

StrongWeigh[®]

**WIRELESS ONBOARD
VEHICLE SCALE SYSTEM**





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SYSTEM OVERVIEW

The Strong Weigh wireless onboard vehicle scale system consists of:

- A gateway to communicate to all modular sensor devices and report to the display.
- One or more modular sensors (SWMS-IP-LC or SWMS-IP-AIR).
- A display to show total vehicle/trailer weight and individual axle weights
 - Strong Dedicated touchscreen display with optional printer
 - Bluetooth capable Android or IOS device using the “Strong Weigh Basic” App
 - Digital indicator (in development)

The Strong Weigh vehicle scale system is designed to be highly accurate with any suspension type while being simple to install and operate. Some systems can be operational within minutes.

Modular sensors with **NO** moving parts and **NO** wires to route leads to a system that is not susceptible to wear or damaged cables, a common occurrence in other axle load monitoring systems.

Other benefits of our system include:

1. Proven accuracy and reliability from the self-contained sensor and wireless transmitter
 - NO wires, NO mess, NO constant recalibration required
2. Vehicle underload prevention
3. Vehicle overload protection
4. Axle load monitoring
5. Simple trailer switching
6. Easy monitoring through our Android App
7. Fleet management capabilities
8. RS232 output for integration to existing systems

When swapping tractor and trailer combinations, the system uses the calibration data stored in our cloud data server to quickly combine multiple trailers to a tractor. Eliminating the need to recalibrate every time the trailers are swapped.

1. GATEWAY DEVICE

The Gateway is the central hub for the Strong Weigh System allowing for simultaneous connection with up to 23 Strong Weigh Modular Sensors, offering plenty of expansion opportunity.

With a built-in amplifier the Gateway has a usable range to the modular sensors of over 140ft of obstructed distance. This distance is from real world testing with no-line of sight, meaning the sensor is placed on an axle of a vehicle with the Gateway in the cab. In less obstructed situations the range extends to over 1,000ft.

A small size (approximately 4.5" x 3.5" x 1.25") and a cable to connect to the vehicle's diagnostics port for vehicle data makes mounting the Gateway simple and convenient.

Integrated GPS, accelerometer, and offline data logging functionality combines seamlessly with our Fleet Management software (Page 7).



2. SWMS-IP-LC

These fully wireless, easy-to-install modular sensors allow for mounting directly to a vehicle axle in the optimum location for highly accurate measuring of the weight supported. Modular sensors can be mounted in 15 minutes!

Securing the sensor is easy with the slotted design allowing for heavy duty straps to securely hold it in place.

The battery is easily replaceable for quick maintenance when needed. Battery life varies by application, typical vehicle use will last in excess of 5 years!

Weatherproofing is accomplished with the use of a high strength neoprene rubber, and fully encapsulated electronics.

The small form factor antenna gives an excellent range (over 140ft of obstructed distance, in less obstructed situations the range extends to over 1,000ft).



3. SWMS-IP-AIR

These fully wireless, easy-to-install pressure sensors allow for teeing into the air suspension anywhere on the vehicle. A single sensor can be installed in under 1 minute!

The battery is easily replaceable for quick maintenance when needed. Battery life varies by application, typical vehicle use will last in excess of 10 years!

Weatherproofing is accomplished with the use of a SAE-16 style cavity and O-ring, along with fully encapsulated electronics.

The small form factor antenna gives an excellent range (over 140ft of obstructed distance, in less obstructed situations the range extends to over 1,000ft).



