

# AN EXPERIMENTAL STUDY OF MEASUREMENT OF HORIZONTAL DISTANCE WITH THE HELP OF AUTO LEVEL

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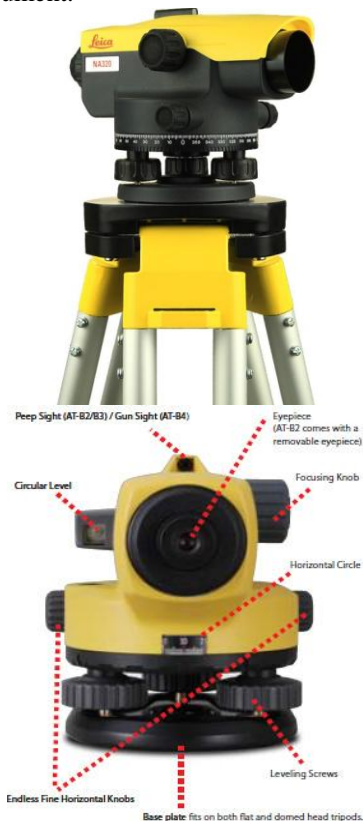
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**Abstract:** By the various methods of determining distance like we measure distance by the help of measurement tape but there is also we can determine the horizontal distance by the help of auto level and staff level. The difference between upper scardia and lower scardia gives the value of horizontal distance between auto level and levelling staff. The value can be measured up to 50m.

## I. INTRODUCTION

The automatic level employs a gravity referenced prism or mirror compensator to automatically orient the line of sight (line of collimation). The instrument is quickly leveled when a circular spirit level is used. When the bubble has been centered or nearly so, the compensator takes over and maintains the horizontal line of sight, even if the telescope is slightly titled. Automatic levels are extremely popular in present-day surveying operations. They are quick to set up, easy to use, and can be obtained for use at almost any required precision.

A level staff, also called levelling rod, is a graduated wooden or aluminium rod, used with a levelling instrument to determine the difference in height between points or height of points about the vertical datum it cannot be used without a levelling instrument.



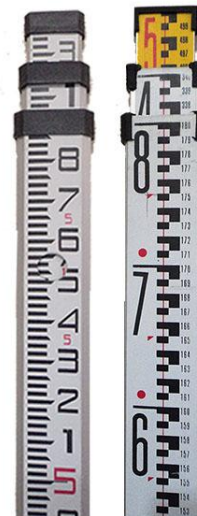
## II. WORKING PROCESS

At first, the auto level should be levelled by taking bubble in the Centre and then put the levelling staff vertically at the particular distance (the distance we have to measure). Now focus the lens on levelling staff and note the reading. First note the reading of upper scardia and then on same point note the reading of lower scardia. Deduct the upper reading from lower reading. Assume the scale 1cm= 1m. The resultant reading will give the value of horizontal distance between auto level and leveling staff.

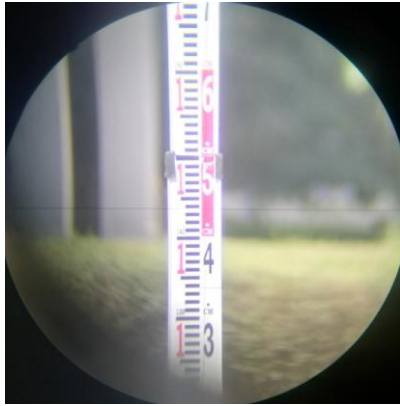
Instrument uses: A plumb bob, or plummet, is a weight, usually with a pointed tip on the bottom, suspended from a string and used as a vertical reference line, or plumb-line. It is essentially the vertical equivalent of a "water level"



A level staff, also called leveling rod, is a graduated wooden or aluminum rod, used with a leveling instrument to determine the difference in height between points or heights of points above a vertical datum.



Readings



Experiment 1

Reading of upper scardia = 147

Reading of lower scardia = 137

Difference =  $147 - 137 = 10$

From the scale 1cm= 1m so, 10cm = 10m

Experiment 2

Reading of upper scardia = 218

Reading of lower scardia = 200

Difference =  $218 - 200 = 18$

From the scale 1cm= 1m so, 18cm = 18m

Result

The reading of both the above experiment is verified from measurement tape and the readings are same.

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