Rice Lake Weighing Systems

SCALE TALK

*Welcome to ScaleTalk, which will be a recurring section of* The Standard. *In each magazine issue, ScaleTalk will present an educational topic related to the scale industry, product tutorial or best practice. From beginning technicians to seasoned veterans, we hope every scale professional will find this section to be interesting and valuable. In our first installment, we will explain the four methods of scale calibration.*

# 4 Methods of Scale Calibration


## Using Calibration Weights

Using certified calibration weights is the most accurate method for calibrating a scale and should be your first choice. This is also the only Legal for Trade method you can use to calibrate scales. It's important to review NIST Handbook 44 to ensure you're using the correct class and amount of weight for the capacity of your scale during calibration procedures. Generally, you will need weights that equal at least 12.5% of the scale's capacity, though some lower capacity scales may require weights equal to the full capacity. For example, if you have a scale with a 50-pound capacity, Handbook 44 recommends using calibration weights equal to 50 pounds to calibrate the scale.

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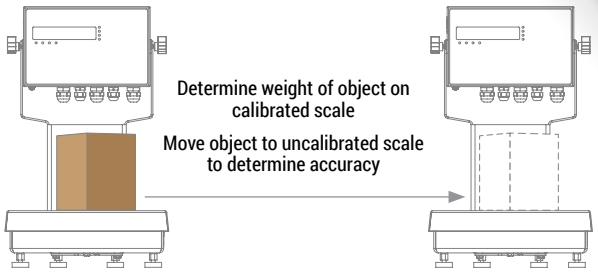


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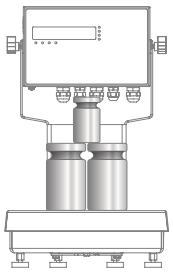
## Using an Object from a Calibrated Scale

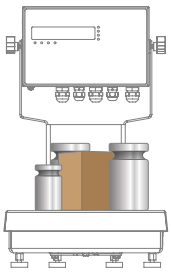
# 3 Using Material to Substitute for Weights

This method is not as accurate as using certified calibration weights but can be used if you don't have enough weights to meet the minimum requirement of 12.5% of the scale's capacity. After you perform an initial calibration with the weights you have, you would remove the weights and replace them with products or material, then add the calibration weights back to see if the scale is returning the expected amount of weight.

For example, if you have a grain hopper scale with a 100,000-pound capacity but have only 4,000 pounds in calibration weights, you can perform an initial calibration with those weights. Then fill the hopper with 4,000 pounds of grain and add the calibration weights back to the hopper. The scale reading should display 8,000 pounds. You would continue this build-up process until you are beyond the 12.5% required to calibrate the scale, although you could continue the process to check accuracy at higher weights.



Uncalibrated scale with test weights



Uncalibrated scale with product and test weights

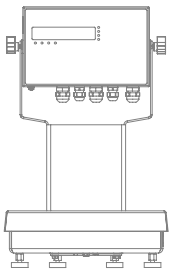
# 4 Calibrating with a Simulator or Theoretical Calibration

The final method is using a simulator, or theoretical calibration. This method should be used only when you don't have any calibration weights. This is the least accurate calibration method and should never be used in a Legal for Trade application. After using this method, you should return to the scale with test weights to perform a full calibration as soon as possible.

This is a complex process with room for error because there are numerous calculations involved. You will also need additional information about the system, such as excitation voltage from the indicator and millivolt output of the load cells. Because you're using a simulator connected to the weight indicator, you won't be able to properly exercise the scale or account for environmental factors during calibration. You will also need to "re-zero" the system after the calibration to account for the weight of the top plate on the load cells, further adding to the inaccuracy of this calibration method.

While it is recommended to use certified calibration weights to calibrate your scales, and necessary to do so in Legal for Trade applications, there are some instances when calibration weights may not be available. If you have a scale known to be accurately calibrated, you can use it to help calibrate another scale. To compare the scales, you would place an object on the calibrated scales and record the exact weight. Then place the same object on the uncalibrated scale to check that it produces the same weight reading. The object works as a temporary substitution for calibration weights to quickly check accuracy.

This method is very useful for large capacity scales, such as truck scales. A truck could drive onto a calibrated scale, record the weight, then drive onto an uncalibrated second scale to check the accuracy.



Uncalibrated Scale


Simulator