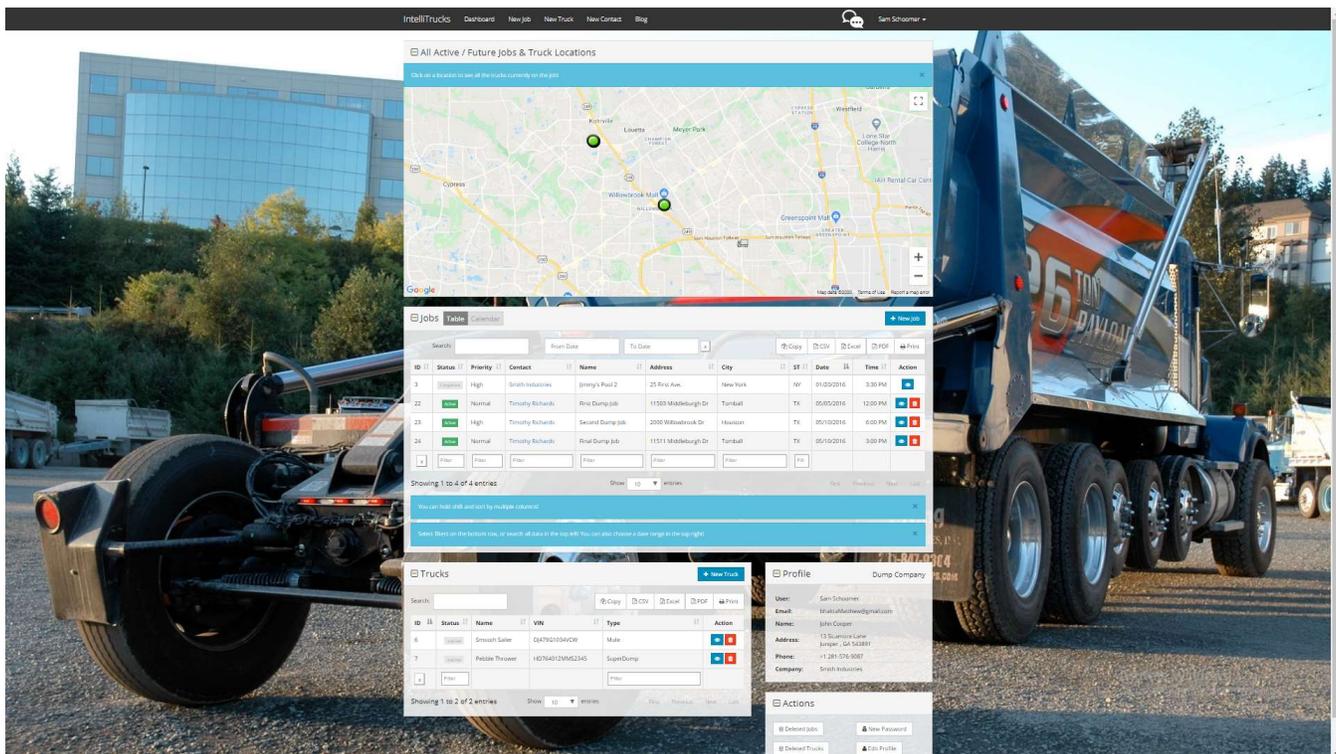
4. INTELLITRUCK FLEET MANAGEMENT

The Intellitruck Fleet Management is an online dashboard to access all your fleet information, from maintenance schedules, current vehicle location and weight, current, past and future job details, all the way to logbooks for a specific truck and driver.

Intellitruck Fleet Management Offers:

- Job creation and vehicle assignment
 - Efficient dispatching with the ability to filter items such as work status, truck type, current schedule, GPS location and weight.
- Simple vehicle reassignment/addition/removal to jobs
 - Direct Truck Messaging and commercial truck specific navigation allow you to instantly redirect your driver to his next destination.
 - Vehicles will have access to jobs assigned to them with all information related to the job that the dispatcher has given. GPS turn by turn is a click away for the driver to start the job.
- Strong Weigh's precision accuracy combined with GPS technology can document where pick up, delivery, and any measurable change in weight occurs, to ensure to correct and complete load reached its destination.
 - Next level ability to analyze, monitor and review the data to improve efficiencies and mitigate theft.
 - Geo-Fencing combined with weight data provides assurance that delivery and pick up were properly executed. Giving you a new level of internal accountability and improved customer service
 - Current location of all vehicles viewable by the dispatcher
- Intellitruck gives you the ability to evaluate each driver's behavior, including vehicle speed, corner turning, braking, fuel economy, and payload efficiency.
 - It's the kind of data that helps you make bad drivers good and good drivers better while at the same time giving you a higher-level view of the entire fleet, equipping you to make informed management decisions.
 - Optional Dash and driver cams can also be integrated for additional insight and accountability.

