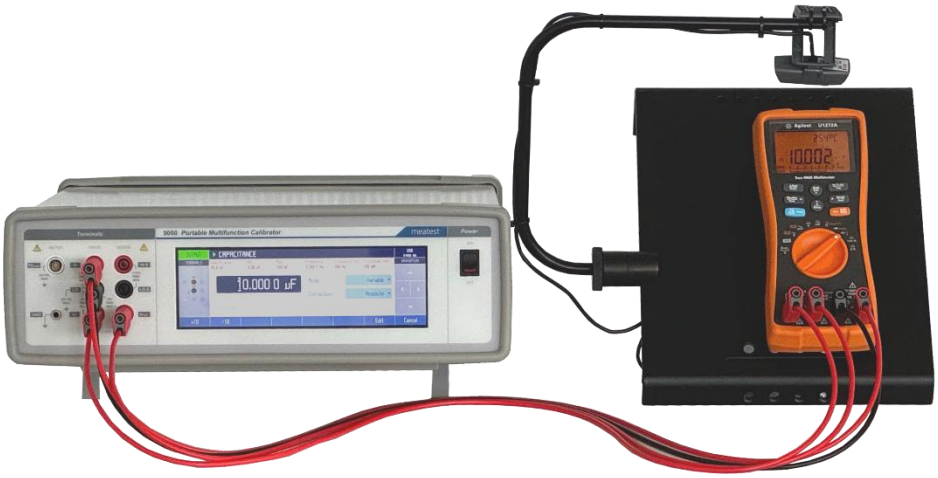
meatest

EN, rev. 19

CamOCR – Optical Readout Module

Operation manual



Content

1. Description

CamOCR is extension module for Caliber, Meatest's automated calibration software, enables automation of calibrations of devices under test (DUT) with seven-segment digital displays, even if they have no built-in PC interface.

By using a digital camera to capture the DUT's display, CamOCR converts scanned images into numerical values. These values are then used in Caliber as readings and used for further calculations of DUT error and Type A uncertainty.

1.1. Application limits

CamOCR is designed to scan numbers from digital 7-segment displays showing at least 3 and maximum 8 digits. CamOCR does not read numbers from dot-matrix displays or analog scales.

1.2. Requirements

- PC with Windows OS (XP / Vista / 7 / 8 / 10 / 11) and at least 1 GB RAM
- Caliber software with CamOCR enabled
- Camera Stand (sold separately; includes PC camera, base plate, camera arm and light cover)

1.3. SW installation

CamOCR software comes pre-installed with Caliber and will activate automatically once the Caliber installation is registered using "Caliber license with CamOCR enabled". If you own a standard Caliber license and want to enable the CamOCR feature, ask your local dealer for a license upgrade.

Note: Camera driver is installed automatically in newer Windows OS versions. Old OS versions might require manual driver installation from CD or camera manufacturer website.

2. Assembly instructions

It's recommended to use the Camera Stand with light covers attached to avoid unwanted light reflections. To do this, fasten the transparent plexi-glass to the base plate (or now obsolete Option 140-01) with attached M4 bolts and transparent pads, then fasten the black L-shaped cover to the plexi-glass in the same way.

Next up, slide the camera arm jaw onto the base plate, position the arm so that the camera is approximately 15 cm or 6 inches away from the DUT display and secure it in place by tightening the jaw bolt (using attached hex key) and toothed wheel on the side of the jaw. Recommended jaw position is around ¼ of the base plate length

3. Camera image setup

Image quality plays an important role in OCR accuracy. Even and sufficient ambient light helps improve OCR performance while shade boundaries and light reflections in the image produce reading errors. Fluorescent ambient light sources are ideal for the job as they create flat and stable lighting as opposed to spotlights or direct sunlight.

The following steps describe how to set the camera and its settings for best OCR results:

1. **Camera activation.** Create or open any procedure in Caliber where one of the devices is set to use Camera as input option ("Instrument response"). Right click on that device in the instrument scheme diagram and click "Open Camera" to activate the camera view.
2. **Image area adjustment.** Adjust the camera arm so that the number to be scanned (including plus or minus sign) fills the entire camera view window. The OCR feature might work with other display numbers and symbols in view but it's likely to increase reading error rate. Use cursor buttons under the camera view window to move the image crop envelope if needed.
   If the scanned display number is too small or too large to fit, you can either move the camera closer or further away from the display or adjust camera resolution using Format button under the camera view window. Higher resolution zooms in, lower resolution zooms out.
3. **Camera focus.** Adjust camera focus by turning lens ring on the camera body if the image is not sharp. Grainy image can be caused by insufficient ambient light.
4. **Image parameters.** Image parameters like brightness, contrast, etc. are set automatically upon camera activation However, you might achieve better OCR performance by adjusting the parameters manually using Setting button under the camera view window. Gamma and Backlight Compensation can compensate for low ambient light, Contrast and White Balance can enhance contrast between display segments and its background and improve OCR accuracy.

3.1. Tips & Tricks

- Make the scanned number fill the entire camera view window in Caliber, ensuring all digits and the polarity sign are clearly visible.
- Avoid any light reflections or shadows over the scanned area. Also avoid direct sunlight and focused spotlights.
- Maintain good contrast in the scanned image. Some displays will start to fade as their battery runs low.
- Ideal camera view angle is perpendicular to display screen or slightly tilted upwards (so that bottom display edge appears slightly wider than the top edge). Higher view angle can help to avoid reflections but also skews the image and therefore increases likelihood of display digit and decimal sign misinterpretations.

Image below shows ideal setup for a 3½digit DUT display: