



SW500 Wired Scale System Users Manual

**Intercomp Co.
3839 County Road 116
Medina, MN 55340, U.S.A.**

**(763)-476-2531
1-800-328-3336
Fax 763-476-2613
www.intercompracing.com**

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Introduction

Specifications

Controls

General:	On/Off, Zero, Backlight, Print, Clear, Actual, Target, Compare, Store/Enter, LF, RF, LR, RR, CG, numeric keypad
Display:	4 x 20 character(0.50") alphanumeric LCD readout

Electrical

Voltage:	6-15VDC
Battery:	9V alkaline (standard)
Battery life:	(w/ backlight off): 80 hours with standard alkaline battery
Filtering:	Analog and Digital. Average of several internal weights gives steady readings for unstable loads
Input/Output:	Input: 4 analog channels Output: digital serial RS232 and USB

Performance

Speed:	1-3 sec to typical reading (static)
Accuracy:	$\pm 0.1\%$ of applied load or \pm display graduation, whichever is greater
Divisions:	SW Standard: 6000 lb/ 2800 kg capacity: graduation = 1 lb/0.5 kg SW Kart: 1600 lb/ 725 kg capacity, graduation = 0.1 lb/0.05 kg SW 8.8K: 8800 lb/ 4000 kg capacity, graduation = 1 lb/0.5 kg SW 20K: 20000 lb/ 9070 kg capacity: graduation = 1 lb / 0.5 kg SW Motorcycle: 1000 lb / 500 kg cap: graduation = 0.5 lb / 0.2 kg

Environmental

Humidity:	10 to 95% non-condensing
Temperature:	Storage: -40° C to +75° C. / -40° F to +170° F Operating -10° C to +40° C. / +14° F to +104° F

Physical

Standard and Motorcycle Pad	Dimensions: Weight:	15" x 15" x 2.5" / 381 X 381 X 635 mm 23 lb / 10.5 kg
SW 8.8K and 20K Weigh Pad	Dimensions: Weight:	15" x 15" x 4" / 381 x 381 x 100 mm 35 lb / 15.9 kg
SW Kart Weigh Pad	Dimensions: Weight :	10" x 10" x 2" / 254 x 254 x 510 mm 6.6 lbs / 3.0 kg
Indicator (with cables)	Dimensions : Weight:	11" x 8" x 2.7" / 279 x 203 x 685 mm 8 lbs / 3.6 kg
Carrying Case	Dimensions: Material:	17" x 11" x 7" / 432 x 279 x 178 mm ABS structural foam

Optional Equipment

15" x 15" Ramp, aluminum, set of four (100342)

This option allows you to drive the car onto the pads in the case that you are not using a setup rack or jacking the car up.

Lightweight composite ramps (171002)

Lightweight composite ramps with roll-off area (171005)

NiMH Rechargeable Battery (9V) (330101)

Tape Printer (340105)

An external tape printer can be connected to the control box. Call Intercomp for details.

Printer Cable, (170002)

Provides RS232 connection, 25 pin connector

Computer Cable (170136)

Replacement Cables, set of 4 (170135)

- Replacement Cable, red (560036)
- Replacement Cable, green (560038)
- Replacement Cable, white (560037)
- Replacement Cable, black (560035)

Declaration of Conformity



We, Intercomp Company
3839 County Road 116
Medina, Minnesota 55340 USA

Declare under sole responsibility that the (SW500) E-Z Weigh Scale to which this declaration relates meets the essential health and safety requirements and is in conformity with the relevant EC Directives listed below using the relevant section of the following standards and other normative documents.

1999/5/EC - Essential requirements and other relevant requirements for Radio and telecommunications terminal equipment

2001/95/EC - General product safety

2002/96/EC as amended by **2003/108/EC** - WEEE directive

2004/108/EC – EMC Directive

2006/66/EC - Batteries and accumulators directive

2006/95/EC – Low Voltage Directive

2009/23/EC - Non-automatic weighing instruments

2009/125/EC - ECO Design – Recast

2011/65/EU - RoHS – Recast

EN 55011:2009, Class B – Limits and methods of measurements of electromagnetic disturbance characteristics of industrial, scientific and medical (ISM) radio frequency equipment.

EN61000-6-1:2007 - Generic standards, Residential, commercial and light industry environment.

EN61000-6-2:2007 - Generic standards, Immunity for industrial environments.

EN61000-6-3:2007 - Generic emission standard, Domestic, commercial and light industry environment.

EN 61010-1/IEC 1010-1 - Safety requirements for electrical equipment for measurement, control and laboratory use.

This product complies with all safety-relevant provision referring to protection against electrical hazards and other hazards, such as mechanical hazards, fire hazards, noise and vibration. The safety issues of this measurement equipment have been evaluated under the self-certification provisions of the relevant directives.

EN 45501:1992 AC:1993 - Specification for metrological aspects of non-automatic weighing instruments

The related technical construction files are held for inspection in the U.K. at Intercomp Europe Limited.

The CE mark, Red M and WEEE marks must be affixed as required in the directives.

A handwritten signature in black ink that reads 'Mark Browne'. The signature is written in a cursive style with a small 'B' and 'r' that are particularly prominent.