- Current and historical vehicle weight and payload display
- Standard Vehicle diagnostics puts you one step ahead of potential issues. Ability to create a preventative maintenance plan based on truck usage
 - With the Strong Weigh scale data, you can better anticipate additional wear and tear from trucks with heavy usage versus those carrying lighter loads.
 - And with the optional Documenting feature, you have quick access to all logged maintenance and inspections from daily, weekly, yearly and even unscheduled repairs.
- Intellitruck can also help meet the ELD mandate. With automatic logging of drive times and customizable alerts both the driver and fleet manager know when a break is required.
- Records vehicle data in the event of excessive G-force such as hard braking or taking a turn too quick (trigger level is dispatcher customizable).



IntelliTrucks Dashboard New Job New Truck New Contact Blog Sam Schooner

Job ID# 3 - Jimmy's Pool 2 Completed

Total Material Delivered

Sand: ██████████
Cement: ██████████

Truck Delivery Data

ID #1 - Bertha - SuperDump Job Complete

Time: 5:33 am - 5:02 am
Total Material: 90249

ID #3 - Betsy - Gunite Job Complete

Time: 5:33 am - 5:02 am
Total Material: 90239

ID #4 - Bob - Gunite Job Complete

Time: 5:33 am - 4:55 am
Total Material: 90227

Job & Truck Location

You can only view the truck locations while the job is active.

Map showing location: Bhakti Center, Company's Office

Details

Name:	Jimmy's Pool 2	Sand Order:	2000
Address:	25 First Ave, New York, NY 10003	Cement Order:	1500
Scheduled Start:	01/20/2016 3:30 PM	Actual Start:	01/20/2016 3:30 PM
Scheduled Stop:	01/20/2016 5:00 PM	Actual Stop:	04/16/2016 12:30 PM
Cost Estimate:	6500	Actual Cost:	10070

Client Contact

Company Name:	Smith Industries	Name:	John Cooper
Address:	13 Scamore Lane, Juniper, GA 54391	Phone:	+1 281-576-9087
Email:	bhaktimachine@gmail.com		

Creator

Creation Date:	01/19/2016 4:01 PM	Name:	John Cooper
Company Name:	Smart Systems Gunite Inc.	Phone:	+1 281-576-9087
Address:	11502 Middleburg Dr., Tomball, TX 77377		
Email:	Conner.mel@sig.com		

Job Details

Job ID: 3
Job Name: Jimmy's Pool 2
Status: Completed

Truck Details

Truck ID: 3
Truck Name: Betsy - Gunite
Status: Job Complete

Material Delivered

Sand: ██████████
Cement: ██████████

Map & Location

Map showing route and location: Bhakti Center, Company's Office

Client Contact

Company Name:	Smith Industries	Name:	John Cooper
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5. STRONG WEIGH BASIC APP

The Strong Weigh Basic application provides access to the incredible accuracy of the Strong Weight Modular Sensors. Allowing for the creation of specific weight groups for all kinds of axle configurations. With it's easy to understand layout, knowing your weights is simple.

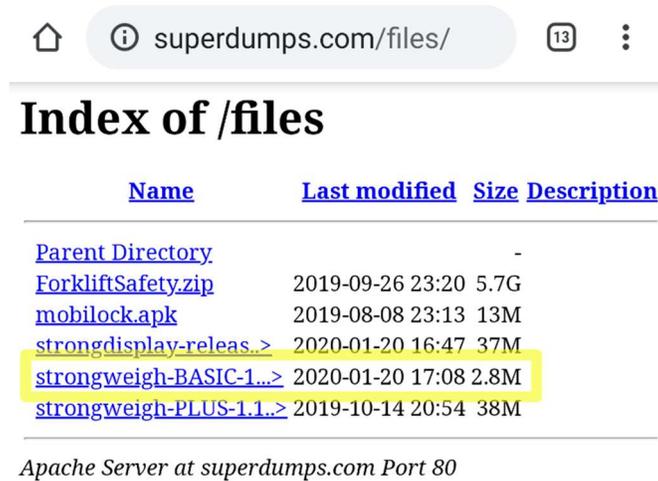
The Strong Weigh Basic application allows for:

- Monitoring current individual axle group weights and total vehicle weight
- Easy grouping of sensors together and labeling them for quick recognition
- Combining grouped sensors into a single weight value
- Individual sensor group calibrations
- Simple trailer setup, calibration, and switching between trailers thanks to our cloud data storage
- Data Logging capability which records the weights, vehicle location, and calibration information. This data can be configured to auto-delete, is encrypted, and retrieval is under the control of the owner

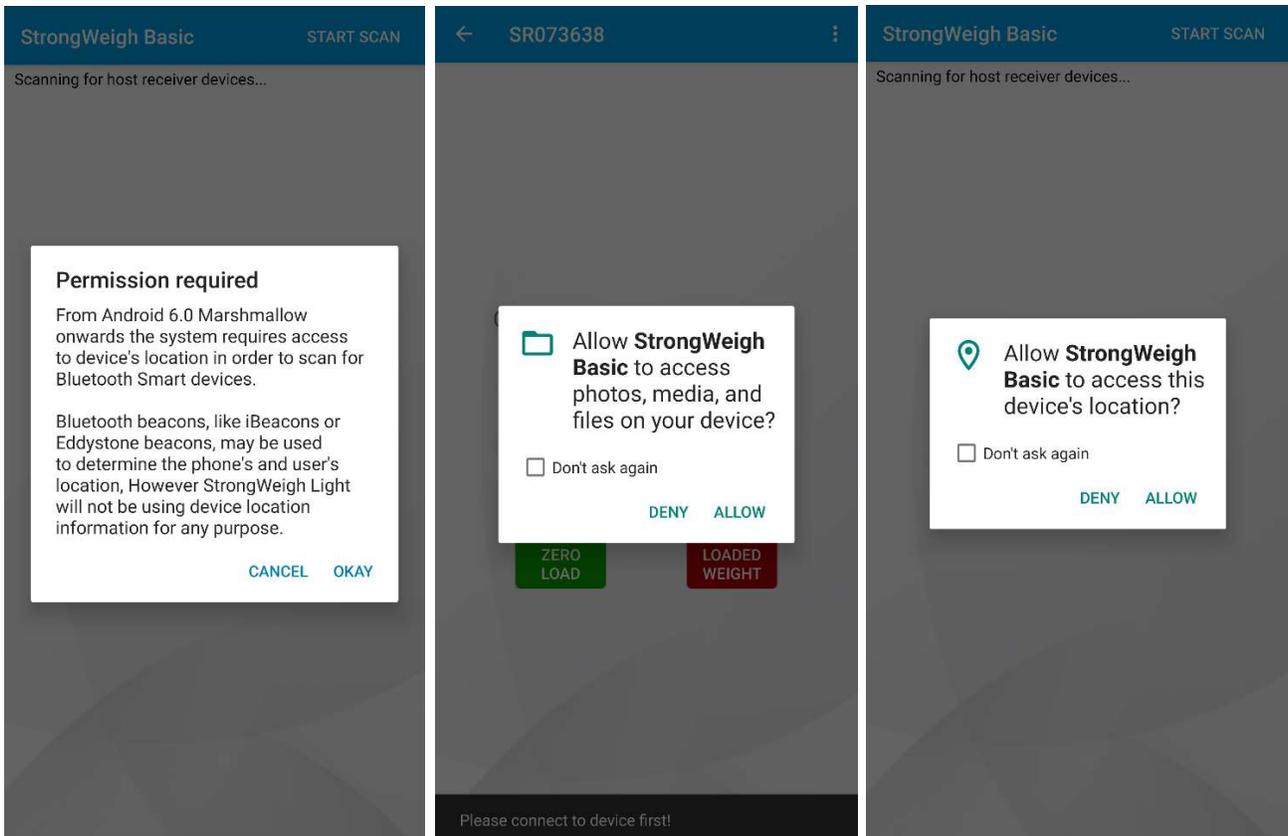
Initial App Setup

After the Strong Weigh Modular Sensor(s) and Gateway are installed and powered on:

- 1) Install the StrongWeigh Basic app from Superdumps.com/files



- 2) Open the app and allow StrongWeigh to access Bluetooth and device Location.



