Low**.

6.   Press ← to confirm setting.
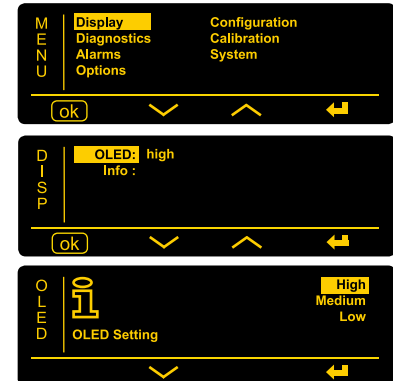
To display version and serial number

1.   In MENU, select **Display.**
2.   Press **(OK)**.
3.   Select **Info**.
4.   Press **(OK)**
5.   Firmware version and serial number displays.
6.   Press ← twice to return to MENU

5.2.2   Diagnostics Menu

To Display Load Cell Diagnostics

1.   In MENU, select **Diagnostics.**
2.   Press **(OK).**
3.   Select **Cells.**
4.   Press **(OK).**
5.   Channel 1 & 2 weight and input mill-Volt readings are displayed. Channel 1 only is the most common setup.
6.   Press ← twice to return to MENU.

Note   *Milli-Volt readings will differ according to the combined tare (empty) weight and any payload in the body. Load cells should only be checked when the vehicle is unloaded. Max input reading is 39.625 milli-Volt, this is approx 10 times more than would be expected.*
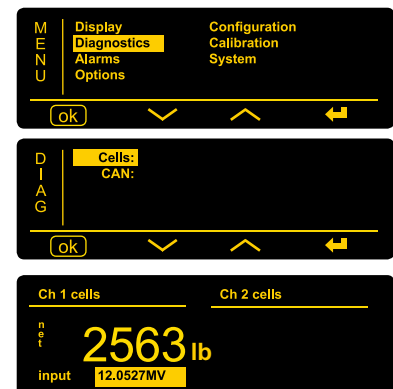
To Display CAN Diagnostics

Not currently available.

6.0 Technical Settings

6.1 Calibration and Setup

To allow for on-vehicle installation variations, an initial and periodic system calibration is required. The first calibration should take place a couple of weeks after the onboard weighing system has been used in service.

When selecting symbol, press the corresponding key below the symbol.

6.2 System Menu

6.2.1 Entering Pin Code (Password)

1. In MENU screen, select **System**.
2. Press **(OK).**
3. Press ⌄ to select **Pin**.
4. Press **(OK)** to display PIN input screen.
5. Enter default password 0350.
   - Press ⌄ or ⌃ to number 0-9.
   - Press ◄◄ to move cursor left.
6. Press ◄┘ to enter code.
7. Press **(OK)** to accept the password.
8. Press ◄┘ to back up to MENU.
9. To Set PIN, select PIN, press **(OK)** and repeat 2 - 6.

Note *Password or PIN is needed for every calibration & calibration change.*

PIN codes can be reset to a new code of your choice, select Reset and repeat steps. This is not recommended, loss of custom password will require serial number of unit and may take up to 48 hours to process the code.
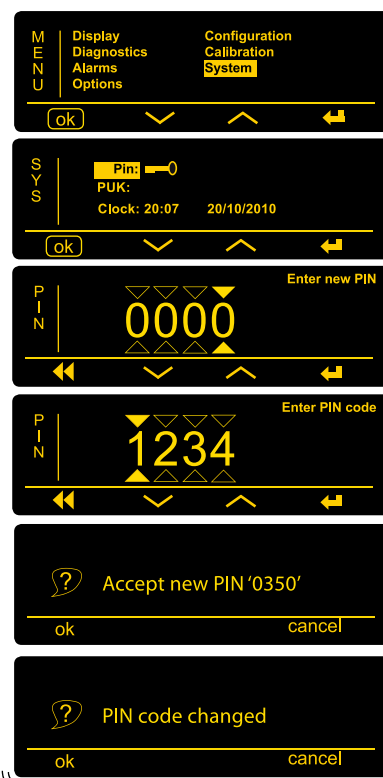
6.2.2 Entering PUK Code

Important *For use if a custom password is used, which is not recommended.*

1. In SYSTEM screen, select **PUK**.
2. Press **(OK).** PUK code enter screen and unique PIN reset code is displayed.
3. Call RLWS at 800-472-6703 and give the unique five-digit number displayed. RLWS will provide a NEW four digit PIN code.
4. Press ⌄ or ⌃ to number 0-9.
5. Press ◄◄ to move cursor left.
6. When PIN is entered press ◄┘ to enter code.

6.3 Alarms Menu

6.3.1 Alarm Setpoints

Allows configuration of the audible alarm.