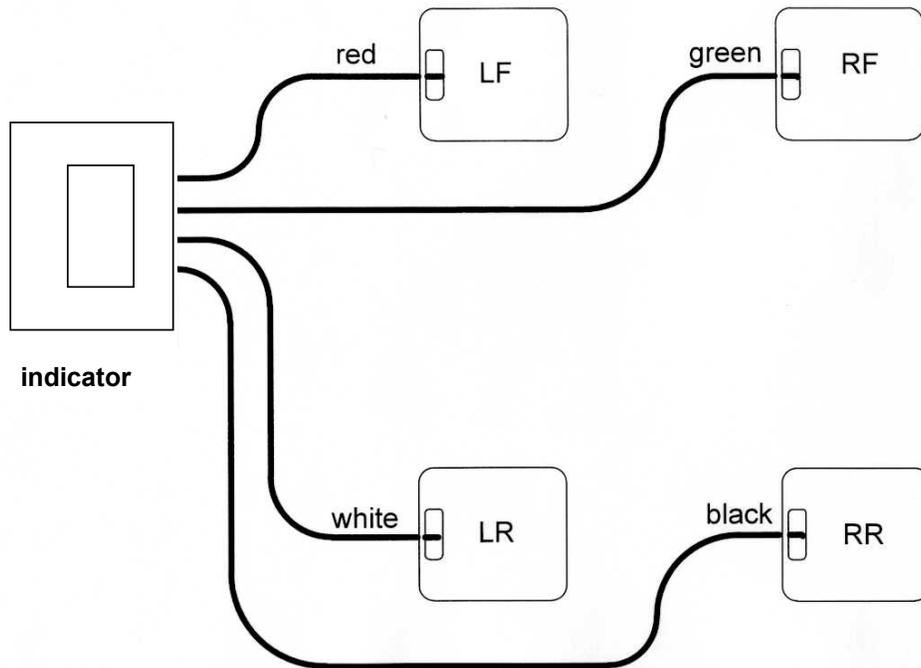
Mark Browne / Quality Manager
March 21, 2013

Setup

Note: This manual covers the operation of the RFX indicator with different RFX scales. If you have the Precision Hub Plates, refer to the Hub Plate users manual for proper set-up instructions and to the “Quick Start” sections that follow this section.

NOTE: Motorcycle mode: For motorcycle scale sets, use the LF (red cable) pad for Front, and the LR (white cable) for Rear. Refer to the “Special Display” section for motorcycle operations.

System



System setup configuration

1. Place the four pads near their appropriate car tire: LF by left front, RF by right front and so on.
2. Connect one end of each cable to a pad: LF-Red cable, RF-Green cable, LR-White cable, RR-Black cable.
3. Turn the control box on.
4. If the pad readings are not zero, press the ZERO key.
5. Jack the car onto each pad.

Operations

There are automotive and a kart versions of the scale systems. The Overview and Display sections of this manual are designated as automotive or kart.

Quick Start (normal)

Setup the scales as described in SETUP on previous page. Turn the indicator and scales 'on'; after a copyright screen you will see a display screen to choose a display format. Press and hold the on button when turning the indicator on to display the copyright screen longer

1:OVAL	5:DRAG/RALLY
2:CUP/NW	6:WHT+%
3:ROAD RACE	7: TOTAL
4:DIRT TRK	8: TOTAL + 4

Note: If you have a Kart scale, the second display format is "Kart" instead of CUP/NW

Most of the displays are fixed display formats. However, choice 3 (Road Racing) is a dynamic display format which allows the user to choose which wheel weights will be totaled and shown as the selected weight.

The four weights that are on the first 2 lines are the individual wheel weights. The weights are displayed in the same pattern as a car: left front, right front, left rear, right rear. You can select or deselect a pad by pressing the LF, RF, LR, RR (left front, right front, left rear, right rear); each time you press the button a select arrow will turn on and off to the right of that pads weight. The third line shows the selected weight and the percentage of selected weight to the total weight. The fourth display line shows the total weight on all four pads.

Quick Start (HUB MODE)

This section applies only to customers with the Precision Hub Plate systems. When using HUB MODE, please start with the “Quick Start (Normal)” instructions first for the initial screen setup. The following section discusses HUB MODE and describes how to enter the hub compensations for each wheel: Tire Weights and Hub Assembly Weights.

HUB MODE allows users to compensate for the weight difference of the Precision Hub Plate System and their wheel and tire assemblies.

The compensation formula used by the indicator is as follows:

**Displayed weight (for each corner) =
[Uncompensated Weight* + Tire Assy Weight – Hub Plate Weight]**

Note on zeroing: If there are weights entered for the hub plate and tire assemblies, pressing the “zero” button will zero the system but the display will show the difference between the tire and hub plate for each wheel position. This may result in the indicator zeroing to a non-zero value!

If using the Precision Hub Plate System, setup the system as described in the SETUP section of the Precision Hub Plate System User’s Manual.

NOTE: Prior to entering into Hub Mode, weigh each wheel and tire and the Hub Plate assembly that will replace it. Record these values for future use.

Hub Mode Entries

1. Turn the indicator and scales 'on'.
2. Press ZERO and PRINT to bring up the following menu: (HUB MODE will show “OFF” if currently disabled or “ON” if enabled):

```
1. SWITCH lb/kg
2. READ ONLY (OFF)
3. HUB MODE (OFF)
(HIT ACTUAL TO EXIT)
```

3. Press “3” to enter the HUB MODE screen:

```
1.HUB COMP (OFF)
2.ENTER TIRE/HUB PLT
(HIT ACTUAL TO EXIT)
```

4. Press “1” to enable the HUB MODE. (HUB COMP should switch to “ON”).

5. Press “2” to enter the Tire assembly weights and the Hub Plate weights. You will be prompted to enter the 4 tire assembly weights one at a time. You will then be prompted to enter the 4 Hub Plate weights one at a time. After doing this the screen will return to the HUB MODE screen

Once HUB MODE has been enabled, the display will show “HUB COMPENSATION ENABLED!” briefly at power-up whenever the indicator is turned on. This is a reminder that the system is operating in this mode, and the weights are being compensated accordingly.

