



## MicroWeigh Standard Checkweigher

WeighTech, Inc. Staff  
Waldron, Arkansas  
1-800-457-3720

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# 1 Introduction

With the WeighTech MicroWeigh a combination of state-of-the-art technology with common down-to-earth basics creates a digital indicator that makes troubleshooting and actual maintenance repair so simple that anyone can be trained to make repairs on this indicator in just minutes.

## 1.1 MicroWeigh Features

- High impact ABS alloy construction.
- Highly visible, easy-to-read display with adjustable contrast and backlight.
- Environmentally sealed touch-sensitive operator control panel.
- Standard units of measure include grams, kilograms, ounces, and pounds.
- RS-232 and Infrared communications are standard with RS-485 option available.
- Wireless data collection using a PDA with WeighTech data-sync software.

## 1.2 MicroWeigh Applications

- Standard weighing
- Label printing
- Tank or vat weighing
- Checkweighing (boxes, bags, and pieces)
- Bench and floor scales
- Batch weighing

# 2 Keypad Operation

The WeighTech MicroWeigh keypad is a watertight sealed touch sensitive sensor. The keys are actually sensitive to contact area, not force. Press lightly with the ball of your fingertip as though you were giving fingerprints. Best results come from using the ball of your finger, not the very tip. Most objects will not trigger the keypad—knives, screwdrivers, tools, etc. do not have enough surface area in contact with the key to register as a keypress. (You might get it to trigger with a medium sized conductive bolt head, if you have skin in contact with the bolt.)

One consequence of the design of the touch sensitive keypad is that it is sensitive to water streams. For this reason, WeighTech includes a unique “washdown mode” to prevent unwanted keypad activity during washdown/sanitation/cleanup intervals. When the indicator is in washdown mode, the indicator will weigh normally but the keypad is locked out.

To unlock the keypad, you must play follow the leader. One key will be lit. Press it. Another key will then light up. Press it. Continue until the indicator displays “Exit washdown”. The indicator will require that you press five keys in a row correctly before it will unlock the keypad. Any wrong keypress will restart the counter back to five. The odds are extremely slight that random water splashing would ever be able to trigger the correct keys in the correct order to unlock the keypad.

### 3 How to Step Through Menus

From the main weight display, press the “Menu/Help” key. You are now in a menu, and the keys now have different functions:

Cancel            Help            Enter            Down            Up

- “Cancel” will back you out of the menu one level at a time.
- “Help” will display information about the current choice (option).
- “Enter” has various functions, depending on where you are in the menu.
- The “Down” key will scroll backward through the menu choices.
- The “Up” key will scroll forward through the menu choices.

#### 3.1 Menus can contain several different items

An item with a “\*” on the right end will do something when you press the enter key—something might be turn the indicator off, drill down into another menu, clear totals, or start a calibration routine. The item with a numeric value (scale capacity, for instance) at the right side of the display might allow you to change the number by pressing the enter key. An item with text (such as “on” or “off”) at the right side of the display might allow you to select from a list of options by pressing the enter key. Some items are just for reference and cannot be changed at all. Examples of reference items would be the software name and revision—these are set when the software is written and cannot be changed.

#### 3.2 How to enter a number

Using the calibration routine as an example: Press the “Enter” key. The indicator display will show “Cal weight \_” and the cursor will be blinking. The blinking cursor is the clue that you can enter an arbitrary number using the up, down, right, and enter keys. Pressing the up/down keys will scroll through the list (0 1 2 3 4 5 6 7 8 9 - . ) in turn. When the desired number appears, press the right arrow (menu/help) key. The blinking cursor will advance one digit to the right, leaving your selected number in place. Continue this sequence until the desired numeric value is visible on the display. Press the “Enter” key to accept the value, or the “Cancel” key to abort.

Example: Enter a calibration weight of 25 pounds

- Start with the indicator at a normal weight display (“ 0.00 lb”)
- Press the “Menu/Help” key
- Scroll through the main menu using the up or down arrow keys until “Calibrate \*\*” is displayed on the indicator
- Press the “Enter” key to start the calibration routine
- The indicator may display “Password” if a calibration password is required. If so, enter it (default calibration password is “Zero” “Zero” “Zero”)
- The indicator should now be displaying “Cal Weight” and a blinking cursor.
- Press the up arrow key. The display should now show “Cal weight 1”
- Press the up arrow key again. The display should now show “Cal Weight 2”
- Press the right arrow key to accept the first digit (2) and advance the blinking cursor to the next digit. The indicator should display “Cal weight 2\_”
- Press the up arrow key five times to select a 5 as the second digit. The indicator should now display “Cal weight 25”
- Press the “Enter” key to accept 25 pounds as a calibration weight.
- The indicator will display “Cal-zero weight”. Press the “Cancel” key to abort the calibration process.

### **3.3 How to select from a list**

This is very much like stepping through a menu. Some settings (such as displayed resolution) must be limited to one of several predetermined values. To edit one of these settings, press the “Enter” key. The currently selected value will move from the far right of the display to the left. This indicates that you may use the up and down arrow keys to scroll through a list of possible values for this setting. Once you’ve selected a value for the setting, press the “Enter” key to complete the selection process. As always, pressing the “Cancel” key will cancel the selection and restore the setting to the previous value.

## **4 General Scale Operations**

### **4.1 Scale On Procedure**

Touch the “Zero / On” key. Indicator will come on and display will read “MicroWeigh by WeighTech” and then continue to the weigh mode. At this point the scale is ready for product or operator input.

## **4.2 Scale Off Procedure**

To turn the scale off touch the “Menu / Help” key. The indicator will display “Power off \*”. At this point touch the “Print / Enter” key and scale display will go blank, and the indicator will be off. (If the auto-on jumper is installed on the interface board, the indicator will immediately power up.)

## **4.3 Zero Procedure**

To zero the indicator touch and hold the “Zero / On” key for about 3 seconds and the indicator will take a new zero. If the current weight reading is unstable, under capacity, or over capacity, no new pushbutton zero will be established.

## **4.4 Units Procedure**

To change the units of measure touch the “Units / Cancel” key. The units will change between pounds, kilograms, grams and ounces (assuming all the units are enabled in the “Parameter” menu) each time that the key is touched.

# **5 Calibration Procedure**

## **5.1 Entering the calibration menu**

With the indicator on and displaying weight, touch the “Menu / Help” key. The display will read “Power off \*”. Use the up / down arrows until the display reads “Calibrate \*”. Touch the “Print / Enter” key and the display should then show “Password”. At this point key in the calibration password. (The default calibration password is “Zero” “Zero” .)