Parameter	Choices	Description
Alarm	Alarm ON	Turns alarm on.
	Alarm OFF	Turns alarm off.
Output	Output Normal	+12 VDC to power and alarm on power connector.
	Output Invert	-12 VDC to power and alarm on power connector.
Gross	Gross PPCO	Not used (custom packer-plate configuration only).
	Net Sounder	Alarm will display speaker and beep when net weight reaches **Alm** value entered.
	Net PPCO	Not used (custom packer-plate configuration only).
	Inc Sounder	For use with inclinometers only – activates alarm when angle reaches above incline (inclinometer setting) in degrees.
	Inc PPCO	Not used (custom packer-plate configuration only).
	Gross Sounder	Alarm will display speaker and beep when gross weight reaches **Alm** value entered.
Alm	Alarm Weight Value	Edit value of the net or gross weight for alarm.
Hys	Hysteresis Value	Not currently available.
Trigger	Off	
	On	2,5,10 seconds – selectable delay prior to alarm activating in seconds.

Table 6-1. Alarm Setpoints Menu

6.3.2 Set Alarm

1. In MENU, select **Alarms**.
2. Press **(OK)**
3. Two setpoints appear. Select **Alarm 1**.
4. Pressing **(OK)** toggles between **ON** and **OFF**. Select **ON**.
5. Pressing **(OK)** toggles between **Output Normal** and **Output Invert**.
6. Pressing **(OK)** toggles between **Gross-Sounder**, **Net-Sounder**, **Gross-PPCO** or **Net-PPCO**.
7. Select **Alm**. The alarm (sounder or flashing beacon) will activate at weight displayed. To change target weight, press **edit** and set the alarm setpoint using techniques in previous steps.
8. Select **HYS**, reset tolerance is edited in lb using techniques in previous steps.
9. Select **Trigger,** then press **(OK)** to toggle between: **OFF**, **2**, **5** or **10** seconds.
10. When all settings are correct, press **(OK)** to confirm.
11. For alarm 2, select **Alarm 2** and repeat steps 7-10.
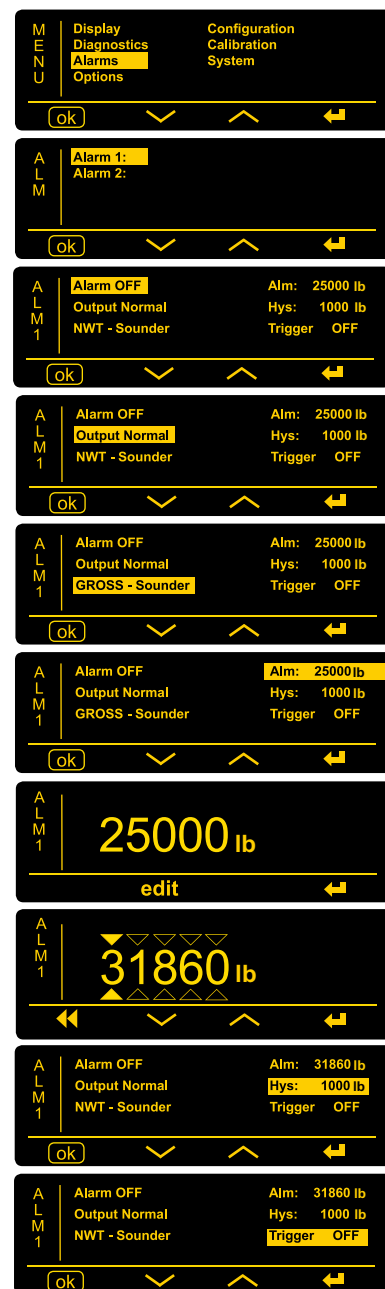
6.4   Options Menu

6.4.1   Select & Change NET, GROSS OR BOTH

Configuration of this setting will turn on visible weight screens in the standard
operator mode. Use the menu key to scroll between settings.

1. In MENU, select **Options**.

2. Press **(OK)**.

3. In OPTIONS menu, select **Modes**.

4. Press **(OK)**.

5. In MODES menu, press ⌄ to toggle between:

       NET & GROSS

       GROSS

       NET

   NET & GROSS is the common option.

6. Press ⏎ to confirm setting.
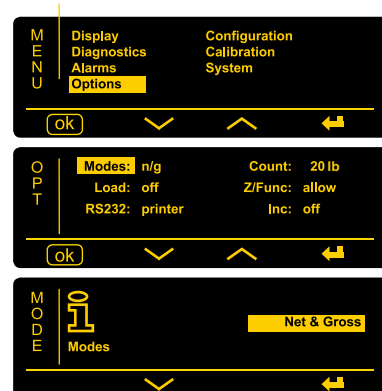
6.4.2   Load/Channel

The load option allows the load/deliver function to be turned ON and OFF.

