

Detailed guide to checking your dumpy level for accuracy and how to self-calibrate*

*Please note that this is a guide for you to check your level, we have included instructions on re-calibrating but do not recommend you re-calibrate your self. Calibration is best done by a trained technician using a calibration station. Whilst we have taken care in providing a true and accurate guide to calibration CMI Lasers takes no responsibility for any damage caused whilst self calibrating your level.

We recommend you test your level regularly as over time vibrations, knocks or drops can take you level out of calibration.

THE BULLSEYE VIAL

To check the bullseye vial, level the dumpy as per normal on a sturdy tripod so that the bubble is exactly central. Now rotate the dumpy so the bullseye vial is now above one of the adjustment wheels and check that the bubble is still within the circle. Then rotate again to the next adjustment wheel and check. If the bubble is within the circle when located over each of the three adjustment wheels then the bubble vial is sufficiently calibrated. Remember it is the compensator within the dumpy that creates the accuracy not how central the bubble is in the bullseye vial (as long as it remains inside the circle the compensator will be able to accurately level the dumpy).

Re-calibrating the bullseye vial takes time and patience. With the bullseye vial above one of the adjustment wheels use a hex key to adjust the bubble so that it moves half the distance between its starting point and the centre of the vial, then use the adjustment wheels to move the bubble the rest of the way to the centre of the vial.

Now rotate the dumpy so that the bullseye vial is now over the next adjustment wheel, if the bubble is not central then repeat the above operation, half the way with the hex key and the other half with the adjustment wheels. Now rotate to the third adjustment wheel and repeat again. Keep going around the dumpy until the bubble is always within the circle NOTE. This can take many complete 360° rotations of the dumpy adjusting on every adjustment wheel to successfully calibrate the bullseye vial.

CHECKING THE COMPENSATOR

Set the dumpy up so directed at a staff or target some meters way. Whilst looking through the eyepiece rotate one of the adjustment wheels (front or back) so that the bubble just starts to exit the circle in the bullseye vial. You will see the image through the eyepiece wobble for a second then stabilise it the level shown now is the same as before moving the bubble then the compensator is working correctly. If not re-check your results and consult your dumpy stockist.

CHECKING THE "I" ANGLE

Set up the dumpy half way between two points A and B make the distance between these points approximately 20m, have a staff solidly mounted exactly vertically with the millimetre scale towards the dumpy level. Take an accurate reading of a_1 and b_1 (see diagram).

Next move the tripod and dumpy so that it is 2m from staff A, level and take readings a_2 and b_2

Perform the following calculation; $b_{2i} = a_2 - (a_1 - b_1)$ If the result (b_{2i}) is equal to the reading for b_2 then the dumpy is calibrated. (Note: $a_1 - b_1$ could be a negative, in this situation you add this figure to a_2 as two negatives make a positive)

If it is not equal check again, if still not equal then the cross hair needs to be adjusted. If $b_{2i} < b_2$ adjust the cross hair down by half the figure of b_{2i} (this should only be a few millimetres if greater then this you may have an error in calculation). The cross hair adjustment is behind the orange housing around the eyepiece and is accessed by rotating the orange cover anti clockwise. At the top of the eyepiece is a brass screw this will adjust the cross hair. You will need to repeat the above operation a number of times, each time the difference between b_{2i} and b_2 should get smaller until finally there is no difference and your dumpy level is then calibrated.