## **5.2 Keying in cal weight**

The display will show “Cal weight \_” and the cursor will be blinking. Using the up, down, and right keys to enter the size of your calibration weight in pounds (i.e. 1, 2, 5, or 10). Press “Enter” to accept the cal weight, or “Cancel” if you make a mistake.

## **5.3 Calibration Example**

(Entering a 25.00 lb cal weight value.) The blinking cursor is the clue that you can enter an arbitrary number using the up and down keys. Pressing the up/down keys will scroll through the list (0 1 2 3 4 5 6 7 8 9 - . ) in turn. When the desired number appears (2), press the right arrow “Menu / Help” key. The blinking cursor will advance one digit to the right (2 \_), leaving your selected number in place. Continue this sequence until the desired numeric value is visible on the display (25\_ ) (25.\_ ) (25.0\_) (25.00). Press the “Enter” key to accept the value, or the “Cancel” key to abort.

## 5.4 Establishing a zero

The indicator will display “Cal–zero weight”. Clear the weighing platform of any foreign objects and once all vibration has died out, press the “Enter” key. Make sure that the platform is not disturbed during this process. Indicator will display “Zeroing...” as it takes an average reading of the zero offset weight (about three seconds).

## 5.5 Accepting a cal weight

The indicator will then display “Cal–add weight”. Add weight to the weighing platform (the weight should be the same amount as the keyed in cal weight) then touch the “Enter” key. The indicator will display “Scaling...” for about three seconds as it performs internal calculations. Finally, the indicator will display “Cal done” for about one second once the calibration cycle is complete.

# 6 Display Messages

## 6.1 General Warning/Error Messages

The following warning and error messages may appear at any time that the display is showing the current weight. They will not be visible when the indicator is displaying a menu item.

**“Setup required”** The indicator is still set to factory defaults, and will require configuration before entering service. This message will clear once the scale capacity (in “Setup Menu”/“Parameters”) has been set.

**“Cal required”** The indicator has not yet been calibrated. This message will clear once the scale has been calibrated.

**“Excite Shorted!”** The measured load cell excitation voltage has been below 1V for more than one second. To prevent any damage to the indicator or load cell, the excitation supply has been disabled. Double check the load cell cable and connections to the interface board, especially at the terminals marked “EX+” and “EX-”. The indicator must be turned off and back on again to clear this message.

**“ADC Full Scale”** The analog to digital converter reading the load cell went to full scale positive or negative for more than a second. This is usually caused by faulty wiring, or in severe cases, a seriously damaged load cell. Check connections, especially on the terminals marked “S1+” and “S1-”. This warning will clear automatically when the load cell readings come back into the normal range.

**“Check Weigh Opto”** This warning message indicates that at least 20 items have been seen by the first optical sensor (zero opto) and *not* seen by the second optical sensor (weigh opto). It will clear automatically as soon as the weigh opto detects an item. This warning message can be disabled by setting “Sensor mon” to off.



**“Check Zero Opto”** This warning message indicates that at least 20 items have been seen by the second optical sensor (weigh opto) and *not* seen by the first optical sensor (zero opto). It will clear automatically as soon as the zero opto detects an item. This warning message can be disabled by setting “Sensor mon” to off.

**“IR locked.”** Access to the setup menus is locked out. The “IR lock” setting in the parameter menu is turned on and it’s been more than one minute since the Palm was used to pull settings or totals. To unlock, use a Palm to pull totals or settings. You will then have 60 seconds to access the setup menus. If you do not wish to lock out the setup menus, turn off “IR lock”.

## 6.2 Calibration Warnings

The following warning messages may appear when entering the calibration routine.

**“Check load cell”** This warning will only appear when entering the calibration routine. It indicates that the load cell reading is past full scale positive or negative. Calibration will not be allowed in this case. Refer to “ADC Full Scale” warning for troubleshooting information.

**“Check excite”** The load cell excitation supply was measured at less than 4.0 volts. Check the load cell and wiring, especially the terminals marked “EX+” and “EX-”. This warning can also be caused by excessive load cell current drain, such as from more than four load cells tied together, or a load cell with damaged strain gauges.

**“Check ex- wire”** Both load cell signal outputs were measured at more than 4.0 volts. This usually indicates that there’s a poor connection at the “EX-” terminal, or that the load cell excitation wiring has gone open (such as from physical damage to the cable).

**“Check ex+ wire”** Both load cell signal outputs were measured at less than 1.0 volts. This usually indicates that there’s a poor connection at the “EX+” terminal, or that the load cell excitation wiring has gone open (such as from physical damage to the cable).

**“Check signals”** The difference between the two load cell signal outputs was measured at more than 0.2 volts. This much imbalance between the two signals is usually caused by either incorrect wiring (such as swapping an excitation and signal wire), or by a severely bent load cell. Check connections, try swapping pairs, or replace the load cell.

**“Check sig+ wire”** The positive load cell signal was measured at either less than 1.5 volts or more than 4 volts. Check wiring at terminal marked “S1+”, check that the load cell signal and excite pairs are correct, and finally consider that the load cell may be damaged.

**“Check sig- wire”** The negative load cell signal was measured at either less than 1.5 volts or more than 4 volts. Check wiring at terminal marked “S1-”, check that the load cell signal and excite pairs are correct, and finally consider that the load cell may be damaged.

## 7 Menus

### 7.1 Main Level

<i>Power off</i>	Turn off the indicator
<i>Production</i>	Enter the production submenu
<i>Washdown</i>	Disable keypad to prevent false keypresses during washdown
<i>Calibrate</i>	Enter quick calibration routine
<i>Dynacal</i>	Dynamic calibration feature
<i>Setup menu</i>	Bunch of stuff...see below
<i>Audit cfg</i>	Number of times an audited config parameter has been changed (HB44)
<i>Audit cal</i>	Number of times indicator has been calibrated (HB44)

### 7.2 Production menu

<i>Cycle on</i>	Enable knockoffs, totals, and start the operating cycle
<i>Cycle off</i>	Disable knockoffs and totals
<i>Low mt</i>	Low side of acceptable weight range
<i>High lmt</i>	High side of acceptable weight range
<i>Tare</i>	Tare weight, in current units
<i>Package</i>	Experimental display of package size, rate, and spacing.
<i>Totals</i>	Display totals submenu

### 7.3 Totals menu

* <i>Cnt</i>	Total number of items (ok, unders, and overs)
* <i>Tot</i>	Total weight of all items (ok, unders, and overs)
* <i>Avg</i>	Average weight of all items (ok, unders, and overs)
* <i>Min</i>	Minimum weight of all items (ok, unders, and overs)
* <i>Max</i>	Maximum weight of all items (ok, unders, and overs)
* <i>Dev</i>	Standard deviation of weight of all items (ok, unders, and overs)
<i>OK cnt</i>	Number of acceptable weight items
<i>OK tot</i>	Total weight of acceptable items
<i>OK avg</i>	Average weight of acceptable items
<i>OK min</i>	Minimum weight of acceptable items
<i>OK max</i>	Maximum weight of acceptable items
<i>OK dev</i>	Standard deviation of weight of acceptable items
<i>Lo cnt</i>	Number of underweight items
<i>Hi cnt</i>	Number of overweight items
<i>Too close</i>	Number of items too close to weigh
<i>Clear stats</i>	Clear all stats/totals. (Will prompt for confirmation. Touch enter to clear totals, cancel to retain totals.)