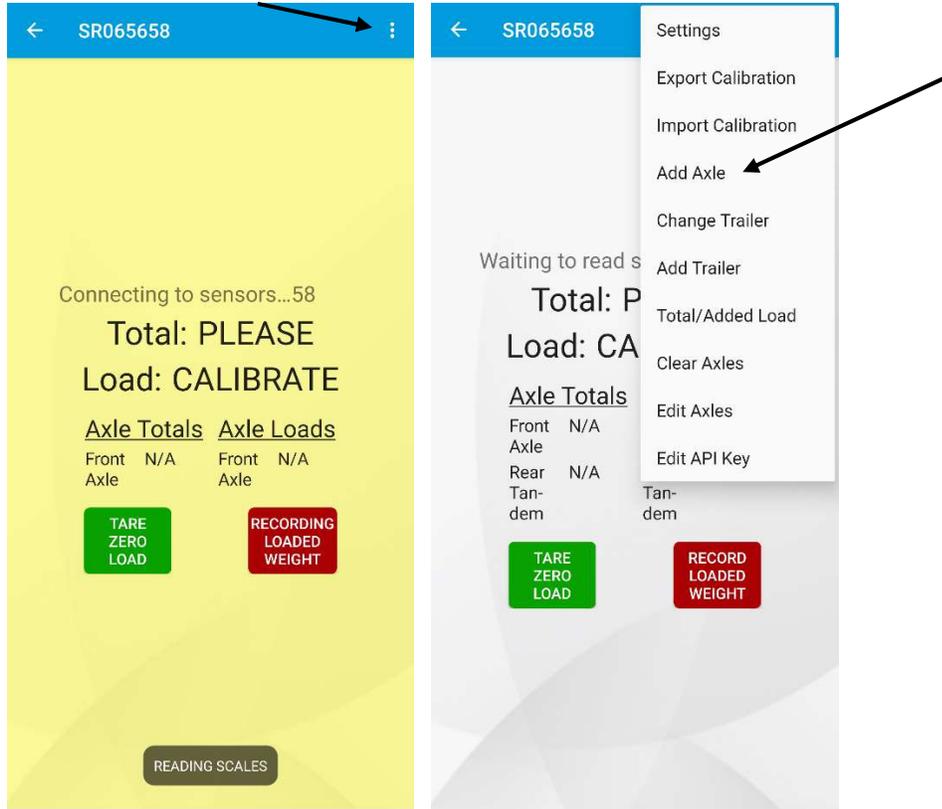
- 3) Locate the Gateway's ID and select the correct Gateway Receiver ID from the list shown. To ensure consistent connection it is recommended that you pair your device with the Gateway. *If you do not see your device on the list, be sure it is correctly wired for 12V ignition power and that it has a proper ground. Return to the app and press the "START SCAN" button on the top right-hand side of the screen. In this example, the Gateway's ID is SR065658.*



- 4) Once the app is connected to the StrongWeigh Host for the first time it will show the following screen, asking for you to input your Truck VIN and API key. The API key is assigned for each vehicle and acts as the password to access our server.

The screenshot shows a dark grey background with a white text box. The text box has a title 'Enter API Key and Truck VIN' and two input fields. The first field is labeled 'API Key' and the second is labeled 'Truck VIN'. Below the input fields is a grey button with the text 'SAVE'.

- 5) After logging in the system will ask to be calibrated before it will show weight values. Click the (three vertical dots) settings icon in the upper right-hand side and select “Add Axle”.



- 6) Input the name you want to give this axle group, the VIN of the vehicle for this axle group, how many sensors are on this axle group, and the position of the axle group (1 is front most group). Example: 1 - Front Axle, 2 – Rear Tandem, 3 – Trailer Axle. Touch save when finished.

The image shows three screenshots of the "Enter Axle Information" form. The first screenshot shows empty fields. The second screenshot shows "Front Axle" with 1 sensor at position 1 and VIN "test1234". The third screenshot shows "Rear Tandem" with 4 sensors at position 2 and VIN "test1234".

