

User manual
Conveyor scales
C2850 | C2880



LOADRITE C2850 | C2880 User manual

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IMPORTANT SAFETY INFORMATION

PLEASE READ CAREFULLY BEFORE USING THE LOADRITE™ WEIGHING SYSTEM

	This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.
	WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
	CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.
	CAUTION used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in property damage.



Work on conveyor belts and all heavy machinery is a hazardous activity. Only experienced professionals should install LOADRITE equipment.

It is your sole responsibility to place, secure and use the LOADRITE Weighing System in a manner that will not cause accidents, personal injury or property damage. Always observe safe operating practices.

Before you use the LOADRITE Weighing System for the first time, familiarize yourself with the system and its operation.



Before any work is carried out on a machine, the correct lock-out or tagging procedure is to be completed.

Do not attempt to service the LOADRITE Weighing System as this could result in personal injury.



Removing LOADRITE Weighing System equipment or adding accessories could affect the accuracy of weighing data and your warranty.

Failure to adhere to these warnings and cautions may lead to death, serious injury or property damage. Trimble Navigation Limited disclaims all liability for installation or use of the LOADRITE Weighing System that causes or contributes to death, injury or property damage, or that violates any law.

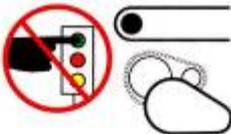
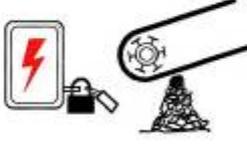
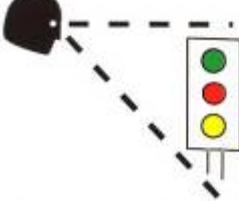
 <p>Do Not Climb, Sit, Stand, Walk, Ride, or Touch the Conveyor at Any Time</p>	 <p>Do Not Perform Maintenance on Conveyor Until Electrical, Air, Hydraulic and Gravity Energy Sources Have Been Locked Out and Blocked</p>	 <p>Operate Equipment Only With All Approved Covers and Guards in Place</p>
 <p>Lock Out All Power and Block Gravity Loads Before Servicing</p>	 <p>Ensure That All Personnel Are Clear of Equipment Before Starting</p>	 <p>Allow Only Authorized Personnel and Trained Personnel To Operate or Maintain Conveyors and Accessories</p>
 <p>Keep Clothing, Body Parts, and Hair Away from Conveyors</p>	 <p>Clean Up Spillage Around Tail Pulleys, Idlers, and Load Points Only When the Power is Locked Out and Guards Are In Place</p>	 <p>Do Not Modify or Misuse Conveyor Controls</p>
 <p>Ensure That ALL Controls and Pull Cords are Visible and Accessible</p>	 <p>Do Not Modify or Remove Controls, Guards, Interlocks, Warnings or other Safety Items without Manufacturer's Approval</p>	 <p>Report All Unsafe Conditions</p>

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1. WELCOME

Thank-you for purchasing this LOADRITE Weighing System. Please read this manual carefully before using the Integrator for the first time. Keep this manual in a safe place and use as your first point of reference.

Formatting

The following formatting in this manual identifies specific types of information:

Convention	Type of Information
Bold	<ul style="list-style-type: none">▶ Indicates a button on the Integrator, or▶ Indicates an area displayed on-screen, including buttons, headings, field names and options.
<i>Italics</i>	<ul style="list-style-type: none">▶ Indicates the name of a screen or window, or▶ Indicates an operation mode that the Integrator can be set to.
Monospace	The exact error message displayed on-screen.

Action Terms

The following terms are used throughout this manual to describe actions:

Term	Description
Press	Push and release a button quickly.
Press and hold	Push and hold a button for 2-3 seconds.
Select	<ul style="list-style-type: none">▶ Use the arrow buttons to "highlight" an item in a menu or list, or▶ When searching for a product or Data Field value, use the keypad to enter the name of the product. The product which matches the name entered will be "highlighted".

