19B/ENGLISH

Wndsn XPD

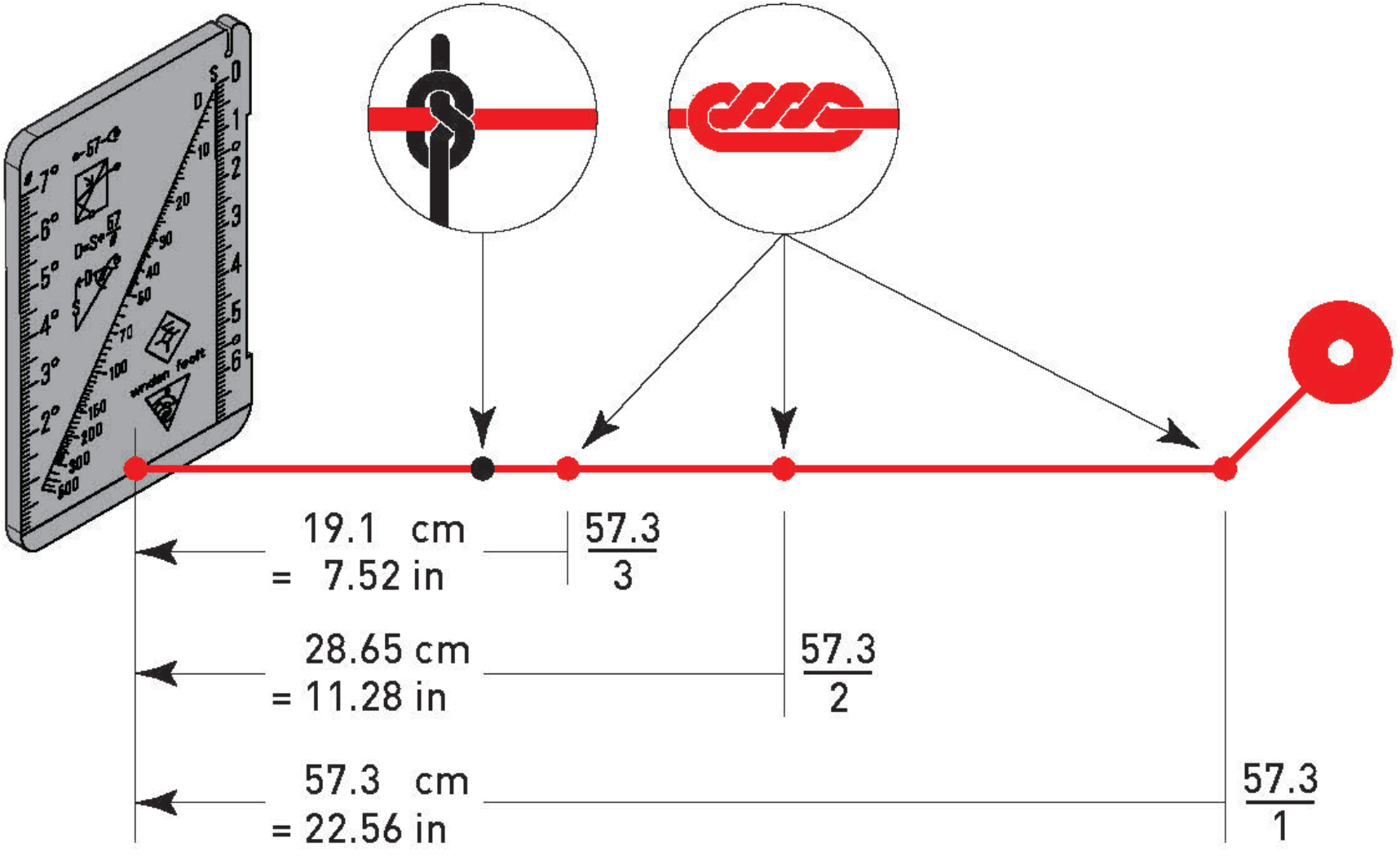
Quadrant Telemeter 7x7x500q90i30

wndsn.com · info@wndsn.com

HOW TO SET UP THE TELEMETER

To install, knot the string through the provided hole. Measure a length of **exactly 57.3 cm (22.44 in) from eye to hole**. You can make a knot at the end or a loop; for measuring distances, hold onto the string with your teeth.

