



Model 6850-7 and 6850-8

Manual Sighting and Reading Table

Instruction Manual

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1. INTRODUCTION

GEOKON Models 6850-7 and 6850-8 Manual Sighting and Reading Tables are manual measurement devices for detecting and measuring the horizontal displacement of a pendulum wire relative to the station inside the dam embankment, at which the sighting device is mounted. The maximum range of the device is ± 25 mm in two horizontal orthogonal directions, X and Y. The sighting device can either be secured to a wall with a bracket or mounted to a table fixed to the floor, depending on the space limitations of the station location.



Software

The manual sighting and reading table consists of a base plate on which is mounted two steel rule reading scales and two sliding sighting devices. By moving the two sighting devices over the reading scales they can both be aligned in such a way that, when looking through the hole in each sliding device, the pendulum wire lines up with one of the front sights. In this position, the two values on the underlying scale can be read and entered into the [Pendulum Collimation Software](#) to yield the X and Y coordinates of the pendulum wire.

height should be around 1 to 1.5 m. Where a higher bracket is needed, the bracket can be mounted on a platform poured with concrete (refer to Figure 3). The slotted hole in the brackets should be 50 mm long.

Except for important dimensions, users may adjust the dimensions and structure of the bracket providing that the new dimensions do not affect mounting and operation.

