



WinCamD may be used with ancillary ‘camera lenses’ to reimage a screen illuminated by a laser beam.

WinCamD has a so-called ‘½-inch’ CCD chip which has an active area of 4.8 x 6.3 mm. Used with a fixed focal length lens they can reimage the illuminated screen onto the CCD.

1) Choosing a lens.

Recommended lenses include the Edmund Industrial Optics (EIO) range listed below. They include a manual iris which further simplifies the issue of setting the correct illumination level.

| EIO P/N * | Focal length | Horiz FOV | FOV at 1m | Min working distance |
|------------------|---------------------|------------------|------------------|-----------------------------|
| L52-585 | 75 mm | 4.8° | 84 mm | 1 m |
| L39-083 | 50 mm | 7° | 120 mm | 1 m |
| L39-084 | 25 mm | 14° | 245 mm | 0.5 m |
| L39-085 | 16 mm | 22.1° | 390 mm | 0.25 m |
| L39-086 | 12.5 mm | 28° | 495 mm | 0.4 m |
| L39-087 | 8.5 mm | 40.4° | 735 mm | 0.2 m |

* The Letter at the front of Edmund P/N’s increments as catalog revisions are issued. The numbers in the P/Ns do not change.

To calculate the linear FOV at distances other than 1 meter, simply multiply by the distance in meters.

These lenses must be used with a 10 mm spacer placed between the lens and the camera head. [Adding a longer spacer reduces the minimum working distance, but at the expense of imaging quality.]

The C-mount spacer kit, EIO P/N L54 261 gives you a variety of spacers, including 5 and 10 mm spacers. This allows you to use the lens with or without the standard DataRay ND4 C-mount filter.

Alternatively purchase individual spacers: 5 mm, EIO P/N L54-628; 10 mm, EIO P/N L54-629.

2) Measuring and Entering Lens Magnification

The software can compensate for known magnifications entered in the **Pixel Multiply Factor (PMF)** box in WinCamD **Setup**.

To calculate this factor, move the camera and lens a known transverse distance and measure the transverse change in the position of the image centroid on the screen.

E.g. You move the camera 10 mm and the image centroid moves 400 microns. The magnification is $(0.4/10) = 0.04$. Enter 0.04 as the PMF factor for X and Y. The on-screen dimensions will then be correct.

3) Speckle Reduction.

Any static screen will show speckle, typically giving intensity modulation of $\pm 20\%$ and significantly affecting the accuracy of diameter measurement. You can get some relief by using the linear and area filters in the **Filter** menu.

Even better, use a rotating screen (e.g. white laminate) to ensure speckle averaging. For small beams, Melles Griot sell the inexpensive 13 ASE 001 for beams up to 22 mm.