

DXL360/S

Dual Axis Digital Inclinerometer User Guide



DXL360/S Series High-precision digital inclinometers for professional horizontal tilt measurement based on gravity reference. **The DXL360S** model features an exclusive gyroscope function, enabling realtime attitude angle detection with initial spatial attitude reference. Built with advanced MEMS technology and optimized compensation algorithms, the devices deliver stable, reliable measurement performance and excellent repeatability.

The DXL360S achieves the best accuracy of 0.05° , a resolution of 0.01° , can adopt 3 types of measurement unit display (degree, mm/m, slope), The exclusive gyroscope function (GYRO) can measure the relative included angle between any planes without environmental restrictions, with a gyroscope measurement accuracy of $\pm 0.5^\circ$. Supports wired and wireless data transmission. **DXL360** to achieve the best accuracy of 0.1° , resolution of 0.02° , can be adopted in 2 types of measurement unit display (degree, mm/m). Supports wired data transmission.

DXL360/S Supports $4 \times 90^\circ$ single axis measurements, $\pm 40^\circ$ dual axis measurements, powerful magnetism on bottom and rear measurement reference surfaces, and V-groove design for easy placement on round tubes for measurements. The DXL360/S is widely used in machinery manufacturing, automotive repair, the medical industry, wood processing, communications inspection, interior design and other fields. The DXL360/S is widely appreciated by customers around the world for its rich functions and practicality.

FEATURES

- DXL360S: High accuracy $\pm 0.05^\circ$ High resolution 0.01°
DXL360: High accuracy $\pm 0.1^\circ$ High resolution 0.02°
- Single-axis and dual-axis tilt angles can be measured.
- Monochrome backlight LCD display with 360° auto flip readout for easy viewing.
- Built-in lithium battery charging.
- The V-groove of shell can be easily placed on corners and round pipes.





- Magnets on the back and all around.
- Audible alarming at settable angle range.
- Gyroscope function can measure the angle between any planes in space. (*DXL360S only)
- Wired data transmission with PC; DXL360S also supports wireless data transmission with mobile phones.





SPECIFICATIONS

Model	DXL360S	DXL360
Measurement Accuracy:	*After Calibrated	
0° to 20°, 0° to -20°	±0.05°	±0.1°
20° to 70°, -20° to -70°	±0.1°	±0.2°
70° to 90°, -70° to -90°	±0.05°	±0.1°
Measuring Range	Single axis: 4 x 90°	Dual axis: ± 40°
Resolution:	0.01°	0.02°
Gyro Accuracy	± 0.5°	---
Gyro Resolution	0.1°	---
Gyro Rotation Speed	<90°/s	---
Display Response Time	<0.4 s	
Audio Sound	75dB@10cm	
Zero offset drift angle per °C	0.0058° (Typical)	
Operating Temperature	0 to 50°C	
Storage Temperature	-10 to 60°C	
Use Interface	Mono-color LCD with backlight	
Supply Power	Rechargeable Li-Polymer 3.7V	






Charger Port	DC 5V 1A Type-C Interface	
Standby Power Consumption	35uA	
Operating Power Consumption	42mA	50mA
Standby Battery Life	2000hours	
Operating Battery Life	15 hours	13 hours
Dimensions (LxWxH)	2.8"x2.8"x1.1" (70x70x28mm)	
Magnetic Base	Set on the four corners	
Magnetic Strength	N52	
Weight	4.6oz (130g)	






BUTTON FUNCTIONS

Button	Function Descriptions	
	Normal Mode	Menu Mode
 Power	This key is primarily used to turn the inclinometer on/off. Press the key to turn it on and press it again to turn it off.	Serves as the escape key at menu mode.
 Buzzer	<p>Function 1: In horizontal measurement mode, short-press this button. The screen displays the icon , and the measured value is reset to zero, indicating entry into relative measurement mode, with the current angle set as the zero measurement plane. In gyroscope mode, short-press this button to clear the gyroscope value.</p> <p>Function 2: Long-press for three seconds to enable or disable the beep function. A small speaker icon  will be shown on the LCD. The buzzer alarming could be set for any angle. For detailed instructions, please refer to section ANGLE ALARMING.</p>	Serves as the upward key at menu mode.