2. INTRODUCTION

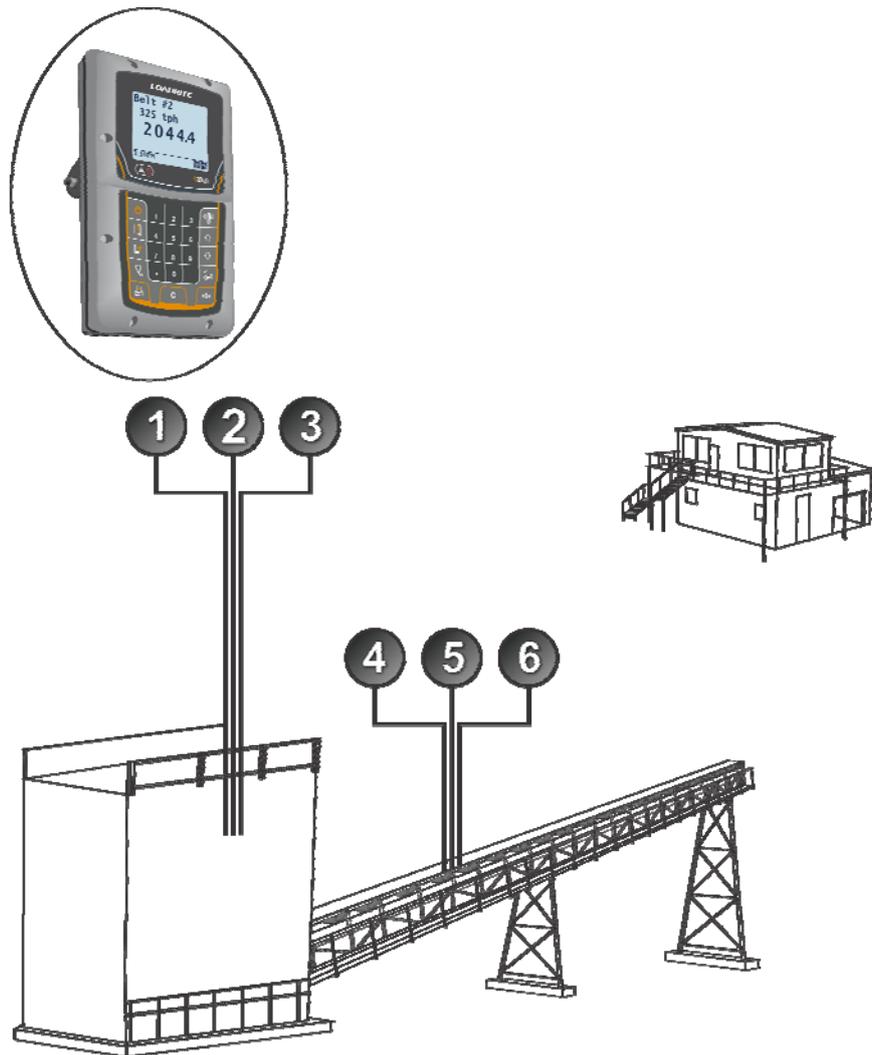
The LOADRITE C2850 | C2880 Weighing System measures the weight of material shifted by a standard conveyor belt typically found in quarries, mines or other similar bulk material applications.

Each C2850 | C2880 Integrator can measure multiple belts. Sensors under each belt measure the load on the belt and the conveyor speed. These signals are read by the LOADRITE C2850 | C2880 which calculates and displays the current material rate and totals moved. It has an internal memory that stores settings and production data even when it is turned off.

The functionality of the LOADRITE C2850 | C2880 is designed to be as close as practical to other LOADRITE products found in bulk material applications. This helps to reduce training needs for users.



2.1. LOADRITE C2850 | C2880 EQUIPPED CONVEYOR BELT



Item	Description
1	LOADRITE Integrator
2	Printer, Ethernet, Radio Modem or LOADRITE Communications Controller (optional)
3	4-20mA and Pulsed Output (optional)
4	Speed wheel (one for each belt measured)
5	Scale frame assembly with load cells (one for each belt measured)
6	Load Cell Amplifier/Junction box (one for each belt measured)

3. QUICK START GUIDE

3.1. TURNING ON THE INTEGRATOR

The LOADRITE Integrator will turn on automatically when you switch on the power.

3.2. UNATTENDED VS INTERACTIVE

The LOADRITE weighing system can be used in either an unattended or interactive manner. This means the system can either:

- ▶ Operate independently without regular user input; or
- ▶ Use functions that require a user to regularly enter data (such as product details).

Different functions described in this manual fall into either of these categories.

3.3. THE RUN SCREEN

The *Run* screen is the first screen that you will see when you turn on the Integrator. It displays the belt name, current material rate (tph), short total and other information for between one and four scales.

Multiple scales

When two, three or four scales are connected to the Integrator, you can toggle between viewing multiple scales or viewing a single scale:

- ▶ Press  or  to toggle between all scales and one scale.

You must toggle to the single-scale view before you can use the following functions:

- ▶  Clearing the short total
- ▶  Zeroing the belt
- ▶  Changing the product
- ▶  Viewing the long totals and life total
- ▶  >  Clearing the long total that is displayed.

3.3.1. One or two scales

The following is an example of the *Run* screen displaying information for a single scale. For two scales, the same information is displayed side-by-side.



	Component	Description
1	Belt name	The name of the belt.
2	Short Total (T(1))	The current short total of material that has been weighed. NOTE: If a problem occurs with the scale, an error message will display here.
3	Material rate (TPH)	The current rate of material on the belt (tph). It is normal for the value to change up and down (sometimes quickly) as material moves along the belt.
4	Belt speed (m/s)	The current speed of the belt.
5	Long Total (T(2))	The current Long Total 1 value of the material that has been weighed.
6	Other belts*	The current status of the other belts.
7	Clock	The current time.
8	Communications	Indicates that the Integrator is communicating or attempting to communicate with a communications device.

* Only displays when multiple scales are active and a single scale is being viewed.

3.3.2. Three or four scales

The following is an example of the *Run* screen displaying information for four scales. For three scales, the same information is displayed minus the fourth scale.



	Component	Description
1	Belt name	The name of the belt.
2	Short Total (T(1))	The current short total of material that has been weighed. NOTE: If a problem occurs with the scale, an error message will display here.
3	Material rate (TPH)	The current rate of material on the belt (tph). It is normal for the value to change up and down (sometimes quickly) as material moves along the belt.
4	Belt speed (m/s)	The current speed of the belt.
5	Clock	The current time.
6	Communications	Indicates that the Integrator is communicating or attempting to communicate with a communications device.