Display Contrast

Adjusting the contrast can improve the readability of the display when viewed from different angles. The display contrast is adjusted by holding down on the backlight button and one of the wheel buttons together. If holding the RF or LF button with the backlight button, the contrast will be increased. If holding down on the RR or LR button, with the backlight button the contrast will be decreased.

Overview (Automotive)

The SW Wired scale system is designed to independently measure the force applied by each tire of a car. This is referred to as the ACTUAL weight applied by each tire. The user can enter the desired corner weights, which will be displayed as the TARGET weight. The COMPARE weight values are the amount of weight that needs to be added or subtracted to a corner weight to achieve the TARGET weight. (When the COMPARE value is negative (-) it implies that the ACTUAL weight is greater than the TARGET weight.)

The SW scale can also perform a number of calculations automatically. Rather than displaying the wheel weights (Actual, Target, or Compare) the user can select to display the weights as a percentage of the total weight, or as a percentage and weight. Additionally the user can select pads in groups (such as left front and left rear, or left rear and right front) and the scale will calculate what percentage of the total weight that group is.

The scale has eight default display modes:

OVAL TRACK	The following parameters are displayed: Each wheel weight, left side and rear %, cross %, and the total weight.
CUP/NW	The following parameters are displayed: Each wheel weight, right side weight, front %, cross %, and the total weight.
ROAD RACING	Choice 3 (Road Racing) is a dynamic display format which allows the user to choose which wheel weights will be totaled and shown as the selected weight. Screen shows each wheel weight, selected weight, selected % to total weight, and total weight.
DIRT TRACK	The following parameters are displayed: left wheel weight and %, rear weight and %, cross weight and %, and the rear bite.
DRAG/RALLY	The following parameters are displayed: Each wheel weight, front %, rear %, and the total weight.
WHEELS AND PERCENTAGES	The following parameters are displayed: Each wheel weight, front right %, left %, right %, wedge, right rear %, and total weight.
TOTAL	This option will provide a quick snapshot of the total weight applied to all of the pads in the system.
TOTAL + 4	This option provides total weight on all of the pads and gives each individual weigh applied to each pad.

Overview (Kart)

The SW series scale system is designed to independently measure the force applied by each tire of a kart. This is referred to as the ACTUAL weight applied by each tire. The user can enter the desired corner weights, which displays as the TARGET weight. The COMPARE weight values are the amount of weight that needs to be added or subtracted to a corner weight to achieve the TARGET weight. (When the COMPARE value is negative (-) it implies that the ACTUAL weight is greater than the TARGET weight.)

The SW500 series scale can also perform a number of calculations automatically. Rather than displaying the wheel weights (Actual, Target, or Compare) the user can select to display the weights as a percentage of the total weight, or as a percentage and weight. Additionally the user can select pads in groups (such as left front and left rear, or left rear and right front) and the scale will calculate what percentage of the total weight that group is.

The scale has eight default display modes:

OVAL TRACK	The following parameters are displayed: Each wheel weight, left side and rear %, cross %, and the total weight.
KART	The following parameters are displayed: Each wheel weight, left side %, front %, cross %, and the total weight.
ROAD RACING	Choice 3 (Road Racing) is a dynamic display format which allows the user to choose which wheel weights will be totaled and shown as the selected weight. Screen shows each wheel weight, selected weight, selected % to total weight, and total weight.
DIRT TRACK	The following parameters are displayed: left wheel weight and %, rear weight and %, cross weight and %, and the rear bite.
DRAG/RALLY	The following parameters are displayed: Each wheel weight, front %, rear %, and the total weight.
WHEELS AND PERCENTAGES	The following parameters are displayed: Each wheel weight, front right %, left %, right %, wedge, right rear %, and total weight.
TOTAL	This option will provide a quick snapshot of the total weight applied to all of the pads in the system.
TOTAL + 4	This option provides total weight on all of the pads and gives each individual weight applied to each pad.

Automotive Displays

If you have a SW series Kart Scale, see the following section titled "Kart Displays".

Oval Track

Note:
= Cross = LR + RF

750	725 lb	← units
950	525 A	← A = actual T = target C = compare
LEFT 57.63% C 56.78%		
REAR 50.00%	2950	← total

CUP/NW

750	725 lb
950	525 A
RIGHT 1250 CR 56.78%	
FRONT 50.00%	2950

Road Racing

750	725	← selected weight
950 ←	525 A	
SELECT: 1675	56.78%	
TOTAL: 2950 lbs		

selected total →

Automotive Displays, continued

Dirt Track

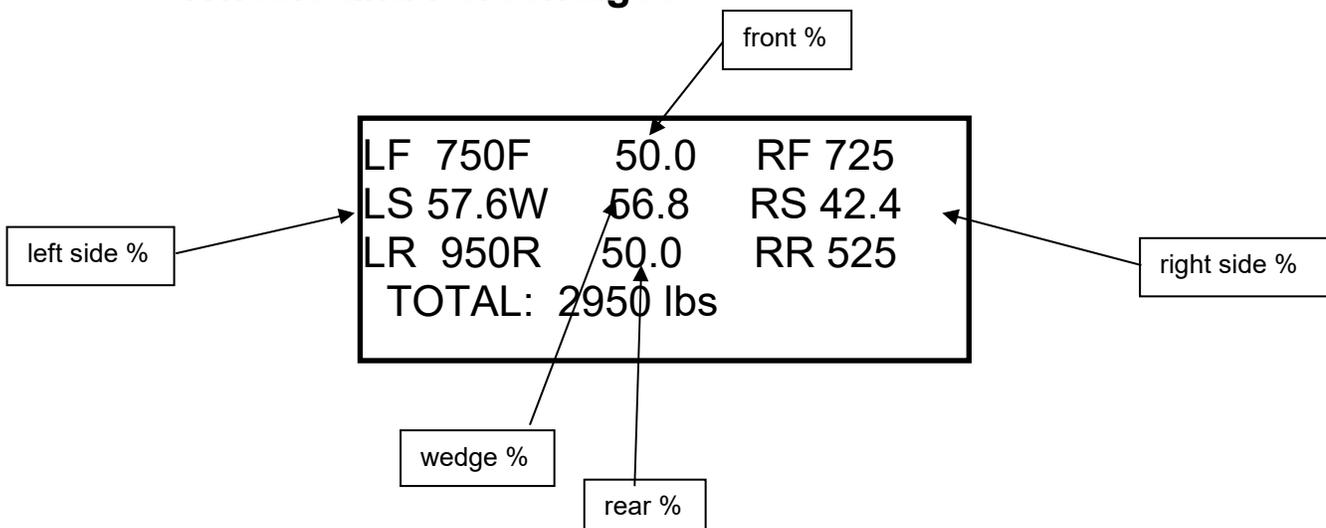
LEFT	1700	57.63%
REAR	1475	50.00%
CROSS	1675	56.78%
REAR BITE	425	A

