

Worm Gear Ratio of Model 520 Geodetic Platform Tiltmeter Legs

Tech Note

Gear Ratio of the Worm Gear Legs

To level the X- and Y-axes of the Model 520-W Geodetic Platform Tiltmeter, the user turns a knob that raises or lowers an invar screw by means of a worm gear assembly. One complete 360° turn of the knob turns the screw by 6°, or 1/60 of a revolution. The ½-inch diameter screw has a pitch of 40 threads per inch, so that one revolution of the knob raises or lowers the screw by: $1/60 \times 1/40$ inch = 1/2400 inch = 0.0106 mm.

The invar screw on each axis is exactly 200 mm from the stationary pivot point in the corner of the tiltmeter. The tilt change produced by a full revolution of the knob is therefore:

$$0.0106 \text{ mm} / 200 \text{ mm} = 0.000053 = 53 \text{ microradians.}$$

The user easily can adjust the knob in steps of 10° or smaller.

A 10° turn of the knob is equal to:

$$53 \text{ microradians} \times 10^\circ / 360^\circ = 1.47 \text{ microradians.}$$

Conversion factor: 4.848 microradians = 1 arc second

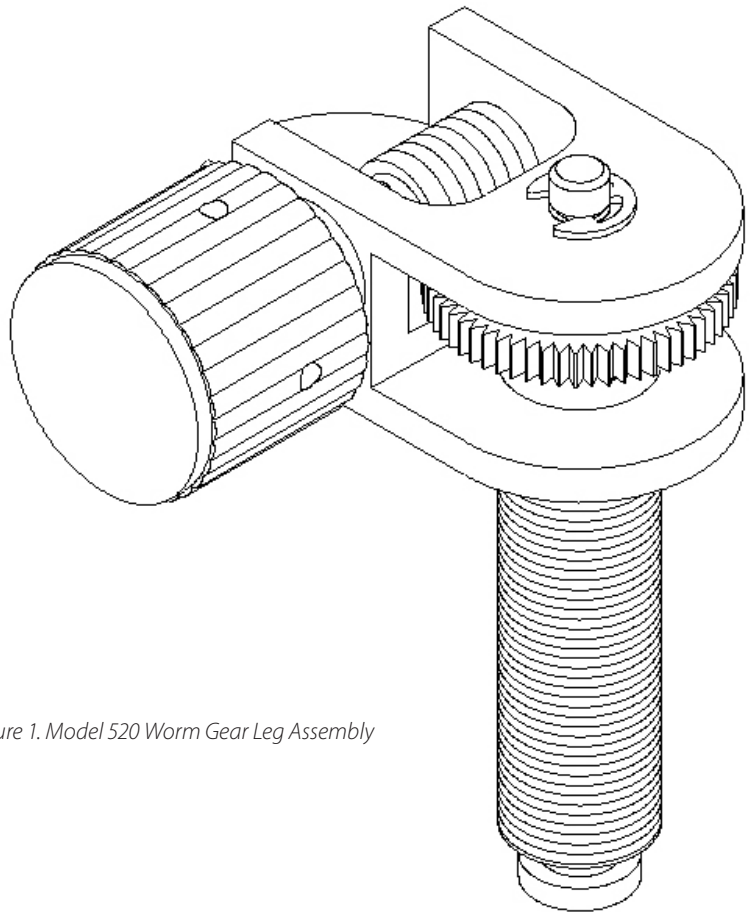


Figure 1. Model 520 Worm Gear Leg Assembly