3.4. KEYPAD

Icon	Name	Description
	Error Light	<p>Illuminates when an error has occurred:</p> <ul style="list-style-type: none"> ▶ Fast flash (0.5 second interval): Load Cell or Tilt Sensor error ▶ Slow flash (2.0 second interval): Data memory is at, or over, 75% capacity.
	Standby	When displaying the <i>Run</i> screen, press to enter <i>Standby</i> mode.
	Data Menu	<p>Displays the <i>Data Menu</i>.</p> <hr/> <p>NOTE: This button can only be used from the <i>Run</i> screen when it is displaying a single scale.</p> <p>If you have multiple scales connected, press  or  to toggle to single-scale view.</p>
	Long Totals	<p>Displays the long totals.</p> <hr/> <p>NOTE: This button can only be used from the <i>Run</i> screen when it is displaying a single scale.</p> <p>If you have multiple scales connected, press  or  to toggle to single-scale view.</p>
	Diagnostics	Displays the <i>Diagnostics Menu</i> .
	Setup Menu Back	<ul style="list-style-type: none"> ▶ Displays the time and accesses the <i>Setup Menu</i>. ▶ Moves back one menu screen without changing the data.
	Up	<ul style="list-style-type: none"> ▶ Moves up a list of options. ▶ Changes the belt being displayed when more than one belt is connected.
	Down	<ul style="list-style-type: none"> ▶ Moves down a list of options. ▶ Changes the belt being displayed when more than one belt is connected.
	Enter	<ul style="list-style-type: none"> ▶ Selects an item. ▶ Accepts changes.
	One	Used to enter the number 1 .
	Two	Used to enter the number 2 .
	Three	Used to enter the number 3 .
	Four	Used to enter the number 4 .
	Five	Used to enter the number 5 .
	Six	Used to enter the number 6 .
	Seven	Used to enter the number 7 .
	Eight	Used to enter the number 8 .

Icon	Name	Description
	Nine	Used to enter the number 9 .
	Decimal Point	Used to enter a decimal point.
	Zero	Used to enter the number 0 .
	Print	Displays the <i>Print Menu</i> .
	Clear	Clears the short total for the current product.
		<p>NOTE: This button can only be used from the <i>Run</i> screen when it is displaying a single scale.</p> <p>If you have multiple scales connected, press  or  to toggle to single-scale view.</p>
	Zero Belt	Zeroes the empty belt.
		<p>NOTE: This button can only be used from the <i>Run</i> screen when it is displaying a single scale.</p> <p>If you have multiple scales connected, press  or  to toggle to single-scale view.</p>

3.5. STANDBY

The *Standby* functionality is only available if enabled and configured during installation.

If you are not going to use the LOADRITE Weighing System for a while, you can put the Integrator into *Standby* mode by completing the following:

Option 1

- ▶ Press .
The Integrator will enter *Standby* mode.

Option 2

Depending on the options selected at installation, the Integrator will enter *Standby* mode if the belt (or belts) is stopped for more than ten minutes. The Integrator will automatically exit *Standby* mode when the belt restarts.

How do I exit *Standby* mode?

- ▶ Press any button to exit *Standby* mode.
The *Run* screen will display.

4. WEIGHING

4.1. ACCURATE WEIGHING

For maximum accuracy, ensure that:

- ▶ The Integrator is correctly and regularly zeroed.
- ▶ There is no material build-up on the belt scale weighing frame or speed wheel.
- ▶ The flow of material along the belt is evenly distributed.
- ▶ The size of each piece of material is less than 1/10 of the covered width of the belt.
- ▶ Always maintain the same belt tension. A change in belt tension will affect the calibration settings.
- ▶ On sloping conveyors, ensure material does not roll down the belt.
- ▶ On portable conveyors, recalibration may be required if the slope of the conveyor is changed, unless an angle sensor is installed.

4.2. ZEROING

It is important to regularly zero the Integrator for each belt. This is to avoid inaccurate readings due to build-up of material on the scale frame, or other changes to the conveyor belt itself.

Zeroing can be performed manually and there is an optional *Auto Zero Track* mode which will automatically adjust for small changes when the belt is run empty.

4.2.1. Manual Zero

1) Ensure that the belt to be zeroed is running and empty.

2) From the *Run* screen for the scale, press .

The Integrator will measure the weight for one or more (depending on the settings) complete revolutions of the belt. The completion percentage is displayed during this process and the message **Zeroed** will display.

- ▶ The zeroing process can be aborted at any time by pressing any button on the keypad.

Manual Zero Error Messages

Message	Description
Belt too Slow!	If the belt is not running, this error message will display and it will not be possible to zero the Integrator.
Is belt empty?	<p>If the weight is greater than 10% of the full scale, when you press , the display prompts Is belt empty?</p> <p>If it is empty, press  which will perform a zero operation. Pressing  will not zero the scale.</p> <p>The Integrator automatically returns to the <i>Run</i> screen when zeroing is complete or zeroing was aborted.</p>
Not Zeroed	If the zeroing process was not successful or aborted, this message is displayed.

4.2.2. Auto Zero Track

When enabled, the *Auto Zero Track* (AZT) function will automatically run when the load on the belt drops to close to zero.

AZT will run for one or more belt revolutions (configured at installation) and while operating will display a percentage of completion message. On completion, if the zero error is within preset limits, the Integrator will automatically adjust the zero.

- ▶ If the accumulated zero error is too large, an error message is displayed. In this case a Manual Zero will need to be performed.
- ▶ If material is fed on to the belt during an AZT function, the Integrator returns to normal operation.