Note:
Rear Bite = LR - RR

Drag/Rally

750	725 lb
950	525 A
FRONT	50.00%
REAR	50.00% 2950

Wheels and Percentages



Automotive Displays, continued

TOTAL

TOTAL: 2950 lbs

TOTAL + 4

750	TOTAL: 2950 lbs	725
950		525

Kart Displays

Oval Track

Note:
CR = Cross = LR + RF

250.5	235.2 lb
310.2	208.0 A
LEFT 55.85%	C 54.33%
REAR 51.62%	1003.9

units
A = actual
T = target
C = compare
total

Kart

250.5	235.2 lb
310.2	208.0 A
LEFT 55.85%	C 54.33%
FRONT 48.38%	1003.9

Kart Displays, Continued

Road Racing

250.5	235.2 ← lb
310.2 ←	208.0 A
SELECT: 545.4 54.33%	
TOTAL: 1003.9 lbs	

selected total

selected weight

Dirt Track

LEFT	560.7	55.85%
REAR	518.2	51.62%
CROSS	545.4	54.33%
REAR BITE	102.2	A

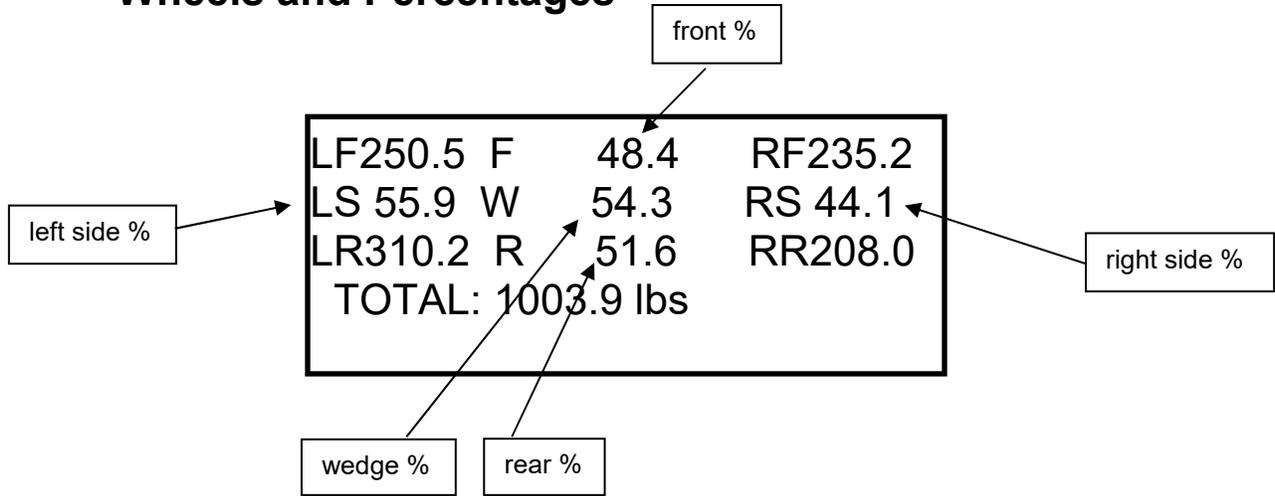
Note:
Rear Bite = LR - RR

Drag/Rally

250.5	235.2 lb
310.2	208.0 A
FRONT	48.38%
REAR	51.62% 1003.9

Kart Displays, Continued

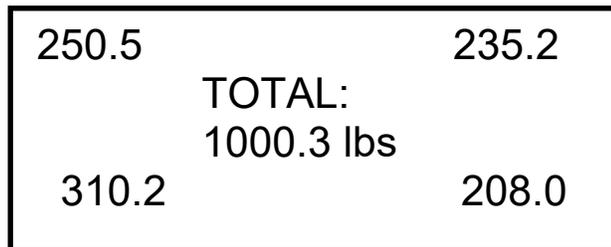
Wheels and Percentages



TOTAL



TOTAL + 4



Controls



The SW E-Z Weigh display is shown

ON/OFF

Press the ON/OFF key to turn the indicator on and off.

ZERO

Press the ZERO key to bring up the zero menu. Press LF, RF, LR, or RR to zero an individual pad or press ZERO to zero all four pads. When the scale is turned 'off' the current zero will be remembered. That means that if a car is on the weigh pads and the unit is turned 'off'; when the scale is turned 'on' the current weight will be displayed, not zero.

AZT (Auto Zero Tracking)

This system contains a feature called Auto Zero Tracking (AZT), which corrects slight zero changes during normal operation. If small weights are added while the display is at or near zero, the indicator may zero them off.