For measurements above 7°, **prepare the string with knots at 57.3/2 cm and 57.3/3 cm**. Now, if you need to measure larger or closer objects, hold the instrument at the /2 knot and the engraved 7° becomes 14° (7x2); held at the /3 knot, the engraved 7° becomes 21° (7x3).

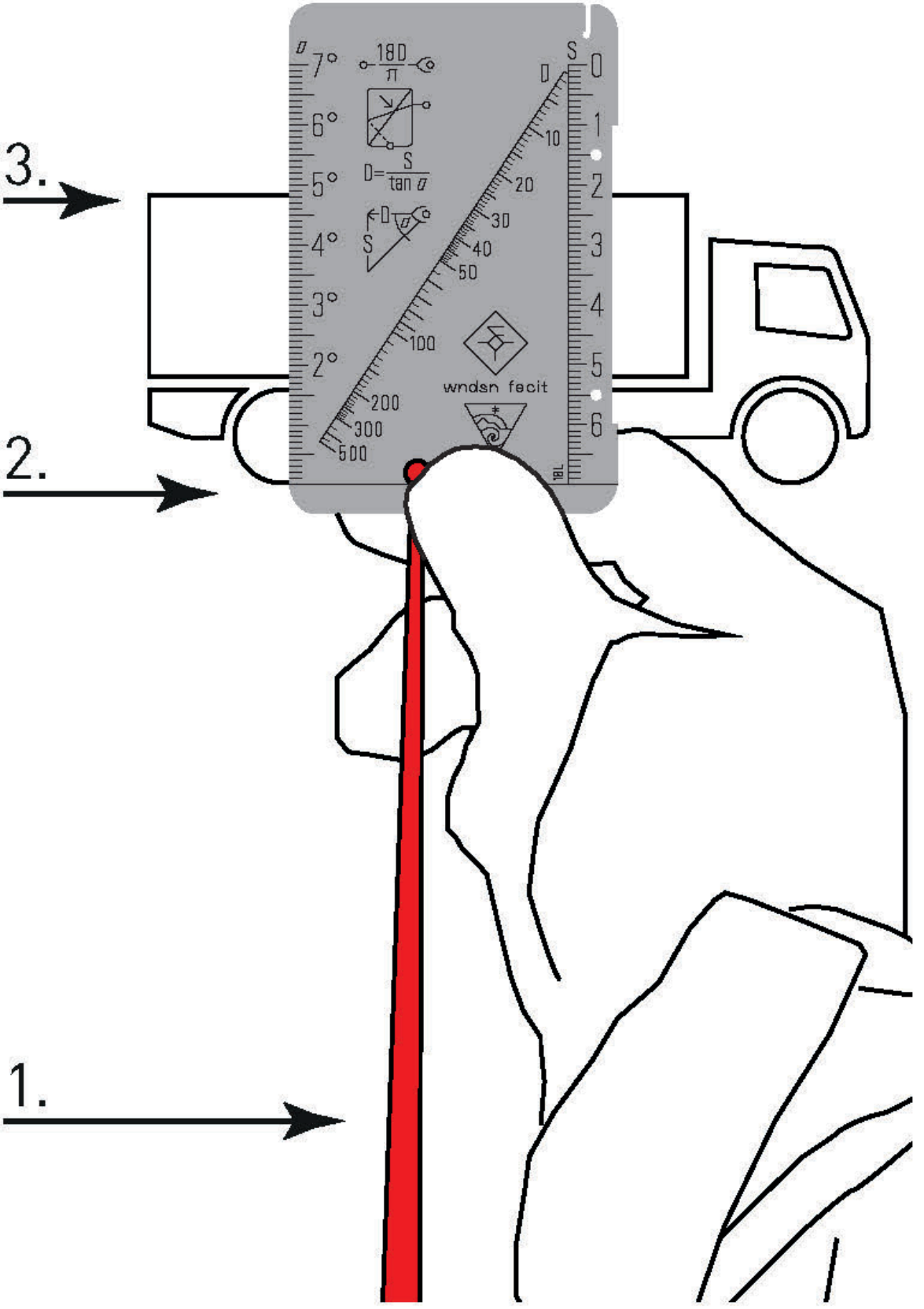

19.1 cm
= 7.52 in
57.3
3
28.65 cm
= 11.28 in
57.3
2
57.3 cm
= 22.56 in
57.3
1

TELEMETER OPERATION 1

1. **Keep the string taut**, for a distance of 57.3 cm from eye to object.