4.3. SHORT, LONG AND LIFE TOTALS

The LOADRITE Weighing System keeps a running total of the material moved. For each product, the following independent totals are stored:

Total	Definition
Short Total	<p>The running total weight of product conveyed for a shift or shorter time period. As material moves along the belt, the Short Total will continue to increment until it is cleared by pressing .</p> <p>It can be used in truck/rail loading applications.</p> <ul style="list-style-type: none"> ▶ The Short Total value is displayed on the <i>Run</i> screen
Long Total 1 (LongTot1)	<p>The running total weight of product conveyed over a long time period, such as a week or a month.</p> <ul style="list-style-type: none"> ▶ To view the Long Total 1 value for the current belt, press .
Long Total 2 (LongTot2)	<p>Same as Long Total 1, but can be set to display the conveyed product for a different time period.</p> <ul style="list-style-type: none"> ▶ To view the Long Total 2 for the current belt, press  then .
Life Total (Life Tot)	<p>The running total weight of product conveyed over the entire life of the scaleframe. The Life Total value cannot be cleared.</p> <ul style="list-style-type: none"> ▶ To view the Life Total for the current belt, press  then  twice.

4.3.1. Clear the Short Total

The short total keeps accumulating until it is cleared. Complete the following to clear the short total:

- 1) From the *Run* screen for the scale, press . The message **Are you sure?** will display.
- 2) Press . The message **Cleared Total** will display. If configured, the short total value and other data can be printed on a LOADRITE Printer or sent to LOADRITE InsightHQ.

4.3.2. Clear the Long Total 1 or Long Total 2

The two long total values keeps accumulating until cleared. Complete the following to clear Long Total 1 or Long Total 2:

- 1) From the *Run* screen for the scale, press .
- 2) Press  or  until **LongTot1** or **LongTot2** is displayed.
- 3) Press . The message **Are you sure?** will display.
- 4) Press . The message **LongTot n Cleared** (where **n** is the product number) will display. If configured, the long total value and other data can be printed on a LOADRITE Printer or sent to LOADRITE InsightHQ.

4.4. VOLUME CONVERSION

The LOADRITE Integrator can optionally display the Total material moved in Volume (Cubic) measurements as well. Each Product type can have a separate Volume Conversion Factor entered.

If required, Volume can be enabled and configured by your certified LOADRITE installer.

When *Volume Conversions* functionality is enabled, the top line of the *Run* screen alternately shows the Belt Name and the Volume equivalent of the current Total.

5. PRODUCTIVITY INFORMATION

The LOADRITE C2850 | C2880 Integrator has several functions for recording and displaying information related to the productivity of the conveyor system. including recording daily production information, tagging data with a definable data field and more. Many of these functions require a LOADRITE Printer or the LOADRITE InsightHQ system to operate.

5.1. TRACKING PRODUCTS AND DATA

The LOADRITE C2850 | C2880 can track both Products and another 8-digit data field. When enabled, these are accessed in turn by pressing .

5.1.1. Products

The *Product Tracking* functionality is only available if multiple products are configured at installation.

The LOADRITE C2850 | C2880 can track up to nine materials/products. It does this by using a different Short and Long Totals for each product. Product tracking is an option that can be enabled at installation.

NOTE: Product tracking requires an operator to enter product details into the C2850 | C2880 Integrator each time the product on the belt changes. As such, this functionality is not suitable for unattended applications.

To change product, complete the following:

- 1) From the *Run* screen for the scale, press .
- 2) Select a product by completing one of the following:
 - ▶ Press  or  to select the correct product, then press .
 - ▶ Use the keypad to enter the product number

The *Run* screen will display information for the selected product. If the *UserData* screen is displayed, see "User Data" on page 5-15.

NOTES:

- (i) The total(s) for each product must be cleared separately.
- (ii) The automated daily reports are not affected by which product is selected; they will report on the total material carried by the belt.
- (iii) When more than one belt is connected to a single Integrator, it is not possible select the product that is in use by another belt.

5.1.2. User Data

A LOADRITE printer or connection to LOADRITE InsightHQ is required for *User Data* functionality.

This functionality allows a data field of a single number to be entered (up to 8 digits) that will then be printed / logged along with:

- ▶ A total that is cleared
- ▶ Timed logging data
- ▶ Other event-type data.

Generally this data field is used to track useful additional data, such as Batch Number, Area, etc. The meaning for the data (and its associated text name) is typically configured during installation.

From the *UserData* screen, complete the following:

- ▶ Use the keypad to enter the User Data value, then press .
- The *Run* screen will display information for the selected product.

NOTE: As this function requires operator input, it is generally not used in unattended applications.

5.2. REPORTING

5.2.1. Daily and Weekly Reports

This function requires the connection of either a LOADRITE Printer, or a LOADRITE Communications Controller (for emailed reports).

The *Full Day Report* and *Full Week Report* provide a useful summary of information on the productivity of the system. If more than one belt is connected, a report will be printed for each belt.

NOTE: The data in these reports are completely independent of the Short Total and Long Total values and are not affected by the selection of product.

Example report

```
#####
Full Day Report
LOADRITE / Results 8884 T
ID #: 8841 Belt #1
Report Printed:
5:36 PM 23 OCT 2015
Start: 12:00 AM 23 OCT

Belt Run:          12:01:46
Belt Loaded:       12:01:46
Unloaded:          0:00:00
Above Low:         12:01:46
Start/Stops:       4
Weight:            2317.7 t
Average tph:       192
Av to Max tph:     19 %
E Total:           980.0 kWh
E Rate:            1.525 t/kWh
First Load:        8:34 AM
Last Load:         12:00 AM
-----
```

Report contents

Item	Description
Full Day Report	The type of report printed.
LOADRITE	This line is a configurable 16 character identifier for when there are multiple systems.
ID#	The ID number of the system, selected at installation.
Report Printed	The time and date the report was actually printed.
Start	The beginning of the 24hr period (time and date) that the report covers.
Belt Run	The hours : minutes : seconds the belt was running for.
Belt Loaded	The hours : minutes : seconds the belt ran at above the minimum load.
Unloaded	The hours : minutes : seconds the belt ran below the minimum load.
Above Low	The hours : minutes : seconds the belt ran at above the low load.
Start/Stops	The number of times the belt started.
Weight	The total weight moved during the period.
Average tph	The average rate (tonnes per hour) of the period.
Av to Max tph	The average rate compared to the expected maximum rate selected at installation.
E Total*	Shows the total energy use for the period (kWh, Liters or Gallons).
E Rate*	Shows the efficiency of throughput in terms of t/kWh, t/l or t/g.
First Load	The time of day the belt first ran loaded.
Last Load	The time of day the belt last had a load on it.