## 7.4 Setup Menu

<i>Parameters</i>	Scale stuff
<i>Check settings</i>	Checkweigher settings
<i>Info menu</i>	Debugging stuff
<i>Clock</i>	Set clock menu
<i>Contrast</i>	Control display intensity

## 7.5 Parameters

<i>S units</i>	Setup units: used for entering capacity and resolution (defaults to pounds)
<i>Capacity</i>	Scale capacity, in setup units
<i>Resltn</i>	Scale resolution, in setup units
<i>AZT max</i>	Maximum weight that can be autozeroed out at one time during operation
<i>Calibrate</i>	Start calibration routine
<i>Dynacal</i>	Dynamic calibration feature
<i>IZ set</i>	Set initial zero at power up (default is off)
<i>lb units</i>	On/Off: Enables the units toggle key to include pound units
<i>kg units</i>	On/Off: Enables the units toggle key to include kilogram units
<i>g units</i>	On/Off: Enables the units toggle key to include gram units
<i>oz units</i>	On/Off: Enables the units toggle key to include ounce units
<i>Address</i>	Communications address, visible in IR transfers to the Palm
<i>Cntst</i>	Enabled/Disabled: If enabled, the three key quick contrast adjustment is allowed.
<i>IR lock</i>	When turned on, the Palm is required to access the setup menus
<i>Defaults</i>	Restore scale to factory default settings (all settings will be lost!)

## 7.6 Check Settings

<i>Low lmt</i>	Low side of acceptable weight range
<i>High lmt</i>	High side of acceptable weight range
<i>Offset wgt</i>	Weight added to each sample to make static and dynamic weights equal
<i>Delay to KO</i>	Time to knockoff (in 1/100 of a second–100 is 1 second, 200 is 2 seconds)
<i>KO duration</i>	Length of time arm is extended (in 1/100s–100 is 1 second, 200 is 2 seconds)
<i>KO</i>	Select between kicking off the rejected items or the accepted items
<i>KO type</i>	Select standard or smart knockoff gate action
<i>R buffer</i>	Length of weighing buffer (filtering)–larger numbers give more stable weights
<i>Z buffer</i>	Length of autozero buffer–larger numbers give more stable weights
<i>Zero dly</i>	Number of ticks until an automatic zero will occur (tick = 1/120 of a second–120 is 1 second)
<i>Auto zero</i>	Control whether scale will automatically zero if a product isn't seen for some time (On/Off)
<i>Sens 1</i>	Leading edge optical beam debounce–larger numbers reject more noise, but also reduce sensitivity to bag edges
<i>Sens 2</i>	Trailing edge optical beam debounce–larger numbers reject more noise, but also reduce sensitivity to bag edges
<i>Zero opto</i>	Std/Rev: select first sensor mode, either light activate (std) or dark activate (rev)
<i>Weigh opto</i>	Std/Rev: select first sensor mode, either light activate (std) or dark activate (rev)
<i>Sensor mon</i>	On/Off: enable or disable the optical sensor failure warning system
<i>Close cnt</i>	Number of ticks from zero opto to weighbridge, used to determine “too close”
<i>Wbrdg ticks</i>	Length of weighbridge, in ticks. Set to 0 to use older too close detection method.
<i>Eye space</i>	Experimental: distance between optical beams (used to determine belt speed, package sizes)
<i>Travel</i>	Set to either L-R or R-L to match direction of item travel, as seen from indicator
<i>Dbase</i>	Control whether IR total dump includes individual item weights (On/Off)
<i>Gap delay</i>	Number of seconds between infeed pauses (used to force gaps for autozero)
<i>Gap drtn</i>	How long to pause infeed, in seconds, when creating a gap

## 7.7 Info Menu

<i>ADC</i>	Raw ADC (analog to digital converter) counts display
<i>Filtered</i>	Filtered ADC counts
<i>Weight</i>	Live weight display (filtered and calibrated to pounds)
<i>Logging</i>	WeighTech use only
<i>Offset</i>	Calibration zero offset, in raw counts
<i>App</i>	Name of firmware app ( <i>microcheck_1</i> )
<i>Build</i>	Software revision info ( <i>Build 72</i> )
<i>Date</i>	Date firmware was compiled ( <i>03/28/2014</i> )
<i>Time</i>	Time of firmware compilation ( <i>11:25:52</i> )
<i>ADC rate</i>	Experimental: Set ADC converter rate—affects a lot of other settings, modify with care!
<i>SI+</i>	Current load cell + signal voltage, 1 Hz update rate
<i>SI-</i>	Current load cell - signal voltage, 1 Hz update rate
<i>Excite</i>	Current load cell excite voltage, 1 Hz update rate
<i>IZ Autoset</i>	Force a new initial zero
<i>IZ</i>	Current initial zero settings, in setup units
<i>Debug msg</i>	On/Off: Turn this parameter on for more extensive messages during powerup
<i>Bootload</i>	Weigtech use only

## 8 Detailed Menu Item Descriptions

### 8.1 Main Menu Level

**Power off** Turns off the MicroWeigh controller. When powered down, the belts will continue to run, as the indicator has no control over the infeed, weighbridge, and outfeed motor drives.

**Production** Enter the production submenu. Most of the functions used on a daily basis are located in this menu, such as cycle on, cycle off, high and low weight range, package rate/size displays, and the sizer totals/statistics.

**Washdown** Disable the keypad to prevent the touch sensitive keypad from registering false keypresses during a washdown period. To enable the keypad, play follow the leader and press the lit keys in order. You must get five in a row to exit washdown mode. (The controller will continue to operate normally in washdown mode—it only affects the keypad.)

**Calibrate** Quick calibration routine. The password required to enter the calibration routine is to touch the Zero/On key (far right side of keypad) three times. The indicator will first prompt for a calibration weight and the calibration weight units, then prompt for all weight to be removed, and finally for the calibration weight to be added. Calibration can only be performed when the system is in the cycle off mode. (Knockoffs and totals disabled.) Before calibrating, several tests are run on the load cell and load cell connections. If any of these load cell tests fail, a warning message will displayed before the calibration weight prompt.