2. Align the **instrument's baseline to the base of the object** to be measured.

3. On the α scale, read the **angular size at the upper bound of the object**.


3.
2.
1.
7°
6°
5°
4°
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0
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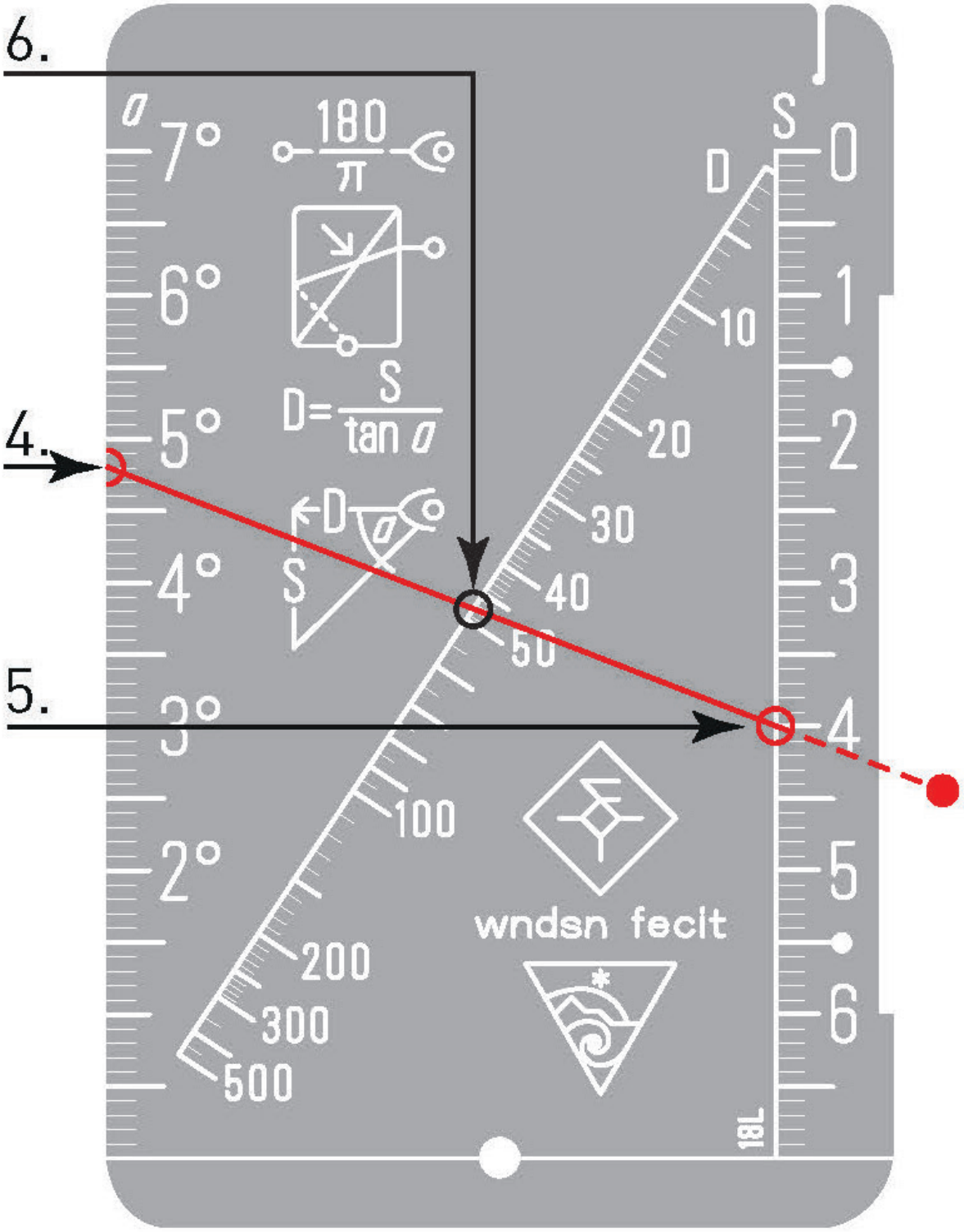
6
18L


6.
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TELEMETER OPERATION 2

4. Take down the instrument and now **align the string with the determined value on the α scale**.

5. On the S scale, **align the free end of the string to the known height**.

6. On the D scale, **read the distance where the string crosses the scale**.

Example: The object measured is **≈ 4.8°** high; the known height of the object is **4 m**; we read on the D scale a distance of **≈ 48 m**.