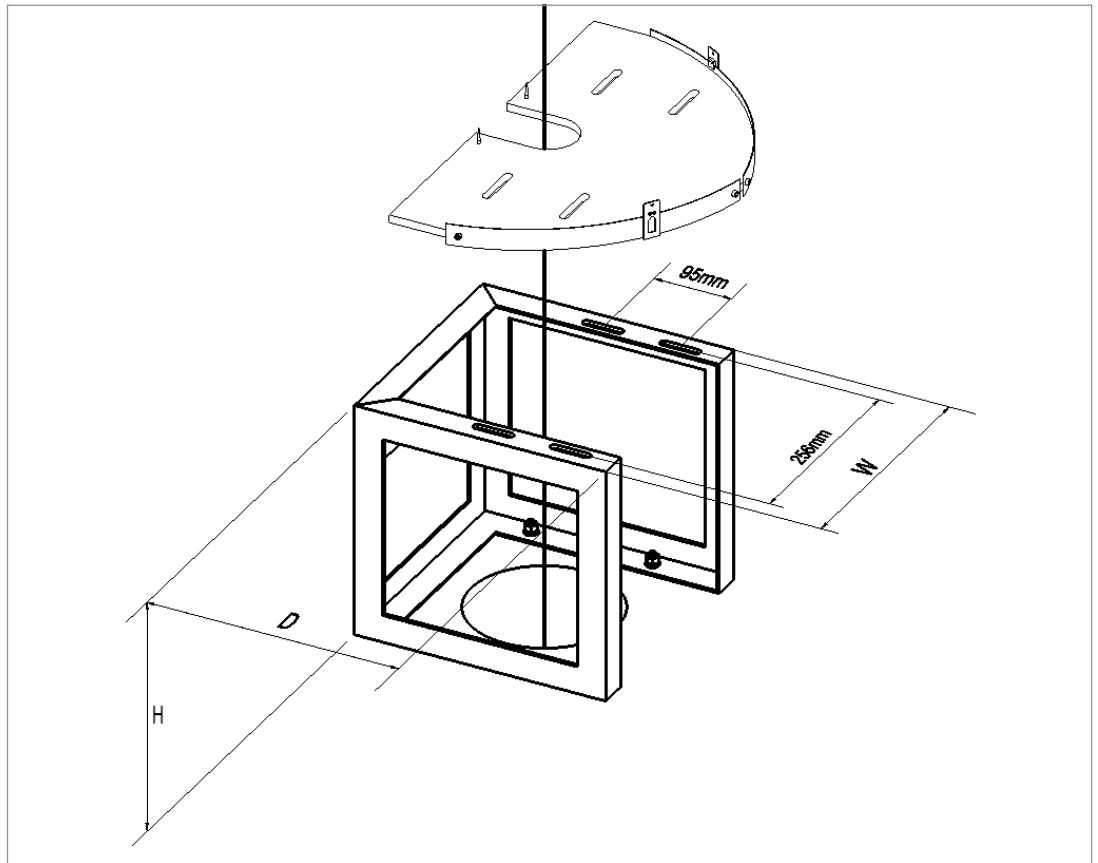


FIGURE 2: Key Dimensions of the Floor Mounting Bracket

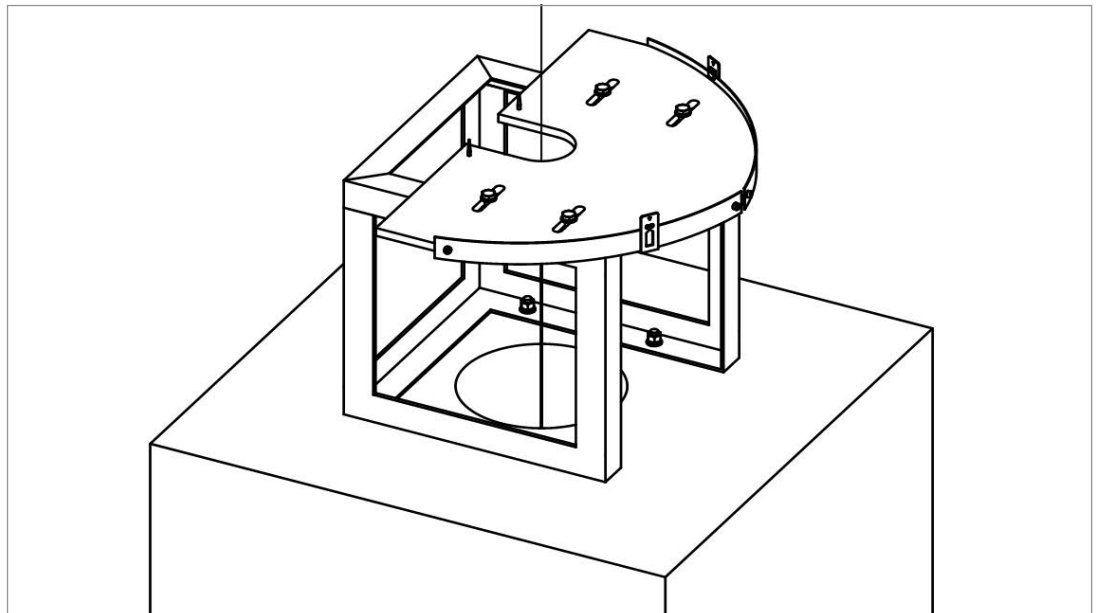


FIGURE 3: Schematic Drawing for Floor Mounting

2.2 WALL MOUNTING

When the distance from the perpendicular to the wall is between 100 to 400 mm (3.9 to 15.8"), the wall fixation method can be used for mounting. Wall brackets can be provided by GEOKON.

Dimension L in Figure 4 is the distance from the straight side of the base plate to the wall. Generally, this distance is 70 mm (2.8").