* Only displays if *Weigh by Energy* functionality is configured.

Time period

- ▶ The *Full Day Report* covers a 24 hour defined at the time of configuration (for example, the period from 12:00am to 12:00am) and is automatically printed once per day.
- ▶ The *Full Week Report* covers the period from Sunday 12:00am (midnight) to the next Sunday 12:00am and is automatically printed the next time the Integrator is turned on after the roll-over time.

Printing on demand

Both reports can be printed on demand by pressing , then  or  to select one of the following options:

- ▶ **Today** - Prints the data from the *Full Day Report* but only up until the current time. Titled *Part Day Report*.
- ▶ **Prev Day** - Prints the *Full Day Report* from the previous 24 hour period.
- ▶ **ThisWeek** - Prints the data from the *Full Week Report* but only up until the current time. Titled *Part Week Report*.
- ▶ **LastWeek** - Prints the *Full Week Report* from the previous week.

Press  or  until the required report is displayed, then press .

5.2.2. Automatic Printing

This function requires a LOADRITE printer to be connected.

Depending on your configuration, a record will be printed when certain events occur, as per the following table:

Event	Data Printed	Always / Optional
Integrator turned on	LOADRITE C-Weigh ID Number Product Number	Always Always Optional
Belt Start / Belt Stop	"Belt Started" and Time, or "Belt Stopped" and Time	Optional Optional
Product changed	"Change to Prod #:" and product ID Time	Always
Short Total cleared ( pressed)	Short Total Value Product Belt Run Time Belt Loaded Time ID Number User Data Time / Date Name (for example, Company or Belt name)	Always Optional Always Always Always Optional Always Optional
Long Total cleared	Long Total Values Product ID Number Time / Date Name (for example, Company or Belt name)	Always Optional Always Always Always
Zero performed ( pressed)	"Zeroed" message Time	Always

The data that is printed for each event will depend on options selected at installation. For further information, contact your LOADRITE distributor.

5.2.3. Timed Logging

This function requires a connection to LOADRITE InsightHQ (for example, via LOADRITE Communications Controller, or Radio Modem).

The LOADRITE C2850 | C2880 can be configured to log a short status record at a specific frequency. The frequency can be set to every 1, 5, 10, 15, 30, 60, 90 or 120 minutes. By using this logging function, it is possible to report on the productivity throughout the day via LOADRITE InsightHQ.

For further information, contact your LOADRITE distributor.

6. MENU OPTIONS

The *Menu* provides options for configuring the LOADRITE Weighing System.

- ▶ To display the *Menu*, press  from the *Run* screen.
- ▶ Press  or  to scroll up or down, then press  to select an option.
- ▶ To exit the *Menu*, press .

Menu Option	Description
Setup	Displays the <i>Install Menu</i> . <ul style="list-style-type: none"> ▶ For further information, contact your LOADRITE distributor.
Clock	Allows you to change the time and date.

6.1. SETUP

The *Install Menu* provides options for configuring the LOADRITE Integrator at installation. A security code is required to access this menu.

- ▶ For further information, contact your LOADRITE distributor.

6.2. CLOCK

The LOADRITE Integrator has an internal clock that can be used for inserting the time and date into printed data.

- ▶ You can display the time and date by pressing .

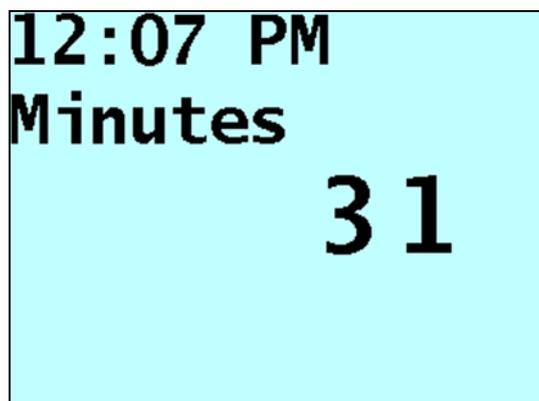
Time Synchronization

When the Integrator is connected to a LOADRITE Communications Controller with access to the Internet, the Integrator will automatically synchronize the clock with the correct Internet time, including automatically adjusting for daylight savings.

6.2.1. Setting the time and date

After selecting **Clock** from the *Menu*, follow the prompts to set the time and date, beginning with the Minutes:

TIP: You can return to the *Run* screen without saving the new time at any stage, by pressing .



- 1) Use the keypad to enter the minutes, then press . The *Hours* prompt will display.
- 2) Press  or  to select **AM** or **PM**.