BACKLIGHT

Press the BACKLIGHT key to turn the backlight on and off.

PRINT (Serial Output)

Press the PRINT key to go to the print menu. Press '1' to print the screen (print format is the same as the last active screen format). Here is an example of a print layout:

```
INTERCOMP, U.S.A.  
TEL: 763-476-2531  
  
ACTUAL LBS  
LF 232 RF 222  
LR 241 RR 206  
LEFT 52.50% C 51.39%  
REAR 49.61% T 901
```

Press '2' for printing options. The following menu is displayed:

```
PRINTING OPTIONS  
1: TOGGLE CONTINUOUS  
   (OFF      )  
2: SELECT BAUD RATE
```

The above example shows that the continuous serial output is disabled. The serial output is an externally available signal that can drive a numeric overhead display board(s), a computer's RS-232 input, or other peripheral. To toggle the continuous serial output choices, press '1'. There are 3 choices:

OFF	Continuous output disabled. Print screen enabled.
MULTI-LINE	Continuous output enabled, multi-line format
TOTAL ONLY	Continuous output enabled, total only format

In order to communicate, the baud rate of the SW scale must match the peripheral you are connecting to. To change the baud rate press '2'. The active baud rate will have a "*" to the right of it. Press the corresponding key to change the baud rate.

See section 'Serial Output' for additional information.

CLEAR

While in normal weighing mode, press the CLEAR button to erase a memory location. See section titled 'Clear Baseline Setup' for more information. Also, press the CLEAR key to clear the number to '00' when at a numeric entry screen.

STORE/ENTER

This key is primarily used to store a setup as a target setup. See section titled 'Store Baseline Setup' for more details. This key is also used when entering numbers.

COMPARE

Press the COMPARE key to see how close the actual weight is to the target weight. The values are positive when more weight needs to be added and negative when weight needs to be subtracted.

TARGET

The ideal weight setup for the car is called the target weight. Press this key to view the target weight. See sections titled 'Store Baseline Setup' and 'Recall Baseline Setup' for details.

ACTUAL

Press this key to view the actual weight.

CG

Press the CG key to enter into Center of Gravity function. Press '1' for Standard CG or '2' for Vertical CG.

Standard CG

1. Enter axle width.
2. Enter wheel base.

The center of gravity screen is now displayed. To exit the CG mode, press CG and then any key except '1' or '2'.

Vertical CG

1. With the car level on the scale, enter the wheel base.
2. Enter the height you will raise the rear wheels by.

The center of gravity screen is now displayed. To exit the CG mode, press CG and then any key except '1' or '2'.

See the 'Center of Gravity' section for more details

Numeric keypad

In normal weighing mode this key is used to recall target setups. See section titled 'Recalling Baseline Setups'.

Use the numeric keypad when asked to enter a number. Press the number keys to enter the number and press STORE/ENTER to complete.

LF, RF, LR, RR

These keys stand for left front, right front, left rear, and right rear. These keys are used when in the Road Racing format. Pressing these keys toggles the corresponding pad between select and unselect. If the pad is selected, an arrow will be indicated to the left of the weight.

Special key combinations

Press the ZERO and PRINT keys simultaneously to reach the following menu.

- | |
|--|
| 1. SWITCH lb/kg
2. READ ONLY (OFF/ON)
3. HUB MODE (OFF/ON)
(HIT ACUTAL TO EXIT) |
|--|

Switch LB/KG

To switch from pounds units (lb) to kilograms (kg), the user can press a
To toggle lb/kg press "1" to toggle lb / kg.

Read Only Mode

If using multiple indicators all indicators except for the one being used as
the master indicator must be set to "READ ONLY". Press the "2" to toggle
between Yes and No or ACTUAL to exit this screen.

Hub Mode

Press "3" to enter the Hub Mode options. See the "Quick Start (Hub
Mode)" section for further instructions on how to configure the system.

Change display format

To change the display format (this is first screen shown at power-up),
press the 1 and 0 keys simultaneously. The following screen should be
displayed:

- | | |
|-------------|--------------|
| 1:OVAL | 5:DRAG/RALLY |
| 2:CUP/NW | 6:WHT+% |
| 3:ROAD RACE | 7: TOTAL |
| 4:DIRT TRK | 8: TOTAL + 4 |

Press the number for the desired corresponding display format.

Lock Display Format

This feature allows for a specific display format (as shown in section
"Automotive Displays" or "Kart Displays") to be shown immediately after
power-up. This means the display format selection menu (as shown on
page 8) will not be displayed after power-up. To activate this feature, go
to the desired display format and simultaneously press the 'RF', '3', and
'CLEAR' keys. The message "DISPLAY CHOICE SAVED" will be
displayed for a second. Turn the indicator off and back on. The indicator

will now automatically go to the chosen display after power-up.

Note: If you want to change the display format that is displayed after power-up, press the '1' and '0' keys simultaneously and choose the desired display format (as described in the above section, "Change display format").

To unlock the 'Lock Display Format' feature, simultaneously press the 'RF', '3', and 'CLEAR' keys. The message "DISPLAY CHOICE UNLOCKED" will be displayed for a second. The display format selection menu will now appear after power-up.

Store Baseline Setup

You may store up to 99 setups. Press the STORE/ENTER key to store a weight setup as a target setup. Use the numeric keypad to save the setup in a memory location 1 to 99. If a setup has already been stored to the location you're trying to store to, the following message will be displayed:

```
* THIS MEMORY SPOT *
* ALREADY HAS DATA *
  1: OVERWRITE
  2: EXIT
```

If you want to continue and store to that memory spot, press '1'. If not, press '2'.