Name	Num of Sensors	Position	VIN
Name	Number of Sensors	Position	VIN
Front Axle	1	1	test1234
Rear Tandem	4	2	test1234

- 7) A list of Sensor ID's will pop up according to the number of sensors assigned to this axle group. Input the SWMS ID's in the appropriate fields. *In the event of a sensor becoming damaged or unresponsive during the life of the vehicle, there is a disable sensor check box that will recalculate the total weight based on values from the remaining sensors.*

- 8) For now, we will skip the Empty Weight, Calibrate 20%, and Calibrate Loaded Weight screen by hitting save on the respective prompts.

- 9) Repeat steps 5-8 for additional axle groups
 10) Once all axles are made and the sensors assigned accordingly, proceed to System Calibration on page 15.

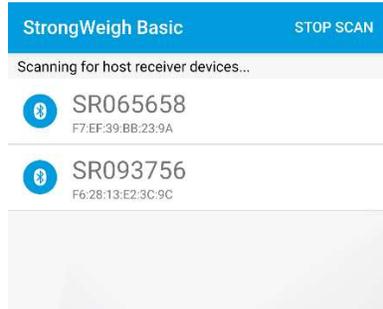
System Calibration

Before the system can be calibrated, the sensors must have first been properly installed and cycled as described in the appropriate sensor installation guide.

- 1) Be sure all tires are properly inflated.
- 2) Obtain an accurate empty weigh reading of the vehicle (Ex. CAT Scales, Platform scales, DOT etc.) and input the appropriate axle weights on the “Record Empty Weight” screen and then press “Save”. **THE ACCURACY OF THE SCALES USED TO CALIBRATE WILL AFFECT THE ACCURACY OF THE SYSTEM.**
- 3) Load the vehicle to approximately 20% of the maximum payload. (approximately 4-tons loaded for a 20-ton capacity truck).
- 4) Obtain an accurate 20% loaded weigh reading of the vehicle. Go to Edit Axles and input the appropriate axle group weights on the “Calibrate 20%” screen then press “Save”
- 5) Return the vehicle back to the loading location and park as level as possible with the steering wheel in the straight position.
- 6) With the **parking brake disengaged and with all auxiliary axles raised**. Go to Edit Axles and with all applicable axle groups progress through the prompts to the “Calibrate 20%” screen then press and hold “Read Sensors” until the confirmation shows on the bottom of the screen, then press “Save”. Repeat for all applicable axle groups.
- 7) **Without Moving the vehicle**, load the vehicle to as close to 100% capacity as possible.
- 8) **After loading and before moving** the vehicle and with the **parking brake disengaged and with all auxiliary axles raised**. Go to Edit Axles and with all applicable axle groups progress through the prompts to the “Calibrate Loaded” screen then press and hold “Read Sensors” until the confirmation shows on the bottom of the screen, then press “Save”. Repeat for all applicable axle groups.
- 9) Obtain an accurate loaded weigh reading of the vehicle. Go to Edit Axles and with all applicable axle groups progress through the prompts to the “Calibrate Loaded” screen then input the Loaded weight of the axle group. Then press “Save”, Repeat for all applicable axle groups.

Normal Operation After Calibration

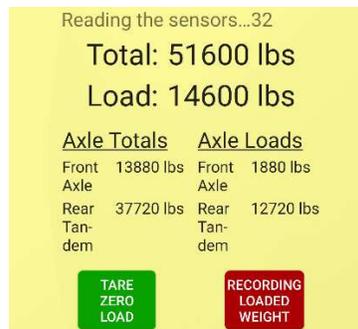
1. Open StrongWeigh App.
2. Select a host receiver to connect to.



3. Park the vehicle at the loading location. For the most accurate scale readings, park as level as possible with the steering wheel in the straight position, press the “Tare Zero Load” button. This will tare the total weight shown to the calibrated empty truck weigh.