 <p>HOLD</p> <p>Degree mm/m %</p>	<p>Function 1: Short-press this button, the icon  flashes, indicating that the current measurement reading is locked.</p> <p>Function 2: Long-press for 3 seconds to cycle through the following measurement units DXL360S: (1) Degree [°] (2) Millimeter per Meter [mm/m] (3) Slope [%] DXL360: (1) Degree [°] (2) Millimeter per Meter [mm/m]. Facilitating unit conversion for users in different industries.</p>	<p>Serves as the downward key at menu mode.</p>
 <p>SET</p> <p>Menu</p> <p>(*DXL360 only)</p>	<p>Long-press for three seconds to enter the menu mode, you can set the parameters.</p>	<p>Serves as the</p>
 <p>GYRO SET</p> <p>Menu</p> <p>(*DXL360S only)</p>	<p>Function 1: Short-press this button to enter gyroscope mode. In gyroscope mode, short-press this button again to exit gyroscope mode.</p> <p>Function 2: Long-press for three seconds to enter MENU mode, you can set the parameters.</p>	<p>confirmation key at menu mode.</p>

LCD ICONS REPRESENTATIONS

	<p>Battery status indication icons. These icons indicate the battery level. There are 3 levels representing empty, half and full.</p>
	<p>Degree mode. Default measurement mode of the instrument.</p>
	<p>Millimeter per meter mode. Converts the degree to the vertical height corresponding to a 1-meter inclined plane, in millimeters.</p>
	<p>Slope mode. Commonly used in pipeline measurement, using tangent function calculation. (*DXL360S only)</p>
	<p>Buzzer alarm function. The icon appears to turn the buzzer alarm on and disappears to turn the buzzer off.</p>

	Press the ZERO key to set the current angle to zero degrees and use this as the horizontal reference. All angles displayed are relative.
	In dual-axis mode. The LCD will display the current icon. It will simulate a dual-axis angle and display the tilt direction.
	In single-axis mode. The E-bubble indicates the direction of the current angular tilt.
	Dual-axis measurement mode. Both the X and Y axis angle will be showed. Dual axis mode measures inclination up to $\pm 40^\circ$ for each axis before it automatically switch to single axis mode.
	Single-axis measurement mode. Measure slope up to $\pm 90^\circ$. The E-bubble indicates the direction of the current angular tilt. As shown in the figure, the current angle is tilted to the left.

RELATIVE/ABSOLUTE MEASUREMENT

Relative Measurement

LCD Icon: 

Absolute Measurement

LCD Icon: **Blank**

Relative and Absolute Mode Switching:

1. Press the **ZERO** button to set the relative zero point and enter the relative angle measurement mode.
2. Press the **ZERO** button again to cancel the relative zero point and return to the absolute angle measurement mode.

HOLD FUNCTION

Holding Mode:

LCD Icon blinking: 

Holding Function:

1. Press the **HOLD** button, and the current measured value will be locked on the display screen.
2. Press the **HOLD** button again to cancel the value lock function.

BATTERY/AUTOMATIC SHUTDOWN

The inclinometer is powered by a 3.7V rechargeable lithium battery. Please charge it with a compliant DC 5V 1A Type-C charger.

The battery icon on the LCD screen blinks when the power is turned on for charging. When the inclinometer is idle for half an hour, it will automatically shut down. The automatic shutdown function can also be canceled by the following operation.

Auto Power-off Time Setting:

1. Long-press the **SET** button for 3 seconds to enter the menu.
2. Use the **ZERO** and **HOLD** buttons to move the cursor, select the *Power* option, and press **SET** to enter.
3. Use the **ZERO** and **HOLD** buttons to select either *Never or 30Min.*
4. Press **SET** to confirm the selection.

RESTORE FACTORY SETTINGS

The unit can be restored Factory Settings when the unit becomes abnormal. All calibration setting will be restored to factory setting. *Not suggest restoring to factory setting in normal status. For accuracy drift, please calibrate the inclinometer. After factory set, please redo calibration to ensure the accuracy.

Restore to Factory Setting:

1. Long-press the **SET** button for 3 seconds to enter menu mode.
2. Use the **ZERO** and **HOLD** buttons to move the cursor, select the *FACTORY SET* option, and press **SET** to confirm entry into the setting.
3. Use the **ZERO** and **HOLD** buttons to select *Yes or No.*
4. Press **SET** to confirm your current selection.