When turned on, the load/deliver screen and totals screen will be available to the driver during normal operating
mode.

Parameter	Choices	Description
Load	Load On	Activate the load/delivery function on the driver display.
	Chan On	For Semi-Trucks only, currently not used.
	Load and Chan On	For Semi-Trucks only, currently not used.
	Load and Chan Off	Deactivate the load/delivery function on the driver display.

*Table 6-2. Load Menu*

Turn Load Option ON and OFF

1. In MENU, select **Options**.

2. Press **(OK)**.

3. In OPTIONS menu, select **Load.**

4. Press **(OK)**.

5. In LOAD option press ⌄ to toggle between settings.
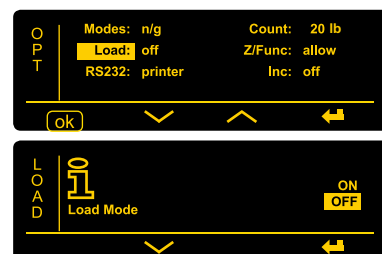
6.5 RS-232

6.5.1 To Select and Change RS-232 Output Options

1. In MENU, select **Options**.
2. Press **(OK).**
3. In OPTIONS menu, select **RS232** and press **(OK).**
4. Press ⌄ toggle between:

> **Printer - printer setup (standard printer setting)**
>
> **Printer CSV (comma, space, value) Data**
>
> **Printer GPVWS (not used)**
>
> **None**
>
> **Scoreboard Format 1 (remote display)**
>
> **Scoreboard Format 2 (not used)**
>
> **Scoreboard Format 3**
>
> **Scoreboard Format 4 NET (not used)**
>
> **Scoreboard Format 4 GROSS (not used)**
>
> **Scoreboard Format 5**
>
> **Scoreboard Format 6 GPVWS (not used)**
>
> **Scoreboard Format 7 BA484D (not used)**

5. Press ⏎ to confirm setting.

RS232 - 9 way 'D' Male Plug on the
back of the M350S where installed
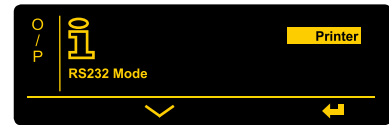
6.5.2 RS-232 Output Options

- *OB-350* Scoreboard Output
- Baud Rate is fixed at 9600,n,8,1
- Data is sent out every 1 second (formats 1, 3 & 4)
- RS-232 - 9 Way 'D' Male Plug

Pin	Function	Notes
1	-	
2	Tx	Transmit From *OB-350*
3	Rx	Receive into *OB-350* (not used)
4	-	
5	Gnd	0V Ground
6	-	
7	-	
8	-	
9	+24V	Vehicle Supply

6.5.3   Scoreboard Format 1

Used for remote displays.

Data output is the NET weight in ASCII + CR and LF

Example

NET   2160 kg

NET   2200 kg

NET   2200 kg

NET   2180 kg

NET   2180 kg

NET   2180 kg

NET   2180 kg

6.5.4   Scoreboard Format 2

Requesting Device sends ASCII command:

"20050026:<CRLF>"

M350S replies

"9F050026: 15.71 t G <CRLF>"

Example:

"9F050026: 15.71 t G <CRLF>"39 46 30 35 30 30 32 36 3A 20 2031 35 2E 37 31 20 74 20 47 0D 0A

6.5.5   Scoreboard Format 3

Data is output in the following format:

<STX(1)> <STA(1)> <SGN(1)> <PAYLOAD(7)> <UNITS(3)> <ETX(1)>

STX = 0x02	Start of text
STA = "N"	Status - N represents NET weight
SGN = 0x20 or "-"	Sign – space = pos, minus sign = negative
PAYLOAD	Weight – next 7 characters are weight in ASCII
UNITS = " kg"	Units
ETX = 0x03	End of text

Example:

(Net weight 15000 kg)	02 4E 20 20 20 31 35 30 30 30 20 6B 67 03
(Net weight 5045 kg)	02 4E 20 20 20 20 35 30 34 35 20 6B 67 03

Note

ASCII =	Character code set 0-127
	click: danshort.com/ ASCIImap/
CR =	Carriage Return
LF =	Line Feed
STX =	Start of the text
STA =	Status
SGN =	milli-Volt load cell Signal
ETX =	End of text
U/S =	Unspecified
CNT =	Count
CHK =	Checksum
Tx =	Transmit
Rx =	Receive

6.5.6   Scoreboard Format 4

(NET / GROSS)

Data is output in the following format:

<STX(1)> <U/S(3)> <CNT(1)> <U/S(5)> <PAYLOAD(3)> <CHK(1)>

STX = 0x01	Start of text
U/S = (3 bytes)	Unspecified – 3 bytes do not use
CNT = hex val	Count – Incremental message count, from 0x00 to 0xFF hex
U/S = (5 bytes)	Unspecified – 5 bytes do not use
PAYLOAD = (3 bytes)	Weight – 3 characters of weight value in hex (note1)
	Select the weight value either NET or GROSS in the M350S set-up.
CHK = hex val	Checksum – longitudinal checksum value not including STX

Example:

Messages with weight 18520 kg (0x004858)

01 00 0A 81 BE 01 01 00 01 00 00 48 58 EC

01 00 0A 81 BF 01 01 00 01 00 00 48 58 ED

01 00 0A 81 C0 01 01 00 01 00 00 48 58 EE

01 00 0A 81 C1 01 01 00 01 00 00 48 58 EF

6.5.7   Scoreboard Format 5

Data is output in the following format:

<STX(1)> <SGN(1)> <PAYLOAD(7)> <STA(1)> <ETX(1)>

STX = 0x02	Start of text
SGN = 0x20 or "-"	Sign – space = pos, minus sign = negative
PAYLOAD	Weight – next 7 characters are weight in ASCII
STA = "N"	Status - N represents NET weight
ETX = 0x03	End of text

Example:

(Net weight 15000 kg)	02 20 20 20 31 35 30 30 30 4E 03
(Net weight 5045 kg)	02 20 20 20 20 35 30 34 35 4E 03

6.5.8   Scoreboard Format 6

Data is output in the following format every 60 seconds:

$GPVWS,<type>,<sgn>,<net>,<gvw>,<alarm1>,<alarm2>,<set1>,<set2>,HHMMSS,DDMTYY*XX

type = 01	Unit type 01 = M350S under body weigher: LOADWEIGH
sgn = "+" or "-"	Sign of Net – plus sign = positive, minus sign = negative
net	Net weight – 5 characters
gvw	Gross Vehicle Weight – 5 characters
alarm1	Alarm 1 set point – 5 characters
alarm2	Alarm 2 set point – 5 characters
Set 1	N = Net, G = Gross: S = Sounder, P = PPCO: 0 = not Activated, 1 = Activated
Set 2	N = Net, G = Gross: S = Sounder, P = PPCO: 0 = not Activated, 1 = Activated
HHMMSS	Hours, Minutes and Seconds
DDMTYY	Day, Month and Year
*XX	Checksum

Example:

Net = 15000kg, gvw = 25000kg, alarm 1 Net sounder at 15500kg, alarm 2 Gross PPCO at 26000kg
$GPVWS,01,+,15000,25000,15500,26000,NS0,GP0,164100,280210*XX

Net = 15900kg, gvw = 25900kg, alarm 1 Net sounder activated at 15500kg, alarm 2 Gross PPCO at 26000kg $GPVWS,01,+,15900,25900,15500,26000,NS1,GP0,164200,280210*XX

6.5.9   Scoreboard Format 7

Data is output in the following format for interface with a BA484D Serial Display:

<CVn,string>   Cyclic Variable

Parameters

n = 1 or 2 Input Variable number, where 1 = net & 2 = gross, string = any 7-bit numeric ASCII string

The <CV> Cyclic Variable is used to update the BA484D display with each variable individually by sending the numeric value as a simple ASCII string. The syntax is <CVn,string> where n represents the input variable to be updated (= 1 or 2) and string is the numeric value to be displayed.

Example:

The command <CV1,123456.0> will set the input variable 1 (net) to a value of "123456."

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6.6   Count by option

1. In MENU, select **Options**.
2. Press **(OK).**
3. In OPTIONS menu, select **Count**
4. Press **(OK).**
5. Press ⌄ to toggle between:

   > 1 lb, 2 lb, 5 lb, 10 lb, 20 lb, 50 lb, 100 lb, 200 lb

6. Press ⏎ to confirm setting.
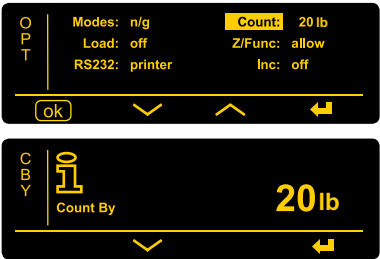
Note *Rice Lake Weighing Systems recommends using 50 lb minimum. Choosing a lower weight value may cause your weight to fluctuate on the display and returning to zero may be difficult.*


6.7   Zero Function

Allows the **Zero** key to be turned on or off when in normal weighing mode.

Parameter	Choices	Description
Z/Func	Allow Keypad Zero	Activate container tare (Gross Mode) or Zero (Net Mode) button on main menu to allow operator to zero up to 1100 lb of weight.
	Inhibit Zero	Deactivate operator zero functionality.