- 3) Use the keypad to enter the hour, then press .
The *Month* prompt will display.
 - 4) Use the keypad to enter the month, (for example, enter **9** for **September**; **10** for **October**), then press .
 - 5) Use the keypad to enter the date, then press .
 - 6) Use the keypad to enter the year, then press .
- The new time and date will briefly display before the *Run* screen is displayed.

7. DIAGNOSTIC MENU

The LOADRITE C2850 | C2880 comes with a suite of diagnostic tools which check various functions and displays the results.

Sensor Input/Load cell Signal

➤  > *Loadcell*

The *Sensor Input* function allows each load cell signal to be monitored in real time. The percentage value is the load cell output. The message **-NT-%** indicates that there is no signal or that the load cell has been disconnected. If the message **-OR-%** (Over range) is displayed, the signal from the load cell is over range. Both of these indicate a fault.

Inputs and Speed Sensor Test

➤  > *Dig Inp*

The *Input Test* function displays the state of the speed sensor(s) and other digital inputs.

For Speed Wheels, the input should pulse **Active** as the sensing wheel rotates. If the wheel is rotated very slowly, the display should display **On** or **Off**. The speed will be displayed on the bottom line of the display. If the speed wheel is rotating and the indicator displays **Off**, this indicates a fault. Most standard LOADRITE C2850 | C2880 speed sensors use a proximity switch to measure pulses from a speed wheel. These proximity switches typically have a small lamp that should also flash as the wheel rotates.

For other Inputs, the input should pulse **Active** as the sensing wheel rotates. If the wheel is rotated very slowly, the display should display **On** or **Off**.

Power Supply Check

➤  > *Supply V*

The *Power Supply Check* function displays the input voltage. The input voltage should be between 12V and 32V and stable to within +/-0.5V.

Live Weight Display

➤  > *LiveWght*

This function displays the weight detected by the load cells. The weight is displayed in kg or lb. A test can be performed by loading a suitable weight (typically less than 100kg/220lb) onto the weighing 'idler' supported by the load cells. The display should show the approximate value of the weight.

NOTE: This test may not show the exact value of the test weight. Other factors such as exact load position, conveyor slope and belt tension may alter the true reading.

Internal Buffer

➤  > *Comms*

This function displays the usage percentage of the internal data communications buffer. This is the amount of data queuing and ready to be sent to LOADRITE InsightHQ. When a cellular modem, radio modem or Ethernet device is connected to the Integrator, the value should show **0%**. A value above **5%** indicates a possible breakdown of the data communication with LOADRITE InsightHQ.

▶ Press  to display the modem buffer.

8. APPENDIX A: SYSTEM SPECIFICATIONS

8.1. WEIGHING ACCURACY

Typical accuracy is 1% for most conveyors and weighing of a single idler. This may vary with different conveyor types, installation options and the physical condition of the conveyor and belt.

8.2. TRADE APPROVAL

The LOADRITE C2850 | C2880 systems are very accurate weighing systems, but not *Legal for Trade*.

Each country or state may have different rules on the definition of *Legal for Trade*. It is important that the operator/owner of the equipment understands these definitions.

8.3. POWER REQUIREMENTS

	C2850	C2880
Supply voltage	12 ~ 32V DC	88 ~ 264V AC
Supply current - LOADRITE Integrator	160mA typical, 350mA max.	800mA max @ 230V AC
Supply current - LOADRITE Printer	50mA standby, 4A peak	-
Transient capability	ISO 16750-2: 4.6.4: Figure 8 and Table 5, 24V alternator without load dump suppression	-
Withstand voltage	-	Input to Output: 3KV AC Input to Frame Ground: 2KV AC Output to Frame Ground: 0.5KV AC
Isolation resistance	-	Input to Output, Input to Frame Ground, Output to Frame Ground @ 500V DC, 25C, 70% RH: 100M Ohms
Frequency range	-	47 ~ 63Hz
Inrush current	-	Cold start: 33A/230V AC
Leakage current	-	<2mA/240V AC

8.4. PHYSICAL SPECIFICATIONS

	C2850	C2880
LCD display	Backlit; 3.8in (diagonal); QVGA.	Backlit; 3.8in (diagonal); QVGA.
Tactile keypad	Backlit; Numeric and special functions.	Backlit; Numeric and special functions.
Weight	1.5 kg (3.2lb)	-
Dimensions	W145 x L240 x D110mm (5.7 x 9.4 x 4.3in)	W280 x L360 x D169mm (11 x 14.2 x 6.7in)

8.5. ENVIRONMENTAL SPECIFICATIONS

	C2850	C2880
Operating temperature	-10°C ~ 50°C (14°F ~ 122°F)	-10°C ~ 50°C (14°F ~ 122°F)
Operating humidity	-	20 ~ 90% RH non-condensing
Storage temperature	-50°C ~ 100°C (-58°F ~ 212°F)	-20°C ~ 70°C (-4°F ~ 158°F)
Storage humidity	-	10 ~ 95% RH
Integrator	Protected to IP54.	Protected to IP65.

8.6. CLOCK

	C2850	C2880
Built-in clock	Hours, minutes, day, month, year.	Hours, minutes, day, month, year.

8.7. SIGNAL INPUTS AND OUTPUTS (INTEGRATOR)

	C2850	C2880
Weight sensor input	1 to 20mA (0-100%)	1 to 20mA (0-100%)
Speed sensor input	Pull-up resistor requiring switch to ground.	Pull-up to 12V, active switch to 0V at up to 800Hz.
Serial communications	RS232 to printer and other devices.	RS232 to printer or remote display. RS232 to modems or LOADRITE Communications Controller (LCC).