4. Load the vehicle. Before moving, press the “Record Loaded Weight” button. To see the current weight of the vehicle.



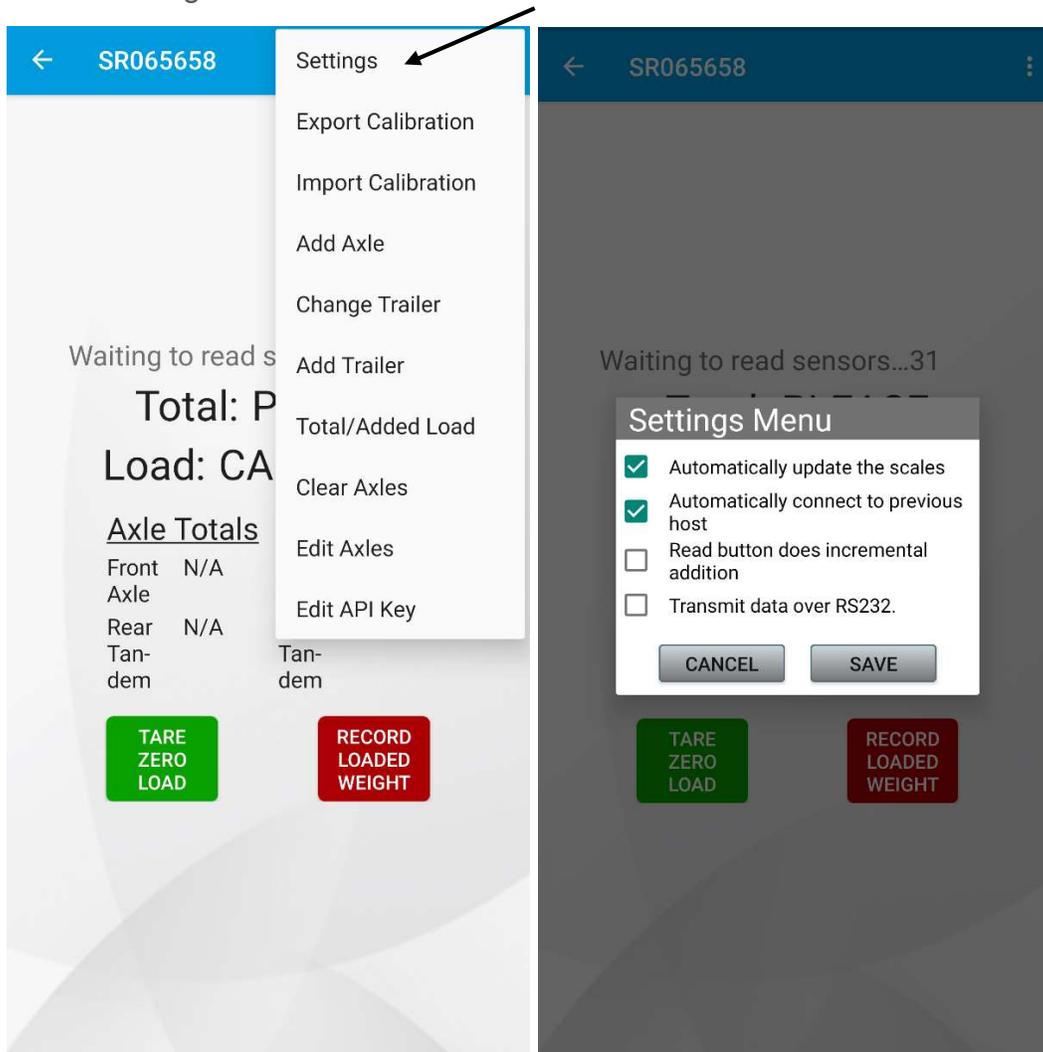
Main App Settings

Automatically update the scales: Scales will be read, and the weight updated and recorded every 1 minute if conditions for a scale read are appropriate.

Automatically connect to previous host: When opening the StrongWeigh Basic app, you will be automatically connected to the previous Host that was selected. If you need to connect to another StrongWeigh Host, you will need to deselect this option.

Read button does incremental addition: Adds a 3rd button to the main screen, the green “Tare Zero Load” is used when the vehicle is empty. The blue button is used starting from the second addition of weight to the vehicle before adding that second weight.

Transmit data over RS232: Allows the Host to send the sensor values using RS232 to an external device for integration use.





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