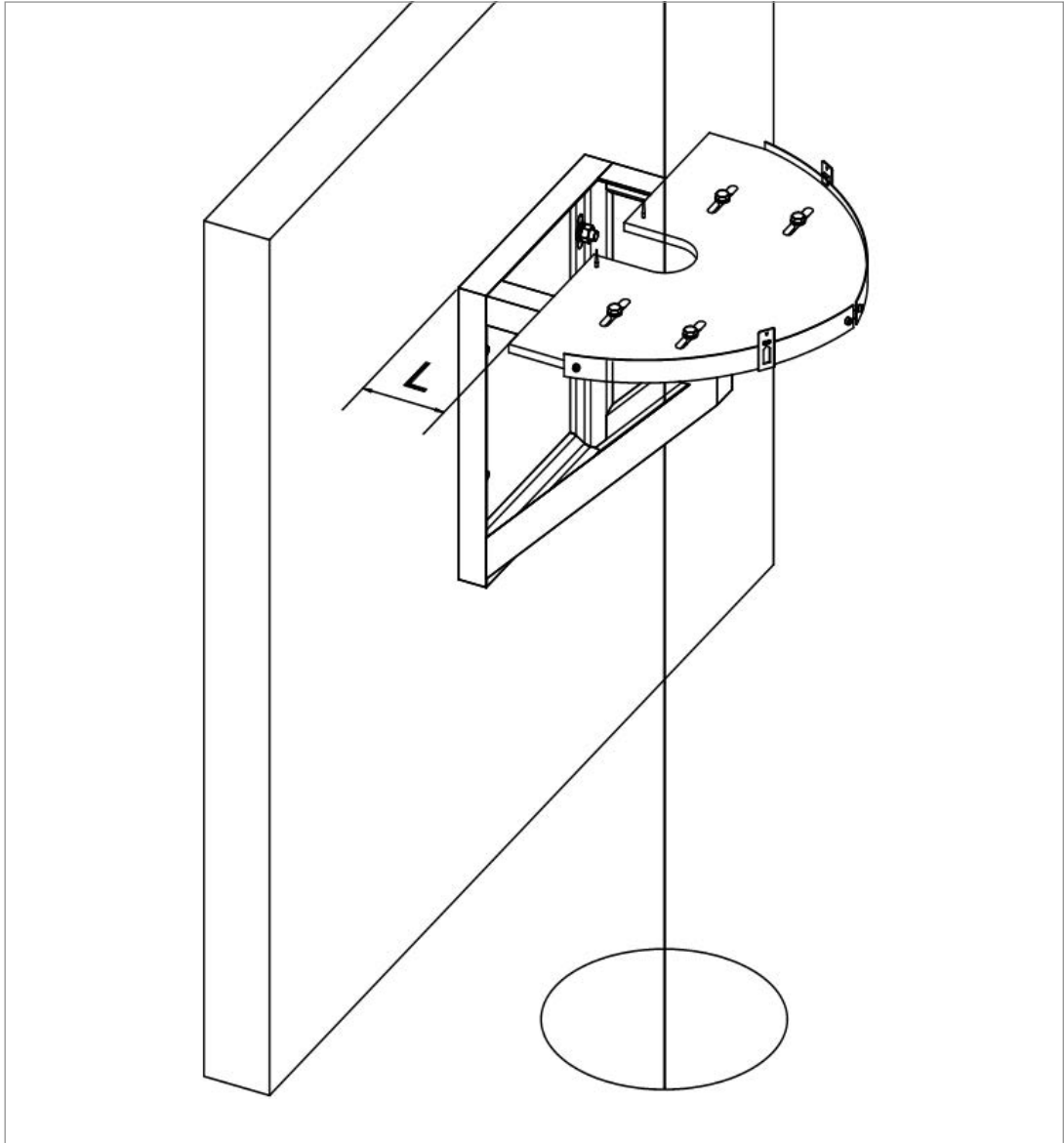


FIGURE 4: Schematic Drawing for Wall Mounting

At the time of mounting, consideration should be given to the distance (M) of the plumb wire away from the wall. The bracket (as shown in Figure 5) is designed so that $M = (L + 73 \text{ mm})$. Dimensions D and H depend on the distance from the plumb wire to the wall, which also determines the width and height of the bracket. Dimension W corresponds with the hole spacing on the manual sighting and reading table. The top height of the bracket should be approximately 1.5 m (5') from the floor to facilitate operation.