For **high-precision calculations**, use: tycho.wndsn.com

UNITLESSNESS

Note that **you can measure in any unit** (cm, in, ft) or system (metric, imperial, custom), the factors are always the same and return your **distance in the same unit you used to approximate the object size**.

ACCURACY

Accuracy is determined by two elements, provided that the string length is respected; the **reading of the scale and approximation of the corresponding mark**, and the **estimation of the height of the measured object**. For training and reference purposes, you may want to create a **table with the exact heights** of common objects.

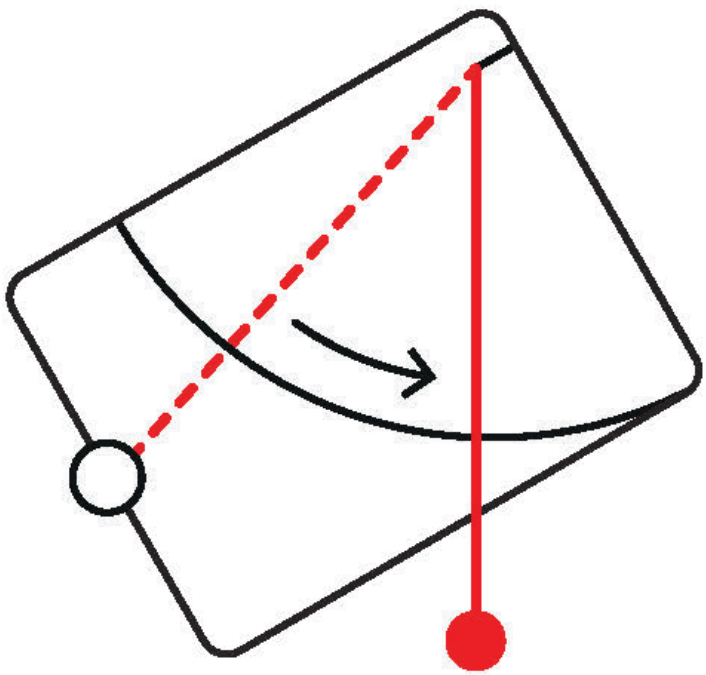
SCALE JUMPS

For measurements that are off the scales or **to make use of the finer ranges of the logarithmic center scale**, it is sometimes necessary to shift decimal points or jump the scales for more precise measurements. This means, if the input value (left hand or right hand scales) is off the scale, **divide by an arbitrary value to fit the scale and multiply the result by that same value**.

- If the input is off the scale: shift power of 10
- If powers of 10 are impractical: divide or multiply by an equal factor on both sides

HOW TO SET UP THE QUADRANT

Use the **Telemeter string** with the weight and **run it through the slot** at the top left.



To establish the measurement, ensure that the string hangs freely, and **read the mark where the string crosses the appropriate scale**.