LANGUAGE SETTING

The language of the display menu can be switched to Chinese or English by the following operation.

1. Long-press the **SET** button for 3 seconds to enter menu mode.
2. Use the **ZERO** and **HOLD** buttons to move the cursor and select the Language Settings option.

3. Press **SET** to switch the menu language between Chinese or English.

ANGLE ALARMING

Alarming Mode: LCD Icon: 

Alarming Angle Setting:

1. Long-press the **SET** button for 3 seconds to enter menu mode.
2. Use the **ZERO** and **HOLD** buttons to move the cursor, select the **ALARM** option, and press **SET** to enter the alarm angle setting interface. Press and hold the **ZERO** or **HOLD** buttons to scroll through values quickly.
3. Press **SET** to confirm the current setting.

SINGLE AXIS	Reference angle value for triggering the buzzer alarm in single-axis measurement mode.
DUAL AXIS X	X-axis reference angle value for triggering the buzzer alarm in dual-axis measurement mode.
DUAL AXIS Y	Y-axis reference angle value for triggering the buzzer alarm in dual-axis measurement mode.
RANGE	Sets the alarm offset range relative to the reference angle value.
TRIGGER AREA	<i>INSIDE</i> (alarm is triggered when the angle is within the calculated range) or <i>OUTSIDE</i> (alarm is triggered when the angle is outside the calculated range).
Example	If the SINGLE AXIS angle is set to <i>20.00</i> and the RANGE is set to <i>01.00</i> , with the TRIGGER AREA mode set to <i>INSIDE</i> , the instrument will trigger the buzzer alarm when the inclination angle is within $+19.00^{\circ}$ to $+21.00^{\circ}$ or -19.00° to -21.00° .

MEASURING DATUM

The inclinometer supports automatic switching between single-axis and dual-axis measurement modes. The operating specifications are as follows:

Single-axis Measurement:

Take the **bottom of the instrument** as the reference plane, and vertically attach the instrument to the measured surface for measurement.



Dual-axis Measurement:

Take the **back of the instrument** as the reference plane, and lay the instrument flat against the measured surface for measurement.



The measurement reading is the result of contact between the reference plane and the measured surface. Do not use other surfaces of the instrument for object measurement.

LEVEL ACCURACY CHECK

Quick Accuracy Self-Check Steps for Inclinometer

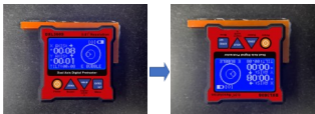
Step 1: Select a **flat marble reference surface** and ensure a stable ambient temperature without fluctuations. Place the inclinometer steadily on the surface. After the readings stabilize, record the current values as **X1, Y1**.

Step 2: Keep the bottom surface of the inclinometer attached to the surface, **rotate it 180°**, and **place it back in the original position**. After the readings stabilize, record the values as **X2, Y2**.

Step 3: Zero offset error: $E_x = (X1 + X2) / 2$, $E_y = (Y1 + Y2) / 2$,

If $E \leq$ the calibrated accuracy range of the product, the accuracy is qualified. If $E >$ the calibrated accuracy range, the accuracy is abnormal, and horizontal accuracy calibration is required.

*Averaging errors from multiple measurements eliminates accidental errors; Accuracy errors may be caused by worn or uneven datum surfaces, large temperature changes (5 to 10°C), or the instrument being dropped or subjected to heavy external impact.



CALIBRATION PROCEDURE

Step 1: Long-press the **SET** button for 3 seconds to enter menu mode, select the *LEVEL CAL.* option, and press **SET.**(**FIG.A**) Place the inclinometer on a roughly flat horizontal surface. The LCD will display *DUAL AXIS CALIBRATION*; press **SET**. The buzzer will sound—keep the inclinometer stable and wait for the buzzer to stop. (**FIG.B**)

Step 2: Rotate the inclinometer 180° clockwise and place it in the same position.(**FIG.C**) Press **SET** again and wait for the buzzer to stop. (**FIG.D**)

Step 3: The LCD will display *SINGLE AXIS CALIBRATION*. Place the inclinometer vertically (the calibration program has a position error prevention function). Press **SET** again and wait for the buzzer to stop. (**FIG.E**) Rotate the inclinometer 180° clockwise in its current state and place it in the same position. (**FIG.F**) Press **SET** again and wait for the buzzer to stop. (**FIG.G**)