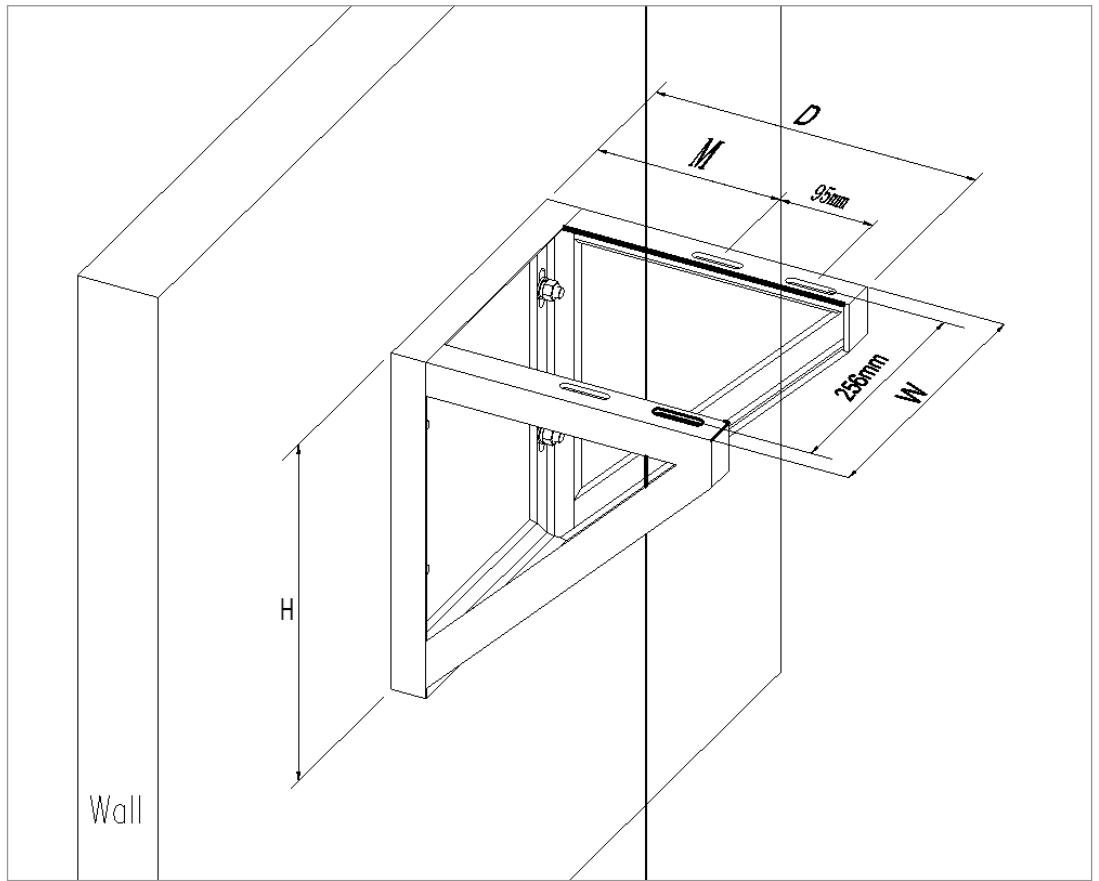


FIGURE 5: Schematic Drawing of Bracket Dimensions

3. OPERATION

1. Remove the cover protecting the base plate surface.

Note: The base plate should be kept covered when not in use.

2. Referring to Figure 6, move the right sliding sight (A1) so that when looking through the hole in the sight, the pendulum wire lines up with the left front sight (A). Read and record the reading on the steel rule to the nearest millimeter.
3. Move the left sliding sight (B1) so that when looking through the hole in the sight, the pendulum wire lines up with the right front sight (B). Read and record the reading on the steel rule to the nearest millimeter.

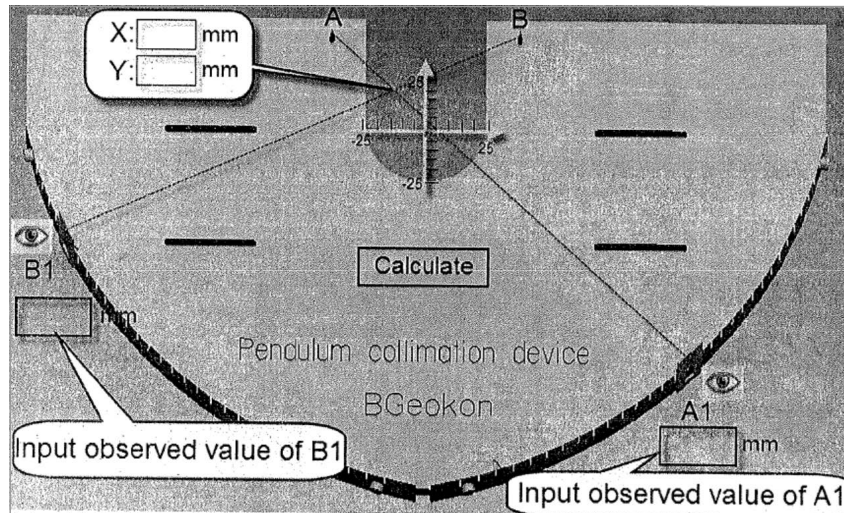


FIGURE 6: Showing the Collimation Process

4. The calculation of the X and Y coordinates is done through the [Pendulum Collimation Software](#). In the software, enter the values of A1 and B1 in millimeters and then touch the 'calculate' icon. The X and Y coordinates will appear in the center of the screen.



Software

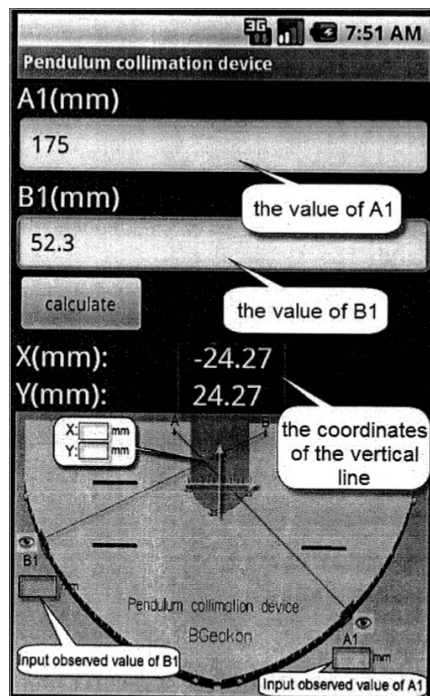


FIGURE 7: Screenshot of the Android Software Output

4. DATA REDUCTION

An alternative way to calculate the X Y coordinates is to calculate the following equations manually:

1. Let 'The scale reading B1(mm)' = B1 , 'The scale reading A1(mm)' =A1
2. Let $\theta = 0.23539256$ (rad)
3. Define k_1 and k_2 , where:

$$k_1 = -\tan\left(\theta + \frac{340 - A1}{300}\right)$$

$$k_2 = \tan\left(\theta + \frac{B1 - 10}{300}\right)$$

4. Calculate output

Coordinates X (mm):

$$X = \frac{56(k_1 + k_2)}{k_2 - k_1}$$

Coordinates Y (mm):

$$Y = 56 + \frac{112 \times k_1 \times k_2}{k_2 - k_1}$$

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