9. APPENDIX B: SPAN CALIBRATION ADJUSTMENT

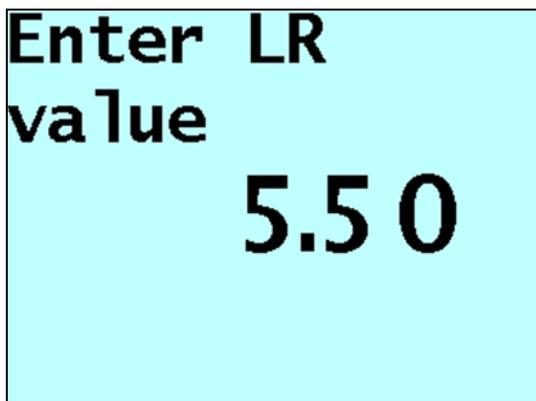
This function allows small changes to be made to the C2850 | C2880 calibration if a conveyor is modified or moved, or if no accurate test weight was available when the C2850 | C2880 was calibrated at installation time.

The adjustment is carried out by entering the known weight of a reference object and the corresponding total provided by the LOADRITE Integrator.

To perform the adjustment, a security access code must be obtained from your LOADRITE installer.

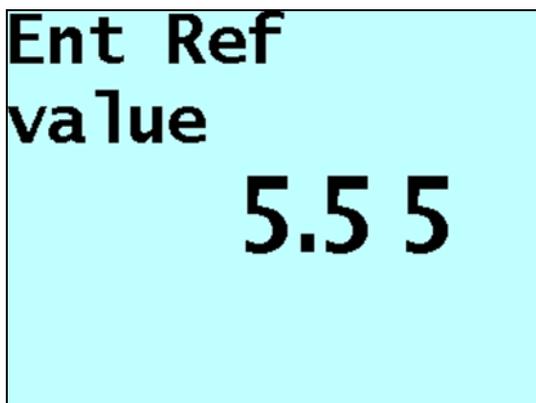
CAUTION The LOADRITE Weighing System alters its calibration every time this function is used. It is important that this function is only used once with a given set of data. If the same weights are entered again, the LOADRITE Weighing System will over-correct and its accuracy will be seriously impaired.

- 1) Press .
- 2) Select **Setup?**, then press .
- 3) Enter the security access code provided by the LOADRITE installer, then press .
The *Belt* screen will display.
- 4) Press  or  to select the belt that is to be calibrated, then press .
The *Enter LR value* screen will display.



Enter LR
value
5.50

- 5) Enter the total weight provided by the LOADRITE Integrator, then press .
The *Enter Ref value* screen will display.



Ent Ref
value
5.55

- 6) Enter the known weight of the reference object, then press .
The LOADRITE Integrator will briefly display the percentage of difference between the two values, before returning to the *Run* screen.

10. APPENDIX C: ERROR MESSAGES

Error Message	Description
Loadcell Error or LCERROR	This message is displayed when a load cell fault occurs and  is pressed.
NT (No Transducer)	Indicates that there is no signal or that the load cell has been disconnected.
OR (Over Range)	Occurs if one or more load cells are loaded over their maximum or have been damaged.
TiltSense Fault	Indicates that there is no signal or that the tilt sensor has been disconnected.

11. APPENDIX D: MAINTENANCE

For accurate weighing with the LOADRITE C2850 | C2880, it is advised to service the belt scale regularly. The following table gives an overview of tasks which should be carried out in regular intervals by the operator:

Item / Area	Task	Maintenance Interval				
		D	W	M	Q	Y
Zero adjustment	Press  before loading the belt with material.	✓				
Belt tension	The belt should touch the weighing idler and the two neighboring idlers when the belt is running empty.	✓				
Belt condition	Inspect visually for wear, tear and cuts.		✓			
Scale frame	Material build-up can cause weighing inaccuracy. Remove any material/debris from scale frame and between scale frame and belt frame. Determine the cause of build-up and take steps to prevent or reduce it.		✓			
Speed wheel	Inspect for wear, material build-up and belt. Check bearings.		✓			
Weighing idler	Inspect the weighing idler for wear and tear. If necessary replace idler or bearings.		✓			
Neighboring idlers	Inspect neighboring idler (left and right from weighing idler) for wear, tear and alignment with weighing idlers. If necessary replace idler or bearings, or align idlers.		✓			
Calibration	Perform a Span Calibration Adjustment.			✓		
Take-Up	Inspect for free travel (bearings, etc).			✓		
Cables / Wire terminations	Visually check all cables and wire terminations for corrosion, moisture, deterioration and tightness.					✓
Print cal	Print C2850 C2880 calibration settings after every change to the set-up configuration.					

Key:

- ▶ **D:** Daily
- ▶ **W:** Weekly
- ▶ **M:** Monthly
- ▶ **Q:** Quarterly
- ▶ **Y:** Annually

12. APPENDIX E: GLOSSARY

4

4-20 mA Module

The 4-20mA module is used to provide an analogue output signal for a PLC. It is an optional accessory.

A

Amplifier

Converts the electronic signal of the load cells from voltage to current.

Auto Zero Track

The Auto Zero Track (AZT) function automatically zeroes the conveyor belt when the load on the belt drops to close to zero.

D

Data Field

Customizable fields that allow you to label your weighing data to help you track and monitor your output, for example, by Truck, Customer, etc.

Display

A screen with adjustable backlighting for night and low-light operations. Used to display weight information and messages.

Docket

A printed record of a load.

- ▶ May also be known as *Ticket*.

