



Inertial Tech Note:

Procedure for Leveling a Surface Using a Jewell Instruments Inclinometer

The following procedure shall be used to level a surface in two directions, left-to-right and front-to-back, using a calibrated Jewell Instruments inclinometer. The leveled surface shall be the standard for all normal production, calibration, and test applications. If a process calls for a level surface that is different than the standard, follow this procedure to make the surface level within the requirement given.

1. Power on the inclinometer that will be used to level the surface. When using an inclinometer having a range of $\pm 3^\circ$ or below, give the unit a minimum of 5 minutes of warm-up time before attempting to level the surface. The typical inclinometer used for leveling is a model LSOC-3.
2. Orient the inclinometer's input axis parallel with the leading edge of the surface (connector facing you); call this the "X" axis direction.
3. Record the output of the inclinometer; call this output voltage "X1".
4. Rotate the inclinometer 180° , the connector now facing away.
5. Record the output of the inclinometer; call this output voltage "X2".
6. Calculate $(X1+X2) / 2 =$ Inclinometer 0° DC Offset Voltage
7. Adjust the surface angle for the "X" axis clockwise or counterclockwise to equal the calculated 0° DC offset voltage from step 6.
8. Orient the inclinometer's input axis parallel with the surface's front to back edge (connector to the right); call this the "Y" axis direction
9. Record the output of the inclinometer; call this output voltage "Y1".
10. Rotate the inclinometer 180° , the connector now facing left.
11. Record the output of the inclinometer; call this output voltage "Y2".
12. Calculate $(Y1+Y2) / 2 =$ Inclinometer 0° DC Offset Voltage
13. Adjust the surface angle for the "Y" to equal the calculated 0° DC offset voltage from step 12.
14. Repeat steps 2 thru 13 until the calculated 0° DC Offset Voltage from the inclinometer is equal to or less than 0.003° in both "X" and "Y" axis directions, to satisfy the condition:
Surface Level $\leq 0.003^\circ \leq \arcsin(\text{DC Offset Voltage} / \text{SF})$, where SF = Scale Factor of the inclinometer used.