Manually Enter the Target Setup

If you would like to manually enter the target weights, enter 00 and press STORE/ENTER. Press 1, 2, or 3 to choose which method you want to enter the target weights (direct key-in, wedge, or target %):

Direct Key-In

Manually entering values in the Direct Key-In format will allow you to set your targets with respect to the following parameters: left front weight, right front weight, left rear weight, and right rear weight.

1. Press the STORE/ENTER key to enter a target setup.
2. Enter '00' and press STORE/ENTER.
3. Press '1' to select Direct Key-In.
4. Enter target weight for left front wheel.
5. Enter target weight for right front wheel.
6. Enter target weight for left rear wheel.
7. Enter target weight for right rear wheel.
8. Enter the memory location you want to save the setup to (1-99).

The screen will display the targets entered. Press the “Actual” or the “Compare” button to see the actual weight on the scales or compare the targets entered to the weights on the scales.

Wedge

Manually entering values in the Wedge format will allow you to set your targets with respect to the following parameters: total weight, left side %, rear %, and wedge %.

1. Press the STORE/ENTER key to enter a target setup.
2. Enter '00' and press STORE/ENTER.
3. Press '2' to select Wedge.
4. Enter the total weight.
5. Enter left side %.
6. Enter rear %.
7. Enter wedge %.
8. Enter the memory location you want to save the setup to (1-99).

The screen will display the targets entered. Press the “Actual” or the “Compare” button to see the actual weight on the scales or compare the targets entered to the weights on the scales.

Target %

Manually entering values in the Target % format will allow you to set your targets with respect to the following parameters: left front %, right front %, left rear %, and right rear %.

1. Press the STORE/ENTER key to enter a target setup.
2. Enter '00' and press STORE/ENTER.
3. Press '3' to select Target %.
4. Enter the total weight.
5. Enter left front %.
6. Enter right front %.
7. Enter left rear %.
8. Enter right rear %.
9. Enter the memory location you want to save the setup to (1-99).

The screen will display the targets entered. Press the “Actual” or the “Compare” button to see the actual weight on the scales or compare the targets entered to the weights on the scales.

Recall Baseline Setup

To recall one of the 99 setups, press a number key 0-9. A menu will be displayed similar to the example below:

```
RECALL SETUP FROM  
MEMORY# 06  
  
(HIT ACTUAL TO EXIT)
```

1. Enter the number of the target location you want to use and press STORE/ENTER.
2. The scale automatically switches to TARGET mode to display the stored setup.
3. At this point you may hit ACTUAL to view the current weights on the scales or COMPARE to display how close your current weights are to the target weights.

Clear Baseline Setup

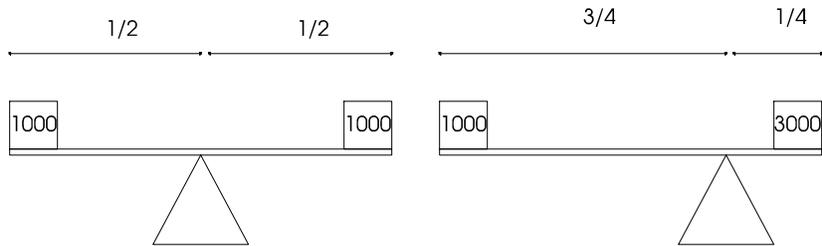
To clear one of the setups, press CLEAR. The following screen will be displayed:

```
CLEAR SETUP FROM  
MEMORY #1-99: 01  
(OR ENTER '00' TO  
CLEAR ALL SETUPS)
```

1. Enter the memory spot you wish to clear and press “Store/Enter” key.
Note: To exit, press the ACTUAL key.

Note: This operation will clear the baseline setup (target weights) in the memory location you select, but will not clear the current targets.

Center of Gravity



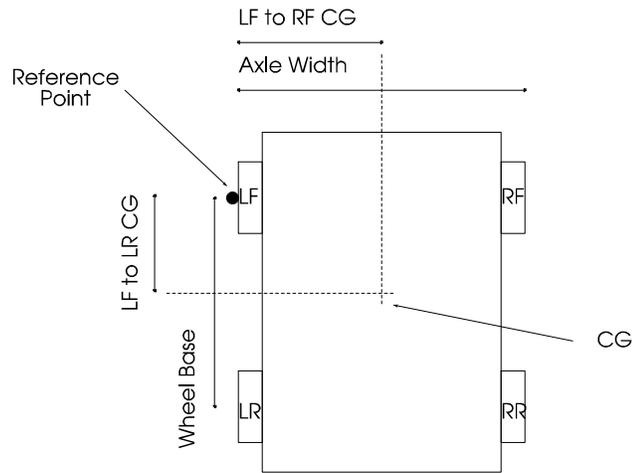
Center of Gravity Examples

The **center of gravity** of an object, such as a car, is the point at which the object will balance if placed on a pivot point. In the diagram above the weights would represent the weight applied by two tires of a car. If the two tires were the same weight the center of gravity would be exactly in the middle. If one tire were heavier the center of gravity would move toward the heavy tire.