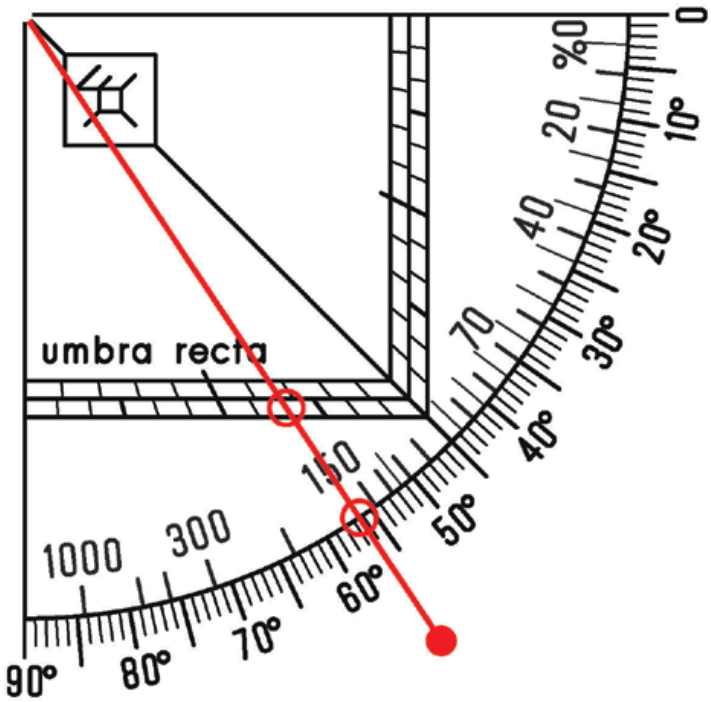
SCOPE OF THE INSTRUMENT

With the α scale on the **front side of the Telemeter, we can measure angles between two arbitrary points**, both of which have to be visible at the same time.

With the **quadrant as well as the inclinometer on the back side, we measure angles relative to the perpendicular** which the plumb line provides. Thus, if we know the height of a landmark, and we know that we are on the same level as that landmark, we can determine its angular height by simply sighting its highest point. We can **then use the nomograph on the front side** for distance calculations.

SHADOW SQUARE OPERATION

The shadow square is used for surveying and to **determine ratios of height or distance** (the tangent of the angle).



If you are 6 ft tall and your shadow is 4 ft long, **what is the altitude of the sun?** By moving the string to the 8 (4/6 = 8/12), we can read on the degree scale that the sun is at an altitude of about 56° (arctan(1.48) = 56°).

QUADRANT OPERATION

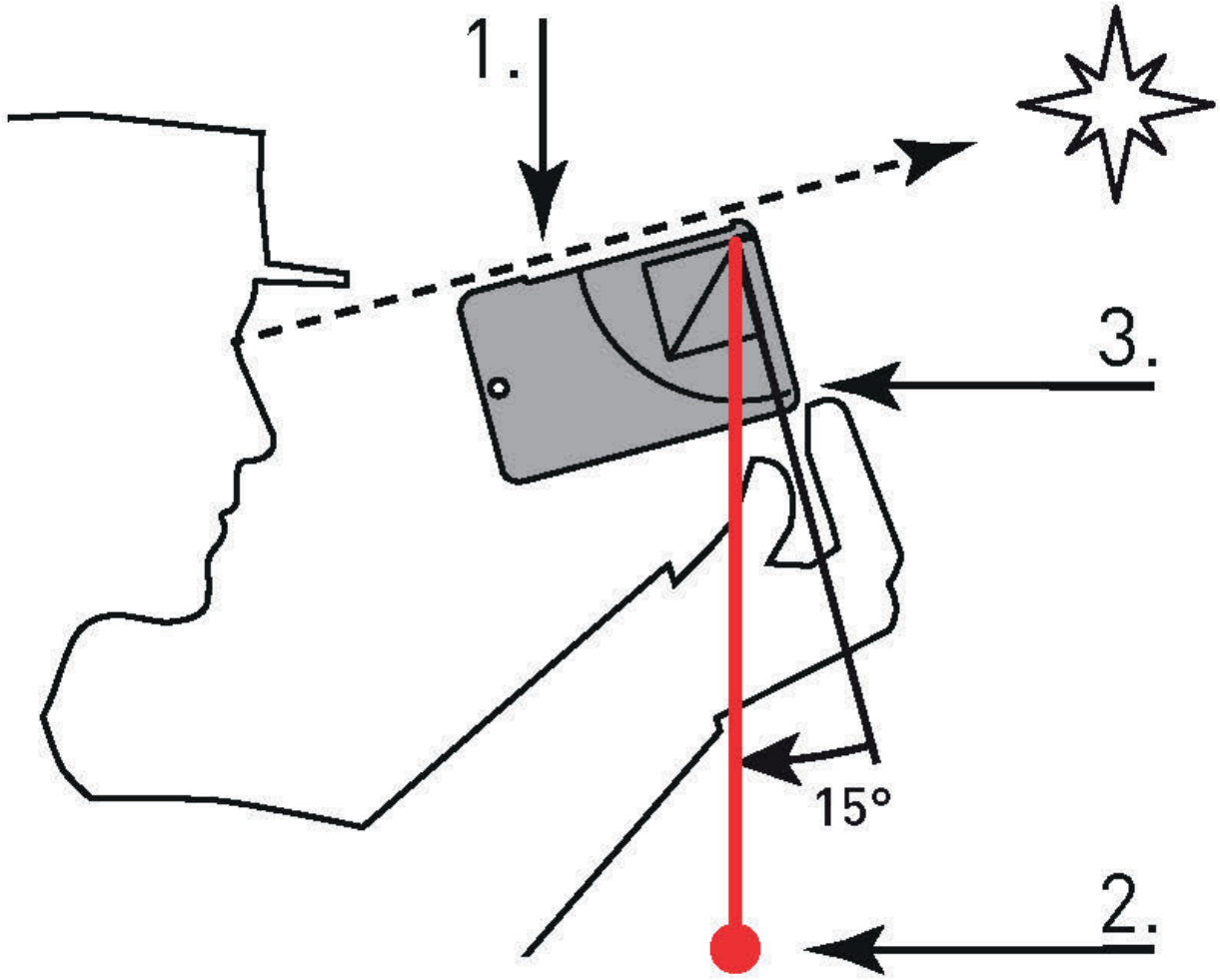
1. **Align** near and far part of the sighting edge with the object to be measured.

