We claim:

1. A method for using parameters of a sensor signal provided by a sensor assembly to verify the sensor assembly, the method comprising:

obtaining a central tendency value of a sensor assembly verification value and a dispersion value of the sensor assembly verification value from a storage in a meter electronics of the vibratory meter; and

determining a probability based on the central tendency value and the dispersion value to determine if the central tendency value is different than a baseline sensor assembly verification value;

wherein the baseline sensor assembly verification value is based on sensor signal parameter values and the sensor assembly verification value is one of an LPO/RPO voltage ratio value, a DRV/LPO voltage ratio value, and a DRV/RPO voltage ratio value.

2. The method of claim 1, wherein determining the probability based on the central tendency value and the dispersion value comprises calculating a *t*-value and calculating the probability using the *t*-value.

3. The method of claim 1, wherein determining the probability based on the central tendency value and the dispersion value comprises calculating a degree-of-freedom based on a number of sensor assembly verification measurements.

4. The method of claim 1, wherein determining the probability based on the central tendency value and the dispersion value comprises calculating a standard error based on a standard deviation and the degrees-of-freedom, wherein the standard error is calculated using the following equation:

$$stderror_{pooled} = \sqrt{\frac{(2 \cdot (stddev_{pooled})^2)}{n_{DOF}}};$$

where:

$stddev_{pooled}$ is the standard deviation; and

n_{DOF} is the degrees-of-freedom.

5. The method of one of any of the foregoing claims 1 through 4, wherein the dispersion value is a pooled standard deviation comprising a standard deviation of sensor assembly verification measurements and baseline sensor assembly verification measurements.

6. The method of one of any of foregoing claims 1 through 5, wherein the probability comprises a confidence interval of the central tendency value that is compared to zero, wherein:

if the confidence interval does not include zero, then detect that the central tendency value does not equal the baseline sensor assembly verification value; and

if the confidence interval includes zero, then detect that the central tendency value equals the baseline sensor assembly verification value.

7. The method of claim 1, wherein the central tendency value is the sensor assembly verification value and the confidence interval of the sensor assembly verification value is calculated using the following equation:

$$CI = SV_{mean} \pm CI_{range};$$

where:

CI is the confidence interval of the sensor assembly verification value;

SV_{mean} is the sensor assembly verification value obtained from a storage system; and

CI_{range} is a confidence interval range calculated based on a standard deviation and a *t*-value.

8. The method of claim 7, wherein the confidence interval range is calculated using the following equation:

$$CI_{range} = stderror_{pooled} \cdot t_{student,99.8};$$

where:

$stderror_{pooled}$ the pooled standard error of the sensor assembly verification measurements; and

$t_{student,99.8}$ is a t-value calculated based on a significance level and a degrees-of-freedom determined from a number of sensor assembly verification measurements comprising the sensor assembly verification value.

9. The method of one of any of claims 1 through 8, further comprising setting a bias dead band, wherein if the central tendency value is less than the bias dead band, then the sensor assembly verification value is not detected as being different than the baseline sensor assembly verification value.

10. The method of claim 1, wherein the baseline sensor assembly verification value comprises a central tendency value and a dispersion value of the baseline sensor assembly verification value.

11. The method of claim 10, wherein the central tendency value of baseline sensor assembly verification value is a mean of the baseline sensor assembly verification value and the dispersion value of the baseline sensor assembly verification value is a standard deviation of the baseline sensor assembly verification value.

12. The method of claim 1, wherein detecting if the central tendency value is different than the baseline sensor assembly verification value comprises determining if the probability based on the central tendency value and the dispersion value does not overlap with a probability of the baseline sensor assembly verification value.

13. The method of claim 12, wherein the probability based on the central tendency value and the dispersion value comprises a confidence interval determined based on the central tendency value and the dispersion value and the probability of the baseline sensor assembly verification value comprises a confidence interval determined based on baseline sensor assembly verification measurements.

14. The method of claim 13, wherein determining if the probability based on the central tendency value and the dispersion value does not overlap with the probability of

the baseline sensor assembly verification value comprises calculating the following equations:

$$LHS = |\mu_{measured} - \mu_{baseline}|;$$

$$RHS = 2 * (\sigma_{measured} + \sigma_{baseline});$$ and

determining that the probability of the central tendency value and the dispersion value obtained from the storage overlaps with the probability of the baseline sensor assembly verification value if:

$$LHS < RHS.$$

15. A meter electronics (20) for using parameters of sensor signals provided by a sensor assembly (10) to verify the sensor assembly (10), the meter electronics (20) comprising:

a processing system (302) including a storage system (304) configured to store a central tendency value of a sensor assembly verification value and dispersion value of the sensor assembly verification value, said processing system (302) being configured to perform the method of one of the foregoing claims 1 through 14.