Figure 6-1. Zero Function Menu

Turn Z/Func On and Off

1. In MENU, select **Options.**
2. Press **(OK).**
3. In OPTIONS menu, select **Z/Func**.
4. Press **(OK).**
5. Press ⌄ to select Z/Func setting.
6. Press ⏎ to confirm setting.
7. Zero is added to the MENU screen.
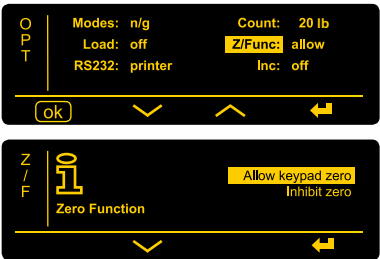
6.8 Inclinometer

On dump trucks and roll off applications, the *LoadRunner* system uses load pins and a hydraulic pressure transducer to determine a weight value. To achieve the best accuracy, calibrate the system at the same incline that will be used for determining the weight value, within ±1-2 degrees.

The inclinometer setup screen shows both the body angle in a numeric value and absolute angle (abs 0.0). For this application, use the level indicators that light up for every degree the body is raised.

The numeric value will indicate a negative value as the body is raised. This is normal. The level to the right will light up one circle at a time.

The inclinometer function allows visual determination of the height the body achieves to accurately weigh consistently.

6.8.1 Calibrate the Inclinometer

1. Ensure the truck is on a level surface and the body is in the down position.
2. In MENU, select **Options**.
3. Press **(OK).**
4. In OPTIONS menu, select **Inc.**
5. Press **(OK).**
6. Press ⌄ to select **On**.
7. Press **CAL** to calibrate the inclinometer.
8. Press **(OK)** to confirm inclinometer zero.
9. Press ⏎ to return to options menu.

Inclinometer screen will be added to the MENU options.
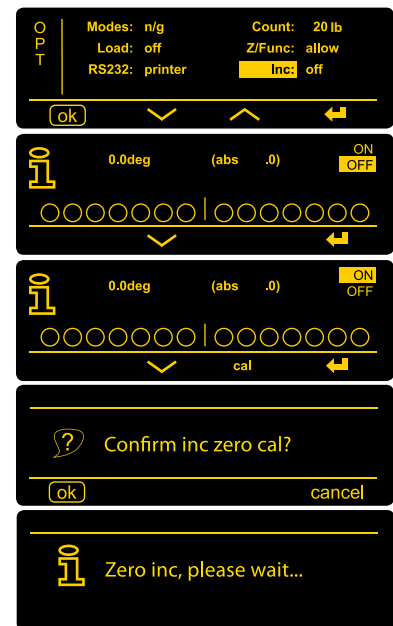
6.9 Configuration Menu – Input

The Input Channel configuration determines what type of truck the *LoadRunner* system is being installed on. Use the following settings and instructions for each type of truck used. Configuring the system differently will affect how the unit performs. The input channel referenced also references the connection on the back of the indicator.

Roll Off/Dump Truck Configuration Settings		
Parameter	Choices	Description
Input 1 (F)	Air/Oil Transducer	Air or Hydraulic Pressure Transducer
Input 1 (R)	Cell x 4	Load Cells
Split	Channel 2 fix	

Straight Truck Configuration Settings		
Parameter	Choices	Description
Input 1 (F)	Air/Oil Transducer	Air or Hydraulic Pressure Transducer
Input 1 (R)	Cell x 4	Load Cells
Split	Single Channel Cal	

6.9.1 Input Channel Configuration

1. In MENU, select **Configuration**.
2. Press **(OK)**.
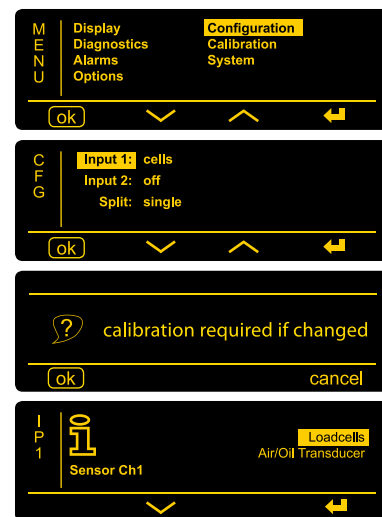3. In CONFIGURATION, select **Input 1.**
4. Press **(OK)**.

Note *Input one is channel 1.*

5. Warning message appears, press **(OK)** to continue.
6. Press ⌄ to select transducer type.

Note *Transducers are load cells, oil & air pressure sensors, etc.*

7. Press ↵ to confirm setting.
8. If Input Channel 2 is connected, select **Input 2** and repeat 4-7. Activating Input Channel 2 changes **Split** to **Dual**.