**Dynacal** Dynamic calibration routine. The password required to enter the calibration routine is to touch the Zero/On key (far right side of keypad) three times. The indicator will first prompt for a calibration weight and the calibration weight units. After the units are entered, the indicator will prompt you to remove all weight. Touch the enter key to establish the new zero. Once a zero is set, the indicator will ask you to weigh items. Send the calibration weight across the weighbridge. The display will update and show you the number of calibration passes. Send that same item across the weighbridge several times to average in on a good calibration. Touch the enter key to accept the calibration or the cancel key to abort.

**Setup menu** Enter the setup submenu, where the configuration settings and test functions are located. This menu is password protected to prevent unqualified personnel from accessing the settings. The password is to touch each of the five keys in order, from left to right. (“Units”, “Menu”, “Print”, “Tare”, “Zero”).

**Audit cfg** Displays the number of times an audited configuration parameter has been changed. There is no way to reset this counter in the field.

**Audit cal** Displays the number of times the indicator has been calibrated. There is no method to reset this counter in the field.

## 8.2 Production Menu

**Cycle on** Start the operating cycle. Each item will be weighed, added to the proper totals, and the knockoffs will operate as needed. The current item weight display will update as each item goes across the weighbridge and breaks the weigh beam.

**Cycle off** Exit the operating cycle. The belts will continue to run. Items going across the weighbridge will still be weighed, the display will still update, but totals will not change and the knockoffs will not activate.

**Lo lmt** Lower range of acceptable weight, in pounds. An item with the same weight as this setting is considered to be ok.

**Tare** Current tare weight.

**Hi lmt** Upper range of acceptable weight, in pounds. An item with the same weight as this setting is considered to be ok.

**Package** Experimental display of package size, rate, and spacing.

**Totals** Enter the totals/statistics menu. Totals can be viewed while the machine is in operation, and the display will update as each item is weighed and assigned to a gate. The totals are also available for download to a Palm through the front panel IR interface. Items that are too close to weigh are counted as too close, but do not affect any other statistic (such as total count, or total weight).

### 8.3 Totals Menu

- \* **Cnt** Total number of items that have been gone across the weighbridge, not counting any items too close to weigh.
  - \* **Tot** Total weight of all items that have been gone across the weighbridge, not including any that were spaced too closely to weigh.
  - \* **Avg** Average (mean) weigh of all items that have gone across the weighbridge, excluding items that were spaced too closely to weigh.
  - \* **Min** Minimum weight of all items that have gone across the weighbridge, except for too close items.
  - \* **Max** Maximum weight of all items that have gone across the weighbridge, not including items that were too close.
  - \* **Dev** Standard deviation of the weight of all items that have been weighed. The standard deviation is calculated assuming that the items comprise the entire population, not a sub-sample of a larger population.
- OK cnt** Total number of items that weighed inside the acceptable weight range.
- OK tot** Total weight of all items that weighed inside the acceptable weight range.
- OK avg** Average (mean) weight of all acceptable weight items.
- OK min** Minimum weight of accepted items.
- OK max** Maximum weight of accepted items.
- OK dev** Standard deviation of the weight of acceptable items. The standard deviation is calculated assuming that the items comprise the entire population, not a sub-sample of a larger population.
- Lo cnt** Number of items that weighed less than the acceptable weight range and were knocked off.
- Hi cnt** Number of items that weighed more than the acceptable weight range and were knocked off.
- Too close** Count of number of items that were too close to weigh. An item is considered to close if it breaks the zero beam at the front of the weighbridge while the previous item is breaking the weigh beam at the end of the weighbridge. Excessive numbers of too close items indicate a problem with the upstream flow to the sizer or upstream singulation problems.
- Clear stats** Clear all the totals and statistics. The indicator will prompt for confirmation ("Sure?") before actually clearing the data. Press the Print/Enter key to clear, or the Units/Cancel key to abort. The indicator will record the date and time of every total clear operation. The date and time of the last clear operation is transmitted to the Palm when the totals are transferred.

## 8.4 Setup Menu

**Parameters** Enter the parameter menu, where all the important (nonvolatile) settings are located. A word of warning—the “Default” option exists to return the settings to the factory defaults. It will prompt for confirmation, but once you’ve defaulted the settings any changes you’ve made are gone forever. If you don’t know why you’d need to return to factory defaults, you don’t.

**Check settings** This menu contains the settings relevant to the operation of the automatic weighing cycle. (Filters, automatic zero settings, optical beam debouncing, etc.)

**Info menu** Enter the info menu, which contains several interesting and useful nonadjustable parameters, such as the current firmware name and revision.

**Clock** Display current date and time. Also allows setting the real time clock. (The MicroWeigh controller real time clock is battery operated, so it will keep time even while the controller is powered off.)

**Contrast** Allows adjustment of the display intensity. Use the up and down arrows to scroll until the display contrast is nice and crisp, then press the Units/Cancel key to exit. This setting is retained through power cycles. There’s an emergency contrast adjustment that’s handy if the display is really washed out and hard to read: touch and hold the Units/Cancel and Menu/Help keys, then touch either the up or down key to adjust contrast. If you can’t tell whether to go up or down, touch the same key repeatedly until the display is easy to read. (It’ll loop around, so it doesn’t really matter if you use the up or down key.)

## 8.5 Parameters

**S units** Default units for resolution, capacity, and other internal settings. Default is to use pounds.

**Capacity** Maximum capacity of scale, in setup units. Must be set during initial installation to remove the “Setup Required” warning message from the display.

**Resltn** Displayed weight resolution, in pounds. Default is 0.01 pounds.

**AZT max** Maximum weight that can be automatically zeroed out by the automatic weighing cycle. Adjust so that the scale can compensate for any product buildup during production. Setting this value too high can result in a bad zero reading, such as if a whole bird were to stick on the weighbridge during an autozero cycle. A good starting point would be about 10% of the expected item weight, so that buildup can be zeroed out but not an entire item.

**Calibrate** Perform a load cell test and calibration. (Feel free to enter the routine to do a load cell test, and touch the cancel key to exit without calibrating at the cal weight prompt. This can be a handy troubleshooting feature.)



**Dynacal** Dynamic calibration routine. The password required to enter the calibration routine is to touch the Zero/On key (far right side of keypad) three times. The indicator will first prompt for a calibration weight and the calibration weight units. After the units are entered, the indicator will prompt you to remove all weight. Touch the enter key to establish the new zero. Once a zero is set, the indicator will ask you to weigh items. Send the calibration weight across the weighbridge. The display will update and show you the number of calibration passes. Send that same item across the weighbridge several times to average in on a good calibration. Touch the enter key to accept the calibration or the cancel key to abort.

**IZ set** Set initial zero. If you have to ask, you probably don't need to be doing it.

**lb units** Enable or disable the pound units display. If enabled, the units key will allow the item weights to be displayed in pounds.

**kg units** Enable or disable the kilogram units display. If enabled, the units key will allow the item weights to be displayed in kilograms.

**g units** Enable or disable the gram units display. If enabled, the units key will allow the item weights to be displayed in grams.

**oz units** Enable or disable the ounce units display. If enabled, the units key will allow the item weights to be displayed in ounces.

**Address** Communications address. Appears as part of the total and parameter information transmitted to the Palm through the IR port.

**Cntst** Enable or disable the three key quick contrast adjustment. This setting does not affect the contrast menu control inside "Setup menu". The default setting is enabled, but it is recommended to disable the quick contrast adjustment before placing the indicator in production.

**Defaults** Set all settings back to factory defaults. Will prompt for confirmation before doing its business. "Sure?": touch the Units/Cancel key to abort, or the Print/Enter key to restore factory default settings. Defaulting will erase any changes to the parameters that have been made, so write them down before defaulting just in case!

## 8.6 Check Settings

**Low lmt** Lower range of acceptable weight, in pounds. An item with the same weight as this setting is considered to be acceptable.

**High lmt** Upper range of acceptable weight, in pounds. An item with the same weight as this setting is considered to be ok.

**Offset wgt** Amount of weight either added or subtracted from the item weight to compensate for difference between static and dynamic weights. Excessive amounts of

offset weight could indicate that the weighbridge is not level. This setting can be either positive or negative to compensate in either direction.

**Delay to KO** Number of ticks from an item blocking the weigh beam to the knockoff. Adjust this value so that the rejects are properly knocked off the outfeed belt.

**KO duration** Number of ticks that the knockoff will be extended. Adjust so that the knockoff can cleanly remove rejects from the outfeed belt and not interfere with the following items.

**KO** If set to “Rejects”, the rejected items (too heavy, too light, too close) will be knocked off the belt. If set to “OK”, only the accepted items will be knocked off.

**KO type** Select either standard or smart knockoff mode. In smart mode, the knockoff gate will stay out if items are arriving fast enough to overlap with the knockoff gate duration.

**R buffer** Weigh buffer filter setting. Larger values give a more stable weight, but require that the item spend more time on the weighbridge. If this parameter is set too high, the dynamic item weights will be much less than actual weight as measured statically. If this parameter is set too low, the weights will be less accurate.

**Z buffer** Zero buffer filter setting. Larger values give a more stable weight, but require that the item spend more time on the weighbridge. If this parameter is set too high, the automatic zero will not be accurate. A good starting point is to set this parameter to twice the “R buffer” setting.

**Zero dly** Length of time (in units of ticks) that no items must be seen before starting an autozero cycle. With the default “ADC rate” setting, there are 120 ticks per second. Factory default for this parameter is 2000, which is about 16 seconds.

**Auto zero** On/Off. Controls whether or not the automatic weighing cycle will attempt to zero out any slight changes in weight when no items are crossing the weighbridge.

**Sens 1** Leading edge debouncing used on both optical sensors. This value specifies the number of consecutive readings that must elapse from beam clear to beam blocked before the transition is registered. Increase this if you’re seeing a single item count as multiple items. (This is most common with irregular packages, such as plastic bags). Decrease if the items are very consistent on the leading edge, as with a box. Units are ticks (120 per second).

**Sens 2** Trailing edge debouncing used on both optical sensors. This value specifies the number of consecutive readings that must elapse from beam blocked to beam clear before the transition is registered. Increase this if you’re seeing a single item count as multiple items. (This is most common with irregular packages, such as plastic bags). Decrease if the items are very consistent on the trailing edge, as with a box. Units are ticks (120 per second).

**Zero opto** Select the operating mode for the first opto sensor. If the sensor is light activated (normally open), select std mode. If the sensor is dark activated (normally closed), select rev mode. It is recommended to use std mode with the Banner opto sensors black wire output. The zero opto sensor detects if products are too close to be accurately weighed and completes the autozero cycle.

**Weigh opto** Select the operating mode for the second opto sensor. If the sensor is light activated (normally open), select std mode. If the sensor is dark activated (normally closed), select rev mode. It is recommended to use std mode with the Banner opto sensors black wire output. The weigh opto sensor detects the products as they transition off the weighbridge.

**Sensor mon** When set to “On”, the system will watch for items being detected by only one of the optical sensors. If more than twenty consecutive items are missed by one of the optical sensors a warning message will appear on the display (either “Check Weigh Opto” or “Check Zero Opto”). The warning message will automatically clear as soon as the failing sensor detects an item. Set to “Off” to disable this warning system completely. (The system can run without the zero opto sensor, but “Autozero” and “Sensor mon” must be disabled and items that are too close to weigh accurately will not be detected. This is a degraded mode of operation.)

**Close cnt** Number of ticks from zero opto beam until weighbridge. Increasing this setting allows the machine to be more forgiving of closely spaced items.

**Wbrdg ticks** Number of ticks required to travel from the zero opto beam to the weigh opto beam. This setting is used to determine if more than one piece is on the weighbridge, which would cause a too close to weigh error. Set to 0 to disable and use the old style too close detection. (Old style detects an item as too close if the zero opto beam is blocked when the item hits the weigh opto beam.) If this setting is not zero, Dynacal will automatically measure the distance between the beams and update this setting.

**Eye space** Distance between the leading zero beam and the trailing weigh beam, in inches. Used to scale the displayed data in the packaging menu.

**Travel** Controls the front panel LEDs to indicate the status of the weigh and zero beams—a useful diagnostic tool, but it doesn’t have any effect on the operation of the machine. Set to correspond to the direction of item travel, as seen when you’re viewing the front panel of the indicator. When set to “L-R”, blocking the zero beam (at the front edge of the weighbridge) will illuminate the Motion LED on the front panel of the indicator, and blocking the weigh beam (at the trailing edge of the weighbridge) will illuminate the Net LED on the front panel. When set to “R-L”, the zero beam will light the Net LED, and the weigh beam will light the Motion LED. If you set the wrong, nothing bad will happen.

**Dbase** On/Off. When on, the indicator will record and transmit each item weight to the Palm. Handy for troubleshooting purposes.

## 8.7 Info Menu

**ADC** Live display of current raw unfiltered counts from analog to digital converter. Full scale is +/- 8 million counts, so values of more than several million are suspicious and could indicate a defective load cell or incorrect wiring.

**Filtered** Live display of current raw filtered counts from analog to digital converter through the R buffer filter.

**Weight** Touch the enter key to enable a live display of the current weight, in pounds. Handy for troubleshooting and testing calibration.