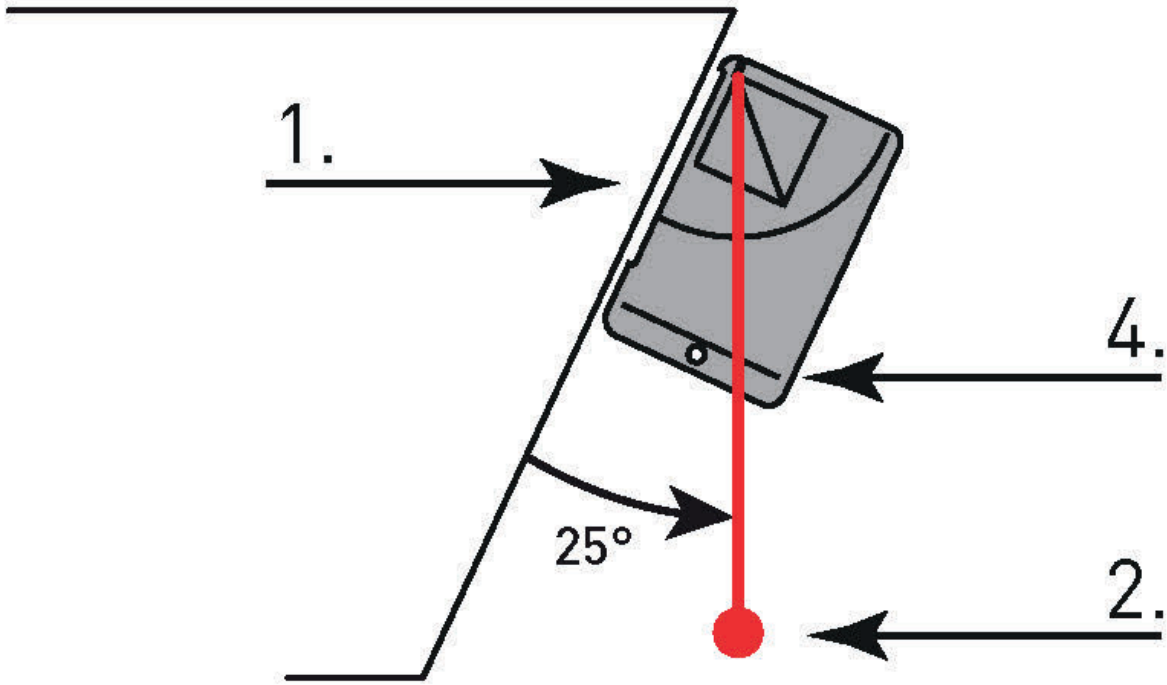
2. **Steady** the string and let it hang freely and perpendicular.

