

Distance Measurement Device

User Guide

1 Overview

This device estimates distances using geometric principles with a folding ruler and string setup. Best accuracy is achieved when measuring objects significantly above or below eye level.

2 Required Equipment

- Folding ruler - fully extended
- Circular string (neck loop)
- Long measuring string
- Distance measurement software

3 Software Operation

3.1 Input Values

Enter these measurements into the program:

- **Relative Height:** Vertical offset to target (+ above, - below eye level)
- **Apparent Height:** Ruler reading where target appears
- **Observation Height:** Your measured eye height

3.2 Procedure

1. Start distance measurement program
2. Click "*Use the Model*"
3. Input three measurements
4. Receive distance estimate

4 Measurement Steps

4.1 Step 1: Initial Setup



1. **Extend** the ruler to full length
2. **Place** circular string around your neck
3. **Step on** the end of the long string

The setup creates the foundation for accurate measurements. Ensure stable footing throughout.

4.2 Step 2: Position Measuring Rod



1. **Insert** ruler through neck string
2. **Push** ruler away from body as far as possible
3. **Let hang** vertically, touching the ground
4. **Hold** the foot string at eye level

Critical: The ruler must hang perfectly vertical for accurate readings.

4.3 Step 3: Target Object Measurement



1. **Locate** your target object
2. **Choose** optimal angle: far above/below eye level
3. **Sight** the target along the ruler
4. **Read** height marking where target appears

Tip: For trees, aim for tip or base - choose the larger vertical offset from eye level.

4.4 Step 4: Eye Height Measurement



1. **Maintain** string position at eye level
2. **Measure** string length on ruler
3. **Keep foot** on string end throughout

This measurement determines your observation height - essential for accurate calculations.

5 Best Practices & Common Errors

Optimal Conditions:

- Target far above/below eye level
- Clear line of sight
- Stable, windless conditions
- Consistent string tension

Common Errors:

- Non-vertical ruler position
- Moving between measurements
- Ignoring vertical target offset
- Inconsistent string handling

Technical Notes: Uses similar triangles and machine learning corrections. Results are approximations - verify when precision is critical.

For technical details, refer to `distance.py` source code.