Definitions
- Input and Channel are used interchangeably.
- Transducers = load cells, oil & air pressure sensors, fifth-wheel load cells, etc.
- Split: single = One input channel, all transducers connected into one junction box (in parallel)
- Split: dual = Separate input channels, i.e. front and rear transducer sets are connected into the M350S
- Dual = Input channels 1 & 2 added together, the total weight of channel 1 & 2 will be displayed. Most VWS load cells can be connected together in parallel as the milli-Volts signals are compatible. VWS load cells, oil & air pressure transducers and fifth wheel load cells have different milli-Volt outputs and cannot be connected into one junction box (with the exception of CANbus enabled sensors).
- Twin = Input channels 1 & 2 are displayed separately (e.g. the front and rear of a vehicle). Separate calibrations are required which require weighing the front and rear axle/s separately and entering the data.

7.0   Calibration

Drive empty truck onto the scale to determine empty weight. Perform span calibration.

Note   *For span calibration, use 3/4 of the full body load.*

7.1   Calculating Tare, Gross & Net Weights

1. To determine actual TARE weight, run the empty vehicle onto a truck scale and note the total weight.
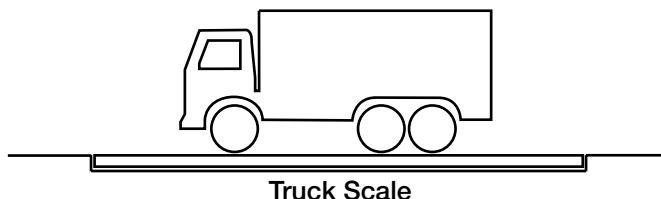

Truck Scale

Figure 7-1. Vehicle on Truck Scale

2. Load the vehicle as close to its legal maximum as possible.
3. Weigh the Loaded Gross vehicle – run the vehicle across the same truck scale and record the Gross vehicle weight.
4. Calculate NET weight using: **Gross - Tare = Net.**
5. Use the NET weight as the span weight during the calibration procedure.

7.1.1   Enter Tare Weight

1. Ensure vehicle is empty, then weigh and record TARE (empty vehicle).
2. In MENU screen, select **Calibration** press **(OK).**
3. Select **Tare.**
4. Press **(OK)** (defaults to 22,000 lb).
5. Press **edit.**
6. Enter vehicle TARE (empty) weight recorded in step 1.
7. Press ↵.
8. Press ↵ again to return to MENU screen.

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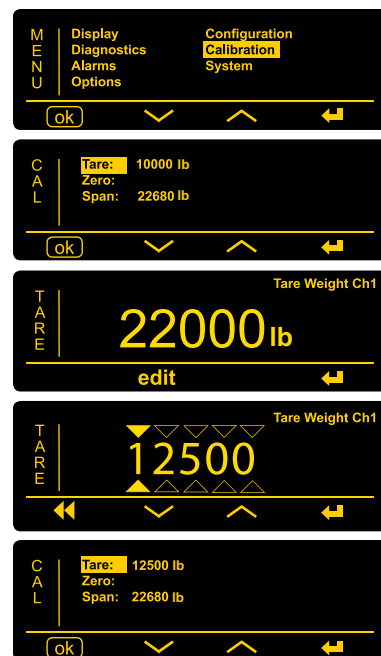
7.1.2   Set Zero Calibration

1. Make sure the vehicle is empty and on level ground.
    For dump trucks and roll off trucks, raise the body clear of the chassis approximately three to four degrees.
2. In CAL menu, press ⌄ to select **Zero**.
3. Press **(OK)**.
4. Press **cal**.
5. Press **(OK)** to **Confirm Ch 1 Zero**.
6. Press ⏎ to return to CAL menu.

7.1.3   Full Span (Net Load) Calibration

1. Load vehicle to its legal max and record GROSS weight.
2. Weigh and record the TARE (empty) vehicle.
3. Subtract the TARE (or KERB) weight from the GROSS weight to give the SPAN (NET) weight.

    31900 -12500 =19400 lb SPAN (NET) PAYLOAD

    If the vehicle is a tipper, raise the body clear of the chassis.
4. In CAL menu, press ⌄ to **Span**.
5. Press **(OK)** (defaults to 62,000 lb).
6. Press **edit.**
7. Edit the SPAN (NET) weight, as in steps 1 & 2 above.
8. Press ⏎ when done.
9. Press **cal**.
10. Press **(OK)** to **Confirm Ch 1 Span cal**.
11. Press ⏎ twice to return to MENU screen.