There are three axis on a car: front to back, left to right, and up to down. The center of gravity on the first two can be determined directly from the weight of each wheel, the up to down, or vertical, requires that one end of the car be lifted; it is addressed in the next section.

continued on next page

Standard CG



Center of Gravity

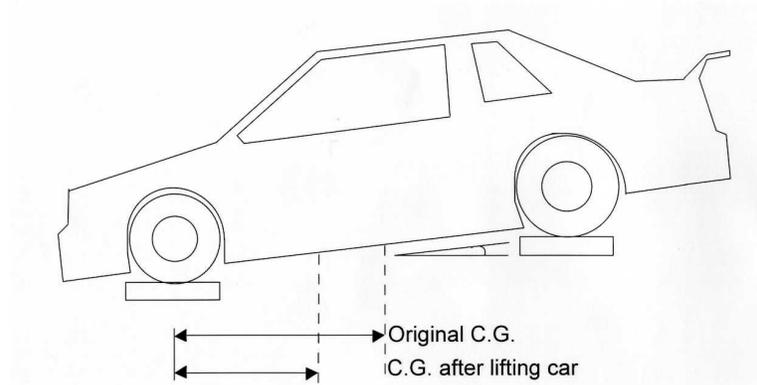
The CG calculation requires that you enter the axle width and the wheel base. Make sure that the front tires are aligned straight forward before you measure them. The axle width is from the outside of a left tire to the outside of a right tire. The wheel base is from the middle of a front tire to the middle of a rear tire. If the measurements are made according to the above diagram the results are from the marked reference point.

After the axle width and wheel base are entered the scale will display the location of the center of gravity from the left front to right front tire, and from the left front to left rear tire (see center of gravity diagram on previous page). Additionally the percentage of the wheel base (left front to left rear), and the percentage of the axle width (left front to right front) is shown. The screen information will be updated if the wheel weights are shifted.

```
LEFT TO RIGHT:  25.4  
(42.33% OF 60.0 )  
FRONT TO REAR: 55.0  
(50.00% OF 110.0 )
```

Press the CG key to return to the regular weight screen.

Vertical CG



CG movement has been exaggerated to illustrate point

There is a point referred to as the **vertical center of gravity** that the car would balance on if it were turned on it's side. As you can see from the drawing above if the back of the car is lifted the front to back center of gravity will move forward, the amount of movement is related to how high up the center of gravity is in the car. The SW Scale will calculate the vertical center of gravity.

1. Have the car level with the ground
2. Press CG to enter the center of gravity menu.
3. Select #2 to start Vertical CG. Have the car level with the ground.
4. Enter the wheel base (refer to the center of gravity section above).
5. The scale will ask you to "Raise the rear wheels by:"
6. Raise the back of the car and weigh pads. A good 'rule of thumb' is raise the back one inch for each foot of wheel base.
7. Enter the amount (from bottom of the pad to ground) the back wheels were raised in tenths (doesn't matter which unit you use inches, centimeters, etc.; the result will be in the same units).
8. The scale will ask you to "Enter the wheel center height". This is the distance from the center of the wheel hub to the edge. This could also be called the axle height.
9. The results will be displayed as shown below:

VERTICAL CG:	17.3
ORIGINAL CG:	55.0
CURRENT CG:	54.3
WB: 110.0 H	10.0

10. At this point, if you press PRINT followed by [1], the vertical center of gravity screen will print out.

Press the CG key to return to the regular weight screen.

Power / Battery

The SW scale comes standard with a 9V alkaline battery. Lift up and out on the battery holder located on the back of the scale indicator. Install new battery with attention to polarity and push the battery holder back in. The scale will operate about 80 hours with a fresh alkaline battery.

Optional Charger This option (sold separately) allows the use of a rechargeable 9V NiMH battery. See section titled “Optional Equipment” on page 5.



WARNING: Do not plug the charger in if you are using a 9V alkaline battery (non-rechargeable). This could result in damage to the battery and your scale.

Your scale will operate indefinitely off of the charger while the battery charges. The scale can be left on or off while the charger is plugged in. Expect 12 to 16 hours to completely recharge the battery.

With a fully charged battery the scale will operate about 35 hours. This specified time is reduced the more the backlight is used. If the battery power is low the SW display will flash a “Low Battery” message. Scale will shut off if the “Low Battery” message is ignored too long. If a rechargeable battery is being used, recharge the battery. If you are using an alkaline cell, replace the battery.

Auto-off feature

The SW indicator has an auto-off feature to save battery life. If no keys were pressed, no serial data was sent, and the weigh readings have not changed for 10 minutes, the backlight will automatically turn off. If no keys were pressed, no serial data was sent, and the weigh readings have not changed for 60 minutes, the SW scale will automatically turn off.

Serial Output

Serial Output is available on the stereo jack (RS232) and the USB port on the left side of the indicator. You must have the appropriate cables for your application (listed in section 'Optional Equipment'). The serial output will be either OFF (on demand print screen), Multi-Line continuous, or Total Only continuous. Press PRINT – 2:PRINTING OPTIONS – 1:TOGGLE CONTINOUS to change this setting. For more info see the section: 'PRINT (Serial Output)'.

The transmitted signal has the following characteristics:

Fixed 8 data bits, no parity, 1 stop bit.

Baud rate is configurable using the PRINT key, see section 'PRINT (Serial Output)'.

Multi-Line continuous output

There are 13 pieces of data transmitted continuously in a repeating pattern:

0	XXXX.X	<p><i>Notes: ASCII <cr> and <lf> follow the weight.</i></p> <p><i>The decimal place is only there if needed.</i></p>
1	XXXX.X	
2	XXXX.X	
3	XXXX.X	
4	XXXX.X	
5	XXXX.X	
6	XXXX.X	
7	XXXX.X	
8	XXXX.X	
9	XXXX.X	
:	XXXX.X	
;	XXXX.X	
<	XXXX.X	

data identifier

data

The first character of each line is the “data identifier” for which weight follows: 0 = LF, 1 = RF, 2 = LR, 3 = RR, etc. The data will follow the data identifier. The **data** will be the actual, target, or compare weights. The type of data transmitted will be the mode you are in (actual, target, or compare).