**Logging** WeighTech use only. Allows recording of ADC and sensor data for playback or transfer.

**Offset** Current zero offset, in counts. Will update during an autozero cycle.

**App** Firmware application name (*microcheck\_1*). Very handy to WeighTech personnel if you call and expect to receive accurate advice.

**Build** Firmware revision code (*Build 72*). Again, this is something that's good to know when contacting WeighTech with questions.

**Date** Date that firmware was compiled (*03/28/2014*). This is not the current date!

**Time** Timestamp of firmware compilation (*11:25:52*). This is not the current time!

**ADC rate** Current analog to digital converter rate. 120 Hz is the factory default setting, but 60 Hz might provide more stable weight readings at slow product rates at the cost of a slower response time. Unless you really want to experiment, best to leave this alone. Changing the parameter will also affect all other parameters that are set in units of ticks.

**S1+** Current load cell positive signal voltage. Should be about half of the excitation voltage, and very close to the negative load cell signal voltage.

**S1-** Current load cell negative signal voltage. Should be about half of the excitation voltage, and very close to the positive load cell signal voltage.

**Excite** Current excitation supply voltage, updated at about 1 Hz. Should be in the 4-5 volt range for normal operating. Very low readings could indicate cable damage, incorrect load cell wiring, or an excessive number of load cells connected to the indicator.

**IZ autose** If enabled, the scale will attempt to set an initial zero every time it's powered on. Not really relevant to this firmware revision.

**IZ** Current initial zero setting.

**Debug msg** Not used in this firmware revision.

**Bootload** Enter bootloader for firmware update procedure. WeighTech use only.

## **9 Troubleshooting**

### **9.1 Load cells**

Go to the “Info menu” and verify that the “Excite” voltage is about 4.5V. A reading of less than 1V probably indicates a short from excite to ground. Confirm by removing the load cell connections. If the excite voltage reads normal with the load cell disconnected, you’ve got a short in the cable or a bad load cell.

Check to see that the signal voltage in the “Info menu” are about half of excite and equal. If one signal voltage is near zero, or near 4V, you may have a disconnected signal wire. Check that connection at the interface board. If the signal voltages are not near zero or 4V, but are more than a 0.5V different, you may have the load cell miswired, or a bent load cell.

Go to the “Info menu” and watch the “ADC” reading (raw counts). It shouldn’t vary more than 100-300 counts with a good load cell and a stable environment. With no load on the cell, it should be within +/- 50,000 counts of zero. (Deadload can cause the no load reading to shift.) If the no load reading is really large (say, greater than one million counts or less than negative one million counts) and the connections are solid, you probably have a bent load cell.

Check the optical sensors: blocking the zero beam (the first beam an item sees as it travels across the machine) should turn on the Motion LED at the front panel. Blocking the weigh beam should turn on the Net LED at the front panel.

Unstable or noisy weights? Perform all the steps listed above. A really good test is to temporarily disconnect the load cell and substitute a known good load cell simulator (available for purchase from WeighTech), or a known good load cell. Calibrate the scale with a convenient test weight and check to see if the weight reading is stable. If so, the noisy load cell has probably been damaged or water-soaked. If the indicator still displays a noisy weight with a load cell simulator, the problem may be in the indicator. Contact WeighTech for further assistance.

### **9.2 Motors & AC Drives**

Be very careful if operating 230V motors on 460V drives—do not attempt to spin the motor until all the drive parameters (especially P-07 and P-08) are properly configured. Do not attach the motors directly to the AC power input! Nuisance trips due to motor overcurrent faults can sometimes be tuned out by increasing parameter P-08 slightly.

### **9.3 Banner Opto Sensors**

The Banner opto sensors will act strangely if wired incorrectly. Be certain that you connect the brown wire (12V) last when rewiring sensors with power on. If the brown and blue wires are swapped, or if the blue wire (ground) is connected last, the sensor will go into alarm mode. In alarm mode, the sensor will appear to work but the MicroWeigh controller will not receive the correct signal. If the led indicators on the Banner appear to be working correctly, but the MicroWeigh front panel indicators don’t show any changes when the beam is blocked, check the Banner sensor wiring.

## 9.4 Before calling WeighTech...

Write down a few key pieces of information. Gather the indicator serial number from the front panel, the software application name and build number from the “Info menu”, and grab the current settings if you have access to a Palm. If anything on the indicator has changed, been replaced, or been modified, mention that to the service technician too. If the problem involves fill rates, hangs, or questions regarding machine capabilities, be ready to describe the product, product flow rate, and any bag/box/tote/combo sizes. If you’re calling about unstable weight readings, over/underload, or other load cell related problems, have the ADC, excite, and signal readings from the “Info menu” handy. When calling, be prepared to describe what is wrong (“it doesn’t work!” isn’t a good description–“hopper gate doesn’t shut in off mode” is much better) and what you expected to see.

## 10 Module Assignments

Slot	Module Type	Function	Module on (lit)	Module off (dark)
M1	OAC5 (black)	Knockoff gate	Gate extend	Gate retract
M5	IDC5K (white)	Zero opto sensor	Beam clear	Beam blocked
M6	IDC5K (white)	Weigh opto sensor	Beam clear	Beam blocked

## 11 Drive configuration (TB Woods drive)

### 11.1 Weighbridge

Parameter	Value	Description
P-01	150.0 Hz	Maximum speed limit
P-02	0.0 Hz	Minimum speed limit
P-03	1.0 s	Acceleration ramp time
P-04	1.0 s	Deceleration ramp time
P-05	0	Drive stop mode
P-06	0	V/F characteristic select
P-07	0.0 s	Rapid deceleration ramp time
P-08	0.45 A	Motor rated current
P-09	60 Hz	Motor rated frequency
P-10	0 rpm	Motor rated speed
P-11	2 %	Motor Voltage Boost
P-12	0	Terminal / Keypad mode select
P-14	101	Extended menu access code
P-15	230 V	Rated Motor Voltage
P-16	0 - 10V	Analog input format
P-17	8 kHz	Effective power stage switching frequency select
P-18	0	Relay output function select
P-19	2	Digital input function select
P-20	80.0 Hz	Preset / Jog speed 1 (80Hz=205FPM)
P-21	80.0 Hz	Preset / Jog speed 2
P-22	80.0 Hz	Preset / Jog speed 3
P-23	80.0 Hz	Preset / Jog speed 4
P-24	100 %	Slip compensation correction factor
P-25	0	Analog output function select
P-26	100 %	V/F characteristic adjustment factor
P-27	0.0 Hz	Skip frequency / speed centre point
P-28	0.0 Hz	Skip frequency / speed band
P-29	0 Hz	V/F characteristic adjustment frequency
P-30	Auto-0	Start mode select
P-31	10 %	DC injection voltage level
P-32	0.0 s	DC injection voltage duration
P-33	0	DC injection braking on enable
P-34	0	External brake resistor enable
P-35	100 %	Speed reference scaling factor
P-36	1	Serial communications drive address
P-37	101	Extended menu access code definition
P-38	0	Parameter Access control

## 11.2 Infeed/outfeed

Parameter	Value	Description
P-01	100.0 Hz	Maximum speed limit
P-02	0.0 Hz	Minimum speed limit
P-03	1.0 s	Acceleration ramp time
P-04	1.0 s	Deceleration ramp time
P-05	0	Drive stop mode
P-06	0	V/F characteristic select
P-07	0.0 s	Rapid deceleration ramp time
P-08	1.10 A	Motor rated current
P-09	60 Hz	Motor rated frequency
P-10	0 rpm	Motor rated speed
P-11	2 %	Motor Voltage Boost
P-12	0	Terminal / Keypad mode select
P-14	101	Extended menu access code
P-15	230 V	Rated Motor Voltage
P-16	0 - 10V	Analog input format
P-17	8 kHz	Effective power stage switching frequency select
P-18	0	Relay output function select
P-19	2	Digital input function select
P-20	60.0 Hz	Preset / Jog speed 1 (60Hz=205FPM)
P-21	60.0 Hz	Preset / Jog speed 2
P-22	60.0 Hz	Preset / Jog speed 3
P-23	60.0 Hz	Preset / Jog speed 4
P-24	100 %	Slip compensation correction factor
P-25	0	Analog output function select
P-26	100 %	V/F characteristic adjustment factor
P-27	0.0 Hz	Skip frequency / speed centre point
P-28	0.0 Hz	Skip frequency / speed band
P-29	0 Hz	V/F characteristic adjustment frequency
P-30	Auto-0	Start mode select
P-31	10 %	DC injection voltage level
P-32	0.0 s	DC injection voltage duration
P-33	0	DC injection braking on enable
P-34	0	External brake resistor enable
P-35	100 %	Speed reference scaling factor
P-36	1	Serial communications drive address
P-37	101	Extended menu access code definition
P-38	0	Parameter Access control



## 12 Replacement Parts

Part Number	Description
1000-115	Load cell, 30 kg capacity
AA0004	Rod clevis, air cylinder
AA0006	Air tubing, duo blue/black, 4 mm x 50 m
AA0009	Air regulator
AA0011	Cylinder flow control
AC0008	Air cylinder
AF0001	Air fitting, QS-1/8-6 (pack of 10)
AF0006	Air fitting, QSL-1/8-6 (pack of 10)
AF0007	Air fitting, QSL-1/4-6 (pack of 10)
AF0012	Air fitting, QSY-6 (pack of 10)
AV0014	1 station air valve assembly
AV0044	Air valve & coil assembly
AV0045	DIN plug, air valve
AV0046	LED gasket, air valve
AV0047	Substation, air valve
AV0048	End plate kit, air valve
CB0014	Weighbridge belt
CB0062	Infeed / outfeed conveyor belting
EF0009	Strain relief, load cell
EP0018	Variable speed drive, 480 VAC, 1 HP
EP0019-101	Weighbridge motor and sprockets
EP0064	Drum motor assembly, 151 FPM
EP0067	Transformer, 120 VAC
HW0018	Housing screw, MicroWeigh, (pack of 4)
HW0019	Screw, 6-19x0.375, trilobe PPH steel (pack of 10)
SE0005	Lens kit
SE0006	Fiber optic cable sensor
SE0011	Fiber optic cable set
SR0002	Output relay (black, G4-OAC5)
SR0007	Input relay (white, G4-IDC5K)
SS0006	Stop switch assembly w/ contacts
WE0028	Main gasket, MicroWeigh
WE0029-1	Power cord, detachable, MicroWeigh
WE0046-101	Front housing assembly, MicroWeigh machine control (specify firmware name and revision)
WE0047-101	MicroWeigh machine control back housing assembly w/ board
WE0076-101	MicroWeigh machine control interface board
WF0325	Knockoff gate
WF0326	Knockoff gate pin
WF0804-1	Weighbridge assembly, 24x16



JOB: CHECKWEIGHER

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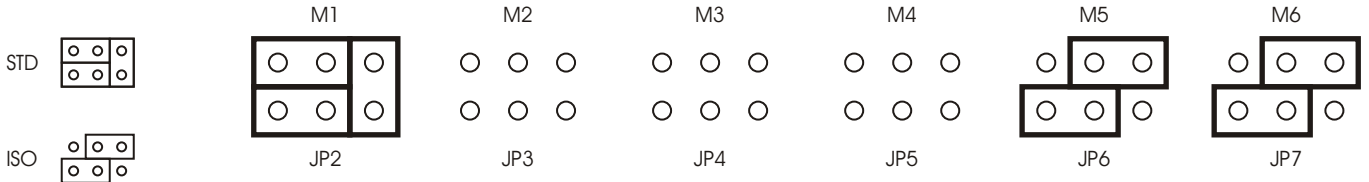
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PAGE: 1 OF 1