I

InsightHQ

Advanced reporting and analysis software used to track productivity for the whole site or multiple sites.

Integrator

The LOADRITE user interface installed on a conveyor belt which the operator uses to record weights. When used in a loader or excavator, the term *Indicator* should be used.

Note: May also be known as *Console, Module, Loadrite, Loadrite Console, Head Unit, Clock, Computer, Scale*; however *Integrator* is the preferred term.

K

Keypad

A set of numeric or alphanumeric buttons on the Integrator which allow you to enter numbers, letters and other characters. Depending on the Integrator model, *Keypad* may also refer to other buttons along-side the numeric or alphanumeric buttons.

L

Life Total

The total amount of product loaded over the entire life of the scaleframe.

Load Cell

The load cell measures the vertical forces on the weighing idler.

Load Cell Amplifier

The load cell amplifier collects, merges and amplifies signals from the connected load cells, then passes the combined signal to the Integrator.

LOADRITE Communications Controller (LCC)

A modem used to transmit data from a LOADRITE Indicator or Integrator to an email address, a FTP site, LOADRITE MMS (via FTP), LOADRITE InsightHQ or LOADRITE Data Services.

LOADRITE Weighing System

Refers to the entire LOADRITE hardware and software weighing system installed at a site, including the Integrator, transducers, sensors, modem, InsightHQ software, etc.

Long Total

The total amount of product loaded over a long period, such as a shift or day.

- ▶ See also *Short Total*.

M

Material

- ▶ See *Product*.

Modem

A device used to transfer live payload and other data from the Integrator to a PC with InsightHQ installed. The modem may be a cellular modem (for example, LOADRITE Communications Controller modem), or a radio modem.

P

Printer

An optional accessory that provides a paper record of the weighing information collected by the Integrator.

- ▶ See also *Docket* or *Ticket*.

Product

Substance that comprises a load. For example, salt, coal, rock, etc.

S

Scale Frame

Connects the load cells with the idler and is attached to the conveyor frame.

Short Total

The running total amount of product loaded onto a truck or carriage. The Short Total amount will continue to accumulate until it is cleared using the *Clear* function.

Speed Sensor

The *speed wheel* or *speed sensor* provides a signal to the Integrator for the calculation of belt speed, flow rate and total weight. Pulses are generated by an internal proximity switch as the wheel rotates on the return belt.

Standby

A low-power mode which the Integrator can be set to between weighs.

T

Ticket

A printed record of a load.

- ▶ May also be known as *Docket*.

Z

Zero/Zeroing

Sets the weight of the conveyor belt to **0**. Zeroing is required to reset the weight of the belt from time-to-time. This is to avoid inaccurate readings due to the build-up of material on the scale frame or other changes to the conveyor belt itself.

13. APPENDIX F: LEGAL INFORMATION

Disclaimer

Trimble Navigation Limited operates a policy of on-going development. Please note that while every effort has been made to ensure that the data given in this document is accurate, due to continued product development, the information, figures, illustrations, tables, specifications, and schematics contained herein are subject to change without notice. Trimble Navigation Limited does not warrant that this document is error-free. The screenshots and other presentations shown in this manual may differ from the actual screens and presentations generated by the actual product. All such differences are minor and the actual product will deliver the described functionality as presented in this document in all material respects. If you find any errors in the document, please report them to us in writing.

Trimble Navigation Limited assumes no liability in connection with the use of any LOADRITE branded product.

Trimble Navigation Limited is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. Such modifications could void the user's authority to operate the equipment.

Compliance

Jurisdiction	Policy	Description	Top-Level Requirement
Australia / New Zealand	Radiocommunications (EMC Standards) Notice 2004 No. 2	Emissions (industrial)	EN 61000-6-4:2006
Canada	ICES-003:2012 Issue 5	Emissions (industrial)	EN 61000-6-4:2006
Europe	Electromagnetic Compatibility Directive 2004/108/EC	Emissions (industrial)	EN 61000-6-4:2006 EN 620:2010
		Immunity (industrial)	EN 61000-6-2:2006 EN 620:2010
United States of America	FCC Part 15 Subpart B - Radio Frequency Devices	Unintentional emission (industrial)	15.107(b) and 15.109(b)



This LOADRITE product is fully EMC (Electro-Magnetic Compatibility) compliant and is CE marked accordingly. A Declaration of Conformity, in accordance with the EMC Directive 89/336/EEC (and as amended) is available from Trimble Navigation Limited on request: info@loadritescales.com

Trimble Navigation Limited cannot be held responsible for modifications made by the User and the consequences thereof, which may alter the conformity of the product with CE marking.

This LOADRITE product is explicitly excluded from the scope of EU RoHS 2 Directive 2011/65/EU in article 2, section (4), paragraphs: (d), (e), (f) and (g).

The LOADRITE C2880 product has a 230V power supply which is approved to UL60950-1 and TUV EN60950-1.

This device complies with part 15 of the FCC Rules and Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This Class A digital apparatus complies with Canadian ICES-003 (A) / NMB-003 (A).

WARNING: This product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm. This Notice is being provided in accordance with California's Proposition 65.

Disposing of LOADRITE electronic equipment

This electronic product is subject to the EU Directive 2002/96/EC for Waste Electrical and Electronic Equipment (WEEE) which requires the separate collection, treatment, recycling and environmentally-sound final disposal of waste of electrical and electronic equipment. As such, this product must not be disposed of at a municipal waste collection point.

Please refer to local regulations for directions on how to dispose of this product in an environmentally friendly manner.



NOTES

MAN-81374-01