Note   *Reverse ZERO/ SPAN (For Straight Trucks Only)*

The reverse zero/span option allows the weighing system to be first calibrated when the truck is full (swapping step 3 & 4), discharging its load then performing calibration zero. You must be in single channel mode: Ch1 only. See Section 7.1.4.

7.1.4 Reverse Zero/Span

Reverse Zero/Span is an alternative to Full Span Calibration. The reverse zero/span is used to perform a simultaneous zero and span calibration with the vehicle fully loaded. You must be in single channel mode, ch1only.

1. Weigh and record the vehicle fully loaded.
2. Do a normal span cal 1 (actual span figures not important). See Section 7.1.2
3. Empty the vehicle, weigh and record the TARE weight.
4. In SPAN menu, check and edit the SPAN figure if required but do not press 'cal'.
5. In CAL menu, press ⌄ to select Zero.
6. Press z⌁ to activate zero/span. Reverse span figure shown top-right corner of display.
7. Press **cal**.
8. Press **(OK)** to confirm channel 1 Zero CAL.
9. Press ⏎ to return to CAL menu.
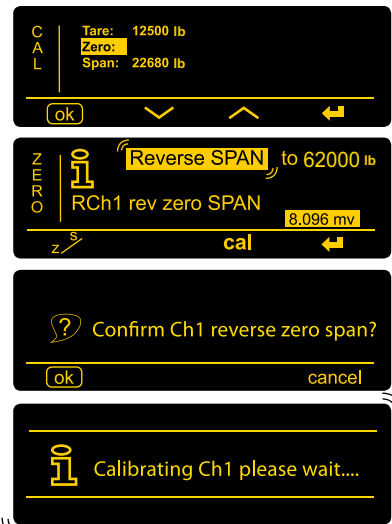
8.0 Appendix

8.1 Terms

The following abbreviations, phrases and terms used in this manual are widely used in the truck weighing industry.

ALARM	An alarm sounder or flashing beacon (where fitted) will activate when alarm set point is reached.
BOGY	Refers to a group of axles fixed close to each other, also known as dual or tri-axles.
CHANNEL	Is the Input Channel.
DUAL	Input channels 1 & 2 added together, the total weight of channel 1 & 2 will be displayed. Most RLWS load cells can be connected together in parallel as the milli-volts signals are compatible. Load cells, oil & air pressure transducers and fifth wheel load cells have different millivolt outputs and cannot be connected into one junction box (with the exception of CANbus enabled sensors).
GROSS	GVW or GMW (gross vehicle weight or gross mass weight) is the total truck weight (NET + TARE).
HYS	Hysteresis - gives the option to activate the alarm in a window range above and below the alarm set point (an alarm reset tolerance).
INPUT	The input channel load cell groups are connected to the INPUT.
LOAD	Part load collected or delivered – press **PRINT** to print and zero the load, weight collected is stored as an accumulation to NET & GROSS.
NET	The payload weight in the truck body.
ON SITE	When **Load** is turned ON in options, on site allows logging onto site and off site for weighing loads collected from a site with multiple bins (waste only).
OUTPUT	Normal = +12 VDC to power and alarm, Output invert = -12 vdc to deactivate (a packer plate).
PIN	Personal Identification Number – password.
PPCO	Packer-plate cut-off, refuse trucks only.
PUK	Pin Unlock Code.
SPAN	The NET weight used to calibrate the scale. It is the difference between the tare (curb or empty weight) and the gross weight.
SPLIT DUAL	Separate input channels, i.e. front and rear transducer sets are connected.
SPLIT SINGLE	One input channel, all transducers connected into one junction box (in parallel).
TARE	Means the weight of the empty (no load) vehicle.
TRIGGER	This is a selectable time delay prior to alarm activation.
TRANSDUCER	Load cells, oil & air pressure sensors, fifth wheel load cells etc.
TWIN	Input channels 1 & 2 are displayed separately (e.g. the front and rear of a vehicle). Separate calibrations are required which require weighing the front and rear axle/s separately and entering the data.
ZERO	Zero Functionality: • No load zero, any minor discrepancies (+/-1100 lb) because the truck body has 'normalized', e.g. stresses and strains incumbent in the mechanical construction of the truck has weakened and dissipated. • Driver zero allows the driver to zero the weight taken from a site to allow the next site's printed ticket to show as a separate set of weighting transactions.

8.2   Troubleshooting

8.2.1 Fusing

The *OB-350* is fitted with a self-resetting thermal fuse. In the event of a fault or an electrical surge, the thermal fuse will activate and cut power. The fuse will reactivate after a few seconds, once the fault has been removed. Trip current is 300 mV or greater than 30 VDC.

Perform the following simple checks to determine that the system is working correctly.

