CHECK CALIBRATION REFERENCE SHEET

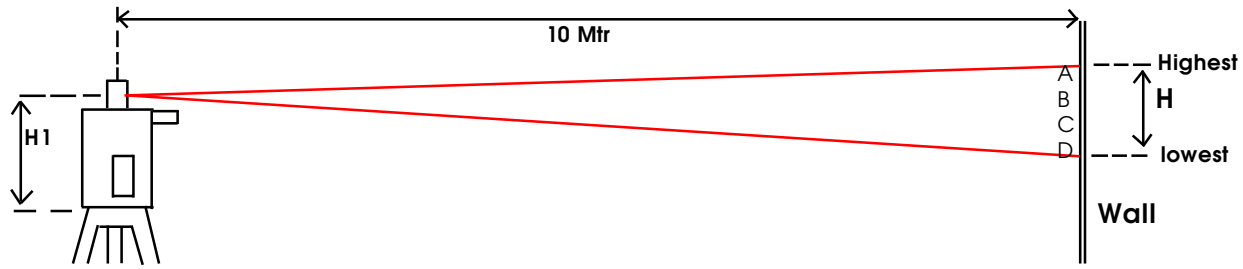
For CMI Lasers ARL510, ARL511, MRL500, MGL500, PRO800

➢ Checking the calibration in horizontal rotation mode

Note: for best results carry out this operation in dark or low light conditions.

1 Set up a tripod 10 meters from a suitable wall. For optimum accuracy make sure the domed head of the tripod is reasonably level. Place the rotating laser unit on the tripod and align the unit so that the handle faces the wall (for PRO800 face the battery compartment to the wall). It is important to place the laser as central as possible on the tripod.

2 Level the unit as per manufacturers instructions (IMPORTANT: for MRL/MGL500 take great care in leveling the unit) and shine laser beam onto the wall. For ease of measuring you may want to stick a sheet of paper to the wall at the place were the laser runs through the middle of it. Make a mark on the wall/paper in order to record the height at which the laser beam strikes it and label it **A**



3 You will be required to measure the height that the laser strikes the wall for each of the four sides of the unit. Rotate the unit by 90 degrees on the tripod by loosening the screw holding the unit to the tripod carefully and rotate. Make sure the unit is central on the tripod top after each rotation and manually re-level for the MRL500, MGL500 and PRO800 units (the ARL510 and ARL511 will self level). Mark the height the laser strikes the wall and label it **B**.

4 Rotate the laser unit by a further 90 degrees continuing in the same direction (clockwise or anticlockwise) so that the handle is now facing the opposite way to the wall and label the height of the laser **C**.

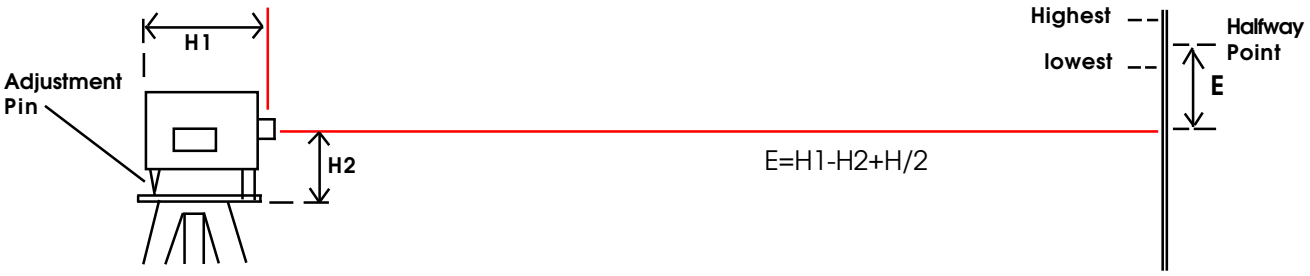
5 Rotate the unit so that the fourth side is facing the wall and repeat the previous instructions labeling the height **D**. Take the measurement **H1** in mm as shown in the above diagram. This is used when checking the calibration in vertical rotation mode, see over leaf. (Note: this feature is not available with the PRO800)

6 On the wall/paper you now have four marks A,B,C and D (Note: if you are using paper leave the paper on the wall for the next part of the test overleaf). With a rule carefully measure the distance between the highest mark and lowest mark. If this distance is greater than 3mm (PRO800 2mm) then the laser unit is out of its desired tolerance and should be returned to your CMI retailer who will quote and arrange for re-calibration. Please repeat this process at least once to confirm your results. **PTO**

- **Checking the calibration in vertical rotation mode**
  (feature not supported by the PRO800 laser)

1 Place your laser unit on its vertical mount and secure onto the tripod (IMPORTANT: the tripod should not have been moved or adjusted from the previous test). Aim the now horizontal point laser emitting from the now front of the unit towards the wall/ paper.

2 Level the unit for vertical rotation operation as per manufacturers instructions using the bubble vial and adjustment pin.



