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Recommended Protocol for Calibration

Calibration is an integral component of your ramé-hart instrument. It's important that it's done properly, verified, and logged. This document provides our recommendation for frequency and procedure. It does not detail how to perform the calibration routine. However, we do have video available online which do walk through the calibration routine and links can be found below.

HOW IT WORKS

The calibration routine used with all current-generations ramé-hart instruments is performed with a Combo Calibration Device (p/n 100-27-31-U or 100-27-31-C) tool that includes a single sphere suspended on a clear surface. The calibration routine takes a picture of the ball and counts how many pixels are required to define the horizontal and vertical diameters. Since the dimension of the ball is known (e.g., 4mm), the software uses simple math to determine the dimensional value of each pixel both horizontally and vertically. These values are stored and used by the software to determine linear and angular dimensional values. For example, if you calibrated your instrument and the calibration routine determined that your horizontal and vertical pixel dimension is 10 μ , and then, if you were to measure a drop and the software calculated that 300 pixels are present at the three-phase line, then the software would then perform a calculation and determine that the drop width is 3mm (10 μ x 300 pixels). The calibration ends with a report showing the horizontal and vertical pixel dimensions as well as the aspect ratio (horizontal over vertical). Note that the aspect ratio is provided so you can quickly determine if the calibration is successful since the ratio should be close to 1.0000.

HOW TO CALIBRATE

For detailed instructions on how to calibrate DROPimage CA, see <http://youtu.be/oqUtOef974c>.

For detailed instructions on how to calibrate DROPimage Standard, see http://youtu.be/H0u5blc_7tY.

For detailed instructions on how to calibrate DROPimage Advanced, see <http://youtu.be/ffDagzl7D2M>.

ORIENTATION

The calibration tool should be positioned on the specimen stage – facing the camera with the front edge flush with lip behind the Plexiglas window as shown in the image below. Ensure that the stage is somewhat leveled. Exact leveling is not required and the calibration results are not affected if the stage is less than perfectly level.



FREQUENCY

When you receive your instrument and you have it setup, you should proceed with the first calibration. After that you must re-calibrate anytime there is a significant change to the system. Here are some examples of what would constitute a change:

- The instrument is moved.
- The lens is changed or adjusted.
- The bulb in the light source is changed.
- There is a change to any overhead or ambient lighting.
- The fiber bundle or light source is changed or replaced.
- The software is upgraded.
- The instrument has been in storage.
- The PC is replaced or upgraded.
- The DROPimage software or camera drivers are reinstalled or updated.

In addition to calibrating the system when there is a change, we also recommend doing a new calibration on a monthly basis.

DAILY CHECK

On a daily basis, prior to taking measurements, we recommend that you CHECK the existing calibration. This is done by going to Calibrate > Check Calibration. This procedure is nearly identical to performing a new calibration. The difference is that the check calibration routine does not **change** the calibration, it simply **compares** your current calibration values with the stored values. If the deviation is greater than 1%, then you should recalibrate the instrument. Under normal circumstances, the deviation should be less than 1%. Note that DROPimage CA does not have a check calibration routine. In the case of DROPimage CA, the recommendation is to perform a new calibration, log it, and compare it with the prior calibration value.

CERTIFIED OPTION

Every instrument shipped from ramé-hart instrument co. includes a Combo Calibration Device, p/n 100-27-31-U, which is the uncertified version. Also available is a certified version of the Combo Calibration Device which includes a NIST-traceable certificate. The p/n is 100-27-31-C. The certified version can be recertified. Order p/n 100-27-31-RE and the device would need to be returned to ramé-hart instrument co. to be re-certified. Some quality standards require annual recertification.

ACCEPTABLE RANGE

The acceptable range for the Certified Combo Calibration Device (p/n 100-27-31-C) for the horizontal and vertical features of the 4mm ball is 4mm +/- 0.0100mm. However, in addition the difference between horizontal and vertical features must not exceed 0.0050mm.

LOG

We strongly recommend that you maintain a calibration log. At a minimum, the log should include the time and date, the person performing the calibration, the horizontal and vertical pixel dimensions and the aspect ratio. Click on Calibrate > Show Calibration to obtain these values. This will help you compare new calibrations with stored values. In general, if the values have changed more than 1%, it's a good idea to perform a new calibration.

QUESTIONS

If you have any question at all regarding calibration procedures and protocol or any aspect of operating your instrument, please contact us.