Step 4: The LCD will display *SINGLE AXIS CALIBRATION* (the calibration program has a position error prevention function). Place the inclinometer vertically on a relatively flat wall with the power button facing upward. Press **SET** again and wait for the buzzer to stop.(**FIG.H**)

Step 5: Rotate the inclinometer 180° and place it vertically in the same position on the wall (the power button must still face upward). (**FIG.I**) Press **SET** again and wait for the buzzer to stop. (**FIG.J**) At this point, the LCD should return to the menu display, indicating the calibration process is complete. Select the *RETURN TO MAIN PAGE* option and press **SET** to return to normal operation mode.

GYROSCOPE FUNCTION (*DXL360S only)

The gyroscope function measures the angle between two planes in space, independent of Earth's gravity.

Enter Gyroscope Mode:

Short-press the **GYRO** button to enter gyroscope mode.

Gyroscope Zero Reset: In gyroscope mode, short-press the **ZERO** button to reset the current measured value to zero.

Exit Gyroscope Mode: In gyroscope mode, short-press the **GYRO** button or the **Power** button to exit.

Measurement Points:

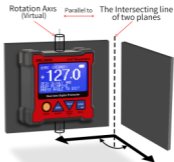
During measurement, keep the rotation axis parallel to the intersection line of the two measured planes, and rotate the instrument slowly around the rotation axis for measurement.

Angle Measurement on Any Surfaces

Example: Measure the included angle between two non-adjacent walls.

Step 1: Attach the back measuring surface of the DXL360S inclinometer to the measured wall A, and press the **GYRO** button to enter gyroscope mode. (Keep the rotation axis parallel to the intersection line of wall A and wall B)

Step 2: Keep the orientation of the rotation axis unchanged, rotate the inclinometer slowly. When the inclinometer is rotated to the measured wall B, the rotation angle displayed on the inclinometer is the included angle between the two walls.



GYROSCOPE CALIBRATION PROCEDURE (*DXL360S only)

Step 1: Place the DXL360S inclinometer on a relatively flat surface. Long-press the **SET** button for 3 seconds to enter menu mode. Use the **ZERO** and **HOLD** buttons to move the cursor to *GYRO CAL.*, then press **SET** to enter gyroscope calibration mode. (FIG.K-L)

Step 2: Pinch the inclinometer's rotation axis with your thumb and middle finger to lift it up, rotate it slowly 360° counterclockwise, place it back in the original position after rotation, and press **SET** to confirm. Rotate slowly to ensure accuracy. (FIG. M-P)

Step 3: Pinch the inclinometer's rotation axis with your thumb and middle finger again to lift it up, rotate it slowly 360° clockwise, place it back in the original position after rotation, and press **SET** to confirm. The gyroscope calibration is now complete. **(FIG. Q-T)**

COMMUNICATION

1. Parameters

Interface: Type-C

Baud Rate: 9600bps

Sampling Frequency: 100ms

Data Format: ASCII string

2. Transmission Method

Model	Connection Mode	Control Mode
DXL360	Wired	One-way Auto Transmission
DXL360S	Wires/Wireless	One-way Auto Transmission/ SCPI Command Control

3. Connection Instructions

- The communication protocol follows the basic serial port protocol and is compatible with standard virtual serial port drivers.
- Connect the device to a computer using a Type-C data cable with data transmission capability.
- DXL360S supports sending SCPI commands via wired or wireless connections for parameter configuration and working status control. The DXL360 supports a wired connection only.
- The pairing name of the DXL360S wireless device corresponds to the serial number printed on the back of the instrument.
- For the complete SCPI command set, please contact customer service. Ensure correct command formatting to guarantee proper functionality.

Horizontal Accuracy Calibration Procedure

FIG. A



FIG. B



FIG. C



FIG. D



FIG. E**FIG. F****FIG. G****FIG. H****FIG. I****FIG. J**

Gyroscope Calibration Procedure

FIG. K



FIG. L



FIG. M



FIG. N



FIG. O**FIG. P****FIG. Q****FIG. R****FIG. S****FIG. T**

SERVICE

E-Mail: support@jingyan.tech

Website: <http://www.jingyan-tech.com/>



Strong Magnetic Field



Warning or Caution



Read Instructions



Wear Approved Eye Protection