3 Very carefully measure the 'halfway point' between the highest and lowest mark on the wall paper and make a mark. Measure the height **H2** in mm and also the distance **H1**as shown in the above diagram and perform the following calculation; **H1-H2**. This will give you a value **E**. Carefully measure down from the 'halfway point' the distance **E** in mm. This point indicates the height of where the plumb laser beam should strike if it is perfectly level. The device is regarded to be within tolerance if the laser strikes in a zone anywhere between 1.5mm above and 1.5mm below this point.

4 If the laser beam does not strike within this 3mm zone double checking that the unit is still indicated as being level by the bubble vial. If the laser beam is out of tolerance then you can either re-calibrate this your self using the following instructions or return to your CMI laser retailer for a quote and to arrange re-calibration for you.

5 Re-calibrating the bubble vial for vertical rotation mode is achieved by first adjusting the unit until the plumb laser beam strikes point **E** using the adjustment pin. Secondly the bubble vial needs to be calibrated to show as being level at this point. This is achieved by removing the plastic screw next to the bubble vial and then turning the hex bolt beneath using a alun hex key until the bubble vial shows as being level. Replace the plastic screw when finished.

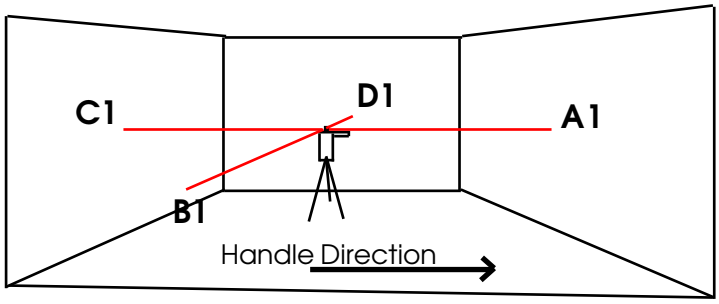
NOTE: when the plumb laser beam is horizontally level it automatically means that the vertical rotating beam is vertically plumb.

CMI Lasers are factory calibrated and should through normal use remain calibrated, however, severe knocks or shocks can make your laser unit perform outside their tolerance. CMI recommend that you check your unit once every 3 to 6 months depending on frequency of use or after any drops or knocks.

➢ **ALTERNATE METHOD** (RECOMMENDED FOR MRL500 AND MGL500)

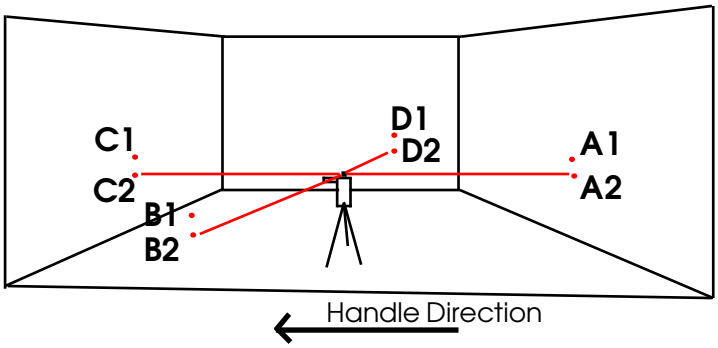
For this method of checking calibration you will need a large room with a solid floor. This method is good for checking all rotating lasers but will provide more accurate results particularly for manual leveling rotating lasers such as the MRL500 and MGL500.

1 Set laser up on tripod somewhere in the room pointing the handle directly at one of the walls in this case wall **A**.



2 Level the laser unit, with a manual leveling laser make sure each of the two bubble vials are set with the bubble in the absolute center of the vial. Turn on the laser level in rotation mode and make a mark on each of the four walls indication the height of the laser beam **A1, B1, C1** and **D1.**

3 Next move the laser and tripod to a different position in the room this time pointing the handle towards the opposite wall, in this case wall **C**. Accurately level as before and turn on in rotation mode.



4 Now mark again on the four walls labeled **A2**, **B2**, **C2** and **D2**. Making sure they ae either directly above or below the original marks A1to D1.

5 Measure the vertical distance between **A1** and **A2**, **B1** and **B2** and so on for all four walls. If all four measurements are equal then the laser is perfectly calibrated, there will most likely be some difference between the four measurements next we need to determine if this difference is within factory allowed tolerance. For example **A1,A2**=8.5mm **B1,B2**=9mm **C1,C2**=9.5mm and **D1,D2**=9mm the difference between the highest and the lowest in this example is 1mm

6 For the MRL500/MGL500 the tolerance is ±3mm at 20m. If the room is 10m across from wall to wall the difference allowed between the highest and lowest to be within tolerance is 1.5mm (for 20m room 3mm and so on) so for the example above the laser level is within calibration tolerance. Re-test to double check your results, the bigger the room the better as any error in marking and measuring is reduced.

IMPORTANT: Factory calibration tolerance is specified when the manual bubbles are exactly central in the vial. Care needs to be taken to ensure that the bubble is exactly central at all times for this test to be valid as human error in leveling manual lasers can make them appear outside tolerance when they are not. Automatic leveling lasers take any potential human error out of leveling.