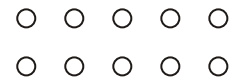
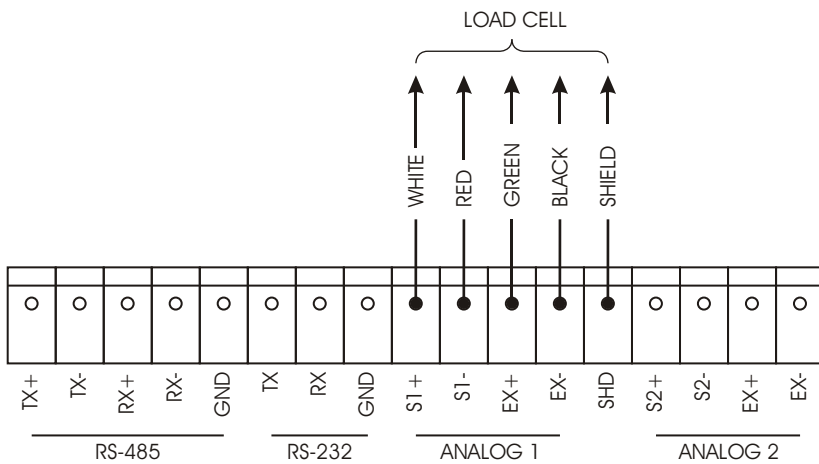
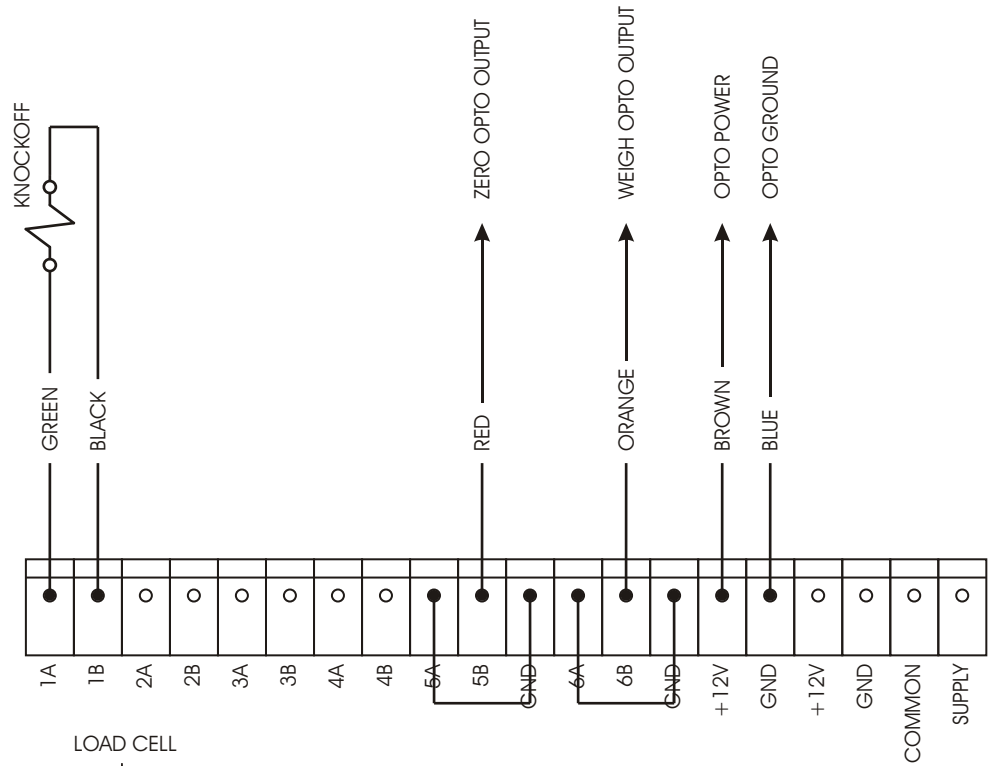
DRAWN BY: NEWELL

DATE: 4-23-2014

FIRMWARE: MICROCHECK\_1



SLOT	TYPE	FUNCTION	LIT	DARK
M1	BLACK OAC-5	KNOCKOFF	EXTEND	RETRACT
M2				
M3				
M4				
M5	WHITE IDC-5K	ZERO OPTO	BEAM CLEAR	BEAM BLOCKED
M6	WHITE IDC-5K	WEIGH OPTO	BEAM CLEAR	BEAM BLOCKED



JP12



## 14 Load Cell Color Codes

Manufacturer	Models	Signal +	Signal -	Excite +	Excite -	Shield	Sense +	Sense -
Advanced Transducers		Green	White	Red	Black	Bare wire		
Allegany Technology		Red	White	Green	Black	Bare wire		
Artech		Green	White	Red	Black			
Beowulf		White	Red	Green	Black			
BLH	C2P1 C3P1 T2P1 T3P1	White	Red	Green	Black	Yellow		
Cardinal		White	Red	Green	Black	Bare wire		
Celtron	CSB DSR LOC SQB STC STC-SS DSR CLB HED DLB LPS HOC MOC	Green Green Red	White White White	Red Red Green	Black Blue Black	Bare wire Bare wire Bare wire		
Dillon	Canister Tension Compression Z-cell	Black Black White	Red Red Green	Green White Red	White Green Black	Orange Orange Orange		
Force Measurement		Green	White	Red	Black	Bare wire		
GSE		White	Green	Red	Black	Bare wire		
HBM	BLC BLF JRT PWS RSC SBF SB3 USB U1T Z6 BBS PLC B35 SP4	White White Green White	Red Red White Red	Green Green Red Green	Black Black Black Black	Yellow Bare Yellow Yellow	Orange	Blue
Interface	SSM 1200 3200	Green	White	Red	Black	Bare wire		
Kubota		Green	Blue	Red	White	Yellow		
National		White	Red	Green	Black	Yellow		
NCI		White	Green	Red	Black	Bare wire		
Pennsylvania		Green	White	Orange	Blue	Bare wire		
Phillips		Green	Grey	Red	Blue	Bare wire		
Revere Transducer	62HU 63HU 363 953 9523 92CC 93CC 42U 43U 263D 462 5102 5103 5123 5223 5723 6762 9102 9103 9123 9363 392B 642 652 692B2 BSP HPS USP1 792 933 SHB SSB CP1 CSP1	Green Green	White White	Red Red	Black Black	Bare wire Orange		
Rice Lake	RL20000 RL20000SS RL20001 RL20001HE RL30000 RL35023 RL35023S RL35082 RL35082S RL35083 RL39123 RL39523 RL50210 RL65044 RL70000 RL75016 RL75016SS RL75040A RL75058 RL75060 RL75223 RL90000 RLETB RLETS RLHSS RLMK4 RL50500 RL70000SS RL71000HE RL75016HE RLMK15 RLMK21 RL75061 RLMK1 RL1521	Green Green	White White	Red Red	Black Blue	Bare wire Bare wire	Yellow	Blue
Sensotec	White	Green	Red	Black	Bare wire			
Sensortronics	60001 60008 60018 60030 60036 60040 60048 60048SS 60050 60051 60060 60060-0101 60063 65007 65016 65016SS 65016W 65023 65023S 65023SS 65024 65040A 65040S 65058 65058S 65061A 65083 65083S 65114 60007 60064 65088-1000 65088-1114	Green White White	White Red Red	Red Green Green	Black Black Black	Bare wire Orange		
Tedea Huntleigh	4158 3411 3421 240 1010 1022 1040 1042 1140 1250 1260 1320 9010 605 1030 1240 1241 355 620 3510	Green Green Red	White White White	Red Red Green	Black Black Black	Bare wire Bare wire Bare wire	Blue Blue	Brown Brown
Toledo		White	Red	Blue	Black	Bare wire	Green	Grey
Weigh-Tronics		White	Red	Green	Black	White/Orange		

WeighTech, Inc.  
1649 Country Elite Drive  
Waldron, AR 72958

Toll free: (800)-457-3720  
Phone: (479)-637-4182  
Fax: (479)-637-4183

Email: [info@weighttechinc.com](mailto:info@weighttechinc.com)  
Web: [www.weighttechinc.com](http://www.weighttechinc.com)

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