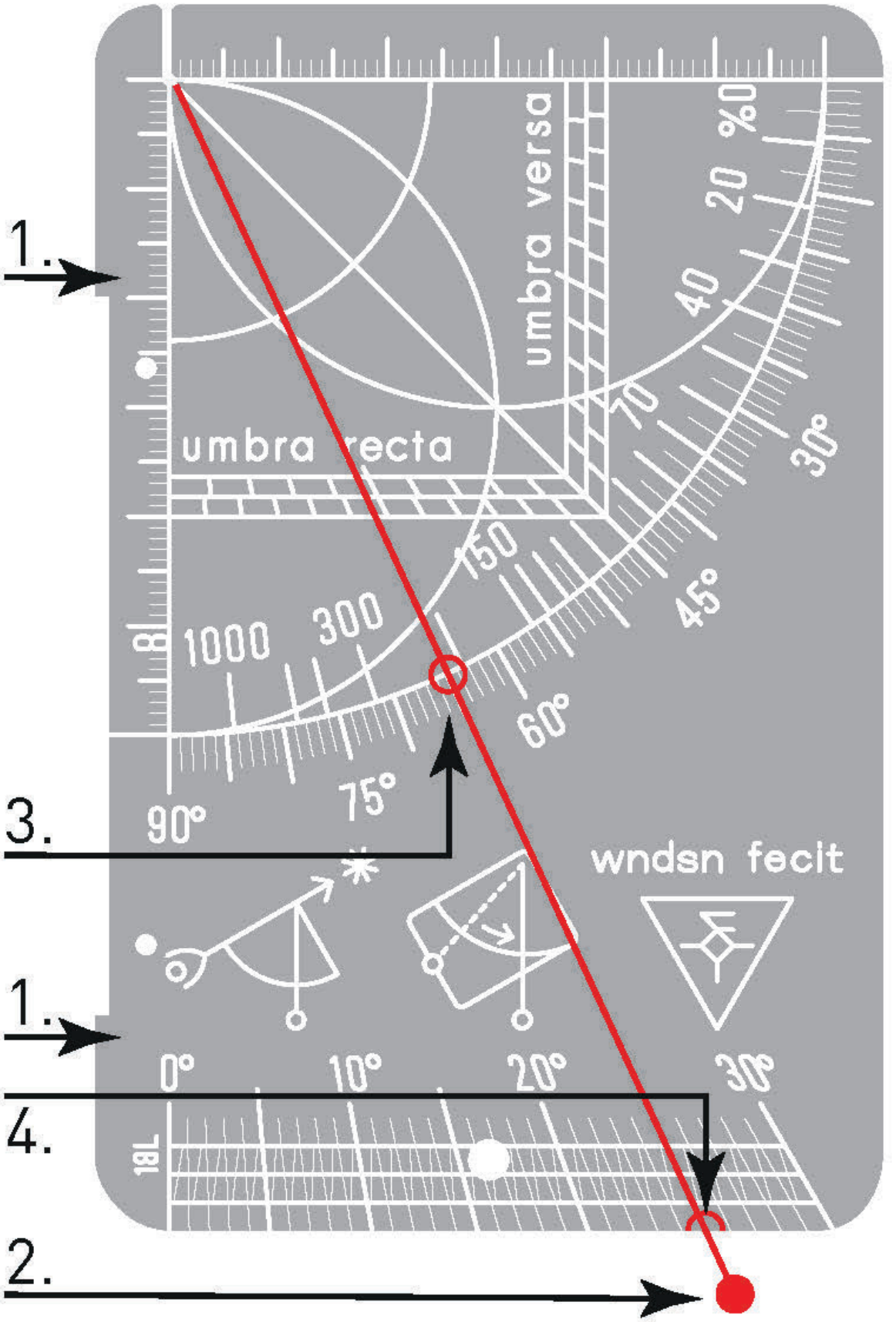
3. On the quadrant scale, **read** the angular size (or altitude) of the object.

3. **Alternatively**, on the slope scale, you can read the percentage of slope.

Please see telemeter.wndsn.com for **in-depth tutorials**.


1.
3.
15°
2.


1.
4.
25°
2.


1.
3.
1.
4.
2.
umbra recta
umbra versa
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90°
75°
60°
45°
30°
1000
300
150
70
40
20
%0
0°
10°
20°
30°
18L

INCLINOMETER OPERATION

1. **Align** the left-hand side of the quadrant with the tangible object to be measured.

2. **Steady** the string and let it hang freely and perpendicular.

4. On the inclinometer scale, **read** the degrees from vertical.

Note that while the **quadrant measures the degrees (or percent) from horizontal**, the **inclinometer measures the degrees from vertical**.