1. If the readings are incorrect, but consistency is high or low, recalibrate the system.
2. If the weight values are erratic, check the power supply (9-30VDC). If the power supply is functional, replace the indicator.
3. If the indicator is found to be defective, remove and contact RLWS service for a replacement. If the problem has not been isolated, continue with the troubleshoot procedures.

> **Note** *Recalibration at this stage could complicate the problem. However, once the problem has been identified and corrected, it would be advisable to refer again to Section 7.0 for calibration details.*

8.2.2 Diagnostics

The diagnostic tool displays the electronic signals coming in from load cells, sensors or CANbus enabled devices. Values shown will vary according to tare weights, any load in the body of the vehicle and mechanical installation integrity. Look for consistency, positive values, and pairs of cells showing similar or dissimilar readings. Typical millivolts readings may range from 1 to 8 mV, (no load to full load).

8.2.3 Visual Checks

If no indicator defects can be found, the fault may be in the cables or load cells. A visual inspection of cables for damage or chafing, crushing. Make sure the cables connections are secure and thumb tightened. Make sure exposed connections are clean and dry.

8.2.4 Load Cell checks

If the display still shows an erratic reading or unusual high reading, disconnect one load cell from the junction box and note its effect on the display. If the display shows a significant impediment, the load cell is probably at fault and will need replacing. If no significant improvement is noticed, reconnect the load cell and repeat the procedure for the remaining load cells.

Condition	Cause
No indicator display	• Power cable disconnected • Power connection fault • Defective indicator
Erratic indicator readings	• Erratic supply voltage - loose cables/connectors • Defective cable or connectors • Defective load cell/s • Deffective indicator • Loose load cell bolts
Incorrect weight readings (not erratic)	• Incorrect calibration • Dirty connectors • Defective cable • Defective load cells • Top load cell mounting bolts too long - always weighing light • Body rubbing on the chassis • Build-up of dirt or grit in the loadcell slot
Unable to calibrate	• Top load cell mounting bolts too long to calibrate maximum weight
Unable to zero	• Defective load cell • Loose or broken connectors

Table 8-1. Troubleshooting Chart

Note *Your RLWS LoadRunner system should be serviced & re-calibrated annually.*

Hardware Warranty Statement

Rice Lake Weighing Systems (RLWS) warrants that all RLWS brand equipment and systems properly installed by a Distributor or Original Equipment Manufacturer (OEM) will operate per written specifications as confirmed by the Distributor/OEM and accepted by RLWS. All systems and components are warranted against defects in materials and workmanship for two (2) years, unless otherwise stated.

RLWS warrants that the equipment sold hereunder will conform to the current written specifications authorized by RLWS. RLWS warrants the equipment against faulty workmanship and defective materials. If any equipment fails to conform to these warranties, RLWS will, at its option, repair or replace such goods returned within the warranty period subject to the following conditions:

Upon discovery by Buyer of such non-conformity, RLWS will be given prompt written notice with a detailed explanation of the alleged deficiencies.

Individual electronic components returned to RLWS for warranty purposes must be packaged to prevent electrostatic discharge (ESD) damage in shipment. Packaging requirements are listed in a publication, "Protecting Your Components From Static Damage in Shipment," available from RLWS Equipment Return Department.

Examination of such equipment by RLWS confirms that the non-conformity actually exists, and was not caused by accident, misuse, neglect, alteration, improper installation, improper repair, or improper testing. RLWS shall be the sole judge of all alleged non-conformities.

Such equipment has not been modified, altered, or changed by any person other than RLWS or its duly authorized repair agents.

RLWS will have a reasonable time to repair or replace the defective equipment. Buyer is responsible for shipping charges both ways

In no event will RLWS be responsible for travel time or on-location repairs, including assembly or disassembly of equipment. Nor will RLWS be liable for the cost of any repairs made by others.

Installer is completely responsible for the design and fitting of the installation, and any changes which might result in voidance of the warranty of the manufacturer of equipment to which the products are installed.

THESE WARRANTIES EXCLUDE ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WITHOUT LIMITATION WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. NEITHER RLWS NOR DISTRIBUTOR WILL, IN ANY EVENT, BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.

RLWS AND BUYER AGREE THAT RLWS' SOLE AND EXCLUSIVE LIABILITY HEREUNDER IS LIMITED TO REPAIR OR REPLACEMENT OF SUCH GOODS. IN ACCEPTING THIS WARRANTY, THE BUYER WAIVES ANY AND ALL OTHER CLAIMS TO WARRANTY.

SHOULD THE SELLER BE OTHER THAN RLWS, THE BUYER AGREES TO LOOK ONLY TO THE SELLER FOR WARRANTY CLAIMS.

No terms, conditions, understanding, or agreements purporting to modify the terms of this warranty shall have any legal effect unless made in writing and signed by a corporate officer of RLWS and the Buyer.

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