Data Identifier	Data	Data Identifier	Data
0	Left Front	7	Rear
1	Right Front	8	Front Bite
2	Left Rear	9	Rear Bite
3	Right Rear	:	Cross
4	Left Side	;	Total
5	Right Side	<	Total Selected
6	Front		

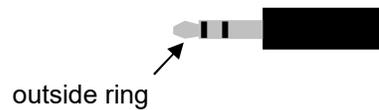
Total Only continuous output

This will transmit a line with the total weight about four times per second:

```
" 5002<cr><lf>"  
" 5002<cr><lf>"  
" 5004<cr><lf>"
```

Serial Output Wiring

The SW indicator's serial output connector is a 3.5mm stereo audio jack. Use a 3.5mm stereo plug to connect to the SW indicator's serial output. The 3.5mm stereo plugs have 3 rings (3 connections) on the post.



Outside ring	-NA-
Middle ring	TXD
Inside ring	ground

USB Output

The USB connector is located on the left side of the Indicator and is the suggested connection used to interface with an external computer.

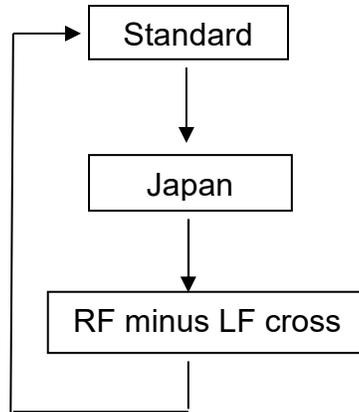
You can download the driver at the web site listed below.

<http://www.ftdichip.com/Drivers/VCP.htm>

Choose the operating system that your computer uses and select the driver that supports "FT232R" and save it to your computer after it downloads. Connect the USB cable from the HH60 Indicator to your computer and have your computer search the driver folder for the driver when prompted by your computer.

Special Displays

There are 3 other display formats other than the Standard version that are available. These 3 special display formats are “Japan”, “RF minus LF cross”, and the Motorcycle version. The “RF minus LF cross” is the RF weight minus the LF weight. The user can toggle the display formats by simultaneously pressing the LF, ‘2’, and CLEAR keys. The display will show the display version for a few seconds and then return to weighing mode. Turn the scale off and back on for the new display format to take effect. The order in which the display formats are toggled is shown in the diagram below:



Japan version

Choose the Japan version as explained in the beginning of this section. Turn the scale off. Turn on the scale back on and you will see the following display:

```
SELECT RACING TYPE
1:FREE SCALING
2:FIXED SCALING
```

Press the ‘1’ key to select “free scaling” or press the ‘2’ key to select “fixed scaling”.

Free Scaling

The “free scaling” display format includes each wheel weight, the total weight of selected pads, the percentage of the selected weight to total weight, and the total weight. The display format will be equivalent to the example shown below:

```
750      725←
950←     525  A
SELECT: 1675 56.78%
TOTAL: 2950 lbs
```

selected total → 950←

selected weight → 725←

Fixed Scaling

The “fixed scaling” display format includes each wheel weight, the total of the front end, the total of the left side, the cross percentage, and the total weight. The display format will be equivalent to the example shown below:

750	725	1b
950	525	A
FRONT	1475	CR 56.8%
LEFT	1700	2950

RF-LF cross version

Choose the “RF-LF cross” version as explained in the beginning of this section. Turn the scale off and turn the scale back on. You will notice there are no options to choose a display format, the indicator will go directly to weigh mode. This display format includes each wheel weight, the RF - LF cross weight, and the total weight. An equivalent example is shown below:

750	800	1b
950	525	A
RF-LF CROSS:	50	
TOTAL:	3025	lbs

Motorcycle Version

For motorcycle scale sets, use the LF (red cable) pad for Front, and the LR (white cable) for Rear. Refer to the “Special Display” section for motorcycle operations.

Choose the motorcycle version as explained in the beginning of this section. The display will give each wheel weight, percentage, and total weight as shown below.

FRONT	300	60%
REAR	200	40%
TOTAL	500 lb	A

Error messages

Pad status error messages (these will display in place of a particular pad's weight)

OFF	No communication from the selected pad. Ensure the pad is turned on (the pad LED will blink when the pad is working properly). If the LED does not turn on at all, check the batteries in the pad.
LOST	Communication has been lost with a pad that was previously communicating. Ensure that the pad wasn't inadvertently turned off and the battery condition.
EEPROM	Contact Intercomp service department for assistance.
BATT	Pad low battery. BATT will blink along with the weight applied to the affected pad.
CAP	The pad is overcapacity or there is a load cell connection error. Reduce the load to the pad and/or zero the pad. If the message persists, there may be a load cell or load cell wiring failure.
UNITS	The pad is set to a different unit (lb / kg) than the indicator. See "Switch lb/kg".
GRAD	The pad is set to a different grad size (car / kart) than the indicator.

Indicator status error messages

LOW DISPLAY BATTERY	Indicator battery is running low. This message will blink on the display. Replace batteries if using alkaline or recharge batteries if using rechargeable batteries.
EEPROM ERROR ENTER CODE: 00	EEPROM check fail. Contact Intercomp service department for assistance.
HUB COMPENSATION ENABLED!	This is not an error, but a notice that your indicator has hub mode compensations active. If you are not using a hub plate system, you should disable hub mode by pressing ZERO+PRINT together followed by "3". Then press "1" to switch HUB MODE from "ON" to "OFF".

How to reach Intercomp Service

Things to know:

Inform the Service Department that the product is a SW wired scale system.

When was the scale system purchased?

Where was the scale system purchased?

What is the serial number?

For Intercomp Service call or fax:

FAX # (763)-476-2613

(763)-476-2531

1-800-328-3336

or send an email to: service@intercompcompany.com with all of the above mentioned information.

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